

MONITORING REPORT CHYULU HILLS REDD+ PROJECT



Document Prepared By



Contact Information

Project title	Chyulu Hills REDD+ Project
Project ID	1408
Version	3.5
Report ID	1
Date of issue	31-December-2020
Project location	Kenya, Makueni County, Taita Taveta County and Kajiado County
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Prepared by	South Pole Carbon Asset Management Ltd.
Validation/verification body	Aster Global
GHG accounting/crediting period	19-September-2013; 19- September-2043. 30-year lifetime
Monitoring period of this report	01 January 2017–31 December 2020

History of CCB status	This Project was validated under the 2nd edition of the CCB Standard with the Validation Statement being issued on the June 18, 2015, and the First Verification Statement being issued on September 21, 2017.
Gold Level criteria	The Chyulu Hills REDD+ Project qualifies for Gold Level certification because of the exceptional benefits it provides to the Climate, Community and Biodiversity aspects of the Project Area and Project Zone. Climate benefits include Project activities to improve and diversify agricultural practices, such as grass banks and mitigating the effects of prolonged and more intense droughts due to climate change, for instance, by providing water storage tanks for livestock and schools ; and the restoration/conservation of riparian areas around Mzima springs, a crucial water source that provides water for wildlife and supplies about 30% of the water for the city of Mombasa. In addition, local institutional capacity building and the protection of the natural ecosystem provide resilience in the community and natural systems to enable them to adapt to the effects of climate change. All Project Partners are improving their capacity for the implementation of the Project activities, with the Project Office providing overall coordination and administration. The Project utilizes a revenue sharing mechanism that ensures that revenue sharing is done through an open and transparent process that engages broad community input, with all groups being treated equally, regardless of social or economic standing. Furthermore, the Project provides community benefits in the form of revenue sharing, alternative livelihood development, jobs, sustainable infrastructure development, environmental awareness and support for the improvement of community social services, particularly health and education. Biodiversity benefits include protection and conservation of the many IUCN Red listed species within the Project Zone, including the Eastern Black Rhino, which is listed as an IUCN critically endangered species, the African elephant (<i>Loxodonta africana</i>), the lion (<i>Panthera leo</i>), cheetah (<i>Acinonyx jubatus</i>), the lesser kudu (<i>Tragelaphus imberbis</i>) and flora species, such as the Red Stinkwood (<i>Prunus africana</i>) and the Afrocarpus (<i>Afrocarpus africana</i>). The Project is taking place in alliance with museums and universities as well as NGOs's that support conservation and research on these important species of fauna and flora.

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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or impact	Achievements during the Monitoring Period	Section reference	Achievements during the Project Lifetime
Mitigation of negative effects due to prolonged and intense droughts.	Activities implemented in Mzima Springs which is a critical water source for Mombasa and towns such as Voi and Maungu that are supplied by the Mzima – Mombasa water pipeline. The springs are also one of the most significant tourist attractions in Tsavo West National Park. During this period, some areas were fenced to prevent bank erosion caused by wildlife, such as elephants, and allow recovery of vegetation. A water tank was also constructed to provide additional water for wildlife and restoration of degraded areas through tree planting was also undertaken. Watering points for livestock and wildlife in Mbirikani Ranch were constructed to reduce the distances travelled to access water, and to reduce rangeland degradation. A number of schools in the eastern community areas, linked to a bursary programme were provided with water tanks. And replacement water tanks were provided to schools where elephants had caused damage.	5	The REDD+ project has assisted local communities with water tanks for schools, hiring of water rangers to protect boreholes, and providing new latrines for schools. MWCT has a major initiative that is protecting and restoring an important spring that will protect the water table on which the local community depends. The Chyulu Hills form a significant aquifer and one of Kenya's so called "water towers". About 80% of the water from this catchment flows out through Mzima Springs. Some of this water is abstracted into a pipeline that provides about 30% of the water supply for the city of Mombasa. The REDD+Project is providing important protection for this nationally important watershed.
Empowerment of women and communities	The REDD+ project and partners have adopted equal opportunity for women and men. The CHRP has been working with the women in project design through their representation in various advisory committees. Project partners are strongly promoting the enrollment of girls in schools through the allocation of an equal number of school bursaries to boys and girls.	4	The REDD+ project and partners are adopting equal opportunity for women and men. The alternative income generating activities, such as craft and jewelry groups, is targeting marginalized groups, especially women, who

	Finally, the CHRP has developed Project Activities to engage with women's groups and help promote financial independence with projects like the grass seedbanks, beekeeping, and handicrafts.		have few other income activities available. The project is encouraging girls' enrolment in schools through the allocation of an equal number of school bursaries to girls and boys.
Human-Wildlife conflict mitigation	With the mitigation of human-wildlife conflict for predation of livestock, crop raiding and for community members accidentally killed by wildlife, the project is reducing reasons for retaliatory killing of wildlife. Interventions such as the use of fencing, rapid ranger response teams and monitoring of wildlife movements through reports on wildlife sightings have been deployed. Over the period the MWCT has paid about \$290,000 and BLF approximately \$ 240,000 in compensation for livestock losses caused by wildlife.	4 and 5	The Project partner have developed human-wildlife conflict databases and provides reports of incidents. Project partners continue to fund more than 50km of fencing to reduce human-wildlife conflict and help secure watering points. MWCT and BLF have significant ongoing programmes to provide community members with compensation for losses of livestock due to wildlife.
Protection of the wild population of the Critically Endangered (CR) black rhino (<i>Diceros bicornis</i>) inside the project area.	Tsavo West National Park has been one of the protected areas in Kenya with special initiatives to protect black rhinos through the Ngulia Rhino Sanctuary and Intensive protection Zone. Historically, the Chyulu landscape contained high population densities of black rhinos. The project area is part of the national strategic refuge areas with actions to enhance the management of existing populations through increased anti-poaching efforts and surveillance of resident populations. To date, black rhino populations have not increased from the last survey in 2017, but it is important to note that no rhino has been lost within the project area due to poaching. The general observed rhino population in the project area now stands at about 8 individuals. The sex ratio is about 2 adult males with 3 adult females, 2 sub adults male and female and a calf over the past three (3) years.	5	In 2013, black rhino population was estimated at 14 individuals. Three new calves were born in that year, though three rhinos were lost due to poaching. To protect the black rhino populations efforts in security and law enforcement have been implemented. For the last period, no black rhinos have been lost. Implementation of the SMART monitoring program and improving the capacities of the rangers.

Improvement of scientific capacity of the community	The community rangers and scouts are involved in security patrolling, the predator loss compensation programmes, collection of wildlife numbers and distribution data, and species research. The project has also provided opportunities for local community participation and skills development, for instance for the REDD+ tree plot sampling programme. 12 people from Kuku A, Kuku, Rombo, Chyulu East and Mbirikani ranches were trained in the standardised methodology of tree plot sampling and tree species identification. They worked together with botanists from National Museum of Kenya, University of Eldoret, University of Nairobi Herbarium, Kenya Forest Research Institute who provided plant taxonomy expertise. In this way the REDD+ project provided significant training, experience and local capacity building in field botanical survey and sampling methodologies and protocols.	5	Activities like patrolling, biomass survey, biodiversity monitoring are based on the improvement of knowledge of the members involved. 598 Rangers were working with all the partners in the year 2020, 521 in 2019, 532 in 2018 and 512 in 2017. The Zimba group that monitors biodiversity consist of 12 Maasai people.
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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 and removals	Net estimated emission removals in the Project Area, measured against the without-project scenario.	Not Applicable	-	Not applicable
	Net estimated emission reductions in the Project Area, measured against the without-project scenario.	3,139,694	3	5,172,696
Forest ¹ cover	For REDD ² projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario.	Data not available: the baseline emissions models predict cumulative emissions over time rather than a rate of ecosystem conversion in hectares per year.	-	Data not available: the baseline emissions models predict cumulative emissions over time rather than a rate of ecosystem conversion in hectares per year.
	For ARR ³ projects: Number of hectares of forest cover increased in the Project Area measured against the without-project scenario.	Not applicable	-	Not applicable
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.	Not applicable	-	Not applicable
	Number of hectares of non-forest land in which improved land management has occurred as a result of the Project's activities, measured against the without-project scenario.	Not applicable	-	Not applicable

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*).

Category	Metric	Achievements during Monitoring Period	Section reference	Achievements during the Project Lifetime
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of Project activities.	Total quantifiable information not available ⁵	-	-
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of Project activities.	Total quantifiable information not available ⁶	-	-
Employment	Total number of people employed in Project activities, ⁷ expressed as the number of full-time employees. ⁸	During the 2017-20 period, project partners have hired about 88 new jobs through REDD+ funding. These include teachers, ranges, scouts and guards, and school and healthcare ancillary staff In addition to new employment, the REDD+ Project has enabled some partners to maintain positions that otherwise would have been lost due to the impact of the	4	Across the project areas the project partners employ or incentivised over 500 rangers, 61 teachers and 5 community health workers

⁵ Quantifiable information not available, however, 775 bursaries for school children were provided, the developed work with women groups and opinion leaders, meetings of sensitization in the communities. Rangers and forest scouts were hired and formed from the communities. 14 community sexual reproductive health and rights forums were held. 5 community health worker (CHW) training seminars were held and attended by 56 CHWs. 247 women and 186 men attended a workshop on sexual and reproductive health/rights. Fire management equipment and response training were provided.

⁶ Quantifiable information not available, however, 247 women attended a workshop on sexual & reproductive health/rights. The work with women groups have been strengthened. The women's programs are developed with women to have resources to feed and give education to their children when husbands are either dead or sick and cannot work. Women's autonomy and rights are a far-reaching issue that the project want to address understanding the necessity for women to develop their all capacities. As a very important activity to highlight MWCT developed 3 anti-FGM (Female Genital Mutilation) Outreaches, 26 influencers were trained in this topic.

⁷ 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.

⁸ 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]).

Category	Metric	Achievements during Monitoring Period	Section reference	Achievements during the Project Lifetime
		COVID pandemic on fundraising		
	Number of women employed in Project activities, expressed as the number of full-time employees.	Total quantifiable information not available ⁹	4	Total quantifiable information not available
Livelihoods	Total number of people with improved livelihoods ¹⁰ or income generated as a result of Project activities.	1300 kg Grass seeds Harvested 900 kgs grass seeds sold (at 500 Ksh/Kg) 150 Hay bales sold 40 Beading items sold 830 beehives to promote community honey production	4	1300 kg Grass seeds Harvested 900 kgs grass seeds sold (at 500 Ksh/Kg) 150 Hay bales sold 40 Beading items sold 830 beehives to promote community honey production
	Number of women with improved livelihoods or income generated as a result of Project activities.	10 local women are in charge for each grass seedbank area. 10 local women work with bead jewelry. Beekeeping and handcrafts promoted with women to improve financial independence	4	10 local women are in charge for each grass seedbank area. 10 local women work with bead jewelry. Beekeeping and handcrafts promoted with women to improve financial independence
Education	Total number of people for whom access to, or quality of, education was improved as a result of project	25 school were supported, 775 scholarships were granted (19 are	4	25 school were supported, 775 scholarships were granted (19 are

⁹ The REDD+ project and partners adopted equal opportunity for women and men. The CHRP has been working with the women through their representation in various advisory committees. Also encouraging girls' enrollment in schools through the allocation of an equal number of school bursaries to boys and girls. Finally, the CHRP has developed Project Activities to engage with women groups and help promote financial independence with projects like the grasslands seedbanks (10 local women are in charge for each area), beekeeping and handcrafts.

¹⁰ 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.

Category	Metric	Achievements during Monitoring Period	Section reference	Achievements during the Project Lifetime
	activities, measured against the without-project scenario	active), 9467 students were enrolled (53% boys, 47% girls).		active), 9467 students were enrolled (53% boys, 47% girls).
	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	9467 students were enrolled, 47% are girls.	4	9467 students were enrolled, 47% are girls.
Health	Total number of people for whom health services were improved as a result of Project activities, measured against the without-project scenario.	44,171 patients were treated, 4,252 children were immunised, and 16,160 laboratory tests were done. ¹¹	4	44,171 patients were treated, 4,252 children were immunised, and 16,160 laboratory tests were done.
	Number of women for whom health services were improved as a result of Project activities, measured against the without-project scenario.	222 hospital births. 506 women received contraceptives for the first time. 68 girls received new sanitary pads and underwear. 247 women attended a workshop on sexual and reproductive health/rights	4	222 hospital births. 506 women received contraceptives for the first time. 68 girls received new sanitary pads and underwear. 247 women attended a workshop on sexual and reproductive health/rights
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.	Quantifiable information not available ¹²	-	Total quantifiable information not available

¹¹44171 Consultations, 16,160 lab test, 222 hospital births, 4,252 immunizations, 506 women received contraceptives for the first time, 68 girls received new sanitary pads and underwear. 14 community sexual reproductive health and rights campaign forums were held, 247 women and 186 men attended a workshop on sexual and reproductive health/rights.

¹² Quantifiable information not available, however, Kenya wildlife service and Kenya forest service developed the installation for of a new water point, provided community water tanks, water quality analysis were also developed,

Category	Metric	Achievements during Monitoring Period	Section reference	Achievements during the Project Lifetime
	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.	Quantifiable information not available	-	Total quantifiable information not available
Well-being	Total number of community members whose well-being ¹³ was improved as a result of Project activities.	70000 Maasai people impacted ¹⁴	4	70000 Maasai people impacted
	Number of women whose well-being was improved as a result of Project activities.	Quantifiable information not available ¹⁵	-	Total quantifiable information not available
Biodiversity conservation	Change in the number of hectares that are significantly better managed by the Project for biodiversity conservation, ¹⁶ measured against the without-project scenario.	410,533.84	3	410,533.84
	Number of globally critically endangered or endangered species ¹⁷ benefiting from reduced threats as a result of Project activities, ¹⁸ measured against the without-project scenario.	One critically endangered species (black rhino – <i>Diceros bicornis</i>). To date, black rhino populations have not increased from the last survey in 2017, but it is important to noted that no rhino has been lost within the project area due to poaching.	5	In 2013, black rhino population was estimated at 14 individuals. Three new calves were born in that year, though three rhinos were lost due to poaching. Since 2017, no black rhinos have been lost due to poaching.

¹³ 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.

¹⁴ 2020 MWCT Impact Report

¹⁵ The REDD+ project and partners adopted equal opportunity for women and men.

¹⁶ 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.

¹⁷ Per IUCN's Red List of Threatened Species.

¹⁸ In the absence of direct population or occupancy measures, measurement of reduced threats may be used as evidence of benefit.

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

The Chyulu Hills REDD+ Project (CHRP) is a multi-partner initiative designed to promote climate change mitigation and adaptation, restore biodiversity and create alternative livelihoods under the United Nations scheme of Reducing Emissions from Deforestation and forest Degradation (REDD+). It is located in the Tsavo-Amboseli ecosystem in the South-eastern part of Kenya and stretches over an area of 410,533.84 hectares (ha). Its main geographic feature is the volcanic Chyulu Hills mountain range, from which the Project derives its name.

The Project Area comprises a diverse range of ecotopes, from afro-montane cloud forests to grassland savannah. It is located between Tsavo (East and West national parks), Kenya's largest protected area, and Amboseli National Park, creating an important corridor within this Tsavo-Amboseli ecosystem. The extended Tsavo-Amboseli ecosystem is rich in biodiversity and includes Kenya's largest population of the increasingly threatened African elephant (*Loxodonta africana*) and the critically endangered black rhino (*Diceros bicornis*).

Communities in the Chyulu Hills landscape are socially, economically and culturally diverse. The western side was traditionally inhabited by the Maasai, a pastoralist tribe with various groups or clans occupying a large area stretching along and adjacent to the Rift Valley throughout Kenya and northern Tanzania. The Maasai still have a very strong sense of their tribal identity and traditional pastoralist way of life. Within the Project Area, many members of the Maasai community are still engaged in pastoralism, although increasingly they are becoming more sedentary and engaging in a wider range of economic activities. Traditionally, the Maasai have lived in proximity to wildlife populations. On the eastern side of the Chyulu Hills the ethnic mix is much more complex. Both the main road and the railway that links Mombasa and the capital city, Nairobi, are close to the eastern border of the Project. The traditional tribe in the area is the Kamba, however, huge influxes of people from all over Kenya have settled in the area. This has resulted in the development of several towns, including Kibwezi in the north and Mtito Andei in the south, both of which are close to the border of the Project; while the development of many shops and businesses contribute to the heavy traffic along the road. Outside of the towns, the area is mainly comprised of small-scale subsistence agriculture, with almost all of the natural habitat having been cleared.

The Chyulu Hills also present a locally and regionally important water tower or catchment, which is a vital water source for much of the surrounding landscape, as well as supplying the coastal city of Mombasa.

The Chyulu Hills landscape, and particularly the forest resources, face a number of threats. Due to the rapid population growth in Kenya, with the national population having grown from about 15 million to 50 million people over the last 60 years, there is tremendous pressure on land. This has resulted in land-use change, with the conversion being primarily due to unplanned agricultural expansion, settlement and unsustainable extractive practices such as charcoal burning and the harvesting of trees for use as timber and wood carvings. One of the major goals of the CHRP is to maintain the ecological health of this vitally important ecosystem by providing economically viable and sustainable alternatives to its destruction.

The CHRP aims to deliver benefits for climate, community and biodiversity, under both the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity (CCB) standards. Its specific climate related goals are to prevent the emission of 18,271,217 t CO₂e over the Project's 30-year crediting period by stopping deforestation, forest degradation and grassland conversion. Reducing 3,139,694 tCO₂e in the current monitoring period

This is being achieved through a range of project activities, forest and wildlife protection, livestock and range management, community engagement and support, reforestation improved agriculture, biodiversity conservation and research, CHCT Governance and Management. (Table 1 and Figure 1).

Table 1. Institutional jurisdiction and type of data collected for the Project.

Institution	Role in the Project
Kenya Wildlife Service (KWS)	Has the overall mandate of managing all wildlife in Kenya. KWS is the custodian of all wildlife data nationally.
Sheldrick Wildlife Trust (SWT)	Manages the Kibwezi Forest Reserve together with KFS and collects aerial data and intelligence on wildlife numbers and distribution across the greater Tsavo ecosystem with a particular focus on elephants. Supports security and anti-poaching and provides equipment and infrastructure in support of conservation.
Big Life Foundation (BLF)	Manages the conservation programmes on Mbirikani Group Ranch, assist KWS, provides ranger patrols, security and intelligence gathering around Mbirikani and supports community education and other social benefits. Collects biodiversity and ecological data in the ranch and the greater Chyulu and Amboseli area.
Maasai Wilderness Conservation Trust (MWCT)	Project coordination entity and repository for Project Area data. Manages conservation and community social benefit programmes on Kuku, Kuku A and Rombo group ranches, including education, health and livelihoods development. MWCT collects data on wildlife numbers and distribution and undertakes research on lions and predators.
Kenya Forest Service (KFS)	Has legal tenure of the Kibwezi Forest Reserve which forms part of the national forest estate. KFS has local tree nurseries and supports community tree planting and agroforestry.

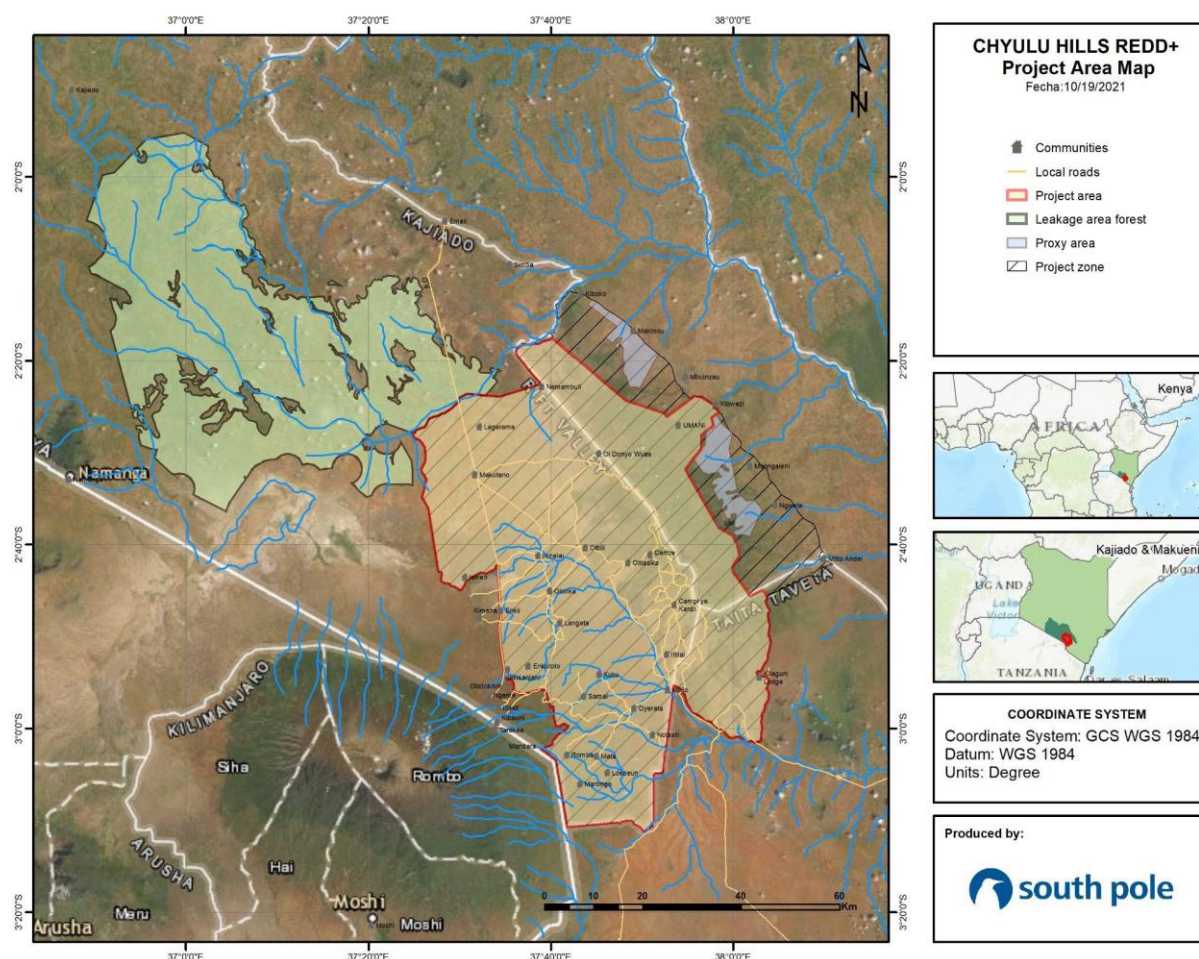


Figure 1. Project Area, project zone and leakage areas

The Project has been generating substantial community and biodiversity co-benefits, this includes new and sustainable livelihood opportunities, such as direct employment in conservation programs, research and tourism, and alternative income generating activities (IGAs), such as honey production, local handicrafts, and grass seed banks. Income generated by the CHRP has been used to maintain and improve social services for local communities, particularly in relation to healthcare and education. Additional programs addressed food and water security and rangeland management, as well as raising the issue of environmental awareness. Together, these programs are protecting carbon stocks, conserving biodiversity and providing significant social and economic benefits to local communities.

This Project has a low non-permanency risk (10%), which is mainly determined by external risks and natural hazards that affect the ecosystems in the dry season (Section 3.2.4.1).

2.1.2 Project Category and Activity Type

The Project falls under VCS sectoral scope 14 “Agriculture, Forestry and Other Land Use” (AFOLU), under Project activities Reducing Emissions from Deforestation and Forest Degradation (REDD+). This Project is categorized as unplanned deforestation and degradation (AUDD) for forest areas and unplanned conversion (AUC) for the grassland areas.

2.1.3 Project Proponent(s)

Organization name	Chyulu Hills Conservation Trust (CHCT)
Contact person	Christopher Tuite
Title	Conservation and REDD+ Adviser
Address	UTM coordinates zone 37M 379594 m E, 9684481 m S.
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The Project Proponent for the CHRP is the Chyulu Hills Conservation Trust (CHCT). CHCT has appointed Maasai Wilderness Conservation Trust (MWCT) to the role of “Project Office”. The role of the Project Office is set out in a formal “Project Office Agreement” between CHCT and MWCT and further elaborated in a special report to the Board entitled “Project Office Roles and Functions”. Broadly the role is to manage overall coordination, communication and collaboration among all of the Project Partners, supporting all needed field operations and logistic, financial management, accounting, and grant management, board operations and communications.

As required under VCS standards, MWCT has established a physical project office within the project area, at the Chyulu Hills Research and Conservation Centre (CCRC) Kuku Group Ranch. The CCRC is located at the UTM coordinates zone 37M 379594 m E, 9684481 m S.

The office is open during regular business hours and is readily available for members of the community to receive information about the Project, to express any concerns or grievances, and to interact with the Project Proponent in an open and transparent manner.

The MWCT staff who support the the Project Office function are described in greater detail in Table 2 below.

Table 2. Staff in the project office

Name	Job title	Background and responsibilities
Samson Parashina	Chairman MWCT and CHCT	Holds a Bachelor of Art and Social Sciences with Honors in Sociology and Political Science. Is a member of Kuku A and Kuku (B) Group Ranches. Samson is an outstanding Maasai with a great conservation vision. He was brought up on Kuku and is a respected community leader; he is a Silver level guide (Kenya Professional Safari Guide Association). Samson was previously the manager of Campi ya Kanzi. He was nominated for the Champions of the Earth at Rio+20 by the UNEP, and received the UNDP Equator Prize. Samson is also the Chairman of the Chyulu Hills Conservation Trust board and serves at Kajiado County Council as the chief officer. REDD+ Project responsibilities: Samson provides an important bridge between the Chyulu Hills Conservation Trust and the Maasai Wilderness Conservation Trust as Chairman. Samson plays a critical diplomatic liaison role in

		communicating with the Maasai community about the REDD+ Project and in relation to discussions and negotiations about the application of REDD+ funds.
Luca Belpietro	Executive Director, MWCT	Holds a Laurea Magistrale (Master) in Economics, creating a thesis on Wildlife as a Natural Resource in Kenya. Luca is an active conservationist with over 20 years of field experience with Maasai communities. For five years he was the Managing Director of Guber Srl, a prominent Italian finance and credit management company. He permanently moved to Kenya in 1995 and founded Campi ya Kanzi and Maasai Wilderness Conservation Trust. REDD+ Project responsibilities: As Executive Director, Luca is responsible for all aspects of the planning and management of MWCT and its function as a REDD+ Project Office.
Titus Muia	Finance and Administration Director	Titus holds a Master of Business Administration (Finance) degree and a Bachelor of Commerce (Accounting) degree. He is also a Certified Public Accountant of Kenya (CPA-K), and a member of the Institute of Certified Public Accountants of Kenya (ICPAK). Titus has also been trained on Economic Tools for Conservation by the Conservation Strategy Fund at Stanford University. He received his secondary school education at Starehe Boys. He has a wide range of experience in financial management and administration at profit and non-profit organizations. His passion for nature and social services began when he was a boy scout, rising through the ranks to attain the prestigious Lion Scout Award. REDD+ Project responsibilities: Titus is responsible for all accounting and financial management operations in relation to REDD+ funds, including banking and cash management, financial reporting, grant management, banking and audits.
Christopher Tuite	REDD+ and Conservation Adviser	Chris was born in Kenya and educated in the UK. He was an undergraduate at the University of Liverpool and completed his Ph.D. research at the University of Bristol on the ecology and conservation of flamingos and soda lakes in the Eastern Rift Valley of Kenya and Tanzania. Chris also studied business, finance and economics at Arizona State University, and qualified as a CPA. Chris has spent over 30 years working for leading conservation NGOs in various finance, executive, program management and consulting roles, including The Nature Conservancy, International Fund for Animal Welfare, The Green Belt Movement and Conservation International. He has experience with both applied on-the-ground

		conservation and development projects around the world, and in international environmental advocacy, including campaigns on whaling and the international wildlife trade. Since 2008 Chris has focused on the development, financing and marketing of projects that protect tropical forests to generate carbon credits. His most recent projects are in Peru, the Democratic Republic of Congo, Madagascar, and the Chyulu Hills REDD Project in Kenya. For the last nine years Chris has focused on guiding the development of the Chyulu Hills REDD+ Project. REDD+ Project responsibilities: Chris is responsible for providing guidance, support and oversight in all aspects of delivering the REDD+ Project, including planning, project activities, marketing, sales and communications, funding allocation and grant management, on-going verification, and CHCT board reporting and liaison.
George Kingola	Operations Manager	George holds a BSc in Natural Resources Management from Egerton University. His responsibility at the Kenya Facilitation is to implement all MWCT programs and REDD+ field operations.
Muterian Ntanin	Head Rangers Commander	Muterian is responsible for managing and supervising rangers to conduct routine and security foot patrols, lead ranger's meetings for performance feedback and address field challenges, the prosecution of poachers, implement disciplinary measures, lead MWCT's interface with Kenya Wildlife Service, and other ecosystem partners, to respond to poaching threats and other human-wildlife conflicts.
David Kanai	Simba Scout Coordinator	Oversee a dedicated team of 18 Maasai warriors (Moran) who monitor GPS collared lions and other wildlife species. Data collected is analyzed and used to gauge various aspects of different wildlife species, including their eating habits and the prey selection of lions, while also mitigating human-wildlife conflict within the local Maasai communities.
Timothy Lenyai	REDD+ Data Officer and REDD and West Community Coordinator	Oversee all outreaches within the local communities in the west of the Chyulu Hills carbon Project Area.
Lanoi Meteikini	Livelihoods Coordinator	Oversee all local Maasai women's group initiatives to establish sustainable alternative income projects that promote women's empowerment and financial independence.
Mutuku Mutua	Bee-Keeping and REDD+ East Community Coordinator	Bee-keeping specialist. Oversee all aspects of developing bee-keeping and honey production for MWCT. Coordinate community engagement within the eastern communities of the Chyulu Hills REDD+ Project.

Soffiya Mwamure	Kadzo	Administrative Manager	Is undergoing a BSc in Procurement and Contract Management from Maseno University (<i>ongoing</i>). Maintain a fully functional office, organize supplies and equipment to enhance team productivity and perform all procurement services.
David Okul		Conservation Manager	Holds a BSc in Natural Resources Management from Egerton University and an MA in Environmental Management and Planning from the University of Nairobi. Team leader of conservation activities implemented by the MWCT. MWCT implements a myriad of conservation projects, including environmental monitoring, environmental restoration, human-wildlife conflict, ecotourism and payment for ecosystem services.
Patricia Cruz		Communications Director	Has a BSc (Hons.) in Zoology and Conservation from the University of Toronto, Canada. Oversee, strategize, design and implement the flow of information between the organization and its donors, public relations, local communities and all other essential entities.
Andrey Arutyunyan		Grants and REDD+ Project Office Coordinator	Holds a BA in Business Management - Finance and Financial services. Manage the Chyulu Hills REDD+ Carbon Project Office (including evaluating the course of the Project, coordinating Project Partners, field work, proposals and grant activities, and reporting/overseeing incoming and outgoing Project documentation, conducting Project reviews and updating monitoring tools). Andrey is also responsible for grants management (research and applications).
Carole Mercier		Programs Coordinator	Holds a BA in Business Management from the University of Westminster. Provide support to all programs and projects staff to enhance their efficiency towards achieving the set goals and objectives. Assist senior management to improve the quality of strategic decisions and develop innovative tools for monitoring and evaluation.
Ahnes Nailentei		Field Communications Officer	B.Sc in Environmental Education. Provides continuous presence in the field recording documenting and reporting REDD+ project activities and other associated projects and initiatives. Shares information and posts reports with local communities and provides stories and information for local, national and international partners and media,

2.1.4 Other Entities Involved in the Project

The 9 CHCT Trustee partners of the CHRP are jointly essential for the successful development and implementation of the Project. Each of the partners contributes important resources and expertise. Conservation International has provided significant technical and financial assistance since the inception of the Project. South Pole has provided technical assistance and REDD+ expertise for the the Project's second verification. Together, with the traditional Maasai landowners, this CHRP implementation team has proven to be an exceptionally strong partnership, which has ensured the successful execution of activities in line with the Project's objectives.

Organization name	Big Life Foundation (BLF)
Role in the Project	Big Life manages conservation and community programs on Mbirikani Group Ranch in partnership with the Group Ranch leaders and members. Big Life's core programs are wildlife protection (anti-poaching, wildlife law enforcement, rhino protection), reducing human-wildlife conflict (predator loss compensation, Maasai Olympics, human-elephant conflict mitigation), habitat protection (securing wildlife habitat, rangeland management, and community support (education, healthcare). All these activities support the goals of the REDD+ project.
Contact person	Richard Bonham
Title	Director of Operations
Address	P.O. Box 24133-0502, Nairobi
Telephone	0720 737 987
Email	richard@biglife.org

Organization name	Maasai Wilderness Conservation Trust (MWCT)
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Role in the Project	MWCT manages an integrated program that includes conservation and community support that focuses on health, education, livelihoods and ecotourism. MWCT is responsible for running conservation programmes and ecotourism on Kuku, Kuku A, and Rombo Group ranches under MOUs and legal agreements. Programmes include forest and wildlife protection (deployment of field rangers), lion monitoring and tracking for research and to reduce predation on livestock, a compensation program for livestock losses due to wildlife, wildlife population monitoring, rangeland management and restoration, and wetland restoration. MWCT supports education through sponsorship of teacher salaries, school infrastructure and bursaries. MWCT's healthcare programme provides salaries for a doctor and other staff, a diagnostics laboratory, clinics, and an ambulance service. Health programs include antenatal clinics, women's health, reproductive health, and childhood immunization. MWCT also supports livelihood development, especially for women, through bee keeping, handicrafts and seed banks. MWCT is linked to two ecotourism enterprises, a tourist lodge (Campi ya Kanzi) and a student camp (Chyulu Wilderness Camp). All these programmes support the goals of the REDD+ Project. In addition, MWCT acts as the REDD+ Project Office as described in Section 2.1.3 above.
Contact person	Titus Muia
Title	Director of Finance
Address	124 Mbagathi Ridge Road, Nairobi
Telephone	+254 722 290 212
Email	finance@maasaitrust.org

Organization name	Kenya Wildlife Service (KWS)
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Role in the Project	KWS is the statutory authority for both the Chyulu Hills National Park and the Southern Chyulu Extension in the Tsavo West National Park. KWS manages the wildlife, wildlife habitat, security and tourism in all Kenya's national the parks and has overall responsibility for wildlife both inside and outside protected areas. Within the Project Zone, KWS runs a number of community outreach and awarenss projects which aim to raise understanding of environment and wildlife. KWS also deals with human-wildlife conflict mitigation through a national programme.
Contact person	Professor Charles Musyoki
Title	Director of Parks and Reserves Management
Address	Kenya Wildlife Service Headquarters, Langata Road, P.O. Box 40241-00100, Nairobi
Telephone	<u>+254722826911</u>
Email	<u>cmusyoki@kws.go.ke</u>

Organization name	Kenya Forest Service (KFS)
Role in the Project	KFS is one of the departments of the Ministry of Environment and Natural Resources, which is mandated to develop the National REDD+ Strategy and launch the National REDD+ Program through its input into the National REDD+ Coordination Office. With KFS being a key stakeholder in the CHRP, it is anticipated that the implementation of the CHRP will influence policy and program design at a national level. With the broad scope and scale of the CHRP, it is also anticipated that KFS will play a key role in advocating the Project at a national level. In addition, KFS has the legal mandate to manage all national forest in Kenya, including the Kibwezi Forest Reserve. KFS has a tree nursery in the Project Zone and undertakes community outreach to support tree planting and agroforestry by communities and land holders.
Contact person	Alfred Gichu
Title	
Address	Kenya Forest Service Headquarters, Karura, Kiambu Road, P.O.
Telephone	0722 787 403
Email	<u>alfredgichu@yahoo.com</u>

Organization name	Sheldrick Wildlife Trust (DSWT)
Role in the Project	SWT's core programme for which it is most widely known is the rescue, rehabilitation, and release of baby orphan elephants. Some of these are released into the wild in the Kibwezi Forest Reserve. In addition to the elephant orphan programme, DST provides significant logistical support, largely to KWS, through aerial surveillance, a canine unit for tracking poachers locating illegal snares, and identifying illegally obtained wildlife products. DST also funds 5 mobile wildlife veterinary units, and 16 anti-poaching units in partnership with KWS. The primary geographic focus of SWT's field programs is with the Greater Tsavo Conservation Area, including the REDD+ Project Area.
Contact person	Neville Sheldrick
Title	
Address	P.O. Box Number 15555, Mbagathi, 00503
Telephone	0718 023 735
Email	neville@sheldrickwildlifetrust.org

Organization name	Conservation International (CI)
Role in the Project	CI's primary responsibility in the Project has been to provide significant technical, strategic, and financial support during the Project development and implementation stage. CI also markets Chyulu carbon credits through a sales and marketing agreement and operates the VERRA registry on behalf of the project. CI is a non-voting Advisory Member of the CHCT Board.
Contact person	Bjorn Stauch
Title	Senior Regional Director, Conservation Finance Head: Business Development, Africa
Address	
Telephone	+27 82 4415104
Email	bstauch@conservation.org

Organization name	Kuku Group Ranch
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Role in the Project	Trustee organisation and land holder
Contact person	Julius Shumuni Lemoyian
Title	Secretary
Address	P.O. Box 78, Loitokitok
Telephone	0725 928 964
Email	jlemoyian@yahoo.com

Organization name	Rombo Group Ranch
Role in the Project	Trustee organisation and land holder
Contact person	James Panian Kelero
Title	
Address	P.O. Box 63, Loitokitok
Telephone	0710 618 869
Email	jamespanian1980@gmail.com

Organization name	Kuku A Group Ranch
Role in the project	Trustee organisation and land owner
Contact person	Simon Nakao Metito
Title	Treasurer
Address	P.O. Box 191-00209, Loitokitok
Telephone	+254 724 342 369
Email	nkaometito@gmail.com

Organization name	Mbirikani Group Ranch
Role in the project	Trustee organisation and land holder
Contact person	Daniel Metoe
Title	CHCT Board Representative Chairman Imbirikani Group Ranch
Address	P.O.Box 84-00209, Loitokitok
Telephone	+254 721 291 356
Email	metoe14@gmail.com

Organization name	South Pole Carbon Asset (SP)
Role in the Project	SP have provided the technical expertise and coordination required for the second verification process. In addition, SP will be an advisory partner on a number of issues related to project implementation.
Contact person	Jhoanata Bolivar Cardona
Title	Head of forestry and land use projects
Address	Cr #7-59, Medellín, Colombia
Telephone	+57 4 520 5000
Email	j.bolivar@southpole.com

2.1.5 Project Start Date (G3.4)

The Project start date for the CHRP is the date on which the biomass sample plot commenced: September 19, 2013. This is ultimately the date when carbon-related activities began in the landscape and therefore marks the Project start date.

2.1.6 Project Crediting Period (G3.4)

The Project lifetime will be 30 years commencing from the project start date of September 19, 2013 and will end in 2043. The GHG accounting period will be the same 30 years as the lifetime of the Project.

2.1.7 Project Location (G3.3)

The CHRP is located in South-eastern Kenya. The Project Area extends over three counties: Makueni County in the north and the east, Taita Taveta County in the south, and Kajiado County in the west (Table 3). The total Project Area consists of seven land units covering 410,533.84 ha, while the Project Accounting Area covers a total of 374,677.64 ha. Its main geographical feature is the Chyulu Hills, a volcanic mountain range about 150 km southeast of the Kenya Rift (Ritter & Kaspar, 1997), from which the Project's name is derived. The Project Area is located ~150 km south of the Kenyan capital city of Nairobi and can be easily accessed by road via the Nairobi-Mombasa Highway on the east, as well as the Emali-Oloitokitok road on the west. Oloitokitok¹⁹ (2.91° S, 37.52° E) on the west, Emali (2.09° S, 37.47° E) on the north and Mito Andei (2.72° S, 38.20° E) on the east are the three most closely located major towns to the Project Area (Figure 2).

Table 3. The land units in Project Area and their respective Kenyan counties.

County	Land unit
Kajiado	Mbirikani Group Ranch
	Kuku Group Ranch

¹⁹ Oloitokitok is also referred to as Loitokitok.

	Kuku A Group Ranch
	Rombo Group Ranch
Makueni	Chyulu Hills National Park
	Kibwezi Forest
Taita-Taveta	Tsavo West National Park

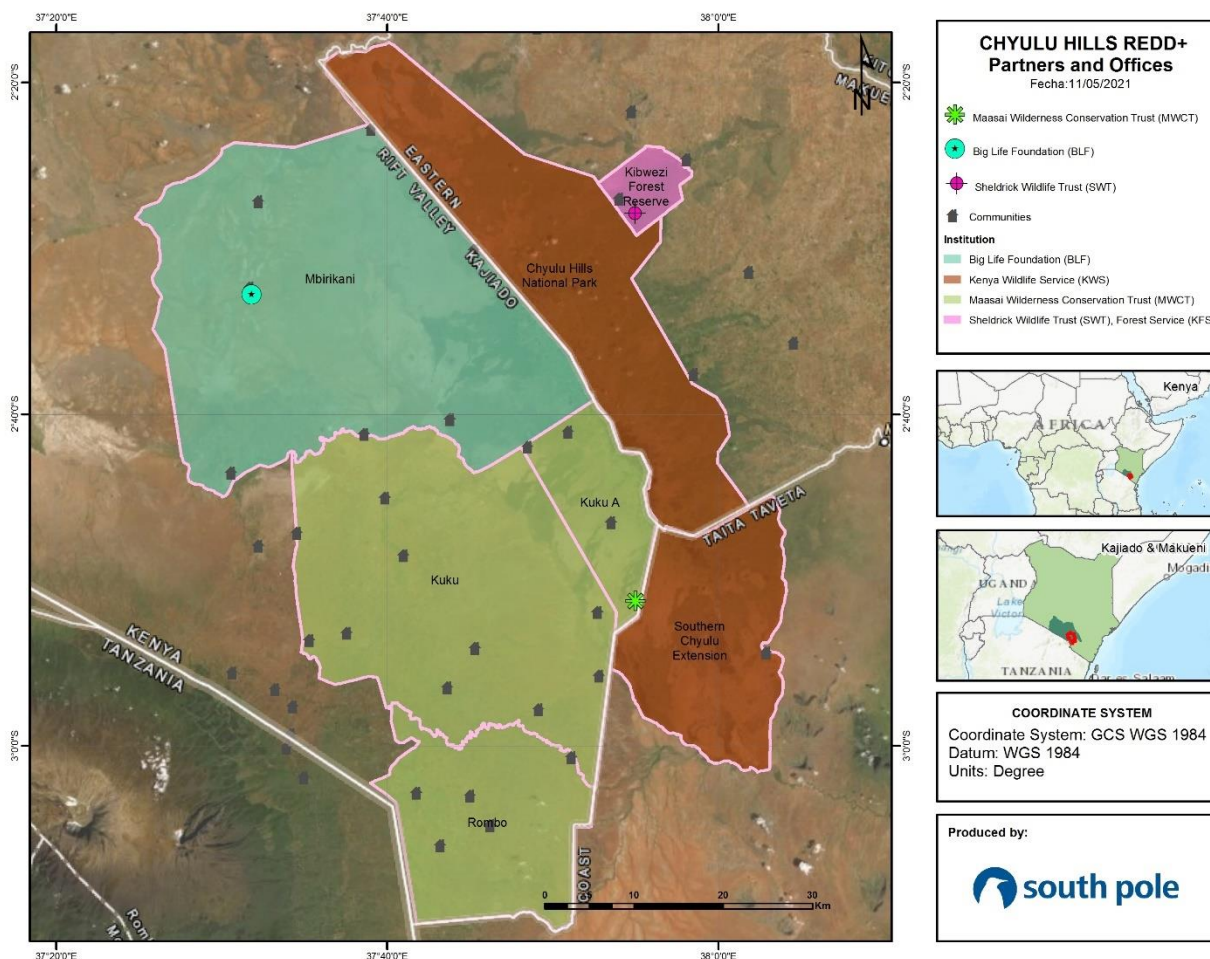


Figure 2. Chyulu Hills project area land units and partners.

2.1.8 Title and Reference of Methodology

The CHRP applied the VCS VM0009 Methodology for Avoided Ecosystems Conversion, version 3.0. The methodology quantifies net GHG emission reductions and removals from AUDD and unplanned conversion (AUC). Please see the CHRP Project Document, Section 4.2, for further details on the applicability of this methodology to the Project.

Additionally, the CHRP used the VCS-approved tool VT0001 ("Tool for the demonstration and assessment of additionality in VCS AFOLU project activities"), V3.0: the VCS AFOLU Non-Permanence Risk Tool, VCS Version 4.0.

2.1.9 Other Programs (CL1.5)

Emission reductions or removals, as a result of this Project, will not be used for compliance under any other trading program or mechanism. The current VCS Project is entirely independent of any other carbon project scheme in Kenya, therefore, no double counting has occurred.

However, the Project has not sought, nor received, any other GHG environmental credit, or has been registered under any other GHG program.

Although the PDD stated that the project aims to be included in a jurisdictional REDD+ program, Kenya is in the process of finishing its national REDD+ policy framework. However, all indications are that existing project level initiatives will be nested into the national system in a way that maintains their integrity and recognises the importance of public-private partnerships such as the CHRP.

The National Expert Group (NEG) of REDD+ nesting was formed and endorsed in 2020 under the auspices of the Environment Ministry and is composed of multiple stakeholders and various Government departments. The GoK acknowledges the role of site-scale activities and wishes to create an enabling environment for investment from all sectors, including the private sector. Several analyses have been undertaken thus far, including on adjustments to a series of Policies, Laws and Regulations in order to accommodate a nested REDD+ system, and nesting has been specifically included in the draft REDD+ Strategy. On a technical level, an analysis was done assessing a suitable approach for baseline allocation under Verra JNR (which unfortunately identified that it is not suitable right now and further improvements are required on Kenya's FRL first - which will also commence shortly led by FAO). Stakeholder engagement is also ongoing.

So at present, the national nesting and jurisdictional framework is still developing so the project does not fall within a jurisdiction covered by a Jurisdictional REDD+ Project. But the project is closely linked to the Department of Environment and Mr. Albert Gichu who serves on the CHCT board and is National REDD+ coordinator and these initiatives are being supported with assistance by our close international partner, Conservation International.

2.1.10 Sustainable Development

According to Kenya's National Environment Policy - KNEP²⁰, the loss of biodiversity is related to deforestation, habitat destruction, unsustainable harvesting of natural resources, overgrazing and the introduction of invasive and alien species, among others. Moreover, in 2015 Kenya joined the global community in adopting the Sustainable Development Goals (SDGs) that covered the thematic areas of environmental, economic and social development. Additionally, in 2016 Kenya implemented the Vision 2030 plan, a long-term development plan with the goal of transforming Kenya into a newly industrializing, middle-income country that provides a high quality of life to all its citizens by 2030, in a clean and secure environment.

The SDGs adopted by all member states of the United-Nations in 2015, describe a universal agenda that applies to, and must be implemented by, all countries. The Sustainable Development Report 2020²¹ (SDR2020) presents and aggregates data on country performance towards these SDGs. The SDR2020 presents the most up-to-date data from official sources (the United Nations, the World Bank, and others), as well as non-official sources (research institutions and NGOs).

²⁰ Ministry of Environment, Water and Natural Resources. 2013. www.environment.go.ke

²¹ Available at: <https://sdgindex.org/reports/sustainable-development-report-2020/>

According to the SDR2020, Kenya ranks 123rd out of 193 countries, with an overall score of 60.17 out of 100. This score measures a country's total progress towards achieving all 17 SDGs. The score can be interpreted as the percentage of SDG achievement. A score of 100 indicates that all SDGs have been achieved.

Kenya has only achieved one of the 17 SDGs, namely SDG 13 (Climate Action). According to the report, major challenges remain in achieving nine of the SDGs and there are clear obstacles in meeting another six of the SDGs and challenges to achieve SDG 12 (Responsible consumption and production). See Figure 3 below for an overview of the current assessment of Kenya's progress towards achieving the SDGs.



Figure 3. Current assessment of SDGs for Kenya

(Source: SDR2020)

According to the trends published in the SDR2020, Kenya is maintaining its SDG achievement for Climate Action (SDG 13). The country is also on track to achieve SDG 8 (Decent work and economic growth). Kenya's score is moderately improving for five of the other SDGs, but is insufficient to achieve its goal. See Figure 4 for more details on Kenya's trends towards achieving the various SDGs.



Figure 4. Trends in SDG achievements for Kenya

(Source: SDR2020)

Therefore, the implementation of the CHRP contributes to reducing the number of challenges for achieving the objectives of the environmental policy of Kenya and the SDGs that are moderately improving; further details can be found in

Table 4 below.

Table 4. SDG's

SDG	Project contribution
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1 NO POVERTY	Poverty is one of the key drivers of deforestation. The Project and Project Partners are implementing a number of interventions to improve economic opportunities and the status of local communities. These include providing direct employment in ecotourism, conservation (rangers, program managers and support staff), teachers and school support staff. The REDD+ Project also hires people and trains them for temporary positions, enabling them to assist with activities related to verification such as social survey enumerators and vegetation plot samplers. The Project is also helping the creation of livelihood opportunities through the development of grass seed banks run by women's groups, the improved quality in production of crafts such as beading, and the development of honey production by community members and groups through training, as well as the provision of hives and equipment, the construction of a high-quality honey processing facility and market value chain development.
2 ZERO HUNGER	The Project is addressing hunger mainly through improved livestock and grazing management for the pastoral communities and improved farming for the farming communities on the eastern boundary. The provision of over 500 full-time jobs by Project Partners is a major factor in improving economic well-being that reduces hunger.
3 GOOD HEALTH AND WELL-BEING	The REDD+ Project is improving community access to key social services, particularly education and healthcare, with special emphasis on women's health and access to water. MWCT has a significant healthcare programme for the Kuku Group ranches, including providing a main clinic with a full-time doctor and nurses, diagnostic laboratory and an ambulance. There is also a focus on women's reproductive health and sexually transmitted disease (STD) prevention. There are also dispensaries that provide basic healthcare supplies and treatment and host regular doctor visits to serve more remote areas. Big Life also provides primary healthcare and family planning services to more remote communities.
4 QUALITY EDUCATION	The education programs of Project Partners includes the provision of salaries for teachers (over 65) and other incentives such as the building and repair of school infrastructures (classrooms, staff accommodation, safety fencing, latrines, supplies). These programs also provide sanitary products for girls.
5 GENDER EQUALITY	The REDD+ Project and Partners are adopting equal opportunities for women and men. The CHRP has been working closely with women in the Project design in relation to their representation in various advisory committees. And has also been encouraging girls' enrollment in schools through the allocation of an equal number of school bursaries to boys and girls. Finally, the CHRP has developed Project activities to engage with women groups and help promote financial independence with projects like the grass seedbanks or handicrafts.

6 CLEAN WATER AND SANITATION	The REDD+ Project has assisted local communities with water tanks for schools, hiring water rangers to protect boreholes, and providing new latrines for schools. MWCT has a major initiative of protecting and restoring an important spring that will protect the water which the local community depends upon. The Chyulu Hills form an important aquifer that supplies about 30% of the water for Kenya's second largest city, Mombasa.
7 AFFORDABLE AND CLEAN ENERGY	Being connected to electricity is an issue for some families in and around the Project Area. The power grid in Kenya comprises of almost 100% renewables. New facilities for the community projects are largely powered by solar power, including a new ecotourism investment and a student camp. These facilities are also using induction cookers, which means that they are not using firewood or charcoal, with there being a plan in motion to use solar charged electric vehicles. The Project will work closely with local communities when searching for opportunities to expand access to renewable energy.
8 DECENT WORK AND ECONOMIC GROWTH	The project is providing direct employment for rangers, teachers, water supply rangers, casual workers, community health worker, kitchen staff, Deputy Education Coordinator. The partner organisations also provide full-time positions for over 400 community members in ecotourism and conservation.
10 REDUCTION INEQUALITIES	The REDD+ Project has a policy of equal opportunities for all jobs, and has a good record for hiring women into roles that would have traditionally been only for by men, such as rangers, tree plot samplers and social survey enumerators. Through the school programs, supported by Project Partners, all schools are now at gender parity. Ten years ago total attendance at Maasai schools consisted of about 80% boys. At all meetings sponsored by the REDD+ Project, women are encouraged to attend and participate. The livelihood programs for bee keeping, crafts and grass banks are focused on opportunities for women.
13 CLIMATE ACTION	The whole focus of the REDD+ Project is to reduce deforestation GHG emissions. 2,618,564 tCO₂ emission reductions for the current monitoring period.
15 LIFE ON LAND	One of the key goals of the REDD+ Project is to protect the biodiversity of the Chyulu landscape, which forms an important corridor within the larger Tsavo-Chyulu-Amboseli landscape, covering an area of about 2.83 million ha in total. The landscape contains a mosaic of habitats, including cloud forest, dry forest, savannah woodland and grasslands, wetlands and springs. These support a wide range of African mammalian, bird, reptile and amphibian species, including IUCN RED Book species classified as near threatened, vulnerable, endangered or critically endangered. Such animals include elephants, black rhinos, lions, giraffes, leopards,

	cheetahs and wild dogs. The area is also classified as an Important Bird Area and one of Kenya's Key Biodiversity Areas. Project activities are significantly focused on protecting these habitats and the diverse range of species.
16 PEACE JUSTICE AND STRONG INSTITUTIONS	The REDD+ Project is supporting the governance of the Group Ranches, including greater participation by women, and improving administration through the elected leaders.
17 PARTNERSHIPS FOR THE GOALS	The Project has successfully brought together nine local partners, including two government agencies, four indigenous Maasai Group Ranches, and three local NGOs to form a unique partnership for governing and managing the REDD+ Project. The Project and/or its Partners, also engage broadly with international partners, including Conservation International, a wide range of other NGOs, as well as multilateral agencies such as GEF and the Green Climate Fund.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (G3.4)

Date	Milestone(s) in the Project's development and implementation
19 September 2013	Project start date and Project crediting start date.
June 2014	MOU signed among Project partners, establishing Project proponent, Project Office agreement and Project operating structure.
July 2014	Project description document and public comment period.
June 2015	Project validation.
2013-2016	Coordination between and enhancement of Project Partner ranger forces.
2013-2014	Establish tree nurseries.
August 2016	SBIA workshops.
August/September 2016	Baseline household survey.
November 2016	Monitoring report/Project implementation report – public comment period.
April 2017	First Project verification event.
June 2017	Project office building complete.
2018-2020	Chyulu Hills Conservation Trust Governance and Management: during this period an office administrator was hired for the general aspects of the trust. In addition, a REDD+ Consultant was hired to help with the development of the Project. General equipment for the offices were acquired.

2018-2020	Community Engagement and Support: teachers for primary and secondary schools were hired, in addition to the construction of latrines at Nolasit school, a fence in the Samai School, and a library in the Olorika school. Procured beehives and tools for its installation. Meetings with the local community and community outreach were held. School bursaries, water tanks and school supplies were delivered.
2018-2020	Forest and Wildlife protection: REDD+ rangers and Simba Scouts were hired and trained. Uniforms, beds, smart phones, GPS and other tools were acquired. While 4 km of electric fencing was installed. In addition, airtime was assigned for monitoring proposes.
2019-2020	Reforestation and Improved Agriculture: forest operations and patrols took place. Rehabilitation of degraded wetlands and riparian areas with 40,000 seedlings in 40 ha. The promotion of woodlot in schools and public institutions in kibwezi with 3,000 seedlings and five water tanks occurred. Finally, the refurbishment and expansion of the Thange Tree Nursery took place (installation, fencing).
2020	Biodiversity Conservation and Research: KWS developed an analysis of bush meat and human wildlife conflict. They also performed an analysis of the water at five specific points. Other activities included the procurement of assorted traps, baits and research equipment. Support for airtime was assigned to monitoring.
2020	Livestock and Range Management: during this period, community outreach and seedball programs were supported.
December 2021	Second Project verification event.
September 2023	Mandatory baseline re-evaluation
September 2029	Mandatory baseline re-evaluation
September 2035	Mandatory baseline re-evaluation
19 September 2043	Project end date and Project crediting end date.

2.2.2 Methodology Deviations

- Proxy area plots re-measurement:

All leakage plots, proxy area plots and project accounting area plots must be remeasured at least every five years, or after a significant event that changes stocks in the proxy or project accounting areas. However, the proxy area plots were not measured due to access constrains, measurements of the plot were performed during the pandemic of Covid-19 and as all proxy plots are in private lands, the access to the plots were not possible. Nevertheless, we did analyse the land cover of the plots with updated (2020) geospatial information. Please refer to section 3.2.1.6. and to Annex_1_Proxy_Area.

This deviation does not affect the conservativeness of the estimations since we are using information of the land cover that correspond to the year of the plots measuring. In this sense we are confirming that the vegetation type of the proxy areas corresponds to the same than those identified in the previous validation and verification of the project.

This deviation was applied just to the parameter proxy area carbon stock and do not affect any other section of the methodology followed.

- Soil sampling and remeasurement

The parameter 'Carbon not decayed in SOC at the end of the current monitoring period' included under Section 3.1.2 of the monitoring report was not monitored for the current monitoring period according to Appendix H and Section 8.1.5 of the methodology VM0009.

The deviation to the methodology occurred primarily due to the need to comply with national Covid-19 pandemic regulations. This lock down made it impossible to effectively transport soil samples between counties. In addition, the soil analysis laboratories, located in Nairobi, were severely limited in their capacity to process samples throughout the Covid-19 pandemic.

The deviation does not affect the conservative approach because, as detailed in the biomass information and the disturbances analysis, the project area has not experienced a significant loss of vegetation due to deforestation or degradation. In this sense, the soil carbon in the project area is unlikely to have been reduced and instead has probably been conserved and increased.

2.2.3 Minor Changes to Project Description (*Rules 3.5.6*)

- Monitoring Plan Indicators

During this monitoring period some indicators included in the Social and Biodiversity Impact Assessment were not reported. From the total of 80 indicators established (41 indicators for community, and 39 for biodiversity), 16 were not measured, because the collection of data on some metrics has not yet been implemented or was not consistent, and other activities have not been prioritized for the project or have been carried out without the use of REDD+ funds. However, none of the indicators not measured represent an impact for the project or generate negative effects. The indicators not reported during this monitoring period are highlighted in the document "Community and Biodiversity Monitoring". Please refer to Annex_2_Community_Biodiversity_Monitoring.

2.2.4 Project Description Deviations (*Rules 3.5.7 – 3.5.10*)

During this period there are no Project description deviations.

2.2.5 Risks to the Project (*G3.5*)

The description for each of the risks identified for the Project and the mitigation measures adopted are outlined in the table below.

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
Human induced risks		
Slash and Burn / Unsustainable Agriculture	The Project Zone is considered semi-arid to arid, with frequent crop failures. It is an extremely difficult area to sustain subsistence, rain-fed	Mitigation for this risk during the monitoring period, as shown in section Error! Reference source not found. and Error! Reference source not found. , is developed by promoting

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
	agriculture, which nevertheless continues to be the primary agricultural practice throughout the area. To find better areas to grow crops, farmers may attempt to expand their growing areas trying to find more fertile, less degraded or moist soil, following a drought event. These practices may result in the possible expansion of degradation and deforestation. Farmers also degrade the land (extract hardwoods for fuel and charcoal), and those degraded areas are then entirely cleared for agricultural fields within a short period of time (often < 1 year).	opportunities for Alternative Income Generating Activities (IGAs) such as beekeeping and honey production, and grass seed banks. Also, the project is promoting alternative livelihoods such as employment in other sectors (rangers, plot sampling teams, and craft / woodcarving sales, etc.). The project is also supporting tree planting in partnership with KFS through restoration of a tree nursery. This allows the project to promote agroforestry approaches, including the use of more drought resistant crops and trees.
Charcoal burning, wood carvings, and firewood collection	Within the Project Area there are currently some unregulated, extractive activities, including charcoal burning, firewood extraction and wood extraction for carvings. These are the main threats of deforestation and degradation in the CHNP area and pose some risk to the Project's climate benefits.	It was recognized that the law enforcement units lack resources to effectively reduce the threat of charcoal burning, wood carvings and firewood collection, however, a strengthened ranger force and aerial surveillance operated through MWCT, KFS, DSWT, KWS and Big Life, with more than 100 rangers hired across the Project Area (see section Error! Reference source not found.), patrol the zone permanently, with tools such as the SMART system and new digital communications (see section 5.1.1). This increased capacity is helping to control and reduce these threats. The ability to maintain protection activities on the ground during the COVID pandemic with REDD+ funding has made a significant and important contribution to mitigating these threats during 2020.
Poaching	Subsistence bushmeat hunting and commercial poaching are risks to this Project's biodiversity benefits. Bushmeat poaching normally	Project Partners, particularly KWS, DSWT, BLF and MWCT provide a strong presence with rangers aerial surveillance and security capacity to

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
	focuses on smaller herbivore species and can be for household consumption or sale. Commercial poaching is largely directed at elephants and rhino for their tusks and horn respectively. This poaching is linked to international wildlife trafficking. Commercial poaching tends to fluctuate over time. The last few years have seen a lowering of poaching pressure.	prevent and control poaching and illegal activities. There is a specific focus on protection of the small black rhino population. A total of 174 rangers patrol the Mbirikani area, with 178,000 km of foot patrols and 79,000 km of aerial patrols. This effort discourages poaching and tree cutting, provides linkage to the community and intelligence and law enforcement. Furthermore, rhino monitoring data are collected on a daily basis which includes details on location and the health of the animals (see key results indicators on biodiversity in the Project Area in section Error! Reference source not found.). The Project undertakes educational activities, workshops and creates jobs in wildlife conservation that will serve to raise awareness and increase the tolerance for and perception of wildlife in the local communities.
Anthropogenic fires	Human induced fires; is a frequent threat in the Project Area. Whilst some are set intentionally by pastoralists with the goal of allowing fresh pasture to grow, others may start accidentally from cooking fires set by herders or poachers.	The Project has continued supporting the partners in their fire management efforts. The project partners jointly aim to reduce illegal incursions of people into the Project Area, thus mitigating anthropogenic fire potential. Furthermore, there is monitoring of fire events and other potential contributions to reversals as part of annual monitoring efforts to support required reporting on and accounting for any major loss of carbon in the Project Area. Irrespective of their origin, KWS, BLF and MWCT have well-thought-out fire management regimes in place and a close collaboration exists to address fire events. To support fire prevention a 22km firebreak road has been constructed inside Chyulu Hills National Park. Also, when there are fires in the area, DSWT has a helicopter with fire-fighting capacity that can be deployed and the project has

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
		also. purchased pumps for firefighting by Kenya Wildlife Service.
Natural risks		
Droughts	Droughts are a regular occurrence in the area, prediction by climate change models will only make this situation worse. These had severe economic impacts on food security and livelihood strategies, and similar events in the future pose a risk to the Project's envisaged community and biodiversity benefits.	As droughts are naturally occurring phenomena, the Project aims to mitigate the impacts of recurring droughts through promoting adaptive and drought-resistant livelihood strategies, such as concentrating on agricultural practices that increase yield, and in particular moisture retention, to minimize the devastating effects of drought on subsistence agriculture. Mzima Springs is also one of the most significant tourist attractions in Tsavo West National Park. During this period, some areas were fenced to prevent bank erosion caused by wildlife, such as elephants, and allow recovery of vegetation. New water points, water tanks, troughs, plumbing, a borehole and solar pump were installed during the monitoring period. Other activity includes the promotion of better livestock husbandry management through the construction of water points to improve access to water and reduce grazing pressure around water points. Previously, communities had to walk long distances with their herds to get water, which was in one single point, causing soil compaction and degradation due to the trampling of livestock. Now, with three water points, the herds are better distributed and there is less concentration animals in a single area. (see section Error! Reference source not found. Error! Reference source not found., Ecosystem enhancement and section Error! Reference source not found. Error! Reference source not found.).

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
Fire	There is a possibility of natural fires occurring in the landscape. However, the frequency of these is very low and most fires are caused by humans, either deliberately or accidental. These occur multiple times annually in the area. Whilst some are set intentionally by pastoralists with the goal of allowing fresh pasture to grow, others may start accidentally from cooking fires set by herders or poachers. In the area you have selected (Kajiado) the wildfire hazard is classified as high according to the information that is currently available to this tool. This means that there is greater than an 50% chance of encountering weather that could support a significant wildfire that is likely to result in both life and property loss in any given year²².	The Chyulu hills REDD+ Carbon Project partners are developing a new strategic fire management plan to enhance prevention, monitoring and response to fire.²³ Also, the project area is monitored for significant disturbances. For the detailed description of all disturbance monitoring procedures please refer to the project protocol "Standard Operating Procedure - Disturbance Monitoring"²⁴.
Political risks		
Kenya's political stability	In its 50 years of independence, Kenya has maintained notable political stability, despite changes in its political system and conflicts in neighboring countries. A new constitution was passed in 2010, which included provisions for the establishment of devolved governance structures. Known as "devolution" many formerly central government roles are being transitioned to the newly established county governments, which will have a greater sphere of influence. With	There are two government organizations included as Project Partners (KWS and KFS). The Project is therefore closely linked with key environmental government ministries. At the national government level. KFS and the Ministry of the Environment and KWS and the Ministry of Tourism and Wildlife. At the county level all the partners have contact and communications related to the REDD+ Project with senior county elected and administrative officials.

²² See the support in the Annex_10_Natural_risks- ThinkHazard_Kajiado

²³ See the support in the next route: Annex_10_Natural_risks -2020 MWCT Impact Report

²⁴ See the support in the Annex_10_Natural_risks\ Chyulu Hills Redd+ Project climate Monitoring Plan

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
	Kenya's previous and current stability however, the political risks to the CHRP are considered minimal.	All these links facilitate the operation of the project in partnership with government at different levels.
Legislative changes	There always some risk of changing legislation or the potential of new policies that could potentially affect natural resource management and/or land tenure. Previously, there have been cases in which the government has expropriated lands through compulsory purchase for development schemes. That said, the likelihood of such changes occurring is considered to be extremely small, especially given that half of the Project Area is currently under government ownership and a large proportion is technically under protective status (although in practice, much of the area is not physically protected).	All have the potential to provide input to government in relation to legislative changes related to REDD+.
Policy risks		
Risk of reversal	Risk of project reversal due to community opposition is considered minimal, as the landowners and communities alike have been heavily involved in the design of the CHRP, and they have openly and widely been consulted through numerous outreach and information-sharing meetings.	As a Project governance policy, all stakeholders are always able to seek further information or air grievances if desired (see section 2.3.4). In addition, the Group Ranches themselves are invested in the project as Trustees of the CHCT, which is the Project Proponent, and have a significant governance role through their appointment of four out of nine Trustee Representatives on the CHCT board. The Project will continue to engage all the surrounding communities, provide employment and support for community social services, and improved livelihood opportunities. All these factors build and enhance community support for the project and make them authentic

Identified Risk	Potential impact of risk on climate, community and/or biodiversity benefits	Actions implemented to mitigate the risk
		owners and stakeholders so reducing the risk of opposition to the project and its goals. The project is also making significant funding allocations to the communities on the eastern side of the project area even though they are not currently represented on the CHCT board. This is also building understanding of the REDD+ project and support for forest and wildlife protection.
Insufficient Revenues	All REDD+ credits are currently sold on the voluntary market, posing a risk to recurring, sustainable income flow. If credits are not sold, there will be no revenue, and thus no monetary support for the Project over its 30-year lifetime, save initial investment. Nevertheless, the project partners believe that the project is extremely well-placed to attract credit buyers.	The project has an exceptionally appealing background story set in an iconic African landscape that includes the Chyulu Hills and its cloud forest, purportedly the inspiration for Ernest Hemingway's Green Hills of Africa, the backdrop of Mount Kilimanjaro, and a mosaic of savannah, woodlands, lava flows and volcanic cones. Within this landscape is written the history and culture of the proud Maasai living alongside Africa's best-known charismatic wildlife. The project also has important support from international celebrities. Finally, the internationally recognized Project Partners provide significant experience and capacity for supporting the marketing of the project's credits and the CHRP aims to be included in a jurisdictional REDD+ scheme, which could, in the future, allow for the sale of larger credit volumes, on a recurring, sustainable basis, to sovereign nations. As of the end of the current crediting period, the project had successfully sold about 50% of available credits from the first verification with indications of strong demand. Subsequent experience has seen over 95% of first verification sold by the end of 2021. For 2022 market demand and prices both seem to be growing.

On the other hand, overall risk of the project is 10% which is mainly determined by some historical dispute of land (section 2.3.4) and fires that affect the ecosystems in the dry season (Section 3.2.4.1).

Risk Category	Rating
Internal Risk	0
External Risk	2
Natural Risk	5
Overall Risk Rating (a + b + c)	10

With respect to fires, indigenous communities in Africa have a long history of using fires for several reasons including ecological and cultural dynamics²⁵. Within the Chyulus ecosystem, fires mainly affect acacia-savanna ecosystems which have natural resistance to fires and the capacity to recover quickly. Historically, fires have had minimal impact on the key forest resources such as the cloud forest.

Under the intensification of climate change, climate hazards are expected to increase in frequency and intensity in a warming world. For this reason, the Chyulu Hills project is developing a fire plan where equipment, infrastructure, personnel, and coordinated emergency response are at the core of the strategy. The project had advanced this plan, working cooperatively with all the partners.

In 2021, GIS analysis was used to develop a historical record of fires in the ecosystem and understand fire dynamics of fires for the period 2000-2020. The results show that most affected areas correspond to the acacia savanna strata (**Error! Reference source not found.** and **Error! Reference source not found.**).. Some limited areas of cloud forest show some small impact by fires, however after a field survey of those areas, it was confirmed that hat the affect is minimal, and almost entirely restricted edge areas.

This fire analysis provides a baseline and further future work will provide additional guidance for the planning and implementation of an adaptive fire management plan.

2.2.6 Enhancement of High Conservation Values (G3.6)

As described in Section 1.3.6 of the Project Description, the Chyulu Hills ecosystem supports a range of high conservation value elements. These include forming part of the Greater Tsavo Ecosystem and incorporating the Chyulu Hills National Park and a portion of Tsavo West National Park, which are classified as IUCN Protected Area Management Category II. The Greater Tsavo Ecosystem contains Kenya's largest population of elephants, numbering about 12,000 and representing about 2.5% of the total population of this IUCN listed vulnerable species. The Chyulu Hills also supports a small population of critically endangered black rhinos, and the larger ecosystem is a priority area for rhino protection and population growth. The location of the Project Area is recognized as being an important dispersal and corridor area

²⁵ Anthropogenic fires and local livelihoods at Chyulu Hills, Kenya. 2014. Landscape and Urban Planing.

linking wildlife populations in the Tsavo Conservation Area with Amboseli National Park. The ecosystem also supports important populations of other near threatened, endangered, and vulnerable species, including leopard, cheetah, lions and giraffes. The Chyulu Hills cloud forest is floristically rich and contains a number of commercially valuable tree species. Further detailed information on these species is provided in Section 5. The role of the Chyulu Hills as an important water supply aquifer provides a critical ecosystem service to the whole region.

The direct protection of the area through ground patrols, aerial reconnaissance, the gathering of intelligence on poaching activity plays a significant role in protecting the forest carbon stocks, the water catchment function, and all wildlife species. Project partners provide special protection for the resident rhino population. The various initiatives to reduce human-wildlife conflict (fencing, warning systems, compensation programmes) all serve to reduce human threats to all wildlife species. The extensive community benefit programmes run by project partners and partially financed through the REDD+ project (see section 4) all contribute to building support for protecting the natural resources of the area and creating and demonstrating economic benefits and opportunity through payments for ecosystem services.

These actions, described also in section 5.1.2, aim to ensure the maintenance or enhancement of the high conservation value attributes identified as:

- G1.8.1 – Globally, regionally or nationally significant concentrations of biodiversity values for Protected areas: Protection of habitats and forest areas of important species like black rhinos and elephants. The activity of patrolling has increased the conservation of the forest and grasslands along the project area, Rangers help the community to understand the importance of the ecosystems and wildlife that surround them, please refer to section **Error! Reference source not found.** for details.
- G1.8.2 – Threatened species, Endemic species, and Areas that support significant concentrations of a species during any time in their lifecycle; Globally, regionally or nationally significant large landscape-level areas where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance: Reduction of deforestation and anthropogenic pressure to the habitats in the Chyulu Hills, derive in wellbeing of species that inhabit in the areas, this include, habitats and forest areas of important species like black rhinos and elephants.
- G1.8.3 – Threatened or rare ecosystems: The protection of endangered species and their habitats favors the long-term viability of their populations, while the connectivity among ecosystems allows the movement and migration of fauna, which results in tourism attractions and income to the region.
- G1.8.4 – Areas that provide critical ecosystem services for hydrological services and erosion control: Some areas were fenced to prevent bank erosion caused by wildlife, such as elephants, and allow recovery of vegetation. A water tank was also constructed to provide additional water for wildlife and restoration of degraded areas through tree planting was also undertaken. Watering points for livestock and wildlife in Mbirikani Ranch were constructed to reduce the distances travelled to access water, and to reduce rangeland degradation. In this sense 40,000 seedlings in 40 ha in degraded wetlands and riparian areas. 3,000 seedlings in schools and public institutions have been planted, see MR section 2.2.1.

The Project also contains several important HCVs related to community. Through protection of the Project Area from ecosystem conversion, the increased conservation-focused activities, the enhanced effort in education, the provisioning of services such as poles for building material, fodder, fuel and medicinal plants, the collaborative management with the communities and a development of a zoning and restoration plan and initiatives such as the development of grass seed banks, these services are not negatively affected by the project (also described in section 4.1.3), the following community HCVs can be maintained:

- G1.8.5 – Areas that are fundamental to meeting the basic needs of local communities

- G1.8.6 – Areas that are critical for the traditional cultural identity of communities²⁶

To the Chyulu Hills REDD+ Project's knowledge, there are no globally or locally recognized areas that are critical for the traditional cultural identity of the communities²⁷. Moreover, upon consultation, it was found that no sacred sites have been established within the Project Area, except for a single fig tree within Chyulu Hills National Park. This tree serves as the site for ceremonies during times of prolonged droughts, but also these ceremonies can be undertaken in other big size fig trees in different locations.

2.2.7 Benefit Permanence (G3.7)

As identified in the former PD section 2.3.2 Measures Taken to Enhance CCB Benefits beyond the Project Lifetime, the Chyulu Hills REDD+ Project implements activities that address the drivers of deforestation and degradation raising awareness of the value of a healthy functioning ecosystem and ecosystem services as a foundation for local economies. A range of project activities that benefit communities are designed to support long-term positive change lasting beyond the project lifetime.

- Education

The project is providing bursaries for school children and has funded improvement of school facilities, including teacher housing, lighting, security fencing, training farmers. The project has also funded salaries for teachers and other school staff. This support improves education for children, both boys and girls, and offers them improved long-term future life opportunities in Kenya's rapidly growing and diversifying economy.

- Poverty reduction

Poverty Reduction and Livelihood Diversification has been approached with activities such as training in Alternative Income Generating Activities (IGAs), direct employment and skills development, provision of bursaries and scholarships for children from poorer families and specific promotion of girls education, improving health facilities and care and strengthening community organization.

- Creation of Alternative Income Generating Activities (IGAs)

Promotion of income generating activities such as beekeeping, honey production, grass seed banks, and bead jewellery making serve to diversify the economic activities in the community, especially for women's groups. The increase in income enables families to improve their economic status, improving their food security, housing, mobile phone access and the ability to pay school fees and healthcare expenses.

- Sustainable management of natural resources and sustainable agriculture

The project is supporting initiatives such as the expansion of tree nurseries and tree planting, which is a focus of KFS, particularly with the eastern small scale agriculture communities. The aim is to improve the productivity, sustainability and resilience of subsistence farming, particularly in the face of the impacts of climate change. For the pastoral communities, Big Life and MWCT are working with the Maasai to implement more sustainable livestock management and rangeland restoration.

Also, to improve the long-term sustainability of the project beyond the crediting period, the project has instituted a range of measures and approaches:

²⁶ HCVs in this category are sacred sites within the project zone's forests, which have not been identified in the Project Area.

²⁷ PDD section 1.3.6.12. Areas that are critical for the traditional cultural identity of communities (e.g. areas of cultural, ecological, economic or religious significance identified in cooperation with the communities).

- Cross-collaboration

The structure of the project, bringing together all the entities in the project area that have land title, including local Maasai communities as well as the local NGOs that support conservation in the ecosystem, with each having equal governance rights, promotes an important level of collaboration and information sharing that was not historically present. This structure strengthens local capacity to effectively plan and integrate conservation actions in the long-term. The Deed of Trust of the Chyulu Hills Conservation Trust with its requirement of a 75% voting threshold to pass resolutions also further promotes collaboration and consensus decision-making. Although, local communities on the eastern side of the project are not represented, the project is allocating significant resources to these communities to demonstrate the long-term value of conservation. All these factors build institutional strength to support long-term sustainability of the conservation programs.

- Strong governance

The Chyulu Hills Conservation Trust, the Project Proponent, has set a strong governance process. The Trustee Board Representatives meet on a regular basis, there is a robust process for allocating revenues from carbon sales and managing those grants. The Board receives regular financial statements and other reports and has demonstrated an ability to collaborate in addressing broad strategic challenges. One recent example is developing a plan to address the threat of fire and investing resources for implementation. The project is also providing guidance to the Group Ranch board members on the roles and responsibilities of the board and has provided them with laptop computers to strengthen their capacity to be effective. This collaborative governance capacity enhances the long-term sustainability of the project.

- Building institutional capacity

In addition to building capacity within the REDD+ Project itself, the project is supporting the strengthening of institutional capacity within project partners, including the community Group Ranches. This includes constructing and equipping offices for Group Ranch leaders, developing land-use plans, and assisting with the development of more sustainable livestock grazing and management practices.

- Other PES

One of the long-term visions for conservation in the Chyulus landscape has been to build a portfolio of payments for ecosystem services to provide increased funding consistently and growth in conservation funding revenue to support programs and the payment of conservation dividends to local community members. Included in the PES portfolio are ecotourism, REDD+, Water and livestock.

Although ecotourism has been severely affected by the COVID-19 pandemic, there has been new investment and it is hoped that tourism income will slowly recover over the next two years. The Project Office has been working for the last two years to develop the concept of a water PES for Chyulus based on the water delivery via the Mzima pipeline and its potential expansion. The consulting firm AECOM have undertaken a detailed baseline analysis and the project is partnering with The Nature Conservancy, who are developing a Mombasa Water Fund initiative. The Chyulu water PES would form an important component of the Mombasa Water Fund project. MWCT and Big Life have been working with external and other partners to develop an integrated approach to livestock management that would be both ecologically and economically more sustainable than current practices.

- Endowment

Based on robust carbon credit sales in the last two years and a strong working capital balance, the CHCT Board allocated a first contribution (~\$300,00) to endowment principal at its April 2021 board meeting. The long-term strategy is to build a substantial endowment during the crediting period so that project activities can be continued after the end of the crediting period. A model for endowment funding is included in the financial analysis for the Non-Permanence Risk Analysis.

2.3 Stakeholder Engagement

2.3.1 Community Consultation (G3.8)

Extensive community and stakeholder identification, outreach and information sharing were carried out during the project development and initial verification periods. This process has continued during the current verification period.

On a continuing basis the Project Office and Project partners maintain an ongoing dialogue and meetings with community members and leaders, particularly in relation to the application of REDD+ funding. For each allocation of funds to the Group Ranches there is extensive discussion with leaders and other community stakeholders about their selection of activities or interventions to be funded. Then during grant implementation there is continuous dialogue and information exchange between the Project Office and the community leaders and entities being funded, such as schools or clinics.

REDD+ funding of projects from carbon sales did not begin until 2018. In anticipation of future funding, the project carried out an extensive programme of community outreaches right across the Project Area with a total of 41 separate community meetings (Figure 5). In addition, to update the community members about the status of the REDD+ project, a primary goal was to gather input on the self-identified priorities for the use of REDD+ funds when these became available. Records of all the meetings were filed and a full report and analysis were undertaken. Grants to the communities then started in 2018. In 2019 there was significant engagement with the communities in relation to the actual awards of grant funding.

In 2020 the first grant funding (KES 12 million) was provided for the eastern communities. In association with this award, further community meetings were held in March 2020 to reaffirm the priorities for funding identified by the communities. Based on these priorities, the first funding focused on bursaries for underprivileged children, beehives and bee-keeping equipment and training to promote income generation, and water tanks for schools.

In 2020, surveys for the REDD+ Project social impact analysis (see Section 4.3) were carried out. In addition to the formal collection of survey data, the visits at the household level also provided an opportunity for interviewees and family members to discuss the REDD+ Project, provide input and receive information.

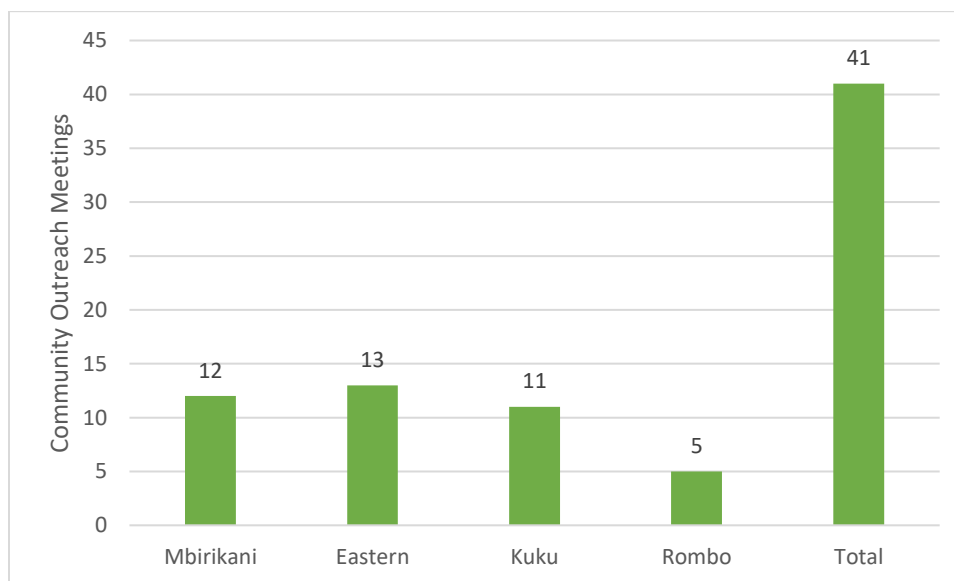


Figure 5. Community Outreach Meetings in the project area 2018.

2.3.2 Public Comment Period Publicity (G3.9)

To ensure that all stakeholders have access to the Project information, including monitoring report documents, and are able to comment on the documents during the public comment period, the following steps were implemented:

- An executive summary of the second monitoring report was made available in English and Swahili at all Project Partners headquarters, and at the chief's offices, which were posted on the Project bulletin boards.
- The Project Partners actively communicated to community members the start of the Public Comment Period at their community outreach meetings and encouraged them to file any comments. Community engagement officers would also make note of any verbal comments and ensure that these were also registered.
- A computer was made available to any member of the public at the Project Office, located at the MWCT CCRC, Kuku Ranch, so they could make any comments directly onto the CCB website. All Public comments received in writing will be passed on to the Project Verifier.

2.3.3 Distribution of Project Information (G3.9)

The local meetings informed the local community and authorities about the Project activities. Communities were informed through emails, formal letters, phone calls, with important information also being displayed on boards (see Figure 6), which were located in strategic points of the project area.



Figure 6. Field information board

The Monitoring Plan has been made available for public review at the Project Office, and at the office of each of the Project Partners. The results of the community monitoring are included in this Project Monitoring Report, which is being made publicly available in the Project Area, with a hard copy being made available for review at the Project Office, and at the office of each of the Project Partners. Additionally, a Monitoring Report summary has been written and provided to communities throughout the Project Area in English and Swahili. The Monitoring Report has also been posted on the CCB website for public review and comment (as was mentioned in section 2.3.2).

During March 2021, South Pole and the Project Office visited the Project Area, including several implementation activities, with meetings with the community members also being held. During these meetings, communities were informed about the ongoing verification process and the following visit of the validation verification body. In July 2021 a further community outreach programme across the project Area and project Zone was undertaken to provide updated information on the REDD+ Project, present the summaries of the Implementation Report and advise community members about the public comment period.

2.3.4 Conflicts and Grievances (G3.10)

The CHRP strives to minimize the possibility of conflicts and grievances by maintaining close linkages and working proactively with communities and stakeholders throughout the Project Area. The Project has an open-door policy, which encourages community members, stakeholders and employees to visit the Project Office, which is located at the Community Conservation Research Centre (CCRC) at the Maasai Wilderness Conservation Trust (MWCT), on Kuku Group Ranch, and discuss any issues or feedback directly with Project staff.

If any conflicts or grievances were to arise, the CHRP has a feedback and grievance redress policy and process, which aims to provide an efficient, fair and accessible mechanism for resolving complaints and conflicts, whilst ensuring that the process is transparent and comprehensive. This grievance and conflict resolution procedure will also apply to any groups external to the CHCT that are involved in Project benefit distribution or the operation of Project activities. The CHRP feedback and grievance redress process has been publicized to communities, with a copy also being provided to the Project Verifier.

This procedure applies to CHCT and any activities under the CHRP. Individual Project Partners currently have their own respective feedback and grievance redress procedures in place. These vary from an open door and open dialogue policy, to formalized procedures. In the case of KWS, for example, written and verbal complaints are registered by the Community Warden and delivered to the TWNP Senior Warden. The complaints are then verified, and a report written. Every quarter, these reports are sent to the KWS headquarters to be kept on file. In addition, KWS has a 24-hour hotline that community members can call any time of the day or night.

Two types of issues accounted for in the grievance process include:

- Issues or conflict between the community or other Project stakeholder and the CHCT.
- Concerns regarding employee rights, work practices, and employee safety raised by CHCT employees or contractors.

During the monitoring period a total of 4 grievances were registered (Table 5):

Table 5: Grievances during the period 2016 – 2020.

DATE GRIEVANCE	PERSONAL DETAILS	NATURE OF COMPLAINT
12 July 2016	Mr. Saidimu Nkoe	Complain about validation process and proof required that local populations would not be negatively impacted by the REDD+ project.
09 December 2016	Kuku Youth Alliance	Complain about misuse of resources, gradual entrenchment of a culture corruption and abuse of office in both group ranches.
28 December 2016	Soil Sampling Working Team	Grievance about soil sampling team working on Sundays. (Verbal grievance).

25 May 2020	Kilelo Kilitia, Sayianka Kosei, Lanet Kimare, Kikardi Suyianka. Mbirikani community members	Objection of release of carbon funds to Imbirikani (KES 10m Grant distributed by CHCT board in November 2019)
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All the grievances followed the grievance redress policy, except for the one from the Soil Sampling Team, which was a verbal grievance, however all of them were answered following the procedures. All the supporting information of each of the grievances are available (see Annex_3_Grievance).

2.4 Management Capacity and Best Practices

2.4.1 Required Technical Skills and Expertise (G4.2)

The Chyulu Hills REDD+ Project is managed and operated by a pool of qualified staff, who each possess significant years of experience and a positive track-record in their respective fields. Below is a listing of the key positions and Project-specific technical skills deemed necessary for the successful operation of the REDD+ Project. Between the Project Partners and their advisors, the Project possesses all of the following skills:

- **Project Management:** Strong knowledge of REDD+, third-party crediting and good leadership skills required. Experience of African conservation projects, security matters and on-the-ground operations deemed necessary. Knowledge of Swahili and/or Maa beneficial.
- **Carbon Accounting:** Excellent knowledge of carbon accounting, GIS and remote sensing necessary. Experience in VCS and CCB crediting advantageous. Attention to detail and ability to train plot samplers required.
- **Social and Biodiversity Monitoring:** Thorough understanding of Monitoring, Reporting and Verification (MRV) requirements necessary. Background in monitoring and research beneficial. Knowledge of Swahili and/or Maa required.
- **Operations and Administration:** Experience on-the-ground security operations in Kenya, mechanical skills and ability for quick assessment in security cases required. Good leadership and coordination skills necessary. Basic knowledge of Swahili and/or Maa beneficial.
- **Community Engagement:** Strong understanding of REDD+, fluent in Swahili and/or Maa and good presentation skills required. Enthusiasm to engage with local communities and a willingness to answer recurring questions with the same preciseness needed. Preferably from local communities.

Currently the project has an installed staff capacity of 12.95 FTEs (per Project Office 2022 budget costing analysis) making up a team that is significantly or wholly focused on support of implementation, validation and verification of the REDD+ Project. In addition, the project team in the field has the support of a full-time, qualified and experienced advisor, partnership with the Conservation International carbon finance team, and the services of South Pole. All have very significant experience in the development, implementation, and management of REDD+ Projects. There is ongoing, regular consultation and information exchange via meetings, conference calls and email between staff and external advisers and consultants on all issues related to the ongoing management and implementation of the project and the national and international policy environment related to REDD+.

In addition, the project provides specific expert-led training for key activities or functions such as tree plot sampling, social benefit impact assessment, soil sampling, and botanical survey (See section of plant

Diversity in 5.3). Members of the team involved in community outreach are also guided in terms of full inclusion of community members in outreaches, and information sharing and key communications materials and messages.

2.4.2 Worker Training (G4.3)

As most of the Project Partner organizations have well-established institutional structures and capacity, they have staff training and orientation programs. For staff that are hired specifically for the REDD+ Project, appropriate training is provided. For example, rangers funded through the REDD+ Project have joined the ranger force operated by MWCT and Big Life. These rangers receive standard basic training and further training at the national ranger training school operated by KWS. During the Monitoring Period about 100 rangers across the Project Area were hired, five teachers have been kept by the project, and nine new computers, with computer training, were provided to enhance local governance and management, also, five community health workers received training seminars in related health topics.

Temporary staff have also been hired by the REDD+ Project to assist with field tree plot sampling and social benefit impact assessment. These workers all received specialist training.

Both permanent positions, such as rangers and teachers, and temporary positions provide an enjoyable experience and training for local staff, providing experience and skills development. The Maasai Wilderness Conservation Trust presents this aspect in its annual impact report (see Annex_10_Natural_risks\ 2020 MWCT Impact Report).

2.4.3 Community Employment Opportunities (G4.4)

The CHRP considers local employment a priority and local sourcing is strongly encouraged at all levels of the Project, from casual workers up to management positions. The CHRP recognizes that local hiring is a major benefit to the implementation and operation of the Project due to the knowledge and familiarity local people possess about the landscape, its communities and its biodiversity. Their involvement will also ensure the sustainability and continuity of the Project throughout the Project's Lifetime and beyond.

Currently, the majority of the Project Partners' employees come from the local area. The Project Office will continue employing and training local people in order to increase local participation in the Project design and implementation, as well as build capacity, knowledge and a robust skills base.

Also, the Project has adopted an Equal Opportunity policy (see Annex_4_Employment_Policies). All job opportunities funded through the REDD+ CHRP are openly advertised through the Project Office and Project partners. The selection of potential employees is undertaken through an open and transparent process that provides equal opportunity to all applicants. The CHRP operates a strict non-discrimination policy so that women and vulnerable groups of people will receive an equal of employment, regardless of the type of work. One example of this is that during validation the Project employed a female plot sampler, a job that is physically demanding and usually carried out by men. In addition, the CHRP has been working with the women through their representation in various advisory committees. Finally, the CHRP has developed Project Activities to engage with women groups and help promote financial independence with projects like the grass seedbanks (10 local women are in charge of each area), beekeeping, and handcrafts.

Job applicants are selected for an interview based on their skills and experience required for the advertised positions. Employment vacancies are publicly advertised through the same channels that other Project news is publicized, such as through posters at the Project Office and on the Project notice boards located at various sites in the Project Area. Project staff also email and text community members and leaders to notify them of job opportunities. Successful candidates are selected in a non-discriminatory manner through a fair and open process. Preference is given to applicants who live in the local communities. Unsuccessful

candidates are provided with an explanation for why they were not selected in order to assist them to improve if there is another vacancy in the future.

2.4.4 Relevant Laws and Regulations Related to Worker's Rights (G4.5)

The CHRP abides by all worker's rights laws and regulations. Workers will be informed about their rights at the point of their employment during the employee orientation. Below is a list of the relevant laws.

The Employment Act, 2007

Employment Act 2007 is an Act of Parliament that declares and defines the fundamental rights of employees to provide basic conditions of employment of employees, to regulate employment of children, and to provide for matters connected with the foregoing.

The Labor Institution Act, 2007

The Labor Institution Act 2007 is an Act of Parliament to establish labor institutions, to provide for their functions, powers and duties, and to provide for other matters connected thereto.

The Labor Relations Act, 2007

The Labor Relation Act 2007 is an Act of Parliament to consolidate the law relating to trade unions and trade disputes, to provide for the registration, regulation, management and democratization of trade unions and employers organizations or federations, to promote sound labor relations through the protection and promotion of freedom of association, the encouragement of effective collective bargaining and the promotion of an orderly and expeditious dispute settlement, conducive to social justice and economic development and for connected purposes.

The Work Injury Benefits Act, 2007

The Work Injury Benefits Act 2007 is an Act of Parliament which provides compensation to employees for work-related injuries and diseases contracted during their employment and for connected purposes.

The Retirement Benefits Act, 1997

The Retirement Benefits Act 1997 is an Act of Parliament to establish a Retirement Benefits Authority for the regulation, supervision and promotion of retirement benefits schemes, the development of the retirement benefits sector and for connected purposes.

The National Social Security Fund Act, 1989

The National Social Security Act (the 1989 was revised in 2012) is an Act of Parliament to establish a National Social Security Fund, to provide for contributions to, and the payment of, benefits out of the Fund, and for matters connected therewith and incidental thereto.

The Occupational Safety and Health Act, 2007

The Occupational Safety and Health Act 2007 is an Act of Parliament to provide for the safety, health and welfare of workers and all persons lawfully present at workplaces, to provide for the establishment of the National Council for Occupational Safety and Health and for connected purposes.

The CHRP compiles into a document (Please refer to folder Annex_4_Employment_Policies, all the policies concerning the hiring for employment or selection of individuals for participation in project activities in the Chyulu Hills REDD+ Project. Furthermore, workers were informed about their rights during the employee orientation, about the Worker Health and Safety Plan and methods to mitigate the risks and for the 2020 year, they were informed about the healthy measurements to prevent Coronavirus. A hard copy of the relevant laws and policies are kept at the Project Office and any worker is free to consult these any time during working hours.

The CHRP is committed to fair treatment and equal opportunity for any person including, but not limited to, gender, religion, nationality, tribe, or sexual identity. The Project has established an equal opportunity policy that ensures that the Project will not engage in or be complicit in any form of discrimination. Moreover, the CHRP is committed to providing a workplace that is safe and free from all sexual harassment or unwelcome sexual advances. The Project has drafted a document outlining a sexual harassment policy, defining sexual harassment and describing the recourse that any employee who feels that they have suffered sexual harassment should take.

Below can be found a list of relevant employment policies:

- Equal Opportunity Policy²⁸
- Child Labour Policy
- Worker Health and Safety Plan (see 2.4.5)
- Sexual Harassment Policy

These policies cover all hiring or employees under the Chyulu Hills REDD+ Project. The partners of the CHCT pledge to work towards aligning their hiring and employment policies with these for their employees who work on REDD+ Project-related activities or individuals they select for participation in project activities that they manage. Section 1.2 and **Error! Reference source not found.** shows the hiring effort and employees by partners, all of them complying with the mentioned policies.

2.4.5 Occupational Safety Assessment (G4.6)

The CHRP ensures that workers health and safety are protected to the best of the Project's ability at all times and across all sites. Risks are identified, mitigation strategies produced and appropriate measures adopted in order to minimize any risks.

Given the nature of the Project and its geographical surroundings, it is recognized that certain occupations present a greater risk to the health and safety of workers, particularly occupations that require spending long periods in relatively remote and rugged areas. These include plot samplers, researchers and rangers, who may be faced with challenging terrain as well as the risk of encountering wild animals or people

²⁸ The CHRP has been working with the women through their representation in various advisory committees. Also encouraging girls' enrollment in schools through the allocation of an equal number of school bursaries to boys and girls. Finally, the CHRP has developed Project Activities to engage with women groups and help promote financial independence with projects like the grasslands seedbanks (10 local women are in charge for each area), beekeeping and handcrafts.

involved in illegal activities such as poaching, wood cutting or illicit cultivation, all of whom could pose a risk to their safety. In addition, forest fires may also pose a safety risk if they spread rapidly and unexpectedly. The Project has created a comprehensive Health and Safety Plan that ensures that all workers health and safety is protected to the best of their ability, and that all workers are fully informed about workplace risks and safe practices in order to mitigate those risks. These include training in safe working practices, first aid training for some staff members as well as the enforcement of requirements for the safe handling of equipment and other materials. In addition, this Health and Safety Plan provides a comprehensive list of the measures that will be taken to inform employees of their rights, to assign roles and responsibilities to supervisors and workers, and provide a safe workplace culture. This document will be used regularly and revised as needed to ensure that it contains current information and includes all job categories and potential risks. A copy of the plan has been provided to the verifier and will be kept at the Project Office and be readily available for any consultation. Furthermore, the CHRP will ensure a detailed orientation of newly recruited employees during their initial introduction at work and ensure that they are fully aware of their rights as well as their responsibilities.

2.4.6 Financial Health of Implementing Organization(s) (G4.7)

To ensure adequate financial support over the Project lifetime, it is vital to obtain sufficient, stable and secure long-term financial resources and the allocation of an appropriate form to cover the costs of managing the Project Area and to guarantee that these are managed efficiently and effectively in terms of concerns regarding conservation and other purposes.

The financial health of the implementing organisations and of the project itself is presented in detail in the Financial Viability Analysis for the Non-Permanence Risk Analysis and estimating the financial risk score. The two-government agency and NGO project partners all have a multi-year history of operations and provide an underlying financial base that is now being augmented by significant REDD+ revenues from carbon credit sales. Between them the project is in a strong financial position to be able to continue implementation of the project (see Annex_5_Financial_Statements).

2.5 Legal Status and Property Rights

2.5.1 National and Local Laws (G5.1)

The CHRP meets all local, national and international laws, which relate to this Project. Regarding the national laws, KWS and KFS as part of the constituent CHCT Trustee partners, as well as part of the Ministry of Environment and Natural Resources, are in constant communication with the National Government and are aware of the environmental laws, so if a law is changed, updated or loses validity, they will be notified. MWCT and Big Life are in constant communication with the local communities and their representatives, and take part in the discussions and support management activities among others, so they are aware of the local laws and regulations. At the international level KWS, KFS, and Sheldrick Wildlife Trust are active in Kenya's engagement with multiple international conservation agreements, treaties and policy related to environmental and species conservation.

Relevant laws and international agreements are outlined below:

The Land (Group Representatives Act), 2010

The Land (Group Representatives Act) 2010 is an Act of Parliament to provide for the incorporation of representatives of groups who have been recorded as owners of land under the Land Adjudication Act, and for purposes connected therewith and purposes incidental thereto.

The Forest and Conservation Management Act, 2016

The Forest and Conservation Management Act 2016 is an Act of Parliament which will give effect to Article 69 of the Constitution with regard to forest resources, and provide for the development and sustainable management, including conservation and rational utilization of all forest resources for the socio-economic development of the country and for connected purposes.

The Wildlife (Conservation and Management) Act (Cap. 376), revised 2009 and 2013

The Wildlife (Conservation and Management) Act 2013 is an Act of Parliament to provide for the protection, conservation, sustainable use and management of wildlife in Kenya and for connected purposes.

The Land Act (No. 6), 2012

The Land Act 2012 is an Act of Parliament which will give effect to Article 68 of the Constitution, to revise, consolidate and rationalize land laws, and provide for the sustainable administration and management of land and land-based resources, and for all connected purposes.

The Environmental Management and Coordination Act, 1999

The Environmental Management and Coordination Act 1999 is an Act of Parliament to provide for the establishment of an appropriate legal and institutional framework for the management of the environment and for matters connected therewith and incidental thereto.

The Water Act, 2002

The Water Act is an Act of Parliament to provide for the management, conservation, use and control of water resources and for the acquisition and regulation of rights to use water, to provide for the regulation and management of water supply and sewerage services, to repeal the Water Act (Cap. 372) and certain provisions of the Local Government Act, and for all related purposes.

The Water Act 2016

A new Water Act was passed in 2016 to replace the old act. The new Act is an Act of Parliament to provide for the regulation, management and development of water resources, water and sewerage services, and for other connected purposes.

The Agriculture, Fisheries and Food Authority Act, 2013

The Agriculture, Fisheries and Food Authority Act is an Act of Parliament to provide for the consolidation of the laws on the regulation and promotion of agriculture generally, to provide for the establishment of the Agriculture, Fisheries and Food Authority, to make provision for the respective roles of the national and county governments in agriculture, excluding livestock and related matters in furtherance of the relevant provisions of the Fourth Schedule to the Constitution, and for connected purposes.

The Constitution of Kenya, 2010

The Constitution of Kenya (2010) is the supreme law of Kenya. It establishes the structure of the Kenyan government and also defines the relationship between the government and the citizens of Kenya.

The National Climate Change Response Strategy, 2010

The National Climate Change Response Strategy - Kenya has developed its first National Climate Change Response Strategy (NCCRS) in order to put in place robust and thorough adaptation and mitigation measures to minimize risks and maximize opportunities. The strategy is designed to enhance Kenya's participation in global climate change (COP) discussions.

Climate Change Act 2016

The Climate Change Act 2016 is an Act of Parliament to provide for a regulatory framework for an enhanced response to climate change, to provide for mechanism and measures to achieve low carbon climate development, and for connected purposes.

International Treaties

Kenya is a signatory to the following International Treaties.

Convention of Biological Diversity: Kenya ratified the convention on July 26, 1994, and signed its two related mandates, the **Cartagena and Nagoya Protocol** on September 11, 2003, and January 2, 2012, respectively.

United Nation Framework Convention of Climate Change: Kenya signed this on June 12, 1992, and ratified the **Kyoto Protocol** on September 25, 2005.

African Convention on Conservation of Nature and Natural Resources: Kenya signed on September 15, 1968.

Convention on International Trade in species of Wild Fauna and Flora (CITES): Kenya ratified on December 13, 1978.

Convention on the Conservation of Migratory Species. Kenya has been a Party since 1999.

2.5.2 Free, Prior and Informed Consent (G5.3)

The Project has undertaken a long-term and continuous dialogue with local communities within the Project Area and Project Zone and Free Prior Informed Consent (FPIC) Officers. The inclusion of the Maasai Group Ranches as Trustees in the Chyulu Hills Conservation Trust has also insured that these local communities are not only consulted but are true stakeholders in the governance and distribution of benefits. The Project has also held extensive outreach and consultation with communities in the project Zone on the eastern side of the project Area (see also discussions in Section 2.3.1).

2.5.3 Property Rights Protection (G5.4)

The implementation and development of the project did not lead to involuntary removal or relocation of any stakeholder. As mentioned in section 2.2.7, board meeting with the leaders of every community and members of the organizations involved in the Project has been taking place. These meetings help to verify the activities implemented in the Project and assure that not removals or relocations of property rights take place.

- Mikulolo land dispute.

This land dispute affects an area on the northern border of Chyulu Hills National Park, which is also the border of the Project Area. The dispute was reported in the Project design Document as it is a long-running case.

The case involves a claim by the Mikululo Ranching (Direct Agricultural) Co. Ltd contesting the gazettement of two parcels of land into the national park. The first dates back to 1983 when the Chyulu Hills National Park was formally gazetted under the appropriate laws. The second dates to an extension of the national park of about 10,000 acres which was formally gazetted in August 1995. It is important to note that Mikululo Ranching is not an indigenous group but a commercial agricultural enterprise through which shareholders or members, who may or may not originate from within or close to the project area, are able to obtain plots for settlement and small-scale agriculture.

Based on the proper legal gazettement of these parcels under Kenyan law, Wildlife (an Conservation Management) Act Chapter 376, KWS has sought to prevent incursion of these lands by settlers from Mikululo Ranching Co. In February 2019 the Mikululo filed suit to prevent KWS from evicting settlers from the 10,000 acre parcel. The court ruled against KWS and required KWS to abstain from actions to evict settlers on the disputed land but also required that the settlers must not extend their settlement or other activities beyond the 10,000 acre parcel partially settled. In August 2019 KWS lodged a notice of appeal with the Court of Appeal against the entire judgement together with an Application for a stay of execution of the judgement pending appeal. The appeal process has been substantially slowed by the impact of the COVID pandemic on the operation of Kenya's court system but KWS legal representatives are pursuing it.

KWS believes that the lands in question were properly and lawfully gazetted for inclusion in the national park and their counsel, as well as legal counsel retained by the REDD+ Project, believe that the land court judgement will be overturned by the appeal.

It should be noted that this dispute is not about the removal or relocation of indigenous groups or others with a historical claim to the disputed land. Rather it is about a commercial company attempting to expropriate land that was lawfully incorporated into the national park as far back as 1983 and that this land was previously not settled. The Project Office has recently obtained historical satellite imagery showing that there was indeed no historical settlement of this area so neither the creation of the National Park nor the development of the REDD+ project have resulted in involuntary removal or relocation of any stakeholder.

2.5.4 Identification of Illegal Activity (G5.5)

There are some activities that, if carried out in the Project Area, are illegal. These are currently being addressed by the Project Partners. The REDD+ project funding is assisting project partners to monitor illegal activities and reduce or prevent their occurrence.. Activities that may impact the Project's climate objectives include charcoal burning, wood extraction for carvings and some logging. Project Partners have on-going security operations and ranger teams that patrol the area with the aim of stopping any such activities, particularly in the National Parks and the Forest Reserve (KWS and KFS). Selective logging and removal of poles for fencing is currently allowed on the Group Ranches with approval by the Group Ranch leaders committee, but during negotiations with the stakeholders it was made clear that such activities should be strictly controlled or stopped.

Poaching is a potentially serious problem, both in terms of bush meat and elephant/rhino poaching for tusks and horn products, and may affect the Project's biodiversity impact. However, Project Partners, particularly KWS, DST, BLF and MWCT, are dedicated to protecting these animals and have comprehensive security operations in place in order to monitor and respond to any illegal activity. These initiatives include working closely with government law enforcement, including the police and court system, and developing the collaboration of local communities through information sharing and the delivery of project benefits.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Data / Parameter	α
Data unit	Unitless
Description	Combined effects of β and θ at the start of the historic reference period for the Forest Project Accounting Area
Source of data	Reference area and historic reference period
Value applied	-0.5673113

Justification of choice of data or description of measurement methods and procedures applied	<i>Time and place in which the logistic model is fit</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	α
Data unit	<i>Unitless</i>
Description	<i>Combined effects of β and θ at the start of the historic reference period for the Grassland Project Accounting Area</i>
Source of data	Reference area and historic reference period
Value applied	-1.13912
Justification of choice of data or description of measurement methods and procedures applied	<i>Time and place in which the logistic model is fit</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	β
Data unit	<i>unitless</i>
Description	<i>Effect of time on the cumulative proportion of conversion over time for Forest Project Accounting Area</i>
Source of data	Reference area and historic reference period
Value applied	0.0001032
Justification of choice of data or description of measurement methods and procedures applied	<i>Time and place in which the logistic model is fit</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	β
Data unit	<i>Unitless</i>

Description	<i>Effect of time on the cumulative proportion of conversion over time for Grassland Project Accounting Area</i>
Source of data	<i>Reference area and historic reference period</i>
Value applied	<i>0.000578</i>
Justification of choice of data or description of measurement methods and procedures applied	<i>Time and place in which the logistic model is fit</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	γ
Data unit	days
Description	Time shift from beginning of historic reference period to Project Start Date
Source of data	Historic reference period
Value applied	<i>10,725</i>
Justification of choice of data or description of measurement methods and procedures applied	<i>Time in which the logistic model is fit. The start of the historic reference period is 9 May, 1984 and the Project Start Date is 19 September, 2013.</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	θ
Data unit	unitless
Description	Effect of certain covariates on the cumulative proportion of conversion over time
Source of data	Reference area and historic reference period
Value applied	<i>N/A</i>
Justification of choice of data or description of measurement methods and procedures applied	<i>Time and place in which the logistic model is fit</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	λ_{soc}
Data unit	proportion (unitless)
Description	Exponential soil carbon decay parameter
Source of data	Value from the literature. Davidson, E., and Ackerman, I. 1993. Changes in soil carbon inventories following cultivation of previously untilled soils. Biogeochemistry, 20(3), 161-193.
Value applied	0.2
Justification of choice of data or description of measurement methods and procedures applied	<i>Default value from VCS methodology VM0009</i>
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	$\hat{\sigma}_{\text{EM}}$
Data unit	standard deviation (unitless)
Description	The estimated standard deviation of the state observations used to fit the logistic function for the Forest Project Accounting Area BEM
Source of data	Remote sensing image interpretation
Value applied	0.43027
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	$\hat{\sigma}_{\text{EM}}$
Data unit	standard deviation (unitless)
Description	The estimated standard deviation of the state observations used to fit the logistic function for the Grassland Project Accounting Area BEM
Source of data	Remote sensing image interpretation
Value applied	0.21912

Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	B
Data unit	set
Description	The set of all selected carbon pools in biomass. Is a subset of C
Source of data	PD
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	C
Data unit	set
Description	The set of all selected carbon pools
Source of data	Monitoring records
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	J
Data unit	set

Description	The set of all observations of conversion. When superscripted with a monitoring period, the conversion observations are taken for leakage analysis.
Source of data	Remote sensing image interpretation or field observations in the leakage area.
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Comments	

Data / Parameter	$\mathcal{M}$
Data unit	set
Description	The set of all monitoring periods
Source of data	Monitoring records
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	$\mathcal{T}$
Data unit	ha
Description	The set of all species/categories of livestock
Source of data	Monitoring records
Value applied	N/A

Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of project emissions</i>
Comments	Parameter not used

Data / Parameter	A_{PAA}
Data unit	ha
Description	Area of Forest Project Accounting Area
Source of data	GIS analysis prior to sampling
Value applied	265,547.07
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	A_{PAA}
Data unit	ha
Description	Area of Grassland Project Accounting Area
Source of data	GIS analysis prior to sampling
Value applied	109,130.57
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline emissions</i> <i>Determination of project emissions</i>
Comments	

Data / Parameter	A_{PX}
Data unit	ha
Description	Area of proxy area for the Forest Project Accounting Area

Source of data	GIS analysis prior to sampling
Value applied	19,825.8
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	- Determination of baseline emissions - Determination of project emissions
Comments	

Data / Parameter	A_{PX}
Data unit	ha
Description	Area of proxy area for the Grassland Project Accounting Area
Source of data	GIS analysis prior to sampling
Value applied	1,028.54
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	- Determination of baseline emissions - Determination of project emissions
Comments	

Data / Parameter	C_{Lp}
Data unit	tCO ₂ e/ha
Description	Carbon stocks in project leakage area
Source of data	Leakage area sampling
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	Direct measurement
Purpose of the data	Determination of baseline emissions
Comments	Parameter not used

Data / Parameter	f_{LS}^i
Data unit	kg CH4 head-1 yr-1
Description	Emission factor for the defined livestock population, i
Source of data	IPCC default values
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	<i>Obtained directly from IPCC default values</i>
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	Parameter not used

Data / Parameter	m
Data unit	tCO2e/ha
Description	Average carbon in merchantable trees cut each year as a result of legally-sanctioned commercial logging
Source of data	Timber harvest plans or measurement of carbon stocks in merchantable trees in the Project Accounting Area.
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	<i>Should use the most accurate of the two data sources if both are available</i>
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	Parameter not used

Data / Parameter	n_d
Data unit	unitless
Description	Number of spatial points in the Forest Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	10,285

Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	n_d
Data unit	unitless
Description	Number of spatial points in the Grassland Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	1,508
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	o_i
Data unit	unitless
Description	State observation for the i th sample point in the Forest Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	<i>See Annex 14 – BEM Export Grid Forest PAA</i>
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	o_i
Data unit	unitless

Description	State observation for the i th sample point in the Grassland Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	See Annex 14 – BEM Export Grid Grassland PAA
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	P_{LME}
Data unit	unitless
Description	Portion of leakage related to market
Source of data	VCS methodology VM0009 Section 8.3.3
Value applied	0
Justification of choice of data or description of measurement methods and procedures applied	<i>No market leakage from Project</i>
Purpose of the data	<i>Calculation of leakage</i>
Comments	Parameter not used

Data / Parameter	q
Data unit	days
Description	Lag between start of degradation and conversion
Source of data	Expert knowledge, results from the PRA or reports from peer-reviewed literature
Value applied	0
Justification of choice of data or description of measurement methods and procedures applied	<i>Commonly accepted methods in the social sciences, choice determined and justified by Project Proponent</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	$r_{CF\ b}$
Data unit	unitless
Description	Carbon fraction of biomass for burned wood or herbaceous material b
Source of data	Literature estimates or direct measurement
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	<i>No burning of wood or herbaceous material in Project</i>
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	Parameter not used

Data / Parameter	r_{RS}
Data unit	unitless
Description	Expansion factor for above-ground biomass to below-ground biomass (root/shoot ratio)
Source of data	IPCC Guidelines for National Greenhouse Gas Inventories, 2006, Volume 4: Agriculture, Forestry and Other Land Use, Chapter 4: Forest Land, Table 4.4
Value applied	0.4
Justification of choice of data or description of measurement methods and procedures applied	<i>IPCC default value for Tropical shrubland</i>
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	r_U
Data unit	unitless
Description	Onset proportion of conversion immediately adjacent to Project Area
Source of data	GIS analysis and image interpretation
Value applied	0.3965

Justification of choice of data or description of measurement methods and procedures applied	<i>Measured using GIS</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	t
Data unit	days
Description	Time since Project Start Date
Source of data	Monitoring records
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	t_i
Data unit	days
Description	The point in time of the observation made at point i
Source of data	Remote sensing image interpretation
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	t_{PA}
Data unit	days
Description	Time prior to the Project Start Date when the primary agent began commercial logging in the Project Accounting Area.

Source of data	Harvest plans prepared for the Project Accounting Area, or by public record
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	t_m
Data unit	days
Description	Length of project or logging in baseline scenario
Source of data	PD
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	
Comments	Parameter not used

Data / Parameter	t_{PL}
Data unit	days
Description	Length of project crediting period
Source of data	PD
Value applied	10,957
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	t_{PAI}
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Data unit	days
Description	Number of days after the Project Start Date for the start of a Project Activity instance in a grouped project
Source of data	PD
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	w_i
Data unit	unitless
Description	weight applied to the i th sample point in the Forest Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	<i>See Annex 14 – BEM Export Grid Forest PAA</i>
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

Data / Parameter	w_i
Data unit	unitless
Description	weight applied to the i th sample point in the Grassland Project Accounting Area reference area
Source of data	Remote sensing image interpretation
Value applied	<i>See Annex 14 – BEM Export Grid Grassland PAA</i>
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>

Comments	
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Data / Parameter	x
Data unit	unitless
Description	Covariate values
Source of data	Parameter not used
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	<i>Should use the most accurate of the data sources if both are available</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	x_i
Data unit	geographic coordinates
Description	Latitude of the i th sample point
Source of data	Remote sensing image interpretation
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline emissions</i>
Comments	

Data / Parameter	x_0
Data unit	unitless
Description	Covariate values as of the Project Start Date
Source of data	Parameter not used
Value applied	

Justification of choice of data or description of measurement methods and procedures applied	<i>Should use the most accurate of the data sources if both are available</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	x_{SA}
Data unit	unitless
Description	Covariate values as of the arrival of the secondary agents
Source of data	Parameter not used
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	<i>Should use the most accurate of the data sources if both are available</i>
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	Parameter not used

Data / Parameter	y_i
Data unit	geographic coordinates
Description	Longitude of the i th sample point
Source of data	Remote sensing image interpretation
Value applied	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of the data	<i>Determination of baseline scenario</i>
Comments	

3.1.2 Data and Parameters Monitored

Data / Parameter	$\mathcal{W}^{[m]}$
Data unit	Set

Description	The set of all burned wood or herbaceous material
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	N/A
Comments	Parameter not used

Data / Parameter	$A_{B \Delta PAA}^{[m]}$
Data unit	ha
Description	Area of avoided conversion
Source of data	Generated from equation
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.3.3.4</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.52]
Comments	Parameter not used

Data / Parameter	$A_{P1}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 1 prior to first verification event – Cloud Forest
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	<i>GIS analysis of best available data</i>
Frequency of monitoring/recording	<i>First monitoring period</i>
Value monitored	4,823
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Cross-check of GIS analysis</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	GIS analysis

Comments	
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Data / Parameter	$A_{P\ 2}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 2 prior to first verification event – Woodland/Thicket
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	<i>GIS analysis of best available data</i>
Frequency of monitoring/recording	<i>First monitoring period</i>
Value monitored	24,874
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Cross-check of GIS analysis</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	GIS analysis
Comments	

Data / Parameter	$A_{P\ 3}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 3 prior to first verification event – Woodland- Sparse/Low
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	<i>GIS analysis of best available data</i>
Frequency of monitoring/recording	<i>First monitoring period</i>
Value monitored	53,075
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Cross-check of GIS analysis</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	GIS analysis
Comments	

Data / Parameter	$A_{P\ 4}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 4 prior to first verification event – Lava Forest
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	<i>GIS analysis of best available data</i>
Frequency of monitoring/recording	<i>First monitoring period</i>

Value monitored	16,718
Monitoring equipment	N/A
QA/QC procedures to be applied	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions
Calculation method	GIS analysis
Comments	

Data / Parameter	$A_{P\ 5}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 5 prior to first verification event – Lava Forest- Sparse/Low
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	GIS analysis of best available data
Frequency of monitoring/recording	First monitoring period
Value monitored	14,558
Monitoring equipment	N/A
QA/QC procedures to be applied	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions
Calculation method	GIS analysis
Comments	

Data / Parameter	$A_{P\ 6}^{[m=0]}$
Data unit	ha
Description	Area of Forest Project Accounting Area stratum 6 prior to first verification event – Acacia- Savannah-Mosaic
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	GIS analysis of best available data
Frequency of monitoring/recording	First monitoring period
Value monitored	151,499
Monitoring equipment	N/A
QA/QC procedures to be applied	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions
Calculation method	GIS analysis
Comments	

Data / Parameter	$A_{P\ 7}^{[m=0]}$
Data unit	ha

Description	Area of Grassland Project Accounting Area stratum 1 prior to first verification event – Grassland
Source of data	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied	<i>GIS analysis of best available data</i>
Frequency of monitoring/recording	<i>First monitoring period</i>
Value monitored	<i>109,130.57</i>
Monitoring equipment	<i>N/A</i>
QA/QC procedures to be applied	<i>Cross-check of GIS analysis</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	GIS analysis
Comments	

Data / Parameter	$B_b^{[m]}$
Data unit	CO ₂ tonnes
Description	Carbon dioxide in burned wood or herbaceous material b
Source of data	Measurements of biomass
Description of measurement methods and procedures to be applied	<i>Scale</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	<i>16,888</i>
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Summation
Comments	Data of biomass of shrubs was included in this analysis, trees biomass was not included since after field visit verification we confirmed trees are not affected by trees. Most of the fires affect mainly grasses, however, burning of small shrubs were included in the project emissions calculations. For more details refer to section 3.2.2.3

Data / Parameter	$C_B^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 v3 Section 6.4 and Appendix B.4</i>

Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	5
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [B.33]

Data / Parameter	$C_{BBGB}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in BGB at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Section 8.1.7
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	-2,490,258
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.32]
Comments	This value corresponds to Cumulative Carbon Not Decayed in BGB (tCO ₂ e) for the year 2020 for both Forest and grassland

Data / Parameter	$C_{BDW}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in DW at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Section 8.1.6
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	0
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.36]
Comments	

Data / Parameter	$C_{B\ SOC}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in SOC at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.5
Frequency of monitoring/recording	Every monitoring period
Value monitored	-3,357,180
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Subtraction
Comments	This value corresponds to Cumulative Carbon Not Decayed in Soil (tCO ₂ e) for the year 2020 for both forest and grassland

Data / Parameter	$C_{BWP}^{[m]}$
Data unit	tCO ₂ e
Description	Carbon not decayed in WP at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix C
Frequency of monitoring/recording	Every monitoring period
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [C.1]
Comments	

Data / Parameter	$C_{B\ AGMT}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline carbon stocks in above-ground merchantable trees at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2.1
Frequency of monitoring/recording	Every monitoring period

Value monitored	N/A
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Weighted per ha average
Comments	

Data / Parameter	$C_{B\ BGMT}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline carbon stocks in below-ground merchantable trees at the end of the current monitoring period
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 v3 Appendix B.2.1</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Weighted per ha average
Comments	

Data / Parameter	$C_{P\ AGMT}^{[m=0]}$
Data unit	tCO ₂ e
Description	Project carbon stocks in above-ground merchantable trees at Project Start
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 v3 Appendix B.2.1</i>
Frequency of monitoring/recording	<i>At Project Start</i>
Value monitored	N/A
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Summation across plots
Comments	

Data / Parameter	$C_{P\ BGMT}^{[m=0]}$
Data unit	tCO ₂ e

Description	Project carbon stocks in below-ground merchantable trees at Project Start
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2.3
Frequency of monitoring/recording	At Project Start
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of project emissions
Calculation method	Summation across plots
Comments	

Data / Parameter	$C_{Bb}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline scenario average carbon stock in selected carbon pools
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.1.5
Frequency of monitoring/recording	Every monitoring period
Value monitored	211.3 Forest 206.3 Grassland
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Weighted per ha average
Comments	Forest: this value corresponds to the sum of 5 tCO ₂ e/ha Biomass in the proxy area, plus 206 tCO ₂ e/ha SOC in proxy area Grassland: 206.3 tCO ₂ e/ha SOC and 0 tCO ₂ e/ha Biomass

Data / Parameter	$C_{B BM}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline carbon stocks in biomass at the end of the current monitoring period for the Forest Project Accounting Area
Source of data	Proxy area sampling

Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2
Frequency of monitoring/recording	Every monitoring period
Value monitored	5
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.18]
Comments	

Data / Parameter	$C_{B\ BM}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline carbon stocks in biomass at the end of the current monitoring period for the Grassland Project Accounting Area
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.18]
Comments	This value was not updated due to the low rates of increment of carbon stock in soils in this compartment. More conservative approach

Data / Parameter	$C_{B\ SOC}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline soil carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2.6
Frequency of monitoring/recording	Every monitoring period
Value monitored	206.33
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions

Calculation method	Equation [F.32]
Comments	This value was not updated due to the low rates of increment of carbon stock in soils in this compartment. More conservative approach

Data / Parameter	$C_{B\ SOC}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Baseline soil carbon stocks at the end of the current monitoring period for the Grassland Project Accounting Area
Source of data	Proxy area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 v3 Appendix B.2.6
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	206.33
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.32]
Comments	This value was not updated due to the low rates of increment of carbon stock in soils in this compartment. More conservative approach

Data / Parameter	$C_P^{[m]}$
Data unit	tCO ₂ e/ha
Description	Project carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	<i>134.57 for Biomass and 371 for SOC</i>
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [B.31]
Comments	

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

Description	Project carbon stocks at the end of the current monitoring period for the Grassland Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	22.2
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [B.31]
Comments	

Data / Parameter	$C_P^{[m-1]}$
Data unit	tCO ₂ e/ha
Description	Project carbon stocks at the beginning of the current monitoring period
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Prior monitoring period</i>
Value monitored	<i>Forest: 66.85 tCO₂e/ha biomass – 371 tCO₂e/ha SOC Grassland: 17,9 tCO₂e/ha biomass – 232 tCO₂e/ha SOC</i>
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Already reviewed</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [B.31]
Comments	

Data / Parameter	$C_P^{[m=0]}$
Data unit	tCO ₂ e/ha
Description	Project carbon stocks prior to first verification event for the Forest Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Prior monitoring period</i>
Value monitored	66.86
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Already reviewed</i>

Purpose of the data	Calculation of project emissions
Calculation method	Equation [B.31]
Comments	

Data / Parameter	$C_P^{[m=0]}$
Data unit	tCO ₂ e/ha
Description	Project carbon stocks prior to first verification event for the Grassland Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	Prior monitoring period
Value monitored	17.93
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Already reviewed
Purpose of the data	Calculation of project emissions
Calculation method	Equation [B.31]
Comments	

Data / Parameter	$C_{P\ 1\ BM}^{[m=0]}$				
Data unit	tCO ₂ e/ha				
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 1 at project start – Cloud Forest				
Source of data	Project Accounting Area sampling				
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2				
Frequency of monitoring/recording	Prior to first monitoring event				
Value monitored	<table border="1"> <tr> <th>Carbon_trees(tCO₂/ha)</th><th>Carbon_shrub_(tCO₂/ha)</th></tr> <tr> <td>1487.05 (383.5)</td><td>22.5 (8.7)</td></tr> </table>	Carbon_trees(tCO ₂ /ha)	Carbon_shrub_(tCO ₂ /ha)	1487.05 (383.5)	22.5 (8.7)
Carbon_trees(tCO ₂ /ha)	Carbon_shrub_(tCO ₂ /ha)				
1487.05 (383.5)	22.5 (8.7)				
Monitoring equipment	Equipment list in Annex 11				
QA/QC procedures to be applied	Review of monitoring records				
Purpose of the data	Calculation of project emissions				
Calculation method	Average of plot measurements in a given stratum				
Comments	Standard error in parenthesis				

Data / Parameter	$C_{P\ 2\ BM}^{[m=0]}$
Data unit	tCO ₂ e/ha
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 2 at project start – Woodland/Thicket

Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2		
Frequency of monitoring/recording	Prior to first monitoring event		
Value monitored	Carbon_trees_(tCO2/ha)	Carbon_shrub_(tCO2/ha)	
	187.7 (25.1)	4.5 (0.4)	
Monitoring equipment	Equipment list in Annex 11		
QA/QC procedures to be applied	Review of monitoring records		
Purpose of the data	Calculation of project emissions		
Calculation method	Average of plot measurements in a given stratum		
Comments	Standard error in parenthesis		

Data / Parameter	$C_{P\ 3\ BM}^{[m=0]}$		
Data unit	tCO2e/ha		
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 3 at project start – Woodland-Sparse/Low		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2		
Frequency of monitoring/recording	Prior to first monitoring event		
Value monitored	Carbon_trees_(tCO2/ha)	Carbon_shrub_(tCO2/ha)	
	162.5 (23.9)	2.7(0.3)	
Monitoring equipment	Equipment list in Annex 11		
QA/QC procedures to be applied	Review of monitoring records		
Purpose of the data	Calculation of project emissions		
Calculation method	Average of plot measurements in a given stratum		
Comments	Standard error in parenthesis		

Data / Parameter	$C_{P\ 4\ BM}^{[m=0]}$		
Data unit	tCO2e/ha		
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 4 at project start – Lava Forest		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2		
Frequency of monitoring/recording	Prior to first monitoring event		

Value monitored	Carbon_trees_(tCO2/ha)	Carbon_shrub_(tCO2/ha)	
	267.9 (42.5)	7.8 (1.8)	
Monitoring equipment	<i>Equipment list in Annex 11</i>		
QA/QC procedures to be applied	<i>Review of monitoring records</i>		
Purpose of the data	<i>Calculation of project emissions</i>		
Calculation method	<i>Average of plot measurements in a given stratum</i>		
Comments	<i>Standard error in parenthesis</i>		

Data / Parameter	$C_{P\ 5\ BM}^{[m=0]}$		
Data unit	tCO2e/ha		
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 5 at project start – Lava Forest-Sparse/Low		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Appendix B.2</i>		
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>		
Value monitored	Carbon_trees_(tCO2/ha)	Carbon_shrub_(tCO2/ha)	
	177.8 (32.7)	4.6 (1.7)	
Monitoring equipment	<i>Equipment list in Annex 11</i>		
QA/QC procedures to be applied	<i>Review of monitoring records</i>		
Purpose of the data	<i>Calculation of project emissions</i>		
Calculation method	<i>Average of plot measurements in a given stratum</i>		
Comments	<i>Standard error in parenthesis</i>		

Data / Parameter	$C_{P\ 6\ BM}^{[m=0]}$		
Data unit	tCO2e/ha		
Description	Project carbon stocks in biomass in Forest Project Accounting Area stratum 6 at project start – Acacia-Savanna-Mosaic		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Appendix B.2</i>		
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>		
Value monitored	Carbon_trees_(tCO2/ha)	Carbon_shrub_(tCO2/ha)	
	46.46 (6.5)	3.9 (2.20)	

Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Average of plot measurements in a given stratum
Comments	Standard error in parenthesis

Data / Parameter	$C_{P\ 1\ BM}^{[m=0]}$		
Data unit	tCO ₂ e/ha		
Description	Project carbon stocks in biomass in Grassland Project Accounting Area stratum 1 at project start – Grassland		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2		
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>		
Value monitored	Carbon_trees_(tCO ₂ /ha)	Carbon_shrub_(tCO ₂ /ha)	
	21.7 (4.7)	0.5 (0.07)	
Monitoring equipment	<i>Equipment list in Annex 11</i>		
QA/QC procedures to be applied	<i>Review of monitoring records</i>		
Purpose of the data	<i>Calculation of project emissions</i>		
Calculation method	Average of plot measurements in a given stratum		
Comments	Standard error in parenthesis		

Data / Parameter	$C_{P\ AGMT}^{[m=0]}$		
Data unit	tCO ₂ e/ha		
Description	Project carbon stocks in above-ground merchantable trees prior to first verification event		
Source of data	Project Accounting Area sampling		
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2		
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>		
Value monitored	N/A		
Monitoring equipment	<i>Equipment list in Annex 11</i>		
QA/QC procedures to be applied	<i>Review of monitoring records</i>		
Purpose of the data	<i>Calculation of project emissions</i>		
Calculation method	Average of plot measurements in a given stratum		
Comments			

Data / Parameter	$C_{P\ BM}^{[m=0]}$		
Data unit	tCO ₂ e		

Description	Project carbon stocks in biomass prior to first verification event
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>
Value monitored	19,710,032.19
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [F.17]
Comments	

Data / Parameter	$C_{Pb}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Average carbon in biomass in the Forest Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>
Value monitored	134.57
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Average of plot measurements in a given stratum
Comments	

Data / Parameter	$C_{Pb}^{[m]}$
Data unit	tCO ₂ e/ha
Description	Average carbon in biomass in the Grassland Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2
Frequency of monitoring/recording	<i>Prior to first monitoring event</i>
Value monitored	21.7
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>

Calculation method	Average of plot measurements in a given stratum
Comments	

Data / Parameter	$C_{P\ SOC}^{[m=0]}$
Data unit	tCO ₂ e/ha
Description	Project soil carbon stocks prior to first verification event in the Forest Project Accounting Area
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2.6
Frequency of monitoring/recording	At Project Start
Value monitored	371.01
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of project emissions
Calculation method	Average of plot measurements in a given stratum
Comments	

Data / Parameter	$C_{P\ SOC}^{[m=0]}$
Data unit	tCO ₂ e/ha
Description	Project soil carbon stocks prior to first verification event in the Grassland Project Accounting Area
Source of data	Project accounting area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2.6
Frequency of monitoring/recording	At Project Start
Value monitored	232.22
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of project emissions
Calculation method	Average of plot measurements in a given stratum
Comments	

Data / Parameter	$C_{P\ \Delta\ WP}^{[m]}$
Data unit	tCO ₂ e
Description	Project carbon stocks in wood products at the end of the current monitoring period
Source of data	Project Accounting Area sampling
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix C

Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [C.2]
Comments	

Data / Parameter	$E_{\Delta GER}^{[m]}$			
Data unit	tCO ₂ e			
Description	Linear GERs for the current monitoring period			
Source of data	Area measurements			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.4.1			
Frequency of monitoring/recording	Every monitoring period			
Value monitored	31/12/2017 1,084,945	31/12/2018 1,084,945	31/12/2019 1,084,945	31/12/2020 1,087,918
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of GER calculations			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation F.53			
Comments	Linear model is used since GERs predicted by the linear model are conservatively less than [F.53]. Please Refer to Annex_6_Net_Emissions_Chylulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{\Delta NER}^{[i]}$			
Data unit	tCO ₂ e			
Description	Linear NERs for monitoring period i			
Source of data	Area measurements			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.4.3			
Frequency of monitoring/recording	<i>prior monitoring period</i>			
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020

	831,453	800,866	770,398	736,986
Monitoring equipment	<i>Equipment list in Annex 11</i>			
QA/QC procedures to be applied	<i>Review of NER calculations</i>			
Purpose of the data	<i>Calculation of baseline emissions</i>			
Calculation method	Equation [F.55]			
Comments	Linear model used. Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_B^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions at the end of the current monitoring period
Source of data	Proxy area measurements
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.1</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	15,889,600
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.16]
Comments	Value of Cumulative Baseline Emissions (tCO ₂ e) for December 31, 2020. Please refer to Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_B^{[m-1]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions at the beginning of the current monitoring period
Source of data	Proxy area measurements
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.1</i>
Frequency of monitoring/recording	<i>Prior monitoring period</i>
Value monitored	6,885,882
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.16]

Comments	Cumulative Baseline Emissions (tCO ₂ e) for December 31, 2016 for Forest and Grassland Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm
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Data / Parameter	$E_{B\Delta}^{[m]}$			
Data unit	tCO ₂ e			
Description	Change in baseline emissions			
Source of data	Proxy area measurements			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1			
Frequency of monitoring/recording	Every monitoring period			
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020
	2,008,130	2,131,278	2,260,401	2,603,910
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.15]			
Comments	Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{B\text{BM}}^{[m]}$			
Data unit	tCO ₂ e			
Description	Cumulative baseline emissions from biomass at the end of the current monitoring period			
Equations	F.22			
Source of data	Monitoring the proxy area			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2.3			
Frequency of monitoring/recording	Every monitoring period			
Value monitored	16,153,902			
Monitoring equipment	Not applicable			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.22]			
Comments	Value for forest and grassland in 2020. Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{B \Delta BGB}^{[i]}$			
Data unit	tCO ₂ e			
Description	Change in baseline emissions from below-ground biomass during monitoring period i			
Source of data	Monitoring the proxy area			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2.3			
Frequency of monitoring/recording	Already Monitored			
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020
	582,782	607,104	631,036	731,089
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.30]			
Comments	Please refer to Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{B \Delta DW}^{[i]}$			
Data unit	tCO ₂ e			
Description	Baseline emissions from dead wood in monitoring period i			
Source of data	Measurements in the proxy area			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.2.4 and B.2.5			
Frequency of monitoring/recording	Already Monitored			
Value monitored	N/A			
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.34]			
Comments				

Data / Parameter	$E_{B \Delta SOC}^{[m]}$			
Data unit	tCO ₂ e			
Description	Baseline change in emissions from soil carbon			
Source of data	Measurements in the proxy area			

Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6			
Frequency of monitoring/recording	Every monitoring period			
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020
	391,966	369,595	420,374	385,974
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.26]			
Comments	Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{B \Delta SOC}^{[i]}$			
Data unit	tCO2e			
Description	Baseline emissions from soil carbon in monitoring period i			
Source of data	Measurements in the proxy area			
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6			
Frequency of monitoring/recording	Every monitoring period			
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020
	391,966	369,595	420,374	385,974
Monitoring equipment	Equipment list in Annex 11			
QA/QC procedures to be applied	Review of monitoring records			
Purpose of the data	Calculation of baseline emissions			
Calculation method	Equation [F.26]			
Comments	Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm			

Data / Parameter	$E_{B AGMT}^{[m]}$			
Data unit	tCO2e			
Description	Cumulative baseline emissions from above- ground commercial trees at the end of the current monitoring period			
Source of data	Measurements in the proxy area			

Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.6.1, 8.1.6.2, 8.1.6.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.37]
Comments	Parameter not used

Data / Parameter	$E_{B\ BGB}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from below- ground biomass at the end of the current monitoring period
Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	2,552,010
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.30]
Comments	This value comes from the sum of the baseline emissions from below- ground biomass between 2017 and 2020. Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{B\ BGB}^{[m-1]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from below- ground biomass at the beginning of the current monitoring period
Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	2,040,705
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions

Calculation method	Equation [F.30]
Comments	This value comes from the baseline emissions from below-ground biomass 31 December 2016. Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{B\ DW}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from dead wood at the end of the current monitoring period
Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.34]
Comments	

Data / Parameter	$E_{B\ DW}^{[m-1]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from dead wood at the beginning of the current monitoring period
Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.34]
Comments	

Data / Parameter	$E_{B\ SOC}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative baseline emissions from soil carbon at the end of the current monitoring period

Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	5,583,135
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.27]
Comments	Value for SEM for forest and grassland Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{B\ SOG}^{[m-1]}$
Data unit	tCO2e
Description	Cumulative baseline emissions from soil carbon at the beginning of the current monitoring period
Source of data	Measurements in the proxy area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.2.1, 8.1.2.2, 8.1.2.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	4,015,226
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.27]
Comments	Value for SEM for forest and grassland Annex_6_Net_Emissions_Reductions Please refer to Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{B\ A}^{[m]}$
Data unit	tCO2e
Description	Cumulative emissions allocated to the buffer account at the end of the current monitoring period
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.4.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	434,275

Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Multiplication
Comments	Please refer to Annex_6_Net_Emissions_Reductions Numeric Output/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_L^{[m]}$
Data unit	tCO2e
Description	Cumulative emissions from leakage at the end of the current monitoring period
Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.3</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	744.376
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of leakage</i>
Calculation method	Equation [F.45]
Comments	This value refers to linear leakage. Please refer to Annex_6_Net_Emissions_Reductions Numeric Output/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_L^{[m-1]}$
Data unit	tCO2e
Description	Cumulative emissions from leakage at the beginning of the current monitoring period
Source of data	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.3</i>
Frequency of monitoring/recording	<i>Already monitored</i>
Value monitored	0
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of leakage</i>
Calculation method	Equation [F.45]
Comments	0 because it was the first Monitoring Period

Data / Parameter	$E_{L\Delta}^{[m]}$
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Data unit	tCO2e				
Description	Change in emissions due to leakage				
Source of data	N/A				
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3				
Frequency of monitoring/recording	Every monitoring period				
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020	
	- 140,613	- 170,813	- 201,013	- 231,936	
Monitoring equipment	Equipment list in Annex 11				
QA/QC procedures to be applied	Review of monitoring records				
Purpose of the data	Calculation of leakage				
Calculation method	Equation [F.44]				
Comments	This is the value for linear leakage. Please refer to Numeric Output/Chyulu Hills_Total_NERs.xlsm				

Data / Parameter	$E_{L\ AS\ F}^{[m]}$
Data unit	tCO ₂ e
Description	Cumulative emissions from activity-shifting leakage in forested strata at the end of the current monitoring period (linear)
Source of data	Measurements in the activity-shifting leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	-744,376
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of leakage
Calculation method	Equation [F.46]
Comments	Please refer to Annex_6_Net_Emissions_Reductions Numeric Output/Chyulu Hills_Total_NERs.xlsm

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

Source of data	Measurements in the activity-shifting leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3.3.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of leakage
Calculation method	Equation [F.47]
Comments	Non leakage in grassland. Please refer to Grassland leakage_final.xlsx and to Annex_6_Net_Emissions_Reductions Numeric Output/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{LME}^{[m]}$
Data unit	tCO2e
Description	Cumulative emissions from market leakage at the end of the current monitoring period
Source of data	Measurements in the market leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3
Frequency of monitoring/recording	Every monitoring period
Value monitored	N/A
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of leakage
Calculation method	Equation [F.51]
Comments	There is not leakage due to market effect. Please refer to section 3.2.3.1.2

Data / Parameter	$E_P^{[m]}_{\Delta}$				
Data unit	tCO2e				
Description	Change in project emissions				
Source of data	Monitoring records for Forest Fire, Burning, logging, wood products, and natural disturbance events				
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.2				
Frequency of monitoring/recording	Every monitoring period				
Value monitored	31/12/2017	31/12/2018	31/12/2019	31/12/2020	
	- 1,639	-	- 5,433	- 9,818	

Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [F.41]
Comments	Please refer to NER model/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{P \Delta BRN}^{[m]}$
Data unit	tCO2e
Description	Cumulative project emissions due to burning at the end of the current monitoring period
Source of data	Monitoring plots in the project
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.2.2
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	16,890
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [F.42]
Comments	Please refer to Annex_6_Net_Emissions_Reductions NER model/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$E_{P \Delta LS}^{[m]}$
Data unit	tCO2e
Description	Cumulative project emissions due to livestock grazing within the Project Area.
Source of data	Monitoring in the Project Area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.2.4
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	0
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	Equation [F.43]
Comments	

Data / Parameter	$E_{P \Delta SF}^{[m]}$
Data unit	tCO2e

Description	Cumulative project emissions due to the use of synthetic fertilizers within the project area.
Source of data	Monitoring in the Project Area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.2.5
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of project emissions</i>
Calculation method	CDM A/R methodological tool Estimation of direct and indirect (e.g. leaching and runoff) nitrous oxide emission from nitrogen fertilization
Comments	

Data / Parameter	$E_U^{[m]}$
Data unit	tCO2e
Description	Cumulative confidence deduction at the end of the current monitoring period
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.4.1.1
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	24,408
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Equation [F.57]
Comments	Please refer to Annex 6_Net_Emissions_Reductions Numeric Output/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$n_{LS i}$
Data unit	count
Description	The number of head of livestock species/ category i in the Project Area
Source of data	Monitoring in the Project Area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.2.4
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A

Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of leakage</i>
Calculation method	Use of literature or expert knowledge
Comments	

Data / Parameter	$p_{L\ DEG}^{[m]}$
Data unit	proportion (unitless)
Description	Portion of leakage due to degradation in forest at the end of the current monitoring period
Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.3.2.3</i>
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	<i>0.20</i>
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of leakage</i>
Calculation method	Summation across leakage plots
Comments	Estimated in Forest leakage_final.xlsx

Data / Parameter	$p_{L\ DEG}^{[m=0]}$
Data unit	tCO2e
Description	proportion (unitless)
Source of data	Portion of leakage due to degradation prior to first verification event
Description of measurement methods and procedures to be applied	<i>VCS Methodology VM0009 Section 8.3.2.3</i>
Frequency of monitoring/recording	<i>At Project Start</i>
Value monitored	<i>0</i>
Monitoring equipment	<i>Equipment list in Annex 11</i>
QA/QC procedures to be applied	<i>Project verification</i>
Purpose of the data	<i>Calculation of leakage</i>
Calculation method	Summation across leakage plots
Comments	

Data / Parameter	$p_{L\ CON\ G}^{[m]}$
Data unit	proportion (unitless)
Description	Portion of leakage due to native grasslands conversion at the beginning of the current monitoring period

Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3.2.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of leakage
Calculation method	Summation across leakage plots
Comments	Estimated in Grassland leakage_final.xlsx

Data / Parameter	$p_{L\ CON\ G}^{[m=0]}$
Data unit	proportion (unitless)
Description	Portion of leakage due to native grasslands prior to the first verification event
Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3.2.4
Frequency of monitoring/recording	At Project Start
Value monitored	0
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Project verification
Purpose of the data	Calculation of leakage
Calculation method	Summation across leakage plots
Comments	First monitoring period

Data / Parameter	$p_{L\ CON\ G}^{[m-1]}$
Data unit	proportion (unitless)
Description	Portion of leakage due to native grasslands conversion at the end of the current monitoring period
Source of data	Monitoring in the leakage area
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.3.2.4
Frequency of monitoring/recording	Every monitoring period
Value monitored	0
Monitoring equipment	Equipment list in Annex 11
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of leakage
Calculation method	Summation across leakage plots
Comments	First monitoring period

Data / Parameter	$p_{SL}^{[m]}$
Data unit	proportion (unitless)
Description	Proportion of AGMT that is not merchantable and goes into slash estimated from inventory
Source of data	Estimated from inventory
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 8.1.6.3
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	N/A
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Conservatively used volume of a cone
Comments	Parameter not used

Data / Parameter	$t^{[i-1]}$
Data unit	days
Description	Time from Project Start Date to beginning of monitoring period i
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	N/A
Value monitored	1199
Monitoring equipment	N/A
QA/QC procedures to be applied	N/A
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	Subtraction
Comments	Parameter not used

Data / Parameter	$t^{[m]}$
Data unit	days
Description	Time from project start date to end of current monitoring period
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	2260

Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Subtraction
Comments	

Data / Parameter	$t^{[m-1]}$
Data unit	days
Description	Time from Project Start Date to beginning of current monitoring period
Source of data	Monitoring records
Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	Every monitoring period
Value monitored	1199
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Subtraction
Comments	

Data / Parameter	$U_B^{[m]}$
Data unit	tCO2e
Description	Total uncertainty in Proxy Area carbon stock estimate
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.1.5
Frequency of monitoring/recording	Every monitoring period
Value monitored	10.76
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [B.34]
Comments	

Data / Parameter	$U_{EM}^{[M]}$
Data unit	tCO2e/ha
Description	Total uncertainty in Baseline Emissions Models for the Forest Project Accounting Area
Source of data	N/A

Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 6.8.10
Frequency of monitoring/recording	Every monitoring period
Value monitored	9,439
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.14]
Comments	Please refer to Annex_6_Net_Emissions_Reductions_NER model/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$U_{EM}^{[M]}$
Data unit	tCO2e
Description	Total uncertainty in Baseline Emissions Models for the Grassland Project Accounting Area
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Section 6.8.10
Frequency of monitoring/recording	Every monitoring period
Value monitored	2,139
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [F.14]
Comments	Please refer to Annex_6_Net_Emissions_Reductions_NER model/Chyulu Hills_Total_NERs.xlsm

Data / Parameter	$U_P^{[m]}$
Data unit	tCO2e/ha
Description	Total uncertainty in the Forest Project Accounting Area carbon stock estimate
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.1.5
Frequency of monitoring/recording	Every monitoring period
Value monitored	37.49
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [B.34]

Comments	Please refer to Annex_7_Biomass_Inventory 211126_Biomass_2020_V2.xlsx
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Data / Parameter	$U_P^{[m]}$
Data unit	tCO ₂ e/ha
Description	Total uncertainty in Grassland Project Accounting Area carbon stock estimate
Source of data	N/A
Description of measurement methods and procedures to be applied	VCS Methodology VM0009 Appendix B.1.5
Frequency of monitoring/recording	Every monitoring period
Value monitored	28.03
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	Equation [B.34]
Comments	Please refer to Annex_6_Net_Emissions_Reductions Parameters,Chyulu Hills_Grassland_NERs_V2.xlsm. and 211126_Biomass_2020.xlsx

Data / Parameter	$wc_{Pi}^{[m=0]}$
Data unit	tCO ₂ e
Description	Weighted average carbon stocks for biomass or SOC in the Project for the set of selected strata
Source of data	Biomass inventory
Description of measurement methods and procedures to be applied	Inventory or GIS
Frequency of monitoring/recording	Every monitoring period
Value monitored	Forest:134.57 Grassland:22.21
Monitoring equipment	N/A
QA/QC procedures to be applied	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method	N/A
Comments	

Data / Parameter	$X^{[m]}$
Data unit	varies
Description	Covariate values
Source of data	Parameter not used

Description of measurement methods and procedures to be applied	N/A
Frequency of monitoring/recording	<i>Every monitoring period</i>
Value monitored	
Monitoring equipment	N/A
QA/QC procedures to be applied	<i>Review of monitoring records</i>
Purpose of the data	<i>Calculation of baseline emissions</i>
Calculation method	N/A
Comments	Parameter not used

3.1.3 Monitoring Plan

3.1.3.1 Sampling area

Tree Inventory was undertaken in the Chyulu Hills landscape in the southern part of Kenya, encompassing a total area of 410,534 ha. This region is of global conservation importance as it forms an integral migratory corridor between the Amboseli ecosystem to the west and the greater Tsavo ecosystem to the east (Figure 7). The Project Area comprises of six major tenured land units. These are the Mbirikani Group Ranch, Kuku Group Ranch, Kuku A Group Ranch, Rombo Group Ranch, Chyulu Hills National Park and Southern Chyulu Extension – part of the Tsavo West National Park, and Kibwezi Forest Reserve.

At the inception of CHRP, seven land cover classes were defined using remote sensing and ground-based mapping. These were grassland, acacia-savannah mosaic, lava forest, lava forest sparse/low, cloud forest, woodland/thicket and woodland–sparse/low. A total of 415 permanent biomass plots were then distributed on the seven defined land cover classes using a stratified random approach, with each plot measuring 17.84 meters in radius, which is equivalent to 0.1 ha in size. However, for the plots in the cloud and lava forests the radius was reduced to 10 meters. These permanent plots were used for biomass monitoring, assessing disturbance and regeneration, and will be subsequently used in future verification phases of the project, including this second verification phase.

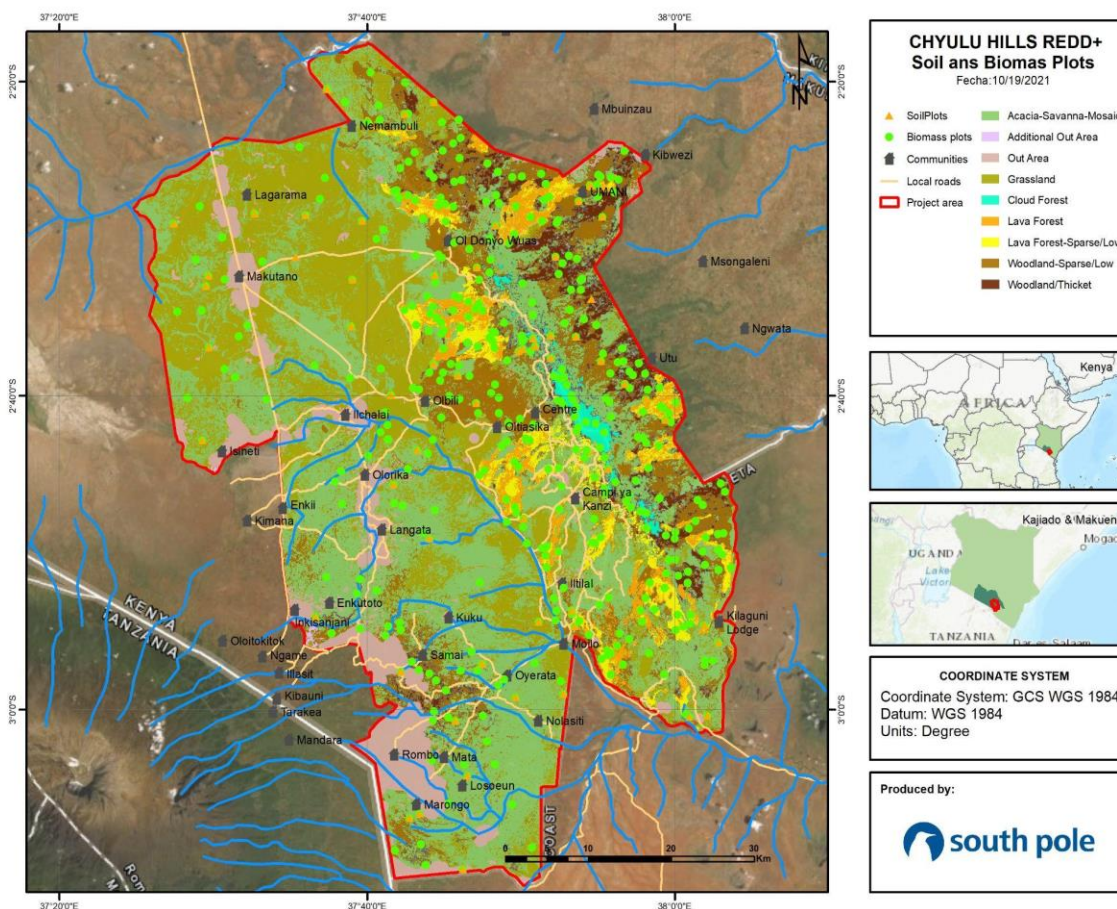


Figure 7. Soils and biomass plots

The selected carbon pools in the Forest project accounting area (REDD+ baseline type) and Grassland project accounting area (AcoGS baseline type) are shown in Table 6. Selected carbon pools in the Forest Project Accounting Area and Table 7. Selected carbon pools in the Grassland Project Accounting Area.

Table 6. Selected carbon pools in the Forest Project Accounting Area (REDD+ baseline type).

Pool		Required	Included in Project	Justification
AGMT	Above-ground merchantable tree	Yes, if baseline scenario or project activity(ies) include the harvest of long-lived wood products. Otherwise, accounting for this carbon pool is not required	No	No commercial tree harvesting or production of long-lived wood products included in baseline
AGOT	Above-ground other (non-merchantable) tree	Yes	Yes	Major pool considered
AGNT	Above-ground non-tree	Yes, if the baseline scenario includes perennial tree crops.	Yes	Major pool considered

		Otherwise, accounting for this carbon pool is optional.		
BGMT	Below-ground merchantable tree	Optional	No	No commercial tree harvesting or production of long-lived wood products included in baseline
BGOT	Below-ground other (non-merchantable) tree	Optional	Yes	Major pool considered
BGNT	Below-ground non-tree	Optional	Yes	Major pool considered
LTR	Litter	No	No	Conservatively excluded
DW	Dead Wood	Yes, if AGMT is selected	No	Conservatively excluded
SD	Standing dead wood	Optional	Yes	Major pool considered
LD	Lying dead wood	Optional	No	Conservatively excluded
SOC	Soil organic carbon	Optional	Yes	Major pool considered. Although soils were not measured in this monitoring period, soil data from the previous monitoring period was included assuming a conservative approach that the carbon stock remained constant*.
WP	Long-lived wood products	Yes, if AGMT is selected	No	Conservatively excluded

*Monitoring of soil carbon was performed during the second semester of 2016, please refer to MR88 of Monitoring Report for the first verification and Annex_8_Soils_first_verification, this corresponds to a period not longer than 5 years, which is a short period where we do not expect significant changes in the soil carbon stock due to the nature of the ecosystems.

In addition, due to pandemic of Covid-19 we were restricted to access the proxy which are in private lands. This lock down also made impossible the ground and air communications between the counties, which created great difficulties for the transport of soil samples. In addition, laboratories located in Nairobi city had restricted work and sample processing limitations due to the pandemic.

We support the conservative approach considering that, as detailed in the biomass information and the disturbances analysis, the project area has not experienced a considerable loss of vegetation due to deforestation or degradation, in this sense, the soil carbon in the project area has not been affected and instead has been conserved and probably increased. Besides this, as this is a costly exercise and considering that carbon revenues have been prioritized in other activities, the project partners did not monitor SOC and will assume the soil carbon measurements for the next stages of the project.

Table 7. Selected carbon pools in the Grassland Project Accounting Area (REDD+ baseline type).

Pool	Required	Included in Project	Justification
------	----------	---------------------	---------------

AGMT	Above-ground merchantable tree	Yes, if baseline scenario or project activity(ies) include the harvest of long-lived wood products. Otherwise, accounting for this carbon pool is not required	No	No commercial tree harvesting or production of long-lived wood products included in baseline
AGOT	Above-ground other (non-merchantable) tree	Yes	Yes	Major pool considered
AGNT	Above-ground non-tree	Yes, if the baseline scenario includes perennial tree crops. Otherwise, accounting for this carbon pool is optional.	Yes	Major pool considered
BGMT	Below-ground merchantable tree	Optional	No	No commercial tree harvesting or production of long-lived wood products included in baseline
BGOT	Below-ground other (non-merchantable) tree	Optional	Yes	Major pool considered
BGNT	Below-ground non-tree	Optional	Yes	Major pool considered
LTR	Litter	No	No	Conservatively excluded
DW	Dead Wood	Yes, if AGMT is selected	No	Conservatively excluded
SD	Standing dead wood	Optional	Yes	Major pool considered
LD	Lying dead wood	Optional	No	Conservatively excluded
SOC	Soil organic carbon	Optional	Yes	Major pool considered. Although soils were not measured in this monitoring period, soil data from the previous monitoring period was included assuming a conservative approach that the carbon stock remained constant.
WP	Long-lived wood products	Yes, if AGMT is selected	No	Conservatively excluded

MR.93 Description of plot sizes and layout

Plot radius are described in the following table

Area	Plot Radius
Tree Plots	
Cloud Forest and Lava Forest	10 meters
All other Strata	17.84 meters
Shrub Plots	
All Plots	5 meters

3.1.3.2 Training of field botanists and biodiversity samplers

As part of the verification process, in accordance with the VM0009 methodology, over 400 tree-plots were sampled using standard ecological monitoring methodologies. The tree plot sampling protocol required the identification of all the trees in each plot. A team of skilled botanists²⁹ were employed from various institutions: National Museums of Kenya (NMK), Kenya Forestry Research Institute (KEFRI), University of Eldoret (UoE) and the University of Nairobi (UoN). The botanical team was lead by the head of the Botany Department and herbarium at the National Museum of Kenya. The field botanists supported the three tree-plot sampling teams to correctly identify trees within each plot. All of the botanists had sufficient expertise in plant taxonomy and forest inventorying and were further supported by the full botanical taxonomy resources of the national herbarium. Three plot sampling teams of 4-5 people each were hired from the local communities living in and around the Project Area. The plot samplers were responsible for laying out plots and carrying out the various required tree measurements.

A training workshop for the botanists and plot samplers (Figure 8) took place between November 9 and 13, 2020, at Maasai Wilderness Conservation Trust (MWCT). Leon Theron Africa Regional Carbon Technical Director from Conservational International (CI), lead the training program to teach the standard operating procedures (SOPs) for biomass sampling. Dr. Paul Musili from NMK, botany department, taught basic plant taxonomy and procedures for the collection and preservation of herbarium specimens. A few days were also set aside (during the training) to do field trials, where teams practised these newly acquired skills to ensure that the protocols and procedures would be correctly applied once the actual survey was started.



Figure 8. Training session with botanists and local samplers at MWCT center

²⁹ See Findings\FirstRound\Climate\ Chyulu Hills Redd+ botanical report Appendix 1.

3.1.3.3 Sampling

Each of the three teams consisted of a botanist and four or five tree-plot samplers. The Standard Operating Procedures (SOPs) for biomass plot sampling, originally developed and applied for the validation and first verification, with some modifications, was followed throughout the sampling period. Each team was assigned sampling plots for each day, along with inventory datasets from the previous day; all of which was used as a guide during the (second) Inventory. In practice, each team navigated their way to the assigned plots using the smart phone App Gaia GPS and Garmin GPS. At the location of the plot, the team identified the plot center point and set the angle to start measurements (Figure 9). Plants were then numbered clockwise from 0. All the data for the day were recorded on standard data sheets³⁰ by the field botanist. The data were then entered into the Open Data Kit (ODK) App by one of the biodiversity samplers, after which it was relayed to MWCT (after crosschecking and confirmation with the field botanist).

Specimens of species whose identification was in doubt, and/or could not be determined in the field, were collected for further identification and confirmation. For more detail regarding the identification and herbarium process refer to the Botanical report.



Figure 9. Plot sampling procedure. A, biodiversity sampler finding plot center point. B, setting the angle to start the sampling (clockwise). C, circumference measurement and D, a field botanist (left) recording species names and associated data, and (right) a biodiversity sampler entering data in to ODK (Photo source: Musili, PM).

³⁰ See Appendix 3 in Findings\FirstRound\Climate\ Chyulu Hills Redd+ botanical report.

To accomplish accurate data, cross checking was performed in the field during the inventory. Subsets of the plots were selected for remeasurement to provide a quality control check. After transmittal to the Project Office, quality control reviews of the data were performed by Andrey Arutyunyan and David Okul. with additional reviews by Dr. Musili. When outlier or questionable data were identified, the field teams were asked to check the field measurements and their data entry.

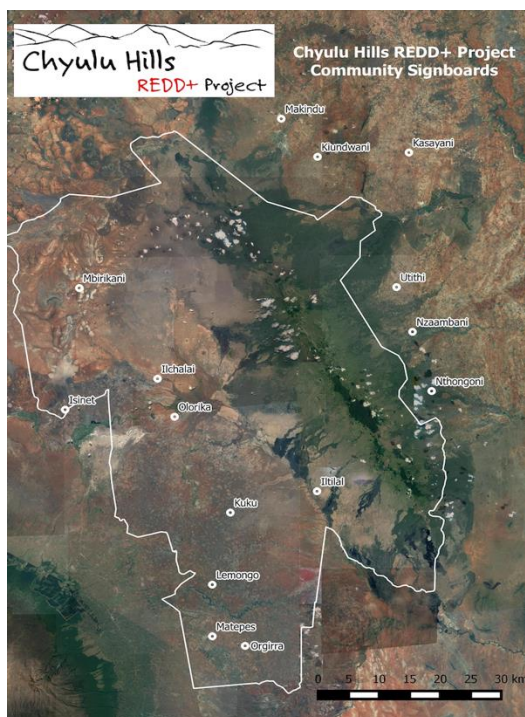
For estimation of carbon stocks accordingly to species and diameter we followed the validated allometric equations for the project. For more details, refer to the document Allometry for PD v02.pdf

3.1.4 Dissemination of Monitoring Plan and Results (CL3.2)

After initial submission of the Monitoring Report to VERRA, summaries were prepared in English, Swahili and MAA (see Annex_9_MR_summaries) A variety of communications channels were used to ensure that community members and leaders across the Project Area and Project Zone were fully informed about the key contents of the monitoring report, that it had been posted on the VERRA website, and that comments could be submitted to VERRA. The following describes the communications outreach that was undertaken:

1. Community Notice Boards and Project Office

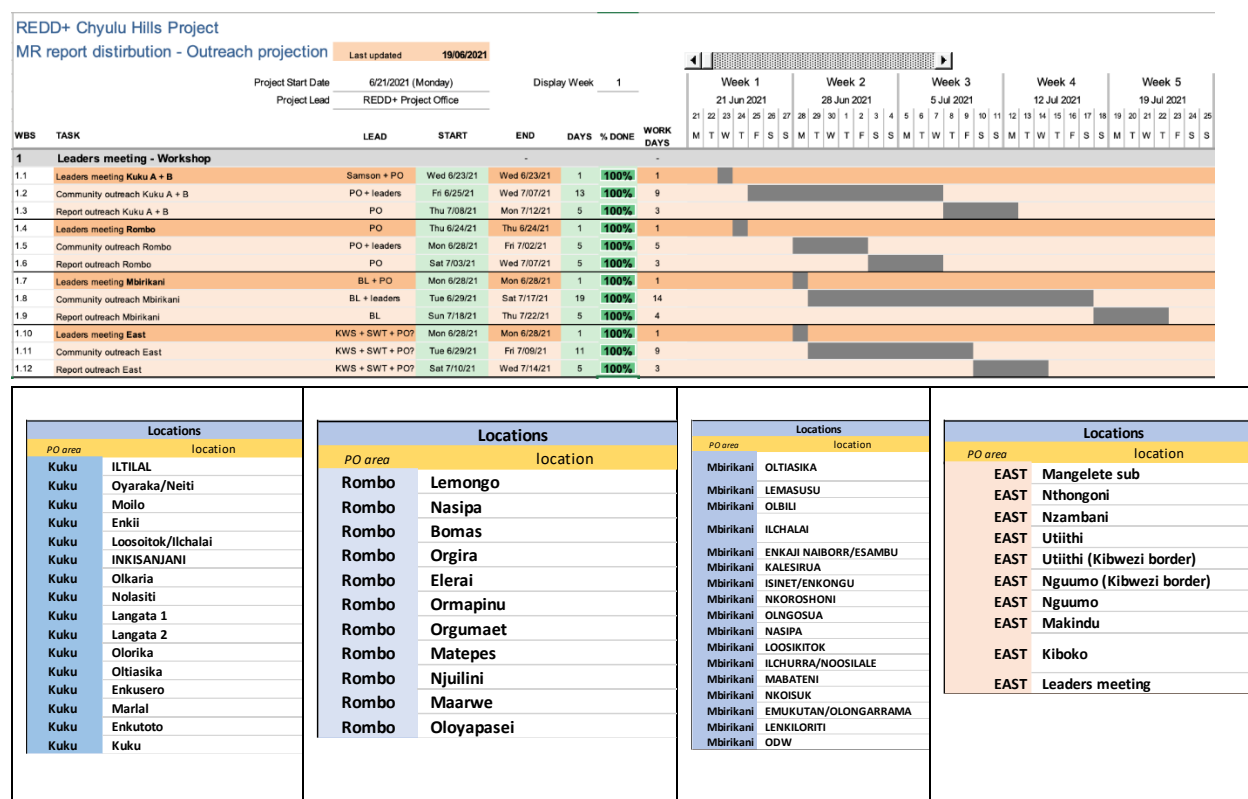
The summary of the Monitoring Report was posted on 13 community signboards. The map below shows the location of the community notice boards in villages and settlements across the project area and project zone. These notice boards were installed during the validation and initial verification of the project so that community members are aware that they are a means for obtaining information about the REDD+ project. The photo shows an example of one of the notice boards.



In addition, a hard copy of the summary report was available at the Project Office (PO) premises for public consultation and the Project Office staff were available to answer questions or concerns.

2. Community Outreach Meetings

After the completion of the Monitoring Report and its submission to VERRA, the Project Office organised a total of 54 meetings with community members and leaders at villages and meeting locations across the project area and project zone over a five-week period. The focus of the meeting agenda was to provide an update on the status of the REDD+ project and particularly to provide information about the Monitoring Report through reference to the summary that was presented and discussed. The schedule and locations of the meetings is shown in the tables below.



3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

The Baseline Emission Model (BEM) and the Soil Emissions Model (SEM) were used to calculate the emissions that would occur under the baseline scenario in the absence of the Project. The BEM predicts the cumulative emissions from biomass as a result of ecosystem conversion and forest degradation. A separate BEM for the Forest Project Accounting Area and Grassland Project Accounting Area was evaluated. The BEM is parameterized using observations of historic imagery from the reference area. The SEM is based on a logistic model of ecosystem conversion and assumes that soil organic carbon (SOC) begins to decay in the Project Accounting Area at the point in time the patch of land is cleared to a converted state.

The change in baseline emissions for this monitoring period [m=1] ($E_{B\Delta}^{[m=1]}$) was calculated using equation [F.15] of the methodology. This process was applied separately for each project accounting area.

$$E_{B\Delta}^{[m]} = E_B^{[m]} - E_B^{[m-1]} \quad [F.15]$$

This is a function of the cumulative emissions at the beginning ($E_B^{[m-1]}$) and end ($E_B^{[m]}$) of the monitoring period as given by equation [F.16].

$$E_B^{[m]} = E_{B\,BM}^{[m]} + E_{B\,SOC}^{[m]} - C_{B\,SOC}^{[m]} - C_{B\,BGB}^{[m]} - C_{B\,DW}^{[m]} - C_{B\,WP}^{[m]} \quad [F.16]$$

Where:

$E_{B\,BM}^{[m]}$ = Cumulative baseline emissions from biomass at the end of the current monitoring period;

$E_{B\,SOC}^{[m]}$ = Cumulative baseline emissions from soil carbon at the end of the current monitoring period;

$C_{B\,SOC}^{[m]}$ = Carbon not decayed in SOC at the end of the current monitoring period;

$C_{B\,BGB}^{[m]}$ = Carbon not decayed in BGB at the end of the current monitoring period;

$C_{B\,DW}^{[m]}$ = Carbon not decayed in DW at the end of the current monitoring period; and

$C_{B\,WP}^{[m]}$ = Carbon not decayed in WP at the end of the current monitoring period.

The results for this monitoring period are:

Forest $E_{B\Delta}^{[m]} = 14,298,995$

Grassland $E_{B\Delta}^{[m]} = 1,590,605$

Total $E_{B\Delta}^{[m]} = 15,889,600$

MR. 10 Calculation of current baseline emissions $E_{B\Delta}^{[m]}$ as of the current monitoring period

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cells P119:R119

MR. 11 Calculation of baseline emissions $E_{B\Delta}^{[m-1]}$ from the prior monitoring period

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cell F 119

Values from the prior monitoring period are:

Forest $E_{B\Delta}^{[m-1]} = 6,127,466$

Grassland $E_{B\Delta}^{[m-1]} = 758,416$

Total $E_{B\Delta}^{[m-1]} = 6,885,882$

MR. 12 Calculation of cumulative baseline emissions for each selected pool ($E_{BM}^{[m]}$ and $E_{SOC}^{[m]}$) and undecayed carbon ($C_{BGB}^{[m]}$, $C_{SOC}^{[m]}$) as of the current monitoring period. The project does not include wood products or deadwood; therefore, the variables of equation [F.16] were not calculated.

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cell G118:R118

The following sections explain the process followed to obtain the values used in the equation.

3.2.1.1 Calculating Baseline Emissions from Biomass

Cumulative baseline emissions from biomass $E_{B\ BM}^{[m]}$ are estimated for both the Forest PAA and Grassland PAA accordingly to the baseline type, following the methodology, for baselines types F-U1 and G-U1 we are using equation [F.22] of the VCS methodology VM0009 v3:

$$E_{B\ BM}^{[m]} = BEM_{U1}(c_{P\ BM}^{[m=0]}, c_{B\ BM}^{[m]}, t^{[m]}, x^{[m]})$$

This estimate employs a Biomass Emissions Model (BEM) for baseline type F-U1 and G-U1 using equation [F.5] of the VCS Methodology VM0009 v3:

$$BEM_{U1}(c_P, c_B, t, x) = \frac{A_{PAA}(c_P - c_B)}{1 + e^{-\beta(t+0.5q-t_{PAI})-\theta(x-x_{PAI})^T-\alpha}}$$

Table 8 below presents the values for the parameters used in the calculation of BEM.

Table 8. Parameters used for baseline emissions from biomass calculation

Parameter	Description	Forest value	Grassland Value
A_{PAA}	Area of project accounting area	265,547.19	109,130.57
C_p	Project carbon stocks	134.57	21.7
C_B	Baseline carbon stocks in proxy	5	0
r_U	Onset proportion of conversion	0.39065	0.39065
β	Effect of time on the cumulative proportion of conversion over time	0.0001032	0.000578
α	Combined effects of beta and theta at the start of the historic reference period	-0.5673113	-1.13912
θ	Effect of certain covariates on the cumulative proportion of conversion over time	0	0
q	Lag between start of degradation and conversion	0	0
x_0	Covariate values as of the project start date	0	0
t	Time since project start date (days until 19/09/2013)	2,660	2,660
t_{PL}	Length of project crediting period	10,957	10,957

Following the equations above the results for the 2016 – 2020 period are:

Forest: $E_{B\ BM}^{[m=1]} = 14,703,577$

Grassland: $E_{B\ BM}^{[m=1]} = 1,450,325$

Total $E_{B\ BM}^{[m=1]} = 16,153,902$

MR.13 Calculations of cumulative baseline emissions from biomass $E_{B\ BM}^{[m]}$ for the current monitoring period

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cells P7:R7

MR.14 Calculations of cumulative baseline emissions from biomass $E_{B\ BM}^{[m-1]}$ for prior monitoring periods

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cell F7

3.2.1.2 Calculating Baseline Emissions from Soil Organic Carbon

As a conservative approach, soil carbon was not included in the current monitoring period due to the low carbon stock increment in the ecosystem, in this sense, soil carbon stocks from the first monitoring period were used.

Cumulative baseline emissions from SOC $E_{B\text{SOC}}^{[m]}$ for baseline types F-U1 and G-U1 are estimated using equation [F.28] of the VCS Methodology VM0009 v3:

$$E_{B\text{SOC}}^{[m]} = SEM_{U,2,3} \left(c_{P\text{SOC}}^{[m=0]}, c_{B\text{SOC}}^{[m]}, t^{[m]}, x^{[m]} \right)$$

The estimate employs the Soil Emissions Model (SEM) for baseline type F-U1 and G-U1 using equation [F.8] of the VCS Methodology VM0009 v3:

$$SEM_{U1}(c_P, c_B, t, x) = \frac{A_{PAA}(c_P - c_B)}{1 + e^{-\beta(t-t_{PAI}) - \theta(x-x_{PAI})^T - \alpha}} \left[1 + \frac{1}{1 + e^{-\alpha - \theta(x_0 - x_{PAI})^T - \beta t_{PAI}}} \right] - \frac{A_{PAA}(c_P - c_B)}{1 + e^{-\alpha - \theta(x_0 - x_{PAI})^T - \beta t_{PAI}}}$$

Table 9 Parameters used for baseline emissions from SOC calculation

Parameter	Description	Forest value	Grassland Value
A_{PAA}	Area of soil carbon accounting	125,710.2	79,451
c_P	Project carbon stocks - SOC	371	232.2
c_B	Baseline carbon stocks in proxy - SOC	206.3	206.3
r_U	Onset proportion of conversion	0.39065	0.39065
β	Effect of time on the cumulative proportion of conversion over time	0.0001032	0.000578
α	Combined effects of beta and theta at the start of the historic reference period	-0.5673113	-1.13912
θ	Effect of certain covariates on the cumulative proportion of conversion over time	0	0
λ_{soc}	Exponential soil carbon decay parameter	0.2	0.2
q	Lag between start of degradation and conversion	0	0
x_0	Covariate values as of the project start date	0	0
t	Time since project start date (days until 19/09/2013)	2,660	2,660
t_{PL}	Length of project crediting period	10,957	10,957

Forest $E_{B\Delta\text{SOC}}^{[m]} = 4,551,712$

Grassland $E_{B\Delta\text{SOC}}^{[m]} = 1,031,423$

Total $E_{B\Delta\text{SOC}}^{[m]} = 5,583,135$

MR. 18 An estimate of current baseline emissions from SOC $E_{B\Delta\text{SOC}}^{[m]}$ [F. 26] as of the current monitoring period

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cell G64:R64

MR. 19 An estimate of cumulative baseline emissions from SOC $E_{B\Delta\text{SOC}}^{[m]}$ for the current monitoring period

Please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm cell G63:R63

MR. 20 Calculations of cumulative baseline emissions from SOC $E_{BASOC}^{[m-1]}$ for all prior monitoring periods

3.2.1.3 *NER Model/Chyulu Hills_Total_NERs.xlsm cell F63 Carbon not decayed in DW*

The CHRP does not include planned forest harvesting in the baseline scenario. Therefore, the deadwood carbon pool has been conservatively excluded from project carbon accounting.

3.2.1.4 *Calculating Carbon Not Decayed in BGB*

Carbon that has not yet decayed in the below ground biomass (BGB) carbon pool is estimated using equation [F.10] of the VCS Methodology VM0009 v3:

$$DEM_{DW,BGB}(E_{B\Delta}^{[m]}, t, t^{[m-1]}) = \frac{E_{B\Delta}^{[m]}}{1 + e^{t - t^{[m-1]} - 3650}} \left[1 - \frac{t - t^{[m-1]}}{3650} \right]$$

The Decay Emissions Model (DEM) for carbon in the BGB and deadwood carbon pools is based on the default VCS decay models for those pools, for this BGB formula [F.32] is applied.

Forest: $C_{B\ BGB}^{[m=1]} = -2,284,002$

Grassland: $C_{B\ BGB}^{[m=1]} = -206,255$

Total $C_{B\ BGB}^{[m=1]} = -2,490,258$

For more details regarding calculation of carbon stored in non-decayed BGB $C_{B\ BGB}^{[m]}$ for the current monitoring period and previous monitoring period please refer to Annex_6_Net_Emissions_Reductions NER Model/Chyulu Hills_Total_NERs.xlsm row 62 as required in MR.26, MR.27 and MR.28.

3.2.1.5 *Calculating Carbon Not Decayed in SOC*

Carbon that has not yet decayed in the SOC carbon pool is estimated using equation [F.33] of the VCS Methodology VM0009 v3:

$$C_{B\ SOC}^{[m]} = \sum_{i \in \mathcal{M}} DEM_{SOC}(E_{B\Delta\ SOC}^{[i]}, t^{[m]}, t^{[i-1]})$$

This estimate employs the Decay Emissions Model (DEM) for carbon in the SOC for baseline type F-U1 and G-U1 using equation [F.9] of the VCS Methodology VM0009 v3:

$$\begin{aligned} DEM_{SOC}(E_{B\Delta}^{[m]}, t, t^{[m-1]}) \\ = E_{B\Delta}^{[m]} - \frac{365 E_{B\Delta}^{[m]}}{\lambda_{SOC}(t - t^{[m-1]})} \left[\frac{\lambda_{SOC}(t - t^{[m-1]})}{365} + e^{-\frac{\lambda_{SOC}(t - t^{[m-1]})}{365}} - 1 \right] \end{aligned}$$

Forest: $C_{B\ SOC}^{[m=1]} = -2,672,291$

Grassland: $C_{B\ SOC}^{[m=1]} = 684,888$

Total: $C_{B\ SOC}^{[m=1]} = 3,357,180$

MR. 29 An estimate of carbon stored in non-decayed SOC $C_{B\ SOC}^{[m]}$ for the current monitoring period please refer to Annex_6_Net_Emissions_Reductions_NER_Model/Chyulu_Hills_Total_NERs.xlsm row 119 as required in MR.29.

3.2.1.6 Proxy areas

Plots located in these areas were not measured due to access constrains, plot measurements were performed during November 2020 and March 2021, during this period Covid-19 pandemic was affecting a lot of areas around the world and Kenya was establishing lockdowns in order to reduce the spread of the virus. In this sense the access to private property was more restricted and, although the team tried to reach some plots to measure, there were not possibilities to achieve the goal to find the leakage plots. For this reason, we analyze the land cover of each plot with updated information from the European Space Agency for 2020 (Figure 10). We used the same geographical coordinates validated for the project and check their current land cover in order to understand the vegetation dynamic of the proxy plots.

It was found that land cover from the current monitoring period is very similar than the previous one (please refer to Appendix C of the PDD), having agricultural land as the principal land use of the plots. For this reason, carbon stock for proxy areas from the previous monitoring period were used.

Table 10. Land cover of proxy plots

Land Cover	Number of plots	Percentage
Bare / sparse vegetation	1	2%
Cropland	31	65%
Grassland	8	17%
Shrubland	7	15%
Tree cover	1	2%
Total general	48	100%

Please refer to 2020_Proxy_plots_LandCover.xlsx in Annex_1_Proxy_Area for details of each proxy plot

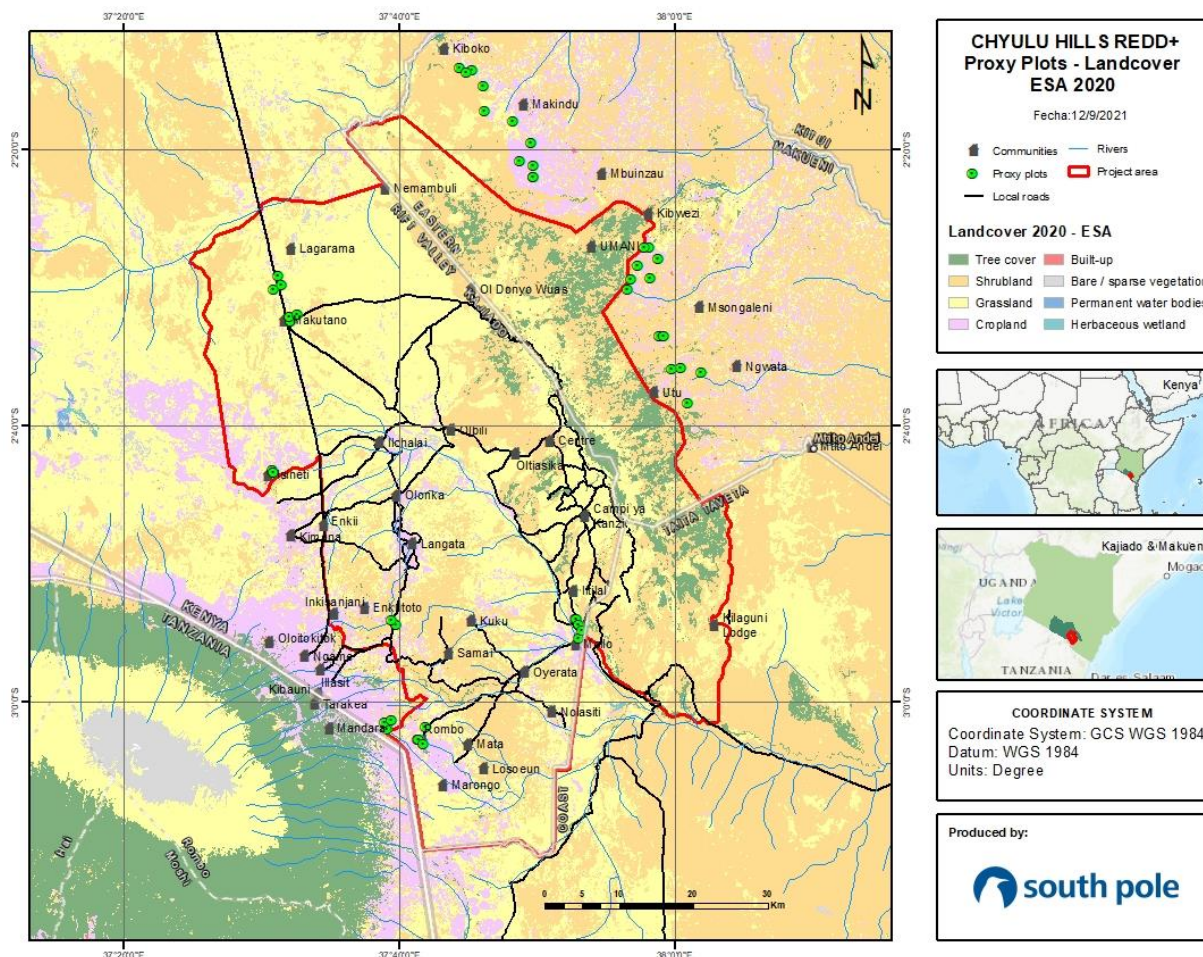


Figure 10. Land cover 2020 Proxy Plots

3.2.2 Project Emissions

3.2.2.1 Emissions from carbon stock changes

No reductions of overall carbon stock have been found in the current monitoring period. The results of the tree plot sampling have instead, indicated an increase in the number of trees and biomass. This is likely due to the positive impact of implementation activities and improvement in the application of the sampling protocols. Details of measurements are detailed in section 3.1.3.

Carbon stocks and its standard errors in parenthesis are explained in Table 11.

Table 11. Biomass Carbon Stocks

Project Boundary	Strata (AWF Class)	Strata area (ha)	Carbon_trees (tCO ₂ /ha)	Carbon_shrub_(tCO ₂ /ha)
PAA Forest	Acacia-Savanna-Mosaic	151,499	46.46 (6.5)	3.9 (2.20)
PAA Forest	Cloud Forest	4,823	1487.05 (383.5)	22.5 (8.7)

PAA Forest	Lava Forest	16,718	267.9 (42.5)	7.8 (1.8)
PAA Forest	Lava Forest-Sparse/Low	14,558	177.8 (32.7)	4.6 (1.7)
PAA Forest	Woodland-Sparse/Low	53,075	162.5 (23.9)	2.7(0.3)
PAA Forest	Woodland/Thicket	24,874	187.7 (25.1)	4.5 (0.4)
PAA Forest	Total F-U1	265,547	2329.4 (28.9)	46.1 (0.7)
PAA Grassland	Barren/Grassland	109,130.57	21.7 (4.7)	0.5 (0.07)

3.2.2.2 Emissions from burning

Project activities do not involve biomass burning; therefore, this value is zero

3.2.2.3 Emissions from disturbances

MR. 32 Fires are part of the dynamic of the communities and vegetations inside the project area. For this reason, we performed an analysis of the historical behavior of the fires in the project area (Figure 11). We find that during the period between 2001-2020 Acacia savanna is the strata more frequent burned (**Error! Reference source not found.**). Please refer to Annex_11_Fires.

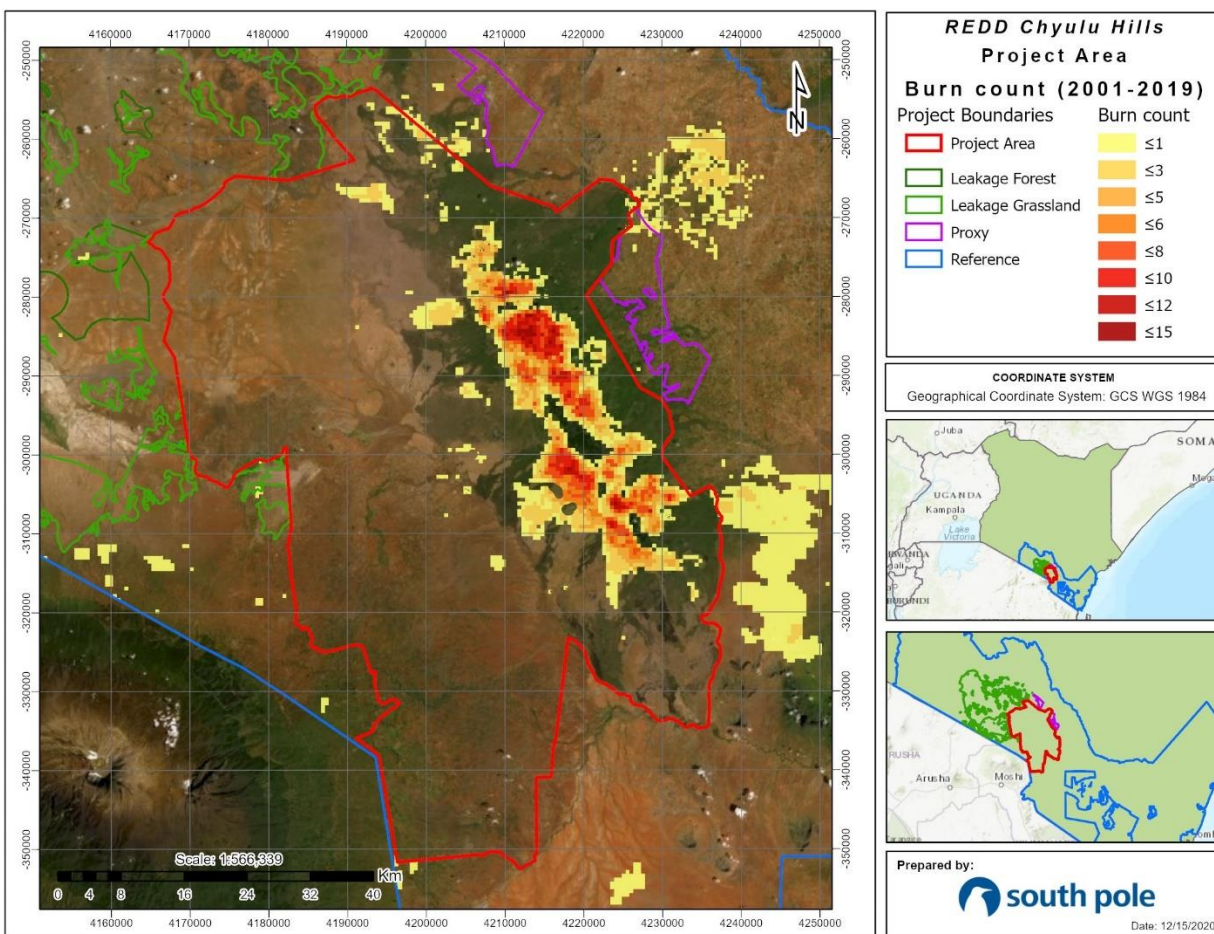


Figure 11. Frequency of fires_ 2001-2019.

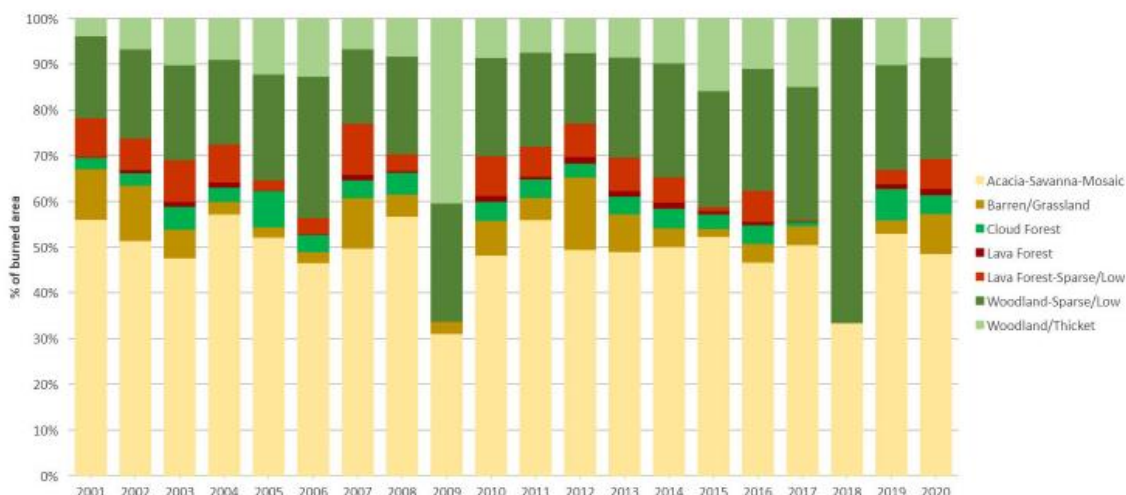


Figure 12. Vegetation strata affected by fires over time.

Area affected are detailed in

Figure 13. Affected areas(ha)

Year	Project Boundary	Strata	Burnt area (ha)	Burnt area (% of strata)	Burnt area (% of boundary)
2017	PAA Forest	Acacia-Savanna-Mosaic	2,778.71	1.83%	1.05%
	PAA Forest	Cloud Forest	37.77	0.78%	0.01%
	PAA Forest	Lava Forest	6.88	0.04%	0.00%
	PAA Forest	Lava Forest-Sparse/Low	22.81	0.16%	0.01%
	PAA Forest	Woodland-Sparse/Low	1,755.41	3.31%	0.66%
	PAA Forest	Woodland/Thicket	676.27	2.72%	0.25%
2019	PAA Forest	Acacia-Savanna-Mosaic	9,601.32	6.34%	3.62%
	PAA Forest	Cloud Forest	359.34	7.45%	0.14%
	PAA Forest	Lava Forest	21.51	0.13%	0.01%
	PAA Forest	Lava Forest-Sparse/Low	395.50	2.72%	0.15%
	PAA Forest	Woodland-Sparse/Low	4,603.58	8.67%	1.73%
	PAA Forest	Woodland/Thicket	1,587.37	6.38%	0.60%

2020	PAA Forest	Acacia-Savanna-Mosaic	16,865.39	11.13%	6.35%
	PAA Forest	Cloud Forest	653.66	13.55%	0.25%
	PAA Forest	Lava Forest	111.33	0.67%	0.04%
	PAA Forest	Lava Forest-Sparse/Low	1,838.24	12.63%	0.69%
	PAA Forest	Woodland-Sparse/Low	7,177.89	13.52%	2.70%
	PAA Forest	Woodland/Thicket	2,308.50	9.28%	0.87%
2017	PAA Grassland	Barren	281.70	0.26%	0.26%
2019	PAA Grassland	Barren	1,048.78	0.96%	0.96%
2020	PAA Grassland	Barren	3,069.75	2.81%	2.81%

Figure 13. Affected areas(ha)

MR. 33 In the field evaluation of this disturbances, performed in 2020 and 2021, we found that off all species surveyed, only six (6) were confirmed to have been affected by fire; and include:

1. *Nuxia congesta* R. Br. ex Fresen.
2. *Pistacia aethiopica* Kokwaro
3. *Olinia rochetiana* A. Juss.
4. *Euclea racemosa* L.
5. *Ozoroa insignis* Delile
6. *Acacia drepanolobium*

The last two, were most common in the ranches; and were partly affected and showed high level of recovery (sprouting) while the rest were found in the Chyulu Hills National Park. fire had more impact on the understory (grasses, herbs, forbs and smaller shrubs). In some very few cases where fire was noticed in the targeted class, only minor/ partial burns were seen and, in most cases, that did not result to death or actual burning.

MR. 34 We used this information to analyse the emissions from burning, confirming in the field that trees and big and small shrubs, were not affected by fires. This information was used due to it is the most accurate and updated data the project has collected (Refer to Fires Annex for more details) as well as using carbon stock of plots that were both burned and not burned, we are including a high variable data that could explain the shrubs biomass in different successional stages. In this sense, all small shrubs (100%) were included

in the estimations to account the emissions from burning. Total emissions included in the project emissions are in Table 12 and detailed in Climate Annex³¹

Table 12. Fire emissions

Year	Forest and Grassland GHG (tCO ₂)
2017	1,638
2019	5,433
2020	9,817
Total	16,888

3.2.2.3.1 Loss event

As the VERRA standard states “In an AFOLU project, any event that results in a loss of more than five percent of previously verified emission reductions and removals due to losses in carbon stocks in pools included in the project boundary that is not planned for in the project description” we compared the emissions of the current fires with the VCU’s from 2016 (see Table 13) and we found this event do not correspond to a loss event.

Table 13. Comparison between previous VCU’s and current emissions from fires

Year	Net GHG emission reductions or removals (tCO ₂ e)	Emissions for burning current monitoring period (tCO ₂ e)	%
2016	2,033,002	16,888	0.83

3.2.3 Leakage

MR.51 Following the SOP’s validated for the Project 70 plots were visited, 35 forest leakage area plots and 35 grassland leakage area plots within the Forest and Grassland activity shifting leakage areas (Figure 14).

³¹ Annex_11_Fires - ChyuluHills_FireMonitoringData_2017_2020_Historic_2001_2019.xlsx

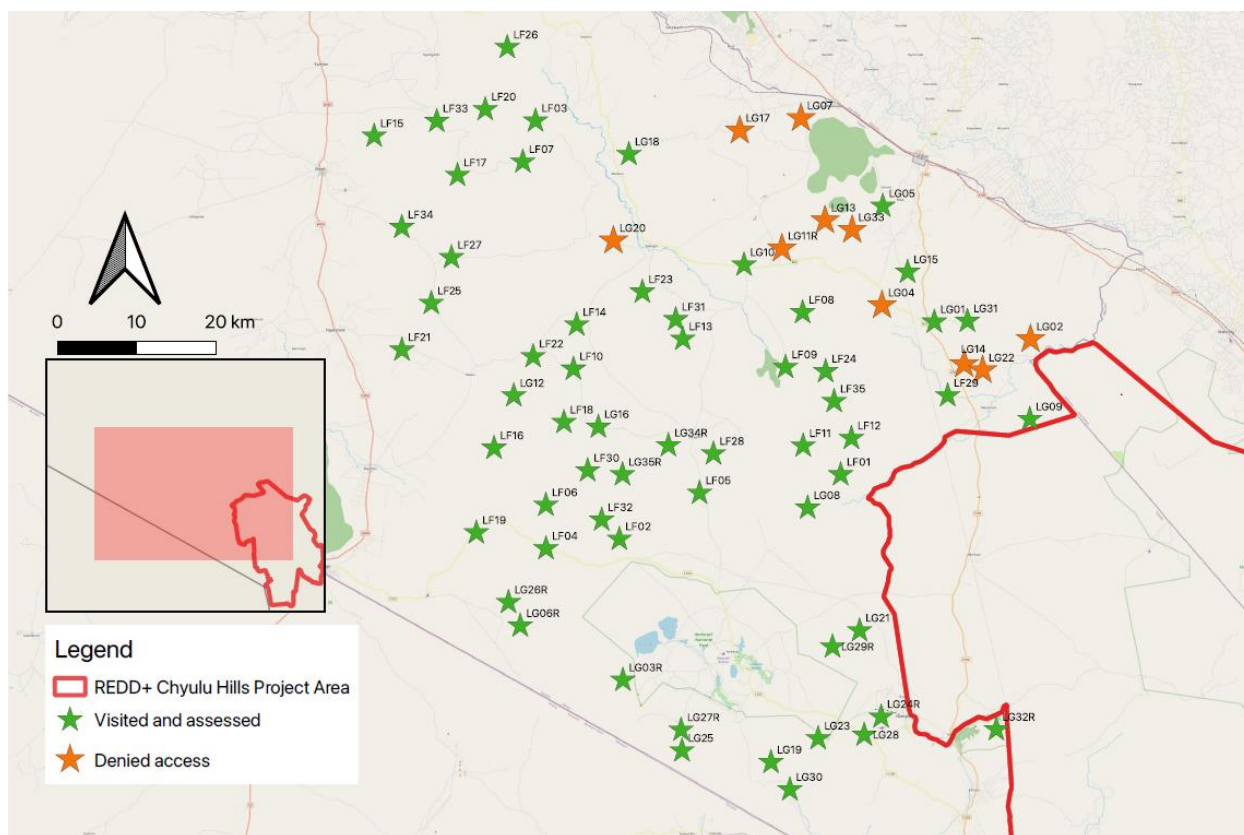


Figure 14. Plots visited following the SOPs validated.

MR. 48 and **MR.49** Calculations of cumulative emissions from activity shifting leakage for the current monitoring period are related in Annex_6_Net_Emissions_Reductions in excel files: Forest leakage_final.xlsx, Grassland leakage_final.xlsx and included in the estimations of final NER's in: Chyulu Hills_Forest_NERs_V3.xlsm, Chyulu Hills_Grassland_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

Equations F.48 and F.49 where applied

$$LEM_F(c_P, c_B, p_{L\ DEG}, t, x) = p_{L\ DEG}^{[m]} A_{AS}(c_P - c_B) - \frac{A_{AS}(c_P - c_B)}{1 + e^{\ln\left(\frac{1}{p_{L\ DEG}^{[m=0]}} - 1\right) - \beta t - \theta(x_0 - x)^T}}$$

$$LEM_G(c_P, c_B, p_{L\ CON\ G}, t, x) = p_{L\ CON\ G}^{[m]} A_{AS}(c_P - c_B) - \frac{A_{AS}(c_P - c_B)}{1 + e^{\ln\left(\frac{1}{p_{L\ CON\ G}^{[m=0]}} - 1\right) - \beta t - \theta(x_0 - x)^T}}$$

Estimation of $p_{L\ DEG}^{[m]}$ is detailed in Annex-Climate-Leakage-Forest leak final.

3.2.3.1.1 Mitigation strategies

A description of the Project mitigation strategies implemented for leakage that will reduce the demand and impact in forest resources is shown below. It is important to note that these strategies will continue during the project lifetime and will evolve according to the necessities identified and the lessons learnt.

Activity	Description	Effect
Forest Patrolling	As a strategy of forest protection, rangers operate inside and outside the Project area to conserve and sensitize community people	People are learning about the importance of forest conservation and their role in this process. Ranger provide a mechanism for information exchange with the community that improves intelligence gathering and builds community support.
Community Engagement and Support	Many project activities hire and engage community members, including rangers, biodiversity monitoring, teachers, water guards, Simba scouts, beekeeping, are part of the different option the project is giving to the community	People have improved their economic capacity; with this income they can contribute to their children's schooling and food, reducing pressure on the forest. The project has continued to hold multiple community outreach meetings and to deliver a range of benefits, including employment for rangers, salaries for teachers and other school staff, improved water access, bursaries for school children, school infrastructure (security fencing teacher accommodation, latrines), equipment and training for beekeeping, and
Environmental outreaches	Both with the community and the schools, the project has different activities in order to explain the benefits of the REDD+ project and the conservation in general	Community members, including school students have increased awareness of the importance of protecting natural resources and engage in activities such as tree planting and avoid activities such as tree felling
Reforestation and Improved Agriculture	Refurbishment of tree nursery, rehabilitation of degraded wetland and riparian areas, tree planting in schools	Increase of environmental awareness

MR.56 The estimated value $P_{L\ DEG}^{[m]}$ for the current monitoring period and supporting calculations.
Please refer to: Forest leakage_final.xlsx, Grassland leakage_final.xlsx and included in the estimations of final NER's in: Chyulu Hills_Forest_NERs_V3.xlsm, Chyulu Hills_Grassland_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

MR.57 The calculated value $P_{L\ DEG}^{[m=0]}$ for the first monitoring period

Please refer to: Forest leakage_final.xlsx, Grassland leakage_final.xlsx and included in the estimations of final NER's in: Chyulu Hills_Forest_NERs_V3.xlsm, Chyulu Hills_Grassland_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

MR.58 The estimated value $P_{L\text{ CON } G}^{[m=0]}$ for the current monitoring period and supporting calculations
Please refer to: Forest leakage_final.xlsx, Grassland leakage_final.xlsx and included in the estimations of final NER's in: Chyulu Hills_Forest_NERs_V3.xlsm, Chyulu Hills_Grassland_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

MR.59 The calculated value $P_{L\text{ CON } G}^{[m=0]}$ for the first monitoring period
Please refer to: Forest leakage_final.xlsx, Grassland leakage_final.xlsx and included in the estimations of final NER's in: Chyulu Hills_Forest_NERs_V3.xlsm, Chyulu Hills_Grassland_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

3.2.3.1.2 Market Leakage

Market leakage can occur if a project reduces the supply of market goods, such as timber, relative to the baseline. Market leakage is assessed independently for the Forest Project Accounting Area and for the Grassland Project Accounting Area. As explained before, the most likely baseline scenario is conversion of forest and native grassland to agriculture. This agriculture is primarily subsistence, with little production remaining beyond household consumption. Without the Project there would be increasing demand for land and continued low productivity of agricultural production, crop failures from droughts, and few alternatives for income generating activities available to local communities. Given that the agents and drivers practice subsistence farming, and a key Project Activity is to work with local farmers to increase yields on land that is currently farmed, no net reduction in agricultural production due to the Project is anticipated.

3.2.4 Net GHG Emission Reductions and Removals

3.2.4.1 Quantifying Gross Emissions Reductions

MR.65 Quantified GERs for the current monitoring period including references to calculations

Table 14 Quantified linear GERs for the current monitoring period

Monitoring Period	Year	Forest Linear GERs	Grassland Linear GERs	Total Linear GERs
Second	2017	953,147	131,798	1,084,945
	2018	953,147	131,798	1,084,945
	2019	953,147	131,798	1,084,945
	2020	955,759	132,159	1,087,918
Total		3,815,201	527,553	4,342,754

Please refer to Annex_6_Net_Emissions_Reductions NumericOutput/Chyulu Hills_Total_NERs.xlsm cells E6:P6.

MR.66 Quantified linear GERs for the prior monitoring period

Table 15 Quantified GERs for the prior monitoring period

Monitoring Period	Year	Forest Linear GERs	Grassland Linear GERs	Total Linear GERs
First	2013	164,921	33,181	198,102
	2014	578,808	116,453	695,261
	2015	578,808	116,453	695,261
	2016	577,223	116,134	693,356
Total		1,899,760	382,220	2,281,980

MR.67 Graph of GER's by monitoring period for all monitoring periods to date

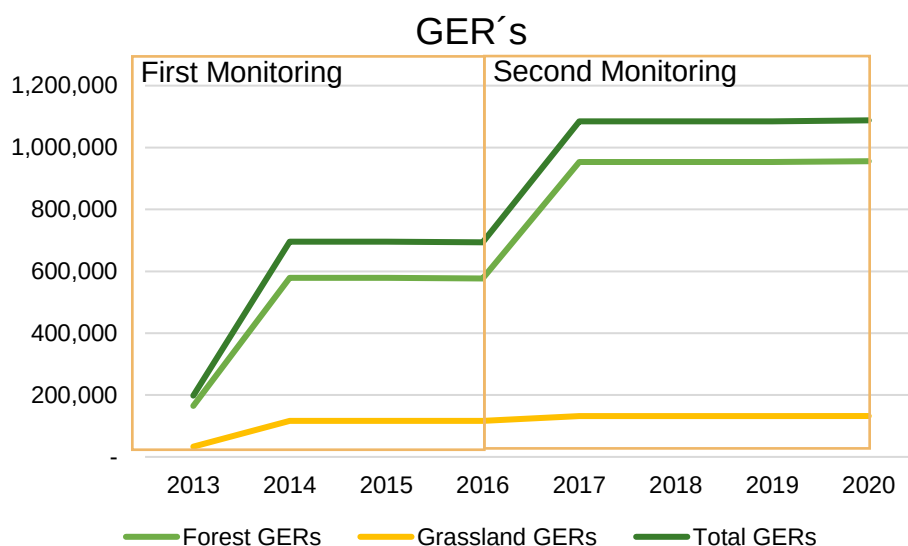


Figure 15. Graph of GER's of current and previous monitoring periods.

3.2.4.2 Determining Deductions for Uncertainty

The confidence deduction $E_U^{[m]}$ is determined by [F.57], which is a linear combination of weighted standard errors of estimates from baseline emissions models and carbon stock measurements.

MR. 68 The confidence deduction $E_U^{[m]}$ and estimated standard errors used to determine the confidence deduction.

The standard errors for biomass sampling are detailed in Table 11 and deductions for uncertainties are detailed in **Error! Reference source not found.**

MR. 69 Reference to calculations used to determine this confidence deduction

Please refer to Annex_6_Net_Emissions_Reductions and Annex_7_Biomass_inventory 211126_Biomass_2020.xlsx, Chyulu Hills_Grassland_NERs_V3.xlsm, Chyulu Hills_Forest_NERs_V3.xlsm and Chyulu Hills_Total_NERs_V3.xlsm

3.2.4.3 Using a Linear Model for Gross Emissions Reductions

We selected this option due to the project corresponds to baseline type F-U1 and G-U1. Also, GER's quantified by [F.53] are higher than linear estimations, in this sense we chose the more conservative option.

MR. 70 The linear model used to generate GERs for the current monitoring period correspond to:

$$slope = Max/t_{PL}$$

Max corresponds to maximum cumulative baseline emissions reduction value over project lifetime

t_{PL} is the Length of project crediting period

After this the following equation was applied, where *t* corresponds to Time since project start date

$$LinModel = slope * t + intercept$$

MR. 71. A graph of GERs from the linear model by monitoring period for all monitoring periods to date that used a linear model.

Please refer to MR.67

3.2.4.4 Determining reversals

MR.72 There has not been reversals in the project

3.2.4.5 Quantifying Net Emissions Reductions for a PAA

Table 16. Total net emissions reductions (linear)

Year	Linear GER's (tCO ₂ e)	Confidence deduction (tCO ₂ e)	Leakage (linear) (tCO ₂ e)	Buffer (tCO ₂ e)	Net Linear GHG emission reductions or removals (tCO ₂ e)
2,017	1,084,945	-4,385	-140,613	-108,495	831,453
2,018	1,084,945	-4,771	-170,813	-108,495	800,866
2,019	1,084,945	-5,048	-201,013	-108,495	770,389
2,020	1,087,918	-10,204	-231,936	-108,792	736,986
Total	4,342,754	-24,408	-744,376	-434,275	3,139,694

MR. 74 Quantified linear NERs for the current monitoring period including references to calculations.

Please refer to Numeric Output/Chyulu Hills_Total_NERs.xlsm.

Table 17 Quantifying Total linear Net Emissions Reductions

Vintage Period	Year	Cumulative Baseline emissions or removals (tCO ₂ e)	Current Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions-linear (tCO ₂ e)	Net Linear GHG emission reductions or removals (tCO ₂ e)
1 January 2017 – 31 December 2017	2017	8,894,011	2,008,130	-1,639	-140,613	831,453
1 January 2018 – 31 December 2018	2018	11,025,289	2,131,278	0	-170,813	800,866
1 January 2019 – 31 December 2019	2019	13,285,690	2,260,401	-5,433	-201,013	770,389
1 January 2020 – 31 December 2020	2020	15,889,600	2,603,910	-9,818	-231,936	736,986
Total		48,196,690	9,003,718	-16,890	-744,376	3,139,694

Table 17 reflects an actual calculation of baseline and project emissions but NERs are based on linear GERs, so the numbers don't add up to NERs in this table. Refer to MR.77 for the final NERs.

MR. 75 Quantified NERs for the prior monitoring period

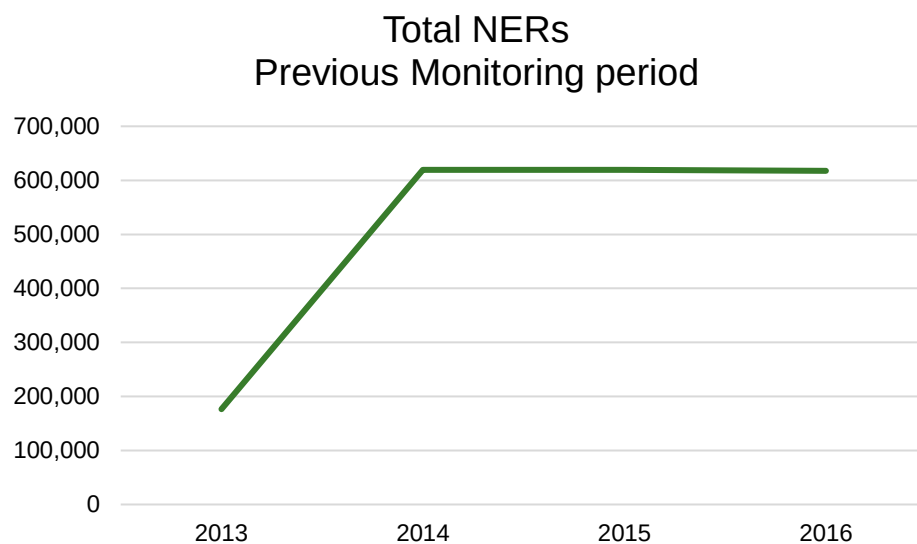


Figure 16. Quantified Linear NERs for the prior monitoring period.

MR. 76 A graph of Linear NERs by monitoring period for all monitoring periods to date

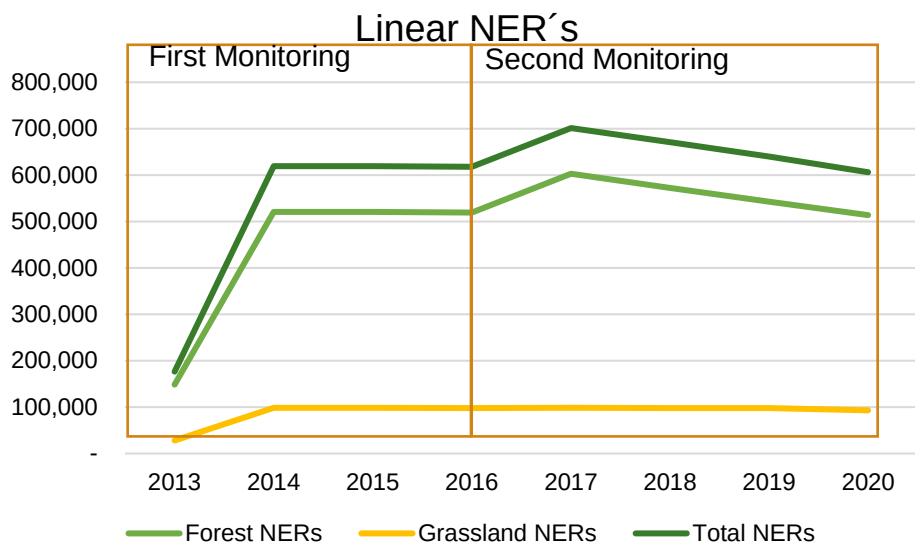


Figure 17 Graph of NERs by monitoring period for all monitoring periods to date.

3.2.4.6 Determining Buffer Account Allocation

MR. 77 Reference to the VCS requirements used to determine the buffer account allocation.

Year	Linear GER's (tCO2e)	Confidence deduction (tCO2e)	Leakage - linear (tCO2e)	Buffer (tCO2e)	Net Linear GHG emission reductions or removals (tCO2e)
2,017	1,084,945	-4,385	-140,613	-108,495	831,453
2,018	1,084,945	-4,771	-170,813	-108,495	800,866
2,019	1,084,945	-5,048	-201,013	-108,495	770,389
2,020	1,087,918	-10,204	-231,936	-108,792	736,986
Total	4,342,754	-24,408	-744,376	-434,275	3,139,694

The tool V3.0: the VCS AFOLU Non-Permanence Risk Tool, VCS Version 4.0. was used to calculate the buffer credits.

MR.78 Reference to calculations used to determine the buffer account allocation.

Please refer to Annex_6_Net_Emissions_Reductions Chyulu Hills_Grassland_NERs_V3.xlsm, Chyulu Hills_Forest_NERs_V3.xlsm and Please refer to Numeric Output/Chyulu Hills_Total_NERs.xlsm

3.2.4.7 Evaluating Project Performance

MR.84 Description of the cause and effect of deviations from *ex-ante* estimates

The NERs presented in this monitoring report are significantly lower than the *ex-ante* estimates that were displayed in the CHRP PD. For the *ex-ante* estimates of project NERs the soil carbon was estimated by using the results of soil carbon sampling from the Kasigau Corridor REDD+ Project. This project is very close to the project and contains very similar soil types and ecosystems. However, for the previous verification soil sampling of the Project Area was performed completed, and the results showed a significantly smaller soil carbon pool than what was estimated. This monitoring period used the soil sampling of the previous period in order to have a conservative approach.

3.3 Optional Criterion: Climate Change Adaptation Benefits

3.3.1 Activities and/or Processes Implemented for Adaptation (GL1.4)

Water

In the face of climate change, one of the most critical issues both globally and in Africa and particularly in arid and semi-arid areas is water security. Climate change models³² suggest that rainfall in Kenya may actually increase but as throughout much of the world, temperatures are expected to rise and extremes with accompanying drought will also increase in frequency and severity. As mentioned previously, the project activities are protecting the moist tropical forest component of a regionally important aquifer that supplies both local communities and Kenya's second largest city, Mombasa. The aquifer represents a complex interplay between unusual geology and climate with water retention between about two and ten years so that it effectively acts as a storage reservoir, with an estimated capacity of about 600 million cubic metres³³. Due to this retention capacity, the system provides natural adaptation and resilience to climate change. It is interesting to note that a proposed new dam, the Mwache Dam, being planned to provide a significant increase in water supply to Mombasa will have a capacity of 118 million cubic meters (about 20% of the Chyulu aquifer) and the World Bank estimate of the total cost is \$200 - \$250 million. The REDD+ Project Area includes a substantial part of the Chyulu aquifer recharge zone so that the project is providing an important function in the protection of this important watershed (Figure 18, Figure 19, Figure 20, Figure 21).

³² Analysis carried out by UK Meteorological Office

<https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/climate-science/climate-observations-projections-and-impacts/kenya.pdf>

³³ The Great Chyulu Hills Reservoir. Tuite, C.H. (2019) Swara July – September 2019

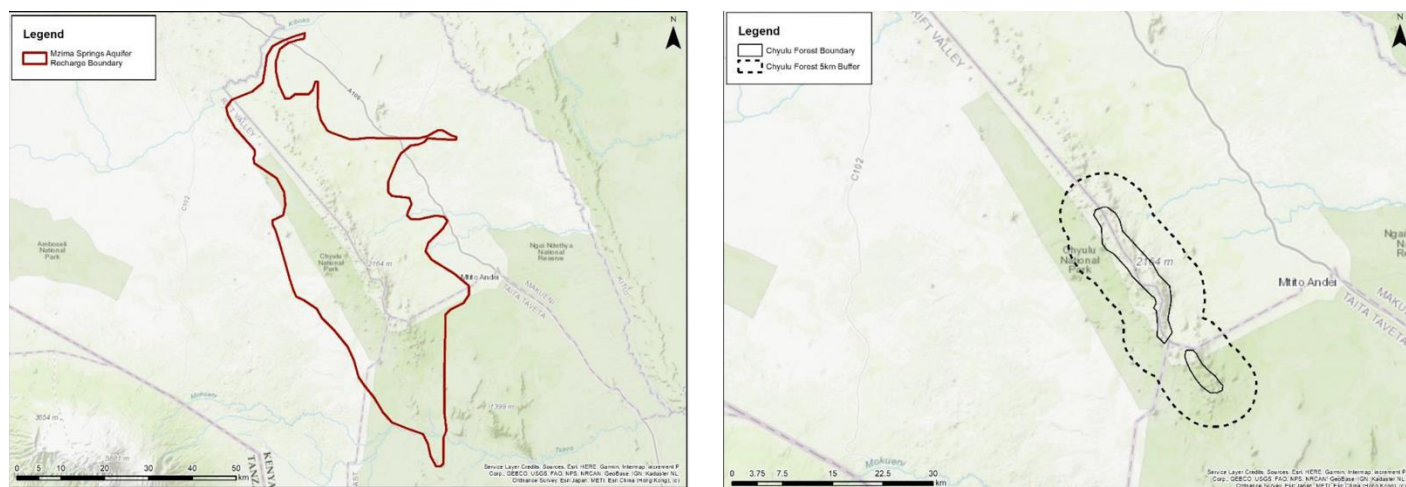


Figure 18. Mzima Springs Aquifer recharge boundary (red) and forest boundary (black).



Figure 19. Mzima springs land scape.



Figure 20. Degradation effect in the borders of the spring.



Figure 21. Fence to avoid elephants from entering one side of the Mzima spring.

In the last two years, the Project Office has worked closely with the international consulting group AECOM, to develop a Baseline Report feasibility analysis for a water PES based on the supply of water from the Chyulus aquifer to Mombasa and other towns and communities in the region. This Baseline Report has been delivered under the Global NDC Implementation Partners (GNI_{plus}) project being undertaken in Kenya. It is a three-year project funded by the German Government through the International Climate Initiative (IKI). The Project Office has also developed a collaboration with The Nature Conservancy through which a Chyulu Hills water PES programme will be incorporated into a broad vision for improving water security for Mombasa and other coastal towns through formation of a Mombasa Water Fund.

At a more local level MWCT has led an initiative to restore the Ol Pusare spring on Kuku Group Ranch. The freshwater spring is an important water resource for wildlife and the water flows into Tsavo West National Park. Historically, the spring and wetland area around it were well-known for wildlife, including elephants, rhinos, hippopotamus and crocodiles. About ten years ago the Group Ranch started to lease land around the spring for commercial tomato cultivation, a process that in itself was technically illegal. The tomato growers pumped water from the spring and started to sink wells. Immediately the water table dropped, which impacted the flows from the spring and also bore holes in the nearby town of Ilital. Land was cleared, pesticides were used and wildlife were discouraged from using the spring. MWCT brokered an agreement to lease the spring and surrounding area and build a new international student camp, The Chyulu Wilderness Camp. The camp is now operational, vegetation is being restored and wildlife is returning to use the spring as an important water source. The outcome has demonstrated the value of conserving an important water source for wildlife, improved water security for the community and is providing income for community members. In addition, the new camp is totally solar powered and uses no

wood or charcoal for cooking and is an important demonstration pilot for developing such facilities with a zero carbon footprint. All these benefits support adaptation and resilience for wildlife and communities in relation to climate change.

On Mbirikani Group Ranch the project has funded a new water point, troughs, plumbing, and special guards to provide security at water points. These benefits improve water access and security for families and their livestock and support adaptation to climate change. Figure 22 shows the building where the water tanks are going to be stored so it will be easily available to the people and be protected from the wildlife, with a watering trough being built close by for the surrounding animals.



Figure 22. Watering point for animals and building for water tanks for the community

Tree Planting

On the eastern side of the Project Area, KFS is renovating a tree nursery near Kibwezi. This will improve the ability to provide trees for local farmers and schools and for restoration of degraded forest. These programmes support climate change adaptation, for instance in crop diversification and implementation of improved agroforestry.

On the western side, the rehabilitation of the Ol Pusare spring is being supported through development of a tree nursery.

Rangeland restoration and sustainable livestock management

Current practices of livestock management are not sustainable in the long-term and more frequent and extreme droughts as predicted by climate change models will only make this situation worse. This has significant impacts on the economic security at the household level. For instance, a severe drought in 2008-9 resulted in the loss of about 90% of livestock, which in a pastoralist community are a major individual wealth asset. Project partners MWCT and Big Life are developing a major initiative, funded by a major US corporate donor and the UN Green Climate Fund, to develop an integrated approach to livestock an

rangeland management, including rotational grazing, improved breed quality and animal husbandry, degraded land restoration and financial incentives for herd reduction. One of the reasons for the success of these awards was because of the existence of the REDD+ project. One of the primary objectives of these initiatives is to enhance adaptation and resilience to climate change.

Grass Seed banks

Linked to the restoration initiative, MWCT has worked with women's groups to develop grass seed banks. Indigenous grass seed has a significant retail value. The restoration project itself is buying seed from the women's groups and the groups can also generate income from the sale of the grass hay for cattle feed. In addition to supporting the rangeland restoration, the project is also generating significant income for the women. This new income provides adaptation to resilience to climate change at the household level.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM1.1)

The Chyulu Hills REDD+ Project, through the theory of change, established three key issues in the community component, namely: high levels of poverty and livelihood vulnerability; food insecurity; and poor education standards. The activities implemented during the project were established in the Social and Biodiversity Impact Assessment (SBIA) workshops held (see Table 18).

Many of the Project activities of the CHRP have been developed by different Project Partners in the western and eastern communities, which has been crucial to maintaining benefits and having a positive impact on the local area in the "with-project" scenario. The western community is represented by the people located in the Entonet, Mbirikani, Kimana, Central, Lenkism and Rombo Divisions, whereas the eastern community is represented by the communities located in the Kibwezi District.

The most tangible REDD+ Project impacts³⁴ from each partner are listed in Table 19 in section 4.4..

³⁴2020 MWCT Impact Report.

Table 18. Impacts evaluated under "without project" and "with-project" scenario for each community.

Focal issue	Defined activities theory of change	Positive Impacts
Poverty Reduction and Livelihood Diversification	Western Community: • Training on Alternative Income Generating Activities (IGAs) and direct employment. • Provision of bursaries and scholarships and specific promotion of female education. • Improving schooling infrastructure. • Establishing micro-finance schemes • Creation of jobs and stimulating investment in new businesses. • Improving health facilities and care. • Strengthening Community Organizations. Eastern Community: • Training on Alternative Income Generating Activities (IGAs) and direct employment. • Provision of bursaries and scholarships and specific promotion of female education. • Improving schooling infrastructure. • Creation of jobs and stimulating investment in new businesses. • Strengthening Community Organizations.	Western Community: • Promotion of income generating activities such as beekeeping (150 beehives delivered and 1 beekeeping training), honey production , grass seed banks, and bead jewellery making serve to diversify the economic activities in the community, especially for women's groups. • The increase in income enables families to improve their economic status, improving their food security, housing, mobile phone access and the ability to pay school fees and healthcare expenses. • The project has also initiated an extensive school bursary programme for western community children, particularly focusing on poorer families. • Rangers, teachers, social impact survey enumerators and tree plot samplers and others hired through REDD+ funding from the local communities reduce the social and economic inequality and provide jobs for community members. All these economic benefits reduce the dependency on the extraction of natural resources. Eastern Community: • Beekeeping and honey production is an important

		activity in this community due to the historical production of these product. Here the activities were focused on new practices of beekeeping, workshops to develop technical capacities and commercialization and strengthening community organizations. 680 beehives and 68 kits of equipment were delivered, and 3 training sessions on beekeeping were held. • School bursaries is also an important activity in this community, along the improvement of school infrastructure such as water tanks for children to have access to water. • Jobs related to the maintenance of roads and fire management in the Kibwezi forest reserve are important source of income for the community.
Food Security	Western Community: • Training on agricultural methods and intensification • Training on Alternative Income Generating Activities (IGAs) • Strengthening Community Organization • Generation of Jobs • Establishing tree nurseries Eastern Community: • Training on Alternative Income Generating Activities (IGAs). • Strengthening Community Organization • Generation of Jobs	See section above and: Western Community: • Training on agricultural methods and intensification were implemented with the communities in 1 acre of organic farm in KUKU as a pilot project that serve to validate the sustainable farming framework and act as an educational source for others to attain. Eastern Community:

	Establishing tree nurseries	Tree nurseries are part of a program by KFS, with the objective of reforest the Kibwezi Forest Reserve. The communities are linked in planting process and management of the tree nurseries.
Improvement of Education	Western Community: - Provision of bursaries and scholarships - Construction and improving of school facilities - Employment of teachers and initiatives to increase their motivation Eastern Community: - Provision of bursaries and scholarships - Construction and improving of school facilities - Strengthening Community Organization Generation of jobs Raising awareness of and promoting female education is a general activity promoted in both communities.	Western Community: - The project is providing bursaries for school children (a total of 624 bursaries were granted) and has funded improvement of school facilities (2 latrines constructed at Nolasit and Olorika schools), including teacher housing, lighting, security fencing. The project has also funded salaries for teachers and other school staff. - This support improves the quality and safety of the schools and, reduces class size and provides better education for children, both boys and girls. Eastern Community: - Provision and installation of 6 water tanks plus water catchment system for schools were valuable activities for the schools in the eastern community that did not have access to water. - School Bursaries are also very important and one of the activities that local communities request the most,

		especially because that provides a relieve in the poorest families that can get education to their children. During this period a total of 151 bursaries were granted.
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4.1.2 Net Positive Community Well-Being Impacts (CM1.1)

According to the results (Table 18), there are no negative impacts identified in the community groups described in section 4.1.1. On the contrary, the community has benefited from the implementation of the project activities, improving their well-being and reducing the focal issues of high poverty and livelihood vulnerability, food insecurity and poor education, assisting the communities to adapt to the impacts of climate change. This means that the net well-being of the community groups is positive during this period. Results are shown in section 4.3.2.

4.1.3 Protection of High Conservation Values (CM1.2)

HCV G1.8.4. Areas that provide basic ecosystem services in critical situations

HCVs under this category include forests critical to water catchment and grassland for the prevention of soil erosion. Conservation of these services are the main priority of the project and its project partners and project activities carried out in the current verification period have supported the conservation of these resources. The direct protection forests and the watershed are being accomplished through the deployment of ranger forces, tree planting, and forest and wetland restoration. In addition, the monitoring and implementation of activities in Mzima springs, which is an important area for the provision of basic ecosystem services (HCV G1.8.4), mainly water provision (See section 3.3.1) included seeds and tree planting and fencing of the area (Please refer to Annex_2_Community_Biodiversity_Monitoring) .

On the other hand, the construction of water points on Mbirikani Group Ranch are key to reduce the pressure on grasslands and provide water for the livestock. The grasslands are fundamental to meeting the basic needs of local communities, due to the importance of livestock on the economic security of the community. Therefore, activities such as rangeland restoration and sustainable livestock management are of relevant for the conservation of the HCV established for the project (HCV G1.8.5) (See section 3.3.1). Moreover, for grasslands, project partners are working with the Maasai communities to develop land use and improved livestock management and the restoration of degraded areas. A major initiative for further expanding these activities was started in 2019-20. This inherently provides positive effects on these high conservation values. No related negative effects are anticipated as a result of the project.

HCV G1.8.5 Areas that are fundamental to meeting the basic needs of local communities

HCVs under this category include provisioning services, such as poles for building material, fodder, fuel and medicinal plants. Through collaborative management with the communities and a development of a zoning and restoration plan and initiates such as the development of grass seed banls, these services are not negatively affected by the project.

G1.8.6. Areas that are critical for the traditional cultural identity of communities

HCVs in this category are sacred sites within the project zone's forests, which have not been identified in the Project Area.

4.2 Offsite Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM2.2)

The analysed impacts in section 4.1 are identified for community groups, CHRP does not expect any negative impacts on other Stakeholder Groups.

The Chyulu Hills REDD+ Project believes that there are no net negative impacts on legitimate offsite stakeholders. Potential offsite stakeholders may include charcoal traders along the Nairobi-Mombasa highway. Although we recognize that halting certain extractive activities from protected areas may affect the temporary income of such offsite stakeholder, such activities are a legal offence and therefore support law enforcement in the area. On the contrary, halting these activities may in fact lead to a positive impact on such offsite stakeholders as they may aim to generate their income in a more legal manner.

In addition, the Chyulu Hills REDD+ Project is aware that there is a heightened risk to a potential increase in human-wildlife conflict as wildlife numbers increase. The project has been working with partner organisations that operate outside but in close proximity to the project area and project zone on the eastern side and in close partnership with KWS has provided water tanks to replace tanks damaged by elephants. These activities serve mitigate any negative effects, widen community support for conservation, and reduce human-wildlife conflict.

4.2.2 Net Impacts on Other Stakeholders (CM2.3)

CHRP does not expect any negative impacts on other Stakeholder Groups. The possible negative impacts are related to stakeholders that performs illegal activities, such as charcoal burning and illegal hunting, therefore, its control will result in benefits for the communities and the biodiversity.

On the other hand, with the protection of the landscape and increase in wildlife, it is possible to have more frequent wildlife conflicts with the communities. Thus, comprehensive compensation schemes are operated to provide monetary compensation to community members for any losses caused by wildlife. Finally, by encouraging offsite stakeholders to closely collaborate with the Project Office and its partners, particularly ranger teams, any negative result from wildlife intrusion may be stopped before leading to conflict

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan Development (CM3.3)

Not applicable.

4.3.2 Community Monitoring Plan Results (CM3.1, CM3.2, GL2.5)

The community monitoring or social benefit impact analysis was based on the previous survey carried out for the first verification and activities implemented with the community. In total, 41 indicators (Refer to Annex_2_Community_Biodiversity_Monitoring) were used.

The questionnaire was modified slightly to improve its structure and form in relation to standard social science methodologies. The survey was overseen by Dr. Laura Perry from the University of Oxford Wildlife Conservation Research Unit (WildCRU).

To provide continuity and comparability the survey was based on the same 300 household selected for the previous verification using a stratified randomized selection process based on national census data. For the current survey an additional 26 households were added, bringing the total sample size to 326. The distribution of households was fairly evenly divided between the eastern with the locations and western communities. The increase in sample size was partially to take account of likely population increases.

Households and communities in this area are subject to change, and some households were no longer present at their original location. Where it was not possible to resample the original household, the next closest household was used as a replacement, and the GPS coordinates updated for future surveys. In total 23 households could not be resampled, and the same number of new families were added in their place (Figure 23).

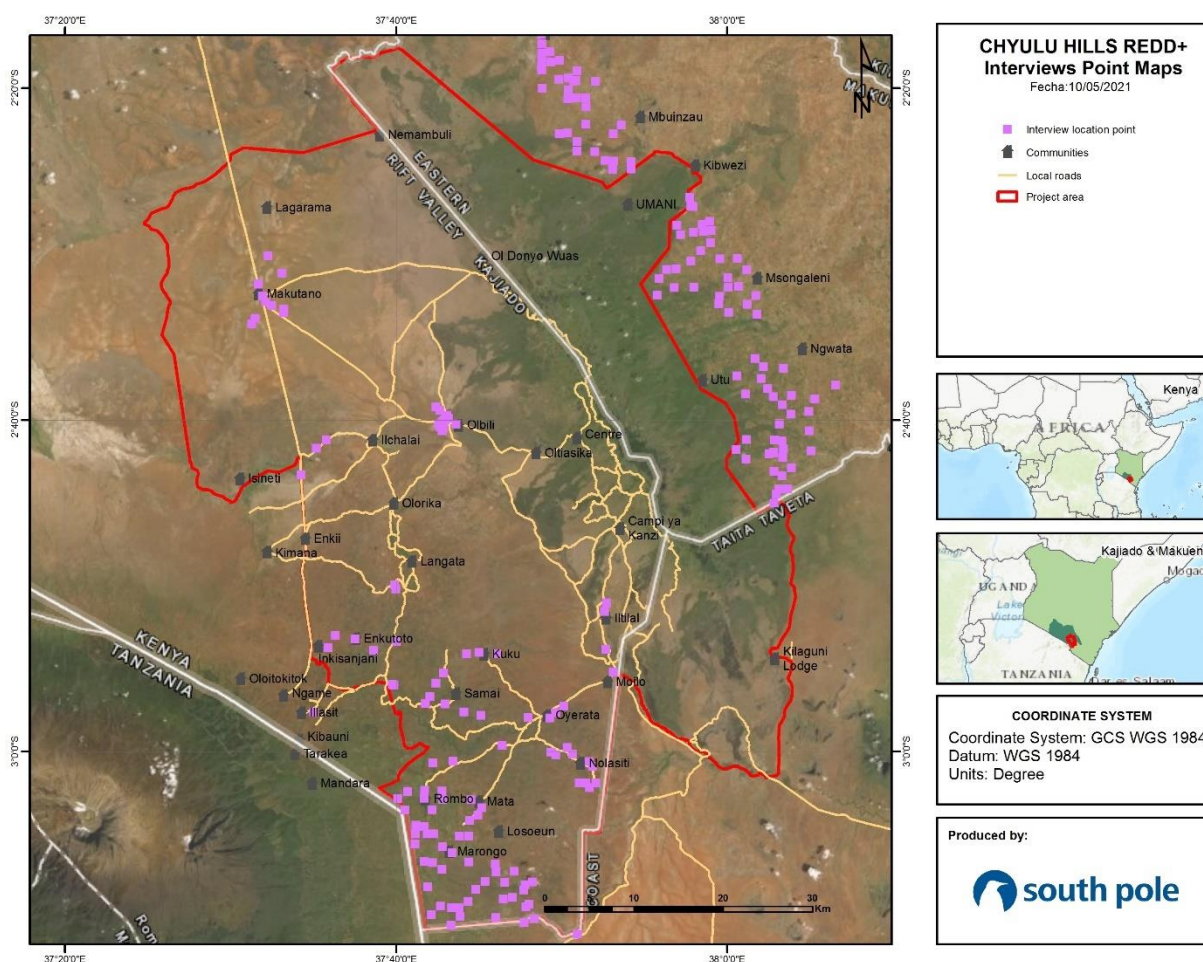


Figure 23. Social characterization survey points sampled

Survey enumerators and data collection process.

The following teams of enumerators were recruited to conduct the household surveying.

- East 1: Lucy Muia; Victor Musyoki*. Utithi to Mang'elete.
- East 2: Shadrack Nedtei; Regina Ndungwa*. Kiboko to Utithi.
- West 1: Evalyne Lenku*; Joshua Kiroshi*. Kuku and Rombo.
- West 2: Michael Muntura; Koinary Thomas; Francis Senchuka. Imbirikani and Kuku.

Individuals marked with * were previously employed to conduct the 2016 survey. These individuals were considered 'experienced' and were duly distributed between teams to even out experience levels. Where possible, individuals resampled any household which they had previously visited over prior surveying periods.

All the enumerators attended a four-day training session facilitated by Dr. Perry

The data collection and upload process were significantly improved, moving from paper recording to use of mobile surveying technology and a Qualtrics app format for survey collection. All enumerators were trained during a four-day training workshop in a standard survey process and to be proficient with the technology. The remote process minimised the risk of data transmission or editing errors, and allowed the survey supervisor to quality check data collection in real time. Data collection was carried out between June and September 2020 and was affected by changing Covid-19 regulations. All enumerators followed Kenyan national protocols for Covid-19 management. Full details of the social impact survey methodology and results are contained in a full report (Annex_12_Household_surveys) Some key results are summarized below.

Key Summary Results

- The respondents had a choice of survey language, and were encouraged to record responses in the language in which they felt most comfortable. In total, 35.3% chose to use Maa, 42.3% used Kamba, 14.7% Swahili, and a small but distinct group (7.7%) chose to use English. The average age of the primary respondent was 40.9 years old, although participants between the ages of 16 and 82 years were included in the sample.
- Mean family size was 9.5 individuals, with the average family containing 2.5 adult men, 2.4 adult women, and 4.7 children, of which 30% were under the age of 5.
- *Household education levels.* In approximately a third (31.0%) of households, the household head was the most educated person in the family, suggesting that younger generations have much higher levels of education than existing family leaders. Indeed, the most educated family member in an impressive 58.0% of households had attended either college or university. By contrast, in 40% of households the most educated individual in the family had only attended primary school (comparable with the 44% on the West, and 28% on the East from the 2016 survey). As in the previous survey, overall education levels were slightly higher on the east of the project zone. This illustrates a very binary difference in access to education, and the project should focus on access to education for this distinct, 'low education' segment of the population. Note: The bursary programme funded by the REDD+ project for eastern communities is targeting children from poorer backgrounds.
- *Livestock species.* An overwhelming majority of participants kept livestock – 96.6% – and this was uniform across both the eastern and western project areas. Generally participants in the West had higher numbers of shoats and cattle. Indeed, in the East virtually all households had between 0 and 10 cows, and 0 and 15 goats, whereas in the West, many participants had upwards of 60 cows and 75 shoats.
- *Crop losses to wildlife.* Altogether, of the participants who produced crops, 75% had experienced crop loss in the previous five years, or 70% in the East, and 83% of the crop-growers in the West. This is similar to the previous survey, which found that 75% of respondents in the West and 66% in the East had lost crops in the previous 12 months. Overwhelmingly, participants identified

elephants as the primary species responsible for crop damage, with 63.5% of families saying elephants were the worst local species for causing damage

- Compared with crop raiding, a smaller total number of participants had experienced livestock predation in the preceding five years – 62.9%. This proportion was consistent across both project regions (62% in the West, 66% in the East). This is a lower proportion than recorded in the 2016 survey, in which 80% of participants in the East, and 90% in the West reported experiencing livestock losses in the previous 12 months. Note: This decrease in conflict is very positive, and may reflect an overall improvement in the livestock management practices across the region, including those promoted by project partners.
- Virtually all respondents recognised the value of trees, and 93.9% of participants on the West, and 99.2% on the East said they believed there would be benefits to having more trees on their land. Indeed, 90.5% of eastern participants (compared with 77% in 2016) said they had previously planted trees on their land, whereas only 41.9% (an increase from 28% in 2016) of western participants had done so.
- On average, in a good year, the modal family earned 10,000-20,000KSh per month; however this was different between regions, with the 5,000-10,000KSh monthly income bracket most common in the east, and 20,000 – 50,000KSh more common in the west. In the east, just 5% of the families interviewed said they earn more than 20,000KSh per month in a good year, which is a substantial decrease on the 2016 census, when 10% of respondents earned more than this figure.
- Food hardship was severe across the region, and 92.6% of families said there were times of the year when they could not access sufficient food for the family, similar to the findings of the 2016 survey, which found that 90% of families experienced some seasonal shortage of food.
- Overall, 24.8% of participants had interacted with one of the REDD+ project member organisations over the past 12 months. Most commonly, as in the 2016 survey, these interactions concerned human-wildlife conflict events. Across the entire sample, 39.2% of participants agreed or strongly agreed that they understand the purpose of the carbon project, and how it impacts the area. This was relatively consistent between regions, with 45.2% in the East, and 30.1% of participants in the West stating that they understood the project. Although only a small proportion of participants (n = 41, 12.6%) had directly interacted with the REDD+ project (e.g. employed by, compensation for livestock predation etc.), the majority (72.4%) felt that the project currently benefitted them and their family. An even higher proportion felt that there would be benefits to themselves and their family in the future, with 96% agreeing or strongly agreeing that they expect to see increased benefits.
- Of the participants who had been involved in specific project activities, 16 had been involved in beekeeping, 19 in ecotourism-related activities, 2 in crafts and jewellery groups, and 4 in the grass bank work. We expect a substantial increase in these numbers by the time of the next assessment.
- Participants had strong preferences in the possible expansion of project benefits. The highest priority benefit was increased access to scholarships for students, or subsidised education. The preferred second activities reveal interesting insights into the high levels of general knowledge of existing project activities: preferences were distributed across various themes, which relate to small projects in certain parts of the project zone. Overall, 31.9% of participants prioritised medical clinics or a general expansion of the medical services provided in the region, closely followed by scholarships (25.4%) and seed banks (16%). These preferences also differed regionally, eastern participants preferring to expand the hippo rollers programme (29.3% first priority) and scholarships (24%) in the East, and in the West scholarships (55%) and clinics (23%) were first priority, followed by seed banks (19%) (Figure 24).

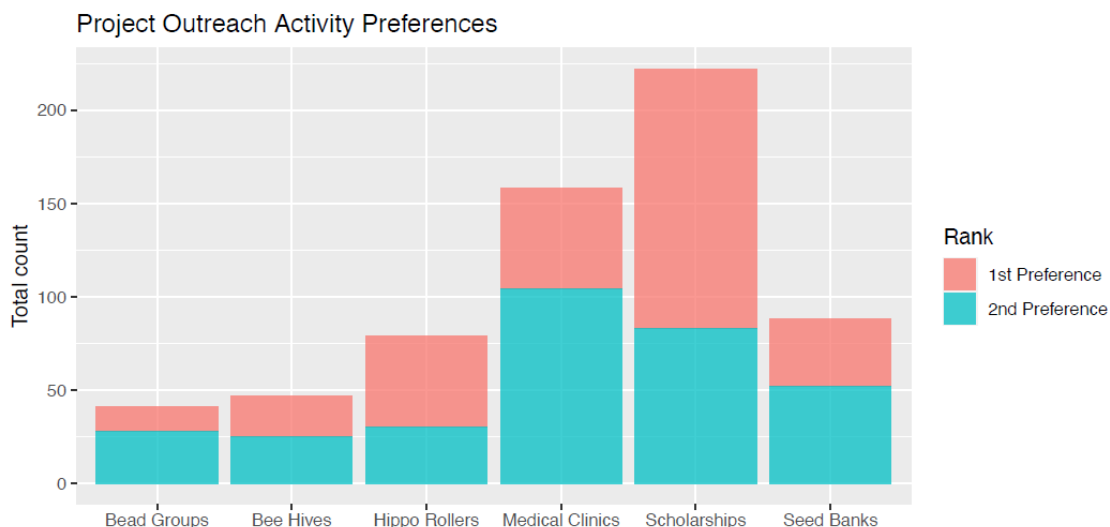


Figure 24. Project outreach activity preferences.

The social impact analysis survey has provided some interesting results both in terms of long-term monitoring of socioeconomic change within the project zone and also in terms of understanding perceptions and attitudes that can guide the future planning of benefits delivered by the REDD+ project. Examples are the strong community support for assistance with providing education, particularly for lower income and more needy families; the need to continue efforts to reduce human-wildlife conflict through interventions such as fencing, responding to crop raiding by elephants, and reducing livestock losses to predators and providing compensation. It is also clear that there is quite widespread knowledge of the REDD+ project and awareness of benefits that are starting to be delivered.

- Activities implemented

The following pictures correspond to some of the key activities implemented in the Chyulu project.

Bead jewellery and grass seed bank are important activities for the women in the western communities, since the profits generated from the sale of the items are used by them in activities of their preference. These activities are part of the Alternative Income Generating Activities (IGAs).



Figure 25. Maasai women's group that grow grass and cereals as income for their families.



Figure 26. Bead jewelry is another economic activity for the Maasai women

Beekeeping is an activity that western and eastern communities, but particularly the eastern community in the north-eastern part of the Project Area is strongly supported by community members; in this activity they have been learning about the ecology and importance of these insects through beekeeping trainings (3 sessions in the eastern community and 1 session in the western community). They have been changing old techniques of beekeeping for newer and safer approaches, received kits and equipment (68 kits in the eastern community, 680 beehives in the eastern community and 150 beehives in the western community) and have seen direct benefits, especially because the honey produced in this area is recognized as being very high quality.



Figure 27. Beekeeping community team in charge

Regarding health support for the communities, MWCT employed healthcare staff to ensure that the health program was able to fully function, supporting several dispensaries and supplied the local communities with medical equipment and essential drugs. 506 women received contraceptives for the first time; 14 community sexual reproductive health and rights forums were held; five community health worker (CHW) training seminars were held, attended by 56 CHWs. While 247 women and 186 men attended a workshop on sexual and reproductive health/rights. There are some people from the community that are engaged directly with the health activities, they initially talk with people from the local community, so the local communities feel more confident in talking about their issues. This has had a good response from the local communities, with workshop attendance having increased.



Figure 28. Health team present in the Project Area

With regards to the education program, a total of 25 schools were supported, 775 bursaries (151 for eastern and 624 for western communities) with a value of about \$120,000 were granted including approximately even numbers of boys and girls. The project also helped KWS to fund the essay competition for school children to commemorate World Wildlife Day, which helps Children to develop an interest and awareness of environmental issues.



At one school in the western community teachers were facing long commutes to reach their schools. The project has funded the building of new teacher accommodation on the school compound so that teachers can avoid these journeys and spend more time with students. Other activity implemented in a western school was the construction of a fence to protect the children and the water tanks from elephants. Finally,

several water tanks were installed in eastern schools to provide water to the children for toilets and hand washing.



Figure 29. Marlal Primary School - teacher's rooms

The livelihood program supported the Maasai community in the western part to develop an outreach program to address the issue of Female Genital Mutilation (FGM), which although illegal in Kenya still persists in some Maasai communities. The program involved three outreach meetings for women and trained 26 “influencers” to take the campaign across the community.

The activities of the CHRP have been developed through all the different Project Partners. Table 19 lists the most important REDD+ Project activities developed³⁵ by each partner and implemented with communities across the project area. The Annex I include all the results for the community indicators measured during this period. Indicators that were not measured because the collection of data and metrics has not yet been implemented or was not consistent through all the project area, and other activities were not included because they were not prioritized for the project board or have been carried out without the use of REDD+ funds. However, none of the indicators not measured represent an impact for the project or generate negative effects.

Table 19. Project activities by partner

CHRP Project Partner	REDD+ Project activities
Maasai Wilderness Conservation Trust	75 REDD+ rangers hired. Food rations and water supply for rangers. New uniforms and bedding for rangers.

³⁵2020 MWCT Impact Report.

CHRP Project Partner	REDD+ Project activities
	Expanded quarterly ranger management meetings. New ranger training. Smartphone and digital radio communications. Equipment for rangers. Women group income generating activities (bee keeping, grass seed banks, beading)
Big Life Foundation	Fire management equipment and response training. New water point, community water tanks, troughs and plumbing. Opinion leaders meeting. 15 community sensitisation meetings. Four forest scouts employed. Five water rangers employed. Utility bill payments to support community water access. New uniforms for rangers. Vehicle repairs and maintenance. Bursaries for school children.
Sheldrick Wildlife Trust	Heavy equipment, fuel and maintenance for 22km road/fire break construction. Employment of local community members for road clearing. Helicopter costs for aerial surveying and fire-fighting
Kenya Wildlife Service	Additional food rations and water supply for rangers. 53 casual workers employed. Aerial tree re-seeding. Purchase of 8,880 assorted seedlings for reforestation. Water quality analysis for wildlife water points. Borehole and solar pump installation. Local FM radio broadcasts on conservation. Community outreach programs. Outreach to county and sub-county government leaders. Expanded community outreach programs. Purchase of pumps for firefighting. Expanded travel and project transport. Plant and vehicle maintenance.
Kenya Forest Service	12 community lunches. 480 beehives to promote community honey production. Promotion of beekeeping value chain in kibwezi east. 30 leader's meetings. Refurbishment (fencing) and expansion of tree nursery. Rehabilitating of degraded wetland and riparian areas. Promotion of tree planting in schools and public institutions. Capacity building in nature-based enterprises development. Support for forest operations and patrols.

Finally, the Chyulu Hills REDD+ Project places great emphasis on women empowerment. For example, with the education program and bursaries, almost half of the beneficiaries are girls, as well as people with few resources to afford the school fees for their children as mentioned above. The CHRP has developed Project Activities to engage with women groups and help promote financial independence as well as decision-making amongst these women. The overall benefits for the women are positive, generating empowerment within the community and different economic alternatives in a society where previously there were no such opportunities.

- High Conservation Values

The HCVs for communities are related to areas that provide basic ecosystem services in critical situations, hydrological services, erosion control and areas that are fundamental to meeting the basic needs of local communities.

- Areas that provide basic ecosystem services in critical situations (e.g. watershed protection, hydrological services, erosion control)

The protection of water sources such as the springs in the project area and the cloud forest is very important to secure water availability for the communities and conserve the water catchments. Therefore, planting trees in springs like Olpusare and Mzima will reduce the erosion of the land, maintain the water quality and provide communities with water for consumption, food production and livestock. Other activity implemented to secure water availability was the installation of water tanks and water catchment systems in 6 schools in the eastern community. With these water tanks, children and teachers were benefited with water provision.

In the western community, activities developed for ecosystem improvement such as livestock husbandry, communal grazing areas, grasslands protection and planting trees were important to maintain vegetation cover and tree cover, reducing the erosion and land desertification, resulting in productive land for the community where to perform their economic activities based on livestock. During 2019 and 2020, MWCT developed the Dry Season Rangeland Survey of Kuku Group Ranch. The rangeland monitoring component was developed to be able to establish and monitor the condition of the rangeland and assess forage availability for both livestock and wildlife, so that effective integrated wildlife and livestock management planning can occur.

Another activity developed with the western community in Mbirikani Group Ranch was the installation of a new water point, troughs, plumbing, and special guards to provide security at water points. These construction improve water access and security for families and their livestock and support adaptation to climate change, by reducing the livestock trampling therefore, the affectation to the grass.

See indicators SIA22 and SIA26 in Annex I, indicators BIA15, BIA17, BIA18 and BIA19 in Annex II, and section 3.3.1 for the complete impacts of the indicators related to high conservation values.

4.3.3 Dissemination of Monitoring Plan and Results (CM3.3)

The Community Monitoring Plan was established and accepted by the Project Proponent. The Plan has been available since the previous Monitoring Period for public review at the Project Office, and at the office of each of the Project Partners. The full results of the community monitoring are included in this Project Monitoring Report, which is being made publicly available in the Project Area, with a hard copy being made available for review at the Project Office, and at the office of each of the Project Partners. Additionally, a Monitoring Report Summary has been written and distributed to communities throughout the Project Area in English and Swahili. The Monitoring Report has also been posted on the CCB website for public review and comment.

4.4 Optional Criterion: Exceptional Community Benefits

4.4.1 Barriers to Benefits (GL2.3)

Potential barriers or risks that prevent benefits from reaching the poorer households include inequality, fewer chances of formal employment and no representation in decision-making processes. The CHRP is taking measures to ensure that these barriers and risks are mitigated and that these benefits will reach poorer households. The benefit-sharing mechanism has been designed in a transparent and inclusive way, with all finances being dispersed through the Project Partners: this prevents potential corruption in the communities. Furthermore, the Project operates under a strict non-discrimination policy and offers the same chances for employment to all applicants. Finally, the advisory committees include representatives from all social groups, who represent the needs of their respective social class. The CHRP will ensure that poorer households have a voice in decision-making regarding the allocation of benefit sharing. The school bursary programs with the eastern communities are specifically targeted towards the most needy households.

4.4.2 Protections for Poorer and More Vulnerable Households and Individuals (GL2.4)

Potential negative impact	Marginalized women across the Project Zone.
Households or individuals affected	Women.
Impact aversion and mitigation	The REDD+ project and partners adopted equal opportunity for women and men. The CHRP places great emphasis on the empowerment of women. This group has been involved in the Project design through their involvement in various advisory committees. It is also hoped to encourage girls' enrollment in schools through the allocation of an equal number of school bursaries to boys and girls. Finally, the CHRP has developed Project activities which will allow easy engagement with women groups and help promote financial independence, as well as decision-making amongst these women. The project has ensured women have been hired for projects such as the Social Impact Assessment and the tree plot sampling.

Potential negative impact	Inequality of wealth across the households in the Project Zone.
Households or individuals affected	Poor households.
Impact aversion and mitigation	Project activities of the CHRP include new income generating activities and craft groups, healthcare and school fee bursaries. The Project will increase community organization to ensure that these groups have a strong voice and an established communication channel to the project management.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B1.1)

The Chyulu Hills REDD+ Project applied a theory of change approach which enables the production of indicators for the biodiversity Monitoring Plan with specific targets of ecosystem enhancement and biodiversity improvement. The Project established two key issues (ecosystem degradation and biodiversity declines) for the biodiversity component to achieve the reduction of deforestation, forest degradation and avoid conversion of grasslands. Actions promoted by the Project generated positive impacts on biodiversity.

Biodiversity element	Ecosystem enhancement
Estimated change	Positive
Justification of change	The Project Area forms a critical component part of one of the largest remaining conservation landscapes in Kenya. The area includes a rich mosaic of ecotypes including springs, wetlands, grassland, savannah woodland, lavaforest and upland cloud forest. Tsavo West NP and the Rhino Area in the Chyulu Hills NP have also been identified as being amongst Kenya's 80 Key Biodiversity Areas (KBAs)(UNEP-WCMC). These Key Biodiversity Areas are areas of high priority for conservation. They are identified using standard global criteria and thresholds, based on the the protection safeguards of biodiversity safeguards at the site scale. These criteria take into account vulnerability and irreplaceability of species (Langhammer <i>et al.</i>, 2007). Important Bird Areas (IBA) are an extension of Key Biodiversity Areas. Parts of the Chyulu Hills have been identified as an IBA (026) for Kenya, as has Tsavo West National Park (027) (Bird Life International). The efficacy of the protection status of both of the aforementioned areas is under question, as both locations have seen moderate to severe pressure from encroachment, poaching and illegal charcoaling / wood extraction. One of the main contributions of the Project is the integration and collaboration of different partners across the Project Area. Although project partners adopt a range of conservation strategies, the REDD+ project has encouraged a level of communication, information-sharing, and collaborative action that was not previously present. Kenya Forest Service (KFS) and Sheldrick Wildlife Trust (SWT) manage the Kibwezi Forest Reserve, which is a woodland area under restoration and conservation. With the installation of electric fences, an increase in anti-poaching patrols and an active natural resource management, the area has been rehabilitated, improving the regeneration of vegetation in the woodlands, wetlands and riparian areas, increasing the water quantity and quality in the local springs, and reducing logging and wildlife conflicts with the local communities. In addition, SWT has also constructed 22 km of firebreak road in Chyulu Hills National Park and is performing ongoing maintenance. DST also provides extensive aerial patrols and helicopter fire-fighting capability which was deployed in 2020.. Kenya Wildlife Service (KWS) is responsible for all the wildlife in Kenya. For the REDD+ Project, they manage the Chyulu Hills National Park and the Southern Chyulu Extension. These areas are crucial for water catchment as they supply water to several springs around the park and the outflow from Mzima Springs supplying about 30% of Mombasa's water. With assistance from the REDD+ project, KWS has received funding to support the addition of a ranger post and new vehicle and overall protection of the area against illegal logging, poaching and charcoal production has been enhanced. Another important activity is the restoration of the areas surrounding Mzima springs. The activities were focused on the restoration of the degraded areas surrounding the water bodies, and fencing the springs to avoid

	further land degradation, securing the water resource for people and wildlife. There are four group ranches in the Project Area. Big Life Foundation (BLF) supports the conservation of the Mbirikani group ranch area, with a strong presence of rangers and security capacity to prevent and control poaching and illegal activities and a specific focus on protection of the small black rhino population. A total of 174 rangers patrol the Mbirikani area, with 178,000 km of foot patrols and 79,000 km of aerial patrols recorded. This effort discourages poaching and tree cutting, provides linkage to the community and intelligence and law enforcement. Other activity includes the promotion of better livestock management through the construction of water points to improve access to water and reduce grazing pressure around water points. Previously, communities had to walk long distances with their herds to get water, which was located in one single point, causing soil compaction and degradation due to the trampling of livestock. Now, with three water points, the herds are better distributed and there is less concentration animals in a single area. The Maasai Wilderness Conservation Trust (MWCT) leads the conservation programme on Kuku, Kuku A and Rombo group ranches. MWCT operates programmes developing a tree nursery and grass seed banks, and for the restoration of grasslands. For direct protection, security and law enforcement, MWCT has increased the number of rangers patrolling the area between 2017 to 2020. MWCT has also increased the use of the SMART system for data capture and management of ranger deployment and installed new digital communications that allows the monitoring of patrols in real time. MWCT has also substantially restored the Ol Pusare Spring and also runs programmes of lion research and monitoring and predator loss compensation to reduce human-wildlife conflict All of these activities and actions are focused on the sustainable use of land and natural resources, ecosystem conservation, regeneration of forest, protection of wildlife and the prevention of land degradation, while also enhancing and maintaining the high conservation values of the Project Area and its important function as a corridor for wildlife in the Tsavo – Amboseli – Kilimanjaro ecosystem..
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Biodiversity element	Biodiversity Improvement
Estimated change	Positive
Justification of change	The Project Area is of great importance in relation to biodiversity due to the significant concentrations of habitats and diverse landscapes that support several species, including five near threatened (Leopard <i>Panthera pardus</i>, Gerenuk <i>Litocranius walleri</i>, Lesser kudu <i>Tragelaphus imberbis</i>, Thompson's gazelle <i>Eudorcas thomsonii</i> and the Rock python <i>Python molurus</i>), six vulnerable (African Elephant <i>Loxodonta Africana</i>, Cheetah <i>Acinonyx jubatus</i>, Lion <i>Panthera leo</i>, Abbott's Starling <i>Cinnyricinclus femoralis</i>, Martial Eagle <i>Polemaetus bellicosus</i>, African Stinkwood <i>Prunus Africana</i>), three endangered (Wild dogs <i>Lycaon pictus</i>, Basra reed warbler <i>Acrocephalus griseldis</i>, White-backed vulture <i>Gyps africanus</i>) and one critically endangered (Black rhinos <i>Diceros bicornis</i>). The Chyulus is one of the relatively few

	areas where it is possible to find the iconic “big five” African mammals (African elephant, black rhinoceros, African buffalo, Leopard and Lion). More than 30 mammal species are present in the area and the Chyulu Hills National Park host one of the two remnant natural populations of black rhinos. The maintenance of populations of keystone species, including top predators is an indicator of success in terms of biodiversity maintenance and improvement. The REDDD+ project and its partners are playing a key role in maintaining these populations, many of which are declining elsewhere. The activities of project patners that support the conservation of both the plant and animal communities are described in detail elsewhere. These activities include direct protection through deployment of rangers and aerial reconnaissance, reduction of human-wildlife conflict, research and monitoring, and habitat restoration. Details of biodiversity monitoring and species status is described in more detail in Section 5.3.
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5.1.2 High Conservation Value Protection (B1.2)

The Project Area supports a range of high conservation value features that include rare, vulnerable and threatened iconic African species, important tropical upland cloud forest, wetlands, and important ecosystem services such as water catchment and erosion control.

The area is highly significant for the protection of black rhinos (Figure 30, Figure 31) and forms part of a conservation landscape that supports Kenya's largest population of elephants (Figure 32). Kenya has Africa's third largest population of black rhinos, about 850, and the Tsavo Conservation Area is one of the most important strongholds for this species. The geographical location of the Project Area means that it functions as a vital corridor between the Tsavo and Amboseli ecosystems. These ecological and geographical characteristics make the Chyulu ecosystem and area of exceptional conservation value.



Figure 30: Camera trap registry of black rhino (*Diceros bicornis*). Source: Big Life Foundation.



Figure 31: Registry of black rhino (*Diceror bicornis*) in the Project area. Source: Big Life Foundation.



Figure 32: Registry of an elephant (*Loxodonta africana*) in the Project area.

5.1.3 Invasive Species (B1.3)

No non-native species will be used in the Project Accounting Areas. Project activities that include any planting or reforestation within the Project Area are implemented with indigenous tree species from the area.

5.1.4 Impacts of Non-native Species (B1.4)

No non-native species were used in the Project activities.

5.1.5 GMO Exclusion (B1.5)

No GMOs were used in the Project activities to generate GHG reductions or removals.

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impact Mitigation (B2.2)

There are unlikely to be any negative biodiversity impact from the project outside the Project Zone. Along the eastern boundary of the project, some areas have already undergone conversion to small scale agriculture and there are the towns associated with the main Nairobi – Mombasa highway. In these areas wildlife and natural forests and grasslands have largely been extirpated. Other parts of the project boundary areas outside the eastern the boundary are included in Tsavo West or Tsavo Easy National parks. The project benefits the wildlife in these areas, particularly wide-ranging species such as elephants, rather than having a negative impact. Outside the western boundaries of the project there is a mosaic of private land, group ranches and protected areas. Again, the project has no adverse impact on the biodiversity of these areas but rather acts to enhance it.

5.2.2 Net Offsite Biodiversity Benefits (B2.3)

By analyzing the information collected over the Monitoring Period, it was possible to demonstrate that the implementation of Project activities has generated positive net impacts on biodiversity and ecosystems within the Project Zone and outside the Project Area. The protection of endangered species and their habitats favors the long-term viability of their populations, while the connectivity among ecosystems allows the movement and migration of wildlife, which contributes to the conservation of these species and provides the foundation for ecotourism which provides income.

The ranger's patrols and monitoring program generates benefits for wildlife by reducing poaching in the Project Area itself and surrounding areas. The Project area's function as a critical wildlife corridor linking Tsavo and the Amboseli ecosystem is important for maintaining metapopulations of key species across a large-scale inter-connected conservation landscape. The protection of wildlife within the Project Area also provides the opportunity for species occupy or bolster populations in the surrounding areas, including the national parks. For instance, lions from Kuku have been recorded as setting up territories within Tsavo West national park.

The human-wildlife conflict mitigation programs run by project partners and the other conservation programs are helping to support wildlife populations and biodiversity both with and outside the Project Area.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan Development (B3.3)

Not applicable.

5.3.2 Biodiversity Monitoring Results (B3.1, B3.2)

5.3.2.1 Institutional arrangements

Biodiversity monitoring in the Project Area is based on the Chyulu Hills Community and Biodiversity Monitoring Plan (as described in section 5.1.6 of the PDD). Reporting on the indicators illustrates the enhancement of the biodiversity of HCVs and utilizes the monitoring and assessment outcomes outlined in the PDD. The assumption is that by protecting the Project Area from ecosystem conversion, and the wildlife from poaching activities and rangeland degradation, these biodiversity HCVs can be maintained. Five out of the nine institutions are engaged in biodiversity monitoring in the Project Area, as depicted in Table 20.

Table 20.. Institutional Jurisdiction and Type of Data Collected.

Institution	Role in biodiversity data collection in Project Area	Data type and availability
Kenya Wildlife Service (KWS)	Has the overall mandate of managing all wildlife in Kenya. KWS is the custodian of all wildlife data nationally.	Wildlife censuses, endangered species management and research, Human Wildlife Conflict (HWC), Illegal encroachment, anti-poaching, fire monitoring and response.
Sheldrick Wildlife Trust (SWT)	Manages the Kibwezi Forest Reserve together with KFS and collects Aerial survey data in Chyulu Hills and National Tsavo National Parks.	Security surveillance, wildlife monitoring and veterinary services, wildlife population monitoring, fire monitoring.
Big Life Foundation (BLF)	Manages the Mbirikani group ranch and collects biodiversity and ecological data in the ranch and the greater Chyulu and Amboseli area.	Wildlife monitoring, HWC monitoring and response, snare-removal, anti-poaching, habitat restoration.
Maasai Wilderness Conservation Trust (MWCT)	Project coordination entity and repository for Project Area data. Manages conservation programs on Kuku, Kuku A and Rombo group ranches.	Wildlife, livestock surveys and monitoring, endangered species management, HWC monitoring, and response, lion research, anti-poaching, fire monitoring.
Kenya Forest Service (KFS)	Has the legal mandate to manage the Kibwezi Forest Reserve.	Monitoring and protection against Illegal logging of

		forest resources and encroachment.
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The monitoring and data collection are conducted through regularly scheduled surveys and censuses, as well as continuous data collection by rangers and field staff and species specific research. Research uses both manual and digital systems through sightings of over 20 animal species. The digital systems in use by the partners in the Project Area are the Earth Ranger, SMART and camera trap systems. Data collected is analyzed and used to determine various aspects of wildlife species distribution and abundance such as seasonal movement, foraging patterns and behavioral ecology. Monitoring is also a significant measure for mitigating human-wildlife conflict in the local community areas.

Annex II contains the complete list of biodiversity monitoring results for each of the indicators monitored. Some indicators were not measured because the collection of data and metrics has not yet been implemented or was not consistent through all the project area, and other activities were not included because they were not prioritized for the project board or have been carried out without the use of REDD+ funds. However, none of the indicators not measured represent an impact for the project or generate negative effects.

Project Partners jointly provide a significant investment of resources in the direct protection of natural resources and monitoring wildlife. The Project Area, being part of the greater Tsavo-Mkomazi landscape, is surveyed triennially by KWS and the other partners. However, there is an over-reliance on aerial census data despite it not being an appropriate method for the survey of carnivores and smaller mammals. MWCT conducts two regular aerial censuses each year of Kuku, Kuku A and Rombo (one wet season and one dry season). SWT carry out daily aerial patrols across the Project Area but with a focus on the Chyulu Hills National Park and Tsavo West. . BLF also carry out daily aerial surveys, focused on Imbirikani and northern areas of the Chyulu Hills National Park. Additionally, both BLF and MWCT record daily sightings by their ranger forces and occasional surveys within the Project Area as part of their ongoing field operations. Most of the data and information is stored in SMART system repositories that allow analysis of time series and trend data in the longer term. For instance, data on patrol coverage can easily be computed as the equipment used has GIS tracking software. Table 21 summarizes the patrol and census effort in terms of flying hours and ranger numbers and patrol distances covered. MWCT and Big Life have made significant investments in digital communications systems that provide real time and historical data on patrol locations, which allows adaptive deployment of ranger forces.

Table 21. Wildlife monitoring and protection effort for the years 2017-2020

Number of Rangers				
	2017	2018	2019	2020
BLF	125	137	144	174
SWT	12	12	12	21
MWCT	123	135	135	179
KWS	248	243	226	220
KFS	4	5	4	4
Total	512	532	521	598
Ranger Foot Patrol Km				
	2017	2018	2019	2020
BLF	36,002	45,078	46,899	50,407
SWT				
MWCT	65737	56742	61911	56030
KWS				
KFS				
Total	101,739	101,820	108,810	106,437
Aerial Patrol Hours				
	2017	2018	2019	2020
BLF	157	198	143	131
SWT				
MWCT	14	14	7	7
KWS		339.6	609.6	521.8
KFS				
Total	171	551.6	759.6	659.8
Aerial Patrol Km				
	2017	2018	2019	2020
BLF	19,789	24,116	17,770	17,483
SWT				
MWCT	2244	2244	1122	1122
KWS		63,868.00	117,979.00	98,060.00
KFS				
Total	22,033	90,228	136,871	116,665

* Aerial patrols are primarily from Aerial counts that are conducted twice a year (wet and dry season) except for 2019 and 2020. A single aerial count transects is about 1,122 km long with cumulative total flight time of about 56 hours begin done for the years above.

5.3.2.2 Wildlife Biodiversity Analysis Results: Enhanced Status of Wildlife with High Conservation Value (HCV) and their trends

- Mammal Diversity

The Project Area is home to a spectacular array of wildlife as well as a small population of black rhinos that live in the rhino sanctuary in the northern part of the Project Area. The Project landscape supports the iconic “big five” African mammals, that is: the African elephant (*Loxodonta africana*), black rhinoceros (*Diceros bicornis*), African buffalo (*Syncerus caffer*), leopard (*Panthera pardus*) and lion (*Panthera leo*). In addition to these charismatic megafauna, there is a diverse mammal community that includes carnivores such as jackal (*Canis spp.*), wild dog (*Lycaon pictus*), cheetah (*Acinonyx jubatus*), spotted and striped hyena (*Crocuta crocuta* and *Hyaena hyaena*); herbivorous ungulates, including Thompson’s gazelle (*Eudorcas thomsonii*), Grant’s gazelle (*Nanger granti*), eland (*Taurotragus oryx*), bushbuck (*Tragelaphus scriptus*), mountain reedbuck (*Redunca fulvorufula*), steinbok (*Rhapicercus campestris*), Coke’s hartebeest (*Alcelaphus buselaphus cokii*), fringe-eared oryx (*Oryx beisa callotis*), gerenuk (*Litocranius walleri*), impala (*Aepyceros melampus*), lesser kudu (*Tragelaphus imberbis*), wildebeest (*Connochaetes taurinus*), Kirk’s DikDik (*Madoqua kirkii*), Burchell’s zebra (*Equus burchelli*), warthogs (*Phacochoerus africanus*), bushpigs (*Potamochoerus porcus*), and Maasai giraffes (*Giraffa camelopardalis tippelskirchi*).

- Birds Diversity

The Chyulu Hills is classified by BirdLife International as an Important Bird and Biodiversity Areas (IBA), having over 450 bird species. Rarer and threatened species include the IUCN Red listed Abbott’s starling (*Cinnyricinclus femoralis*), that lives on a few montane forest patches in Kenya and Tanzania and is classified as vulnerable (VU).

Based on the 2019 IBA monitoring assessment, Chyulu Hill National Park had a high threat score for bird species. Some of the threats that were identified included, climate change induced drought, human intrusions and disturbances, invasive species, natural systems modification especially fire and infrastructure development.

- Amphibians, Reptiles, Insect’s Diversity

The area is home to a diverse assemblage of amphibians, reptilian and insect species. Some insect species such as the highly endemic butterfly species including, *Pentila tropicalis chyulu*, *Acraea anacreon chyulu*, *Papilio desmondi desmondi* and the near-endemic *Amauris echeria chyuluensis*.

Two endemic amphibian taxa that are of HCV are the *Afraxalus pygmaeus septentrionalis* and *Hyperolius sheldricki*. Some reptiles that are also significant include, snakes such as black mamba (*Dendroaspis polylepis*), puff adder (*Bitis peringueyi*), rock python (*Python molurus*), as well as a variety of species of gecko and lizard.

- Plant Diversity

The inventory of plant diversity was part of the analysis of the plots for the second verification of the Project (Figure 33). The inventory was undertaken in the Chyulu Hills Landscape in six major land units: Mbirikani Group Ranch, Kuku Group Ranch, Kuku A Group Ranch, Rombo Group Ranch, Chyulu Hills National Park and Kibwezi Forest Reserve (part of the Southern Chyulu extension). A total of 415 permanent biomass plots of 0.1 ha each were then distributed on seven defined land cover classes: grassland, acacia-savannah mosaic, lava forest, lava forest sparse/low, cloud forest, woodland/thicket and woodland-sparse/low.

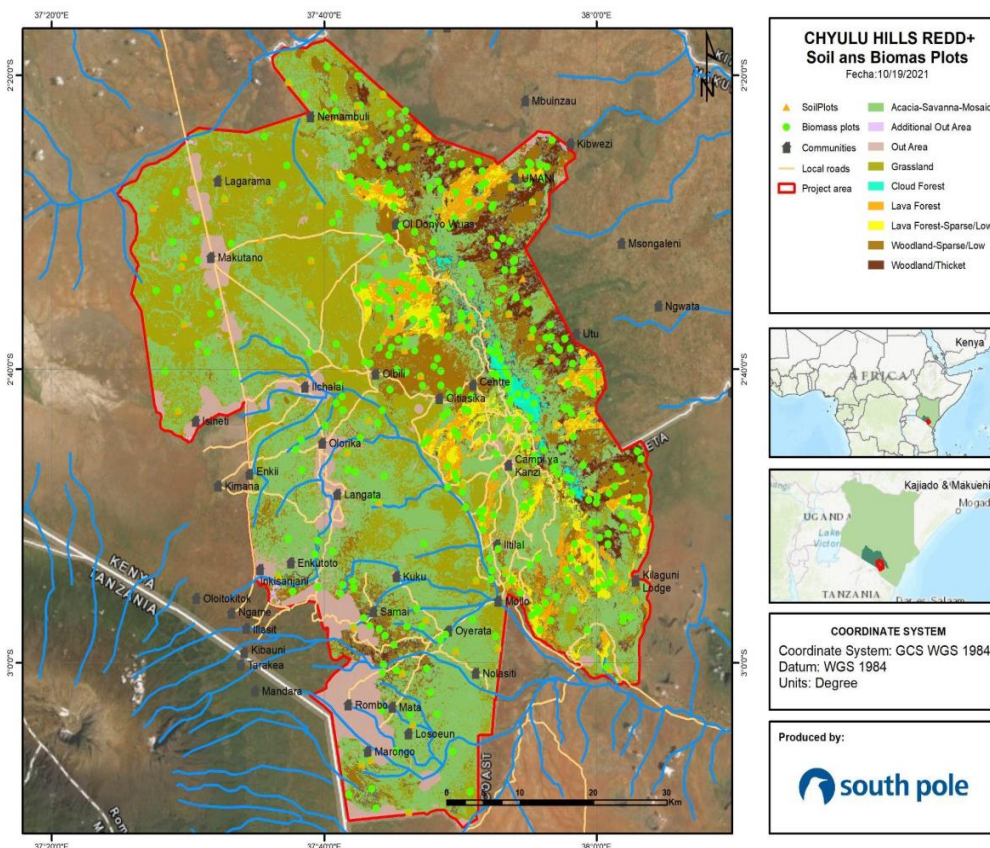


Figure 33: Biomass plots distributed in the Project Area.

- Methods

A standard tree plot sampling protocol was used for measuring and identifying all of the trees in each plot (Annex_climate_Chylulu Hills REDD+ botanical report), a five day training workshop for botanists and samplers was carried out before the field sampling began. The sampling was made by teams composed of a botanist and four or five biodiversity samplers. All of the plots were marked with GPS, and a center point was defined. Then, plants were numbered clockwise from 0. All of the data was recorded in special data sheets by the field botanist (Figure 34). Specimens whose identification was in doubt, and/or could not be determined in the field were collected for further identification and confirmation.



Figure 34: Plot sampling procedure. A. Biodiversity sampler finding plot center point. B. setting the angle to start the sampling (clockwise). C. circumference measurement and D. a field botanist (left) recording species names and associated data, and (right) a biodiversity sampler entering data in the ODK.

Finally, subset data was selected from each of the eight project areas to assess the variation in frequency, floristic composition and species diversity across the Project Area. The 40 plots selected considered the different vegetation types, structure, habitats and micro-climates.

- Results

The detailed botanical survey work has produced an important current reference survey for the tree species of the Chyulus. From the 40 analyzed plots, a total of 1,369 plant individuals were sampled. The Chyulu Hills National Park was the highest location in terms of plant occurrence with 332 individuals, followed by Kibwezi Forest Reserve with 317 individuals. Kuku A and Rombo had the fewest plant occurrences, with 112 and 110 individuals respectively (Figure 35).

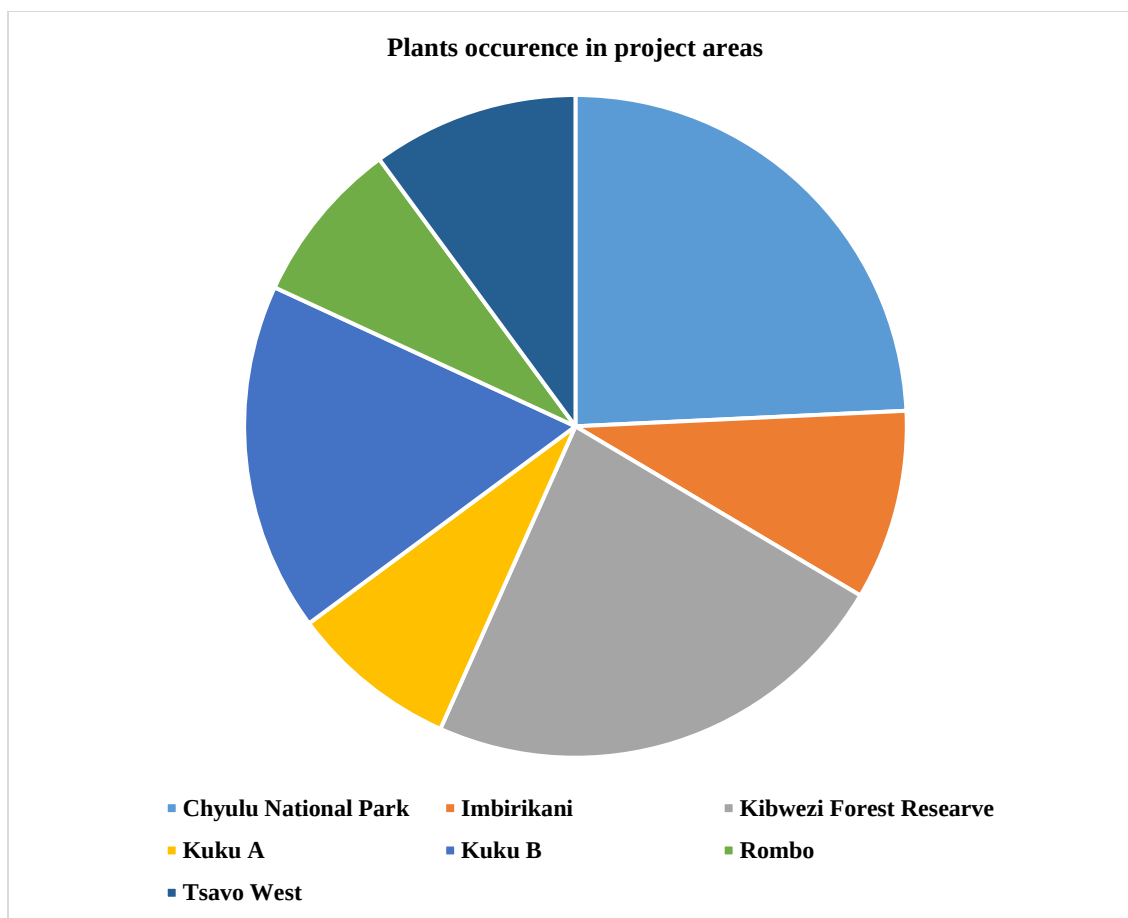


Figure 35: Individuals sampled in different areas within Chyulu Hills Ecosystems.

- Plant families and species occurrence frequency

The most common taxonomic family, was Fabaceae, accounting for 18.2%, followed by Burseraceae, Ebenaceae, Sapindaceae and Celastraceae with 11.3%, 7.8%, 6.9% and 5.9% respectively. For genera, *Commiphora* was the most frequent, followed by *Acacia*, *Diospyros*, *Vepris*, *Combretum*, *Trichocladus*, *Olea* and *Dombeya* with 10.4%, 7.4%, 5.4%, 5.3%, 5%, 4.4% and 3.5% respectively (Figure 36).

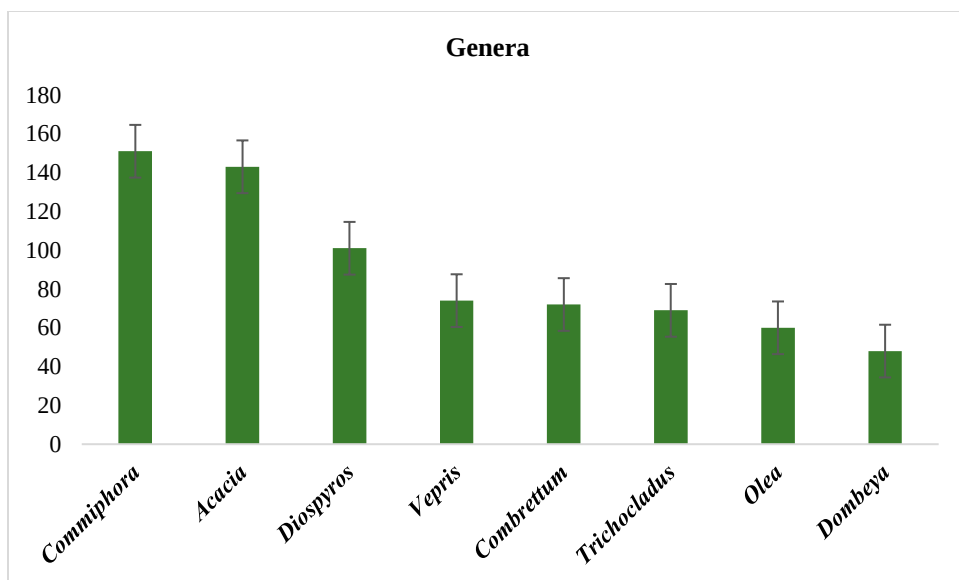


Figure 36: Top eight genera from the 40 plots.

A total of 118 tree species were identified, with *Diospyros consolatae* being the most frequent with 7.4%, followed by *Combretum schumanii* 5.3%, *Acacia mellifera* 5%, *Trichocladus ellipticus* 5%, *Vepris simplicifolia* 4.2%, *commiphora eminii* 3.9%, *Dombeya kirkii* 3.4%, *Haplocoelum foliolosum* 3.4%, *Pappea capensis* 3.3%, and *Craibia brevicaudata* 3.2% (Figure 37).

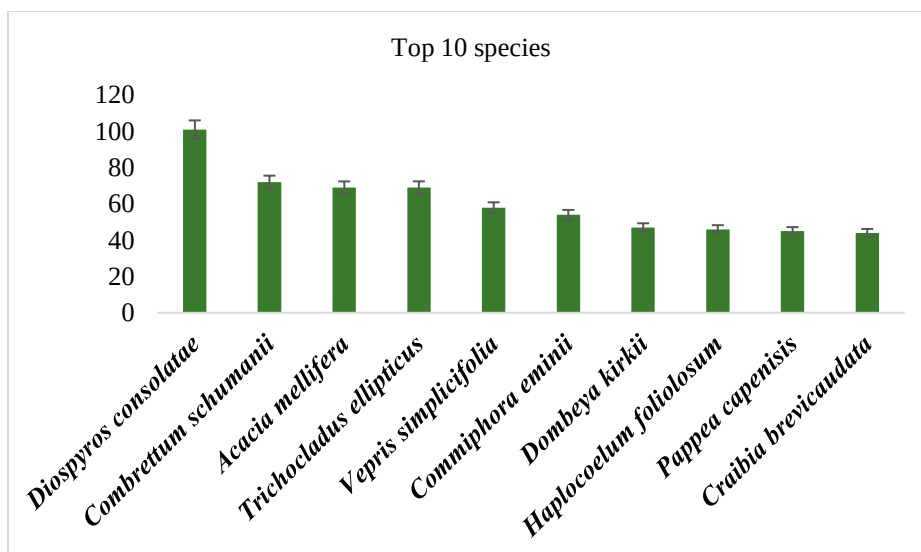


Figure 37: Most occurring species in Chyulu Hills Ecosystem.

- Species Diversity

The overall Simpson's Diversity Index was determined as 0.97227. Species diversity indices per specific area are presented in Table 22.

Table:

Table 22. Simpson's Indices of Diversity across Chyulu Hills REDD+ Project.

Area/habitat	Chyulu National Park	Imbirikani	Kibwezi Forest Reserve	Kuku A	Kuku	Rombo	Tsavo West
Species Diversity Index	0.9173	0.8627	0.8977	0.9319	0.9355	0.8739	0.9391

The value of Simpson's Index of Diversity ranges between 0 and 1, thus, the greater the value, the greater the sample diversity. In this case, the index highlights the probability that two individuals randomly selected from a sample will belong to different species (Leinster & Cobbold, 2012). All of the CHRP areas had a high level of species diversity.

- Floristic Composition

Cloud/Mist Forest

The most diverse families in terms of genera in this habitat were: Celastraceae, Euphorbiaceae, Rubiaceae and Apocynaceae with 12.6%, 7.3%, 5% and 2.9% respectively (Figure 38). The dominant species in this habitat was the *Trichocladus ellipticus* (20.2%), followed by the *Vepris simplicifolia* (10.2%), *Eleaodendron schweinfurthianum* (8.8%), *Nuxia congesta* (7.6%), *Casuarina cunninghamiana* (5.8%), *Margaritaria discoidea* (5%), *Pistacia aethiopica* (4.4%), *Apodytes dimidiata* (3.8%), *Ficus lutea* (2.6%), *Maytenus heterophylla* (2.3%), *Olea capense* (2.3%) and *Vangueria apiculata* (2.3%).

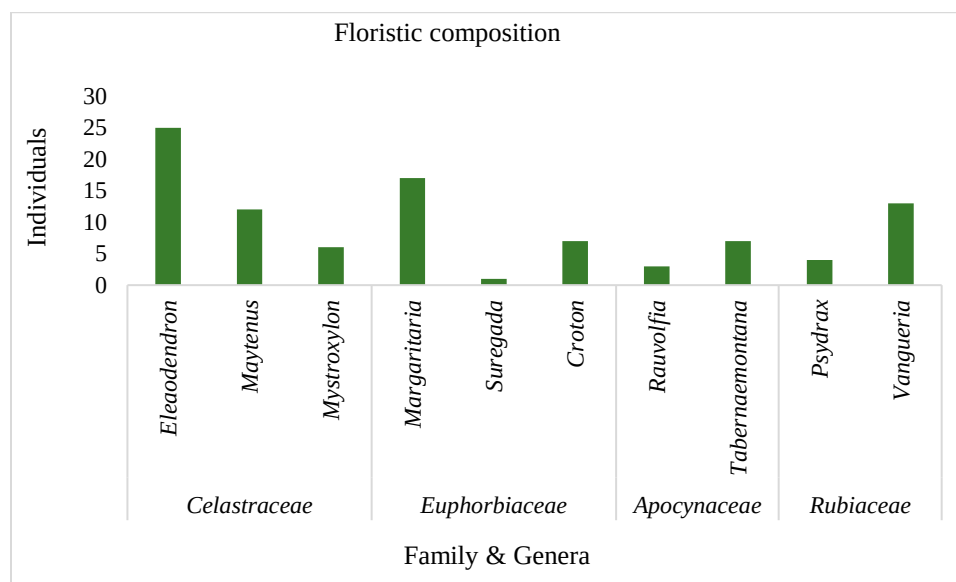


Figure 38: Floristic composition of cloud/mist forest

Chyulu National Park

The most diverse families in terms of genera were the Sapindaceae (6.8%), Ebenaceae (6.8%), Celastraceae (2.7%), Anacardiaceae (2%) and Euphorbiaceae (2%) (Figure 39).

The top 10 dominant species were the *Commiphora eminii* ssp. *zimmermannii* (26.1%), *Dombeya kirkii* (10.5%), *Commiphora baluensis* (7.2%), *Pappea capensis* (4.6%), *Olea europaea* ssp. *cuspidata* (4.6%), *Craibia brevicaudata* (4.6%), *Euclea racemosa* ssp. *schimperi* (3.3%), *Diospyros consolatae* (3.3%), *Pittosporum viridiflorum* var. *viridiflorum* (3.3%) and *Trema orientalis* (3.3%), of the total species sampled.

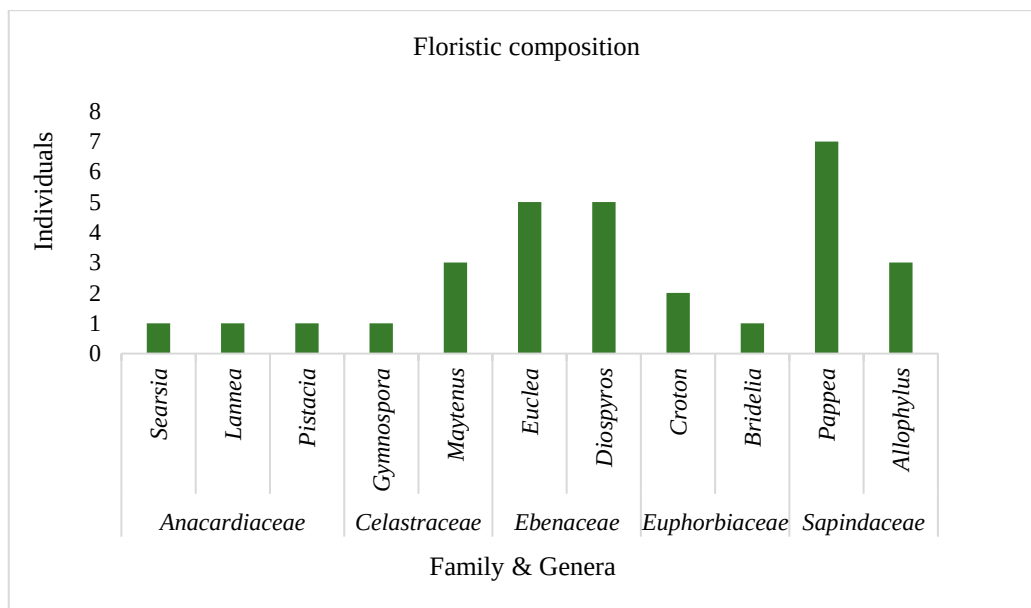


Figure 39: Floristic composition of CHNP

Mbirikani Group Ranch

The most diverse families in terms of genera in this group ranch were the Ebenaceae, Sapindaceae and Celastraceae with 23.2%, 5.8%, and 5.1% respectively (Figure 40).

The frequent species were the *Diospyros consolatae* (25.2%), *Olea europaea* ssp. *africana* (20.1%), *Acacia tortilis* (12.2%), *Acokanthera schimperi* (9.4%), *Pistacia aethiopica* (5.8%), *Elaeodendron schweinfurthii* (4.3%), *Pappea capensis* (4.3%), *Commiphora eminii* (3.6%), *Dombeya kirkii* (3.6%) and *Commiphora baluensis* (2.9%).

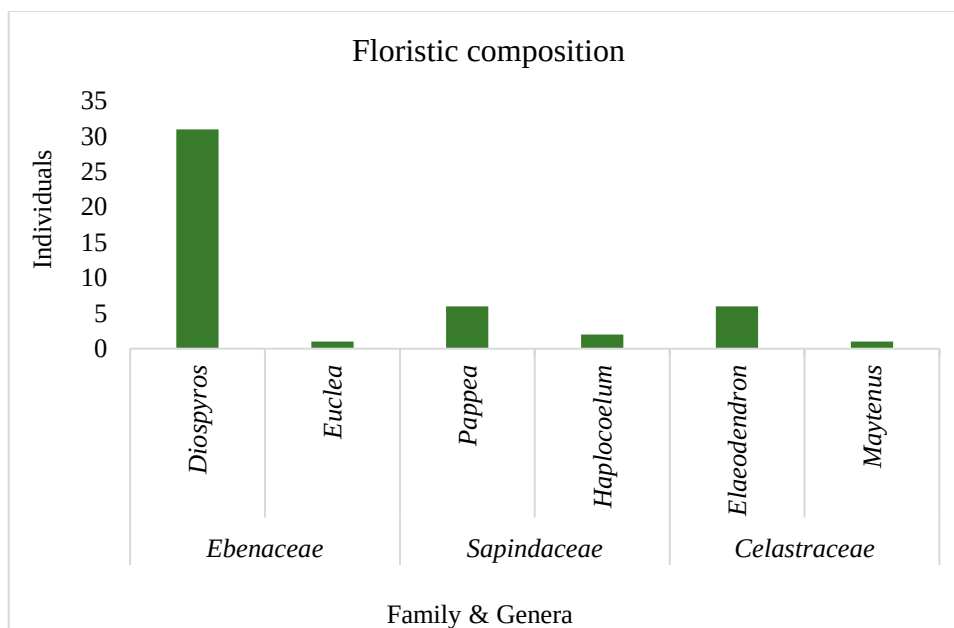


Figure 40: Floristic composition of Mbirikani Group Ranch

Kibwezi Forest Reserve

The most diverse families in terms of genera were the Sapindaceae (16.5%), Ebenaceae (10.1%), Euphorbiaceae (4.6%) and Anacardiaceae (1.2%) (Figure 41).

The dominant species were the *Combretum schumanii* (21.2%), *Craibia brevicaudata* (11.6%), *Haplocoelum Foliolosum* (10.4%), *Diospyros consolatae* (9.8%), *Dombeya Kirkii* (8%), *Vepris Simplicifolia* (7%), *Pappea capensis* (6.4%), *Maytenus undata* (2.8%), *Ochna ovata* (2.1%), *Mystroxydon aethiopicum* (1.8%) and *Bridelia taitensis* (1.8%).

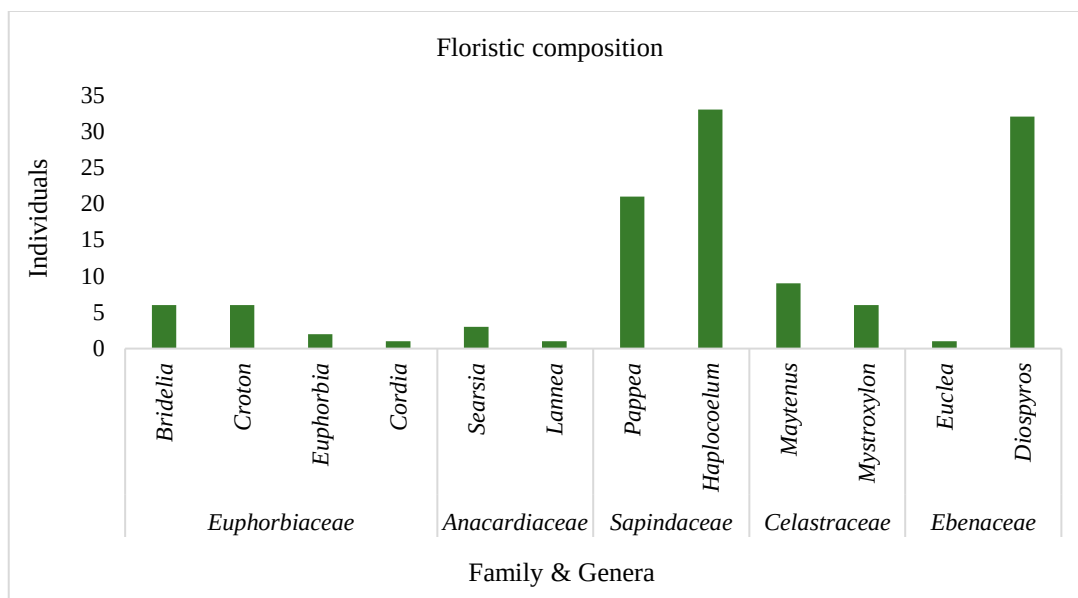


Figure 41: Floristic composition of Kibwezi Forest Reserve

Kuku Group Ranch

The most diverse families in terms of genera were Fabaceae (57.4%), Ebenaceae (13.2%) and Sapindaceae (2.3%) (Figure 42).

The dominant species encountered were the *Acacia mellifera* (20.2%), *Diospyros consolatae* (12.4%), *Ormocarpum kirkii* (9.3%), *Albizia grandibracteata* (8.5%), *Commiphora emini*. (7%), *Olea europaea* (5.4%), *Acacia nilotica* (5.4%), *Commiphora africana* (2.3%) and *Maytenus undata* (2.3%).

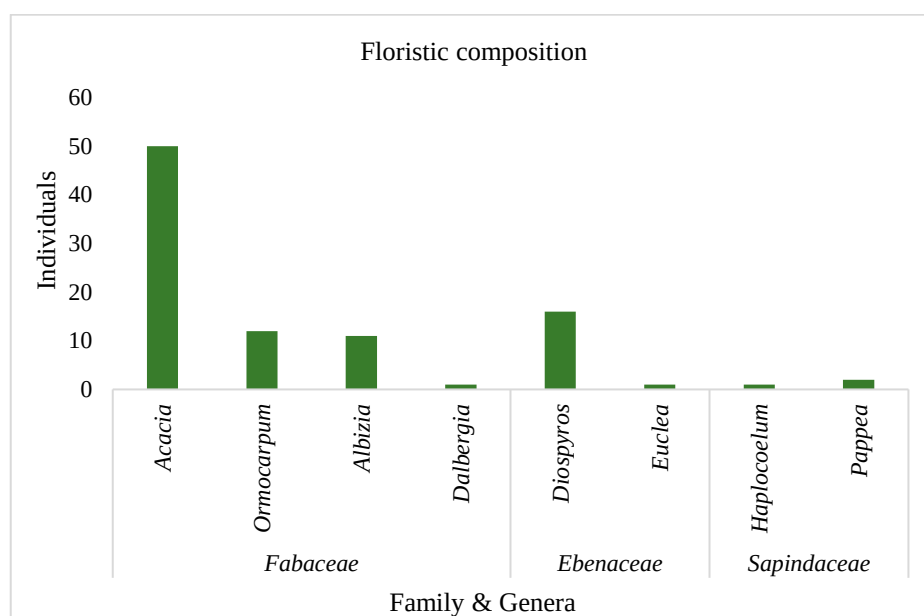


Figure 42: Floristic composition of Kuku Group Ranch

Rombo

The most diverse families in terms of genera were the Fabaceae, Malvaceae and Anacardiaceae yielding 54.6%, 3.8% and 3.1% respectively (Figure 43).

The dominant species were the *Dalbergia melanoxylon* (22.3%), *Acacia mellifera* (14.6%), *Commiphora kua* (13.1%), *Acacia senegal* (6.2%), *Commiphora confusa* (6.2%), *Balanites aegyptiaca* (5.4%), *Acacia nilotica* (4.6%), *Acacia tortilis* (4.6%), *Commiphora africana* (3.8%) and *Lannea schweinfurthii* (3.1%).

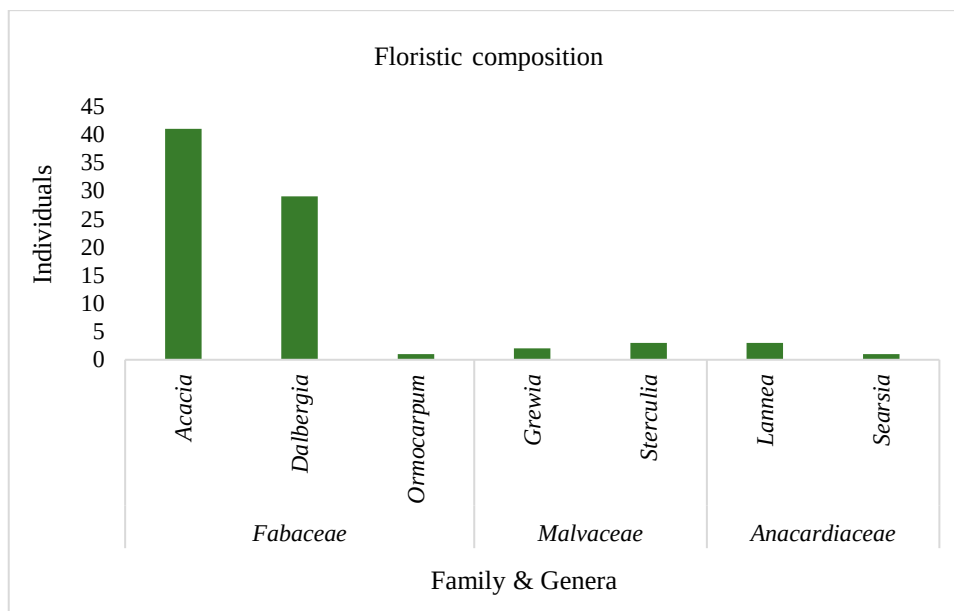


Figure 43: Floristic composition of Rombo group Ranch

Kuku A Group Ranch

The most diverse families in terms of genera were the Sapindaceae (6.6%), Rutaceae (4.1%), Capparaceae (3.3%), Rubiaceae (2.5%) (Figure 44).

The commonest species in this group ranch were the *Acacia mellifera* (16.5%), *Commiphora schimperi* (10.7%), *Acacia senegal* (8.3%), *Acacia drepanolobium* (7.4%), *Acacia tortilis* (5.8%), *Haplocoelum foliolosum* (5.8%), *Melia volkensii* (5.8%), *Commiphora baluensis* (4.1%) and *Acacia nilotica* (4.1%).

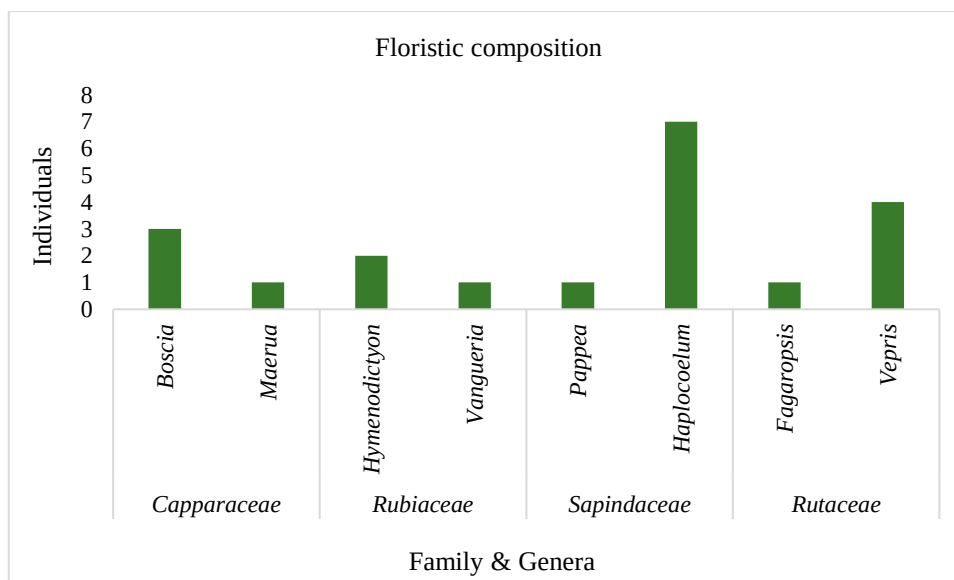


Figure 44: Floristic composition of Kuku A Group Ranch

Tsavo-West National Park

The most diverse families in terms of genera were the Euphorbiaceae (11.1%), Rubiaceae (4.9%), Sapindaceae (4.9%) and Anacardiaceae (2.5%) (Figure 45).

The frequent species sampled were the *Commiphora schimperi* (11.1%), *Diospyros consolatae* (9.9%), *Euphorbia bussei* (9.9%), *Boscia coriacea* (8%), *Acacia mellifera* (6.2%), *Cordia monoica* (4.9%), *Pappea capensis* (3.7%), *Melia volkensii* (3.7%), *Hymenodictyon parvifolium* (3.1%) and *Rothmannia fischeri* (3.1%).

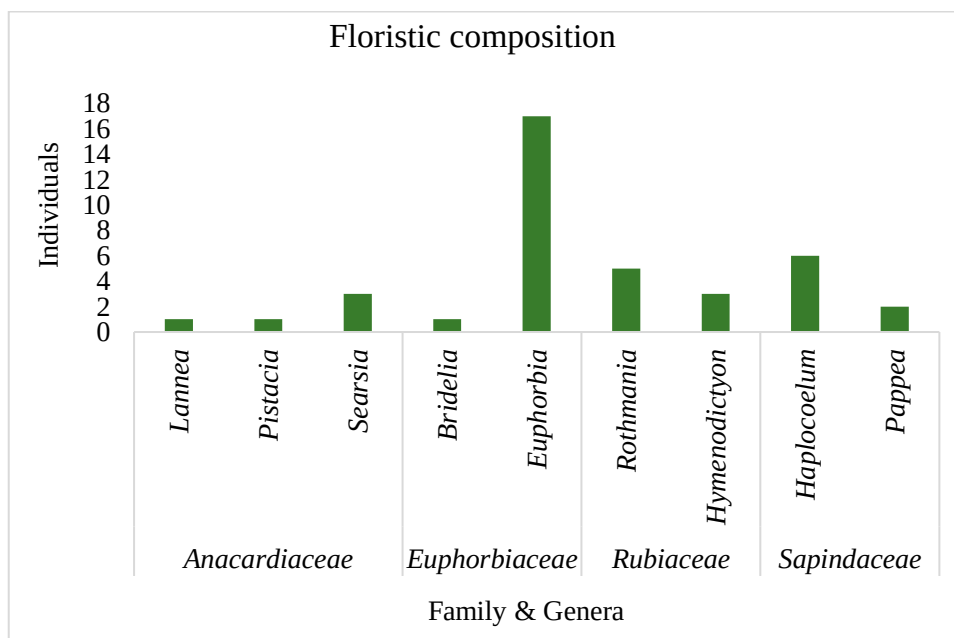


Figure 45: Floristic composition of Tsavo-West National Park

Acacia mellifera was dominant across Kuku A, Rombo and Kuku especially as this is a robust species with recurved defensive thorns that deter browsing from herbivores, and its low palatability properties (Adams, 1967). Whilst the *Dombeya Kirkii*, *Commiphora schimperi*, *C. eminii ssp. Zimmermannii* are common in Kibwezi, CHNP and the Tsavo west. These Project Areas are protected and relatively wet with some riparian patches, which are preferred by these species (Kindt et al., 2014).

The genus *Commiphora* was also dominant in Kuku A, Rombo and Kuku. This is most likely due to the semi-arid environmental conditions, and the topography and soils associated with dry *Acacia-Commiphora* woodlands (Alsherif, 2019) that covers most of the Project Area. *Diospyros* is also most common in Imbrikani, Kibwezi forest and CHNP. All of these Project Areas have some parts that have high elevation and are relatively protected. *Diospyros* are also known to occur in low land forests (Ramezani et al., 2016) such as the Kibwezi Forest Reserve and CHNP.

5.3.2.3 Species Populations and distribution trends in the Chyulu Hills REDD+ Project

The data presented in this section are largely based on some of the large mammals, as there is limited time series data on the population status and trends of all the possible species found in the Project Area. And the large mammal metrics provide a good indicator of overall ecosystem health. It is noted that temporal trends in data analysis and interpretation indicate that all the species exhibited oscillations across the years.

- **Population status and trends: Until 2017**

The assessment is based on reports such as the triennial dry season Tsavo-Mkomazi 2017 aerial surveys and Project Area species monitoring data and results undertaken by various partners. Generally, at the greater Tsavo-Amboseli-Mkomazi landscape level it is reported that there is a general increase in large mammal's species abundance. Notably, the overall population of buffalo, giraffes and elephants in the Tsavo ecosystem increased by about 52%, 49% and 14.7% between 2014 and 2017 respectively (Table 23). In addition, there is an 8.8% annual population increase for elephants in the period 2010–2017 a species that has high forage requirements, high water dependency and large home range (Figure 46) (Table 24). For example, known individuals have been observed to the south of Amboseli National Park and in the north of the Chyulus³⁶.

Table 23. 2017 Elephant, Buffalo and Giraffe abundance in the Tsavo-Mkomazi Landscape.

Adopted from the TME Large Mammal Survey 2017

Regions	Elephant			Buffalo		Giraffe	
	Count No.	No. of herds	Elephants/km ²	Count No.	Buffalo/km ²	Count No.	Giraffe/Km ²

³⁶ Njumbi et al 2018.

Tsavo East National Park (South)	6072	779	7.01	3534	0.84	538	0.13
Tsavo West National Park	2833	352	2.99	1725	0.26	1389	0.21
Taita Ranches	1746	129	1.86	1768	0.26	510	0.07
Tsavo East National Park (North)	1655	298	2.28	1461	0.15	351	0.04
Other Areas	364	36	0.04	5	0.00	823	0.10
Galana Ranch	93	8	0.13	2	0.00	84	0.10
Rombo	60	3	0.05	30	0.03	321	0.27
Mkomazi National Park	23	9	0.01	98	0.03	255	0.08
Chyulu Hills National Park	20	5	0.02	0	0.00	48	0.07
Total	12,866	1,619	14.39	8623	0.18	4323	0.09

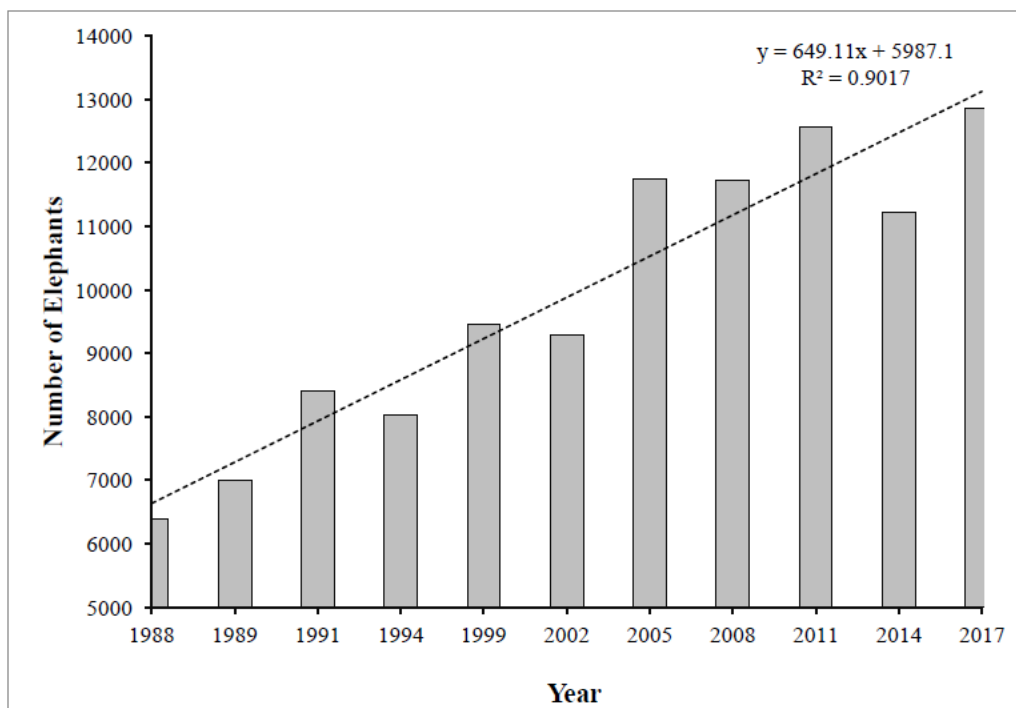


Figure 46: KWS Elephant population trend data for the Tsavo-Mkomazi ecosystem including the project area for the period 1988 to 2017.

More recent data suggests improved security and anti-poaching operations, including those carried out by REDD+ partners in and around Tsavo have maintained this positive trend has continued through 2020

: Elephant numbers by location in Tsavo-Mkomazi ecosystem (1962-2017).

Table 24. Elephant numbers by location in Tsavo-Mkomazi ecosystem (1962-2017).

Location/Year	1962	1965	1969	1970	1972	1973	1978	1988	1989	1991	1994	1999	2002	2005	2008	2011	2014	2017
Tsavo East (N)	4,073	8,056	6,619	0	6,435	9,011	220	770	134	450	399	1,337	4,089	2,499	4,118	2,094	1,257	1,655
Tsavo East (S)	1,358	4,744	5,709	6,008	6,633	3,955	2,469	2,283	3,020	3,436	2,733	3,221	2,087	3,896	3,731	4,120	5,329	6,072
Tsavo East	1,394	2,238	8,134	6,592	4,328	9,208	1,938	1,274	2,106	1,233	3,132	2,119	2,168	2,626	21,614	2,142	2,918	2,833
Chyulu NP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	131	135	42	20
South Kitui NR	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0
Mkomazi NP	-	-	-	-	2,067	-	667	93	11	131	302	77	63	41	8	256	59	23
Galana Ranch	3,540	-	2,964	-	4,379	500	1,076	90	74	50	46	27	14	11	308	398	12	93
Taita Ranch	-	-	500	-	1,235	-	79	853	642	1,413	287	1,245	828	1,292	1,108	2,751	1,420	1,746
Rombo Area	-	-	-	-	-	-	-	-	193	-	446	12	2	31	0	0	149	60
Other blocks	-	-	-	100	300	-	-	-	46	50	26	30	35	1	130	509	31	364
Outside	-	-	-	-	-	-	-	1,036	966	1,644	1,107	1,391	-	1,376	38	168	0	0
Total (parks)	6,825	15,038	20,462	12,600	19,463	22,174	5,294	4,420	5,271	5,250	6,566	6,754	8,344	9,026	10,149	8,614	9,605	10,603
Total (non-parks)	3,540	-	3,464	100	5,914	500	1,155	1,979	1,728	3,157	1,466	2,693	940	2,680	1,584	3,959	1,612	2,263
Grand Total	10,365	15,038	23,926	12,700	25,377	22,674	6,449	6,399	6,999	8,407	8,032	9,447	9,284	11,742	11,733	12,573	11,217	12,866

Source: Laws, 1969; Leuthold, 1973; Otichillo, 1983; Olindo et al., 1988; Douglas-Hamilton et al., 1994; Kahumbu et al., 1999; Omondi and Bitok, 2008; Ngene, et al, 2011; Kyale et al., 2014 and Lala et al., 2017.

- **Key species populations, spatial distribution and densities**

Moderate species concentrations based on kernel density maps have been recorded in the Project Area (see Figure 47). During the KWS³⁷ Tsavo-Mkomazi wildlife census in 2017, the overall elephant population density was about 12,866 individuals i.e., between 7-14 elephants/km², with an annual recruitment rate of 4.9%. Within the Project Area a higher concentration of the species was noted to be around water points and in community areas around Olpakai, Kuku and Olpusare. The density of buffalo was about 0.18 per km², which is an increase from 0.13 buffalo km² in 2014. The populations were distributed around either permanent or supplemented watering points in the landscape, including the Project Area. About 82% of buffalo populations are predominantly in groups, with the average group size for the whole landscape being 27 individuals. However, there were significant differences in the number of buffalo in different regions across the Tsavo-Mkomazi landscape, with the largest group being composed of about 425 individuals. The total number of giraffes in the Tsavo-Mkomazi ecosystem, including the Project Area, was about 4,323 giraffes, which is an increase from 2,891 in 2014. The highest number of giraffes in 2017 was located in the Tsavo West National Park. Having an average group size of 80 individuals (KWS Aerial Survey report 2017). In many other parts of their range, giraffes suffered significant declines in their population³⁸ in the last 30 years whereas census results from the Chyulus landscape suggest a healthy population is being maintained.

As noted above during the 2014-2017 period, the general elephant, giraffe and buffalo populations increased by approximately 1,649, 1,432 and 2,711 respectively. Mean elephant herd sizes of around 7 elephants/herd, were observed in the protected areas, while around 13 elephant/herd were observed to be outside the protected areas. These species have been put under immense pressure through illegal killings and the decreased range of land they can use, caused by land use changes, all of which has decreased their overall populations from about 40,000 individuals in the 1970's. In addition, as demonstrated above, elephant and other species population numbers have been increasing and stabilizing in recent years, a trend that is expected to continue through projects such as REDD+ that are increasing conservation resources and management.

It is noted that MWCT carries out one wet season and one dry season aerial census per year across the surrounding group ranches, focusing particularly in Kuku. The MWCT aerial census surveys of KGR in 2020 made a total of 1,228 observations³⁹. Of these, 46.5% (n = 571) were wild animal encounters, where 13 wildlife species were counted, including one avian species. During this survey the Plains zebra⁴⁰ (*Equus quagga boehmi*) was the most abundant species counted, with herd size ranging from 1-50, with these being found throughout the group ranches, except for in the most highly populated and disturbed agricultural areas, such as the northern Chyulu Hills and the northern Kuku Plains.

In the same survey, the Maasai giraffe (*Giraffa Camelopardalis tippelskirchi*)⁴¹, Thompsons and Grant's gazelle (*Nanger granti*) were also determined to be the most common ungulate species, with herd sizes ranging between 1-15, 1-5 and 1-7 respectively. The Maasai giraffe was more abundant outside the

³⁷ KWS conducts regular wildlife census triennially with the last for the TCA area being in 2017. Another census was planned for 2020 but was postponed due to the global pandemic.

³⁸ Giraffe Conservation Foundation website <https://giraffeconservation.org/giraffe-conservation-status/>

³⁹ Due to the COVID Pandemic MWCT only managed to conduct one survey in 2020.

⁴⁰ The IUCN has since classified the plains zebra and its various subspecies as 'near threatened' since the species population have declined by 24% since 2002.

⁴¹ IUCN lists the Masai giraffe as endangered because its population has declined by about 50% in the last three decades.

protected areas, while the Grant's gazelle is less dependent on water than the Thomson's gazelle, this means it is able to have a wider distribution. Overall, there has been a gradual decline in gazelle numbers over the period 2010–2020, with no gazelles being observed in dense bush lands or in the high areas of the Chyulu Hills. The densest wildlife concentrations were around the Kanzi, Loosoitok, Olpakai and Olpusare areas.

The Impala is the most common antelope species in the Project Area, with the highest number of Impalas observed over the last seven years being observed in 2014. High concentrations of the species are found in plains areas, and mostly outside the protected areas of Chyulu that have dense vegetation and tough terrain. They are more abundant around Motikanju, Kanzi Conservancies, Rombo and areas around Olpusare springs and conservations in the southern parts of the MWCT. However, data observations are indicating a steady decline in the population since 2016 (Figure 48 and Figure 49).

As can be seen from the wildlife sighting data (Figure 47), it is clear that the wildlife is spread across the Project Area. However, higher concentrations of populations are found towards the east of the Project Area and the protected area of the Chyulu National Park, where human settlements are restricted.

Despite some of the areas in the Project Area being classified as an important bird area, no data and information exists about species population and their numbers. The Masai ostrich is the only bird species to be counted during the MWCT 2020 annual survey. A total of 36 ostriches were counted during the survey, with most being observed in flat and open habitats with low densities. Species numbers seem to be stable, except for 2018, where there was a slight dip in ostrich numbers.

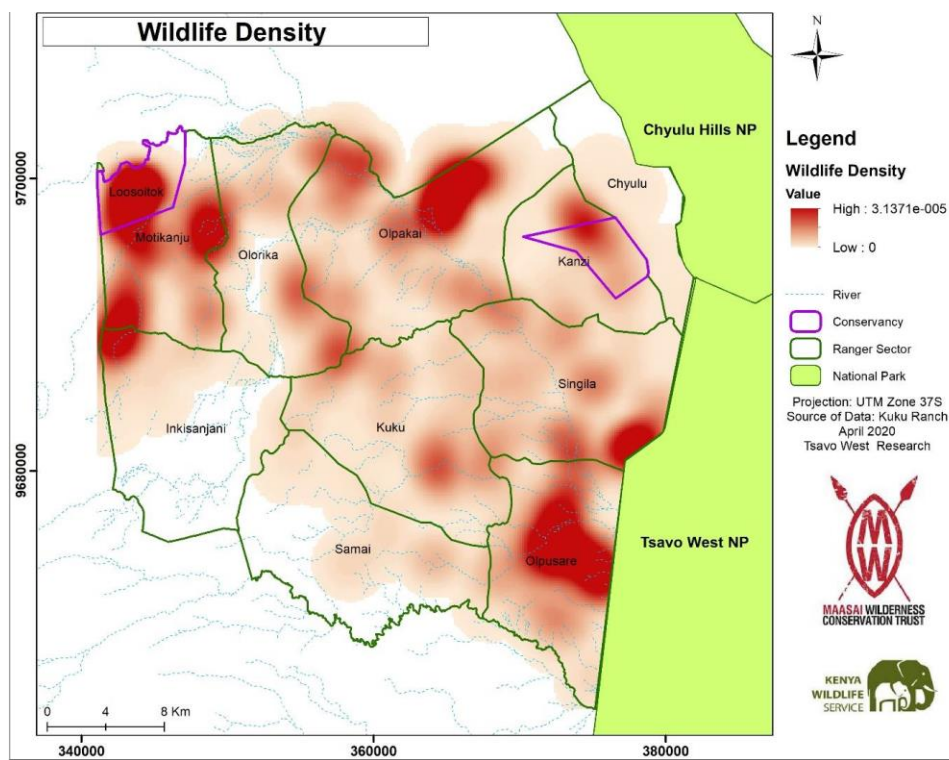


Figure 47: MWCT Aerial Kernel density of assorted wildlife species around the KGR 2020

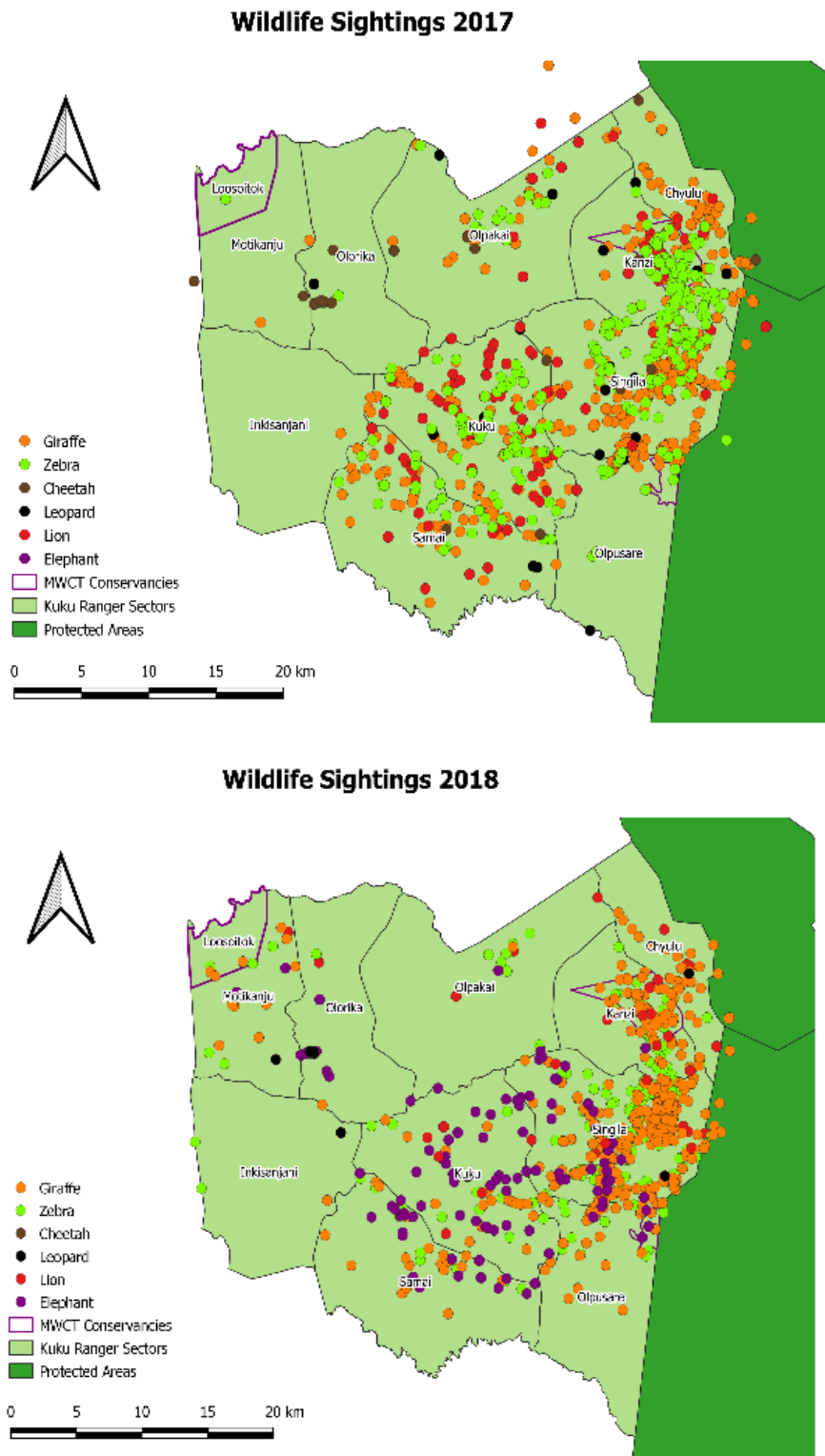


Figure 48. Wildlife sighting from foot patrols within the project area 2017-2018

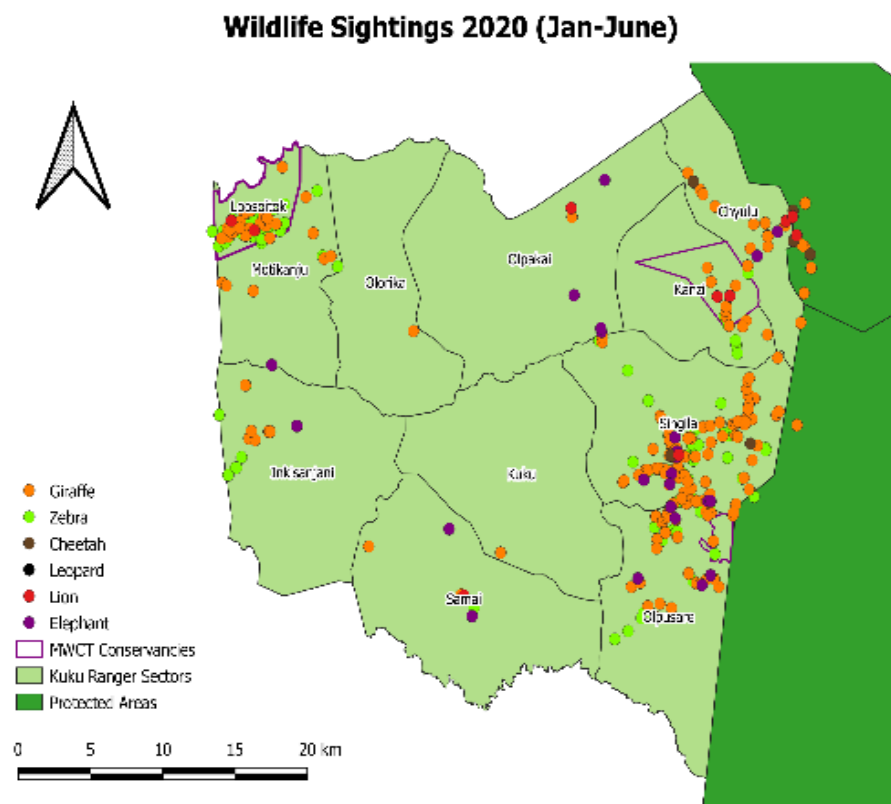
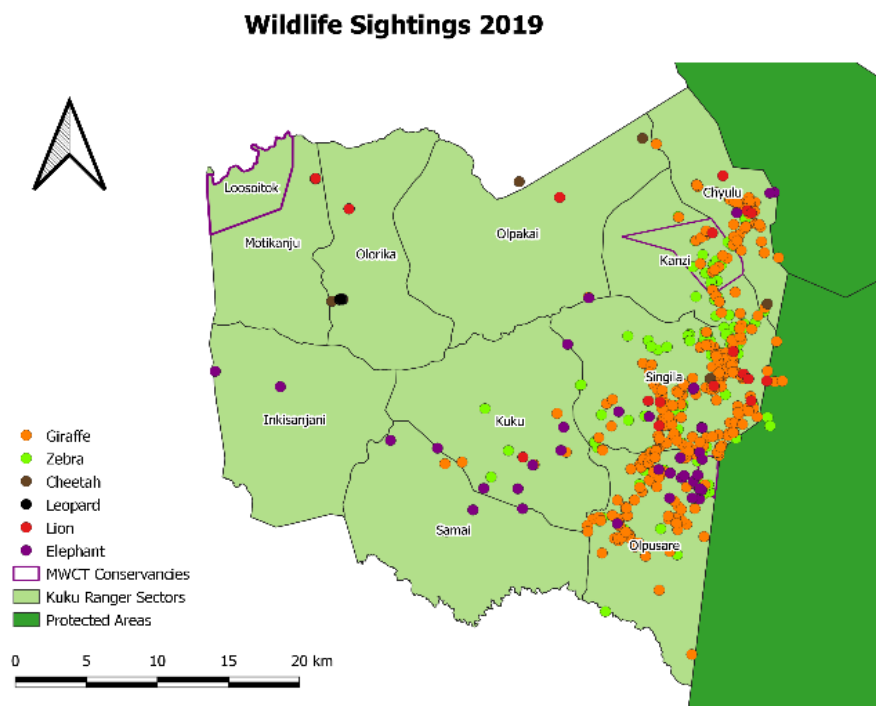


Figure 49: Wildlife sighting from Foot patrols within the project area 2019-2020

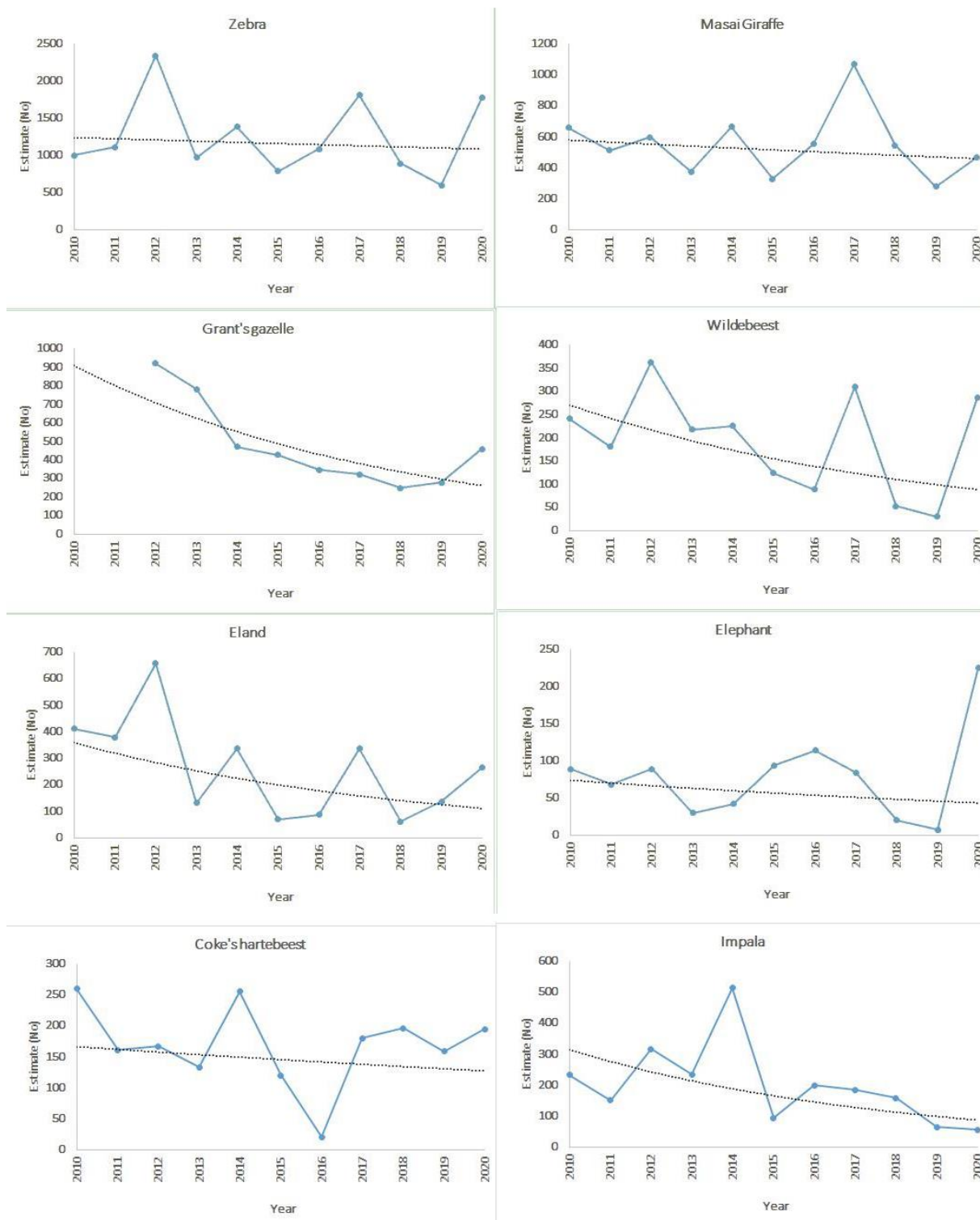


Figure 50: Temporal trends for selected wildlife species for the period 2010-2020 in KGR

Other wildlife species that were abundant included; the blue wildebeest, with high concentrations being observed in the northern and south eastern parts of the group ranch on the open grasslands near Olpakai,

Olpusare and Motikanju. It is clear that the trend is a healthy population, although drastic drops were reported in 2016, 2018 and 2019 (Figure 50). However, the population are gradually recovering, with an annual increase rate of 1.6% for the last 11 years. The eland was also observed around the Oosoitok, Ol pakai and Ol pusare areas, with mean herd sizes of 1-11 individuals. Trends (Figure 50) show that the number of elands fluctuates annually, being affected by seasonal and rainfall variations, while the overall trend of the population has been gradually declining, but is now beginning to stabilize. Elands are dependent on the availability of water which affects the distribution patterns and densities of the species across the Project Area. Previous surveys have shown that there are more elands in the group ranches in the wet seasons in comparison to the dry season.

It is difficult to draw conclusions about the population status of species from census data in one part of the project area in a single year since there is significant inter-year variability and Kuku and the whole Chyulu landscape are a component of a much larger landscape. However, from the above data, including the January 2020 census suggests that overall populations of these mammal species are being maintained or perhaps increasing. This can be attributed to a number of factors but it is reasonable to suggest that the collaborative conservation programs of the REDD+ project partners are being effective in maintaining wildlife populations.

Overall, it is estimated that up to 4% of elephants in a population die of natural causes, however, there was an 8.3% elephant carcass ratio for the Tsavo-Mkomazi ecosystem for 2014-2017. Data and information from the Project Partners also indicates that there is a general decline in wildlife killings, bushmeat and poaching incidences between 2017 and 2019, with only one elephant carcass being reported in the Project Area in the same period. Despite up to four HWC conflict incidences being reported in 2019 around Kuku, Kuku A and Rombo. The killing of wildlife for bushmeat or in retaliation for livestock losses or human deaths is a continuing threat. However the HWC mitigation programmes run by MWCT and Big Life appear to be having a positive impact. In 2019 MWCT reported a 79% and 86% decline of wildlife mortality in Kuku, Kuku A and Rombo as a result of bushmeat poaching or poisoning respectively (Table 25).

Although Big Life register wildlife data (wildlife species other than elephants, lions and rhinos which is showed in other sections) on SMART systems, they are focused on law enforcement activities, therefore, the data is available for consultation, but analysis are required to digitalize the maps of species distribution:

Table 25. Amalgamated data recorded from all Project Partners on poaching related incidences in project area from 2017-2019

Years	Bushmeat arrests	Trophy arrests	Wildlife killed
2017	43	69	33
2018	22	101	15
2019	28	31	7

5.3.2.4 Key Endangered and Endemic Species Management Regimes

- **Lion Research**

Carnivores such as lions have great ecological value as “top predators” and are critical to healthy ecosystem function, exerting impacts over smaller predators, prey species and vegetation. Their predation activities create impacts that ripple downward through the trophic levels of an ecosystem, i.e., they contribute to ecosystem processes and species diversity. Lions form a vital component of the Project Area’s natural ecosystem and play a critical role in the balance of the ecosystem. The presence of lions in the area is considered to be an indicator of general ecosystem health. However, the population of lions across Africa has been on the decline in recent years, resulting in this species being listed as vulnerable by the IUNCN. Kenya’s national population of lions was estimated at 2,749 in 2002, 2,280 in 2004 and less than 2,000 in 2020, in comparison to the overall lion population in Africa which is about 25,000, spread across 102 populations in Africa. These figures denote a steady decline in populations, highlighting the conservation challenges that lions now face.

Lion species decline is caused by a variety of factors including, loss of habitats, disease, reduced prey numbers and increasing numbers of human wildlife conflict; i.e., it is reported that human wildlife conflict with pastoralists, due to predation of livestock, has caused the killing of a sizeable number of lion populations. Furthermore, it is also noted that this conflict with pastoralists is among the single greatest source for the decimation of lion species populations in the country according to the Lion-Hyena National Conservation Strategy 2018. Based on the national lion and hyena conservation and management strategy, the Project Area has been identified as one of the major remaining strongholds of lion populations in Kenya (Figure 51).

Due to the importance of lions in the ecosystem and their role in human-wildlife conflict, MWCT is conducting ongoing research into lions, using radio/satellite collaring and deployment of special “Simba Scout” rangers to track individual and groups of lions (Figure 52). This initiative also provides a valuable management tool that allows the research program to notify the local community about the location of lions, which assists in mitigating human-wildlife conflicts. To date, a total of seven (7) individual lions on the Kuku Group Ranch have been collared with GPS/VHF tracking collars⁴². This type of monitoring enables data to be collected on population growth rates, prey selection, social behavior, and habitat utilization.

⁴² De-collaring and re-collaring of these prides are planned for 2020.

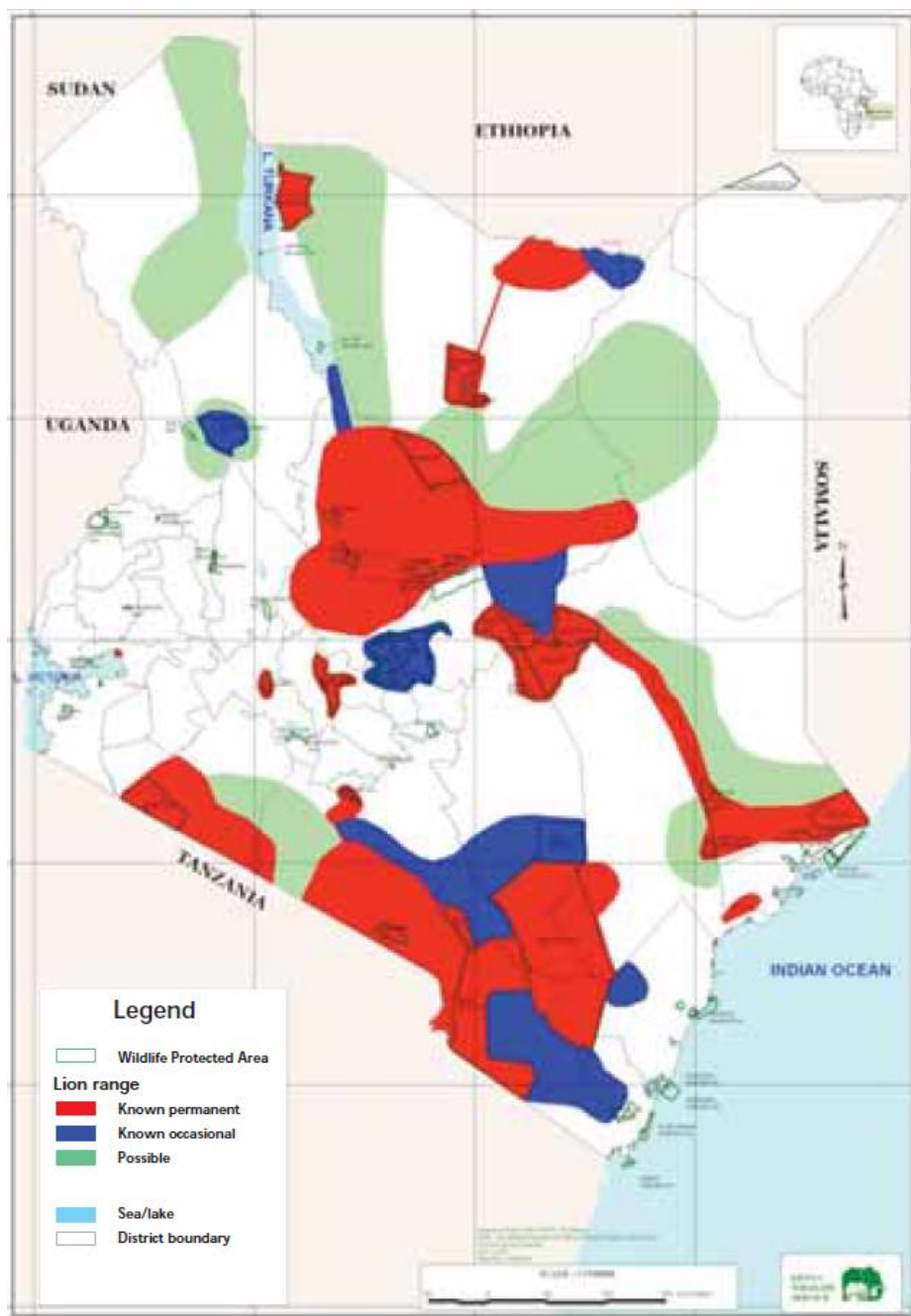


Figure 51: Current lion distribution ranges in Kenya 2018

Adopted from the National Lion and Hyena Conservation and Management Strategy 2020-2030-Kenya

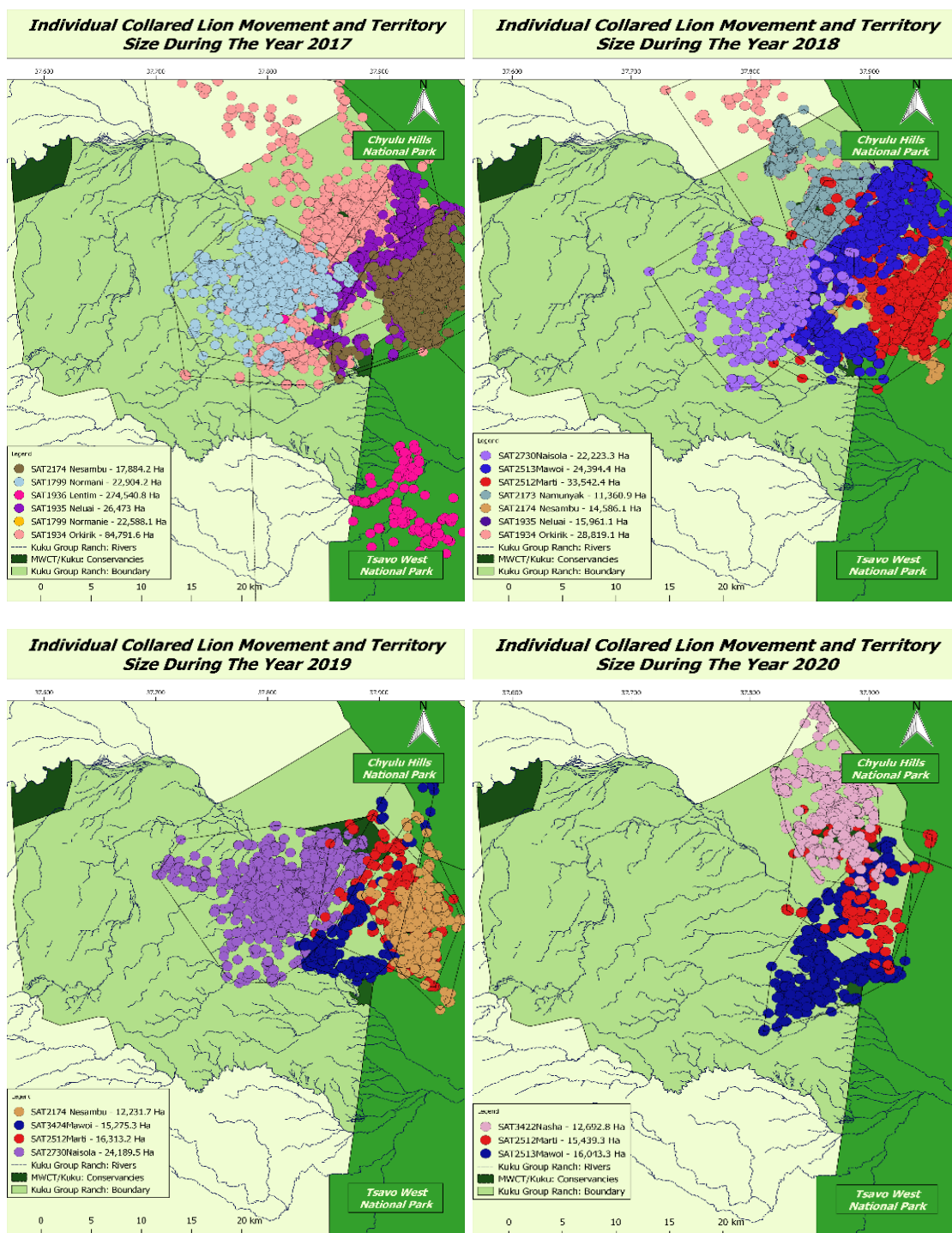


Figure 52: Collared lion movement within the Project Area 2017-2020

- **Black Rhino**

The Project Area and the Tsavo ecosystem are considered to be a stronghold for black rhino in Kenya. The black rhino is a highly protected species with intense security measures in place to protect them. The species is considered a flagship and umbrella mammal species for the Project Area ecosystem because its

conservation requirements, by default, encompass those of other smaller species. However, decimation of the species due to poaching has resulted in all surviving subspecies of black rhinos being listed as critically endangered (Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and as Critically Endangered in the IUCN Red List of Threatened Species). Currently, Kenya holds about 80% of the global population of the eastern black rhino sub-species, with management efforts in the Project Area being dovetailed into national programs.

The Project Area forms part of the national strategic refuge areas being classified as an Intensive Protection Zone (IPZ); i.e., the rhino area of about 1,195km² extends from KARI Kiboko, the Chyulu Hills National Park, to the community areas of Mbirikani Group Ranch in the northern part of the Project Area. Being an IPZ means that there are actions that have been amplified to enhance the management of existing populations such as, increased anti-poaching efforts (armed security in a fenced off area) and increased ranger surveillance of resident rhino populations. Furthermore, rhino monitoring data is collected on a daily basis which includes details on location and the health of the animal. These data are then submitted to the national black rhino database where it is amalgamated and analyzed regularly to improve species security, scientific and recovery efforts. Being a highly protected species means that the data collected and analyzed is kept confidential on a “need to know basis”, with certain clearance levels being in place at KWS management. The data can also be accessed by special teams such as the IUCN Black Rhino Technical species group, CITES technical and security teams and certain donors who fund the conservation efforts of the species directly.

To date, rhino populations have not increased from the last survey that was conducted in 2017, based on DNA analysis. It has also been noted that no rhino has been lost within the Project Area due to poaching, with metapopulation growth rate targets which are below 6%, being attained nationally year on year⁴³. The general observed rhino population in the Project Area now stands at about eight individuals, with 80% of this population being within the Chyulus Hills National Park (home range), and the other 20% being outside the park on community land. The sex ratio is about two adult males with three adult females, two sub adults male and a female calf over three (3) years. KWS and BLF have been relying on physical sightings of the species to determine these numbers, i.e., it is noted from records that in 2018 nine individuals were sighted. The variation in numbers is partly due to the terrain and vegetation of the area, which makes observation challenging.

The species monitoring and management efforts are geared towards enhancing genetic diversity, or at least minimizing the loss of heterozygosity, by ensuring the maximum rate of gene transfer to future generations. Current species conservation efforts and biological monitoring activities are centered around securing the ITZ in Tsavo West, protecting the resident rhino population, habitat assessments, use of technology such as camera traps being strategically located and conducting dedicated surveillance by sighting and tracking individual rhinos that are fitted with GSM trackers implanted in their horns.. Habitat and species quality and suitability assessments are also regularly conducted to study population pressures. However, there is still a need to improve habitat management through controlling invasive alien plant species (IAPS) that are rampant in some parts of the TCA, frequent fires and the provision of water. It is noted that due to the dense vegetation found in the Chyulus, extra effort is being placed on tracking and tracing individual members of the population. Furthermore, KWS and BLF have drilled one borehole in the Mukururu ITZ site near the ranger camp to try and address the provision of water issue, with plans to gradually introduce rhino populations from other sites to enhance the genetic diversity. Moreover, fires have

⁴³ Black Rhino Status Report 2019.

significantly reduced browsing areas, placing increasing pressure on browsing densities. Rhino populations are also suffering from in-breeding, which merely reinforces the notion that genetic diversity from other areas is needed. With increased security across the project area and in parts of the Group Ranches there is a future potential opportunity to expand the area made suitable for black rhino.

- **Elephants**

The elephant population in Tsavo Conservation Area is Kenya's largest at around 12,000 though recent data suggests this has grown.. The area represents approximately 2.0% of the remaining African elephant range and about 37% of elephant range within Kenya. The 2017 elephant census was the 18th total elephant count to be conducted in the area, with counts dating as far back as 1962. However, it is noted that while the counts are not regularly implemented, they provide a reliable long-term trend which is important for the conservation and management of the population in the Chyulu. Table 24 shows the precipitous decline in elephants through severe poaching in the 1970's and 1980's, a pattern that was seen throughout elephant range states and led to the CITES listing of African elephants in 1989. Since 1989 to the present day there has been a steady, healthy recovery.

Poaching and droughts are constant threats to elephant populations, significantly contributing to a reduction in their numbers. However, when elephant populations are not suffering from droughts or rampant poaching, their population is able to recover quite quickly. In the recent past, Kenya had robust efforts and initiatives in place that significantly contributed to the recovery of the elephant population. In the Project Area active efforts have been undertaken by Project Partners, including anti-poaching and monitoring patrols in the air and on the ground, translocations, dung and DNA analysis, afforestation programs, improved landscape management and water availability, as well as getting the local community involved in conservation. These efforts have contributed to the national elephant recovery strategy. This strategy has been implemented in the Project Area and recovery rates show the strong and resilient nature of this population and point to the importance of the ecosystem for both elephants and wildlife in general.

Regarding data collection, the Project Partners monitor elephant carcasses and live elephant numbers in order to understand the rates of increase or decrease and threats. Positive species conservation efforts have led to an increase in TCA elephants, with a recorded increase of about 15.1% (2014: n = 11,158 elephants; 2017: n = 12,843) elephants (Figure 53).

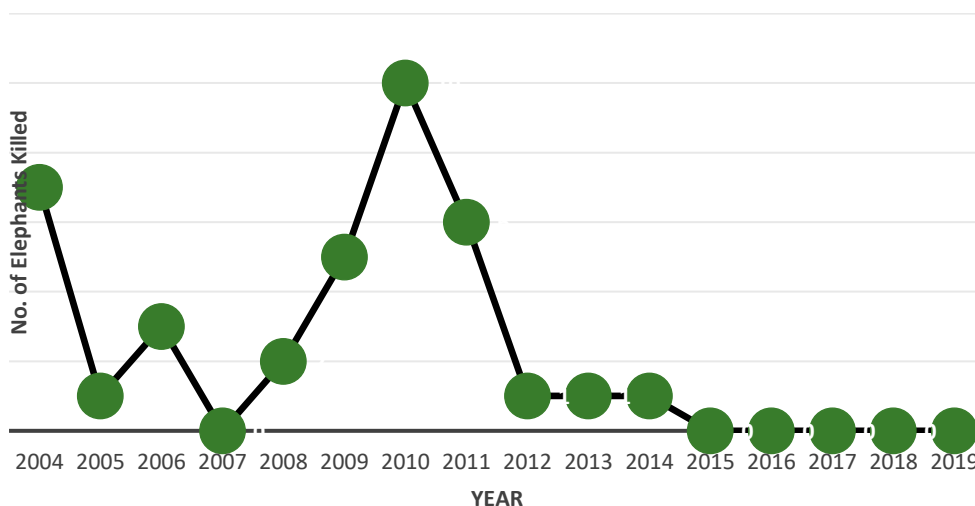


Figure 53: KWS elephant mortality records and trends with the Project Area- 2004-2019

Figure 53 shows the significant increase in elephant mortality in the Project Area from 2008 to 2012. This period coincided with a major road building project for a road which linked Loitokitok to the main Nairobi-Mombasa highway. The road building was constructed using a significant number of Chinese workers, which resulted in an increase in elephant poaching. The protection initiatives of the REDD+ Project partners have reduced this mortality to very low levels from 2015 to 2020.

The role of the Chyulus landscape as an important corridor, linking the greater Tsavo ecosystem to Amboseli, is evident from the elephant radio-tracking programs data carried out by Save the Elephants in Tsavo and Amboseli Trust for Elephants in Amboseli National Park (Figure 54).

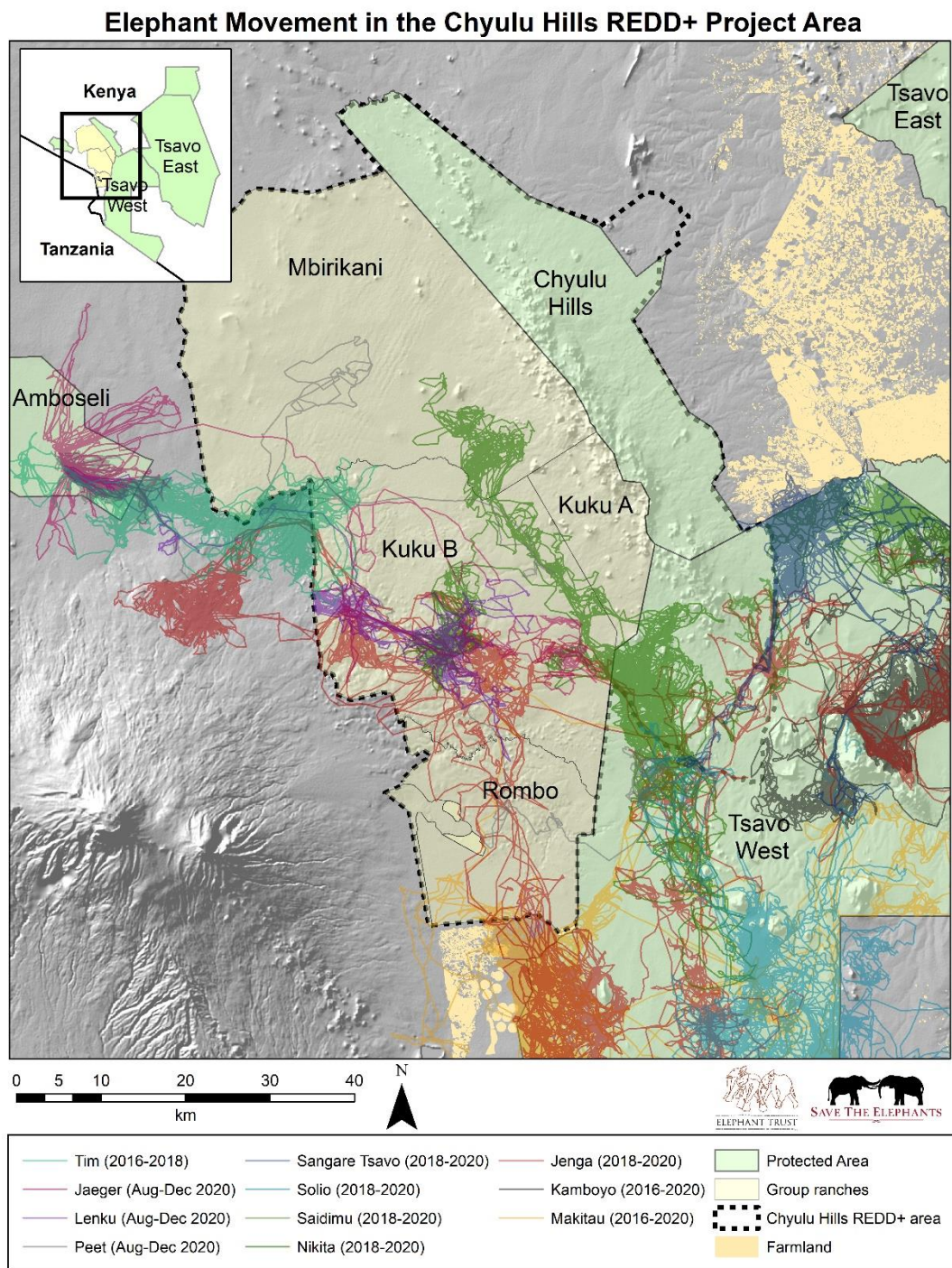


Figure 54: Radio tracking date of elephants between REDD+ Project Area and Amboseli (data from Save the Elephants and Amboseli Elephant Trust)

5.3.2.5 Key Result Indicators 2017–2019 on biodiversity in the Project Area

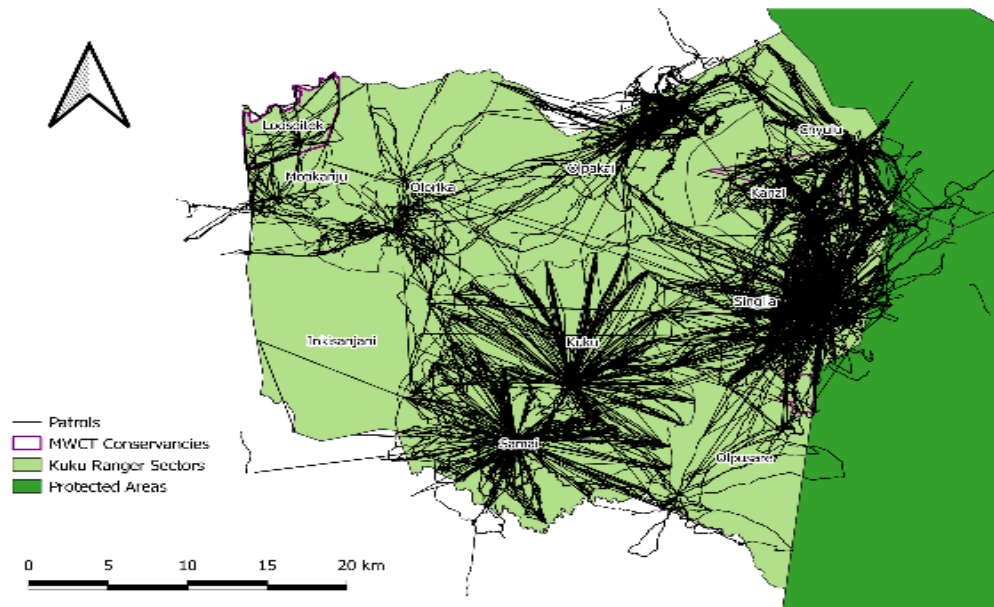
- **Improved Biodiversity Protection**

In terms of security and anti-poaching efforts a total of about 730 rangers were recruited and trained by the Project Partners, with 446, 135 and 149 being recruited in 2017, 2018 and 2020 respectively. It is clear that all sectors existing in the Project Area, including the forest reserve, the Chyulu Hill National Park, the Group Ranches and the MWCT area, are actively patrolled daily, with the assistance of these ranger teams. These rangers are instrumental in assisting the Partners conduct security surveillance and patrols, monitoring animal movements, collecting both security intelligence and ecological data, building information-sharing and trust with the local communities, and acting as an early warning system for human wildlife conflict response. Metrics on the ranger forces, and patrol effort are in Table 21.

A total of 55 ranger patrol bases and stations are located throughout the landscape. The ranger patrol bases are temporary, while the ranger stations are permanent. These establishments also serve as residences for the rangers and response centers for communities to obtain information or report illegal encroachment or poaching. Table 21 shows that rangers cumulatively patrolled over 400,000 km during the reporting period and this excludes comparative data from KWS which are not available.

Over this period it was reported that a total of 1,306 snares were recovered while 201 trophy arrests and 93 bushmeat arrests were made, signifying the robust security and anti-poaching efforts in the Project Area. As noted above, about 55 animals were lost due to various factors, including retaliation or control of human wildlife conflict incidences. It is equally observed that with an increase in the number of patrols the number of snares and trophy recoveries have increased. This denotes positive efforts in the security operations of the Project Area, demonstrating increased security for wildlife. The ranger patrol maps below (Figure 55 and Figure 56) from MWCT illustrate the patrol effort and patterns for MWCT.

Simba Scout and Ranger Patrol 2017



Simba Scout and Ranger Patrol 2018

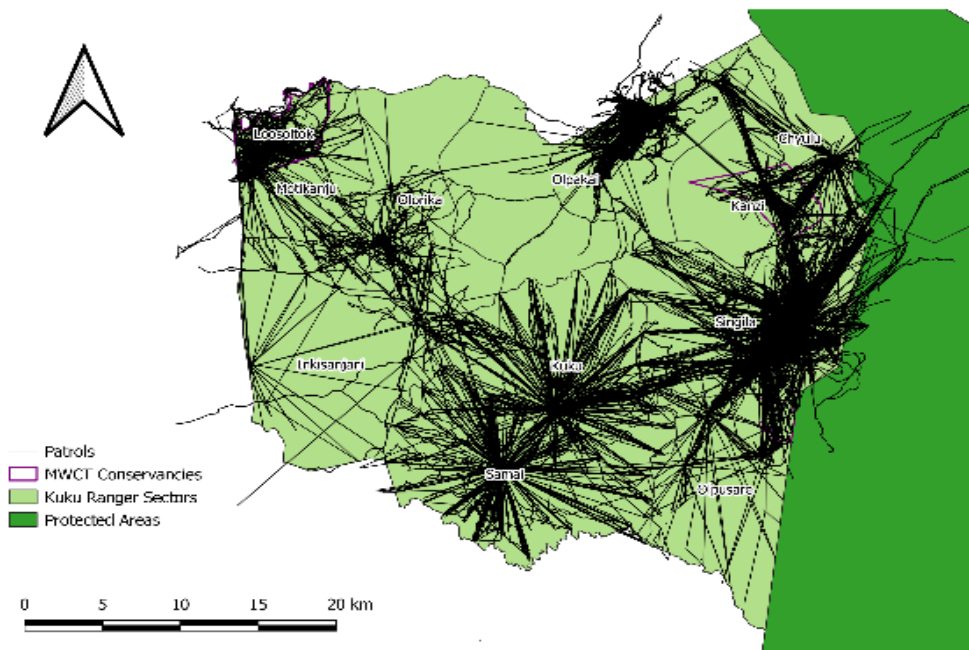
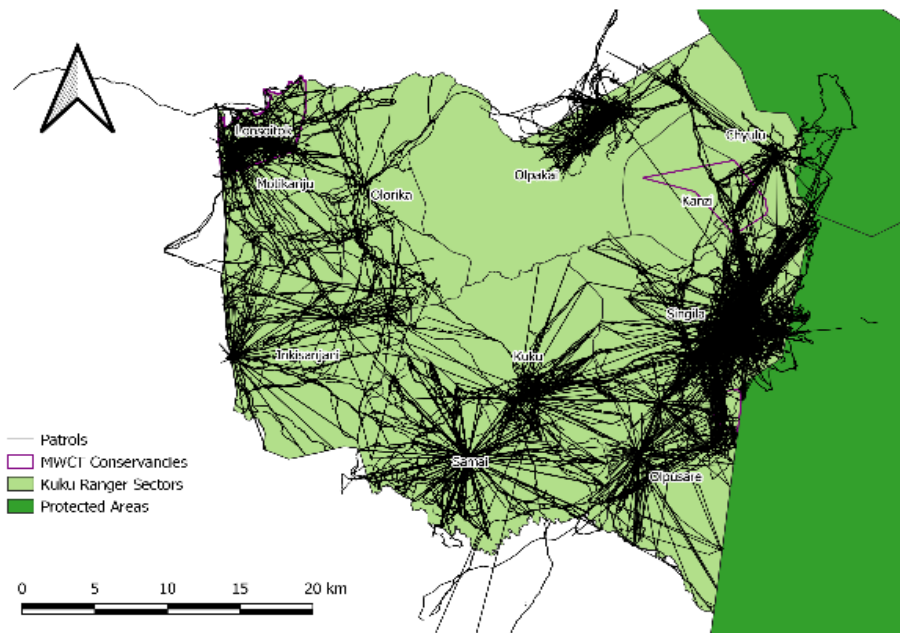


Figure 55: Simba Scout Security patrol movements within the project area 2017-2018

Simba Scout and Ranger Patrol 2019



Simba Scout and Ranger Patrol 2020 (Jan-June)

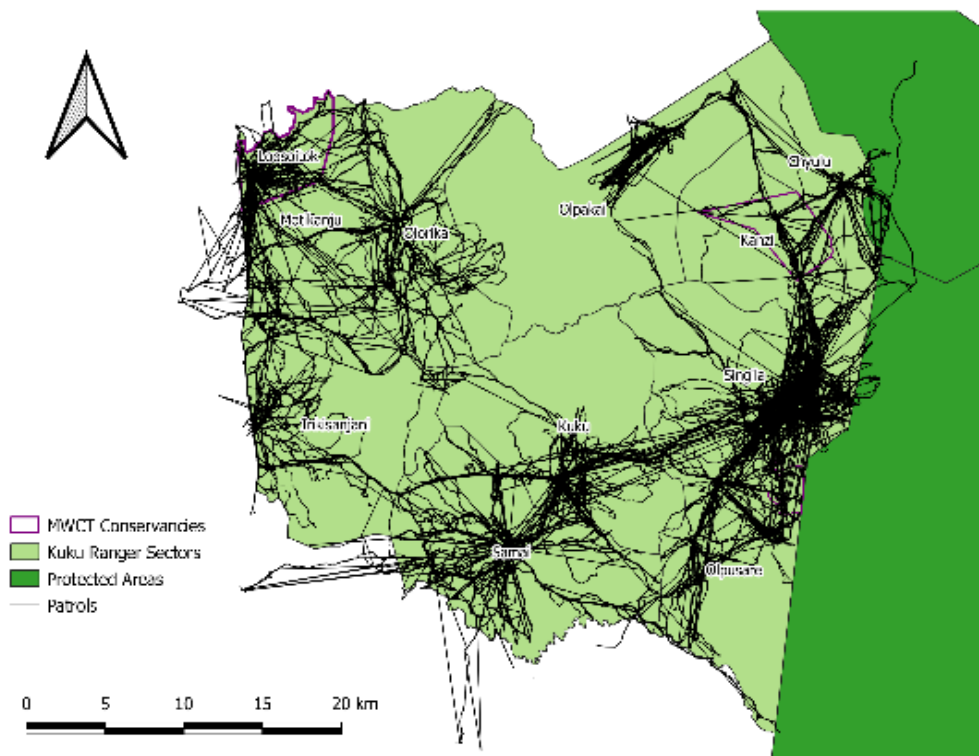


Figure 56: Simba Scout Security patrol movements within the project area 2019-2020

Human Wildlife Conflict (HWC) continues to be a significant issue in terms of promoting community support for wildlife conservation in the Project Area. This aspect has resulted in loss of property, livestock and life for the communities that live within or adjacent to the Project Area. KWS, MWCT and BLF maintain records and databases of human wildlife conflict incidents that occur across the Project Area.

Conflicts have been most prominent in areas close to human settlements, especially the Mukururo area, Langata, Endonya Emunyu, Olpusare, Samai, Kuku Village and Olorika areas. Interventions such as the use of fencing, rapid ranger response teams and monitoring of wildlife movements through reports on wildlife sightings have been deployed. KWS, MWCT and BLF ranger sectors and rapid response units from Kiboko PAMU station, MWCT headquarters and Mbirikani have acted swiftly and efficiently in the past to reduce potential retaliation actions. In addition, the collaring of lions and understanding their location to provide information to herders and movements is an important tool for mitigating livestock losses due to lion predation.

The livestock loss compensation programs managed by MWCT and BLF are vital initiatives for promoting tolerance of wildlife by Maasai herders. Over the period, the BLF has used approximately USD \$240,000 to compensate for the loss of about 6,302 livestock that were lost to predators. Over 70% (about 4497), total annual livestock loss numbers, were reported in Kuku, Kuku A and Rombo. The predator-loss compensation schemes run by BLF and MWCT (Wildlife Pays Programme) show that hyenas, jackals and lion cause the majority of these losses. Table 26. shows the total livestock loss compensation paid in the years 2017-20 by MWCT (Wildlife Pays Programme) and Big Life. The average is about KES 16.5 million per year (~\$150,00 per year).

Table 26. Livestock loss compensation paid by MWCT (Wildlife Pays) and Big Life

Total compensation BLF and MWCT Wildlife Pays 2017 – 2020 (amounts in KES)				
	2017	2018	2019	2020
BLF	9,001,600	7,718,000	8,601,900	9,351,265
MWCT (Wildlife Pays)	7,987,050	7,718,000	8,508,100	7,323,400
Total (KES)	16,990,667	15,438,018	17,112,019	16,676,685

The traditional response to livestock losses or accidental human deaths from wildlife is retaliatory killings. Project partners particularly focus on trying to prevent retaliatory killings of lions and elephants. For both lions and smaller predators retaliation may involve poisoning kills and this can lead to the deaths of multiple animals. Over the period, a total of 12 retaliatory killings of wildlife were prevented, while 95 wildlife killing incidences were reported. 2019 recorded the highest number of recorded incidences of wildlife retaliatory killings and crop raiding, 51 and 69 respectively. Six human deaths and injuries were also recorded over the period, with no deaths or injuries being registered in 2017 and 2018 respectively (Table 27).

Table 27. Amalgamated Project Partners data showing annual Human Wildlife Conflict indicators in the Project Area.

Years	Predator compensation	Livestock loss	Crop raiding	Human injuries	Retaliatory killings	Killings prevented
2017	9,001,600	2,248	61	2	23	4
2018	7,718,000	2,025	33	0	21	4
2019	8,601,900	2,029	69	1	51	4

Data obtained from BLF Predator compensation scheme, KWS, BLF and MWCT records on Human Wildlife Conflict data for 2017.2018.2019. Above table does not have data from the Wildlife Pays Programme.

Table 28 shows that livestock losses compared to estimated total livestock on Kuku and Rombo Group Ranches

Table 28. Annual total Livestock losses recorded in KGR and Rombo ranch.

Year	Livestock losses	Livestock totals	% Loss
2017	1526	41,075	3%
2018	1582	68,515	2.3%
2019	1389	24,962	5%
Total	4497	134,552	10.3%

- Number of illegal livestock incidents in group ranches**

The impacts of livestock on the rangelands and forests inside the Project Area are significant. These include rangeland degradation, competition with wildlife, and the setting of fires, Following the regular wildlife and livestock survey activities that occurred in the Project Area and were conducted by KWS, MWCT and BLF; there has been about a 14.7% annual population increase for cattle between 2010 and 2020. Since the severe drought in 2009, the number of cattle has increased rapidly. Data from MWCT aerial censuses show that 2020 had the highest number of cattle, with an increase of over 177% from 2019 (Table 29). Figure 57 shows comparative densities of livestock across the Kuku Group Ranches. The highest livestock concentrations were around the Inkisanjani, Singila and Olorika areas (Figure 57).

A total of 13,691 cattle were counted in 292 herds during the MWCT 2020 wet season count. There was a mean herd size of 46.7 cattle/herd, ranging from 1 individual to herds of 400. Overall, there was a cattle density of 12.05 cattle/km² in KGR. Large concentrations were observed in the Kuku Plains, around Lake Olpakai and close to Iltilal and in Inkisanjani and Samai near the KGR boundary. Other areas of high livestock concentration include the Iltilal, Kuku/Samai and Nolasit areas.

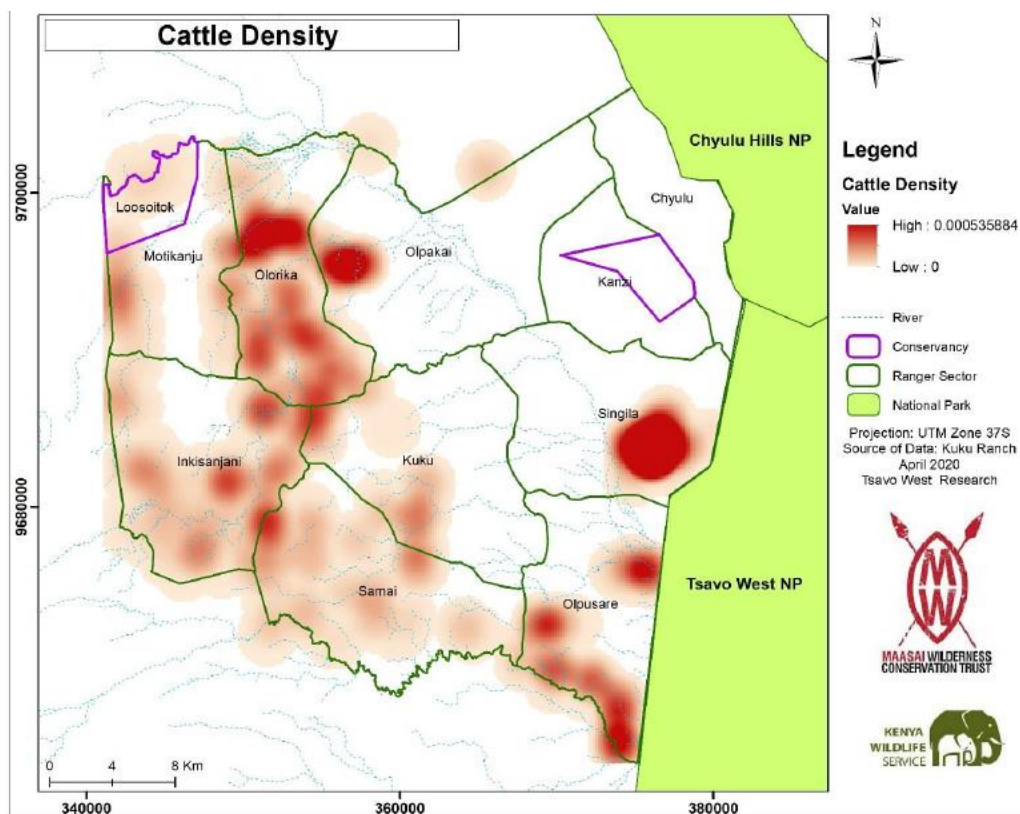


Figure 57: Aerial Kernel Density Map for cattle during the Wet Season Survey 2020 in Kuku Group Ranch

Table 29. Table showing annual numbers of cattle, shoats and donkeys found in KGR

Type of livestock/Year	2010	2011	2012	2013	2014	2016	2017	2018	2019	2020
Cattle	3000	7500	9000	13000	12000	10000	13500	8985	4919	13631
Shoats	5000	12000	19500	25000	30000	22000	27000	31000	20023	30499
Donkeys	45	60	125	149	145	135	235	39	9	50
Total	8045	19560	28625	38149	42145	32135	40735	40024	24951	44180

From the Kuku Group Ranch (KGR) data it is clear that the shoat population has increased sixfold since 2010, and are the most abundant of all the species counted in the January 2020 aerial survey. The 2020 survey observed a total of 30,499 shoats in 348 herds. This illustrates a rapid increase in shoats with a 17.9% annual increase between 2010 and 2020, a mean herd size of 87.7 shoats/herd with a range in groups from 3-500 shoats being recorded. Overall, there was a shoat density of 26.9 shoats/km² with fluctuations over the years, where the highest annual change was experienced between 2010 and 2011 (+129%), and the lowest annual change between 2013 and 2014 (+21%). Sheep and goats were generally observed closer to the bomas than cattle, while the highest densities are closer to populated areas and along river courses.

The number of donkeys observed increased after the drought of 2009. The January 2020 count showed a considerable reduction when compared to 2011-2017, and a 28% increase between 2018 to 2020⁴⁴. A total of 50 donkeys were counted in 17 groups, being located in mainly agricultural and more densely populated areas. Higher densities of donkeys were concentrated in the Inkisanjani and Samai areas.

Evidently, there is a negative relation in the spatial distribution of wildlife and livestock, with wildlife being found in predominantly lower densities in between livestock dominated areas on the KGR. Higher livestock concentrations are found in the more densely populated and agricultural areas which have a more reliable supply of water throughout the year. Higher wildlife densities were found in the Motikanju Conservancy, along the Motikanju and Maisoyati rivers close to Ilchalai, near Lake Olpakai, in the Kanzi Conservancy and between Oyarata and Moilo (Figure 58).

The project partners are working on an integrated approach to assist the communities to adopt more sustainable management practices, including rotational grazing, breed improvement and improved husbandry, rangeland restoration, and financial incentives for herd size reduction. This is a complex and long-term initiative that impacts both biodiversity values and community economic well-being. The monitoring programme will continue to collect data on livestock numbers in the project area.

⁴⁴ It appears from observations on the ground that the aerial census underestimates the total number of donkeys' present. Aerial Survey Report 2020.

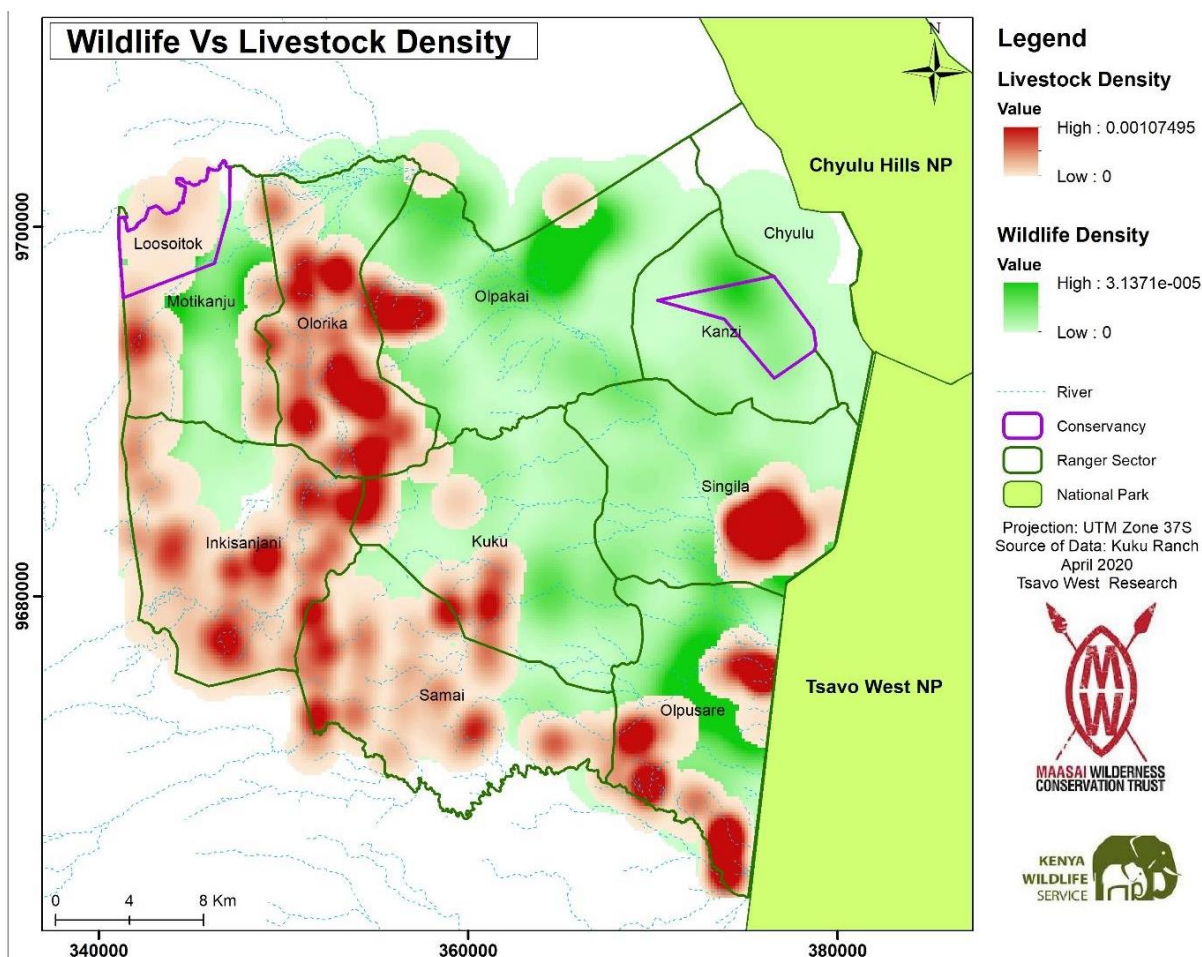


Figure 58: Kernel Density Map on the spatial distribution for wildlife and livestock during the 2020 aerial survey in the KGR.

5.3.2.6 Restoration of Wildlife Habitats, Livestock and Range Management Practices

- **Degraded Sites Identification and Mapping**

As part of the habitat restoration efforts, especially around areas of the KGR and the Kibwezi Forest reserve, habitat restoration efforts have been undertaken, including identification and mapping of degraded sites. The rehabilitation effort uses tree seedlings, grass seedbanks, bunds and organic farming techniques to restore the degraded sites. Within the Kuku group ranch, the following sites were identified as degraded sites for restoration activities: Enkii, Ol Pusare A, B, D, Inkisanjani and Langata and restoration work using grass seedbanks, bunds and organic farming techniques have been applied. Cumulatively MWCT has identified, mapped and rehabilitated close to 4,080 acres of degraded rangeland.

- **Reduced Logging**

Over the period there has been a gradual reduction in habitat destruction activities associated with illegal logging. The presence of kilns within the Project Area has drastically reduced from 206 kilns in 2017 to eight in 2019. This is likely due to both positive messaging and attitude changes and improved habitat protection from the various security and surveillance efforts. Similarly, logging and charcoal arrests have reduced from 2018 to 2019 by 30% and 68%, which is similar to the number of confiscated charcoal bags that reduced by over 80% over the same period.

5.3.3 Monitoring Plan and Results Dissemination (B3.3)

The Biodiversity Monitoring Plan was established and accepted by the Project Proponent. The Plan has been available since the previous Monitoring Period for public review at the Project Office, and at the office of each of the Project Partners. The full results of the biodiversity monitoring are included in this Project Monitoring Report, which is being made publicly available in the Project Area, with a hard copy being made available for review at the Project Office, and at the office of each of the Project Partners. Additionally, a Monitoring Report Summary has been written and distributed to communities throughout the Project Area in English and Swahili. The Monitoring Report has also been posted on the CCB website for public review and comment.

ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

NA

ADDITIONAL PROJECT IMPACT INFORMATION

NA

APPENDIX X: ANNEX

ANNEX I. List of Community indicators, results, methods, and Gold Level Impacts.

Community Indicators								Gold Level
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for Data Collection	(Positive / Negative) Impacts on Poorer households individuals and other disadvantaged groups including women
Poverty & livelihoods	Livelihood diversification enhanced	Establish at least one extra source of income for at least 100 households by 2021	SIA01	# planning/training events on income-generating activities or entrepreneurship	Eastern community: -3 training events for beekeeping. -Promotion of beekeeping value chain in Kibwezi east. -Capacity building in nature-based enterprises development. Western community: -1 training event for beekeeping. - Workshops with woman groups for jewellery	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	The training events on income-generating activities such as beekeeping, jewellery and nature-based enterprises provide positive impacts on poverty reduction and creation of alternative income. By diversifying their economy, especially for women's, the community is able to improve their conditions regarding food security, housing, health care expenses, payment of school fees and access to other commodities like mobile phones. In addition, these activities promotes financial independence as well as decision-making amongsts the women's.
			SIA02	Amount of seed capital provided for business establishment	Not implemented yet due to the development of other activities prioritized by the communities.	Output	Indicator not measured during this verification period.	Indicator not measured during this verification period.
			SIA03	# new local jobs created under project	53 casual workers employed 75 REDD+ Rangers hired (more than 100 rangers have been benefited with REDD+ funds, either new hiring or paid salary). 61 Teachers incentivised through REDD+ funds 8 teachers were hired directly through REDD+ funds 5 Community Health Workers	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Rangers, teachers, social impact survey enumerators and tree plot samplers and others were hired through REDD+ funding from the local communities, reducing the social and economic inequality and providing jobs for community members. This has a positive impact on poor households which can access jobs and economical opportunities.
			SIA04	# new IGAs or businesses initiated	Eastern community: -Beekeeping Western community: -Jewellery -Beekeeping	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Income-generating activities such as beekeeping, jewellery and nature-based enterprises provide positive impacts on poverty reduction and creation of alternative income. By diversifying their economy, especially for women's, the community is able to improve their conditions regarding food security, housing, health care expenses, payment of school fees and access to other commodities like mobile phones. In addition, these activities promotes financial independence as well as decision-making amongsts the women's.
			SIA05	# livelihood support-products from own farms	Eastern community: - Honey Western community: -Grass seeds banks -Livestock -1 acre of organic farm was established in KUKU as pilot project to demonstrate and validate this approach	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Beekeeping is an activity that the community, particularly in the north-eastern part of the Project Area is very strongly supported by community members; in this activity they have been learning about the ecology and importance of these insects. They have been changing old techniques of beekeeping for newer and safer approaches, and have seen direct benefits, especially because the honey produced in this area is recognized as being very high quality. For the pastoral communities, Big Life and MWCT are working with the Maasai to implement more sustainable livestock management and rangeland restoration. Grass seed banks is an activity developed with the women of the Maasai communities, they are in charge of the area an also of the income generated.

Community Indicators								Gold Level
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for Data Collection	(Positive / Negative) Impacts on Poorer households individuals and other disadvantaged groups including women
			SIA06	# off-farm livelihood support products	Eastern community: -Beehives: Up to 2020 Project distributed to the community around 680 beehives, 68 kits with equipment, and 3 beekeeping training sessions. Western community: -Beehives: Up to 2020 Project distributed to the community around 150 beehives and one training session.	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Beekeeping is an activity that the community, particularly in the north-eastern part of the Project Area is strongly supported by community members; in this activity they have been learning about the ecology and importance of these insects. They have been changing old techniques of beekeeping for newer and safer approaches, and have seen direct benefits, especially because the honey produced in this area is recognized as being very high quality.
			SIA07	# physical assets, structures & utilities in household	Western community: -50 hiporollers were distributed across Kuku Area. No other partner were involved in this yet.	Impact	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	The hiporollers are a strategy to benefit the women in the community which usually are in charge of getting potable water for the houses, and have to carry the buckets of water for long distances. With the hiporollers, the can carry more water with less fiscal effort and spend less time in this activity.
			SIA08	Income levels and diversification at household level	Eastern and Western communities: On average, in a good year, the modal family earned 10,000-20,000KSh per month; however this was different between regions, with the 5,000-10,000KSh monthly income bracket most common in the East, and 20,000 – 50,000KSh more common in the West. In the East, just 5% of the families interviewed said they earn more than 20,000KSh per month in a good year, which is a substantial decrease on the 2016 census, when 10% of respondents earned more than this figure. (See Findings/FirstRound/Community_Monitoring Plan/SIA Analysis_020221 Household Survey). Regarding the diversification of income at household activities such as beekeeping, jewellery and grass seeds banks have been implemented.	Impact	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	Income-generating activities such as beekeeping, jewellery and nature-based enterprises provide positive impacts on poverty reduction and creation of alternative income. By diversifying their economy, especially for women's, the community is able to improve their conditions regarding food security, housing, health care expenses, payment of school fees and access to other commodities like mobile phones. In addition, these activities promotes financial independence as well as decision-making amongsts the women's.
	Improved health facilities and care	Help improve health access to at least 100 households across the Project Area by 2021	SIA09	# and type of fixed health facilities in the area	Not considered during this monitoring period due to the prioritization of other activities.	Output	Indicator not measured during this verification period.	Indicator not measured during this verification period.
			SIA10	# and kind of health care professionals in the area	Western community: -1 community health workers coordinator, 4 cleaners for dispensaries	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	MWCT employed healthcare staff to ensure that the health program was able to fully function, supporting several dispensaries and supplied the local communities with medical equipment and essential drugs. This support has allow the community to have access to vaccines, medical treatment and laboratory tests in the health facilities and with the mobile clinics.
			SIA11	# km to fixed health facility	The implementation of this activity starts in 2021 with the replacement of a Solar System for energy, therefore, it will be measured the next verification period.	Outcome	Indicator not measured during this verification period.	Indicator not measured during this verification period.
			SIA12	# mobile clinic outreaches conducted in area	This activity was developed without the use of REDD+ funds.	Output	Indicator not measured during this verification period.	Indicator not measured during this verification period.
			SIA13	# patients treated in fixed facilities and mobile clinics	Western community: -A total of 44,171 patients were treated (2017=9,923; 2018=10,546; 2019=13,522; 2020=10,180)	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	With the healthcare staff is was possible to treat the local communities, given them opportunities to access to medical equipment and essential drugs.

Community Indicators								Gold Level
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for Data Collection	(Positive / Negative) Impacts on Poorer households individuals and other disadvantaged groups including women
			SIA14	# children (<5yr) immunised in fixed facilities and mobile clinics	Western community: -A total of 4,252 children were immunised (2018=146; 2019=2,097; 2020=2,009)	Outcome	MWCT Internal Reports Frequency: Annual	With the support of the healthcare professionals in the area it was possible to immunize the children in the community, reducing the risks of health problems.
			SIA15	# laboratory tests done in REDD+ project-supported facilities	Western community: -A total of 16,160 laboratory tests were done (2017=4,622; 2018=4,102; 2019=3,545; 2020=3,891)	Outcome	MWCT Internal Reports Frequency: Annual	MWCT employed healthcare staff to ensure that the health program was able to fully function, supporting several dispensaries and supplied the local communities with medical equipment and essential drugs. This support has allow the community to have access to vaccines, medical treatment and laboratory tests in the health facilities and with the mobile clinics.
			SIA16	Proportion of household income used for health purposes	Eastern and Western communities: On average a household spent between 0-5000KES per year on medical care (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	The support on healthcare staff and health related activities should reduce the household income used for health purposes, however, more data is required and take into account the years with the Covid-19 conditions.
Food security	Sustainable agricultural intensification	Increase agricultural yields in 100 households by 25% by 2021	SIA17	# community members trained on improved agricultural techniques	Around 10 people received various trainings in sustainable farming. The aim of those trainings were to demonstrate the alternative method to usual practices with the long term benefits, however, no REDD+ funds were used for this activity.	Output	Indicator not measured during this verification period.	Indicator not measured during this verification period.
			SIA18	# farms incorporating improved agricultural methods	Western community: -1 acre of organic farm was established in KUKU as a pilot project that serve to validate the sustainable farming framework and act as an educational source for others to attain. The organic farm was established on 2019 - with the first harvest obtained in middle of 2020.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Organic farms could be a potential strategy to coup against food scarcity. Therefore, by having a pilot, it was possible to know which species are able to be suitable crops for the area, and harvested. This could bring a huge positive impact on the communities that depend on crops.
			SIA19	Level of productivity from farms with improved methods	Western community: The farm supplies various fully organic vegetables throughout the season 3 (July-September) and 4 (October-December) of 2020, however it is spectect to produce food every season (January-march, april-june, july-september).	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	More data and seasons are required to assess the levels of productivity from organic farms and its impacts in the community.
			SIA20	# hunger months at household level	Eastern and Western communities: -On average a family may have limited food acces for 3/4 months per year (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Impact	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	With the implementation of organic farms and improvement on farming methods it is spected that the communities could have access to food every year, nevertheless, more data is required to assess the impacts.
			SIA21	# trees planted & surviving (3yrs) on communal areas	Eastern community: -Each school were planting trees withing school territory as part of 4k club movement promoted by the government (3,000 seedlings). See MR section 2.2.1.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Restoring and promoting tree growing withing school territory benefited the children, improved soil conditions, and will provide shade among other benefits in school areas which are very dusty and open spaces.
			SIA22	# trees planted & surviving on individual farms	Western community: -2000+ trees planted within Olpusare Spring.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	The trees planted within Olpusare Spring will reduce the erosion and sedimentation, also reduce the degradation of the area. The Chyulu Wildernes Camp was build in the area, and now the water source is an important place for wildlife, improved the water security of the community and is providing income for community members.
			SIA23	# Soil & Land Management activities on farms and grazing areas	Justdiggit project: Activity implemented without the use of REDD+ funds.	Outcome	Indicator not measured during this verification period.	Indicator not measured during this verification period.

Community Indicators								Gold Level
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for Data Collection	(Positive / Negative) Impacts on Poorer households individuals and other disadvantaged groups including women
	Improved water provision	Help improve water access to at least 100 households across the Project Area by 2021	SIA24	# new or improved water harvesting initiatives implemented	Eastern community: -17 water tanks damaged by animals were replaced. 6 schools were provided with water tanks and water catchment system. 1 water point was refurbished and made operational	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Water scarcity is one of the risks of the area due to the changes in climate. By providing water tanks and water catchment systems in schools and in the communities, people can count with water sources from rains.
			SIA25	# km to nearest water points for household	Eastern and Western communities: -On average a nearest water point is 6.5 km (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	On Mbirikani Group Ranch the project has funded a new water point, troughs, plumbing, and special guards to provide security at water points. These benefits improve water access and security for families and their livestock and support adaptation to climate change.
			SIA26	# water sources for household use	Eastern and Western communities: -5 (rain water, dams/pounds, rivers/streams, boreholes, pipes)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	This information is relevant to understand the water consumption and water supply needs to develop strategies and alternatives to the households. The community have been benefited with the installation of water tanks, planted trees in springs and the construction of water points.
			SIA27	# water sources for agricultural use	Eastern and Western communities: -5 (irrigation, harvesting water, dams/pounds, boreholes, rivers)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	This information is relevant to understand the water consumption and water supply needs to develop strategies and alternatives to the households. The community have been benefited with the installation of water tanks, planted trees in springs and the construction of water points.
			SIA28	Amount of water levels/flow from major catchment(s)	This activity has not been implemented yet due to resources and prioritization.	Impact	Indicator not measured during this verification period.	Indicator not measured during this verification period.
Education	Improved education infrastructure		SIA29	# primary & secondary schools in the area	Western community: Mbirikani - 2 Secondary, 14 Primary, Rombo - 4 secondary, 7 primary Kuku - 3 secondary, 19 primary Eastern community: South Kibwezi - 27 secondary, 84 primary North Kibwezi - 10 secondary, 36 primary	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	Information collected on primary and secondary schools in the area will be used to elaborate and promote actions in order to improve the actual situation where families have difficulties to send their children to the school due to the long distances.
			SIA30	# km to nearest primary & secondary schools	Eastern and Western communities: 27% of the people from the survey expressed that it is difficult or very difficult to access the school. (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	Information collected on primary and secondary schools in the area will be used to elaborate and promote actions in order to improve the actual situation where families have difficulties to send their children to the school due to the long distances.
			SIA31	# schools built, renovated or supplied with furniture	Western community: 1 school with animal proof fences, 1 school with construction of staff quarter, 2 schools with latrines, 1 school electrical renovation.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	At one school in the project area teachers were facing long commutes to reach their schools. The project has funded the building of new teacher accommodation on the school compound so that teachers can avoid these journeys and spend more time with students, generating positive impacts on the communities.
	Better teaching standards		SIA32	# teachers employed or incentivised	Western community: 8 teachers were hired and still employed to date. 6 teachers were provided with staff accommodation on the school premises. In total 61 teachers were incentivised with payments of the salaries, improvements in the constructions and accommodations of the schools, provision of electricity, fencing of school, bringing school cook, cleaners.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	By providing support to teacher the project is benefiting the community, reducing the high number of teacher - students ratio (1 teacher to 40-50 students), and supporting also the teachers in terms of accommodation and better conditions to do their labor.
			SIA33	Average student:teacher ratios	Eastern and Western communities: 1 teacher to 40-50 students	Outcome	MWCT and Big Life education records.	Information collected will be useful to have a baseline and improve the actual conditions of student:teacher ratios.
			SIA34	School performance in national exams	Not information available during this monitoring period	Impact	Indicator not measured during this verification period.	Indicator not measured during this verification period.
	Positive attitudes towards education		SIA35	# education-related sensitisation meetings held	Not information available during this monitoring period	Output	Indicator not measured during this verification period.	Indicator not measured during this verification period.

Community Indicators								Gold Level
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for Data Collection	(Positive / Negative) Impacts on Poorer households individuals and other disadvantaged groups including women
			SIA36	# students and amount spent on bursaries	Eastern community: -151 bursaries in 2020 Western community: -624 bursaries in 2020 For a total of - \$120,000 in both communities.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	The communities and schools were supported with bursaries, including approximately even numbers of boys and girls, encouraging specially girls to assist to school. This has a positive impact on the education of the community.
		Reduce number of school-age pupils not in school due to fees by 25% by 2021	SIA37	# school-age students not in school due to fees	Eastern and Western communities: From household survey 15% indicated that one of more members are not attending school due to the school fee (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	This information is relevant to understand the needs of support the community with bursaries and better conditions of schools. The communities have been benefited with bursaries for school fees reducing the gap of students not attending school due to fees.
			SIA38	# school-age girls not in school for non-money related issues	Eastern and Western communities: A total of 117 kids are not attending schools for nonmoney related issues. 53 of them are girls (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	By improving the conditions of the schools, providing bursaries and supporting teachers the project aims to increase the participation of the kids in schools. On the other hand, raising awareness and promoting female education is important for the project in order to increase the participation of girls in schools. This will generate positive impacts in the education of the community.
			SIA39	Highest level of education attained in household	Eastern and Western communities From a total of 326 responses, the level of education attained was: no schooling 112, Primary 125, secondary 69, College/University 20 (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	The project is supporting activities to provide more education to the children of the community in order to offers them improved long-term future life opportunities.
	Positive attitudes towards wildlife conservation		SIA40	# awareness & sensitisation meetings held	Western community: 15 community sensitisations meetings in Mbirikani, 30 leader's meetings with KFS Eastern and Western communities: around 20 community outreaches were delivered by Partners across project area to educate community on REDD+ development, positive attitus and fire	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.	The project is supporting initiatives such as the expansion of tree nurseries and tree planting, which is a focus of KFS, particularly with the eastern small scale agriculture communities. The aim is to improve the productivity, sustainability and resilience of subsistence farming, particularly in the face of the impacts of climate change. For the pastoral communities, Big Life and MWCT are working with the Maasai to implement more sustainable livestock management and rangeland restoration. The project partners are working on an integrated approach to assist the communities to adopt more sustainable management practices, including rotational grazing, breed improvement and improved husbandry, rangeland restoration, and financial incentives for herd size reduction.
			SIA41	# households with positive views towards wildlife & wildlife conservation	Eastern and Western communities: 72% of responses from household survey expressed as they like the wildlife (See Findings\FirstRound\Community_Monitoring Plan\SIA Analysis_020221 Household Survey)	Impact	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).	The project is generating positive attitudes in the community towards wildlife and wildlife conservation by showing the importance of conserving the ecosystems and the sustainable use of natural resources. The community has been benefited with the resources generetad by the carbon project in terms of education, poverty reduction, creation of jobs and alternative income generating activities.

ANNEX II. List of Biodiversity indicators, results and methods.

Biodiversity Indicators							
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for data collection
Ecosystem improvement	Reduced logging	Reduce illegal logging and charcoal production in Project Area by 25% by 2021	BIA01	# log heaps/firewood piles	Data not collected consistently during this verification period. RCHP is working on a standard way to collect this data and reports.	Outcome	Indicator not measured during this verification period
			BIA02	# wood-harvesting/logging incidents	Four incidents of wood harvesting involving sandalwood in proximity of CHNP.	Outcome	MWCT Reports and KWS reports. Frequency: Annual reports.
			BIA03	# poles/wood posts	Data not collected consistently during this verification period. RCHP is working on a standard way to collect this data and reports.	Outcome	Indicator not measured during this verification period
			BIA04	# kilns recorded	47 Kilns destroyed	Outcome	MWCT Reports and KWS reports. Frequency: Annual reports.
	Reduced encroachment & illegal grazing	Reduce encroachment and illegal grazing in National Parks by 50% by 2021	BIA05	# arrests of loggers and charcoalers	12 people arrested, 6 for charcoal burning and 6 for sandalwood harvesting: Jul-17 Charcoal burning in Rombo, 1 suspect arrested; December-17 sandalwood harvesting CHNP, 1 suspect arrested; February-17 charcoal burning in Inkisanjani, 1 person arrested; May-17 1 person Samai charcoal, 1 suspect arrested; May-17 1 person Samai charcoal, 1 suspect arrested; April-18 Sandalwood harvesting, 2 suspects arrested; October-18 Charcoal burning inkisanjani, 1 suspect arrested; May-19 charcoal in Inkisanjani, 1 person arrested; February-20 Sandalwood harvesting CHNP, 3 suspects.	Outcome	MWCT reports. KWS reports. Annual reports
			BIA06	# charcoal bags recorded	47 Kilns destroyed and 9.5 charcoal bags confiscated	Outcome	MWCT Reports and KWS reports. Frequency: Annual reports.
			BIA07	# alternative energy sources tested/introduced e.g., solar, eco-charcoal	Activity not implemented yet due to lack of resources.	Output	Indicator not measured during this verification period
			BIA08	# fuel-efficient stoves tested/introduced	Activity not implemented yet due to lack of resources.	Output	Indicator not measured during this verification period
			BIA09	# (or acreage) of encroachment incidents for settlement or agriculture in Project Area	10,000 acre parcel by the Mikululo Ranching (Direct Agricultural) Co. Ltd. (See section 2.5.3 Property Rights Protection).	Outcome	KWS report and Court information about the case.
			BIA10	# of significant fires recorded	Section 3.2.2.3 of the Monitoring Report contains the information regarding fires.	Outcome	Fire Analysis document
			BIA11	# acreage burnt	Section 3.2.2.3 of the Monitoring Report contains the information regarding fires.	Outcome	Fire Analysis document
			BIA12	# illegal livestock confiscated/driven out in the National Parks	Data not collected consistently during this verification period. RCHP is working on a standard way to collect this data and reports.	Outcome	Indicator not measured during this verification period
			BIA13	# illegal grazing incidents	Data not collected consistently during this verification period. RCHP is working on a standard way to collect this data and reports.	Outcome	Indicator not measured during this verification period
			BIA14	# arrests made for illegal grazing in the National Parks	Data not collected consistently during this verification period. RCHP is working on a standard way to collect this data and reports.	Outcome	Indicator not measured during this verification period
	Improved livestock husbandry		BIA15	# farmers trained & practicing improved husbandry	Constructed 4 fixed cattle crushes to aid the local community in spraying their livestock. Developed 3 pilot grazing plans in Kuku Group Ranches covering Kuku zone (9,748 hectares), Otiasika zone (11,690 hectares) and Itlilal zone (14,171 hectares) MWCT facilitated a two-day exchange trip and grazing management training workshop at the Mara Training Centre in the Enonkishu Conservancy, Mara. The training was attended by 16 Kuku Group Ranch members & Group Ranch Officials and 3 Rombo Group Ranch Officials (Q2-2017)	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA16	# & diversity of legitimate livestock within ranches	Livestock diversity is mainly cows and goats. In the East households had between 0 and 10 cows, and 0 and 15 goats, whereas in the West, many survey participants had upwards of 60 cows and 75 goats. (See MR section 4.3.2 Community Monitoring Plan Results).	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).
	Communal grazing areas retained		BIA17	# land use plans developed, including holistic grazing management plans	During 2019 and 2020, MWCT developed the Dry Season Rangeland Survey of Kuku Group Ranch. The rangeland monitoring component was developed to be able to establish and monitor the condition of the rangeland and assess forage availability for both livestock and wildlife, so that effective integrated wildlife and livestock management planning can occur.	Output	Mbirikani Group Ranch, Rombo Group Ranch, Kuku Area Ranch reports.

Biodiversity Indicators							
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for data collection
			BIA18	# pilot programmes initiated towards improved range management	Continued support of 5 grass seedbanks, 4 bunds projects, rangeland monitoring, and tree planting of approximately 3000 trees.	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA19	# individual farms fenced or size of areas fenced off	Boma use was near ubiquitous, and further 89.8% of the families who owned livestock used reinforced bomas to protect livestock animals overnight, of which the majority (66.8% of those using bomas) were constructed of thorn-bushes. A sizeable proportion were also constructed of timber (11.6%) and iron sheets (17.7%). (See Findings/FirstRound/Community_Monitoring Plan/SIA Analysis_020221 Household Survey).	Outcome	Household Survey for the period of the verification (2017 - 2020). Frequency: Once per verification (Two years for the data collection).
	Improved wildlife habitats	Construct/improve 5 water points for wildlife and livestock within Project Area by 2021	BIA20	# new waterpoints for wildlife	Three water points installed in Mbirikani, one water point in Mzima springs	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA21	# wildlife using new waterpoints	Photo evidence of wildlife using the new waterpoints. It is not possible to have a total number.	Outcome	Camera traps and rangers patrolling information. REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA22	# degraded sites identified for inclusion into a restoration programme (document)	Justdigdig Project: Activity implemented without the use of REDD+ Funds.	Output	Indicator not measured during this verification period
		Plant & care for 1000 indigenous tree seedlings in degraded areas annually	BIA23	# trees planted & surviving (3rd year) in Project Area	40,000 seedlings in 40 ha in degraded wetlands and riparian areas. 3,000 seedlings in schools and public institutions. See MR section 2.2.1.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA24	# seedlings and saplings within Project Area	40,000 seedlings in 40 ha in degraded wetlands and riparian areas. 3,000 seedlings in schools and public institutions. See MR section 2.2.1.	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA25	Abundance and diversity of trees & shrubs	See MR section 5.3.2.1 Plant Diversity	Impact	Vegetation analysis "Carbon biomass (Botanical) Inventory Report.
Biodiversity improvement	Reduced poaching	Reduce poaching for bushmeat by 25% by 2021	BIA26	# rangers employed	See MR section 5.3.2.1 Table 18.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA27	# active outposts/observation posts	Every ranger post act as observation posts as every ranger is patrolling across designated sector. 16 Mbirikani, 13 in Kuku.	Outcome	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.

Biodiversity Indicators							
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for data collection
			BIA28	# patrols done (coverage)	See MR section 5.3.2.1 Table 18.	Output	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA29	# patrol distances	See MR section 5.3.2.1 Table 18.	Output	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA30	# snares recovered	See MR section 5.3.2.1. A total of 1,306 snares were recovered	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA31	# bushmeat poachers arrested	See MR section 5.3.2.3 Table 22. A total of 93 arrests.	Outcome	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
		Reduce commercial poaching by 10% by 2021	BIA32	# commercial poachers arrested	See MR section 5.3.2.3 Table 22. A total of 93 arrests.	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA33	# animals injured or killed (carcasses)	See MR section 5.3.2.3 Table 22. A total of 55 wildlife killed	Impact	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
	Reduced human-wildlife conflicts	Reduce the number of human-wildlife conflict incidents by 25% by 2021	BIA34	# human-wildlife conflict incidents (human injury/fatality)	3 People killed by elephants, 3 others injured by giraffe, lion and elephant.	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
			BIA35	# human-wildlife conflict incidents (crops, livestock, property)	See MR section 5.3.2.5 Table 24. A total of 163 crop raidings were reported and 4497 livestock incidents were reported	Outcome	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.

Biodiversity Indicators																											
Focal Issue	Key results	SMART Objective	Indicator Code	Indicator	Results	Indicator type	Methodology for data collection																				
			BIA36	Amount of compensation paid out for wildlife-related losses	See MR section 5.3.2.5 Table 23. Total compensation BLF and MWCT Wildlife Pays 2017 - 2020 <table><tr><td></td><td>2017</td><td>2018</td><td>2019</td><td>2020</td></tr><tr><td>BLF</td><td>9,001,600</td><td>7,718,000</td><td>8,601,900</td><td>9,351,265</td></tr><tr><td>MWCT (Wildlife Pays)</td><td>7,987,050</td><td>7,718,000</td><td>8,508,100</td><td>7,323,400</td></tr><tr><td>Total (KES)</td><td>16,990,667</td><td>15,438,018</td><td>17,112,019</td><td>16,676,685</td></tr></table>		2017	2018	2019	2020	BLF	9,001,600	7,718,000	8,601,900	9,351,265	MWCT (Wildlife Pays)	7,987,050	7,718,000	8,508,100	7,323,400	Total (KES)	16,990,667	15,438,018	17,112,019	16,676,685	Outcome	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.
	2017	2018	2019	2020																							
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Total (KES)	16,990,667	15,438,018	17,112,019	16,676,685																							
			BIA37	# retaliatory killings of wildlife by the local community	See MR section 5.3.2.5 Table 15. A total of 95 retaliatory killings were reported	Outcome	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.																				
	Enhanced status of wildlife, especially HCV species		BIA38	Presence, abundance and diversity of wildlife in the Project Area	See MR section 5.3.2.2, 5.3.2.3 and 5.3.2.4	Impact	REDD+ Project Office Records - Internal Reports Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.																				
			BIA39	Wildlife distribution & evidence of movement between National Parks & Project ranches	See MR section 5.3.2.3 and 5.3.2.4	Impact	REDD+ Project Office Records - Internal Reports. Frequency: Annual, with activities performed quarterly, or monthly. Monthly reports elaborated to the directors of the project.																				