

Kulera Landscape REDD+ Project for Co-managed Protected Areas in Malawi



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Project Title	Kulera Landscape REDD+ Project for Co-managed Protected Areas in Malawi
Project ID	1163
Version	V2-0
Report ID	
Date of Issue	21 December 2020
Project Location	Malawi
Project Proponent(s)	Department of Parks and Wildlife (DNPW) Nyika-Vwaza Association (NVA) Nkhotakota Wildlife Reserve Association (NAWIRA), and Terra Terra Global Capital LLC info@terraglobalcapital.com kulera@terraglobalcapital.com
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Validation/Verification Body	SCS Global 2000 Powell St #600, Emeryville, CA 94608
GHG Accounting/ Crediting Period	VCS and CCB Accounting Period Oct 1 2009 to Sep 30 2039
Monitoring Period of this Report	VCS and CCB Accounting Period Oct 1 2013 to Sep 30 2019
History of CCB Status	CCB Validation 2014 CCB 1 st Verification (concurrent with VCS) 2014
Gold Level Criteria	Community, Biodiversity and Climate Adaption Gold

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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

Outcome or Impact	Achievements during the Monitoring Period	Section	Achievements during the Project Lifetime
Increased economic benefits derived from sustainable natural resource management and conservation (S1)	388% Increase in average income from main food crops - USD 2.7 million in carbon revenue to finance program activities	4.1.1	Since the Validation and first Verification were conducted concurrently, these metrics for MR1 established the baseline, therefore all performance is measured between MR1 and MR2.
Number of farmers, processors & others who have adopted new technologies or management practices (S6)	74% adopting soil fertility 78% adopting water/soil conservation 48% adopting agroforestry systems 29% adopting farm feed	4.1.1	Since the Validation and first Verification were conducted concurrently, these metrics for MR1 established the baseline, therefore all performance is measured between MR1 and MR2.
Number of households with ownership/access to small livestock for nutrition and income	82% household with livestock 10% decrease in the % of people with livestock	4.1.1	Since the Validation and first Verification were conducted concurrently, these metrics for MR1 established the baseline, therefore all performance is measured between MR1 and MR2.
Number (and trend) of Trigger found present in the Project Areas	6 Trigger Species present in Project Area	5.4.1	Since the Validation and first Verification were conducted concurrently, these metrics for MR1 established the baseline, therefore all performance is measured between MR1 and MR2.

1.2 Standardized Benefit Metrics

Sec.	Metric	Achievement During Monitoring Period	Section Ref.	Achievement During Project Life
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	This project generated removals through tree planting and improve woodland management in the Project Zone, but these are not quantified at this time.	N/A	This project generated removals through tree planting and improve woodland management, but these are not quantified at this time.
	Net estimated emission reductions in the project area, measured against the without-project scenario	2,273,585 NERs	3.2.4	1,154,957 NERs MR1 2,273,585 NERs MR2 3,313,046 NERs Total
Forest Cover	For REDD [1] projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	12,607	3.2.4	21,026
	For ARR [2] projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	N/A While the Project promotes woodlots planting these areas are not quantified under VCS for removals at this time.	3.2.4	N/A While the Project promotes woodlots planting these areas are not quantified for removals at this time.

Sec.	Metric	Achievement During Monitoring Period	Section Ref.	Achievement During Project Life
Forest Management	Number of hectares of existing production forest land in which IFM practices have occurred because of the project's activities, measured against the without-project scenario	N/A Which the project implements improved woodland management in the Project Zone it does not track these spatially.	N/A	N/A Which the project implements improved woodland management in the Project Zone it does not track these spatially.
	Number of hectares of non-forest land in which improved land management has occurred because of the project's activities, measured against the without-project scenario	N/A	N/A	N/A
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	Awareness Training 48,170, Technical Training 29,854, Outreach/In-reach 15342 Total 93,366	4.1.1	121,317
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities	Awareness Training 23,866, Technical Training 10,729, Outreach/In-reach 6,397 = Total Women and Girls 40,992	4.1.1	52,647

Sec.	Metric	Achievement During Monitoring Period	Section Ref.	Achievement During Project Life
Employment	Total number of people employed in of project activities, ^[1] expressed as number of full-time employees ^[2]	Paid Positions (Total Days, FTE) Association Director, Staff and Trustees 10,800 46.75 Zone NRCs 7,200 31.17 NRCs 31,680 137.14 Community Stipends 15,625 67.64 (does not include solar agents and cookstove FCs)	External reference	Same as MR2
	Number of women employed in project activities, expressed as number of full-time employees	Women are estimated to be 30%	External reference	N/A
Livelihoods	Total number of people with improved livelihoods [3] or income generated as a result of project activities	271,270	4.1.1	271,270
	Number of women with improved livelihoods or income generated as a result of project activities	135,635	4.1.1	135,635
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	N/A - Not a focus of this project	N/A	N/A - Not a focus of this project
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	N/A - Not a focus of this project	N/A	N/A - Not a focus of this project
Education	Total number of people for whom access to, or quality of, education was improved as a result of project activities, measured against the without-project scenario	Increased access to formal education is not promoted, however project communities receive education from trainings reported above	N/A	Increased access to formal education is not promoted, however project communities receive education from trainings reported above

Sec.	Metric	Achievement During Monitoring Period	Section Ref.	Achievement During Project Life
	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	Increased access to formal education is not promoted, however project communities receive education from trainings reported above	N/A	Increased access to formal education is not promoted, however project communities receive education from trainings reported above
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	There was a reported increase in the number of HH using bore holes and piped water during the period (6% and 3% respectively)	5.1.1	Same as MR 2
	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	N/A	N/A	N/A
Well-being	Total number of community members whose well-being was improved because of project activities	Based on the detailed project community impact indicators that are mapped to well-being, the project is improving the wellbeing of the project communities and that in the HHS most respondents reported these impacts. Thus, we believe that all people have improved wellbeing 271,000	4.1.1	271, 270
	Number of women whose well-being was improved because of project activities	135,635	4.1.1	135,635
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation,[1] measured against the without-project scenario	In the Project Area and the Project Zone the hectares of reduced deforestation plus hectares of increased reforestation was 37327 for this monitoring period over the baseline	3.2.4	In the Project Area and the Project Zone the hectares of reduced deforestation plus hectares of increased reforestation was 18413 for this monitoring period over the baseline

Sec.	Metric	Achievement During Monitoring Period	Section Ref.	Achievement During Project Life
	Number of globally Critically Endangered or Endangered species ^[2] benefiting from reduced threats because of project activities, ^[3] measured against the without-project scenario	6 IUCN EN or CR listed species present in Project Area Section and described 5.4.1. Trend % change in the number of trigger species present is described in the Table 30	5.4.1	Same for MR 2

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

The overall goals of the Kulera REDD project are to reduce deforestation and forest degradation in three key protected areas in central and northern Malawi, Nyika National Park, Vwaza Wildlife Reserve, and Nkhotakota Wildlife Reserve, and to improve livelihoods by managing natural resources as an asset base, creating long-term sustainable alternative livelihoods, improving biodiversity and increasing food security. During this monitoring period, the project proponents, the Department of Parks and Wildlife, the Nyika-Vwaza Association (NVA), Nkhotakota Wildlife Reserve Association (NAWIRA), and Terra Global Capital (Terra Global) have been implementing the activities in the Program's long-term implementation plan to deliver climate, social and biodiversity benefits to Malawi and the people living in the Program Zone.

As facilitated by the co-management agreements between Community Associations (NVA and NAWIRA) and the protected area managers, (DNPW and Africa Parks), capacity has been built in the community associations to carry out park management and enforcement activities. The project has also supported several interventions designed to provide alternative income sources, improve food security, and reduce pressures on natural resources.

Project activities implemented during this monitoring period include community capacity building, developing project management institutions, establishing project monitoring systems through participatory methods, strengthening land tenure status and forest governance structures, forest protection through increased patrolling and fencing, fire prevention, reducing fuelwood consumption, sustainable intensification of agriculture and development of local enterprises for diversification of income streams. Project activities implemented during this monitoring period are detailed in Section 6 Project Implementation Information .

The ability to control leakage depends on ensuring that communities have alternative access to the fuel needed to cook, have land and inputs to grow food for their families and have income from sources other than through illegal activities. To manage this risk, the Program promotes cookstoves and planting of fuel woodlots, crop diversification/conservation agriculture, and income generating opportunities. The income generation activities promoting include community stipends for implementing Program work (patrolling, boundaries/fire breaks, community association management), commissions for solar sales, NTPF for local sale, beekeeping, etc. These each reduce the risk of leakage through addressing drivers of deforestation. To address non-permanence risk, the Program conducts an extensive outreach to the communities in the Program Zone covering the risk of fires and importance of conservation. The Program implements fire prevention measures and equitably shares benefits across the full scope of villages in the Program Zone.

Net emission reductions and VCUs of the Project are demonstrated in Table 25. Net Emission Reductions and VCUs by Monitoring Period in Section 3.2.4

The supporting organizations that changed during this monitoring period are a 1) reduced role for Total LandCare and 2) African Parks was contracted by the Malawi government to manage protection in the Nkhotakota Wildlife Reserve. Total LandCare remains a valuable partner to the Program and provides support for some aspects of local administration related to large procurements provides specialize technical support for specific field program such as cookstoves and other trainings. Since 2015, the management of Nkhotakota Wildlife Reserve has been

conducted by African Parks, who together under a co-management agreement protect the forests, wildlife and provide benefits to the surrounding communities of NAWIRA.

This Monitoring Report is to be verified under CCB Version 3.1 and VCS Version 4.0.

2.1.2 Project Category and Activity Type

This project is an Agriculture, Forestry and Other Land Use (AFOLU) project under the Reducing Emissions from Deforestation and Degradation (REDD) project category. Specifically, the project is of the Avoided Unplanned Mosaic Deforestation and Degradation (AUMDD) typology.

This project is a grouped project, and during this monitoring period it started to implement activities in two new areas that were not included in the 5km of Nkhotakota Wildlife Reserve. These will be added in the next verification but will include vintages from this period.

2.1.3 Project Proponent(s)

Kulera REDD Project Proponents are the Department of Parks and Wildlife (DNPW), the Nyika-Vwaza Association (NVA), the Nkhotakota Wildlife Reserve Association (NAWIRA), and Terra Global, who will work with their implementation partners to develop, implement and monitor the Project. Detailed roles and responsibilities may be found in the REDD+ Agreement as listed in Section 1.13.3 of the VCS PD.

The Department of Parks and Wildlife (DNPW) is responsible for the management of the Project Areas.

Organization name	Department of Parks and Wildlife, Government of Malawi
Contact person	Brighton K Kumchedwa
Title	Director
Address	Department of Parks and Wildlife
Telephone	265 1 759 832/ 265 888868557/ 265 999868557
Email	dpw@wildlifemw.net , bright.kumchedwa@gmail.com

The Nkhotakota Wildlife Reserve Association (NAWIRA) is the Community Associations that represents the villages adjacent in the Project Zone around the Nkhotakota Wildlife Reserve.

Organization name	Nkhotakota Wildlife Reserve Association (NAWIRA), Malawi
Contact person	James Sadrack
Title	Nkhotakota Wildlife Reserve Association Chairperson
Address	PO Box 47 Nkhotakota, Malawi
Telephone	+265999778174

Email	nawira.kk@gmail.com
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The Nyika-Vwaza Association (NVA) is the Community Associations that represents the villages adjacent in the Project Zone around the Nyika National Park, Vwaza Wildlife Reserve.

Organization name	Nyika-Vwaza Association, Malawi
Contact person	Duncan Chiza Mkandawire
Title	Nyika-Vwaza Association Chair
Address	Private Bag 6, Rumphi, Malawi
Telephone	265 884 122 336
Email	chizaduncanmandawire@yahoo.com

Terra Global is a project proponent as an investor in the project and supporting the registration, issuance and marketing of emission reductions. Terra Global also acts as an implementing partner for the development and on-going management of the emission reductions generated under the Project (see Section 1.4.2 of the VCS PD). Terra Global leads trust fund management and carbon development and marketing.

Organization name	Terra Global Capital, USA
Contact person	Leslie L. Durschinger
Title	Founder, Managing Director
Address	325 27 th Street, Unit 745 Oakland, CA 94612
Telephone	+1 415 215 5941
Email	Leslie.durschinger@terraglobalcapital.com
Website	http://www.terraglobalcapital.com

2.1.4 Other Entities Involved in the Project

Total LandCare (TLC) has extensive experience designing and implementing community-based forest management and agricultural projects and environmental sustainability in rural Malawi. TLC has contributed extensively to Malawi's Agriculture Development Program (ADP) and has been widely consulted by the World Bank and the Norwegian Government in formulating their strategic country frameworks.

Total LandCare provides specialized technical support for specific community-based natural resource management components, cookstove implementation, and local administration support where needed.

Organization name	Total LandCare
Role in the project	Project identification, design, implementation of REDD+ activities and livelihoods programs
Contact person	Trent Bunderson
Title	Executive Director
Address	Total LandCare P.O Box 2440, Lilongwe, Malawi
Telephone	265 999 838 072
Email	trentbunderson@yahoo.com
Website	http://www.totalandcare.org

2.1.5 Project Start Date (G1.9)

The project start date is **1 October 2009**.

2.1.6 Project Crediting Period (G1.9)

The project's initial crediting period is 30 years, starting 1 October 2009 and ending 30 September 2039.

2.1.7 Project Location

The project location has the same as the Project Document and includes the same Project Activity Instances. It is located in three different Protected Areas in the Northern and Central Regions in Malawi: Nyika National Park, Vwaza Marsh Wildlife Reserve, and Nkhotakota Wildlife Reserve (see Figure 1. al location of Kulera Biodiversity Project areas in Malawi.). Nyika National Park (NP) occupies a tract of mountain plateau and associated hills and escarpments in northern Malawi in an area covering 3,200km² and bordering Chitipa, Karonga, and Rumphi Districts whilst the western boundary borders Zambia. It is the largest national park in Malawi and is centered upon 10°33'S, 33°50'E. Vwaza Wildlife Reserve occupies a tract of diverse terrain in northern Malawi covering 978 km² and it is centered upon 11° 00'S, 33° 28' E. The reserve comprises a region of hills and pediments in the east, and a region of wetland and alluvium in the west. The reserve lies partly in Rumphi and partly in Mzimba District, whilst its western and part of its northern boundary coincides with the Malawi – Zambia border. Nkhotakota Wildlife Reserve is the oldest and largest wildlife reserve covering 1082 km² and is centered upon 12°55'00" S, 34°18'00" E. It is located in the Central Region of Malawi. Most of the reserve is comprised of miombo woodlands with large patches of grasses bordering wetlands.

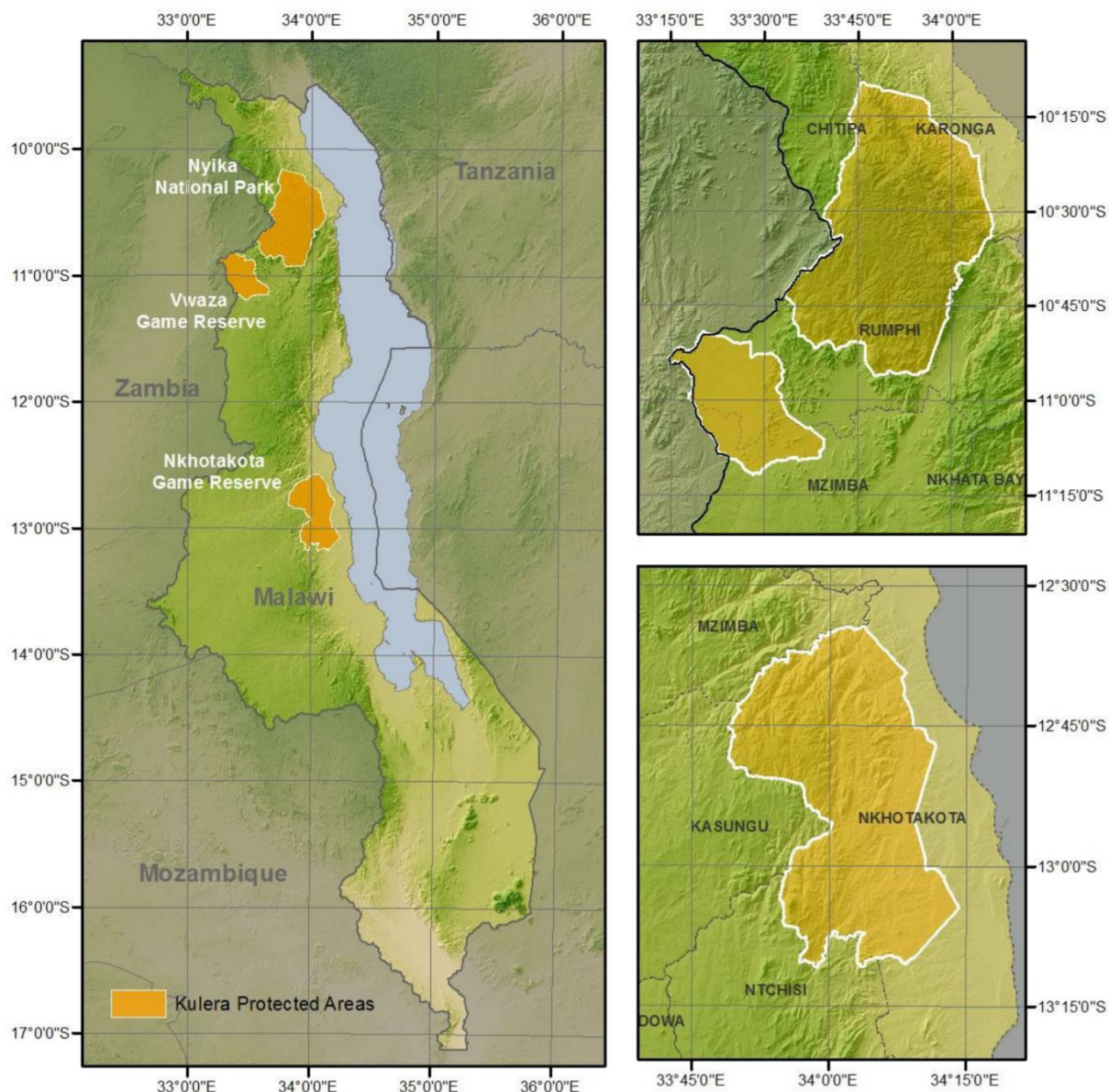


Figure 1. Project location of Kulera Biodiversity Project areas in Malawi.

2.1.7.1 Nyika National Park

The Nyika National Park is located on a high dissected plateau that consists of rolling plains with rocky outcrops, with an elevation ranging from 600-2600 m asl. Nyika is in an area of relatively high rainfall (see VCS PD). The name “nyika” means “where the water comes from,” and it is among a number of Protected Areas established to secure water sources. It is an important headwater area and is the source of tributary streams that feed the South Rukuru River. Nyika National Park was established as a reserve in 1948. In order to protect several key water catchment areas, the park boundary was later extended in 1978 (Department of Parks and Wildlife 2004a).

Vegetation consists of montane grasslands and evergreen forests with patches of relic montane evergreen forests. Predominantly, expansive rolling grasslands are interspersed with evergreen riverine forests along waterways. On the escarpment and at lower elevations, the vegetation is mainly deciduous miombo woodland (*Brachystegia-Julbernardia spp*).

Most streams and rivers are perennial, and stream flow characteristics are ascribed to high overall rainfall with some rain throughout the year, low evaporation (cloudiness and low ambient temperature), good vegetation cover to promote infiltration, and deep, freely draining soils. However, a recent survey of river conditions revealed that rapid bank erosion is occurring in some places. River channels are becoming wider and shallower, and silt is being deposited over gravel beds (Environmental Affairs Department 2006). Soils are of two types: either deep, well drained, red and fine textured with high levels of acidity, or moderately deep to shallow, well drained, medium to fine textured, and stony (Mawaya et al. 2011).

Nyika National Park is a biodiversity hotspot, important for both plants and mammals. According to the GOM Biodiversity Strategy, it has the highest number of large mammals and the highest concentration of Roan Antelopes on the African continent. Important wildlife species include: zebra, roan antelope, eland, reedbuck, bushbuck, common duiker, bush pig, leopard, hyena, and a small population of elephants. It also supports the world's largest breeding population of blue swallow (*Hirundo atrocaerulea*) and has 215 orchid species. Farmers report continued depredations of their crops by wildlife from the park, particularly monkeys, baboons, wild pigs, elephant, and buffalo (Department of Parks and Wildlife 2004a).

Communities around Nyika practice subsistence farming consisting mainly of maize, beans, cassava, and groundnuts. Cash crops are tobacco, cotton and, on a limited scale, coffee in the Nchenachena area east of Nyika. There is also high potential for honey production and collection of termites and wild mushrooms, which are abundant during the rainy season. Livestock includes cattle, goats and sheep but the tsetse fly found around the southwestern borders poses a risk of trypanosomiasis.

2.1.7.2 Vwaza Wildlife Reserve

The Vwaza Wildlife Reserve, at an elevation of 1100-1600 m asl, consists of flat plains with dotted hills and marshy wetlands fed by streams arising on the Nyika plateau. The South Rukuru River on the southern boundary drains into Lake Kazuni, which is located at the southeastern tip before it turns east. The lowest point is at Lake Kazuni (1,082 m) in the southeast, and the highest point is 1,660 m at Mahobe Hill in the northeast. Vwaza Marsh was declared a protected area in 1941 and expanded to its current size in 1984 (DNPW 2004b).

The vegetation is a mosaic of open to dense woodland dominated by areas of *Brachystegia*, *AcaciaBauhinia-Combretum*, and mopane woodlands, with wetland grasslands and marshes in the central lowlands. Soils are very deep, brown, and medium textured, with variable drainage (well drained to poor). Wildlife species include buffalo, elephants, roan antelope, greater kudu, Liechtenstein's hartebeest, eland, and impala. Lake Kazuni supports large populations of hippopotami and crocodiles.

Communities around Nyika practices subsistence farming consisting mainly of maize, beans, cassava, and groundnuts.

2.1.7.3 Nkhotakota Wildlife Reserve

The Nkhotakota Wildlife Reserve, found at an elevation ranging from 500-1,700 m asl, consists of rolling to steeply dissected and undulating topography, which is mountainous in the west, where

Chipata hill rises to a height of about 1,700 m. The wildlife reserve is an important catchment area for Lake Malawi because three major rivers (Bua, Dwangwa and Kaombe) pass through it.

The vegetation is comprised of dense *Brachystegia* woodland and riverine forests, interspersed with occasional patches of tall *Hyparrhenia-Andropogon* grasses in the low-mid altitudes, and dense evergreen forest in the uppermost elevations. Soils are moderately deep to deep, well drained, coarse to medium textured, and occasionally stony with often a skeletal subsoil.

Wildlife species include lion, elephant, buffalo, leopard, zebra, hippo, crocodile, warthog, kudu, roan antelope, sable antelope, eight other species of antelope, and over 160 species of birds. The Bua River is a breeding haven for two endemic fish species: Mpasa (lake salmon) and Sanjika.

The human population around the reserve practices subsistence farming of cassava, maize, groundnuts, beans, and rice. They also fish in the Bua River and in Lakes Chikukutu & Malawi. Cash crops grown here are rice, cotton and tobacco. In addition, termites and wild mushrooms are harvested and honey is produced. Livestock include cattle, goats, pigs, poultry, but numbers are low and there is a high risk of trypanosomiasis due to the tsetse fly.

2.1.8 Title and Reference of Methodology

The VM0006 Methodology for Carbon Accounting for Mosaic and Landscape-scale REDD Projects, version v2.2, "Carbon Accounting for Mosaic and Landscape-scale REDD+ Projects" is the methodology was used for this project. The Project Area meets all applicability criteria of the methodology.

2.1.9 Other Programs (G5.9)

This Project is not registered under any other ETS, environmental credit scheme or any other GHG program.

2.1.10 Sustainable Development

The Kulera REDD+ Program strongly delivers on 12 of the 17 Sustainable Development Goals.

Within the 12 SDGs the program delivers superior impact in the following 8 core SDGs:

- 1 - No Poverty
- 2 - Zero Hunger
- 5 - Gender Equality
- 7 - Affordable and Clean Energy
- 8 - Decent Work and Economic Growth
- 13 - Climate Action
- 15 - Life on Land
- 17 - Partnership for Goals

The program also directly impacts the following 4 SDGs:

- 3 - Good Health and Well Being
- 4- Quality Education
- 6 - Clean Water
- 9- Industry, Innovation and Infrastructure

1 - No Poverty

	One of the fundamental goals of the Kulera REDD+ Program is to reduce poverty through conserving biodiversity, demonstrating that development can be a partner to conservation. As most people in the program area live on less than \$1.25 per day, our project actions are structured to improve local livelihoods by facilitating income-generating activities and expansion of non-timber forest products in the area. The communities targeted by the program are dependent on natural resources and rainfed annual crops (the majority being corn). The program supports farmers in using techniques and crops that will help them become more resilient to climate change. Also, by promoting and building capacity in alternative income-streams (e.g. honey, mushrooms, coffee, macadamia, fruit, solar sales), communities gain increased incomes from sustainable forest management and more independence from climate-related shocks and disasters. By encouraging and building capacity in alternative income streams, the Kulera REDD+ program also promotes increased access to financial markets and value-chain links for local producers.
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2 - Zero Hunger

	As most communities in the project area rely on rainfed annual crops, Kulera REDD+'s focus on promoting crop diversification, improved crop varieties and supporting animal husbandry helps create food year-round. In addition, improved agriculture technology transfer helps make communities be more productive and grow more food on less land. The program supports animal husbandry of small-scale livestock of goats, chickens and pigs through community clubs. This provides the protein desperately needed by communities to reduce malnutrition. Most communities in the project area rely on rainfed annual crops, have very low to no income, and often face food scarcity. All inputs in the program support these small-scale farmers in crop diversification, and improved crop varieties. These inputs are helping communities grow more food on a smaller amount of land, increasing their crop productivity and overall incomes. The program supports conservation agriculture, which helps with soil and water conservation as well as reduced fertilizer inputs. Practices such as mulching, crop residue management, manure management, hedgerows, and agroforestry, as well as the use of improved varieties help crops become more resilient to a changing climate.
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5 - Gender Equality

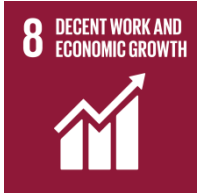
	Within the Community Associations legal frameworks are in place to require at least 30% women involvement in governance within the association bylaws. In both Associations, women are in the Executive Committee. Further when the initial design of the program was developed, social surveys conducted in the region required to include women and under-represented minorities to participate in order to tailor the program activities to promote equality and improve the livelihoods of traditionally underserved groups. The program activities that primarily benefit women include fuel efficient cookstoves to reduce time collecting fuel wood and reduce smoke and promotion of ground nuts and soy which are primarily cultivated by women. In the Kulera GotLights Solar program promoted women sales agents, who were trained to use mobile technology to sell lights on credit and generate incomes from commissions on sales.
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7 - Affordable and Clean Energy

	The Kulera GotLights Solar program brings house-hold solar lights to very rural households. Communities in the area have less than 1% electrification rate and are able to purchase a high-quality solar light on credit. Kulera GotLights Solar Program's business model leverages the governance structures and network established under the program, by selling lights through a community-based network of sales agents. The target market is the ~350,000 communities involved in the Kulera REDD+ Project living in the 10km buffer zone of three protected areas in Northern and Central Region in Malawi. The solar lights reduce in the use of non-renewable batteries and wood fuel for fire for light. Having household solar light promotes income generating activities that can be done at night while conserving forest resources at the edges of three protected areas in Malawi. Women are particularly impacted as there is a reduction in fuelwood collection and households save money by not buying non-renewable batteries. This also reduced waste when flashlights and batteries are improperly disposed of within the countryside.
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8- Decent Work and Economic Growth

	The Kulera Program creates Income Generating Activities (IGAs) such as honey production, mushroom production, sale of solar lights, and production of macadamia nuts. These jobs are designed to increase incomes of individuals, while keeping community members safe and with jobs in and around their
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	forests. These also contribution to SDG indicator 1 – no poverty, but they go beyond this by providing opportunities for next generations to live a new and interesting livelihood with income benefits to stay within their rural village. The Department of Parks and Wildlife provides job opportunities working in the protected areas as guards as well as through their extension and education program on conservation and anti-poaching, Women are employed and paid the same as their men counterparts, and by-laws are in place for workers protection at each of the Community Associations. The salaries are based on a livable fair wage and have provided numerous steady job opportunities for individuals in the region. Community forest workers for the Kulera REDD+ Program follow Standard Operating Procedures for worker safety in the field. Safety procedures help reduce risk of forest workers. The program is based on equal employment rights for all employees, including women, migrants, and underserved minorities. Eco-tourism is promoted through the project, as the communities are near three protected areas. The program is just getting started looking into eco-tourism sites for camping and cultural exchange.
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13 - Climate Action

	The REDD+ Program itself is an integrated strategy/plan which increases the governments and community's ability to adapt to the adverse impacts of climate change, foster climate resilience and create healthy communities. The Kulera program educates community members on systemic and individual ways to implement adaptation, mitigation and teaches safe technology transfer for reducing deforestation and helping create resilient communities. Communities involved in the program understand climate change, and their role in the REDD+ program. The program mobilizes climate finance to fund the on-going program implementation through the monetization of verified emission reductions for climate change mitigation benefits. Given that the Kulera REDD+ Program is the largest and most developed REDD+ program in Malawi, it provides valuable capacity building related to operational and technical components for Malawi national REDD+ program. The Kulera program supports conservation agriculture which helps with soil and water conservation as well as reduced fertilizer inputs. Practices such as mulching, crop residue management, manure management, hedgerows, and agroforestry, as well as the
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	use of improved varieties help crops become more resilient to a changing climate. Protection of existing forests helps reduce mudslides and floods.
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15 - Life on Land

	REDD+ protects forests and the biodiversity and communities they support, providing for conservation and sustainable use of natural resources. REDD+ works to directly reduce deforestation and have healthy communities supported by sustainable landscapes; the program is fundamentally structured to sustainably manage forests and halt deforestation in the region. The Kulera REDD+ works to directly reduce forest degradation and deforestation through finding solutions to drivers and agents of deforestation. The three protected areas in the Kulera Program are found in the highlands and are some of the last natural forested areas in the region. REDD+ works to directly reduce deforestation and have healthy communities supported by sustainable landscapes; the program is fundamentally structured to sustainably manage forests and halt deforestation in the region. Benefit sharing is clearly defined by the Kulera Program where communities are involved in the creation of the program design and how to improve livelihoods through resource conservation. The program is structured to directly transfer the benefits from carbon offset sales into project actions that directly improve the livelihoods and increase opportunities for local stakeholders. Communities targeted by the program act to end poaching by 1) community patrolling to deter poachers from entering the forest 2) Small-scale livestock production to meet the protein needs of the community 3) surrendering of fire arms that would be used for poaching.
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17 - Partnership for Goals

	The Kulera REDD+ program by its very nature is a partnership between the government and the communities under legally recognized co-management. This is a program that applied legally recognized co-management, which is between the Department of Parks and Wildlife and two large Community Associations, together they protect the forests and build livelihoods of the communities in the buffer zone. The program which is large in scale covering 700,000 hectares of protected area and 350,000 people impacts a large of rural poor communities. Through the implementation of the program
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	the partners local and international, government, communities' associations, private companies and NGOs work together to mobilize and share experiences to achieve sustainable development. The Community Associations Chairpersons are very much involved at sharing REDD+ experiences at a national level, providing south-south exchange on informing the Government implementing REDD+ on the ground. The Kulera REDD+ Program is creating business plans to attract private sector that directly support project activities and will be used to gain additional investments 1) wild mushroom production and processing, 2) a honey processing facility, 3) an eco-tourism site. The Kulera REDD+ program has a long partnership with Total LandCare, a local NGO, to procure new technologies such as treadle-pumps and improved crop varieties. The program is supported by several international companies that have through their carbon neutrality pledges by purchasing verified emission reductions which finance the program.
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2.2 Project Implementation Status

2.2.1 Implementation Schedule (G1.9)

The full details of implementation results are included in Section 6.. Below is a list of the high-level management milestones:

Date	Milestone(s) in the project's development and implementation
Oct 2013	2 nd monitoring period started
Jun 2014	Completion of VCS+CCB triple gold validation and 1 st verification with 1 million VCUs
Jul 2015	First carbon sales
July 2015	Africa Parks was contract by DNPW to manage Nkhotakota
July 2015	Collaborative work planning and budget prioritized key activities based on available funds and adopted through consensus of partners
Feb 2016	Bicycles and Motorcycles procured for project mobility
Jun 2016	Hosted large carbon buyer to project
Aug 2016	Completed business plan for revolving solar fund
Sep 2016	Program activities (per workplan) began implementation with through allocation of advances and liquidations to partners

Date	Milestone(s) in the project's development and implementation
Nov 2016	Wholesale order of solar lights places
Feb 2017	Full solar program operationalized with the arrival of solar lights and training
May 2017	Developed first detailed procures for financial management of partners
Jul 2017	Based on available funds, year 2 activities and budgets were updated.
Oct 2017	Updated and standardize travel and per diem policies
Jul 2018	Approval of year 3 budget
Sep 2018	NAWIRA updated co-management plan with Africa Parks
Mar 2019	Legal analysis completed for local REDD+ Entity formation
May 2019	New vehicles (Land Cruisers) procured for DNPW, NVA and NAWIRA
Aug 2019	Additional bicycles procured for DNPW, NVA and NAWIRA
Sep/Oct 2019	Field data training and field collection completed
Sep 2019	2 nd monitoring period ended

2.2.2 Methodology Deviations

2.2.2.1 Deviation – Application of Emission Factors from Last Monitoring Period

During the process of completing the quantification for the emissions reduction during this monitoring period a clerical error was discovered in the application of the discounting factor for one of the emission factors (EVG to BAR) for the Project Document and first Monitoring Report. Inadvertently, the discounting factor of 0.82148 was not multiplied by this transition. Fortunately, there was very limited EVG area in the Project Area and very few EVG to BAR transitions on the first monitoring period, thus difference in the total reported GHG emission reductions and/or removals for that period was less than five percent, which is below the materiality threshold (Section 4.8 of the VCS Validation and Verification Requirements of project which is not considered large (> 300,000 VCUs on average per year).

This project will be required to update its baseline next verification which will be ten years from project start and will make this correction that this time. However, to ensure conservativeness for this monitoring period, the emission factor applied for EVG to BAR will be the original one in the PD and 1st Monitoring report of -760.92 tCO₂e versus -500.04 tCO₂e which was the monitoring value during this monitoring period based on the biomass surveys with the correct discounting factor. This is conservative as it increases the ex-post monitored emissions which lowers the Net emission reductions.

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

There were two changes since the PD was validated 1) the government of Malawi contracted Africa Parks to manage the Nkhotakota Wildlife Reserve and 2) the Program added the sales of

small-scale household solar lights to its project activities. Africa Parks through its agreement with the government and the co-management agreement with NAWIRA fully supports the implementation of the REDD+ Program. And the solar Program managed as a revolving fund, provides light to households to reduce the cost and toxic waste of flashlights and batteries and provides jobs and income generation for community sales agents.

The PD and first Monitoring Report was not clear on what allometric equation was used for evergreen plots, as they contain many buttressed trees and the allometric equation by Chave et al. 2005, is not specific on how trees with buttresses were measured to assess an allometric relationship. The same allometric questions and deductions used in the PD and First Monitoring period were followed for the Second Monitoring Period. Mugasha et al. 2013 was found to be most similar to conditions in Malawi and was used for all plots as the overwhelming majority of the trees fell in the low DBH range where the Mugasha equation comparatively underestimates biomass as compared to Chave et al. For very large trees over than 80 cm at 1.3m. a deduction factor was applied. This is clearly stated here, as in the PD and MR1, the Data and Parameters section was unclear.

The Project operates in the Project Area (5km inside of the protected areas border) and in the 5km outside of the border of the protected area. When the PD was written this led to some confusion about the definition of the Project Zone as being 10km outside the border. The definition of the Project Zone (that part which is not part of the Project Area) should have always been 5km outside the border of the projected areas. This has always been the area of implementation which is defined in the constitutions of the Associations, co-management agreements and the REDD+ Agreement. Further adding to confusion is that at the time the project was validated the CCB definition was vague for Project Zone. Version CCB v2.0 defined Project Zone as *“The ‘project zone’ is defined as the project area and the land within the boundaries of the adjacent communities potentially affected by the project.”*

The current version of the CCB v3.1 defines Project Zone as *“‘Project zone’ is defined as the area encompassing the project area in which project activities that directly affect land and associated resources, including activities such as those related to provision of alternative livelihoods and community development, are implemented. For grouped projects, the project zone also includes all potential project areas (i.e., all potential new land areas in which project activities that aim to generate net climate benefits may be implemented in the future after the initial validation).”*

The Kulera REDD+ project's Project Zone technically is 10 km of which 5km are inside the protected area (Project Area) and 5km outside the border. This is where project activities are being implemented AND it is the area that has been shown to through PRAs and cost distance analysis to be those communities that are dependent on the land and associated resources of the Project Area.

Please note that given the nature of this project and the fact that there people do not live inside of the protected areas, we refer to the areas in which activities related to communities are being implemented and impacts monitored, as the Project Zone (which is the portion of the Project Zone that does not include the Project area). Project Description Deviations (Rules 3.5.7 – 3.5.10)

2.2.4 Project Description Deviations

In efforts to adopt the most current standards, this Program is verified for this Monitoring Period under the most current version of both VCS 4.0 and CCB v3.1. This Monitoring Report meets all the requirements for v4.0 of the VCS, and the following text outlines how this project fulfills all the requirements to change from v2-0 to v3-1.

2.2.4.1 CCB Changes from v2.0 the v3-0.

The numbered items in italic text below are directly from the document CCB Standards Third Edition December 2013, page 4 and are described as “The main changes in the Third Edition.” How this project fulfills each are described below each numbered item.

1. *In order to reduce repetition and redundancy and to increase the ease of use of the standards, the criteria have been reorganized to group all relevant criteria into the Climate, Community and Biodiversity sections, including the corresponding Gold Level criteria (one in each section).*
This is met by applying the newest template
2. *The General section has been reorganized to give greater emphasis to stakeholder engagement in a dedicated criterion.*
This is met by applying the newest template
3. *Gender is also given greater attention by explicitly requiring women, or sub-groups of women, to be identified as a Community Group that must benefit from the project where they derive different income, livelihood and cultural values from the project area from other community members, and also by adding an indicator in the Community Gold Level that requires projects to explicitly outline impacts on women.*
This requirement is met by applying the newest template and see Section 2.3.11, 4.4.3, specifically 5 - Gender Equality in section 2.1.10 Sustainable Development and included in multiple sections within this monitoring report.
4. *The Climate section of the Standards is waived for projects using a recognized Greenhouse Gas Program. Procedures and the criteria and process for deeming programs as ‘recognized’ are defined in the ‘Rules for the Use of the CCB Standards’ that has also been revised in 2013. The Climate section in the Standards is only to be used to demonstrate a project’s net positive climate benefits and not for claiming GHG emissions reductions and removals units that may be used as offsets.*
This program has met this requirement as this is VCS verified Project.
5. *The Third Edition also enables projects to use programmatic approaches that allow the expansion of project activities to new land areas subsequent to project validation. This helps to reduce transaction costs, especially for smallholder-led projects that need to aggregate smallholder land parcels at scale, but are likely to start small and expand over time*
While this is a grouped project, no new activity instances have been added during this period.
6. *In order to clarify, strengthen and address gaps in existing indicators, modifications have been made and additional indicators included throughout the standards.*
Each of the indicators in CCB version 3.0 are explicitly included in the most current combined Template and numbered accordingly. For example, Section G3. STAKEHOLDER ENGAGEMENT in the Standard has 11 indicators which are mapped in the monitoring report each as such (G3.1 – G3.11). This shows that that we have met the newest standard by completing each of these sections.
7. *The Gold Level criteria have been made more stringent, thus setting a higher bar for projects to achieve the Gold Level. In addition, the Community Gold Level criterion has been modified to identify smallholder- and community-led projects that deliver equitable benefits, in order to assist with showcasing these exceptional projects.*

There are nine indicators under the Gold Level Community section of which all but GL2.1,3,7 is included directly in Section 4.4 and we demonstrate how we meet each of them.

For those not explicitly in the template under Section 4.4, here is how we comply:

- For Gold Level indicator GL2.1 – Malawi meets the requirement of low human development country as mentioned in Section 2.2.6.2. The description of Malawi being a HIPC is also described in the PD, and this condition has not changed since validation. The UNDP states “Malawi’s HDI value for 2017 is 0.477— which put the country in the low human development category— positioning it at 171 out of 189 countries and territories. Malawi’s GNI per capita decreased by about 31.3 percent between 1990 and 2017¹.
- For Gold indicator GL2.3 – the discussion of reducing community risks is in section 4.1.2. and overall, in the design of the program which demonstrates that activities address communities’ risks. In addition, section 4.1.1 Community Impacts for each indicator identifies types of benefits, costs, and risks.
- For Gold indicator GL2.7 - Relevant and adequate information about predicted and actual benefits, costs and risks have been communicated to smallholders/community members. Evidence that the information is understood is described in the community impact indicators 4.1.1. These are monitored are based on household surveys demonstrating that communities broadly have knowledge about the project activities and technical approaches that are being promoted. See indicators regarding “knowledge of” and “adopt of techniques” reported in Section 4.1.1. Additionally, all project activities are voluntarily adopted after trainings in which any costs, benefits and risk are discussed. Also, through the dissemination of the results in the monitoring report, conducted at the local-local community level, it has facilitated even more broadly communities’ awareness of benefits, costs and risks of the Program.

8. *Finally, this Edition also provides enhanced transparency to assist with differentiation between the multiple benefit qualities of different projects by including a requirement in the Rules for the Use of the CCB Standards for a cover page that summarizes climate, community & biodiversity benefits.*

This is completed in Section 1.

2.2.4.2 CCB Changes from v3.0 to 3.1

The numbered items below are directly from the document CCB Standards Third Edition v3.1 dated 21 June 2017, Appendix 1: Document History and are described as “Main updates (all effective on issue date).” These are all administrative in nature or do not apply to this project.

- 1) Overall re-formatting to include numbered sections (throughout).

¹ UNDP Malawi, Human Development Indices and Indicators: 2018 Statistical Update, Briefing note for countries on the 2018 Statistical Update. <http://hdr.undp.org/sites/default/files/Country-Profiles/MWI.pdf>

- 2) Reorganization of content to move information about governance and development of the CCB Program and acknowledgements to the end of the document (Section 6 and 7).
- 3) Updated the roles of the VCS and CCBA in the management and governance of the CCB Program (Section 6 and throughout).
- 4) Removed the 'Glossary' section, as all definitions are now included in the CCB Program document CCB Program Definitions.
- 5) Changed the following terms and document titles (throughout): Approved Auditor to validation/verification body Right of use to project ownership Projects using the programmatic approach to grouped projects Project design documentation to project description Project implementation report to monitoring report Rules for the Use of the Climate, Community & Biodiversity Standards to CCB Program Rules Fee Schedule for the Climate, Community & Biodiversity Standards to CCB Program Fee Schedule
- 6) Updated the definition of start date and clarified the start of the project lifetime (G1.9).

There are no other Project Description Deviations during this monitoring period.

2.2.5 Grouped Projects

The methodology used for this project is VM0006 v2.0, and this is a grouped project. However, while there were activities implemented in areas that will be added in the next monitoring report, there are no new instances are being added monitoring period, and therefore no eligibility criteria are provided.

2.2.6 Risks to the Project (G1.10)

The Project faces a number of potential risks to the expected climate, community and biodiversity benefits. The following outline, while not exhaustive, represents the most likely anticipated risks. The Project team has prepared an overall risk rating for the Project, using the VCS AFOLU Non-Permanence Risk Tool (VCS Version 4.0) for this monitoring period.

These risks continue to decline as the Program's implementation capacity increases and with higher sales of carbon revenue more funds are available to implement the on-the-ground activities

2.2.6.1 Community Adoption Risk

In any REDD+ Project, there is a risk that the communities will not adopt the practices necessary to reduce deforestation in the Project Areas and that the drivers of deforestation will continue throughout the crediting period of the Project. This risk has been mitigated through an extensive community engagement process throughout the Project.

- NRC
- Association meetings
- Community conservation

2.2.6.2 Enforcement Capacity in Protected Areas

Malawi is a Heavily Indebted Poor Country (HIPC) and, with limited resources for enforcement, lacks the means to enforce laws related to natural resources. The DNPW employees are unable to fully protect the areas for which they are assigned. Specifically, each park ranger is responsible for patrolling 20 km²; though, admittedly, three times more rangers are needed to protect the same area. The patrol camps lack adequate infrastructure, are spread too far apart, and there are not enough camps within the parks. Park rangers have access to one vehicle per protected area,

which discourages transportation to more remote regions of protected areas, as well as communication among park rangers. Park rangers are sometimes less equipped and outnumbered by poachers and illegal loggers. Although poaching and illegal logging operations are reported by park rangers, these events usually are tolerated by rangers. Park rangers are also paid a low wage. The Project proponents have mitigated this risk through a series of Project activities designed to further mobilize communities and increase the capacity of park officials in protection and enforcement of park boundaries. These activities include, for example, providing training to Community Associations in participatory law enforcement and providing logistical support to protected areas officials to improve communications and mobility, among others (see Section 1.3.2.3). Policy Effectiveness

The co-management agreements provide local communities with the rights to share in the benefits of conservation and natural resource-based enterprises. However, the above overview of policies and institutions raises several questions regarding the effectiveness of decentralization policies, and suggests challenges that may need to be considered in the development of these projects:

- At the local level, there is a proliferation of committees—it is not clear if they are competing for authority or operating in parallel. For example, the Customary Land Bill, 2012 established new customary land committees, chaired by the Group Village Head (GVH), and provided these committees a number of new powers including the right to determine the portion of customary land that will be set aside as communal land and for what purpose (Malawi Law Society 2012). Traditional Chiefs have publicly challenged the law stating that having GVHs head the land committees will result in a power conflict between them and the Chiefs (Nkawihe 2013).
- The District Assembly has Village and Area Development Committees to engage local communities. At the area level, they cover all villages under a particular chief, whose role is primarily one of community mobilization which can create some conflict or confusion for a program implemented through the community associations.
- There is a significant difference between policies and practice. Although the country has strong forestry policies that aim to benefit communities, it is clear that implementation is a work in progress and although a number of village natural resource management committees (NRCs) and zone natural resource councils (ZNRCs) have been formed, actual forest management plans have yet to be approved. \

The Project is mitigating these risks by providing clarity on decentralized governance structures for protected areas management, through strengthening co-management agreements between the DNPW, Africa Parks and Community Associations. In addition, through the REDD+ agreements between the DNPW and Community Associations the roles and responsibilities of Association members (i.e. the communities) in natural resource management has been clarified.

2.2.7 Benefit Permanence (G1.11)

The permanence of social and biodiversity benefits is protected through the on-going implementation of Program activities. See details in the Long-term Project Implementation Plan.

2.3 Stakeholder Engagement

2.3.1 Stakeholder Access to Project Documents (G3.1)

Throughout the life of the Program, there have been documents that the Project Partners have created and used to communicate to the communities in the Project Zone and other stakeholders.

DNPW, NVA, and NAWIRA continue to communicate the results in the Monitoring Reports to the communities in the Project Zone through summaries of 1) collection of participatory monitoring data from NRC and ZNRCs, 3) on-going program activity reporting, 4) dissemination of key component of the VCS/CCB Monitoring Reports, and 5) Grievance and Redress policy.

For local communities, the access to Program documentation and results as well as Grievance Procedures follow communication channels that rely on a combination of formal and traditional ways of communication and conflict resolution in Malawi, these are detailed in the PD.

2.3.1.1 Project Reports and Records

Project reports and records include a variety of different types of documentation from different activities that occur as part of the Project. These documents include such information as lists of participants that attended training sessions and meetings; quarterly, semi-annual and annual reports compiled by the implementing partner, patrol reports, materials distributed etc. These documents are kept at the Partner Offices. The frequency with which these documents are generated and utilized in the monitoring process is variable, but at minimum these reports and records are generated at least once per year. Any funds received from the program are carefully spent and meticulously documented reporting on activities implemented, subjects covered, and/or materials purchased. Additional information on these reports are kept at the partner office and are summarized by Terra to for monitoring of Project Activities.

2.3.2 Dissemination of Summary Project Documents (G3.1)

All partners in the Kulera REDD+ Program have been working collaboratively on this combined VCS/CCB Monitoring Report.

For the second VCS/CCB Monitoring Report, the Associations (NVA and NAWIRA) with support from DNPW will distribute the summary of the Monitoring Report and the relevant updates made to the CCB Monitoring Plan to each ZNRC in the Project Zone as well as the relevant Traditional Authorities. During the Associations' meeting with each ZNRC they are provided information on the results in the monitoring report, solicited for feedback, and provided the materials needed to meet with each of the NRCs to review the monitoring report. The ZNRCs take the information and materials they have been provided by the Association and conduct meetings with the NRCs who in turn have meetings with the communities. NRC prepares reports with relevant information from the community meetings to submit to the ZNRCs and the ZNRCs provide input to the Associations. Monitoring report results are communicated to verbally based on a summary developed by all project partners in Chichewa and/or Tambuka was appropriate. Beyond the NRC and ZNRCs soliciting input and documenting the key information shared during dissemination, they notify the communities of the public comment period and the Verra url for posting public comments if they wish to do directly. For best communication to underrepresented groups, the women of the Executive Committee of each Association, will meet with women in the ZNRC to get their feedback as well. As many NRCs are led by women, women's input is imperative. Comments are gathered during the meetings and submitted to the Community Association Executive Committee or submitted directly to the CCB via their website.

DNPW will communicate about the VCS/CCB Monitoring Report via email and posting the draft Monitoring Report on Communication Boards at their Offices in Lilongwe, Vwaza, and Nyika. In addition, DNPW will be in communication with African Parks to present the VCS/CCB Monitoring Report, gather their feedback and notify them of the 30-day comment period so that that they can submit comments privately to the CCB via the website or CCBStandards@v-c-s.org.

All relevant Public Comments submitted to the CCB during the public comment period will be addressed to the partners.

2.3.3 Informational Meetings with Stakeholders (G3.1)

The Project engages more than 50,000 households in the Project Zones. This number of households represents a total population of 275,000 people who are living in rural communities in the border zone of the Project's protected areas.

This is done through a series of formal meetings that include 1) awareness meetings at NRC and ZNRC level, 2) association meetings on a quarterly and annual basis, and 3) technical trainings. These are all communicated through the structure that starts with the association, passed down to the zones and then the local levels. Meetings are also held by DNPW and AP who publicize them through their on-going communications with the communities.

2.3.4 Community Costs, Risks, and Benefits (G3.2)

This is a community-based project where all participation is voluntary. As this project funding source is based on a payment for performance, community members and other stakeholders can weigh the costs and benefits and participate if they choose to do so. Since Project Start community members have been deeply engaged in designing a program that meets their needs. Communities understand the cutting down forest may give them more agricultural land, but they will lose benefits of the Project Activities such as agriculture extension and assistance from Community Associations such as trainings and workshops on improving agricultural techniques. Activities such as using improved cookstoves, comes at a cost – communities participating in the program must attend training and build their own bricks, in return they receive education on fuel-efficient cookstoves, cookstove parts and all the benefits of a fuel-efficient stove (less fuelwood needed, less time collecting wood and more time at home, less smoke, etc.).

Communities themselves identify risks with the Program during the Social Assessments which are conducted with each verification. Communities are asked about drivers of deforestation, solutions to that driver and challenges associated with implementing solutions. The PRA SOP and the results of the PRA are available to the VVB. During this monitoring period, communities in the Project Zone reduced deforestation, demonstrating that project benefits are community benefits.

Community costs, risks and benefits are detailed in Sections 4.1.1 describing the Community Impacts through the monitoring period. Section 4.1.2 outlines measures to mitigate any negative effects. And finally Section 4.1.3 demonstrates that there is a net-positive community wellbeing, demonstrating that the benefits associated with the program outweigh costs.

2.3.5 Information to Stakeholder on Verification Process (G3.3)

There have been numerous sensitivity meetings within the Community Associations to inform local community members about the REDD+ Program over the years. They have also been informed about the standards used and the Validation and Verification process. These meetings are conducted by the DNPW and Associations with the community groups around the Project Zone.

During the group discussions held to review the VCS/CCB Monitoring Report, the Community Associations informed the communities that a VVB will be coming to visit some of the communities at the time verification. At this time, communities are free to communicate openly about their

experience with the Kulera REDD+ Program. They are welcome to communicate directly to the VVB, and there will be a translator present.

2.3.6 Site Visit Information and Opportunities to Communicate with Auditor (G3.3)

The verification of the second monitoring report of Kulera REDD+ Program has been delayed due to the COVID-19. In-person communications between Terra Global and DNPW/ the Community Association were limited to remote communication after March 2020. After this time, the Terra Global and the local partner continued regular communications through Zoom calls, WhatsApp's and through Terra Global's local Project Coordinator. This provided details on the process of preparation of the monitoring report which has been supported by DNPW, AP, NVA and NAWIRA. In September an all partners Zoom call for 2 days was conducted with an agenda that included the process for the monitoring report preparation and VVB audit. This was followed up by additional Zoom meeting to prepare in October.

The Executive Committee of each Community Association has carefully communicated to the ZNRCs about the VVB's visit following national standards for COVID-19. During the group discussions for the VCS/CCB Monitoring Report, the Community Associations informed the local Zone NRCs in the Project Zone that a VVB will be coming to visit the communities at the end of 2020. Communities were informed that the VVB is a neutral party and that they should feel free to communicate openly about their experience with the Kulera REDD+, Project. They were welcomed to communicate directly to the VVB, and they were informed that a translator would be present. Based on the audit plan provided by the VVB the communities will be given a chance to communicate with the auditor during the site visit.

2.3.7 Stakeholder Consultation (G3.4)

This is a community-based REDD+ Program, community stakeholders are at the center of program design. This program is designed by communities to solve issues they face every day to help improve livelihoods and conserve forests. There have been numerous Stakeholder Consultations during the program design, and throughout the program implementation. Many Community Association meetings are about project actions; implementing activities, reviewing what has been done, and what can be improved for the future. The findings from these meetings help influence project performance, activities funded, and how, what, when and where these activities will be implemented. At Project Start the Partners drafted the first activities of the REDD+ Program, which were thought to be attainable, expected to reduce deforestation the most significantly and had the best benefits to communities. Every year, or two years the Partners Community Associations and DNPW and Terra revisit funding available for the Program Activities and approve a budget that will best serve the need of the project participants.

2.3.8 Continued Consultation and Adaptive Management (G3.4)

As stated before the Program is implemented with project proponents that are the two large community associations in the Project Zone. Villages in the border zone of the Project Areas are all formally represented through their Associations. The Association communicated and coordinated through its ZNRCs and NRC all elected from within the communities

Adaptive management is necessary in any REDD+ Project where activities need to consider a changing set of social dynamics and climate, and this REDD+ Project Follows an Adaptive Management Plan. Forest needs and community needs will change over time as we are all affected by climate change. The Adaptive Management Plan recognizes that communities and those on the ground are best situated to address these issues. As the drivers and agents of

deforestation change the proposed Project Activities need to change as well. Past drivers and associated activities may become ineffective or inappropriate over time.

During the Monitoring Period communities were asked during the Household Surveys and Participatory Rural Appraisal (PRA) to identify new and effective project activities and describe the risk of implementation each. Risks identified will be considered during future implementation. IN addition, there is a collaborative working planning process undertaken every 2 years with all the partners to update the Long-term Program Implementation Workplan to reflect the needs to communities, consistent with the REDD+ Agreement. The PRAs also identify if drivers and agents of deforestation, as well as community needs had changed. Although there was no significant change to the drivers and agents of deforestation, as well as the needs of communities, it is important to adapt project management to capture the dynamics of a country in development.

Specific issues that were identified through the Adaptive Management Plan that need attention for future years included:

- More support to community associations to improve the collection, organization and digitization of activity monitoring data
- Improved tracking of technical training versus awareness meetings
- With the additional funds that expected to be available through increased carbon revenue, expand the implementation to full scale with a focus on field training and inputs for:
 - Cookstoves
 - Conservation agriculture
 - Tree planting (woodlots and tree crops)
 - Woodland management
 - Livestock
- Improved tracking and reporting of grievances
- Training for better association record keeping and electronic storage
- Business development fund with pool for reimbursable capital to fund new businesses

2.3.9 Stakeholder Consultation Channels (G3.5)

The Project Stakeholders are defined as any individual with a stake in the implementation and outcomes of the Kulera REDD+ Project. These include community members, local authorities, and NGOs. The most significant stakeholders in the Kulera REDD+ Program are the communities living in the border zone of the three Protected Areas. Villages in these areas have Village Natural Resource Committees (NRCs), which are then grouped by Zone into ZNRCs, the umbrella organizations for these community groups are the Nkhotakota Wildlife Reserve Association (NAWIRA) and the Nyika-Vwaza Association. Communication comes from the village level to the Community Association through these organizations. Communities down to the NRC level are familiar of the communication process, and since many NRCs have many women members, women's voices are heard and expressed in Project Activities. Each NRC has at least one woman member to ensure that communication on women's involvement and their feedback is clearly heard. ZNRCs have quarterly meetings to have their voices heard at the Community Association Level.

In addition, Traditional Authorities (TAs) including Village Headmen and Group Village Headman are able to communicate the needs of their constituents directly to the Community Association. Traditional Authorities are on the Board of Trustees for each Community Associations. Customarily Traditional Authorities can be very powerful in Malawi, and the communication channels are set

up to communicate with the villages directly, while keeping TAs involved in the process, but not overpowering the villagers.

DNPW and the Associations work closely together and commonly communication is shared between the groups. Most DNPW employees have access to email and communication is shared down the chain-of-command.

2.3.10 Stakeholder Participation in Decision-Making and Implementation (G3.6)

The Kulera REDD+ Program was designed to solve problems that communities, DNPW and Africa Parks face in conserving forests in and around three Protected Areas while improving livelihoods. Local stakeholders are very engaged through the process of the communicating issues and ideas through the program as described above and in the Project Document. During this monitoring period, a neutral third party conducted the Participatory Rural Appraisal (PRA) and household Surveys (HHS), and local communities in the Project Zone were involved in decision making of project actions that work best for them. The third-party was is not involved with the Community Associations, DNPW, African Parks nor the NRCs or ZNRCs. Information from the PRA and HHS were compared to the Implementation Plan, to identify that truly impactful activities that were carried out during the Monitoring Period.

In order to secure that women and underrepresented groups are involved in the Program design, implementation and decision making, women and underrepresented groups were necessary to be involved in the PRA. Women within the Project Area are commonly expected to have traditional roles, and involvement in a political setting for rural women is particularly difficult, but NRCs are commonly a place for women to express their needs of natural resources.

2.3.11 Anti-Discrimination Assurance (G3.7)

Both Community Associations updated their Constitutions during this Monitoring Period and both have upheld the Anti-discrimination clause. DNPW and African Parks abide by Malawi law, which prohibits discrimination based on gender, race, or religion. During the Monitoring Period Terra Global updated their Employee Handbook and Corporation Policies to explicitly include an anti-discrimination clause. There were no complaints or grievances received during this period about discrimination.

2.3.12 Grievances (G3.8)

There was no centralized grievance record keeping during this monitoring period. For community to community grievances they are dealt with first at the village level by the village headman. Then if there is no resolution at this level, it goes to the Group village headmen and finally if unresolved to the chief (traditional authority of that level). In cases where grievances are not resolved in this traditional manner, they are brought to the attention of DNPW, AP, NAWIRA and/or NVA. These are discussed and resolved within the regular scheduled NRC, ZNRC meetings or special meetings and documented in the DNPW reports. Grievance raised to the Associations are discussed during their meetings and the resolution is captured in the Associations meeting minutes. Given that Terra Global is a project proponent whose email is publicly available under the Verra registry listing, every so often Terra Global will receive a complaint. This is logged and on communicated to the local partners to determine the proper response to the complaint and determine if any action needed to be taken.

2.3.13 Worker Training (G3.9)

Training of project communities is a core component of the program, as it seeks to change the way communities use their natural resources and build better livelihoods. Details of these activities around trainings and results can be found in the Long-term Implementation Plan and Project implementation reporting in Section 6, respectively.

The implementing partners have worked to ensure that those who participate in the Project or are in some way engaged in project activities related to conservation and site visits, undergo training to outline potential hazards and risk. Project Activities will be another avenue to engage with the communities and provide them with basic training on monitoring and discouraging harmful forest activities. Basic training is always provided, and more training is provided as requested by the communities. Community leaders are trained on how to utilize equipment such as camera traps, and how to conduct research on biodiversity efforts in the region. Training is provided through workshops utilizing participatory approaches, along with extensive field training in the sites where activities are to occur.

2.3.14 Community Employment Opportunities (G3.10)

Community members have received employment benefit through the program. Community members are compensated for attending a specific training to improve livelihoods, increase awareness etc. There are also opportunities for employment to carry out Project Activities such as patrolling or clearing fuel breaks. More formally, some Community Members are employed through the Community Association. Special attention is given to not have employment opportunities available to women and vulnerable and/or marginalized people. Each Community Association includes bylaws describing un-biased approach to employment and monitoring of success of inclusion is in section 4.4.2 Marginalized and/or Vulnerable Community Groups (GL2.4)

Table 1. Community Stipends Offered through the Kulera Program (People days)

	2017			2018			2019			Conservative Total During Monitoring Period
	DNPW	NAWIRA	NVA	DNPW	NAWIRA	NVA	DNPW	NAWIRA	NVA	
Number of community members who received stipends (fuel breaks, patrols, etc.)	-	2,251	3,842	-	1,559	4,172	-	452	3,349	15,625

Table 2. Paid Community Governance Positions at the Association Level (People days)

	NVA	NAWIRA
Executive Committee	6,336	6,624
Zone NRC	8,640	-
NRC Heads	38,016	-

2.3.15 Relevant Laws and Regulations Related to Worker's Rights (G3.11)

The Project meets or exceeds all applicable national labor laws and regulations covering worker rights. Compliance will be achieved by the explicit approval of the work plans that the DNPW and Associations will develop on a bi-annual basis and through the creation and implementation of hiring practices within the associations. This will ensure that actions are consistent with the national legal framework. The implementation partners inform workers of their employment rights during community meetings. Documents explaining national rules on worker's rights and the obligations of both contracting parties will be made available in local languages when relevant. Below is a list of relevant laws and regulations covering workers' rights:

- Labour Relations Act (No. 16 of 1996)
- Malawi Employment Act No 6 of 2000
- Employment Amendment Bill in Parliament 2010

2.3.16 Occupational Safety Assessment (G3.12)

During the work in the field, the main risks for the safety of workers include malaria, falling trees, dangerous wild animals and bush fires. Malaria is a risk for workers, especially when they are working in the forest for a long consecutive period. Bushfires are a regular occurrence in the Project Areas during the dry season. However, they tend to be ground fires of lower intensity that can be easily avoided. Nonetheless, bush fires and fire-fighting activities pose a potential risk to workers. Dangerous animals are common in some of the Project Areas. In addition, animals that are harmed from poaching or snares are very dangerous. Clear safety guidelines were formulated to address risks that endanger worker health. Before the Biomass Survey and Biodiversity Survey teams were taught how to avoid dangerous animal encounters. In order to avoid accidents, a DNPW guard as well as a community member from the local community accompanied all teams when entering the Protected Areas.

Often disadvantaged groups become associated with jobs of greater health risk. Special attention was given to make sure that work groups will be from diverse backgrounds and that knowledge of any risk associated with Project employment is understood.

2.4 Management Capacity

2.4.1 Required Technical Skills (G4.2)

The following table details the technical expertise needed to implement and monitoring the results of the Kulera Program, and which partners provide this technical expertise.

Technical Skills (√=experienced, UD = under development)	DNPW/ AP	NVA/ NAWIRA	Terra	Others - Supporting
Program Design and Implementation Management				
Ability to Assess Drivers of deforestation and degradation and related socio-economic issues.	√	√	√	
Understanding of local tenure and land management laws	√	√	√	
Track record in administering landscape scale REDD+ programs with multiple partners	√	√	√	
Community engagement expertise	√	√	√	
Ability to guide the overall implementation	√		√	

Technical Skills (√=experienced, UD = under development)	DNPW/ AP	NVA/ NAWIRA	Terra	Others - Supporting
Expertise to assess the overall implementation of the Program			√	
Monitoring Data Collection	√	UD	√	
Fiscal management	√	UD	√	
Greenhouse Gas Quantification				
Deep understanding of VCS Standard and methodologies			√	
Development and/or assessment of REDD+ baselines and/or reference levels at the project and landscape scales for relevant activities			√	
Field data SOP design and training experience	UD	UD	√	
Participatory Monitoring for VCS+CCB	UD	UD	√	
Modeling, measuring and monitoring forest carbon stocks and emissions factors			√	
Modeling, measuring and monitoring land-use change using remote sensing, GIS and statistical techniques.			√	
Accounting of GHG emission reductions and/or removals, including estimation of leakage emissions from relevant activities, at the jurisdictional scale.			√	
Land-use change modeling			√	
AFOLU non-permanence risk assessments.			√	
Expertise on the IPCC Guidelines and GFOI Methods and Guidance Document;			√	
Forest Protection and Biodiversity				
Experience in designing protection programs for forest areas	√			
Wildlife monitoring and tracking experience	√	√		
Ability to run anti-poaching programs	√			
Participatory demarcation experience	√	√		
Local species knowledge	√	√		
Program Related Technical Skills				
Cookstove building and promotion	UD	UD		TLC
Conservation Agriculture	√	√		TLC
Woodlots and Nurseries				
Small Scale Livestock	√	√		TLC
Solar	√	√	√	
Business Plan Development - Local Enterprises	UD	UD		
Honey	√	√		
Other NTPF value chains	√	UD		
Gender and Marginalized Groups Engagement	√	√	√	
Stakeholder Engagement and Social Impacts				
Ability to communicate clearly in the local language or guarantee the presence of an interpreter and/or translator.	√	√		
Experience training communities on NRM related activities	√	√		
Communications	√	√		
Safeguards and Benefits	√	√	√	

Technical Skills (√=experienced, UD = under development)	DNPW/ AP	NVA/ NAWIRA	Terra	Others - Supporting
Traditional Authority Leadership	√	√		
Local community knowledge, culture and traditions	√	√		
Management of feedback and grievances	√	√	√	
Institutional Arrangement and Financing				
Monitoring plan development and collection			√	
Legal agreement development			√	
Carbon Markets	UD	UD	√	
Financial structuring			√	
Institutional and legal frameworks relevant to REDD+ programs, baselines and/or nesting			√	

2.4.2 Management Team Experience (G4.2)

2.4.2.1 DNPW

Brighton K. Kumchedwa, Director

Since 2013, Brighton Kumchedwa has been director of the Department of National Parks and Wildlife, determined to end Malawi's status as a soft touch for elephant poachers and a major transit route for illegal wildlife traffickers from Tanzania, Mozambique and Zambia. Forceful, personable and tireless, he has co-opted the president and cabinet; persuaded parliament to approve a draconian new Wildlife Act imposing penalties of up to 30 years for wildlife crimes; and convened a top-level committee to coordinate the anti-poaching efforts of the police, military, intelligence, immigration, judicial and anti-corruption agencies. Brighton has been recognized as Winner of the Tusk Award for Conservation in Africa 2017 for his leadership in taking the poaching crisis head-on, helping to create new laws and policies to investigate, prosecute and recognize poaching as a serious crime. Brighton was instrumental in working with African Parks in the recent historic '500 Elephant' translocation where 520 elephants were safely rehomed, a conservation success story that made global headlines.

Catherine Charity Chunga, Senior Parks and Wildlife Officer (Education and Extension)

Ms. Chunga has been working for the Department of National Parks and Wildlife (DNPW) since 1994. She has worked in many National Parks in Malawi including Nyika National Park, Mzuzu Nature Sanctuary, Nkhotakota Wildlife Reserve, Kasungu National Park, Lake Malawi National Park and is currently working at the DNPW - Headquarters in Lilongwe as a Senior Parks and Wildlife Officer in the Education and Extension Unit.

The DNPW Education and Extension Unit is responsible for collaborative management initiatives, promotion of community livelihood around Protected Areas and coordination of environmental education activities in schools and communities. Ms. Chunga has been working for Kulera REDD+ Program as a Malawi Desk Officer since 2017, and is responsible for preparation of workplans and budgets, coordination and supervision of the Kulera REDD+ program, and is responsible for compiling and submitting liquidations necessary to fund Project Activities.

2.4.2.2 Africa Parks

Samuel Kamoto, Park Manager of Nkhotakota Wildlife Reserve

Formally Program Manager for Extension and Environmental Education at African Parks - Majete. Before joining African Parks Network, Samuel worked with the Department of National Parks and Wildlife for 20 years on various management and Education positions. From Department of National Parks, he worked with the Wildlife and Environmental Society of Malawi (WESM), first as Director for Advocacy and Environmental Education Program and later as Executive Director.

2.4.2.3 NAWIRA

James Sadrack, Chairman

Mr. Sadrack played a key role in the development and creation of the NAWIRA association under the Kulera Biodiversity Program. As Chairman of the association he manages all daily activities, develops workplans and budgets, monitors ongoing activities and coordinates other relevant stakeholders on conservation in coordination with association trustees and executive members. Mr. Sadrack has been certified as a REDD+ expert by the Department of Forestry and is a member of the National REDD+ Expert Group. Currently he is an appointed member of the Malawi REDD+ Communications Strategy Group.

2.4.2.4 NVA

Chiza Duncan Mkandawire, Chairman

Mr. Mkandawire manages all program operations for the association and has been participating in REDD+ issues beginning in 2003 through the Kulera Biodiversity Program funded under USAID. His involvement in the program was invaluable to the development of the Project Document and the validation and verification of the REDD+ project. He was one of the first participants in the Malawi REDD+ Readiness Program and was certified as a REDD+ expert by the Department of Forestry in Malawi. He is a member of the REDD+ Expert Group and was an appointed member of the Malawi REDD+ Communications Strategy Group.

2.4.2.5 Terra Global Capital

Terra Global is the global leader in forest and land-use carbon advisory and finance. Terra was founded in 2006 to provide governments, NGOs and private companies with support for market and payment-for performance-based approaches that benefit rural communities. As proven innovators, Terra provides both technical advisory in the measurement and commercialization of emissions reductions and carbon finance through our dedicated Terra Bella Investment Fund and separately managed investment vehicles. Terra has established itself as a valued partner to a global client base by supporting the sustainable management of natural resources and through the development of rural livelihoods.

Leslie L. Durschinger - Founder, CEO

Conservation Finance, Sustainable Landscape Program Development

Leveraging 20 years of experience and a proven track record in the financial services industry, Ms. Durschinger founded Terra Global Capital in 2006 to promote results-based approaches to sustainable landscape management through climate smart agricultural and reducing deforestation. Ms Durschinger is recognized as a pioneer and innovator in alignment of development values and financially viable approaches to sustainable landscape management.

Terra is now the leader in forest and agriculture program development, GHG analytics and business model development, providing technical expertise their global client base of governments, NGOs, and private companies in a collaborative and participatory manner. Under Durschinger's leadership Terra has structured risk mitigation instruments, trust funds and private equity funds to drive investment capital to sustainable agricultural production and forest management. Prior to Terra, Ms. Durschinger held senior management positions in the areas of derivatives trading, investment management, algorithmic trading, risk management, and securities lending. She the co-Chair of the International Emission Trading Associations Natural Capital Solutions working group, and is a member of the Verified Carbon Standard (VCS) AFOLU Steering Committee, REDD+ Social & Environmental Standards Committee, VCS JNR Permanence Work Group, Coalition on Agricultural Greenhouse (C-AGG) Advisory Committee and W+ Standard Advisory Council. Ms. Durschinger and her family make small production olive oil on their farm in Mendocino County. Among her previous employers are JP Morgan, Merrill Lynch, Barclays Global Investors and Charles Schwab.

Erica Meta Smith, M.F., RPF - Director

Forestry, Field Training, GHG Quantification

Ms. Smith, M.F., RPF. Forest Carbon Field Development Specialist, Joined Terra Global Capital in 2009. Ms. Smith provides technical forestry knowledge, on-ground carbon quantification expertise, and specializes in forest mensuration programs. She has firsthand knowledge of a forestry-based income the experience of depending on natural resources as a livelihood. Before working with Terra Global Capital Ms. Smith worked in forest policy and on forestry technical operations. She received her undergraduate degree in forestry and Master of Forestry from University of California-Berkeley in 2005 and 2007. Her master's work reviewed California Climate Action Registry's Forestry Protocols and implications of carbon markets in California. Ms. Smith is a Certified Ecologist through the Ecological Society of America and a Registered Professional Forester in the State of California. Ms. Smith has worked extensively in the REDD+ sector training communities and working with in-country experts for excellence in MRV across Africa and Asia.

David Montoya González

Remote Sensing Analysis and GIS

Mr. Montoya has a widely experience in remote sensing and GIS. He holds a bachelor's degree in Forest Engineer from the National University of Colombia (UNAL) and a master's degree in remote sensing from Federal University of Rio Grande do Sul (UFRGS) – Brazil. Mr. Montoya has worked with multiple Colombian government entities, such as the national department of statistics (DANE), supporting the 3rd National Agricultural Census, and the National University of Colombia in research projects in the Andean Region, focused in geomorphometry, and in the Sibundoy Valley with the indigenous communities Inga and Kamentsá analyzing the land cover changes and natural resources sustainability. Mr. Montoya has also worked in the private sector developing GHG assessments and quantification in Latin America,, Australia and the United States.

Krysla Grothe, M.S., Associate

Natural Resource and Climate Change Mitigation Program Manager

Ms. Grothe is a natural resource and climate-smart agriculture specialist focusing on improving economic and environmental outcomes through innovative, market-based approaches, and evidence-based policy and program implementation. She holds a bachelor's in science in international agricultural development from University of California, Davis, a master's in science in global health policy and management, and a masters in sustainable international development

from Brandeis University. With 9+ years of experience in sustainable agricultural and climate change mitigation program implementation in Asia, Africa, and Latin America, she has led projects to be effective through building meaningful partnerships among various stakeholder groups and leveraging indigenous knowledge into program design. Prior to working with Terra Global, Ms. Grothe worked for MIT's Development Lab (D-Lab) researching participatory action and humanitarian innovation design methods and analysis. Utilizing complex policy and market-based strategy and supporting gender and racial equity through participatory program design, she is effective at strengthening strategic focus by using evidence-based methodologies to advance program development for improved socio-economic and environmental outcomes.

2.4.3 Project Management Partnerships/Team Development (G4.2)

The Program has all the partnerships needed to implement activities. When new activities require new technical expertise or partners, the Program is able to source them, for example with GreenLight Planet, Angaza and Airtel money for the establishment of the household solar program.

The partners that are currently supporting the program with specific technical activities include Total LandCare, a long term and important partner for the Program.

2.4.3.1 Total LandCare

TLC has contributed extensively to the Agriculture Development Program (ADP) and has been widely consulted by the World Bank and the Norwegian Government in formulating their strategic country frameworks. Many others have sought input from TLC to improve the effectiveness of their programs. This demand stem largely from the successful results of USAID's Chia Watershed Project and its follow on project Management for Adaptation to Climate Change (MACC) with the Norwegian Government. Once the Project is operational, it will provide a base for future projects related to biodiversity. TLC is also a member of the Civil Society Agriculture Network (CISANET) and heads the Irrigation Thematic Group whose mandate is to advocate policy reform in the irrigation sub-sector, to promote harmonization of methods/approaches and to share experiences.

Trent Bunderson has accumulated 28 years of professional development experience in Africa including 5 years with the Western Sudan Agricultural Research Project funded by USAID and the World Bank, and 23 years in Malawi, primarily with USAID projects. His work has included the diverse areas of: 1) assessing traditional land-use practices on range resources and wildlife populations, 2) research and Kulera Landscape REDD+ Project for Co-Managed Protected Areas, Malawi - PDD for the CCB Standard 58 development of agroforestry and conservation practices for crop and livestock production systems; 3) community-based systems of natural resource management from an ecological/watershed perspective; and 4) development and promotion of sustainable land and water management practices with a focus on conservation agriculture, agroforestry, and farm diversification. Trent currently provides leadership and technical.

Zwide Jere has 30 years of experience working with rural communities in partnership with government, non-governmental and private sector organizations. This gives him a unique privilege in handling issues that cut across these sectors. His strong capability is assessing and analyzing issues/problems of watersheds and resolving conflicts arising from resource uses by the different groups will add value to the planned program. Mr. Jere's experience has been focused on the following areas: 1) land use planning; 2) natural resources management and environmental monitoring; 3) developing, testing and promoting soil conservation and agroforestry interventions; 4) community empowerment; 5) production of userfriendly high quality

extension and training materials in the form of manuals, training kits, posters, leaflets and radio messages targeting different audiences; 6) training of trainers, extension agents and farmers in agroforestry, soil conservation, treadle pump irrigation, M&E, environmental monitoring and management, PRA, annual workplan development.

Blessings Mwale was the Project Manager for the Sustainable Land Management Programme in the Shire River Basin under UNDP, with financing from Global Environmental Facility (GEF); as well as for the Enhancing Food Security and Developing Sustainable Rural Livelihoods under the UN FAO, financed by the Royal Norwegian Government. Prior to these roles Blessings held a position with the UN World Food Programme, and worked as Food Security Advisory/Deputy Head of Programme.

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

The financial health of the implementing organizations is based on the sources of funds that the Program has to operate. The 2019 Financial Review (Annex J) shows that the program has funds to operate, monitoring and complete future verifications.

2.4.5 Avoidance of Corruption and Other Unethical Behavior (G4.3)

All the formation documents and agreements that are put in place the support the Program include requirements that participants conduct the operations of the Program in an ethical manner and without corruption. Terra Global has a FCPA and anti-discrimination policies and the Associations follows laws as a Trust under the Trust and Trustees Incorporation Acts, CAPS 5.02 – 5.03 of the Laws of Malawi. As it relates to the potential for mismanagement of financial resources,

2.4.6 Commercially Sensitive Information (Rules 3.5.13 – 3.5.14)

The annexes listed in (Appendix 4: Additional Information) indicate what data and information are commercially sensitive.

2.5 Legal Status and Property Rights

2.5.1 Recognition of Property Rights (G5.1)

Nothing since the validation of the PD has changed with respect to property rights and rights to natural resources.

2.5.1.1 Project Areas

The Project Areas are located 5km inside the border of three public protected areas: Nyika National Park, Vwaza Marsh Wildlife Reserve, and Nkhotakota Wildlife Reserve. The National Parks and Wildlife Act of 1992 provides the Minister with the authority to declare public land in Malawi as national parks or wildlife reserves, as well as change the boundaries of existing protected areas; and when each of the protected areas were gazetted they became the property of the Government of Malawi.

In addition, the Act provides for community co-management of national parks and the wildlife and forest resources, found within the National Parks Amendment Act No. 15, 2004. The NVA has signed a co-management agreement with the DNPW providing NVA specific rights and responsibilities for management of natural resources within the boundaries of the protected areas.

And NAWIRA, signed co-management agreement with DNPW until 2015 when Africa Parks took over and signed a new co-management agreement in 2018.

Additionally, the Project Proponents have each signed an “Agreement for the Carbon Development, Carbon Rights and Benefits Sharing with Respect to Emission Reductions for the Kulera Biodiversity Landscape REDD+ Project in Co-Managed National Protected Areas in Malawi” (September 2013). This agreement formalizes the roles and responsibilities of each of the Project Proponents to the develop the Project and support the development of emission reductions from the Project and affirms that each of the Project Proponents will transfer emission reductions from the Project to a Public Private Partnership Entity, eliminating any potential ambiguity around ownership of emission reductions.

2.5.1.2 Project Zones

The Project Zones include 5 km outside the protected areas. The socio-economic baseline survey results indicate that land tenure is similar near the three Protected Areas and is customary land tenure. In fact, over 90% of land around the three protected areas is managed under customary land tenure practices. Other types of tenure systems such as borrowing (free use), tenancy, and renting /leasing were less important in all the study sites (Phiri, Mapemba, and Sopo 2011).

According to National Land Policy of 2001, the government may assign land as public land which any land that is held in trust and managed by the Government or Traditional Authorities and accessible to the public at large. Within the boundaries of Traditional Authorities public lands are lands that are not allocated exclusively to any group, individual or family; however, they are reserved for the exclusive use of members of the respective Traditional Authority. These include, for example, dambos or communal grazing and communal forest areas. The policy emphasizes that public lands held in trust for members of a particular community does not automatically transfer ownership of that land to the Headsperson, Chief or public official and therefore is not considered private. On the contrary, private lands, also called “customary estates,” are customary lands that are allocated exclusively to a clearly defined community, corporation, clan, family or individual. Once registered customary estates provide the proprietor private usufructuary rights in perpetuity and can be leased or used as security for a mortgage loan.

However, because the interest of a customary estate is usufructuary only, the sale, lease or mortgage are subject to what are known as the overriding interests of the community and the sovereign rights of the state. Administratively, Malawi is divided into 28 districts. Each district is subdivided into smaller administrative units, or Traditional Authorities (TAs), which are ruled by Chiefs. While not recognized as an administrative unit, per se, Extension Planning Areas (EPAs) map very closely to Traditional Authorities. Within Traditional Authorities there are even smaller units headed by a Group Village Headman (GVH), which oversees several villages. The village headed by a traditional Village Headman (VH) is the smallest administrative unit in Malawi. The recent Customary Land Bill, 2012 established new customary land committees, chaired by the GVH, and provided these committees a number of new powers including the right to determine the portion of customary land that will be set aside as communal land and for what purpose (Malawi Law Society 2012).

Strengthening land tenure and providing clarity on governance structures for protected areas management are critical first steps in protecting reserves from illegal encroachment. The Project provides support to strengthening land tenure and forest governance by creating and improving participatory, decentralized governance through co-management of the protected areas between the DPNW and Community Associations representing over 50,000 villages adjacent to protected

areas. The activities to enforce the protected area tenure and establish formalize co-management governance structures includes:

- Clarification of protected area boundaries and, where necessary, facilitation of zoning/re-zoning in collaboration with stakeholders;
- Formation of functional democratically elected Community Associations with formalized governance through their bi-laws and constitutions;
- Facilitation of the transfer of rights and access to natural resources in protected areas, including, where appropriate, revenue sharing in the protected areas from the DNPW to local communities through co-management agreements; and
- Facilitation, development and execution of REDD+ agreements between the DNPW and Community Associations to define roles and responsibilities under the REDD+ program, carbon tenure and financial and operational governance arrangements.
- Development of benefits sharing and distribution program for Project proponents. (From CCB PD)

2.5.2 Free, Prior and Informed Consent (G5.2)

During the Monitoring Period there were no changes to the Project Area boundaries. The most significant change to the management of the program is that African Parks became the concession holder for Nkhotakota Wildlife Reserve. African Parks worked closely with NAWIRA to conduct sensitivity meetings about park boundaries and fences. Together they identified areas where gates were necessary for communities to extract resources from Nkhotakota Wildlife Reserve. The fence is welcomed by the local community as it helps reduce wildlife-human conflict, especially crop loss, and adds a sense of security. If there is a conflict of ownership between the Protected Area and the boundary communities, the fence was simply moved into the Protected Area. AP's policy is to allow DNPW and the communities to solve boundary issues. In the case where the fence moved into the Protected Area, the perceived boundary changed, and it is up to NAWIRA to educate the local community that the Kulera REDD+ Project exists inside and outside the fence.

2.5.3 Property Right Protection (G5.3)

The Project activities have not and will not involve the resettlement of any communities or households, since Project goals include stopping settlements before they happen. Resettlement is not a component of the Project design nor would it be acceptable under Malawi Law. None of the Project activities requires any relocation, voluntary or involuntary.

The Project will not encroach uninvited on private property, community property, or any other government property. Within the Government of the Republic of Malawi, the DNPW oversees national parks and game reserves. The Project Areas are in legally recognized Protected Areas under the National Parks and Wildlife Act, CAP 66.07 (1992) as amended and the Regulations Game Act, CAP 66.03. As supported by the 2004 Amendments to the National Parks and Wildlife Act (1992), Community Associations can enter into co-management agreements for the national parks and game reserves. DNPW and NVA currently have a co-management agreement covering the Nyika National Park and Kulera Landscape REDD+ Project for Co-Managed Protected Areas, Malawi - PDD for the CCB Standard 64 Vwaza Marsh Wildlife Reserve, and NAWIRA is in the process of developing a similar agreement with the DNPW.

2.5.4 Identification of Illegal Activity (G5.4)

There have been illegal activities found in the Project Area during the Monitoring Period, all of which were related to poaching, harvesting of wood, or encroachment into the Protected Areas for farming and/or settlement. The illegal activities are drivers of deforestation identified through this REDD+ Program. Project Activities address each of these drivers, and no project benefits are received from illegal activities.

2.5.5 Ongoing Disputes (G5.5)

There are not on-going disputes of property rights in the Program, thus there is no activity that could prejudice the outcome.

2.5.6 National and Local Laws (G5.6)

2.5.6.1 National Park and Wildlife Act, CAP 66 07 (1992)

The Project Areas are in legally recognized Protected Areas under the National Parks and Wildlife Act, CAP 66.07 (1992) as amended and the Regulations Game Act, CAP 66.03. Thus areas cannot be legally converted at any time in the future to non-forest and their status as protected areas constitutes a legally binding commitment. The National Parks and Wildlife Act was implemented to protect rare, endangered and endemic species of wild plants and animals and guides the establishment and management of national parks and wildlife areas throughout Malawi. It designates rare and endangered species that are protected under the Act and the administrative procedures required for species protection. This act provides for provisions for community co-management of national parks and the wildlife and forest resources found within the National Parks Amendment Act No. 15, 2004.

Park Declarations

Nyika National Park was first declared as a park on 1 January 1966 under the Game Ordinance. It was also known as Malawi National Park. In 1978 the park was extended to its present size by inclusion of the plateau's northern and southern foothills.

Vwaza Marsh Wildlife Reserve was gazetted as Vwaza Game Reserve in 1977 under the Game Act, published as Government Notice No.33 of 1977.

According to the Protected Areas Master Plan for Central Region (Vol. III, 1983) Nkhotakota Wildlife Reserve was declared in its present form by the Game Reserve (Declaration) Order, 1970, 26 October 1970, published as Government Notice No. 266 of 1970.

The Chiefs Act, 1967

According to Chiefs Act 1967, traditional authorities, or "chiefs" may appoint Group Village Headmen and Village Headmen to assist him in carrying out his functions. Each village or group village, represented by a Group Village Headman that decides to enter into community forest management is required to elect a Village Natural Resource Management Committee (VNRMC) to represent their interests and act as points of liaison in dealings with forestry extension workers and other government officials. The VNRMC must also be willing to take on the lead role in forest planning, management and administration, and to participate in training. The Project will be implemented through these Headmen to aggregate individually owned trees planted in privately owned lands.

National Environmental Management Act, 1996

Establishes the rules and regulations and procedures guiding Environmental Impact Assessments (EIAs). The Act led to the creation of the Environmental Affairs Department (EAD) in the Ministry of Natural Resources and Environmental Affairs which is responsible for the administration of the EIA process in Malawi.

Malawi Decentralization Policy, 1998

According to Malawi's Decentralization Policy 1998, District Assemblies make up Malawi's system of local government and can create committees at Area, Ward or Village level for purposes of facilitating participation of the people in the Assembly's decision making. The District Assembly is comprised of an elected Chairman/Mayor and one councilor per Ward, as well as ex officio non-voting members including the Traditional Authority and Sub-Traditional Authority from the local government area, 5 people appointed by elected members to represent special interest groups, and members of parliament from constituencies that fall within the local government area. In this sense, the District Assembly is both a governmental and "non-governmental" entity. This policy may authorize District Assemblies responsible for forest management and conservation on customary lands, including having the legal capacity for local level planning and licensing (FGLG 2008). Most of this responsibility rests with the District Forest Offices, which are accountable to the District Assemblies. The Project benefits by this decentralization policy as most of the legal decision can be made locally through district assemblies.

National Forest Programme, 2001

- Is intended to be the implementing program for the 1996 forest policy and Forest Act of 1997. It outlines a strategic framework of priorities and viable actions for improving forestry and livelihoods in Malawi. It aims to link policy and on-the-ground practice so that they Kulera Landscape REDD+ Project for Co-Managed Protected Areas, Malawi - PDD for the CCB Standard 63 support good forest and tree management as a means of alleviating poverty and improving livelihoods in Malawi.

Malawi National Land Policy, 2002

According to National Land Policy of 2001, the government may assign land as public land which any land that is held in trust and managed by the Government or Traditional Authorities and accessible to the public at large. Within the boundaries of Traditional Authorities public lands are lands that are not allocated exclusively to any group, individual or family; however, they are reserved for the exclusive use of members of the respective Traditional Authority. These include, for example, dambos or communal grazing and communal forest areas. The policy emphasizes that public lands held in trust for members of a particular community does not automatically transfer ownership of that land to the Headsperson, Chief or public official and therefore is not considered private. On the contrary, private lands, also called "customary estates," are customary lands that are allocated exclusively to a clearly defined community, corporation, clan, family or individual. Once registered customary estates provide the proprietor private usufructuary rights in perpetuity and can be leased or used as security for a mortgage loan. However, it is important to note that because the interest of a customary estate is usufructuary only the sale, lease or mortgage are subject to what are known as the overriding interests of the community and the sovereign rights of the state.

Forest Act 1997, Forest Policy 1996, and Community Based Forest Management Policy in 2003

The National Land Policy 2002 defines categories of land ownership in Malawi while the specific use of forest resources within these particular land tenure systems is defined in the National Forest Policy of Malawi in 1996 and further refined in Community Based Forest Management Policy in 2003. Specifically, the Community Based Forest Management Policy allowed for communities on customary lands – mostly unallocated customary lands – to achieve a full forest ownership and control through the conclusion of a Forest Management Agreement with the government. It is important to note that “ownership” in this sense also means usufructuary, or use rights, only. Forest Act 1997 requires charcoal production to be licensed, and for license applications to be consistent with approved forest management plans and agreements. The Project will conform to this law for any charcoal promotion in the Project Areas.

Updates since PD and the First Monitoring Report include the 2017 amendment which “This Act makes amendments to the Forestry Act consequential to the entry into force of the Customary Land Act, 2016.”. There was no meaningful impact on the project

In 2016, Malawi’s Parliament passed 10 new laws (The Land Bill, 2016; Customary Land Bill, 2016; Physical Planning Bill, 2016; Land Survey Bill, 2016; Registered Land (Amendment) Bill, 2016; Land Acquisitions (Amendment) Bill, 2016; Local Government (Amendment) Bill, 2016; Malawi Housing Corporation (Amendment) Bill, 2016; Forestry (Amendment) Bill, 2016; and Public Roads (Amendment) Bill, 2016.) that will make fundamental changes to the status and registration of land rights. The new framework introduces a decentralized land administration and registration system and, for the first time, provides for the formalization and registration of customary rights. This only provides additional opportunities for the Program to formalize areas that are improved by the communities to protect their investments.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Data/parameter [EA1]:	CF
Data unit:	[Mg C (Mg DM) ⁻¹]
Description:	Carbon fraction of dry matter in wood
Sources of data:	Default value of 0.5 (IPCC GPG-LULUCF 2003)
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied	Partitions carbon from biomass data. Used in calculations of annual carbon loss per deforestation driver (VM0006 Section 8.1.3.2, EQ 1-10), calculations of carbon stock density from OM pools (VM0006 Section 8.1.4.4, EQ 24), and carbon accounting for harvested wood products (VM00066 Section 8.4.1.1, EQ 101)
Purpose of Data:	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage

Any comment:	
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Data/parameter [EA2]:	<i>E</i>
Data unit:	[-]
Description:	Average combustion efficiency of the aboveground tree biomass
Sources of data (*):	1. Project-specific measurements 2. Regionally valid estimates 3. Estimates from Table 3.A.14 of IPCC GPG LULUCF 4. If no appropriate combustion efficiency can be used, use the IPCC default of 0.5
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied	Used in calculations of carbon loss from biomass burning. In VM0006 this parameter is used in the deforestation drivers analysis to account carbon loss from forest fires (Section 8.1.3.2 EQ 10).
Purpose of Data:	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Any comment:	

Data/parameter [EA3]:	<i>P</i>
Data unit:	[-]
Description:	Average proportion of mass burned from the aboveground tree biomass.
Sources of data:	GPG-LULUCF Table 3A.1.12
Value applied:	
Justification of choice of data or description of measurement methods and procedures applied	Used in calculations of carbon loss from biomass burning. In VM0006 used to account carbon loss from forest fires in the deforestation drivers analysis to (Section 8.1.3.2 EQ 10).
Purpose of Data:	• Calculation of baseline emissions • Calculation of project emissions • Calculation of leakage
Any comment:	N/A for monitoring period.

Data/parameter [EA4]:	GWP_{CH_4}
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Data unit:	[-]
Description:	Global Warming Potential for CH ₄
Sources of data:	IPCC default value of 25
Value applied:	25
Justification of choice of data or description of measurement methods and procedures applied:	Used to convert CH ₄ emissions to CO ₂ emissions. Methane accounted in calculations that include prescribed burning for firebreaks (VM0006 Section 8.2.3 EQ 70) prescribed burning for ANR (VM0006 Section 8.2.4.5 EQ77) and flooded rice agriculture (VM0006 Section 8.3.4.2.2 EQ 100
Purpose of Data:	Determination of baseline scenario (AFOLU projects only)
Any comment:	N/A for monitoring period.

Data/parameter [EA5]:	ER_{CH_4}
Data unit:	Proportion
Description:	Emission ratio for CH ₄
Sources of data:	Table 3A.1.15 in IPCC GPG-LULUCF 2003
Value applied:	IPCC default value of 0.012
Justification of choice of data or description of measurement methods and procedures applied	Used in CH ₄ calculations that include prescribed burning for firebreaks (VM0006 Section 8.2.3 EQ 70) and ANR (VM0006 Section 8.2.4.5 EQ77)
Purpose of Data:	- Calculation of baseline emissions - Calculation of project emissions - Calculation of leakage
Any comment:	N/A for monitoring period.

Data/parameter [EA6]:	sc_1
Data unit:	[-]
Description:	First shape factor for the forest scarcity equation; steepness of the decrease in deforestation rate (greater is steeper).
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Value applied:	20
Justification of choice of data or description of	Use model-fitting procedures described in VM0006 Section 8.1.5.4

measurement methods and procedures applied	
Purpose of Data:	Determination of baseline scenario (AFOLU projects only)
Any comment:	Used in calculation of class/stratum transition rates. One of two parameters that determine the shape of the forest scarcity factor curve (VM0006 Section 8.1.5.4, EQ 40).

Data/parameter [EA7]:	sc_2
Data unit:	[-]
Description:	Second shape factor for the forest scarcity equation; relative deforested area at which the deforestation rate will be 50% of the initial deforestation rate.
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Value applied:	0.7
Measurement procedures:	Use model-fitting procedures described in VM0006 Section 8.1.5.4
Justification of choice of data or description of measurement methods and procedures applied	Used in calculation of class/stratum transition rates. One of two parameters that determine the shape of the forest scarcity factor curve (VM0006 Section 8.1.5.4, EQ 40).
Purpose of Data:	Determination of baseline scenario (AFOLU projects only)
Any comment:	Higher values of sc_2 result in lower deforestation and are therefore conservative.

Data/parameter [EA8]:	$\rho_{wood,j}$
Data unit:	[Mg DM m ⁻³]
Description:	Average basic wood density of species or species group j
Sources of data:	GPG-LULUCF Table 3A.1.9. or published data/literature.
Value applied:	0.60
Justification of choice of data or description of measurement methods and procedures applied:	Used to calculate total carbon stock from harvested timber volume (VM0006 Section 8.4.1.1, EQ 101)
Purpose of Data:	- Calculation of baseline emissions - Calculation of project emissions

	Calculation of leakage
Any comment:	Average density value of African tree species.

Data/parameter [EA9]:	BEF_2
Data unit:	[-]
Description:	Biomass expansion factor for converting volumes of extracted round wood to total aboveground biomass (including bark).
Sources of data:	IPCC GPG LULUCF Table 3A.1.10 or published data from scientific peer reviewed literature
Value applied:	3.4
Justification of choice of data or description of measurement methods and procedures applied:	Converts wood volume to biomass. Used in calculations of annual carbon loss per deforestation driver for logging, wood collecting and fuelwood collecting (VM0006 Section 8.1.3.2, EQ 4,5,6,7),
Purpose of Data:	Determination of baseline scenario (AFOLU projects only)
Any comment:	Value 3.4 from IPCC GPG LULUCF Table 3A.1.10 for tropical, broadleaf forest for trees >10cm DBH. This data was not used.

Data/parameter [EA10]:	$NCV_{biomass}$
Data unit:	[TJ (Mg DM) ⁻¹]
Description:	Net calorific value of non-renewable biomass that is substituted.
Sources of data:	IPCC default value.
Value applied:	not used - substitute non-renewable biomass not part of project activities
Justification of choice of data or description of measurement methods and procedures applied	Parameter used to quantify emissions from CFE activities (VM0006 Section 8.2.5, WE 108)
Purpose of Data:	Determination of baseline scenario (AFOLU projects only)
Any comment:	0.015 TJ (Mg DM) ⁻¹ commonly used

3.1.2 Data and Parameters Monitored

3.1.2.1 Sizes, Areas, and Transitions

Land-use Change Analysis

Description of the Data Sources

Historical Landsat images were used from USGS using the GLOVIS data acquisition system. In order to best evaluate the medium-resolution Landsat images, high resolution images from Google Earth were used to assist the image interpreter.

Pre-processing of Remote Sensing Data

All available Landsat images listed in Table 3, covering the area of interest (169-67, 169-68 and 168-69), were used to produce the historical land cover maps. All images were downloaded from USGS GLOVIS.

Table 3. Landsat imagery used to for the monitoring period

Area of Interest	Path-Row	Date Main Image	% Main Image	Date of Parsed Image	% of Parsed Image	Weighted Date
Nyika	169-67	20190803	88	20191022	12	20190813
Vwaza	169-68	20190531	100	0	0	20190531
Nkhotakota	168-69	20190422	95	20190913	5	20190429

Application of the Tool for Calculating Deforestation Rates Using Incomplete Remote Sensing Images

The VCS tool VT0006 Tool for Calculating LULC Transitions and Deforestation Rates Using Incomplete Remote Sensing Images was used to remove excessive clouds and clouds shadows. The classification was carried out from Landsat images from the end of the wet season, a time in which it is possible to differentiate the Miombo forest more clearly from the bare ground, in addition the areas affected by fires are smaller in this season compared to the dry season. However, in these images clouds and cloud shadows cover a large part of the project area and the leakage area in Nyika and Nkhotakota.

The VT0006 Tool for Calculating LULC Transitions and Deforestation Rates Using Incomplete Remote Sensing Images was used to resolve these areas. Two additional images, one for Nyika and one for Nkhotakota were classified and parsed into the larger images. These were in the same year corresponding to the dry season with a minimum percentage of clouds were classified. Subsequently, the pixels that in the wet season image were classified as clouds and cloud shadow, were replaced by the pixels of the dry season classified image. This same procedure was completed for the burned areas in the wet image, as well. Burning is a common occurrence in Malawi, and fires commonly burn in agriculture fields as well as in the understory of miombo woodland.

The same procedure was carried out to improve the classification of the evergreen forest, since this type of cover during the wet season has a high degree of confusion with the wet Miombo forest, while in the dry season the evergreen forest is very clearly distinguishable from any LULC

classes. Table 4 shows the areas that have been parsed for both Protected Areas Nkhotakota and Nyika.

Table 4. Total areas parsed in Nkhotakota and Nyika

Class	Nkhotakota				Nyika			
	Project Area		Leakage Area		Project Area		Leakage Area	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Burned	-	0%	0	0	447.39	1%	1,354.32	1%
Cloud Shadow	1,025.37	1%	1,142.55	1%	4,812.84	6%	4,990.23	4%
Cloud	1,353.69	2%	5,191.29	5%	2,611.89	3%	2,496.06	2%
Evergreen Forest	51.39	0%	2.97	0%	5,037.75	7%	1,313.46	1%
Other Classes	67,760.82	97%	97,605.72	94%	63,894.96	83%	105,684.84	91%
Total	70,191.27	100%	103,942.53	100%	76,804.83	100%	115,838.91	100%

LULC Classification and Forest Stratification

The following steps outline remote sensing procedures that were followed throughout this project and to create the monitoring images used for this monitoring period:

- Analysts interpreted ~2,000 reference points of Miombo Forest (MI1), Evergreen Forest (EVG) and Non-Forest (BAR) for each image which were cross-referenced with high-resolution imagery from Google Maps, Microsoft Bing Maps. The reference points were randomly divided into 66% training points and 33% verification points.
- The calculated indices and band ratios from the composite images in the monitoring period were classified using a machine learning algorithm.
- After classification, the spatial coherence was improved by applying some morphological operations (clumping and sieving, and majority filtering).

Classification Accuracy

Accuracy metrics were calculated based on the randomly selected verification points for each of the images in the monitoring period. The 33% of reference points that were assigned as verification points were used to assess the accuracy of land use classification. Confusion matrices for each of the images were calculated. The classified images are classified with sufficiently high accuracy, as demonstrated by the accuracy measures (Table 5) and confusion matrices in Table 6.

Table 5. Accuracy for the verification of the classification of the images in the monitoring period

Area of Interest	Overall Accuracy
Nkhotakota	95%
Nyika	96%
Vwaza	96%

Table 6. Confusion matrix with omission and commission percentages for Nkhotakota

	BAR	MI1	BRN	WTR	SHD	CLD	EVG
BAR	267	12				1	
MI1	12	229			2	1	1
BRN	1		1				
WTR				163	9		
SHD					2		
CLD						6	
EVG							5
Omission	95%	95%	100%	100%	15%	0%	83%
Commission	95%	93%	50%	95%	100%	100%	100%

Table 7. Confusion matrix with omission and commission percentages for Nyika

	BAR	MI1	BRN	WTR	SHD	CLD	EVG
BAR	284	5				2	5
MI1	11	167			1		
BRN			7				
WTR				31			
SHD				1	15		
CLD						14	
EVG							81
Omission	96%	97%	100%	97%	94%	88%	94%
Commission	96%	93%	100%	100%	94%	100%	100%

Table 8. Confusion matrix with omission and commission percentages for Vwaza

	BAR	MI1	BRN	WTR	SHD	CLD
BAR	1117	20	3	1		
MI1	73	1275		6	1	1
BRN		5	35			
WTR				52		
SHD	3	4	1	2	86	
CLD	1					94

	BAR	MI1	BRN	WTR	SHD	CLD
Omission	94%	98%	90%	85%	99%	99%
Commission	98%	94%	88%	100%	90%	99%

Land Transitions in Project Area and Leakage Areas

The tables below are the ex-post transitions for each of the Project Areas during the Monitoring Period.

Table 9. Ex-Post Monitored Transitions in the Project Area Nyika (in hectares)

	Project Area - Baseline					Project Area - Ex-Post				
	DF		RF			DF		RF		
	From	MI1	EVG	BAR	BAR	From	MI1	EVG	BAR	BAR
	To	BAR	BAR	MI1	EVG	To	BAR	BAR	MI1	EVG
	Nyika					Nyika				
MR1	2009	921	91	0	0	2009	348	70	0	0
MR1	2010	919	91	11	1	2010	348	70	0	0
MR1	2011	904	94	23	2	2011	348	70	0	0
MR1	2012	898	91	31	2	2012	348	70	0	0
MR2	2013	901	91	43	3	2013	311	47	167	41
MR2	2014	891	94	51	4	2014	311	47	167	41
MR2	2015	892	85	62	4	2015	311	47	167	41
MR2	2016	883	84	67	7	2016	311	47	167	41
MR2	2017	872	91	78	6	2017	311	47	167	41
MR2	2018	881	83	94	6	2018	311	47	167	41

Table 10. Ex-Post Monitored Transitions in the Project Area Nkhotakota (in hectares)

	Project Area - Baseline					Project Area - Ex-Post				
	DF		RF			DF		RF		
	From	MI1	EVG	BAR	BAR	From	MI1	EVG	BAR	BAR
	To	BAR	BAR	MI1	EVG	To	BAR	BAR	MI1	EVG
	Nkhotakota					Nkhotakota				
MR1	2009	1186	0	0	0	2009	101	1	0	0
MR1	2010	1212	1	1	0	2010	101	1	0	0
MR1	2011	1205	1	2	0	2011	101	1	0	0
MR1	2012	1197	1	4	0	2012	101	1	0	0
MR2	2013	1213	0	6	0	2013	148	0	54	0
MR2	2014	1200	1	7	0	2014	148	0	54	0
MR2	2015	1205	1	10	0	2015	148	0	54	0
MR2	2016	1196	1	11	0	2016	148	0	54	0
MR2	2017	1201	1	13	0	2017	148	0	54	0
MR2	2018	1199	1	14	0	2018	148	0	54	0

Table 11. Ex-Post Monitored Transitions in the Project Area Vwaza (in hectares)

		Project Area - Baseline					Project Area - Ex-Post			
		DF		RF			DF		RF	
	From	MI1	EVG	BAR	BAR	From	MI1	EVG	BAR	BAR
	To	BAR	BAR	MI1	EVG	To	BAR	BAR	MI1	EVG
	Vwaza					Vwaza				
MR1	2009	622	0	0	0	2009	184	0	0	0
MR1	2010	609	0	9	0	2010	184	0	0	0
MR1	2011	602	0	17	0	2011	184	0	0	0
MR1	2012	593	0	24	0	2012	184	0	0	0
MR2	2013	587	0	31	0	2013	131	0	90	0
MR2	2014	573	0	38	0	2014	131	0	90	0
MR2	2015	563	0	43	0	2015	131	0	90	0
MR2	2016	552	0	51	0	2016	131	0	90	0
MR2	2017	548	0	63	0	2017	131	0	90	0
MR2	2018	540	0	70	0	2018	131	0	90	0

Land Transitions in the Leakage Areas

The tables below show the baseline and ex-post transitions for each of the Leakage Areas during the 1st and 2nd Monitoring Period.

Table 12. Ex-Post Monitored Transitions in the Leakage Nyika (in hectares)

		Leakage Area - Baseline					Leakage Area - Ex-Post			
		DF		RF			DF		RF	
	From	MI1	EVG	BAR	BAR	From	MI1	EVG	BAR	BAR
	To	BAR	BAR	MI1	EVG	To	BAR	BAR	MI1	EVG
	Nyika					Nyika				
MR1	2009	683	9	695	46	2009	830	10	1588	16
MR1	2010	682	13	694	46	2010	830	10	1588	16
MR1	2011	695	13	692	46	2011	830	10	1588	16
MR1	2012	704	12	694	46	2012	830	10	1588	16
MR2	2013	703	12	692	45	2013	1091	22	2652	19
MR2	2014	708	14	694	46	2014	1091	22	2652	19
MR2	2015	715	15	691	46	2015	1091	22	2652	19
MR2	2016	728	15	697	45	2016	1091	22	2652	19
MR2	2017	727	15	695	45	2017	1091	22	2652	19
MR2	2018	725	15	688	46	2018	1091	22	2652	19

Table 13. Ex-Post Monitored Transitions in the Leakage Area Nkhotakota (in hectares)

		Leakage Area - Baseline					Leakage Area - Ex-Post			
		DF		RF			DF		RF	
	From	MI1	EVG	BAR	BAR	From	MI1	EVG	BAR	BAR
	To	BAR	BAR	MI1	EVG	To	BAR	BAR	MI1	EVG
	Nkhotakota					Nkhotakota				
MR1	2009	626	0	101	0	2009	585	0	1297	0
MR1	2010	599	0	102	0	2010	585	0	1297	0
MR1	2011	606	0	104	0	2011	585	0	1297	0
MR1	2012	614	0	104	0	2012	585	0	1297	0
MR2	2013	599	0	104	0	2013	1215	0	2237	0
MR2	2014	611	0	105	0	2014	1215	0	2237	0
MR2	2015	606	0	104	0	2015	1215	0	2237	0
MR2	2016	615	0	105	0	2016	1215	0	2237	0
MR2	2017	610	0	106	0	2017	1215	0	2237	0
MR2	2018	611	0	107	0	2018	1215	0	2237	0

Table 14. Ex-Post Monitored Transitions in the Leakage Area Vwaza (in hectares)

		Leakage Area - Baseline					Leakage Area - Ex-Post			
		DF		RF			DF		RF	
	From	M1	EVG	BAR	BAR	From	M1	EVG	BAR	BAR
	To	BAR	BAR	M1	EVG	To	BAR	BAR	M1	EVG
		Vwaza					Vwaza			
MR1	2009	563	0	611	0	2009	294	0	908	0
MR1	2010	576	0	610	0	2010	294	0	908	0
MR1	2011	583	0	609	0	2011	294	0	908	0
MR1	2012	591	0	609	0	2012	294	0	908	0
MR2	2013	597	0	609	0	2013	675	0	1482	0
MR2	2014	611	0	610	0	2014	675	0	1482	0
MR2	2015	621	0	611	0	2015	675	0	1482	0
MR2	2016	632	0	610	0	2016	675	0	1482	0
MR2	2017	636	0	605	0	2017	675	0	1482	0
MR2	2018	643	0	605	0	2018	675	0	1482	0

Parameters

Data/parameter [MN2]:	$\Delta area_{projectAreaEAH,projectScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Area (ha) undergoing transition <i>i</i> within the project area, excluding the ANR area, and harvest areas, under the project scenario for year <i>t</i> .
Sources of data:	Land-use change modeling (ex-ante) Remote sensing analysis (ex-post)
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification
Frequency of monitoring:	At least once before verification
Value monitored:	Table 9, Table 10 Table 11
Monitoring equipment:	Land-use classification, Landsat
QA/QC procedures to be applied:	
Purpose of Data:	Estimate areas undergoing change from one class to another during the project scenario during the monitoring period.
Calculation method:	Follow the procedures described in section 8.1.5 of the methodology.
Any comment:	Required for monitoring period

Data/parameter [MN5]:	$\Delta area_{leakageArea,projectScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>i</i> within the leakage area under the project scenario for year <i>t</i>

Sources of data:	Remote sensing analysis, Landsat
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification, summarized in the transition rates analysis described in Section VCS PD 3.1.5.
Frequency of monitoring:	At least once before verification
Value monitored:	Table 9, Table 10 Table 11
Monitoring equipment:	n/a
QA/QC procedures to be applied:	
Purpose of Data:	Used to predict LULC transitions in the leakage area under the project scenario
Calculation method:	Follow the procedures described in Section 3.1.2
Any comment:	Required for monitoring period

Data/parameter [MN50]:	$u_{classification}$
Data unit:	[-]
Description:	Discounting factor for NERs from avoided deforestation, based on the accuracy of classification, i.e. dividing land into broad land use types.
Sources of data:	Remote sensing analysis, Landsat
Description of measurement methods and procedures to be applied:	Table 5 Accuracy for the verification of the classification of the images in the monitoring period
Frequency of monitoring:	At least once before verification
Value monitored:	The table for Emission factors and discounting factors for LULC Transitions.
Monitoring equipment:	RS Software, python.
QA/QC procedures to be applied:	
Purpose of Data:	Used to measure accuracy of LULC transitions of the classification for the project emissions.
Calculation method:	
Any comment:	

Data/parameter [MN10]:	$area_{biomassLoss}(i)$
Data unit:	[ha yr ⁻¹]

Description:	Total annual area of LULC class 1 that was cleared for creating firebreaks
Sources of data:	Records of implemented activities or management plan
Description of measurement methods and procedures to be applied:	Records of implemented activities do not include clearing of forest biomass, but shaded fuel breaks. Biomass removed is grasses and herbs that would have been burnt in the absence of the project.
Frequency of monitoring:	At least once before verification
Value monitored:	0
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	Calculation of project emissions
Calculation method:	N/A
Any comment:	No biomass loss occurred from fire breaks in this monitoring period.

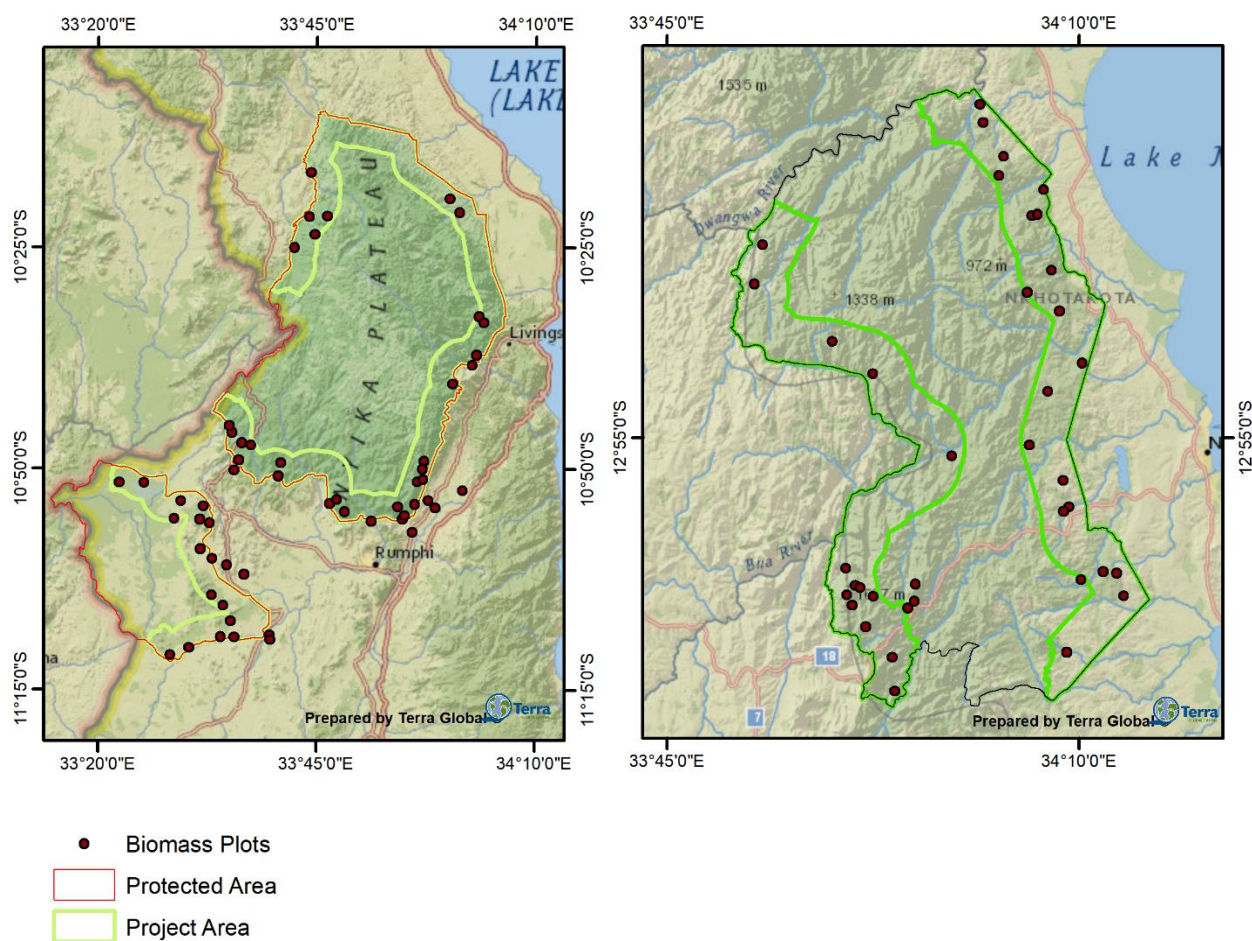
Data/parameter [MN11]:	$area_{fireBiomassLoss}(i)$
Data unit:	[ha yr ⁻¹]
Description:	Annual area of forest stratum 1 that was cleared by using prescribed burning
Sources of data:	Records of implemented activities or management plan
Description of measurement methods and procedures to be applied:	Records of implemented activities do not include clearing of forest biomass, but shaded fuel breaks. Biomass removed is grasses and herbs that would have been burnt in the absence of the project.
Frequency of monitoring:	At least once before verification
Value monitored:	0
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	Calculation of project emissions
Calculation method:	N/A
Any comment:	No biomass loss occurred from burning to clear fire breaks in this monitoring period.

3.1.2.2 Carbon Stock Measurements

Biomass Inventories

Forest inventories or biomass plots were measured using a similar SOP to the last Monitoring Period. The Kulera PD describes processes followed and a full Forest Inventory data as well as the SOP for field measurements is provided to the VVB. Some plots were revisited, and some new biomass plots were added. New plots that were added used a stratified random sampling approach for new plot location. Permanent sampling plots were marked with a buried metal maker, but at remeasurement the metal markers were not found, so plot biomass locations varied slightly from the first monitoring period. Soil carbon was measured in a sub-sample of plots, similarly to what was done during the last monitoring period.

Ninety-three biomass plots were measured in 2019 with 72 plots in Miombo Forest, 6 plots in Evergreen Forest, and 15 bare non-forest areas. The sampling design and procedures to measure each of the biomass pools are described in detail in the Standard Operations Procedure for biomass inventories.



Map 1. Biomass Plots Measured During the Monitoring Period

Table 15. Biomass Pools Measured

LULC	AG Tree	BG Tree	AG Sapling	BG Sapling	AG Non-tree	BG Non-tree	Standing dead	Down dead	Soil Organic	Total
[-]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]	[t C ha-1]
Evergreen	180.90	42.51	1.16	0.27	0.14	0.20	4.31	1.07	82.05	312.61
Miombo	35.15	16.71	0.75	0.53	0.16	0.23	0.41	0.16	27.37	81.48
Non-forest	2.11	1.23	0.25	0.18	0.12	0.17	0.00	0.00	23.16	27.21

Table 16. Summary of Biomass Stock Measurements during the Monitoring Period

Biomass Stock Density	Unit	Miombo	Evergreen	Non-forest
Average	Mg DM ha-1	162.96	625.23	54.43
Standard deviation	Mg DM ha-1	52.49	147.67	10.04
Maximum	Mg DM ha-1	319.14	881.28	75.86
Number of observations (n)	-	72.00	6.00	15.00
Standard error of the mean	Mg DM ha-1	6.19	60.29	2.59
Lower Confidence Limit of the mean	Mg DM ha-1	150.63	477.71	48.90
Upper Confidence Limit of the mean	Mg DM ha-1	175.29	772.74	59.95
HWCI	Mg DM ha-1	12.33	147.52	5.52

The overall biomass inventory showed that there was a slight decrease in carbon in forest classes, and an increase in carbon in the non-forest classes. This shows that there is still a strong pressure on forests in the Project Area and Project Zone.

Table 17. Difference in Biomass Stock Measurements from the Baseline

Biomass Stock Density	Unit	Miombo	Evergreen	Non-forest
Average	Mg DM ha-1	-4.19	-57.78	2.03

Uncertainty Analysis for Biomass of LULC transitions

The appropriate emission factors associated with the land cover transitions i.e. from one LULC class to another LULC class were calculated from the inventoried plots. The uncertainty is expressed as the half-width of the 95% confidence interval around the mean of the difference between the carbon stocks between the LULC classes. The applicable emission factors and uncertainty discounting factor for applicable LULC are shown in Table 18. Overall, the combined error of transition required a discounting factor to be applied to the overall emission factors.

Table 18. Combined Error of Transition and Discounting factor

From	To	Combined Error of Transition [-]	Discounting Factor [-]	Transitions Non-Allowable
EVG	MIO	0.29782	0.70	N/A
EVG	BAR	0.24120	0.76	
MIO	EVG	0.29782	0.70	N/A
MIO	BAR	0.14139	1.00	

From	To	Combined Error of Transition [-]	Discounting Factor [-]	Transitions Non-Allowable
BAR	EVG	0.24120	0.76	N/A
BAR	MIO	0.14139	1.00	

Calculate Emission Factors

Once the carbon stock densities are calculated, carbon emission factors and their uncertainties for each LULC class transitions are calculated according the formulas set out in the methodology Section 8.1.4.5. Table 19 shows emission factors when LULC shifts from one class to another.

Table 19. Emission Factors (Transitions and emissions factors (with decay factor and statistical discounts))

From	To	Emission Factor for below ground live pool if $t \leq 10$ [tCO ₂ ha ⁻¹]	Emission Factor for below ground live pool if $t \leq 10$ [tCO ₂ ha ⁻¹]	Emission Factor for above ground dead pool if $t \leq 10$ [tCO ₂ ha ⁻¹]	Emission Factor for SOC pool if $t \leq 10$ [tCO ₂ ha ⁻¹]
MIO	BAR	-123.14	-5.83	-0.21	-0.77
EVG	BAR	-500.04	-11.52	-1.50	-8.19
BAR	MIO	123.14	5.83	0.21	0.77
BAR	EVG	500.04	11.52	1.50	8.19
EVG	MIO	-376.26	-6.57	-1.24	-7.04
MIO	EVG	376.26	6.57	1.24	7.04
MIO	BAR	-123.14	-5.83	-0.21	-0.77
EVG	BAR	-500.04	-11.52	-1.50	-8.19

Make note the methodology deviation 2 in Section 2.2.2 to see the emission factors for EVG to BAR that was applied to this monitoring period.

Parameters

Data/parameter [MN48]:	$OM_o(i)$
Data unit:	[Mg DM ha ⁻¹]
Description:	Plant-derived organic matter of LULC class or forest stratum i in pool o . [Mg DM ha ⁻¹]
Sources of data:	Field measurements using sampling plots in forest strata or LULC classes.
Description of measurement methods and procedures to be applied:	The average biomass stock density in applicable organic matter pools: aboveground tree - $OM_{AGT}(i)$, aboveground non-tree - $OM_{AGNT}(i)$, lying dead wood - $OM_{LDW}(i)$, standing dead wood $OM_{SDW}(i)$, belowground $OM_{BG}(i)$, and soil organic matter $OM_{SOM}(i)$
Frequency of monitoring:	At least once before every baseline update

Value monitored:	See Table 15. Biomass Pools Measured
Monitoring equipment:	
QA/QC procedures to be applied:	Follow uncertainty deduction procedures described in methodology. Re-measure plots by independent teams.
Purpose of Data:	Calculation of Project Emissions
Calculation method:	
Any comment:	Summed across multiple pools and divided into $OM_{plant}(i)$ and $OM_{soil}(i)$

Data/parameter [MN47]:	$C(t, i)$
Data unit:	[Mg C ha ⁻¹ yr ⁻¹]
Description:	Carbon stock density at time t in stratum i .
Sources of data:	Estimate within the biomass inventory plots
Description of measurement methods and procedures to be applied:	
Frequency of monitoring:	At least once before verification
Value monitored:	See Table 16 Summary of Biomass Stock Measurements during the Monitoring Period
Monitoring equipment:	
QA/QC procedures to be applied:	QA/QC Procedures described in the Field Measurements SOP and excel workbook to enter data.
Purpose of Data:	Used in estimating change in carbon stock density such as in ANR areas for calculation of project emissions
Calculation method:	
Any comment:	

Data/parameter [MN48]:	$f_{allometric}(y)$
Data unit:	Equation
Description:	Allometric relationship to convert a tree metric such as DBH or tree height into biomass
Sources of data (*):	Allometric equations developed locally by groups other than project proponents
Description of measurement methods and procedures to be applied:	

Frequency of monitoring:	May be updated at baseline update
Value monitored:	For <i>Mangifera indica</i>: $AGB = -26.6 + 0.614 \cdot DBH + 1.39 \cdot 40$ (following Chavan and Rasal 2012). For trees ≥ 5 cm DBH, < 80cm DBH: $AGB = 0.1027 \cdot DBH^{2.4798}$ (following Mugasha et al., 2013). For trees < 80cm DBH the following factor was applied to the Mugasha equation: $= (DBH - 80) / 2 + 80, DBH$ (following descriptions in RECOFTC, 2011 and Clark and Clark 2002). For trees ≥ 1 cm DBH, < 5cm DBH, $AGB = \exp(-1.32 + 1.893 \cdot \ln(DBH))$ (following Malimbwi et al. 1994)
Monitoring equipment:	
QA/QC procedures to be applied:	Calculation in Excel workbook
Purpose of Data:	Calculation of project emissions.
Calculation method:	
Any comment:	Mugasha et al. (2013) equation was used for all plots, and a deduction factor was used for trees greater than 80cm DBH. Malimbwi et al. 1994 was used for trees smaller than 5 cm dbh.

Data/parameter [MN49]:	$f_{belowground}(y)$
Data unit:	Equation
Description:	Relationship between aboveground and belowground biomass, such as a root-to-shoot ratio
Sources of data (*):	A relationship obtained from the local/national studies that closely reflect the conditions of the project activity
Description of measurement methods and procedures to be applied:	
Frequency of monitoring:	May be updated at baseline update
Value monitored:	For evergreen plots: $BGB = AGB \cdot 0.235$ (following IPCC GPG) For all other plots: $BGB =$ $DBH < 20$, $BGB = AGB \cdot 0.71$, $DBH \geq 20$, < 40, $BGB = AGB \cdot 0.4$ $DBH \geq 40$, < 60, $BGB = AGB \cdot 0.31$ $DBH \geq 60$, $BGB = AGB \cdot 0.23$ (following Mokany et al. 2006.)
Monitoring equipment:	

QA/QC procedures to be applied:	
Purpose of Data:	Calculation of project emissions.
Calculation method:	
Any comment:	Not monitored in this period.

Data/parameter [MN51]:	$u_{transition}(i)$
Data unit:	[-]
Description:	Discounting factor for the emission factor for the transition from LULC class or forest stratum 1 to class 2 according to the uncertainty of the biomass inventory.
Sources of data:	
Description of measurement methods and procedures to be applied:	See Table 18 Combined Error of Transition and Discounting factor
Frequency of monitoring:	At least once before verification
Value monitored:	See Table 18 Combined Error of Transition and Discounting factor
Monitoring equipment:	RS Software, Landsat
QA/QC procedures to be applied:	
Purpose of Data:	Calculation of project emissions.
Calculation method:	
Any comment:	

3.1.2.3 Data and Parameters to be Monitored – Only at Baseline Reset

Data/parameter [MN1]:	$Size_{projectArea}$, $Size_{leakageArea}$, $Size_{referenceRegion}$, $Size_{referenceForest}$
Data unit:	[ha]
Description:	Size of project area, leakage area, reference region, and forest area in the reference region
Sources of data:	Project design
Description of measurement methods and procedures to be applied:	GIS delineation of protected area boundaries based on official records, RS analysis of forest cover

Frequency of monitoring:	$size_{projectArea}$ and $size_{leakageArea}$ may be adjusted during crediting period per the rules for grouped projects and updated at verification, but only for the additional instances that were added after the project start date, and may be adjusted during crediting period per the rules for grouped projects and updated at verification, but only for the additional instances that were added after the project start date..
Value monitored:	See VCS PD for Table 10: Size and Geodetic Coordinates of Individual Project Parcels (WGS-84) and Table 13. Size of Reference Regions and Leakage Areas around each of the Project Parcels
Monitoring equipment:	n/a
QA/QC procedures to be applied:	Visual evaluation and comparison to Google Earth
Purpose of Data:	$size_{leakageArea}$ and $size_{projectArea}$ used to calculate the Forest Strata-specific Deforestation and Degradation Rates in the Leakage Belts (VM0006 Section 8.3.2.3, EQ 94, 95) $size_{projectArea}$ used to calculate forest scarcity factor (VM0006 Section 8.1.4.4, EQ 40). $size_{referenceForest}$ and $size_{projectArea}$ used to calculate baseline total deforestation and degradation rates (VM0006 Section 8.1.4.1, EQ 37, 38). $size_{referenceRegion}$ used to test applicability conditions for the reference region
Calculation method:	GIS delineation of boundaries
Any comment:	Not required for monitoring period unless it is a baseline reset

Data/parameter [MN3]:	$\Delta area_{projectAreaEAH,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Area (ha) undergoing transition i within the project area, excluding the ANR area, and harvest areas, under the baseline scenario for year t .
Sources of data:	Historical LULC classification and land-use change modeling
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification
Frequency of monitoring:	At least once before every baseline. For added instances, may be recalculated at verification.
Value monitored:	See VCS PD, not required in this monitoring period.
Monitoring equipment:	n/a

QA/QC procedures to be applied:	
Purpose of Data:	Used to establish LULC transitions in the baseline scenario
Calculation method:	
Any comment:	n/a

Data/parameter [MN6]:	$\Delta area_{leakageArea,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>i</i> within the leakage area under the baseline scenario during year <i>t</i>
Sources of data:	Land-use change modeling
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification, summarized in the transition rates analysis described in Section VCS PD 3.1.5.
Frequency of monitoring:	Once every baseline update. May also be updated at the time of instance inclusion that requires new leakage area.
Value monitored:	See VCS PD, not used for this monitoring period
Monitoring equipment:	n/a
QA/QC procedures to be applied:	
Purpose of Data:	Used to predict LULC transitions in the leakage area under the baseline scenario
Calculation method:	See VCS PD.
Any comment:	Not required for monitoring period

Data/parameter [MN7]:	$\Delta area_{historical}(CS_1 \rightarrow CS_2, t_1 \rightarrow t_2)$
Data unit:	[ha yr ⁻¹]
Description:	Area of transition from LULC class or forest stratum 1 to 2 from time 1 to 2 during the historical reference period
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification, summarized in the transition rates analysis described in Section VCS PD.
Frequency of monitoring:	At least once before every baseline update
Value monitored:	See VCS PD, not used in this monitoring period.
Monitoring equipment:	n/a

QA/QC procedures to be applied:	
Purpose of Data:	To calculate the baseline annualize deforestation rate
Calculation method:	See VCS PD.
Any comment:	Not required for monitoring period

Data/parameter [MN8]:	$RFRGrate(CS_1 \rightarrow CS_2)$
Data unit:	[yr ⁻¹]
Description:	Relative annual forest cover increase and regeneration factor for the transition from class or stratum 1 to 2.
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the remote sensing-based classification and stratification procedures detailed in section. Multiply with 100 to obtain a forest cover increase and regeneration rate in percentage per year.
Frequency of monitoring:	At least once before every baseline update
Value monitored:	See VCS PD, not used in this monitoring period.
Monitoring equipment:	n/a
QA/QC procedures to be applied:	
Purpose of Data:	To calculate the baseline annualized reforestation rate
Calculation method:	
Any comment:	Not required for monitoring period

Data/parameter [MN9]:	$area_{historical}(CS_1, t_1)$
Data unit:	[ha]
Description:	Total area of LULC class or forest stratum 1 at time 1
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the remote sensing-based classification and stratification procedures detailed in VCS PD
Frequency of monitoring:	At least once before every baseline update
Value monitored:	n/a
Monitoring equipment:	

QA/QC procedures to be applied:	
Purpose of Data:	
Calculation method:	
Any comment:	Not required for monitoring period

Data/parameter [MN17]:	$BetaReg_{DF}(t)$ and $BetaReg_{DG}(t)$
Data unit:	[ha yr ⁻¹]
Description:	Beta regression model describing the relationship between time and deforestation/degradation rate in the reference region during the historical reference period.
Sources of data:	Historic forest degradation and deforestation modelling
Description of measurement methods and procedures to be applied:	Procedure described in the VCS PD or similar approach from peer-reviewed scientific literature.
Frequency of monitoring:	At least once every baseline update
Value monitored:	n/a
Monitoring equipment:	n/a
QA/QC procedures to be applied:	
Purpose of Data:	To determine the future deforestation rate
Calculation method:	
Any comment:	Not applicable for this monitoring period.

Data/parameter [MN49]:	$proportion_{DF}(d)$ and $proportion_{DG}(d)$
Data unit:	[-]
Description:	Proportion of the gradual carbon loss that leads to deforestation or forest degradation, respectively, due to driver d
Sources of data:	Estimate using the procedure detailed in VCS PD
Description of measurement methods and procedures to be applied:	
Frequency of monitoring:	At least once before every baseline update
Value monitored:	Described in the VCS PD.
Monitoring equipment:	

QA/QC procedures to be applied:	
Purpose of Data:	
Calculation method:	
Any comment:	Not required for the monitoring period.

Data/parameter [MN18]:	Area under agricultural intensification
Data unit:	[ha]
Description:	Size of the area of agricultural intensification separated for each agricultural intensification measure
Sources of data:	Participatory rural appraisals
Description of measurement methods and procedures to be applied:	Calculate based on areas of cropland in the leakage and project areas Only to be included if agricultural intensification activities are implemented.
Frequency of monitoring:	At least once before verification
Value monitored:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of Data:	
Calculation method:	
Any comment:	Not required for the monitoring period.

Data/parameter [MN19]:	Yields under agricultural intensification
Data unit:	[Mg ha ⁻¹]
Description:	Harvested yield for agricultural intensification practices
Sources of data:	Participatory rural appraisals
Description of measurement methods and procedures to be applied:	Only to be included if agricultural intensification activities are implemented.
Frequency of monitoring:	At least once before verification
Value monitored:	Double the amount of the non-project condition
Monitoring equipment:	

QA/QC procedures to be applied:	
Purpose of Data:	
Calculation method:	
Any comment:	Not required for the monitoring period.

Data/parameter [MN20]:	NTFP harvest rate
Data unit:	[m ³ yr ⁻¹] or [kg yr ⁻¹]
Description:	Annual volumes of non-timber forest products extracted
Sources of data:	Participatory rural appraisals
Description of measurement methods and procedures to be applied:	Estimate among participating communities and communities living in the leakage area.
Frequency of monitoring:	At least once before verification
Value monitored:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of Data:	
Calculation method:	
Any comment:	Not required for the monitoring period.

Data/parameter [MN21]:	Local NTFP price
Data unit:	Local currency
Description:	Price of non-timber forest products on local markets
Sources of data:	Participatory rural appraisals
Description of measurement methods and procedures to be applied:	
Frequency of monitoring:	At least once before verification
Value monitored:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of Data:	

Calculation method:	
Any comment:	Not required for the monitoring period.

3.1.2.4 Data and Parameters Not Applicable to Activities in the Monitoring Period

Data/parameter [MN4]:	$\Delta area_{projectAreaWithANR,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the ANR area under the project scenario for year t and in stratum i .
Sources of data:	Land-use change modeling
Description of measurement methods and procedures to be applied:	Calculate based on the LULC classification, summarized in the transition rates analysis described in Section VCS PD 3.1.5.
Frequency of monitoring:	At least once before every baseline update. For added instances, may be recalculated at verification.
Value monitored:	N/A
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of Data:	Used to predict LULC transitions in the baseline scenario
Calculation method:	
Any comment:	N/A for this monitoring period there was no ANR activities.

Data/parameter [MN12]:	$area_{fireBiomassLoss,ANR}(t,i)$
Data unit:	[ha]
Description:	Area of biomass removed by prescribed burning within ANR stratum i during year t
Sources of data:	Records of implemented activities
Description of measurement methods and procedures to be applied:	Only to be included if ANR activities are implemented.
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A

Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN13]:	$area_{projectAreaWithANR,projectScenario}(t,i)$
Data unit:	[ha]
Description:	Amount of land on which ANR activities are planned under the project scenario for year t and in stratum i
Sources of data:	Records of implemented activities
Description of measurement methods and procedures to be applied:	Only to be included if ANR activities are implemented.
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN14]:	$area_{harvest}(t,i)$
Data unit:	[ha]
Description:	Area of forest in harvest stratum i that is harvested at time t .
Sources of data:	Project Design Document or Forest/Harvest Management Plan
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A

Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN15]:	$area_{projectAreaWithHarvest,projectScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Size of strata i within the project area with harvest activities during year t under the project scenario.
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN16]:	$\Delta area_{projectAreaWithHarvest,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the harvest areas under the baseline scenario during year t .
Sources of data:	Land-use change modeling
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A

Any comment:	N/A for this Project
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Data/parameter [MN22]:	$CFW_{baseline}$
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annual volume of fuelwood gathering for commercial sale and charcoal production in the baseline scenario
Sources of data (*):	5. Participatory rural appraisals 6. Recent (<10 yr) literature in the reference region 7. Recent (<10 yr) literature in an area similar to the reference region
Description of measurement methods and procedures to be applied:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $u_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, $CFW_{baseline}$ may only be measured using the first option, social assessments.
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for the monitoring period.

Data/parameter [MN23]:	$DFW_{baseline}$
Data unit:	$[m^3 \text{ yr}^{-1}]$
Description:	Annual volume of fuelwood gathered for domestic and local energy in the baseline scenario
Sources of data (*):	8. Participatory rural appraisals 9. Recent (<10 yr) literature in the reference region 10. Recent (<10 yr) literature in an area similar to the reference region
Description of measurement methods and procedures to be applied:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $u_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, $DFW_{baseline}$ may only be measured using the first option, social assessments.

Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period.

Data/parameter [MN24]:	$DFW_{project}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Biomass (dry matter) of fuelwood collected by project participants under the project scenario.
Sources of data (*):	- Participatory rural appraisals - Recent (<10 yr) literature in the reference region - Recent (<10 yr) literature in an area similar to the reference region
Description of measurement methods and procedures to be applied:	If emission reductions from avoided degradation were excluded due to insufficient accuracy, in which case $u_{classification} = 0$, and emission reductions from fuel-efficient woodstoves are included, $DFW_{baseline}$ may only be measured using the first option, social assessments.
Frequency of monitoring:	At least once before verification
Value monitored:	Same as 95 % of $DFW_{baseline}$
Monitoring equipment:	N/A
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN25]:	$DFW_{allowed}$
Data unit:	$[m^3 yr^{-1}]$

Description:	Biomass (dry matter) of allowed fuelwood collection in the project area under the project scenario. This amount is typically fixed in a management plan. [m ³ yr ⁻¹]
Sources of data (*):	Forest management plan
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value monitored:	Same as DFW _{project}
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN26]:	$VG_{baseline}$
Data unit:	[m ³ yr ⁻¹]
Description:	Biomass (dry matter) of understory vegetation extraction by project participants under the baseline scenario. [Mg DM yr ⁻¹]
Sources of data (*):	- Participatory rural appraisals - Recent (<10 yr) literature in the reference region - Recent (<10 yr) literature in an area similar to the reference region
Description of measurement methods and procedures to be applied:	Calculate by multiplying the number of households involved in extraction of vegetation with the average annual extraction rate by household for different vegetation types
Frequency of monitoring:	At least once before every baseline update
Value monitored:	Not applicable for this monitoring period.
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN27]:	$VG_{project}$
Data unit:	[Mg DM yr-1]
Description:	Biomass (dry matter) of understory vegetation extraction by project participants under the project scenario.
Sources of data (*):	1. Participatory rural appraisals 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region
Description of measurement methods and procedures to be applied:	Calculate by multiplying the number of households involved in extraction of vegetation with the average annual extraction rate by household for different vegetation types
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	Estimate carbon loss from understory vegetation extraction under the project scenario for leakage estimation.
Calculation method:	N/A
Any comment:	Since the underlying driver is not part of the project design, this parameter was not applicable. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN28]:	$VG_{allowed}$
Data unit:	[Mg DM yr-1]
Description:	Biomass (dry matter) of allowed as understory vegetation extraction under the project scenario. This amount is typically fixed in a management plan
Sources of data (*):	Forest management plan
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A

QA/QC procedures to be applied:	N/A
Purpose of Data:	Estimate understory vegetation allowed from the project area under the project scenario
Calculation method:	N/A
Any comment:	Since the underlying driver is not part of the project design, this parameter was not applicable. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN29]:	$CT_{baseline}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of harvested timber round-wood for commercial on-sale under the baseline scenario during harvest h by species j and wood product class ty during year t
Sources of data (*):	1. Participatory rural appraisals conducted by project proponents. 2. Recent (<10 yr) literature in the reference region 3. Recent (<10 yr) literature in an area similar to the reference region 4. Recent (<10 yr) non peer-reviewed reports by local organizations
Description of measurement methods and procedures to be applied:	
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN30]:	$CT_{allowed}$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually allowed volume of harvested timber round-wood for commercial on-sale under the project scenario

Sources of data (*):	Project document and/or management plan
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	Estimate volume for mixture of species
Calculation method:	N/A
Any comment:	N/A for this Project

Data/parameter [MN31]:	$CT_{project}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of harvested timber round-wood for commercial on-sale inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	Project design, surveys, statistical records.
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before verification
Value monitored:	0
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project. Project does not allow extraction of timber for commercial sale.

Data/parameter [MN32]:	$DT_{baseline}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]

Description:	Annually extracted volume of timber for domestic and local use, round wood under the baseline scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	1. Participatory rural appraisals conducted by project proponents
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not applicable for the monitoring period.

Data/parameter [MN33]:	$DT_{allowed}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Annually allowed volume of harvested timber round-wood for domestic and local use under the project scenario
Sources of data (*):	Project document and/or management plan
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before every baseline update
Value applied:	77,538.8 Mg DM Per Year
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Estimate for mixture of species same as in the baseline. Not required for this monitoring period.

Data/parameter [MN34]:	$DT_{project}(h, j, ty, t)$
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Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of timber for domestic and local use, round wood inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	Project design, surveys, statistical records.
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before verification
Value monitored:	77,538.8 Mg DM Per Year
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Same as in the baseline- N/A for this project.

Data/parameter [MN35]:	$contribution_{DF}(d)$ and $contribution_{DG}(d)$
Data unit:	[-]
Description:	Relative contribution of driver i respectively to total deforestation and forest degradation.
Sources of data:	Calculated using procedure described in VCS PD
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before baseline update.
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not applicable for the monitoring period.

Data/parameter [MN36]:	$RelativeDriverImpact_{DF}(t, d)$ and $RelativeDriverImpact_{DG}(t, d)$
Data unit:	[-]
Description:	Relative impact of the geographically unconstrained driver d at time t of the crediting period respectively on deforestation and forest degradation.
Sources of data:	Calculated using procedure described in the VCS PD
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before baseline update.
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period.

Data/parameter [MN37]:	$leakage_{unconstrained}(d)$
Data unit:	[-]
Description:	Leakage cancellation rate for avoiding deforestation/degradation from geographically unconstrained drivers.
Sources of data:	Valid sources to substantiate a smaller leakage rate include social assessments, scientific literature, and reports from civil society or governments. Sources have to be reliable and based on scientific methods and a good statistical design.
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before baseline update.
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A

Purpose of Data:	Unless a lower rate can be justified, a default rate of 100% must be used.
Calculation method:	N/A
Any comment:	Not applicable for the monitoring period.

Data/parameter [MN38]:	<i>effectiveness(a, d)</i>
Data unit:	[-]
Description:	Effectiveness of every project activity <i>a</i> in decreasing any deforestation driver <i>d</i> relative to that driver's contribution to deforestation and forest degradation,
Sources of data:	Literature or expert opinion.
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before baseline update.
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not applicable for the monitoring period.

Data/parameter [MN39]:	<i>Fuelwood(t), Fuel(t)</i>
Data unit:	[m ³ yr ⁻¹ HH ⁻¹]
Description:	Average annual volume of biomass fuel consumed by households in the absence of the project activity in year <i>t</i> for cooking purpose.
Sources of data:	Social assessments results or wood energy statistics applicable to the project
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once every baseline update
Value monitored:	N/A

Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not applicable for the monitoring period.

Data/parameter [MN40]:	$HH_{non-CFE}(t)$
Data unit:	[-]
Description:	Total number of household in the project area that collect biomass fuel from the project area and do not use CFE in year t .
Sources of data:	Social assessments results or wood energy statistics applicable to the project
Description of measurement methods and procedures to be applied:	Cookstove distribution records.
Frequency of monitoring:	At least once before verification
Value monitored:	See 'S_cookstove' worksheet in 2. Calculate emissions sources v0-6 ex-post M1.xlsm workbook'
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Out of 88,740 households, only less than 5% are currently using some form of improved cookstoves. The project expects to distribute new stoves to at least 35,000 households. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN41]:	η_{old}
Data unit:	[-]
Description:	Efficiency of the project cook stoves or appliances.
Sources of data:	Default value of 0.10 for three stone stove or conventional stove that lacks improved combustion air supply mechanism and flue gas ventilation systems i.e., without a grate as well

	as a chimney; for rest of the systems 0.2 default value may be used.
Description of measurement methods and procedures to be applied:	Methodology default for three stone cook stove.
Frequency of monitoring:	At least once every baseline update
Value monitored:	0.10
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN42]:	η_{new}
Data unit:	[-]
Description:	Efficiency of the baseline cook stoves or appliances.
Sources of data:	Values obtained from the manufacturer of the stove. In absence of such value, value may be calculated from field testing using ISO standards.
Description of measurement methods and procedures to be applied:	Based on referenced literature values.
Frequency of monitoring:	Since the stoves used are manufactured by recognized industry (i.e., TLC) that is still in business and provides assures the functional integrity of the product by providing warranty for the stoves stated life, then the monitoring must be done once every baseline update.
Value monitored:	0.2
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	The conservative value from MN41 was used as the mud-and-brick stoves promoted by TLC contain an improved combustion air supply mechanism and flue gas ventilation system.

Any comment:	It was stated by TLC that the fuelwood consumption is reduced by 80% compared to traditional three stone stoves in Malawi. Not required for this monitoring period as emission reductions from cookstoves are not included.
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Data/parameter [MN43]:	$U_{CFE}(t)$
Data unit:	[-]
Description:	Fraction of cumulative usage rate for technologies in project scenario in year t. [-]
Sources of data:	Social assessments – distribution records from project proponents
Description of measurement methods and procedures to be applied:	Cumulative adoption rate and drop off rate revealed by usage surveys [-].
Value monitored:	1, the stoves are built-in and thus the usage rate is 100%. Project proponents report a 100% usage rate. Literature was used to assume a conservative number of a reduction in usage over time.
Monitoring equipment:	N/A
Frequency of monitoring:	Annual
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN44]:	$DF_{LeakageCFE}(t)$
Data unit:	[-]
Description:	Leakage discount factor applicable to GHG emissions reduction benefits from CFE activities [-]
Sources of data:	Default value of 0.95 following AMS.II.G CDM methodology. Social assessments or wood energy statistics applicable to the project.
Description of measurement methods and procedures to be applied:	Methodology default value..

Frequency of monitoring:	Since default value was used, this parameter was not monitored.
Value monitored:	0.95. Default value used
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	As per the methodology, if the default value of 0.95 is used, no survey is required. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN45]:	$EF_{non-CO2,fuel}$, $EF_{CO2,fuel}$
Data unit:	[t CO ₂ TJ ⁻¹]
Description:	Respectively, non--CO ₂ emission factor of the fuel that is reduced and CO ₂ emission factor for the substitution of non-renewable woody biomass by similar consumers.
Sources of data:	Social assessments or wood energy statistics applicable to the project
Description of measurement methods and procedures to be applied:	Emission factor can include a combination of emission factors from fuel production, transport, and use. Both CO ₂ and Non-CO ₂ of the fuel such as emissions factors for charcoal can be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent emission factor of wood.
Frequency of monitoring:	At least once before verification
Value monitored:	30.3 [MgCO ₂ TJ ⁻¹] for EF_Non-CO ₂ , and 122.22 MgCO ₂ TJ ⁻¹ for EF_CO ₂
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Purpose of Data:	N/A
Calculation method:	Emissions factor for CO ₂ emissions was derived from recent biomass inventory. For non-CO ₂ emissions i.e., for CH ₄ and

	N2O, IPCC 2006 GL for emission factors and NCVs, IPCC SAR 1996 for GWPs were used.
Any comment:	See 2. Calculate emissions sources workbook, and sheet "S_Cookstove" for additional details. Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN46]:	EF_{forest}
Data unit:	[t CO ₂ e]
Description:	Emission factor related to leakage.
Sources of data:	If comprehensive national-level statistics on biomass densities are available, EF_{forest} must be calculated based on the average biomass of the country, if local data is not available. Sources of the data allowed are (1) academic research papers and (2) studies and reports published by the forestry administration or other organizations, including the FAO's Forest Resource Assessment reports, (3) the upper range of biomass in the GPG-LULUCF (2003) Table 3A.1.2.
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	To estimated emission factor for unconstrained leakage.
Calculation method:	N/A
Any comment:	There is no unconstrained leakage. See parameter 'Maximum biomass emissions' in worksheet "8. Emissions factor" in workbook '1. Gross Emissions Reductions' Not required for this monitoring period as emission reductions from cookstoves are not included.

Data/parameter [MN39]:	$GR_{allowed}$
Data unit:	[-]
Description:	Number of grazing animals of type g allowed for grazing within the project boundary in the project scenario
Sources of data:	Project management plan

Description of measurement methods and procedures to be applied:	Calculate by multiplying the number of animals taking into account different types of grazing animals.
Frequency of monitoring:	At least once before verification
Value monitored:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	N/A
Purpose of Data:	N/A
Calculation method:	N/A
Any comment:	N/A for this Project

3.1.3 Monitoring Plan

This project monitors all required data and components according to the methodology and the VCS Standard. The following describes the monitoring plan elements related to GHG emission reductions (not the social and biodiversity components), which are included in the Kulera CCB Monitoring Plan (Annex D and E).

3.1.3.1 Organizational Structure, Responsibilities and Competencies

Responsibilities

Department of Parks and Wildlife. Provides the support for the collection of all required field data working with a contracted technical provider (such as Mzuzu College) for the biomass plots, soil and any boundary files needed for NER quantification. They also report data related, such as area of fire breaks and other data required for the GHG quantification.

Africa Parks. Provided access to park and support for biomass teams during the collection process. They also report data related, such as area of fire breaks and other data required for the GHG quantification.

Terra Global Capital. Prepares all SOPs, delivers training to local partners and technical providers for the biomass and soil data collection. Terra Global is responsible for collecting data from field partners, verifying that the required elements are monitored, overseeing or executing all modeling and calculations, and performing second-pass QA/QC checks. In addition, Terra Global is responsible for developing the VCS and CCB monitoring reports for the project.

NAWIRA and the Nyika-Vwaza Association participate in the biomass and soil samples and provide other inputs as needed for GHG quantification.

Collection Methods

The methods used for generating/measuring, recording, storing, aggregating, collating, performing quality checks and reporting the data on monitored parameters are in Table 20. The preparation of SOP's and training provides a standardized and consistent basis for data collection, management and reporting. SOP's and protocols are therefore an important aspect of quality control and assurance.

Table 20. Monitoring data sources and methods and QA/QC Procedures

	Method	Frequency	Responsible
Biomass Inventory	Field Data Collection	Each verification	Terra SOPs, QA/QC and Processing 3 rd Party and DNPW collection
Soil Samples	Field Data Collection	Each verification	Terra SOPs, QA/QC and Processing 3 rd Party and DNPW collection
Land-use Change Analysis	Remote Sensing Analysis	Each verification	Terra SOPs, QA/QC and Processing
PRA	Field Data Collection	Each verification	Terra SOPs, QA/QC and Processing 3 rd Party and DNPW collection
Household Surveys	Field Data Collection	Each verification	Terra SOPs, QA/QC and Processing 3 rd Party and DNPW collection
Biodiversity Surveys	Field Data Collection	Each verification	Terra SOPs, QA/QC and Processing 3 rd Party and DNPW collection
Project Implementation Data		On-going	DNPW, AP and Association on-going collection Terra aggregation and QA/QC review

3.1.4 Dissemination of Monitoring Plan and Results (CL4.2)

Project Partners were involved in the revisions made to the Monitoring Plan during this monitoring period. The updated monitoring plan has been shared with Partners and is located at each of the Partner Offices. The Monitoring Plan Results are described in this document and the official way to inform, engage and empower communities will follow traditional ways of communication. This Monitoring Plan will be presented to community and other stakeholders following procedures described in 2.3.2 Dissemination of Summary Project Documents (G3.1). This Monitoring Plan will be online and accessible to all stakeholders.

3.2 Quantification of GHG Emission Reductions and Removals

This section summarizes the ex-post calculations of the GHG benefits for the current monitoring period. Baseline Emissions Project years are based on the project start date of October 1, 2009. This the second monitoring period, covering vintage years 1 October 2013 to 30 September 2019.

3.2.1 Baseline Emissions

The calculations of Baseline Emissions follows the VCS Methodology VM0006 “Carbon Accounting for Mosaic and Landscape-scale REDD Projects”. Baseline emissions were described and calculated in the Project Document section 3.1. There was no baseline update during this Monitoring Period. The total baseline deforestation and degradation rates are interpolated from past trends and transitions factors applied to each transition. This process is described in the Methodology Section 8.1 and follows equations EQ15 – EQ41.

Table 21 shows baseline emissions or (removals) from 2009 to 2019 based on the requirements of the methodology as reporting in the VCS PD.

Table 21. Baseline emissions by Protected Areas

Vintage YEAR (Start)	Nyika Estimated baseline emissions or (removals) (tCO ₂ e)	Nkhotakota Estimated baseline emissions or (removals) (tCO ₂ e)	Vwaza Estimated baseline emissions or (removals) (tCO ₂ e)	Total Estimated baseline emissions or (removals) (tCO ₂ e)	MR#
2009	169,272	134,877	70,593	374,742	MR1
2010	176,643	147,207	72,794	396,643	MR1
2011	184,700	155,321	75,616	415,637	MR1
2012	189,621	163,319	78,234	431,174	MR1
2013	197,373	173,525	81,050	451,949	MR2
2014	205,710	181,506	82,829	470,044	MR2
2015	206,897	190,454	85,163	482,514	MR2
2016	211,006	198,276	86,915	496,197	MR2
2017	222,315	207,583	88,850	518,748	MR2
2018	224,168	216,141	90,877	531,187	MR2
Total	1,987,704	1,768,209	812,922	4,568,835	

3.2.2 Project Emissions

The Calculations of project emissions follows the VCS Methodology VM0006 “Carbon Accounting for Mosaic and Landscape-scale REDD Projects”.

The changes in the project area were calculated based on remote sensing change analysis and field measurements. Forest biomass were quantified using biomass inventories and following the procedures in Sections 8.2.5 and 8.2.7 Carbon stock densities were re-measured using ground-based biomass inventories, as described in Section 8.1.4.4 of the Methodology .This Monitoring Report compares the changes between the classified image from the first Monitoring Period and the second Monitoring Period following procedures in Section 8.1.2.4 of the methodology .A land transition matrix was produced between the consecutive maps, and the land transition matrix was annualized by dividing the land transition rates by the duration in between the two dates. Transition factors described in 3.2.1 are applied to the transitions of the LUC for the Monitoring Period.

Table 22 shows actual GHG emissions or (removals) measured after project implementation (ex-post) from Oct 2009 to Sept 2013 (MR1) and Oct 2013 to Sep 2019 (MR2).

Table 22. Project emissions by Protected Areas

Vintage YEAR (Start)	Nyika Ex-Post emissions or (removals) (tCO ₂ e)	Nkhotakota Ex-Post emissions or (removals) (tCO ₂ e)	Vwaza Ex-Post emissions or (removals) (tCO ₂ e)	Total Ex-Post emissions or (removals) (tCO ₂ e)	MR#
2009	99,552	13,210	23,196	135,958	MR1
2010	104,652	14,075	24,734	143,461	MR1
2011	109,752	14,939	26,273	150,964	MR1
2012	114,852	15,804	27,812	158,467	MR1
2013	40,136	15,151	10,305	65,592	MR2
2014	41,273	15,796	10,581	67,651	MR2

Vintage YEAR (Start)	Nyika Ex-Post emissions or (removals) (tCO ₂ e)	Nkhotakota Ex-Post emissions or (removals) (tCO ₂ e)	Vwaza Ex-Post emissions or (removals) (tCO ₂ e)	Total Ex-Post emissions or (removals) (tCO ₂ e)	MR#
2015	42,410	16,442	10,858	69,709	MR2
2016	43,546	17,087	11,135	71,768	MR2
2017	44,683	17,733	11,411	73,827	MR2
2018	45,820	18,379	11,688	75,886	MR2
Total	686,675	158,616	167,992	1,013,283	

3.2.2.1 Other Project Emissions

According to the standard and methodology emissions from the following sources are excluded:

1. Fire breaks (VM0006, Section 8.2.4) – the size of firebreaks implemented in the monitoring period is very small, and biomass removed is only annual grasses, and small shrubs that have grown up in the past year.
2. ANR Areas (VM0006, Section 8.2.5) – Not implemented in the project area
3. Cookstoves (VM0006, Section 8.2.6) – none implemented in this monitoring period
4. Harvesting (VM0006, Section 8.2.7) – Not implemented in the project area
5. Emissions from Project vehicles – With ~ 10 trucks and 50 motorcycles the emissions for driving these an estimate 50,000 each per year is insignificant

3.2.3 Leakage

The calculations of leakage emissions follows the VCS Methodology VM0006 “Carbon Accounting for Mosaic and Landscape-scale REDD Projects”. Leakage emissions from geographically constrained drivers are monitored at each monitoring period in the leakage area. This Monitoring Report compares the changes between the classified image from the first Monitoring Period and the second image from the second Monitoring Period. A land transition matrix was produced between the consecutive maps, and the land transition matrix was annualized by dividing the land transition rates by the duration in between the two dates. Transition factors described in 3.2.1 are applied to the transitions of the LUC for the Monitoring Period.

Similar to the first Monitoring Period, leakage from geographically unconstrained drivers was found to be not applicable. A factor approach used the leakage cancellation factors set at validation and followed the procedure in Section 8.3.3. Emissions from sources from leakage prevention activities, were calculated using the equations in Section 8.3.4, and were found to be not applicable.

Per the VCS Project Document that Project is subject only to activity shifting leakage from geographical constrained drivers. Thus, the quantification of emissions from leakage requires comparing emissions in the Leakage Area under the baseline with emissions in the Leakage Area during the monitoring period. If the ex-post monitored emissions are greater these must be deducted from the project emission reduction.

Table 23 shows the leakage deductions as monitoring in the Leakage Areas for geographically constrained leakage.

Table 23. Baseline Emissions in Leakage Area

Vintage YEAR (Start)	Nyika Estimated baseline emissions or (removals) (tCO ₂ e)	Nkhotakota Estimated baseline emissions or (removals) (tCO ₂ e)	Vwaza Estimated baseline emissions or (removals) (tCO ₂ e)	Total Estimated baseline emissions or (removals) (tCO ₂ e)	MR#
2009	(27,868)	59,602	(5,414)	26,321	MR1
2010	(25,936)	60,287	(4,149)	30,202	MR1
2011	(25,597)	64,688	(3,552)	35,539	MR1
2012	(26,082)	69,398	(2,797)	40,519	MR1
2013	(26,713)	71,413	(2,296)	42,403	MR2
2014	(26,539)	76,421	(813)	49,069	MR2
2015	(25,022)	79,747	90	54,815	MR2
2016	(24,114)	84,452	1,511	61,849	MR2
2017	(24,796)	87,635	2,716	65,554	MR2
2018	(25,022)	91,448	3,775	70,200	MR2
Total	(257,689)	745,091	(10,931)	476,471	

Table 24. Ex-Post Leakage during the Monitoring Period from 1 October 2013 to 30 September 2019.

Vintage YEAR (Start)	Nyika Ex-Post emissions or (removals) (tCO ₂ e)	Nkhotakota Ex-Post emissions or (removals) (tCO ₂ e)	Vwaza Ex-Post emissions or (removals) (tCO ₂ e)	Total Ex-Post emissions or (removals) (tCO ₂ e)	Total Ex-Post monitored Leakage (tCO ₂ e)	MR#
2009	(100,004)	(89,763)	(77,482)	(267,249)	-	MR1
2010	(106,519)	(95,717)	(82,622)	(284,858)	-	MR1
2011	(113,034)	(101,672)	(87,761)	(302,467)	-	MR1
2012	(119,549)	(107,626)	(92,901)	(320,076)	-	MR1
2013	(221,726)	(152,711)	(121,911)	(496,347)	-	MR2
2014	(232,302)	(159,701)	(127,425)	(519,428)	-	MR2
2015	(242,877)	(166,691)	(132,940)	(542,508)	-	MR2
2016	(253,453)	(173,681)	(138,455)	(565,589)	-	MR2
2017	(264,029)	(180,671)	(143,970)	(588,669)	-	MR2
2018	(274,604)	(187,661)	(149,485)	(611,750)	-	MR2
Total	(1,928,097)	(1,415,892)	(1,154,952)	(4,498,942)		

3.2.4 Net GHG Emission Reductions and Removals

The calculation of net GHG Emission Reductions and Removals follows the procedures in the VCS Methodology VM0006 "Carbon Accounting for Mosaic and Landscape-scale REDD Projects". The calculation of Ex-post Actual Net GHG Emission Reductions

The table below contains the ex-post values of the actual net GHG emission reductions. Net NERs us the Methodology Equation [EQ105]; actual VCUs were based on Equation [EQ106].

Table 25 provides the annual emission reductions and VCUs for the monitoring period.

Table 25. Net Emission Reductions and VCUs by Monitoring Period

MR#	YEAR	Validated Baseline -Project Area	Ex-Post Project Emissions	Leakage Emissions	GHG from improved cookstoves	GHG from Emission sources	NER	Risk Buffer	Buffer	VCU	MR# VCU Total
		[tCO ₂ e]	[tCO ₂ e]	[tCO ₂ e]	[tCO ₂ e]	[tCO ₂ e]	[tCO ₂ e]	[%]	[tCO ₂ e]	[tCO ₂ e]	[tCO ₂ e]
MR1	2009	(374,742)	(135,958)	-	-	-	238,784	10%	(23,878)	214,906	
MR1	2010	(396,643)	(143,461)	-	27,796	-	280,978	10%	(28,098)	252,880	
MR1	2011	(415,637)	(150,964)	-	48,805	-	313,478	10%	(31,348)	282,130	
MR1	2012	(431,174)	(158,467)	-	49,010	-	321,717	10%	(32,172)	289,546	1,039,461
MR2	2013	(451,949)	(65,592)	-	-	-	386,357	10%	(38,636)	347,722	
MR2	2014	(470,044)	(67,651)	-	-	-	402,394	10%	(40,239)	362,155	
MR2	2015	(482,514)	(69,709)	-	-	-	412,804	10%	(41,280)	371,524	
MR2	2016	(496,197)	(71,768)	-	-	-	424,429	10%	(42,443)	381,986	
MR2	2017	(518,748)	(73,827)	-	-	-	444,920	10%	(44,492)	400,428	
MR2	2018	(531,187)	(75,886)	-	-	-	455,300	10%	(45,530)	409,770	2,273,585

3.3 Optional Criterion: Climate Change Adaptation Benefits

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

Adaptation Benefits - Biodiversity

This Project continues with Gold Level Climate Change adaptation benefits. With climate change communities in the Project Zone will increasingly rely on the extraction of forest resources. Wildlife and other species will become scarcer with climate change due to loss of habitat, irregular weather patterns and increased fires. Wildlife in the Project Area is expected to face harsher living conditions and will travel further for water sources and safety. Activities implemented to adapt to climate change during the monitoring period include:

- Increased forest cover in the Project Area, and Project Zone beyond the Baseline.
- Further identification of High Conservation Value Areas (HCV) for biodiversity that maybe susceptible to Climate Changes.
- Identification of important water sources that may aid in helping wildlife adapt to climate change and may also be place of ambush for poachers.
- Increased patrolling by DNPW, African Parks, and Communities.
- Increased education on wildlife conservation and behavior.

These exceptional biodiversity benefits meeting CCB Gold-Level Criteria are further described in Section 5.4

Adaption Benefits - Communities

As erratic and extreme weather events will cause damage to food production, likely those living in and around the forest will highly depend on forest resources for their livelihood and use the highland areas that may be wetter longer as places to grow crops during droughts. As communities within Malawi rely on rainfed annual crops drought will affect food security. And it is expected that food insecure communities will more rely on hunting of wildlife or other illegal resources. In order to help the communities in the Project Zone become more resilient to climate-caused food shortages, the program has carried out the following activities during the Project Monitoring Period:

- a) Implement climate-smart agriculture practices in the Project Zone.
- b) Agricultural intensification
- c) Crop diversification and shift from exclusive maize production

- d) Access to inputs and technology as well as the sustainable, resilient, and efficient agriculture promoted through adaptive management.
- e) increase incomes to communities so food can be purchased for more productive areas.

These exceptional community benefits meeting CCB Gold-Level Criteria are further described in Section Community Monitoring Plan (CM4.1, CM4.2, GL1.4, GL2.2, GL2.3, GL2.5).

The key component of climate change adaption (as well as biodiversity improvement) is the increase in crop diversification which is promoted by the Program. Comparing the last monitoring period data (2011) with this period's (2019) it shows the increase in diversification among the main food and cash crops of the Project communities.

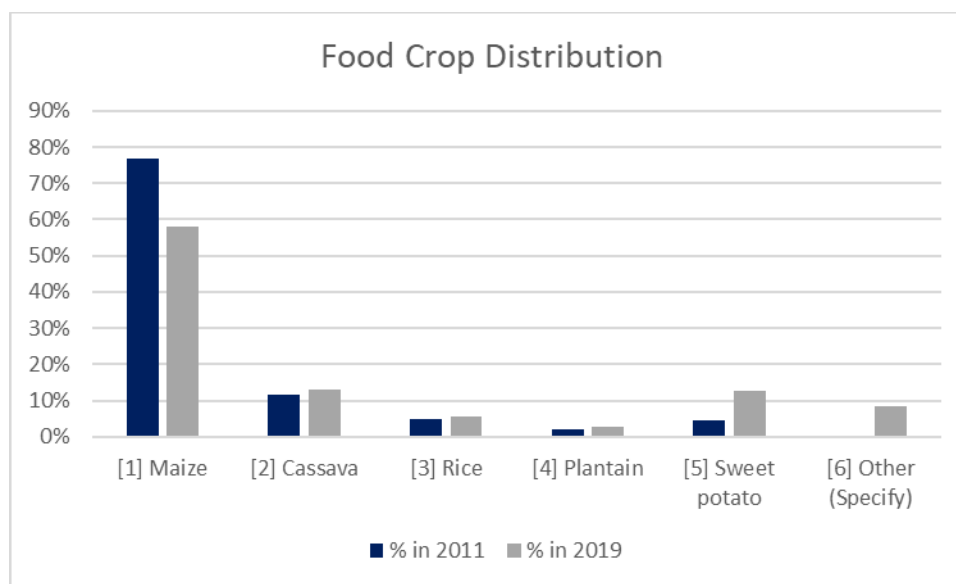


Figure 1. Food Crop Diversification for Climate Adaption

Other reported positive climate adaptation benefits for communities include:

- S.8 # of acres under sustainable agriculture practices
- S.6 # of farmers, processors & others who have adopted new technologies or management practices
- S.10 Area (or # farmers) using irrigation or other water management techniques

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM2.1)

The tables below will present comparisons of the key impact indicators of the data collected in 2011 and the current data (2019). This is aimed at providing a measure of community impact changes that have taken place since 2011.

4.1.1.1 S.1 # Number of people with increased economic benefits derived from sustainable natural resource management and conservation

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.																																				
Impact	The community experienced increased economic benefits including 1) overall increased household income 2) by an increased income from enterprises related to fisheries, sustainable tourism, forestry/agroforestry, sustainable agriculture, and benefits from ecosystem services, and 3) wealth ranking. Increased economic benefits include: Increased household income by Sector (HHS B.1 Income C4) All sources of incomes show an increase average annual income with the number of people reporting income from these sources virtually unchanged between 2011 and 2019: <table><tr><th>Income by Job Sector</th><th>2011 Avg Annual (MKW)</th><th>2019 Avg Annual (MKW)</th><th>% Chg Avg</th></tr><tr><td>Ecotourism</td><td>5,890</td><td>93,558</td><td>1489%</td></tr><tr><td>Employment</td><td>149,118</td><td>657,859</td><td>341%</td></tr><tr><td>Farming</td><td>66,397</td><td>222,400</td><td>235%</td></tr><tr><td>Fishing</td><td>21,057</td><td>286,846</td><td>1262%</td></tr><tr><td>Forestprod</td><td>21,270</td><td>72,809</td><td>242%</td></tr><tr><td>Ganyu</td><td>16,758</td><td>105,288</td><td>528%</td></tr><tr><td>Petty trading</td><td>65,765</td><td>250,470</td><td>281%</td></tr><tr><td>Avg - PZ</td><td>49,465</td><td>241,319</td><td>388%</td></tr></table> B.1 IncomeTransformedData_ all C4s Economic benefits from sustainable resource management – Crops (HHS C. Income – crops > 5% reporting) Crop incomes reported by more than 5% of the households showed increases in maize, cassava, rice, sugar peas, peanuts/ground nuts, and soya. While there were periods of inflation between 2011 and 2019, the consumer price index in 2011 and 2019, the years of the study the CPI was relatively stable.	Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg	Ecotourism	5,890	93,558	1489%	Employment	149,118	657,859	341%	Farming	66,397	222,400	235%	Fishing	21,057	286,846	1262%	Forestprod	21,270	72,809	242%	Ganyu	16,758	105,288	528%	Petty trading	65,765	250,470	281%	Avg - PZ	49,465	241,319	388%
Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg																																		
Ecotourism	5,890	93,558	1489%																																		
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Ganyu	16,758	105,288	528%																																		
Petty trading	65,765	250,470	281%																																		
Avg - PZ	49,465	241,319	388%																																		

Indicator	% Reporting 2011	% reporting 2019	Avg Income 2011	Avg Income 2019	% Chg. Avg Income
C11_4 (Income generated from sale of maize (MK))	35.37%	23.49%	10,719	54,545	408.84%
C11_5 (Income generated from sale of cassava (MK))	8.35%	4.14%	9,072	33,968	274.41%
C11_6 (Income generated from sale of kilombero rice (MK))	5.53%	5.18%	33,710	79,763	136.61%
C11_7 (Income generated from sale of sugar beans (MK))	8.82%	3.50%	9,219	32,724	254.94%
C11_8 (Income generated from sale of peanut (MK))	30.77%	17.52%	14,975	36,665	144.84%
C11_9 (Income generated from sale of soya bean (MK))	6.75%	12.02%	6,040	52,979	777.09%
Total Avg			13,956	48,441	247.09%

Economic benefits from sustainable resource management – NTFPs (HHS K. Econ Benefits)

	2011	2019	% Chg
Number of HH earn income from NTFPs	11%	12%	16%

K. Econ Bene_K1IncomeNaturalResources

While data was collected for NTFPs these sources during this period were incomplete and could not be clearly aggregated for reporting the quantity produced.

Economic benefits from sustainable resource management conservation – generated from Climate Finance (QBO - Financial Records in Project Dedicated Account)

- Over the monitoring period **USD 2.7 million in carbon revenue** was invested back into the Program activities to provide increased resources and income opportunities for Program beneficiaries.

Type of Benefit/Cost/Risk	The impact is actual, direct, and a benefit to the communities.
Change in Well-being	Well-being indicator 2.1 Increased income levels-Financial Capital are met with this metric. Household income increased from sustainable forestry, agriculture, and other enterprises that will enable communities to participate more in the formal economy and focus on investing in longer term solutions to common challenges. Increase in income generation on the household level, holding this much direct benefit, will also encourage the communities to stay committed to the Program and focus on developing a conservation mindset for the natural resources they protect.

4.1.1.2 S.2 # of people receiving training the importance of sustainable natural resources management and/or biodiversity conservation

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	Community members participated in trainings and awareness meetings directly related to understanding the importance of sustainable natural resource and biodiversity conservation and what they can do to support it.			
	NRC/ZNRC (Communities NVA and NAWIRA Reports)			
		Sum of Village Level Awareness Meeting# of meetings	Awareness Meeting- # of people total in meetings	Awareness Meeting - # women in meetings
	NVA	450	13,482	5,358
	NAWIRA	891	34,688	18,508
	Total	1,341	48,170	23,866
	Technical Trainings			
	These are for nursery, honey, conservation ag and livestock.			

			Awareness Meeting - # women in meetings
	NVA	9,800	3,869
	NAWIRA	20,054	6,860
	Total	29,854	10,729
Outreach/In-reach Education for Schools and Other Groups (DNPW and African Parks Data)			
		DNPW and AP	
Number of students that receive education		20,785	
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.		
Change in Well-being	Well-being indicator 4.2 Education Levels, skills- Human Capital- are met with this metric. With more households participating in trainings related to natural resource management, there will be an increase in understanding about natural resource conservation and sustainable management of these resources that they protect. Households that have at least one family member trained in these topics will increase the chances of further engagement in the Program, further there are more opportunities for increased income with more households trained in the effective sustainable management of these resources.		

4.1.1.3 S.3 # of Co-management agreements signed between DNPW and Associations

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.
Impact	A legally binding agreement between Govt and a legally constituted community grouping allowed for mutual benefits from the protection of natural resources in Protected Areas. There were two updated co-management agreements signed between DNPW and the Associations since 2011.

Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.
Change in Well-being	Well-being indicators 1.1 Access to land, water, grazing, 1.2 Ownership of herds, trees, - Natural Capital and 5.1 Membership of organizations- Social Capital and 5.3 Accountability of elected representation – Social Capital are met with this metric. Co-management agreements signed between DNPW and the Associations represent a binding partnership that enable the Program to be more successful with the written consent and commitment from these key stakeholders. The more co-management agreements that are signed represent the success of the Program and the benefit that the communities will experience.

4.1.1.4 S.4 # of policies, laws, agreements, or regulations promoting sustainable natural resource management and conservation that are implemented.

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.																
Impact	Besides the co-management agreements which form the legal and operational basis for DNPW/AP formally working together with NAWIRA and NVA, there were other agreements implemented during the monitoring period to promote sustainable resource management and equitable benefits sharing. These include (also found in Section 6.3.2): <table><tr><th>Protected Area</th><th>Agreement</th><th>Updates During Monitoring Period</th></tr><tr><td rowspan="2">Nkhotakota</td><td>NAWIRA Association Constitution</td><td> - Updated in in 2018 </td></tr><tr><td>Co-Management Agreement</td><td> - Newly signed with Africa Parks in June 2018 </td></tr><tr><td rowspan="2">Nyika and Vwaza</td><td>NVA Association Constitution</td><td> - Updated in 2016 </td></tr><tr><td>Co-Management Agreement</td><td> - Updated and signed in Dec 2017 </td></tr><tr><td>DNPW, Terra, Associations</td><td>REDD+ Agreement</td><td> - Overarching agreement maintained in-force </td></tr></table>	Protected Area	Agreement	Updates During Monitoring Period	Nkhotakota	NAWIRA Association Constitution	Updated in in 2018	Co-Management Agreement	Newly signed with Africa Parks in June 2018	Nyika and Vwaza	NVA Association Constitution	Updated in 2016	Co-Management Agreement	Updated and signed in Dec 2017	DNPW, Terra, Associations	REDD+ Agreement	Overarching agreement maintained in-force
Protected Area	Agreement	Updates During Monitoring Period															
Nkhotakota	NAWIRA Association Constitution	Updated in in 2018															
	Co-Management Agreement	Newly signed with Africa Parks in June 2018															
Nyika and Vwaza	NVA Association Constitution	Updated in 2016															
	Co-Management Agreement	Updated and signed in Dec 2017															
DNPW, Terra, Associations	REDD+ Agreement	Overarching agreement maintained in-force															

	DNPW, Terra, Associations	Fiscal Management Agreement	Signed 2015 and in-force
	AP and GoM	Letter Agreement to confirm terms of management agreement	Waiting for DNPW to provide
	All Project Area	Draft formation document for Kulera REDD+ Agreement	Prepared and distributed to partners for review
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.		
Change in Well-being	Well-being indicators 1.1 Access to land, water, grazing, 1.2 Ownership of herds, trees, - Natural Capital and 5.1 Membership of organizations- Social Capital are met with this metric. Policies, laws, and agreements that promote sustainable natural resource management and conservation assist in the Program success by focusing on the direct commitment and participation of governance structures. The more laws and agreements that can be created or emphasized in support will generate more interest, understanding, and education surrounding the management of these resources. Many real changes are carried out with the formation and enforcement of laws and policies in this regard, and the Program supports the development of these.		

4.1.1.5 S.5 # of households acquired new knowledge/skills in improved livelihoods & NRM (technical trainings and reported knowledge)

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	Improved livelihoods as a result of individuals/households attending training courses in various interventions such as crop diversification, conservation agriculture, irrigation, tree planting, livestock development. Technical Trainings NTPFs For the monitoring period the number of HH reporting they received technical training and the number of trainings.			
	Technical Training	2011	2019	% Chg

% reported received technological training in year (bee, mushroom, NRM, fish, tree, other)	30.9%	45.4%	47%
Number of trainings reported in year	527	1,557	195%

K. Econ Bene_K6TrainingReceived

Type of Training	2011	2019	% Chg in #
[1] Establishment and management of woodlots	137	435	318%
[2] Participatory community forest management	67	310	463%
[3] Bee keeping	9	106	1178%
[4] Mushroom production	2	20	1000%
[5] Sustainable natural resource use and management	147	291	198%
[6] Fish farming and aquaculture	8	18	225%
[7] Tree nursery establishment and management	157	359	229%
[8] Other (specify)	0	16	0%
Totals	527	1555	195%

K. Econ Bene_K6TrainingReceived

Reported Knowledge – Conservation Agricultural

Conservation Ag (Soil Fertility) Knowledge	2011	2019	% Chg
% Knowledge Soil Fertility (HHS - D.Land 11)	96%	72%	-26%

Knowledge (D.11 Soil Fertility)

Soil Enhancements Technologies Known	2011	2019	% Chg
[1] Grain legume rotation	206	336	63%
[2] Crop rotation	534	293	-45%
[3] Use manure	709	724	2%
[4] Fallow	114	54	-53%
[5] Agro forestry methods	333	194	-42%
[6] Incorporation of crop residues	289	345	19%
[7] Compost manure	302	109	-64%
[8] Burning tree branches	25	7	-72%
[9] use inorganic fertilizers	590	665	13%
[10] Other (specify)	1	13	1200%

	# Practices Reported by Households	3103	2740	-12%
	D. Land_D12a (Technology aware of)			
	Livestock Training			
	Training Reported on Improved Livestock Practices	2011	2019	% Chg
	Training on pharmaceutical use	61%	78%	26%
	Training on managing and mitigating overgrazing	40%	83%	106%
	F. Livestock_Pract2_F11 (Training on pharmaceutical use)			
	Technical Trainings (Communities NVA and NAWIRA Reports)			
	These are for nursery, honey, conservation ag and livestock.			
		Awareness Meeting - # people in meetings	Awareness Meeting - # women in meetings	
Type of Benefit/Cost/Risk	NVA	9,800	3,869	
	NAWIRA	20,054	6,860	
Change in Well-being	Total	29,854	10,729	
	Well-being indicators 1.3 Productivity -Natural Capital, 4.2 Education levels and skills- Human Capital, and 5.2 Social network and Support-Social Capital are met with this metric. One of the most critical components of the Program is to promote training and acquisition of new skills and knowledge surrounding sustainable natural resource management and various other improvements in livelihoods. This indicator shows an overwhelming positive impact of households trained in various subjects including effects of overgrazing, downstream impacts of pesticide use, conservation agriculture, tree and nursery development, irrigation to name a few. This promote new livelihood opportunities for some households who gain this new knowledge or skills, and most households will benefit from improved practices implemented by these trainings.			

4.1.1.6 S.6 # of farmers, processors & others who have adopted new technologies or management practices

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.																																																
Impact	Farmers and food process have adopted one or more of technologies being promoted under the project based on (unit of application ha or # adopted), these are the numbers of households reporting in the HHS of ~1,900 households, not the total Program households D8_1 (Cropping system 1) number of household reporting by type (one HH could adopt multiple) <table><tr><th>Adoption of Soil Fertility Practices (D14)</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>% Reported Adopting Practices</td><td>89%</td><td>74%</td><td>-16%</td></tr></table> D. Land_D14 (you practice any soil fertility enhancement practices) <table><tr><th>Adoption of Soil/Water Conservation</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>% Reported Adopting Practices</td><td>70%</td><td>78%</td><td>12%</td></tr></table> D. Land_D22 you are practicing any land/soil and water conservation measures) <table><tr><th>Adoption of Soil/Water Conservation Practice</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>[1] Contour ridges</td><td>417</td><td>349</td><td>-16%</td></tr><tr><td>[2] Vetiver grass</td><td>346</td><td>378</td><td>9%</td></tr><tr><td>[3] Rainwater harvesting</td><td>4</td><td>24</td><td>500%</td></tr><tr><td>[4] Conservation agriculture</td><td>68</td><td>74</td><td>9%</td></tr><tr><td>[5] Box ridges</td><td>216</td><td>286</td><td>32%</td></tr><tr><td>[6] Other (specify) _____</td><td>1</td><td>108</td><td>10700%</td></tr><tr><td># HH Reported Practices</td><td>1,052</td><td>1,219</td><td>16%</td></tr></table> D. Land Tech1 D23 1 - 6	Adoption of Soil Fertility Practices (D14)	2011	2019	% Chg	% Reported Adopting Practices	89%	74%	-16%	Adoption of Soil/Water Conservation	2011	2019	% Chg	% Reported Adopting Practices	70%	78%	12%	Adoption of Soil/Water Conservation Practice	2011	2019	% Chg	[1] Contour ridges	417	349	-16%	[2] Vetiver grass	346	378	9%	[3] Rainwater harvesting	4	24	500%	[4] Conservation agriculture	68	74	9%	[5] Box ridges	216	286	32%	[6] Other (specify) _____	1	108	10700%	# HH Reported Practices	1,052	1,219	16%
Adoption of Soil Fertility Practices (D14)	2011	2019	% Chg																																														
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	<table><tr><th>Adoption Agroforestry</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>% Use of Agroforestry</td><td>40%</td><td>48%</td><td>20%</td></tr></table>	Adoption Agroforestry	2011	2019	% Chg	% Use of Agroforestry	40%	48%	20%																												
	Adoption Agroforestry	2011	2019	% Chg																																	
	% Use of Agroforestry	40%	48%	20%																																	
	G. AgroFor_G2_1																																				
	Adoption of Agroforestry																																				
	<table><tr><th>Practices Reported</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>[1] Fertilizer tree systems</td><td>380</td><td>245</td><td>-36%</td></tr><tr><td>[2] Fodder banks</td><td>8</td><td>18</td><td>125%</td></tr><tr><td>[3] Indigenous fruit tree crop system</td><td>26</td><td>79</td><td>204%</td></tr><tr><td>[4] Rotational wood lots</td><td>7</td><td>28</td><td>300%</td></tr><tr><td>[5] Other (specify) _____</td><td>0</td><td>17</td><td></td></tr><tr><td>[99] NA</td><td>0</td><td>0</td><td></td></tr><tr><td>Total</td><td>421</td><td>387</td><td>-8%</td></tr><tr><td>% reporting</td><td>39%</td><td>45%</td><td>13%</td></tr></table>	Practices Reported	2011	2019	% Chg	[1] Fertilizer tree systems	380	245	-36%	[2] Fodder banks	8	18	125%	[3] Indigenous fruit tree crop system	26	79	204%	[4] Rotational wood lots	7	28	300%	[5] Other (specify) _____	0	17		[99] NA	0	0		Total	421	387	-8%	% reporting	39%	45%	13%
	Practices Reported	2011	2019	% Chg																																	
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% reporting	39%	45%	13%																																		
G. AgroFor_G2_1 commonagro-forestry technologies do you practice																																					
<table><tr><th>Practices - Adoption</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>Farm Feed Conversion</td><td>12%</td><td>29%</td><td>149%</td></tr></table>	Practices - Adoption	2011	2019	% Chg	Farm Feed Conversion	12%	29%	149%																													
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F. Livestock_F4																																					
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.																																				
Change in Well-being	Well-being indicators 1.3 Productivity, 1.4 Soil, water quality-Natural Capital, 3.2 Access to productive equipment-Physical Capital, and 4.2 Education level and skills- Human Capital are met with this metric. Adoption of new technologies and management practices is one of the main objectives of the Kulera REDD+ Program to support reduction in deforestation. With more households reporting using improved agroforestry practices and natural resource conservation in 2019 when compared to 2011, we see an overall positive benefit. The reduction in farming households that reported using soil conservation, and irrigation could be explained by the number of households that switched livelihood options since 2011.																																				

4.1.1.7 S.8 # of acres under sustainable agriculture practices

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these
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	are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.																																			
Impact	Sustainable agriculture methods and approaches under Kulera include contour ridges, vetiver grasses, rain-water harvesting, and box ridges, fallows, agroforestry practices, incorporation of crop residues and compost manure is adopted or piloted by farmers.																																			
	<table><tr><th>Areas of Soil/Water</th><th>% reporting 2011</th><th>% reporting 2019</th><th>% Chg</th><th>Avg acres 2011</th><th>Avg acres 2019</th><th>% Chg</th></tr><tr><td>Tech1_D23 (Area under contour ridges)</td><td>39.9%</td><td>39.8%</td><td>0%</td><td>2.00</td><td>1.68</td><td>-16%</td></tr><tr><td>Tech2_D23 (Area under vetiver grass)</td><td>32.4%</td><td>38.3%</td><td>18%</td><td>1.75</td><td>2.38</td><td>36%</td></tr><tr><td>Tech4_D23 (Area under rainwater harvesting)</td><td>21.8%</td><td>25.4%</td><td>17%</td><td>2.21</td><td>1.90</td><td>-14%</td></tr><tr><td>Tech5_D23 (Area under box ridges)</td><td>11.7%</td><td>14.2%</td><td>21%</td><td>0.11</td><td>0.11</td><td>3%</td></tr></table>	Areas of Soil/Water	% reporting 2011	% reporting 2019	% Chg	Avg acres 2011	Avg acres 2019	% Chg	Tech1_D23 (Area under contour ridges)	39.9%	39.8%	0%	2.00	1.68	-16%	Tech2_D23 (Area under vetiver grass)	32.4%	38.3%	18%	1.75	2.38	36%	Tech4_D23 (Area under rainwater harvesting)	21.8%	25.4%	17%	2.21	1.90	-14%	Tech5_D23 (Area under box ridges)	11.7%	14.2%	21%	0.11	0.11	3%
	Areas of Soil/Water	% reporting 2011	% reporting 2019	% Chg	Avg acres 2011	Avg acres 2019	% Chg																													
	Tech1_D23 (Area under contour ridges)	39.9%	39.8%	0%	2.00	1.68	-16%																													
	Tech2_D23 (Area under vetiver grass)	32.4%	38.3%	18%	1.75	2.38	36%																													
	Tech4_D23 (Area under rainwater harvesting)	21.8%	25.4%	17%	2.21	1.90	-14%																													
	Tech5_D23 (Area under box ridges)	11.7%	14.2%	21%	0.11	0.11	3%																													
	D. Land_Tech1_D23																																			
	<table><tr><th>Areas of Conservation Agriculture Practices</th><th>% reporting 2011</th><th>% reporting 2019</th><th>% Chg</th><th>Avg acres 2011</th><th>Avg acres 2019</th><th>% Chg</th></tr><tr><td>TECH4_D15 (Fallows)</td><td>4.1%</td><td>11.0%</td><td>166%</td><td>1.78</td><td>1.34</td><td>-25%</td></tr><tr><td>TECH5_D15 (Agroforestry practice)</td><td>16.5%</td><td>13.4%</td><td>-19%</td><td>1.68</td><td>1.34</td><td>-21%</td></tr><tr><td>TECH6_D15 (Incorporation of crop residues)</td><td>15.1%</td><td>15.0%</td><td>0%</td><td>1.90</td><td>1.70</td><td>-11%</td></tr><tr><td>TECH7_D15 (compost manure)</td><td>11.1%</td><td>6.7%</td><td>-39%</td><td>0.92</td><td>1.65</td><td>79%</td></tr></table>	Areas of Conservation Agriculture Practices	% reporting 2011	% reporting 2019	% Chg	Avg acres 2011	Avg acres 2019	% Chg	TECH4_D15 (Fallows)	4.1%	11.0%	166%	1.78	1.34	-25%	TECH5_D15 (Agroforestry practice)	16.5%	13.4%	-19%	1.68	1.34	-21%	TECH6_D15 (Incorporation of crop residues)	15.1%	15.0%	0%	1.90	1.70	-11%	TECH7_D15 (compost manure)	11.1%	6.7%	-39%	0.92	1.65	79%
	Areas of Conservation Agriculture Practices	% reporting 2011	% reporting 2019	% Chg	Avg acres 2011	Avg acres 2019	% Chg																													
TECH4_D15 (Fallows)	4.1%	11.0%	166%	1.78	1.34	-25%																														
TECH5_D15 (Agroforestry practice)	16.5%	13.4%	-19%	1.68	1.34	-21%																														
TECH6_D15 (Incorporation of crop residues)	15.1%	15.0%	0%	1.90	1.70	-11%																														
TECH7_D15 (compost manure)	11.1%	6.7%	-39%	0.92	1.65	79%																														
D. Land_TECH4_D15																																				
Type of Benefit/Cost/Risk	The impact is direct, actual and a benefit to the communities.																																			
Change in Well-being	Well-being indicators 1.3 Productivity, 1.5 Biodiversity -Natural Capital are met with this metric. This indicator allows the Program to compare the increase in ha under sustainable agricultural practices as a result of Program Activities. Increasing land areas that are under sustainable agriculture practices and irrigation increases the health of the communities and the surrounding ecosystems.																																			

4.1.1.8 S.9 # of households with ownership/access to small livestock for nutrition and income

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	Improved livestock varieties and practices that are promoted through the Kulera Program such as poultry/guinea, fowl, pigs and goats, selection of improved breed, integrated pest/disease management, and improved feeding and housing techniques are adopted by households.			
	Livestock Ownership	2011	2019	% Chg
	% People reporting Livestock Ownership	91%	82%	-10%
	# of Livestock that are owned by HHs	13,332	10,058	-25%
	Avg # Animals per Owning HH	13.7	11.5	-16%
F. Livestock_F1 Do you own livestock This decrease in change from 2011 could be a result of diversification of livelihood options, leaving higher incomes to purchase protein, rather than care for the livestock themselves. This could also be demonstrating a limited support due to financial constraints of providing inputs to gain access to livestock for nutritional support.				
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.			
Change in Well-being	Well-being indicators 1.1 Access to land, water, grazing, 1.2 Ownership of herds, 1.5 Biodiversity-Natural Capital, 4.2 Education levels and skills and 4.3 Health levels are met with this metric. The reduction in households reporting owning livestock since 2011 can be explained by the implementation of alternative livelihood sources and the emphasis on the long-term impacts of livestock overgrazing in the Program areas and how this may affect conservation payments. The study also reported an increase in households reported practicing farm feed conservation, which is a positive net result of this impact.			

4.1.1.9 S.10 Area (or # farmers) using irrigation or other water management techniques

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally
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	represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	Households and farmers adopted small scale irrigation that involves use of a MoneyMaker treadle pump and low-cost gravity-fed systems of river diversion.			
	Irrigation	2011	2019	% Chg
	% Using Irrigation	49%	30%	-39%
	E. Irrigation_E1Do you practice irrigation farming			
	A reduction in the % of households using irrigation could again be representing movements from small-scale agricultural production to other livelihood options. There could also be a lack of information, support, quality inputs, and guidance on irrigation farming. Limited funds during this monitoring period were directed toward irrigation equipment.			
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities. The decrease in % of households using irrigation could be explained by the diversification of livelihood options and increase in other industries besides agriculture. This could also be explained by limitation to the budget for equipment and will be included in the analysis of the adaptive management.			
Change in Well-being	Well-being indicators 1.3 Productivity, 1.4 Soil, water quality-Natural Capital, 3.2 Ownership/access to productive equipment are met with this metric.			

4.1.1.10 S.11 New technologies made available for transfer

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.
Impact	Through the identification and introduction of new technologies the communities in the program have the opportunity to better their well-being, become more educated and generate more income.

	2 new technology identified and introduced during this monitoring period: - Small-scale household solar which was not be offered by the Program before and was not provided through other sources in the majority of the Project Zone. - Mobile money, solar agents were trained, and the association adopted mobile money
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities. Each new technology will have its specific benefit, costs and risk.
Change in Well-being	Well-being indicators 2.2 Financial savings, access to credit – Financial Capital, 3.1 Access to roads, electricity, piped water – Physical Capital, Educational level, skills – Human Capital are met with this metric.

4.1.1.11 S.12 - # Of households/schools/individuals accessing alternative energy sources/fuel efficient systems

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.																								
Impact	Households and individuals adopted renewable energy which is derived from natural processes under Kulera including solar energy, biofuels, mini hydros, and full efficient cookstoves. these are the numbers of households reporting in the HHS of ~1,000 households, not the total Program households. • There were 27,464 fuel efficient cookstoves implemented during the first monitoring period, which continue to be operated during this period, however the monitoring data was not collected in time for the fuel wood savings from these initial stoves to be included in this monitoring period. • 2,500 small scale household solar systems implemented during the period. <table><tr><th>Source of Lighting</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>[1] Tin lamp</td><td>137</td><td>18</td><td>-88%</td></tr><tr><td>[2] Lantern</td><td>74</td><td>9</td><td>-89%</td></tr><tr><td>[3] Pressure lamp</td><td>2</td><td>0</td><td>-100%</td></tr><tr><td>[4] Wood fuel for Light</td><td>51</td><td>21</td><td>-64%</td></tr><tr><td>[5] Solar power</td><td>11</td><td>99</td><td>688%</td></tr></table>	Source of Lighting	2011	2019	% Chg	[1] Tin lamp	137	18	-88%	[2] Lantern	74	9	-89%	[3] Pressure lamp	2	0	-100%	[4] Wood fuel for Light	51	21	-64%	[5] Solar power	11	99	688%
Source of Lighting	2011	2019	% Chg																						
[1] Tin lamp	137	18	-88%																						
[2] Lantern	74	9	-89%																						
[3] Pressure lamp	2	0	-100%																						
[4] Wood fuel for Light	51	21	-64%																						
[5] Solar power	11	99	688%																						

	[6] Electricity	5	30	425%
	[7] Rechargeable lamps/Torch	764	978	12%
	[8] Other (specify)	2	40	1651%
		1046	1195	
J. NRM_J4_SourceEnergyLight				
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.			
Change in Well-being	Well-being indicators 3.1 Access to electricity, 3.2 Ownership and access to equipment – Physical Capital 4.3 Health Level - Human Capital are met with this metric. One of the most positive outcomes of the Kulera REDD+ Program is the creation of a revolving fund to promote the access and use of alternative energy sources for solar lights. Solar lights and improved cookstoves have numerous positive benefits for households, including better health, lower costs, less labor and improved education levels (lights at night to study).			

4.1.1.12 S.13 - # of communities/ groups engaged in village savings and loan

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.
Impact	Communities and groups engaged in village savings and loans programs to support village banking systems comprised of informal self-organized groups of 20-30 members in a village. This system relies on cross guarantees and social pressure. Number of saving village savings and loan groups operating - No data reported for this period.
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.
Change in Well-being	Well-being Indicators 1.3 Productivity – Natural Capital, 2.1 Income levels, variability over time, distribution within society, 2.2 Financial savings and access to credit,– Financial Capital, 5.1

	Membership of organizations and 5.2 Support from kin, friends-Social Capital are met with this metric. The positive impact of communities and groups engaged in informal savings and loans programs has been documented. Holding community members accountable has led to positive results for these programs.
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4.1.1.13 S.14 - # of producer groups and MSMEs trained in production, processing, post-harvest logistics, processing business, and marketing skills

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	Beneficiary groups and MSMEs received training in production, processing, business, and marketing.			
	Indicator	2011	2019	% Chg.
	% of People reporting receiving enterprise training	26.15%	27.63%	5.64%
	C. Income_C12(Enterprise Training, HHs)			
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.			
Change in Well-being	Well-being indicators 1.3 Productivity – Natural Capital, 2.1 Income levels, levels, variability over time, distribution within society – Financial Capital, 4.2 Education levels – Human Capital are met with this metric. When MSMEs directly engage with training and business and marketing skills, the process of engaging with new or existing markets becomes a much less risky endeavor. Participation in business development, marketing and other related technical trainings promotes new knowledge that communities' members can utilize to engage in diversifying livelihood options and bring new information home to farmers.			

4.1.1.14 S.15 - # of MSMEs accessing loans from commercial banks / lending institutions / credit guarantee facility

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the
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	Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.			
Impact	MSMEs are supported to access loans for their business ventures that were promoted under the project.			
	Indicator	2011	2019	% Chg.
	% people reporting access to loans C. Income_C14(Access Loan)	12.50%	17.44%	39.49%
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.			
Change in Well-being	Well-being indicators 1.3 Productivity – Natural Capital, 2.1 Income levels, variability over time, distribution within society, 2.2 Financial savings and access to credit --Financial Capital are met with this metric. Accessing loans for small businesses can encourage the establishment of various livelihood options and provide meaningful support for the development of new enterprises. With a positive impact of a 9% increase in MSMEs accessing loans, the Program has created this change through the promotion of NTFPs and relevant trainings to guide this process.			

4.1.1.15 S.16 - Volume of NTFP and agro-based products produced and sold

Impact	Measuring production amounts and amounts sold for the main food and cash crops provides estimate of the impact on food security and incomes.			
	Production/Sale Crops	Avg Produced 2011	Avg Production 2019	% Chg.
	C9_4 (Amount of maize produced (Kg))	1,249	788	-37%
	C10_4 (Amount of maize sold (Kg))	294	212	-28%
	C9_5 (Amount of cassava produced (Kg))	1,351	631	-53%
	C10_5 (Amount of cassava sold (Kg))	371	123	-67%
	C9_6 (Amount of kilombo rice produced (Kg))	328	376	15%
	C10_6 (Amount of kilombo rice sold (Kg))	291	379	30%
	C9_7 (Amount of sugar beans produced (Kg))	83	84	1%

	C10_7 (Amount of sugar beans sold (Kg))	36	37	5%
	C9_8 (Amount of peanut produced (Kg))	389	223	-43%
	C10_8 (Amount of peanut sold (Kg))	363	516	42%
	C9_9 (Amount of soya bean produced (Kg))	78	244	215%
	C10_9 (Amount of soya bean sold (Kg))	67	202	203%
	Total Avg	408	318	
C. Income_C9 & C10				
Above is the percentage of households reported participating in the production and processing of NTFPs. This means there has been enough acquisition of skills and knowledge to produce NTFP products. The decrease in reporting from 2011 could be evidence of a diversification of livelihood options, with less people using NTFPs and practicing more sustainable agro-forestry methods, or not participating in this economy at all. NTFP data was collected but could not be accurately be reported on during this monitoring period.				
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.			
Change in Well-being	Well-being indicators 1.3 Productivity-Natural Capital, 2.1 Income levels – Financial Capital are met with this metric. Increased income generated from the sale of NTFPs can greatly improve livelihoods through the development of enterprises and sustainable natural resource management. The increased income can encourage communities to stay actively engaged in Program Activities and not seek out alternative forms of income.			

4.1.1.16 S.17 - % increase in revenue from ecotourism

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases,
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	the results are based on Association reporting from each of their communities.								
Impact	Increased revenues to communities and tour guides involved in ecotourism with links to tour operators. Ecotourism refers to environmentally responsible travel to natural areas, cultural heritage sites, community-based activities in order to enjoy and appreciate nature (and accompanying cultural features, both past and present) that promote conservation, have a low visitor impact and provide socio-economic benefits for local peoples. <table><tr><th>Income by Job Sector</th><th>2011 Avg Annual (MKW)</th><th>2019 Avg Annual (MKW)</th><th>% Chg Avg</th></tr><tr><td>Ecotourism</td><td>5,890</td><td>93,558</td><td>1489%</td></tr></table> B.1 IncomeTransformedData_FarmingC4 (HHS)	Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg	Ecotourism	5,890	93,558	1489%
Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg						
Ecotourism	5,890	93,558	1489%						
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities.								
Change in Well-being	Well-being indicators 1.3 Productivity-Natural Capital, 2.1 Income levels – Financial Capital are met from this metric The increase in revenue from ecotourism suggests that these programs will have a positive effect on creating a conservation mindset as well as increasing incomes for the nearby communities.								

4.1.1.17 S.18 - Diversification of food crops

Community Groups	These results are reflective of all the community groups in the Project Zone. These communities include all the villages within 5km of the boundaries of the Nkhotakota Wildlife Reserve, Vwaza Wildlife Reserve, and the Nyika National Park as these are the communities legally represented by the NVA and NAWIRA community associations. The monitored results are based on a random sample of approximately 1,000 household surveys that were conducted in 2019 with the Project communities in accordance with the household survey Standard Operating Procedures. In some cases, the results are based on Association reporting from each of their communities.															
Impact	The diversification of food crops contributes to food security and healthy soils. The change in crop concentration is measured based on households reporting the five main food crops grown by the household and determining the percentage that grew 1,2,3,4,5 crops. (HHS - (H1_1), (H1_2), (H1_3), (H1_4), (H1_5)) <table><tr><th>Main Food Crops Grown</th><th>2011</th><th>% in 2011</th><th>2019</th><th>% in 2019</th></tr><tr><td>[1] Maize</td><td>1,045</td><td>77%</td><td>1,211</td><td>59%</td></tr><tr><td>[2] Cassava</td><td>155</td><td>11%</td><td>239</td><td>12%</td></tr></table>	Main Food Crops Grown	2011	% in 2011	2019	% in 2019	[1] Maize	1,045	77%	1,211	59%	[2] Cassava	155	11%	239	12%
Main Food Crops Grown	2011	% in 2011	2019	% in 2019												
[1] Maize	1,045	77%	1,211	59%												
[2] Cassava	155	11%	239	12%												

	[3] Rice	63	5%	96	5%
	[4] Plantain	27	2%	54	3%
	[5] Sweet potato	66	5%	261	13%
	[6] Other (Specify)	3	0%	186	9%
	# Reporting	1,359	100%	2,047	100%
	H. Food_H1_1mainfood				
Type of Benefit/Cost/Risk	This impact is direct, actual and a benefit to the communities				
Change in Well-being	Well-being indicators 1.4 Soil and water quality and 1.5 Biodiversity - Natural Capital are met from this metric.				

4.1.2 Negative Community Impact Mitigation (CM2.2)

Any project that seeks to transition from unsustainable natural resource use to sustainable use creates risks to community groups' livelihoods and incomes that were being derived from unsustainable use. For the Kulera REDD+ project, the Program design mitigated these risks by building alternative sources of fuel wood, promoting conservation agricultural and implementing livelihood activities that diversify income streams, provide inputs for other more sustainable land-use, and provides capacity building to foster adoption. The indicators reported in Section 4.1.1 demonstrate that well-beings are not be negatively impacted in the Project Zone.

Allowing for harvesting of NTPFs, promoting fuelwood lots, promotion of sustainable woodland management is also used to mitigate risks for communities that are accustomed to having unmeasured access to these natural resources. The most critical of these mitigation actions would be the establishment of woodlots for fuelwood extraction, promotion of non-timber forest products, and the implementation of fuel-efficient cookstoves in the Project Zone. These measures taken during the Project timeline are essential to mitigating the risk that is presented.

There are no Program activities that threaten community HCVs.

4.1.3 Net Positive Community Well-Being (CM2.3, GL1.4)

Following the guidance in the CCB regarding measuring of community impacts and wellbeing as well as monitoring in accordance with the Project's CCB monitoring plan, the impact indicators are reported in Section 4.1.1. For each of these impact indicators, the associated well-being impacts are defined and included in each table which show how well-being is positively impacted by the Program activities based on the results in that impact indicator. The well-being indicators were adopted from the Sustainable Rural Livelihood (SRL) Framework from *A Framework for Research on Sustainability Indicators for Agriculture and Rural Livelihoods* by Phil Woodhouse, David Howlett and Dan Rigby (Phil Woodhouse, February 2000), provided in Appendix 3: Well-Being Indicators. By determining how many communities or households gained access to biodiversity, agricultural inputs, higher incomes, electricity, education, and membership to organizations, we see an overall positive trend in the well-being indicators being impacted by Project Activities.

The Program's community impact indicators (Section 4.1.1) are mapped to the Community Well-Being Indicators (Appendix 3: Well-Being Indicators) and are used to determine the overall well-

being impacts on the communities in the Project Zone. The well-being impact on communities is provided in the Program's impact indicators in Table 26 :

Table 26. Most Addressed Community Well-being Indicators

#	Component of Human Well-being	#	Indicators of Human Well-Being	Map to Community Indicators
1	Natural capital:	1.1	Access to land, water, grazing.	S.3, S.4, S.9, S.10
		1.2	Ownership of herds, trees	S.3, S.4, S.9
		1.3	Productivity (per unit of land, per unit of water, per unit of inputs)	S.5, S.6, S.8, S.14, S.16
		1.5	Biodiversity	S.8, S.9, S.18
2	Financial capital	2.1	Income levels, variability over time, distribution within society	S.1, S.13, S.14, S.15, S.16, S.17
3	Physical capital	3.1	Access to roads, electricity, piped water	S.12
		4.2	Educational level, skills	S.2, S.5, S.6, S.7, S.9, S.14
5	Social capital	5.1	Membership of organizations	S.3, S.4, S.5, S.13

The Gold Level for climate change adaptation benefits for communities is provided in Section 3.3.1.

4.1.4 Protection of High Conservation Values (CM2.4)

Culturally significant sites within village areas were identified by community members in the initial PRAs and are listed in the Project Document. These include dambwe (shrines for the spiritual masked society known as the Nyau or Gule Wamkulu), and sacred groves protecting graveyards and burial sites (Phiri, Mapemba, and Sopo 2011). Trees in these areas are never cut or cleared from graveyards and sites of religious significance, and as such, these stands of trees create small groves of high cultural importance (Sheridan and Nyamweru 2008). Some communities also identified historic graveyards within the protected areas dating from the time period before communities were evicted from the protected areas included in the Project (Phiri, Mapemba, and Sopo 2011). After the project start, an additional culturally significant area was identified by as Fingira Rock an important cultural symbol in Nyika National Park within the Kulera REDD+ Program Area. The DNPW supports protection and visitation of the Fingira rock as part of managing the park.

Activities beyond forest protection are not promoted under the project, thus there were no negative impacts on community HCV areas reported during this monitoring period.

4.2 Other Stakeholder Impacts

4.2.1 Mitigation of Negative Impacts on Other Stakeholders (CM3.2)

The Project Zone captures the majority of people who were/are dependent on the natural resources in the Project Area. This area covers more than 270,000 people and is where the Program focuses its activities and resources. Given the large geographic size of the Program and the significant number of people participating, it does not directly engage community outside the Program Zone.

However, the Kulera REDD+ program is the only landscape scale REDD+ program in Malawi, which is locally run by the government and two large communities' associations with private sector climate finance funding. These project partners support the Malawi's national REDD+ development and participate and exchanges in Malawi and the region to share their knowledge and experience in participatory management and running a commercially viable REDD+ program.

4.2.2 Net Impacts on Other Stakeholders (CM3.3)

Outside the Program Zone, there may be some feelings of exclusions or marginalization of communities not included. These other (outside) communities may be aware of the Kulera REDD+ Project, but do not have access to resources, training, inputs, and support that the Project provides. This does not mean that the Program inflicts negative well-being on these other stakeholders. The overwhelming impacts to other stakeholders are net positive. Many of the impacts targeted to the Project Zone, are expected to spread out of the Project Area and Project Zone. During the Monitoring Period there have been exchanges between NAWIRA and communities in the South of Malawi, and exchanges between NVA and communities in Zambia. These farmer-to-farmer exchanges helped communities offsite understand benefits of the Kulera Project and hear about technical inputs to address drivers of deforestation through livelihood improvements.

4.3 Community Impact Monitoring

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

The monitoring methodology includes specific periodic social assessments consisting of household surveys to measure the quantitative impacts on the local communities and the PRAs to measure the qualitative impacts against the baseline. Whereas the household survey is semi-structured and canvasses a stratified randomized sample of community members in the Project Zones (participants and non-participants alike) based on socio-economic and geographic variables, the participatory rural appraisals and focus groups provide a targeted, purposive sample of Project participants.

The Participatory Rural Appraisals and Household Surveys for the Kulera REDD+ Program was conducted in the Project Zone around the three Protected Areas (PA) of Nkhotakota Wildlife Reserve in the central region and Vwaza Wildlife Reserve and Nyika National Park in the Northern Region. This was the second set of surveys conducted from the Program, the first in 2011 and the second from the 26th November to 14th December 2019.

A total of 1,914 Household Surveys were collected in 2019, which is comparable to the number of surveys conducted in 2011 in the Project Zone. This socioeconomic data and information were collected from individual households to understand the impact of the Program interventions and

secondary emissions. The standard operating procedures for the 2019 survey was aligned directly with the 2011 SOP to allow for measurement of the impacts from the Program. These survey results also aid the project proponents in measuring the success and deficiencies of the Kulera REDD+ Project and will provide necessary feedback to improvement through adaptive management.

A comprehensive community monitoring plan has been provided to the VVB. This monitoring plan has been enhanced from the previous plan to be more robust and use more directly data that has been collected on the project at the start and under this monitoring period.

Both the specific impact indicators (Section 4.1.1) and the Program Activity monitoring (Section 6) provide all details on what has been monitoring during the period.

4.3.2 Monitoring Plan Dissemination (CM4.3)

Project Partners were involved in the revisions made to the Monitoring Plan during this monitoring period. The updated monitoring plan has been shared with Partners and is located at each of the Partner Offices. The Monitoring Plan Results are described in this document and the official way to inform, engage and empower communities will follow traditional ways of communication. This Monitoring Plan will be presented to community and other stakeholders following procedures described in 2.3.2 Dissemination of Summary Project Documents (G3.1). This Monitoring Plan will be online and accessible to all stakeholders.

4.4 Optional Criterion: Exceptional Community Benefits

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

This Kulera REDD+ Program has been in operation now for a decade. Based on the overwhelmingly positive community impacts described in Section 4.1.1, and the well-being indicators impacted described in Section 4.1.3, this project is well on its way to providing exceptional long-term community benefits.

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

The Kulera REDD+ Program has identified poorer households through social surveys and participatory rural appraisal (PRA) exercises. Barriers and risks that may prevent benefits from going to the most marginalized or vulnerable community groups is managed by the disaggregated structure by which the DNPW and Associations manage access to resources from the Program. By having village NRCs and ZNRCs that are democratically elected and geographically dispersed this promotes encouragement of all households even those that are most vulnerable.

These areas of Malawi do not have large numbers of the more typical ethnic or religious populations as in other countries. Within the Project Zone, the more vulnerable people include single women head of households and people with no formal education. Determining the impact to vulnerable groups of the Program's activities was based on evaluating the household surveys for these groups compared to whole set of households sampled.

This data was based on two vulnerable groups defined as follows:

1. Women head of households, who were single, divorced, widowed, or separated
2. Head of households who reported no education

Community Group	Women head of households, who are single, divorced, widowed, or separated																																															
Net positive impacts	The community impacts of these groups versus the whole were reported as follows:																																															
	Incomes by Sector																																															
	<table><tr><th>Income by Job Sector</th><th>2011 Avg Annual (MKW)</th><th>2019 Avg Annual (MKW)</th><th>% Chg Avg</th></tr><tr><td>Ecotourism</td><td>-</td><td>61,000</td><td></td></tr><tr><td>Employment</td><td>142,000</td><td>-</td><td>-100%</td></tr><tr><td>Farming</td><td>39,704</td><td>185,320</td><td>367%</td></tr><tr><td>Fishing</td><td>1,667</td><td>-</td><td>-100%</td></tr><tr><td>Forestprod</td><td>11,113</td><td>56,293</td><td>407%</td></tr><tr><td>Ganyu</td><td>7,939</td><td>81,611</td><td>928%</td></tr><tr><td>Pettytrading</td><td>35,220</td><td>83,218</td><td>136%</td></tr><tr><td>Avg - Vulnerable 1</td><td>33,949</td><td>66,777</td><td>97%</td></tr><tr><td>Avg - All</td><td>51,517</td><td>267,827</td><td>420%</td></tr></table>	Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg	Ecotourism	-	61,000		Employment	142,000	-	-100%	Farming	39,704	185,320	367%	Fishing	1,667	-	-100%	Forestprod	11,113	56,293	407%	Ganyu	7,939	81,611	928%	Pettytrading	35,220	83,218	136%	Avg - Vulnerable 1	33,949	66,777	97%	Avg - All	51,517	267,827	420%							
	Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg																																												
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	Avg - All	51,517	267,827	420%																																												
	B.1 IncomeTransformedData_all C4s																																															
	Knowledge of Conservation Ag																																															
<table><tr><th>Conservation Ag (Soil Fertility) Knowledge</th><th>2011</th><th>2019</th><th>% Chg</th></tr><tr><td>% Knowledge Soil Fertility (HHS - D.Land 11)</td><td>94%</td><td>87%</td><td>-7%</td></tr></table>	Conservation Ag (Soil Fertility) Knowledge	2011	2019	% Chg	% Knowledge Soil Fertility (HHS - D.Land 11)	94%	87%	-7%																																								
Conservation Ag (Soil Fertility) Knowledge	2011	2019	% Chg																																													
% Knowledge Soil Fertility (HHS - D.Land 11)	94%	87%	-7%																																													
Awareness of Practices of Soil Conservation																																																
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	[4] Rotational wood lots	0	1	
	[5] Other (specify) _____	0	2	
	[99] NA	0	0	
	Total	43	57	33%
	% reporting	19%	23%	19%
G. AgroFor_G2_1 commonagro-forestry technologies do you practice				
Livestock Ownership (F2. 2-9 HHS)				
1. Vulnerable Group 1- 79% (2011), 64% (2019)				
2. Whole Group - 91% (2011), 82% (2019)				
The statistics above compare the incomes, knowledge of soil fertility, adoption of soil conservation, adoption of agroforestry practices and the ownership of livestock between the identified potentially vulnerable group and the communities as a whole. These show that in each case there is positive impact from the Program for this group, but it does indicate that the positive impact at times of lower than the whole group.				
Benefit access	The slightly lower positive impact to this group may be due to less access to program benefits or may have to do with the ability of this group to adopt practices. The Program will continue to evaluate who these potentially vulnerable groups are and how to ensure that have access to Program benefits.			
Negative impacts	None			

Community Group	Head of Households with No Education																																								
Net positive impacts	The community impacts of these groups versus the whole were reported as follows:																																								
	Incomes by Sector																																								
	<table><tr><th>Income by Job Sector</th><th>2011 Avg Annual (MKW)</th><th>2019 Avg Annual (MKW)</th><th>% Chg Avg</th></tr><tr><td>Ecotourism</td><td>-</td><td>34,000</td><td></td></tr><tr><td>Formal Employment</td><td>-</td><td>360,000</td><td></td></tr><tr><td>Farming</td><td>39,422</td><td>135,131</td><td>243%</td></tr><tr><td>Fishing</td><td>21,375</td><td>19,500</td><td>-9%</td></tr><tr><td>Forestprod</td><td>3,230</td><td>74,629</td><td>2210%</td></tr><tr><td>Ganyu</td><td>10,000</td><td>97,372</td><td>874%</td></tr><tr><td>Pettytrading</td><td>36,280</td><td>100,100</td><td>176%</td></tr><tr><td>Avg - Vulnerable 2</td><td>15,758</td><td>117,247</td><td>644%</td></tr><tr><td>Avg - All</td><td>51,517</td><td>267,827</td><td>420%</td></tr></table>	Income by Job Sector	2011 Avg Annual (MKW)	2019 Avg Annual (MKW)	% Chg Avg	Ecotourism	-	34,000		Formal Employment	-	360,000		Farming	39,422	135,131	243%	Fishing	21,375	19,500	-9%	Forestprod	3,230	74,629	2210%	Ganyu	10,000	97,372	874%	Pettytrading	36,280	100,100	176%	Avg - Vulnerable 2	15,758	117,247	644%	Avg - All	51,517	267,827	420%
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B.1 IncomeTransformedData_all C4s																																									

Knowledge of Conservation Ag

Conservation Ag (Soil Fertility) Knowledge	2011	2019	% Chg
% Knowledge Soil Fertility (HHS - D.Land 11)	95%	84%	-12%

Awareness of Practices of Soil Conservation

D. Land D12a (Technology aware of 1)

Soil Enhancements Technologies Known	2011	2019	% Chg
[1] Grain legume rotation	22	22	0%
[2] Crop rotation	44	13	-70%
[3] Use manure	59	59	0%
[4] Fallow	7	2	-71%
[5] Agro forestry methods	25	10	-60%
[6] Incorporation of crop residues	23	31	35%
[7] Compost manure	14	4	-71%
[8] Burning tree branches	3	1	-67%
[9] use inorganic fertilizers	42	57	36%
[10] Other (specify)	0	1	
# HH Reported Practices	239	200	-16%

Adoption of Agroforestry

Practices Reported	2011	2019	% Chg
[1] Fertilizer tree systems	26	17	-35%
[2] Fodder banks	0	0	
[3] Indigenous fruit tree crop system	2	9	350%
[4] Rotational wood lots	1	3	200%
[5] Other (specify)	0	1	
[99] NA	0	0	
Total	29	30	3%
% reporting	13%	12%	-7%

G. AgroFor_G2_1 common agro-forestry technologies do you practice

Livestock Ownership (F2. 2-9 HHS)

3. Vulnerable Group 2- 84% (2011), 61% (2019)

	4. Whole Group – 91% (2011), 82% (2019) The statistics above compare the incomes, knowledge of soil fertility, adoption of soil conservation, adoption of agroforestry practices and the ownership of livestock between the identified potentially vulnerable group and the communities as a whole. These show that in each case there is positive impact from the Program for this group, but it does indicate that the positive impact at times of lower than the whole group.
Benefit access	The slightly lower positive impact to this group may be due to less access to program benefits or may have to do with the ability of this group to adopt practices. The Program will continue to evaluate who these potentially vulnerable groups are and how to ensure that have access to Program benefits.
Negative impacts	None

4.4.3 Net Impacts on Women (GL2.5)

4.4.3.1 Women's Participation in Training and Awareness Meetings

Training is provided to all community members, including women, through the Associations and NRCs, and special attention has been given to ensure that women are actively present and involved in the meetings, including disaggregated data showing the number of women in attendance to trainings and meetings.

Women in the Kulera REDD+ Program have been involved in various steps of the planning and implementation. Community Indicators that are particularly focused on women's empowerment include:

Table 27. % of Women participating in awareness meetings and trainings

Gender Focused Indicators	% of total participants
NAWIRA	
# of women attending Program support and awareness meetings	53%
# of women attending trainings for nursery creation	25%
# of women attending trainings on Conservation Agricultural Practices	48%
# of women attending trainings on honey production practices	45%
NVA	
# of women attending Program support and awareness meetings	40%
# of women attending trainings for nursery creation	39%
# of women attending trainings on Conservation Agricultural Practices	41%
# of women attending trainings on honey production practices	38%

Source: NAWIRA and NVA Association level data

4.4.3.2 Women's Participation in Governance

Women participate in governance through their roles within the Community Association and within the Zone Natural Resource Committees and Village/GVH Natural Resource committees.

The following summarizes the participation of women in the program governance:

- % of woman heads of NRC is 9% (NAWIRA 15%, NVA 6%)
- % of women head in ZNRC is 5% (NAWIRA 5%, NVA 5%)
- % of women in Association staff and board of trustees 14% (NAWIRA 11%, NVA 17%)

The DNPW officer leading day the day oversight Kulera Project is Catherine Charity Chunga Senior Parks and Wildlife Officer (Education and Extension) and the Park Wildlife Office of Nyika was Maisa Chulu Kataya, both women.

Terra Global who has a significant role in the overall program management as well as the development and monetization of emission reductions and removal is a woman-run, women-owned for-profit social enterprise and small business. Terra Global's mission is to facilitate financially, socially and environmentally sustainable forestry and agricultural land management practices. Terra Global is now the leader in sustainable forest and agriculture program development, land-use greenhouse gas quantification and finance, and providing technical expertise and investment capital to their global client base in a collaborative and innovative manner.

4.4.4 Benefit Sharing Mechanisms (GL2.6)

For the Kulera REDD+ Program the DNPW and Associations receive all but 5% of the carbon revenue derived from the sale of carbon. At this time, these funds are fully applied implementation of the Program Activities as defined in the REDD+ Agreement, Long-term Program Implementation Plan and Program budget. This is consistent with the Program Description.

The manner in which the communities participate fully in the benefit sharing is through their Associations. The associations are the legal representatives of the villages in the Project Zone and provided a portion of the budget to implement activities throughout their zones. These funds are used to implement the Program activities designed to support the livelihoods of the communities and the development of alternative income streams.

4.4.5 Governance and Implementation Structures (GL2.8)

The governance of the Program is the same as was provided in the Program Description.

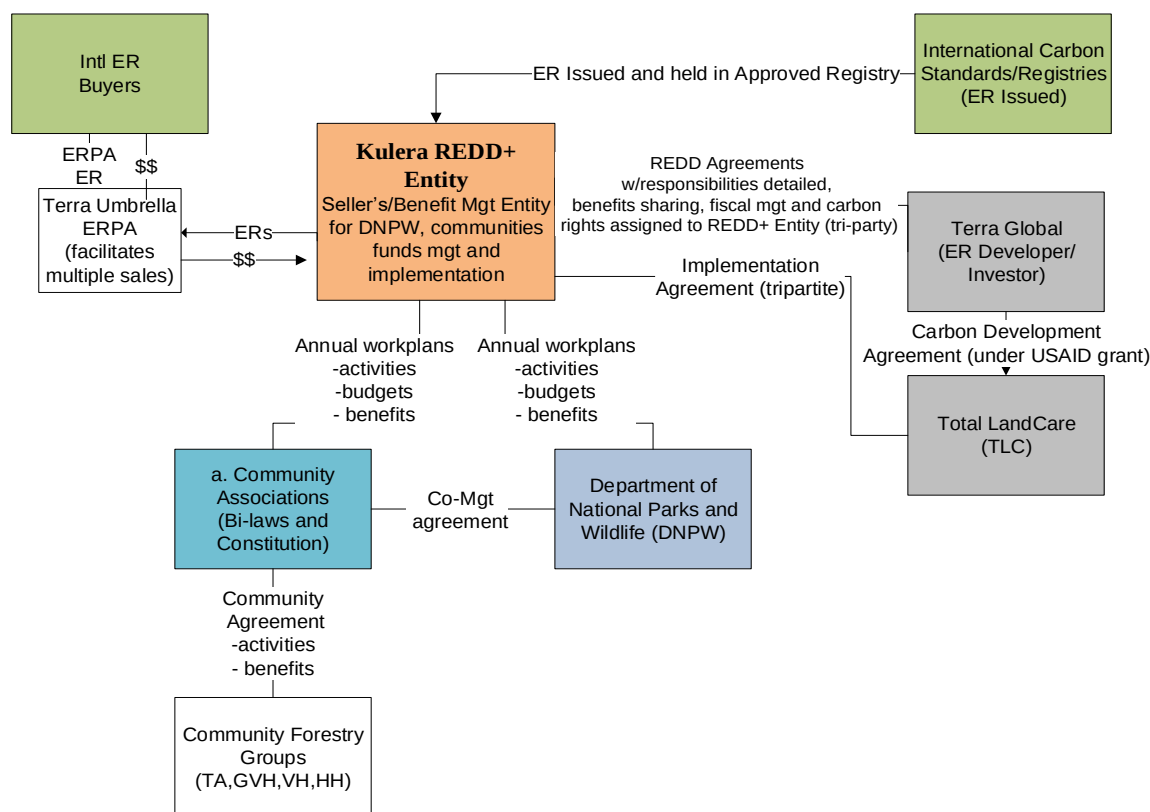


Figure 2. 4.4.104.4.5 Governance and Implementation Structures of the Kulera REDD+ Program

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

The overwhelming increase in attendance at trainings on natural resource management, new technologies, conservation agriculture, irrigation, livestock management, business development, as well as the increase in MSMEs and households in accessing savings, credit and loan transactions demonstrates that the capacity development objectives of the Program are being met. With increasing in attendance in these critical trainings, community members are more equipped to take calculated risks regarding their livelihoods. Indicators that demonstrate increased capacity development are described below:

Table 28. Trends in Capacity Development

Indicator	Definition	Trend
Indicator S.1	# Number of people with increased economic benefits derived from sustainable natural resource management and conservation	Increased
Indicator S.2	# of people receiving training in natural resources management and/or biodiversity conservation	Increased
Indicator S.5	# of households acquired new knowledge/skills in improved livelihoods & NRM practices and # of beneficiary individuals/households attending training courses in various interventions to improve livelihoods	Increased
Indicator S.8	# of hectares under sustainable agriculture practices	Increased
Indicator S.10	Area under irrigation	Increased
Indicator S.12	# Of households/schools/individuals accessing alternative energy sources/fuel efficient systems	Increased

Indicator S.14	# Of producer groups and MSMEs trained in production, processing, business and marketing skills	Increased
Indicator S.15	# of MSMEs accessing loans from commercial banks / lending institutions / DCA facility	Increased
Indicator S.16	Volume of NRM and agro-based products produced and sold.	Increased
Indicator S.17	% increase in revenue from ecotourism	Increased

Source: Household Survey Data 2019

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B2.1)

The project generates net positive impacts on biodiversity within the project zone over the project lifetime. The project maintains or enhances any high conservation values present in the project zone that are of importance in conserving biodiversity. In order to assess and monitor these biodiversity changes, the impacts are broken down into indicators used to measure success. The indicators are monitored through a variety of avenues including biophysical surveys, vegetation/habitat and biomass surveys, biodiversity surveys, and Participatory Rural Appraisals. In some instances, the communities themselves are responsible for monitoring, which increases conservation mindsets in the Project Zone. These indicators are described below with accompanying trends in results.

The following indicators have been defined by the Program to measure that changes in biodiversity in the Project Area and Zone. This data was collected in accordance with the updated program monitoring plan and is based on the following data sources:

- Biodiversity Surveys focused on HCV areas
- Biomass and LULC analysis in Program Area and Leakage Area (Project Zone)
- Participatory Rural Appraisals providing input from communities on biodiversity indicators
- Implementation plan monitoring indicators (DNPW, AP and Associations)

The following indicators have been tracked to measure the impact of biodiversity of the project in accordance with the updated program monitoring plan. During this Monitoring period the Monitoring Plan was updated to show capture more significant Biodiversity Monitoring Data.

5.1.1.1 B.1.1 Number of hectares showing improved biophysical conditions (condition of habitat – Project Area)

Impact/ Change in Biodiversity	For this indicator, performance is measured by number of hectares showing improved biophysical conditions, where 'improved biophysical conditions' means stabilization, improvement or slowing of the rate of decline in one or more selected biodiversity parameters over time. Improved biophysical conditions as measured by forest cover and health improves directly relates to the improved habitat for wildlife which has a positive impact on biodiversity both directly and indirectly.		
Indicator/ Change	Monitored	Miombo Woodland Conserved (ha)	

		MR1	MR2 (Cumulative)
	Nyika	2,183	6,246
	Vwaza	1,641	4,467
	Nkhotakota	4,882	14,035
	Total	8,706	24,749
	Evergreen Forest Conserved (ha)		
		MR1	MR2 (Cumulative)
	Nyika	81	543
	Vwaza	n/a	n/a
	Nkhotakota	0	0
	Total EVG	81	543
	Total Forest	8,787	25,292
Justification of Change	Through the implementation of project actions, the pressure on forests has been reduced which has allowed for the habitat to be protected. Data points from the Biomass Surveys come from biomass plots inside and outside the Project Area and are representative of forest conditions.		

5.1.1.2 B.1.2 Number of hectares showing improved biophysical conditions (within the Project Zone)

Impact/ Change in Biodiversity	For this indicator, performance is measured by number of hectares showing improved biophysical conditions, where 'improved biophysical conditions' means reforestation within The Project Zone. Though project activities, these areas of non-forest within the Project Zone have been reforested. Activities of assisted regeneration and reduced pressure on forests happen in the Project Zone and reforestation efforts are managed by communities.		
Indicator/ Change Monitored	Miombo Woodland Conserved (ha)		
		MR1	MR2 (Cumulative)
	Nyika	3,021	12,535
	Vwaza	2,331	7,261
	Nkhotakota	4,882	14,035
	Total	10,235	33,831

	Evergreen Forest Conserved (ha)		
		MR1	MR2 (Cumulative)
	Nyika	(115)	(326)
	Vwaza	n/a	n/a
	Nkhotakota	0	0
	Total EVG	(115)	(326)
	Total Forest	10,120	33,506
Justification of Change	Through the implementation of project actions, the pressure on forests has been reduced which has allowed for the habitat to be protected and reforested.		

5.1.1.3 B.2.2 Number of hectares in areas of biological significance under improved management (in the Project Zone)

Impact/ Change in Biodiversity	Improved natural resource management includes activities that promote enhanced management of natural resources for one or more objectives, e.g. woodland management, new woodlots and promoting sustainable agriculture. These activities happen in the Project Zone and are managed by communities.																										
Indicator/ Monitored Change	Areas of Improved agriculture and intensification and are described in Section 4.1.1 in S.6 # of farmers, processors & others who have adopted new technologies or management practices (unit of application ha or # adopted). In addition, woodlots were planted through Project Activities. Below are statistics from the Community Associations on woodlots planted and improved management of Community Woodlands during the Monitoring Period. <table> <tr> <th rowspan="2">Woodlot - Tree Planting</th><th colspan="3">Dates Monitored During Period</th><th rowspan="2">Total</th></tr> <tr> <th>2017</th><th>2018</th><th>2019</th></tr> <tr> <td>Trees Planted (number of trees per period)</td><td>117,813</td><td>262,245</td><td>312,349</td><td>692,407</td></tr> <tr> <td>Total number of new households/ village tree lots planted during the period</td><td>18</td><td>43</td><td>49</td><td>110</td></tr> <tr> <td>Average number of trees per hectare (density)</td><td>2,075</td><td>2,100</td><td>2,088</td><td>2,047</td></tr> </table>				Woodlot - Tree Planting	Dates Monitored During Period			Total	2017	2018	2019	Trees Planted (number of trees per period)	117,813	262,245	312,349	692,407	Total number of new households/ village tree lots planted during the period	18	43	49	110	Average number of trees per hectare (density)	2,075	2,100	2,088	2,047
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Total number of new households/ village tree lots planted during the period	18	43	49	110																							
Average number of trees per hectare (density)	2,075	2,100	2,088	2,047																							

	Woodland Regeneration	Dates Monitored During Period			Total
		2017	2018	2019	
	Hectares of woodlands where regeneration is applied	134	194	193	521
	Total number of new regeneration areas during the period	37	2	14	53
	Hectares Woodlots (ARR)	57	125	150	331
	Hectares Woodlands (IFM)	134	194	193	521
Justification of Change	This impact is achieved through the promotion of program activities by adopting new technologies that increase biodiversity as well as improve livelihoods. Woodlots are planted on degraded lands, and improved woodlands are managed by communities so that the trees grow bigger and the area is more divers to support a number of NTFP such as mushrooms, bees etc..				

5.1.1.4 B.2.3 Biomass Conditions of LULC in the Project Area and Project Zone

Impact/ Change in Biodiversity	Biomass of Land-use, Land Cover (LULC) in the Project Area and Project Zone, by each carbon pool.										
Indicator/ Monitored Change		AG Tree biomass	BG Tree biomass	AG Sapling biomass	BG Sapling biomass	AG Non-tree biomass	BG Non-tree biomass	Standing dead biomass	Down dead biomass	Soil Organic Matter	Total biomass
	LULC										
	EVG	361.80	85.02	2.74	0.64	0.27	0.39	8.62	2.14	164.11	625.74
	MIO	70.30	33.44	1.77	1.26	0.31	0.46	0.81	0.33	54.75	163.41
	BAR	4.22	2.46	0.58	0.41	0.23	0.34	0.00	0.00	46.32	54.56
Justification of Change	Forest biomass decreased slightly between the MR1 and MR2, showing continued pressure on forest resources, although the decrease was statically insignificant. Biomass in non-forest areas insignificantly increased.										

5.1.1.5 B.3.1 Wildlife presence in Project Area

Impact/ Change in Biodiversity	Wildlife Presence in Project Area
Indicator/ Monitored Change	Project Activities are designed to increase forest cover and enhance biodiversity through livelihood improvements. Wildlife health and numbers are expected to slowly increase over time. The biggest change to the numbers of wildlife presence in the Project Areas is the translocation of wildlife that moved to Nkhotakota and Nyika from Liwonde National Park and Majete Wildlife Reserve in Malawi. This epic venture carried out by African Parks and DNPW in 2016 and 2017 was one of the largest and most significant elephant translocations in human history. As the Project

	Activities include increased protection of wildlife, DNPW received assistance from African Parks to improve management of Nkhotakota Wildlife Reserve. The following species were translocated:																																																							
	<table><tr><th>New introductions</th><th>Nkhotakota 2016</th><th>Nkhotakota 2017</th><th>Nyika 2017</th><th>Total</th></tr><tr><td>Elephant (<i>Loxodonta africana</i>)</td><td>261</td><td>225</td><td>30</td><td>516</td></tr><tr><td>Kudu (<i>Tragelaphus strepsiceros</i>)</td><td>100</td><td>0</td><td>0</td><td>100</td></tr><tr><td>Buffalo (<i>Syncerus caffer</i>)</td><td>92</td><td>107</td><td>0</td><td>199</td></tr><tr><td>Sable antelope (<i>Hippotragus niger</i>)</td><td>200</td><td>0</td><td>0</td><td>200</td></tr><tr><td>Waterbuck (<i>Kobus ellipsiprymnus</i>)</td><td>404</td><td>101</td><td>0</td><td>505</td></tr><tr><td>Eland (<i>Taurotragus oryx</i>)</td><td>0</td><td>25</td><td>0</td><td>25</td></tr><tr><td>Zebra (<i>Equus quagga</i>)</td><td>0</td><td>25</td><td>0</td><td>25</td></tr><tr><td>Impala (<i>Aepyceros melampus</i>)</td><td>122</td><td>0</td><td>0</td><td>122</td></tr><tr><td>Warthog (<i>Phacochoerus africanus</i>)</td><td>200</td><td>0</td><td>0</td><td>200</td></tr><tr><td>Total Animals translocated:</td><td>1,379</td><td>483</td><td></td><td>1,892</td></tr></table>	New introductions	Nkhotakota 2016	Nkhotakota 2017	Nyika 2017	Total	Elephant (<i>Loxodonta africana</i>)	261	225	30	516	Kudu (<i>Tragelaphus strepsiceros</i>)	100	0	0	100	Buffalo (<i>Syncerus caffer</i>)	92	107	0	199	Sable antelope (<i>Hippotragus niger</i>)	200	0	0	200	Waterbuck (<i>Kobus ellipsiprymnus</i>)	404	101	0	505	Eland (<i>Taurotragus oryx</i>)	0	25	0	25	Zebra (<i>Equus quagga</i>)	0	25	0	25	Impala (<i>Aepyceros melampus</i>)	122	0	0	122	Warthog (<i>Phacochoerus africanus</i>)	200	0	0	200	Total Animals translocated:	1,379	483		1,892
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	Total Animals translocated:	1,379	483		1,892																																																			
	Camera traps in Nyika and Vwaza captured wildlife known in the two parks, but in 2018 and 2019 Camera Traps in Nkhotakota recoded the presence of Rowen Antelope and Honey Bader, both species that were thought to be extinct in Nkhotakota.																																																							
	- There were 11 Trigger species present in the project area during the Monitoring Period. - Frequency, and increase or decrease of presence of trigger species is listed in Table 30. - Proportion of reported in species within forests, no-forests, and wetlands is listed in Table 30.																																																							
Justification of Change	Malawi is a densely populated, agriculture-based country and sufficient ecological corridors no longer exist between Protected Areas to allow for natural movement for non-avian animals. Human-assisted migration was needed to provide the best future for wildlife. The many Project Activities enhanced conditions for wildlife in the Project Areas and Project Zones.																																																							



Image 1. Example of Elephants, a Trigger Species observed in a Camera Trap in Vwaza.

5.1.1.6 B.3.2 Effectiveness of Anti-poaching Activities

Impact/ Change in Biodiversity	This indicator seeks to capture the effectiveness of the program in reducing poaching
Indicator/ Monitored Change	The following data was gathered by DNPW and AP on poaching activities within the three Protected Areas. • 45 animal carcasses found from 2015-2019 with an average of 9 per year. • 725 poaching materials that were surrendered from 2015-2019 with an average of 145 per year. • 4,829 confiscations from 2015-2019 including illegal guns and wire snares. • 327.2 km of fence installed from 2015-2019. • 1,033 # of incidents of human/wildlife conflict reported Patrols and Arrests related to poaching and other illegal activities occur in the Project Areas. Patrol data and anti-poaching

	information is an indicator that there is active monitoring in the Project Areas.
Justification of Change	More patrols will observe more animal carcasses, more snares, and more illegal activities. Data gathered during patrols is important, though relative numbers between monitoring periods may not indicate increased or decreased illegal activities, but increased patrolling is an absolute number that reduces poaching. Regular patrols and arrests ensure that the number of incidences of undetected poaching decreases which indicates that over time absolute poaching should be reduced. This change in biodiversity is linked to ongoing efforts by the DNPW and the Community Associations to encourage communities to turn in illegal guns, wire snares that are used for illegal hunting.

5.1.1.7 B.4.1 Reduced risk of fire – number of fires in Project Area and Project Zone

Impact/ Change in Biodiversity	The indicators measures that reduced negative impact the fires have on the landscape. Through education and fire control measures that Program seeks to reduce the incidence of fire.
Indicator/ Monitored Change	Monitoring data is not available for this period.
Justification of Change	The changes seen in this indicator come from the activities associated with community awareness and the fire breaks and boundary clearing implementing within the program.

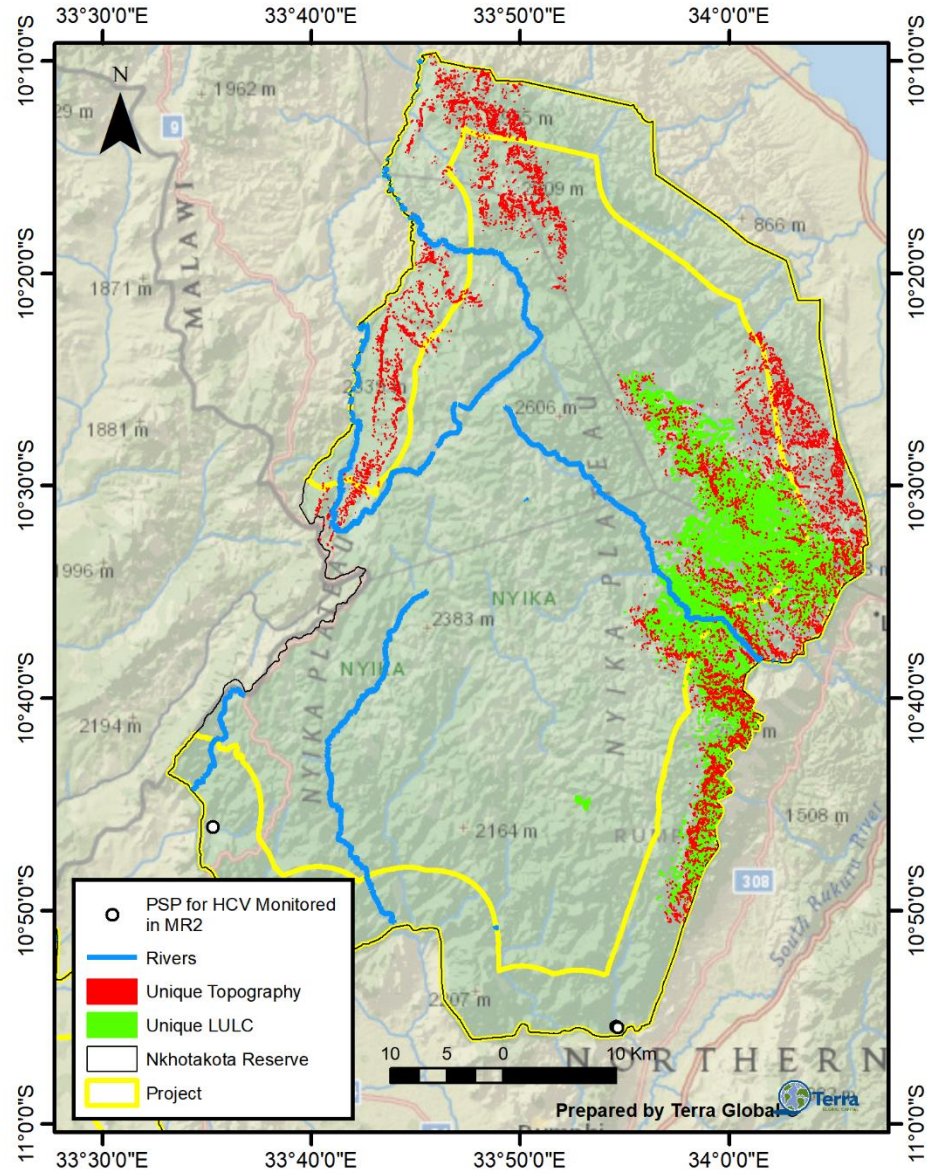
5.1.1.8 B.5.1 Increased water quality

Impact/ Change in Biodiversity	This indicator is designed to capture the impact the Program has on availability of water for the people in the Project Zone, by evaluating the sources of water for Household use, distance to the nearest source of portable water and water point management committee created in Natural Resources Committee. Although there are many agricultural activities that improve water quality and reduced erosion described in Section 4.1.1 Community Impacts (CM2.1), indicators above indirectly measure the changes in availability of clean water.
Indicator/ Monitored Change	- Overall, there was a decrease in households using unprotected wells, springs, and rivers, and increase in households that use piped water and protected wells. - The distance to nearest portable water sources was an average of 1.09 km in 2011 and was reduced to 0.05 km in 2019, demonstrating that water accessibility increased during the monitoring period.

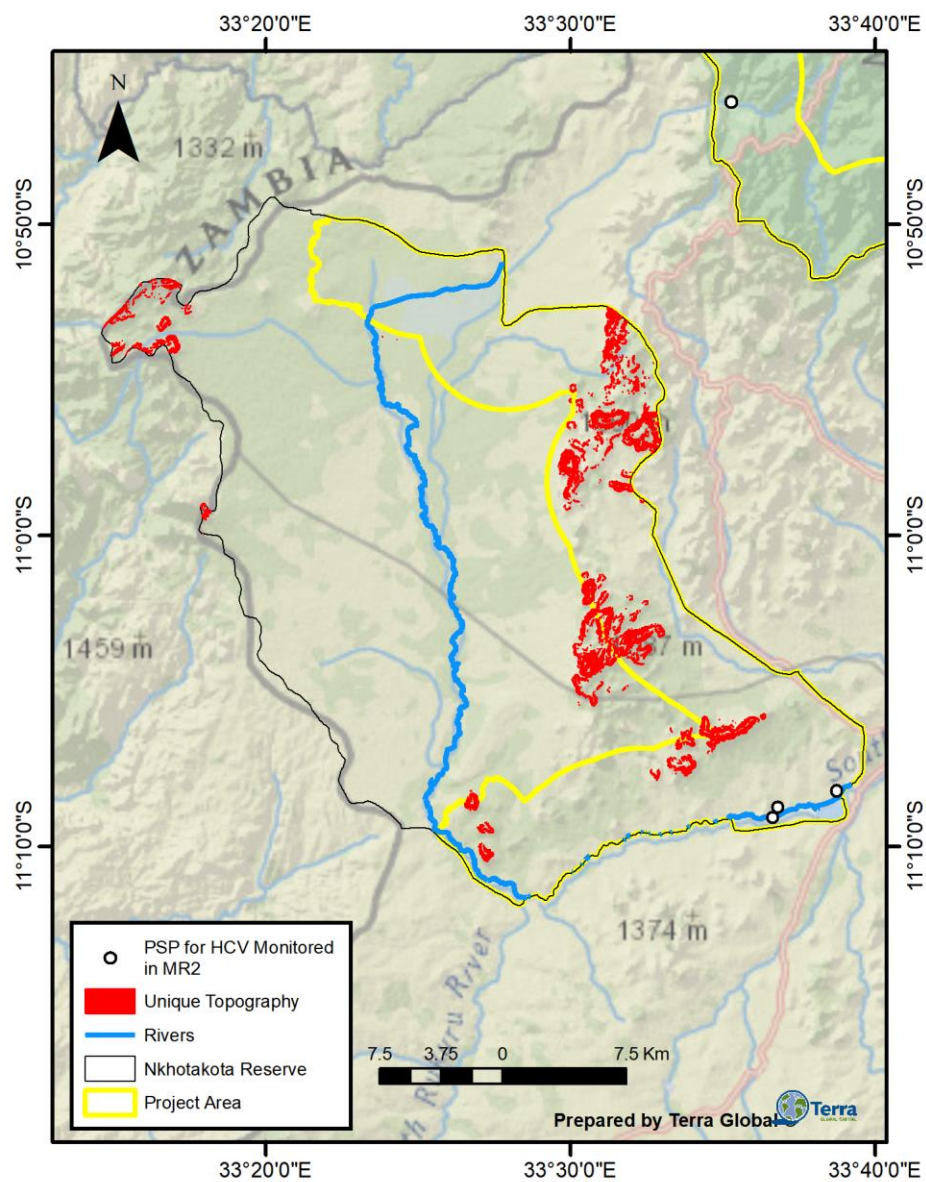
	1,199 households reported having a water management committee in 2011 and 1,463 HHs reported in 2019 for an overall increase in water Management Committees in the Project Zone.
Justification of Change	These indicators were monitored in the same way at Project Start and at during the monitoring period. Project Activities such as a reduction in forest loss, having more trees on the landscape (woodlot, agroforestry, and woodland management), as well as strengthened NRC all assisted in these water quality improvements.

5.1.2 Mitigation Actions (B2.3)

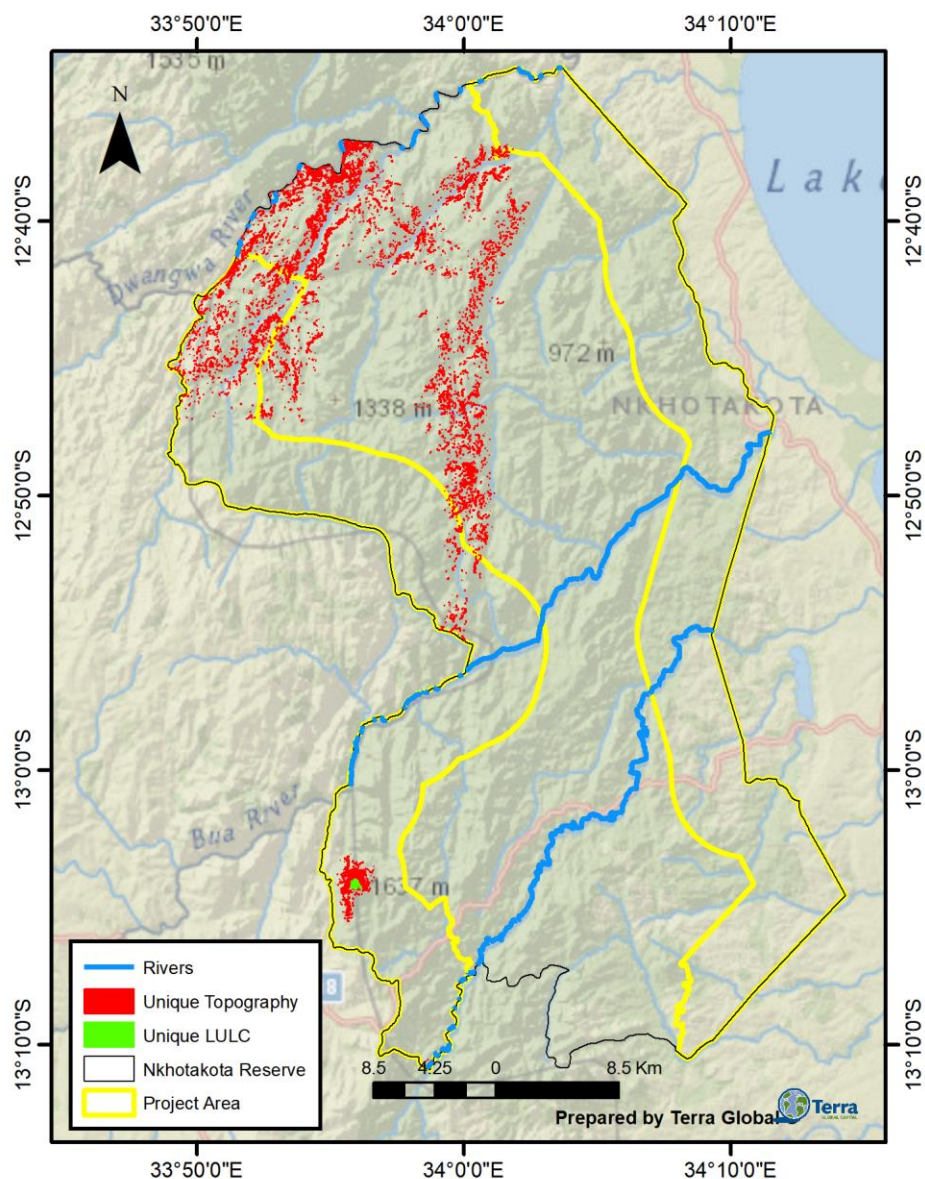
This Project is designed to combat all illegal activities within the protected areas (Project Areas) and to promote more sustainable land/forest management in border zones (Project Zone). This REDD+ Project is designed to address issues where they occur, and not create any negative impacts somewhere else. Specific examples of mitigation actions are described in detail in Section 6 Although there is not a full species count for wildlife for all Protected Areas, this is not postponing any measures to avoid and minimize threats to wildlife. An example of his is the further identification of HCV areas within the Protected Areas. At Project Start areas of High Conservation Vale (HCV) were identified as the Project Areas themselves. In order to best improve biodiversity, enhance wildlife habitat, and concentrate efforts for biological conservation, new Area of High Conservation Value were further identified with the Protected Areas. These will help inform DNPW on possible location of patrolling and to add permanent sampling plots for camera traps. As Africa Parks is managing Nkhotakota Wildlife Reserve, DNPW can concentrate resources in Nyika and Vwaza's areas of HCV.



Map 2. Areas of HCV in Nyika identified during the Monitoring Period



Map 3. Areas of HCV in Vwaza identified during the Monitoring Period



Map 4. Areas of HCV in Nkhotakota identified during the Monitoring Period

As it relates to biodiversity protection and enhancement, there were numerous activities implemented during the monitoring period to maintain and enhance HCVs. These activities were carefully designed to address threats to biodiversity where they occur and to ensure no negative impacts are produced with the Project Zone or somewhere else. Details of the implementation indicators for activities that support biodiversity are included in Section 6 Project Implementation and area summarized as follows:

5.1.2.1 Conservation and Biodiversity Protection Awareness – Regular Meetings

Awareness and training includes the Community Associations who through their NRCs and ZNRCs provide regular meetings to mobilization communities to conserve natural resources, increase food security and increase awareness on Protected Area management, conflict

resolution. Community Awareness meetings were greatly improved and increased during the monitoring period because of the purchase of Vehicles and bicycles. Now communities in very remote areas are able to come to meetings from far away. Mobile phones were also purchased for increased communications and community-based monitoring.

5.1.2.2 Patrolling and Boundary Maintenance

Community patrolling carried out by Community Associations, and more formal patrolling is carried out by both DNPW and African Parks. During the Monitoring Period, carbon funds were used to purchase patrolling equipment such as tents, uniforms and boots for rangers in Nyika and Vwaza. GPSs and mobile phones were also purchased for increased communications. Criminal apprehensions increased because there were more patrols and conditions were greatly improved and the number increased during the monitoring period because of the purchase of Vehicles and bicycles. Now communities in very remote areas are able to come to meetings from far away.

5.1.2.3 Broader Outreach/In-reach with Schools and Other Community Groups

During the monitoring period, DNPW, AP and the Community Associations conducted awareness campaigns through training of primary school teachers in environmental education, facilitation of the establishment of youth conservation clubs, protected area visits for youth clubs, initiation of the development of environmental education curricula development for primary schools and adults. This encourages generations to hold a conservation mindset wherein the protection of these natural resources is more secure.

5.1.2.4 Fire Awareness and Prevention

Specifically to mitigate the damaging effects of fires, the DNPW has developed jointly with the NVA a fire management plan, and implemented fire management activities within the protected areas, including: installation of fire breaks, instituting early warning systems, clearing the forest of dead wood, discouraging fire for hunting, and warding off revenge-based fires. The project implements a fire control and management plan campaign to increase understanding and awareness of the program. Community Associations NVA and NAWIRA both work with communities on the exact border of the parks to conduct fuel breaks at the Protected Area border. Hundreds of work hours were logged by communities on reducing fuel loads on fuelbreaks during the monitoring period. As some communities see the success of the fuelbreaks around Protected Areas, they have installed fuelbreaks around their community woodlands as well.

5.1.2.5 Activities that Increase Biodiversity through Changes to Land Management

Other activities carried out during the monitoring period in the Project Zone include developing alternative sources of fuelwood with 1) woodlots and woodland management, 2) promoting agroforestry and 3) sustainable intensification of agriculture all put more trees on the landscape, improve soil fertility and increase biological diversification.

5.1.2.6 Monitoring and Managing Human Wildlife Conflict

Human Wildlife Conflict continues to be an issue in Malawi and across Sub-Saharan Africa. A potential negative affect of the project is that more wildlife present can mean more conflicts between humans living in the surrounding area and wildlife. Both Community Associations NVA and NAWIRA are the first contact when community members experience a conflict with wildlife. During this monitoring period there were numerous negative interactions with wildlife, and the

Community Associations are now equipped with tools to best mitigate these negative impacts. Both Associations and DNPW are now equipped with vehicles, bikes and motorbikes necessary to bring someone to get medical treatment. In addition, the DNPW vehicle is used to bring rangers to assist animals to return to the park. During this monitoring period the Community Associations DNPW and AP have had numerous meeting to address issues with wildlife. The Community Associations are now prepared to respond, monitor and assist in human wildlife conflicts

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

5.1.3.1 Project's net impacts on biodiversity

The overwhelming net impact on biodiversity is positive. The monitoring plan has defined a key set of biodiversity impact indicators to measure overall impacts of the project (Section 5.1.1). The Project activities have been designed with the objective to increase biodiversity in the Project Area and Project Zone. These indicators show the conditions as they have improved between the baseline and last monitoring report, in addition, they are designed to create an impact and address threats to biodiversity where they are and not push issues somewhere else. During the monitoring period there were more areas of improved biological conditions, more trigger species present in the Project Area, effective anti-poaching activities carried out, reduce risk of fire, and increased water quality.

5.1.3.2 Good Level Climate Change Adaption – Activities Support the ability for biodiversity to adapt to the probable impacts of climate change

During this monitoring period, the Areas of High Conservation Value were further defined as areas within Protected Areas that are specific to help protect and enhance wildlife species, with close attention to climate change mitigation and adaptation. The criteria used to define areas of HVC include:

Unique Topography – Plant and animal species are expected to move away from the equator and upslope (Beckage, 2008), (Kelly, 2008) (Lenoir, 2008) as global temperatures rise due to climate change. For wildlife in the Protected Areas, species will move to cooler climates, and up in elevation. Mountains and hills are identified as place where animals need to migrate and are of High Conservation Value. The strategic shape of escarpments in Nyika linking north to south will help species move north to adapt to warmer temperatures during climate change and is considered an area of HCV. The that cuts east-west across Nkhotakota can have a negative effect on species migration, and there is plan to restrict human access, and increase the chances of safe crossing for wildlife. As erratic and extreme weather events will cause damage to food production, likely those living in and around the forest will highly depend on forest resources for their livelihood and use the highland areas that may be wetter longer as places to grow crops during droughts. As most communities within the region rely on rainfed annual crops, drought will affect food security. Food insecure communities will more rely on hunting of wildlife and other illegal activities such as illegal logging and threatening biodiversity.

LULC – and Edge Effect – Areas of the Nyika Plateau and Chipata Hill in Nkhotakota contain Afromontane Evergreen Forest, which is very unique to Malawi and the region. These forests contain unique species and create habitat many species during the dry season, when the Miombo Woodland becomes deciduous. During a changing climate, these Afromontane Evergreen Forest areas act as a life raft, protecting species from prolonged drought. Fires common in Miombo woodland do not naturally burn in the evergreen forest, further creating necessary habitat. These unique forest types and their surrounding edges are an area of HCV.

Water Sources – Regional Climate Change Scenarios assume that Protected Areas are expected to become overall dryer yet have erratic and possibly extreme weather events such as flash floods and prolonged droughts. These events will cause more pressure on forests and biodiversity they support specifically wildlife. Irregular weather patterns will cause a reduction in rainfall and wildlife will travel farther and to fewer existing water sources during the dry season. For wildlife in the Protected Areas, food sources, habitat and water sources during the dry season will be severely threatened by climate change. These water sources that contain water during the dry season are area of High Conservation Value.

These newly defined HCV areas help DNPW manage Nyika and Vwaza, and design future patrols and monitoring. During this monitoring period, the HCV areas were used for camera traps which identified Trigger Species in the Project Area.

5.1.4 High Conservation Values Protected (B2.4)

No HCV areas of biological significance experienced harm during the Monitoring Period, this is demonstrated by the overwhelming positive effects on biodiversity listed in Section 5.1.1.

5.1.5 Invasive Species (B2.5)

This project supports native forests and the planting of native tree species. No-native species that are promoted through the project are not invasive, and need human support to survive.

5.1.6 Impacts of Non-native Species (B2.6)

The tree species listed below are the common tree species promoted under the Project. There are no known adverse effects for these tree species on the environment as these are mostly indigenous to the local environment.

No invasive species will be promoted by the project and the use of exotic species will be limited. The most common tree species that do well in the Project Areas and have been planted during the Monitoring Period include:

- *Native bamboo*
- *Acacia albida*
- *Senna spectabilis*
- *Faidherbia albida* (Msangu)
- *Senna siamea*
- *Albizia lebbbeck* (Mtangatanga)
- *Accacia polyacantha* (Mthethe)
- *Acacia galpini* (Mkunkhu)
- *Azelia quanzensis* (Msambafumu)

None of these tree species are invasive and they are mostly indigenous to the area. Generally, the trees shall be planted either around homestead or communal village forestry areas to help households meet their domestic, economic and environmental demands. Most importantly, the Project will encourage tree regeneration of the existing local species which tend to grow fast because they already have well established root base. With proper management, tree regeneration also produces good poles and is a reliable source of fuelwood for the local communities.

Non-native crops promoted by the project include improved varieties of cassava, soy, peanuts, coffee, mango, citrus and macadamia. Non-native animal species distributed by the program include, goats, chickens.

Species	Cassava (<i>Manihot esculenta</i>)
Justification of Use	Already used by communities in the Project Zone
Potential Adverse Effect	No adverse effects observed.

Species	Soy (<i>Glycine max</i>)
Justification of Use	Already used by communities in the Project Zone
Potential Adverse Effect	No adverse effects observed.

Species	Peanut (<i>Arachis hypogaea</i>)
Justification of Use	Already used by communities in the Project Zone
Potential Adverse Effect	No adverse effects observed.

Species	Coffee (<i>Coffea spp.</i>)
Justification of Use	Already used by communities in the Project Zone
Potential Adverse Effect	Fruit seeds if brought into the forest have little chance of survival. Although fruit trees may attract animals out of the forest and near villages, this has not been observed during the Monitoring Period

Species	Mango (<i>Mangifera indica</i>)
Justification of Use	Fruit trees maybe planted in and around villages for food security for local communities.
Potential Adverse Effect	Fruit seeds if brought into the forest have little chance of survival. Although fruit trees may attract animals out of the forest and near villages, this has not been observed during the Monitoring Period

Species	Citrus (<i>Citrus spp.</i>)
Justification of Use	Fruit trees maybe planted in and around villages for food security for local communities.
Potential Adverse Effect	Fruit seeds if brought into the forest have little chance of survival. Although fruit trees may attract animals out of the forest and near villages, this has not been observed during the Monitoring Period.

Species	Goats (<i>Capra spp.</i>)
Justification of Use	Safe alternative to bushmeat. Goat meat is similar to that of other ungulates hunted by communities.
Potential Adverse Effect	If goats escape into the surrounding forest they have little chance of survival. Cross-species disease transmission is considered, but was not observed during the Monitoring Period.

Species	Chickens and (<i>Gallus spp. and Numida spp.</i>)
Justification of Use	Safe alternative to bushmeat already used by communities.
Potential Adverse Effect	If chickens escape into the surrounding forest they have little chance of survival. Cross-species disease transmission is considered, but was not observed during the Monitoring Period.

5.1.7 GMO Exclusion (B2.7)

No genetically modified organisms are included in this Project design and that no genetically modified trees were planted. In addition, agricultural interventions under the Project have avoided purchase of genetically modified organisms.

5.1.8 Inputs Justification (B2.8)

There were no pesticides or biological control agents used in this project. There is a small amount of fertilizer within Conservation Agriculture Packs distributed to communities.

Name	Fertilizer
Justification of Use	There is a small amount of chemical fertilizer within Conservation Agriculture Packs distributed to communities. Only communities that participate in Conservation Agriculture trainings are given access to conservation agriculture packs, which consist of maize seeds and a timed-released fertilizer. These communities are already growing maize, and already purchase chemical fertilizer. Thorough the Conservation Agriculture trainings, they learn about when to apply fertilizer, so that less can be used and none is wasted.
Adverse Effect	When the small amount of chemical fertilizer is distributed in conjunction with trainings and education, less fertilizer is applied, and the effect continues in future growing seasons. There is no negative effects expected with this input.

5.2 Offsite Biodiversity Impacts

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

The overwhelmingly positive climate impacts described in section 5.1.1, ensure that the net biodiversity impact of the Project will be undoubtedly positive. The table below describes hypothetical negative offsite impacts, that do not happen as the Project Activities address issues where they are and not shift out of the Project Zone.

Significant negative offsite biodiversity impacts have not occurred. However, to the extent that some negative impacts have occurred (e.g. displacement of hunting pressure to areas outside of the Project Areas) strategies have been developed to monitor and mitigate these impacts, such as providing alternative livelihoods. All these efforts have helped to mitigate any negative impacts to biodiversity.

Negative Offsite Impact	Mitigation Measure(s)
Poaching of wild animals shifts to offsite.	The Project engages communities to reduce poaching through wildlife conservation sensitivity meetings. Alternative employment is created for former hunters such as patrolling, animal husbandry, and beekeeping. Food scarcity and the need for protein is met by introducing small-sale household livestock.

Negative Offsite Impact	Mitigation Measure(s)
A reduction in timber harvesting within the Protected Areas, causes activity sifting leakage to areas outside of the project zone.	The project supports woodlots for fuelwood as well as building materials. Planting of woodlots have been a success during the project period. In addition, communities have managed community woodlands for wood production during the monitoring period.

Negative Offsite Impact	Mitigation Measure(s)
Shifting agriculture cannot take place in the project area, so it shifts somewhere else.	The project engages communities to grow more food on a smaller amount of land to reduce any activity-shifting. Technical inputs such as composting, climate-smart agriculture and improved crop varieties ensure higher yields, with less agriculture land.

Negative Offsite Impact	Mitigation Measure(s)
Unsustainable extraction of forest resources shifts from project area to other forest area.	As communities participate in their local NRC they gain important skills for natural resource extraction. Communities are allowed to enter the protected Areas to extract resources and are encouraged to participate in Village Woodland management to sustainably grow their own resources outside of Protected Areas within the Project Zone.

Negative Offsite Impact	Mitigation Measure(s)
Fuelwood and charcoal production shifts to alternative forest area causing forest degradation.	Project activities include fuel-efficient cookstoves, woodlots and better management of woodlands for fuelwood collection. These mitigation measures will reduce pressure on forests inside and outside the Protected Areas.

As the project has addressed hypothetical negative offsite impacts through Project Activities, No major negative impacts on biodiversity have occurred due to the Project Activities. The benefits greatly outweigh any negative biodiversity impact in the Project Zone.

5.2.2 Net Offsite Biodiversity Benefits (B3.3)

The overwhelming offsite biodiversity impacts will be net positive. many of the impacts targeted to the Project Areas, are expected to spread out of the Project Area and Project Zone. During the Monitoring Period there have been exchanges between NAWIRA and communities in the South of Malawi, and exchanges between NVA and communities in Zambia. These farmer-to-farmer exchanges helped communities offsite understand benefits of the Kulera Project and hear about technical inputs to address drivers of deforestation through livelihood improvements.

The Mitigation Activities listed above demonstrate that overall net effect of the project on biodiversity is positive. Any unmitigated negative impacts have not been found.

5.3 Biodiversity Impact Monitoring

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

Project monitors impacts to ensure positive net impacts on biodiversity in the Project Area. A Biodiversity Monitoring Plan has been developed with defined the indicators, data collection methods, baselines and targets for biodiversity outputs, outcomes and impacts of the Project. During this period the Monitoring Plan was enhanced from the previous plan to be more robust and use more directly data that has been collected on the project at the start and under this monitoring period.

Forests typically contain more biodiversity than non-forested sites because their greater structural complexity makes a broader array of niches and resources available for plants and animals (Tews et al. 2004). On the other hand, planted forests harbor higher levels of biodiversity than the non-forested sites they replace (Carnus et al. 2006, Brockerhoff et al. 2008, Felton 2010). Many mitigation actions such as planting woodlots and protecting village woodlands will support

biodiversity out of the Project Area, and in the Project Zone. Monitoring of biodiversity will first focus on protecting areas of HCV, but biodiversity will also be monitored within the Project Zone. The table of biodiversity parameters below were monitored during this monitoring period.

5.3.1.1 Biodiversity Monitoring for this Verification

Table 29 provides a summary of methodologies, parameters and areas monitored for biodiversity during the monitoring period.

Table 29. Summary of Biodiversity Monitoring Methods

Methodology/ Report	Parameter	Area	Frequency	Responsible Party
• Remote sensing	Changes in forest cover	Project Area and Project Zone	Each verification	Terra Global
• Carbon stock enhancement	Changes in quality of forest habitat	Project Area and Project Zone	Each verification	3 rd Party and Terra Global
• Community interviews	Presence of species, trends where possible	Project Area Zones	Each verification	3 rd Party and Community Associations
• Camera trapping	Presence of species, trends where possible	Project Areas	Each verification	3 rd Party, DNPW, AP
• Forest Inventory	Changes in abundance of forest cover	Project Area and Project Zone	Each verification	3 rd Party and Terra Global
• Biodiversity survey	Changes in forest dependent species	Project Area and Project Zone	Each verification	3 rd Party, DNPW, AP
• Patrolling reports	Poaching incidence of tracked species	Project Area and Project Zone	On-going Quarterly	DNPW, AP, and Community Associations
• NRC reports for community-based monitoring	Natural Resources extracted	Project Area and Project Zone	On-going Quarterly	Community Associations

During the monitoring Period, a third-party team from Mzuzu University was hired to conduct a comprehensive **Biodiversity Survey**. A third party provides unbiased results and are neutral parties to the Kulera REDD+ Program. Their involvement helps the Project Proponents identify issues with the program, understand where biodiversity support is needed and provides an unbiased approach to assessing the biodiversity health. A detailed Biodiversity Assessment SOP was followed to monitor wildlife species in the Protected Areas, and specifically in Areas of HCV. **Camera Traps** were installed by both DNPW and the third-party biodiversity team in areas of HCV and non-HCV areas and taking photos from late 2019 and into 2020. These camera traps confirmed that there were trigger species present in areas of HVC.

The Project Areas are identified as a Key Biodiversity Area (KBA) because of the presence of trigger species, and the ecological niche they provide. In this biodiversity survey, three different methods of surveys— Observation Points, Transects and Walking Observation Transects of HCV

- were conducted for each class of animal (mammal, birds, and herpetofauna). In addition, **community interviews** were conducted to assess presence and absence of species and if they were on the decline. These surveys were conducted in conjunction with **forest inventory** as they were both completed in the same area. The third-party comprehensive Biodiversity Survey took place in 2019. Data on the Biodiversity Indicators are listed in section 5.1.1 and the raw data is provided to the VVB.

Community Based Monitoring at the NRC level takes place every month, and is combined at the ZNRC level, and brought to the Community Association quarterly. This data shows that the communities are using natural resources sustainably. The NRC level reporting that satisfies the indicators are in section 4.3 and the raw data is provided to the VVB. Each Community Association also records community patrolling. The majority of the **patrolling** is conducted by DNPW and AP and results and data from monitoring can be found in section 5.1.1 and the raw data is provided to the VVB.

5.3.2 Biodiversity Monitoring Plan Dissemination (B4.3)

Project Partners were involved in the revisions made to the Monitoring Plan during this monitoring period. The updated monitoring plan has been shared with Partners and is located at each of the Partner Offices. The Monitoring Plan Results are described in this document and the official way to inform, engage and empower communities will follow traditional ways of communication. This Monitoring Plan will be presented to community and other stakeholders following procedures described in 2.3.2 Dissemination of Summary Project Documents (G3.1). This Monitoring Plan will be online and accessible to all stakeholders.

5.4 Optional Criterion: Exceptional Biodiversity Benefits

The Kulera REDD+ Program is a CCB Triple Gold – level project and has exceptional biodiversity benefits, managing for biodiversity conservation in a changing climate.

5.4.1 Trigger Species Population Trends (GL3.3)

There are many Trigger Species present in the Protected Areas, making all the Project Areas Key Biodiversity Areas (KBAs) as identified at Project Start. These 6 Trigger Species are monitored by communities, conserved through wildlife sensitivity meetings supported by DNPW and AP, and their habitat is preserved and protected by the many Project Activities that conserve forest. The Kulera REDD+ project protects some of the last remaining biodiverse hotspots in Malawi. The Project Area consists of some of the last remaining forests and supports an island for biodiversity conservation which meets the vulnerability criteria for KBAs.

The following species were identified by Project Proponents and Local Experts as Trigger Species to the KBAs:

Trigger Species	Blue Swallow (<i>Hirundo atrocaerulea</i>)
With-project Scenario	Direct Project Activities have resulted in maintaining and/or enhancing the habitat of the blue swallow. The Project Activities that reduced threats to this species include increased patrols, confiscations, poaching equipment that was surrendered, boundary clearing, and fencing. Activities related to reducing poaching and increasing conservation mindset in the surrounding community include educational awareness programs in schools,

	community nurseries and apiary training. The blue swallow can also be found within the Project Zones, and activities such as woodlots and woodlands help protect the species. Sightings, trends and locations of the blue swallow are described in Table 30
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Trigger Species	Lion (<i>Panthera leo</i>)
With-project Scenario	Direct Project Activities have resulted in providing habitat for the lion but may have come too late. The Biodiversity survey conducted by AP, did not observe lions in Nkhotakota, and it is expected to be locally extinct. The Project Activities that reduced threats to this species include increased patrols, confiscations, poaching equipment that was surrendered, boundary clearing, and fencing. Activities related to reducing poaching and increasing conservation mindset in the surrounding community include educational awareness programs in schools, community nurseries and apiary training. Sightings, trends and locations of lions are described in Table 30.

Trigger Species	Wattled crane (<i>Grus carunculatus</i>)
With-project Scenario	Direct Project Activities have resulted in maintaining and/or enhancing the habitat of the Wattled crane. The Project Activities that reduced threats to this species include increased patrols, confiscations, poaching equipment that was surrendered, boundary clearing, and fencing. Activities related to reducing poaching and increasing conservation mindset in the surrounding community include educational awareness programs in schools, community nurseries and apiary training. Sightings, trends and locations of the Wattle crane are described in Table 30

Trigger Species	African Wild Dog (<i>Lycaon pictus</i>)
With-project Scenario	Direct Project Activities have resulted in maintaining and/or enhancing the habitat of the African Wild Dog. The Project Activities that reduced threats to this species include increased patrols, confiscations, poaching equipment that was surrendered, boundary clearing, and fencing. Activities related to reducing poaching and increasing conservation mindset in the surrounding community include educational awareness programs in schools, community nurseries and apiary training. Sightings, trends and locations of the African Wild Dog are described in Table 30

Trigger Species	African Elephants (<i>Loxodonta Africana</i>)
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With-project Scenario	Direct Project Activities have resulted in maintaining and/or enhancing the habitat of the African elephants. The Project Activities that reduced threats to this species include increased patrols, confiscations, poaching equipment that was surrendered, boundary clearing, and fencing. Activities related to reducing poaching and increasing conservation mindset in the surrounding community include educational awareness programs in schools, community nurseries and apiary training. Sightings, trends and locations of the African elephant are described in Table 30
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Trigger Species	Lake salmon (<i>Opsoridium microlepis</i>),
With-project Scenario	Direct Project Activities have resulted in improved water quality enhancing the habitat of the Lake Salmon. During the Monitoring Period, DNPW, AP with USFS, Malawi Fisheries Department and local communities worked together to protect lake salmon (Mpasa) habitat and ensure healthy population spawns returning to the river every year. The Project Activities that reduced threats to this species include forest protection and conservation agriculture (to prevent run-off). Activities related to increasing conservation mindset in the surrounding community include educational awareness programs in schools, community nurseries and apiary training. Aquatic species were not measured in the expert third-party biodiversity survey.

5.4.1.1 Priority Status for High Conservation Value Areas of Biological Importance

A comprehensive biodiversity study conducted in accordance with the Biodiversity Assessment Standard Operating Procedure was carried out in 2019 in the Project Zone. The survey was conducted in the dry season in Malawi, so species were concentrated at water sources. Biodiversity surveys took place in newly defined Areas of High Conservation Value in Nyika and Vwaza. AP the manager for Nkhotakota Wildlife Reserve also conducted a biodiversity survey and shared their data with the Project Partners.

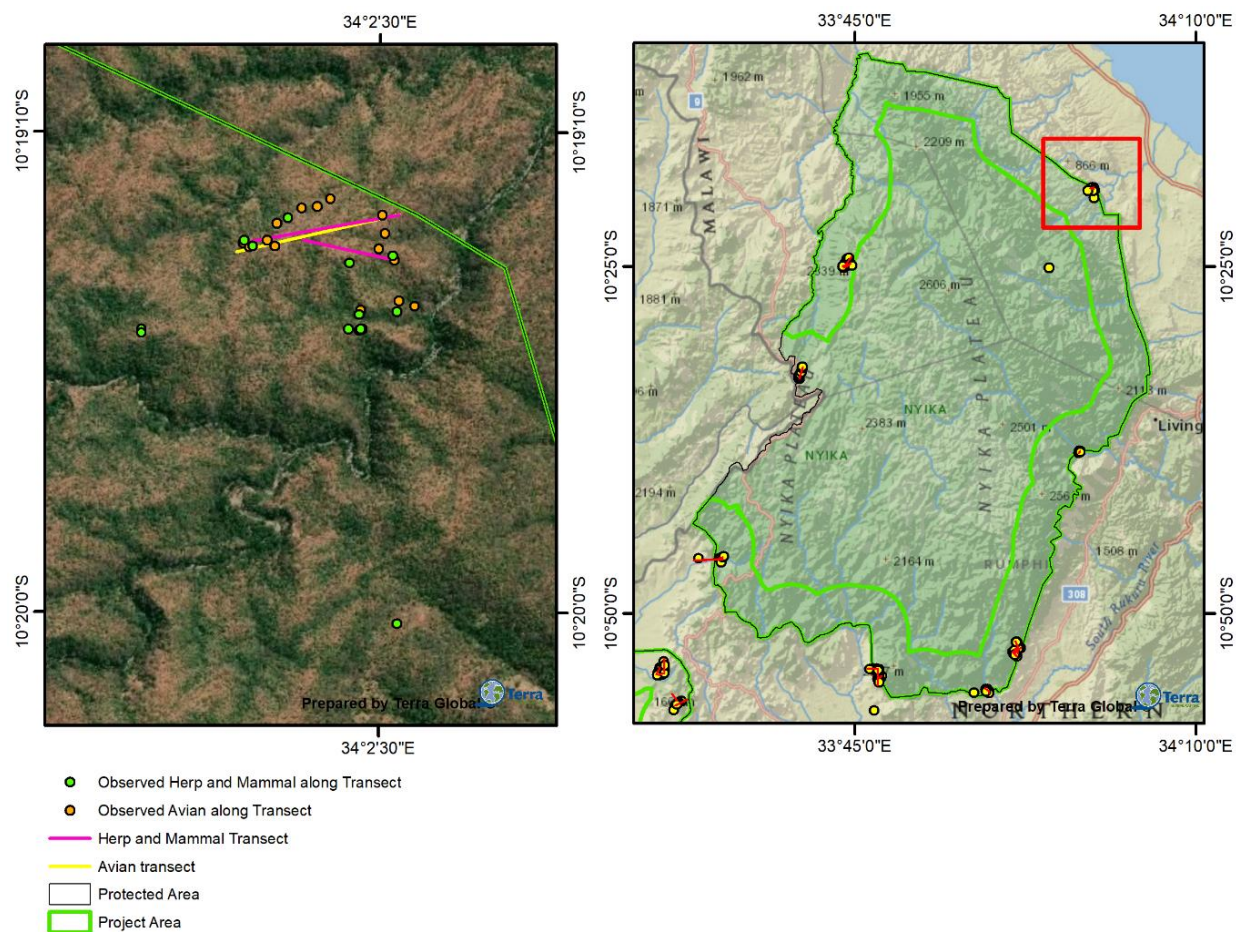
The Protected Areas act as an island of biodiversity in an area experiencing massive forest and biodiversity loss. Although the Protected Areas still provide forest conditions that may support giraffe and rhino these mammals were not found during the biodiversity survey and are expected to no longer be found in the any of the Protected Areas in the REDD+ Program. At project start Lions (*Panthera leo*) still roamed through Nkhotakota Wildlife Reserve but were identified as species that no longer exist in Nkhotakota. Though biodiversity surveys conducted by Africa Parks during the monitoring period, naturally occurring honey badger (*Mellivora capensis*) and roan antelope (*Hippotragus equinus*) that were thought to be extinct in Nkhotakota were discovered. In addition, the table in Section 5.1.1.5 B.3.1 Wildlife presence in Project Area describes species and individuals translocated.

Table 30. Sightings, trends and locations of Important Wildlife Species in the Project Area

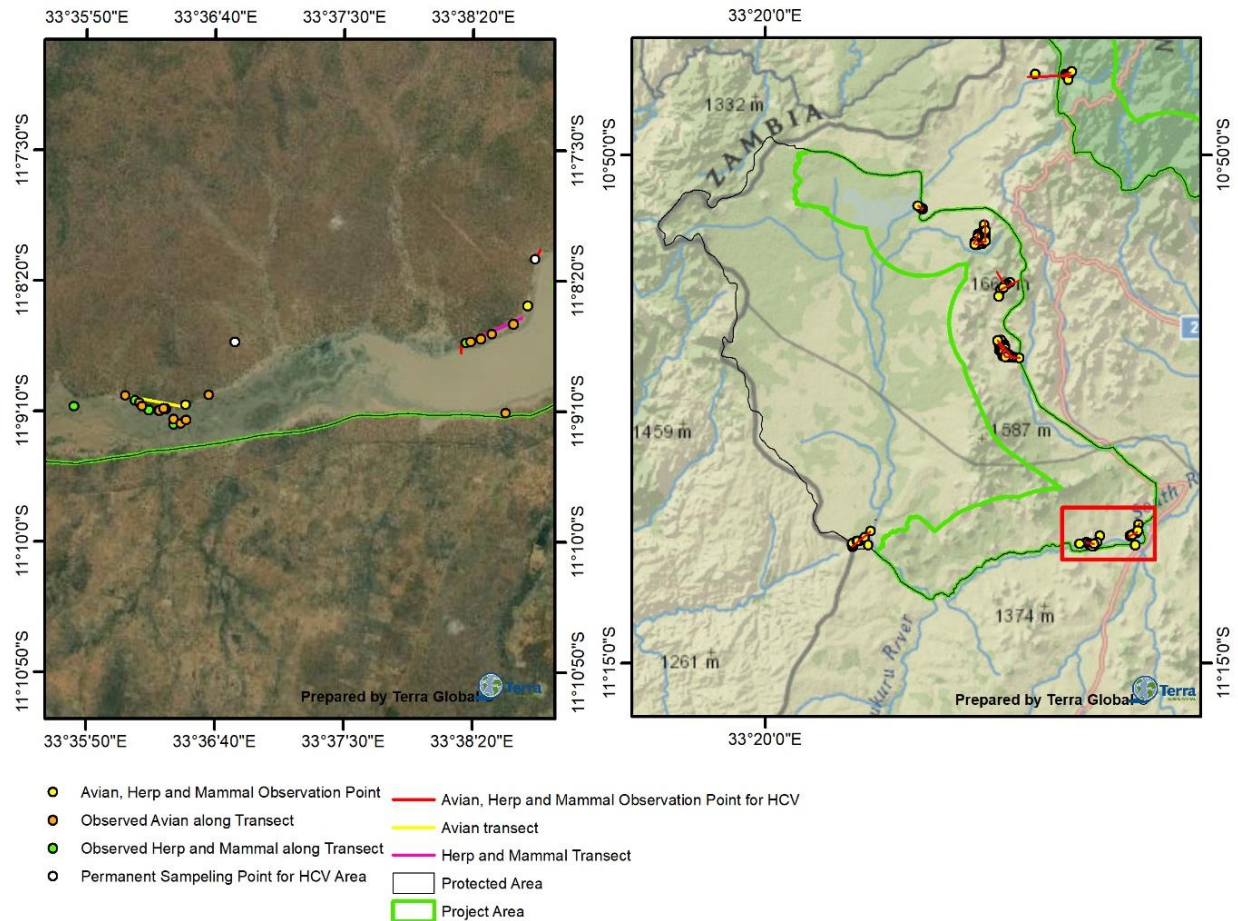
Common Name	Scientific Name	IUCN Status	Type	Common	Uncommon	Rare	Increasing	Decreasing	Constant	Forest	Non-Forest	Wet Areas	Other
Basra Reed Warbler	<i>Acrocephalus griseldis</i>	EN	A	58%	42%	0%	96%	4%	0%	69%	12%	4%	15%
Johnston's River Frog	<i>Amietia johnstoni</i>	EN	H	71%	14%	14%	95%	0%	0%	14%	0%	81%	5%
Madagascar Pond-heron	<i>Ardeola idae</i>	EN	A	25%	25%	50%	25%	75%	0%	25%	0%	25%	50%
Arthroleptis francei	<i>Arthroleptis francei</i>	VU	H	48%	48%	4%	92%	4%	0%	8%	0%	88%	4%
Shoebill	<i>Balaeniceps rex</i>	VU	A	100%	0%	0%	50%	0%	0%	0%	0%	50%	50%
Thyolo Alethe	<i>Chamaetylas choloensis</i>	VU	A	50%	17%	33%	67%	0%	0%	33%	17%	17%	33%
Black Rhinoceros	<i>Diceros bicornis</i>	CR	M	100%	0%	0%	50%	50%	0%	50%	50%	0%	0%
Taita Falcon	<i>Falco fasciinucha</i>	VU	A	42%	25%	33%	75%	8%	0%	83%	8%	0%	8%
Wattled Crane	<i>Grus carunculatus</i>	VU	A	0%	0%	100%	0%	100%	0%	100%	0%	0%	0%
Common Hippopotamus	<i>Hippopotamus amphibius</i>	VU	M	67%	33%	0%	100%	0%	0%	0%	0%	100%	0%
Blue Swallow	<i>Hirundo atrocaerulea</i>	VU	A	67%	33%	0%	100%	0%	0%	83%	0%	0%	17%
African Elephant	<i>Loxodonta africana</i>	VU	M	36%	25%	39%	54%	46%	0%	96%	4%	0%	0%
African Wild Dog	<i>Lycaon pictus</i>	EN	M	27%	27%	45%	32%	64%	0%	77%	9%	0%	14%
Broadley's Mountain Frog	<i>Nothophryne broadleyi</i>	EN	H	50%	50%	0%	67%	0%	0%	50%	0%	33%	17%
Tanzanian Vlei Rat	<i>Otomys lacustris</i>	VU	M	48%	48%	4%	96%	4%	0%	11%	15%	70%	4%
Maccoa Duck	<i>Oxyura maccoa</i>	VU	A	67%	0%	33%	67%	17%	17%	0%	0%	83%	17%
African Lion	<i>Panthera leo</i>	VU	M	8%	4%	88%	24%	68%	8%	92%	0%	0%	8%
Leopard	<i>Panthera pardus</i>	VU	M	19%	8%	73%	27%	73%	0%	96%	0%	0%	4%
Temminck's Ground Pangolin	<i>Smutsia temminckii</i>	VU	M	0%	25%	75%	50%	50%	0%	75%	25%	0%	0%
Lappet-faced Vulture	<i>Torgos tracheliotos</i>	EN	A	25%	13%	63%	38%	63%	0%	88%	0%	0%	13%
White-headed Vulture	<i>Trigonoceps occipitalis</i>	CR	A	36%	36%	27%	36%	64%	0%	100%	0%	0%	0%
Spotted Ground-thrush	<i>Zoothra guttata</i>	EN	A	40%	20%	40%	80%	20%	0%	80%	0%	0%	20%

Source: Community-Interviews of the Biodiversity Inventory

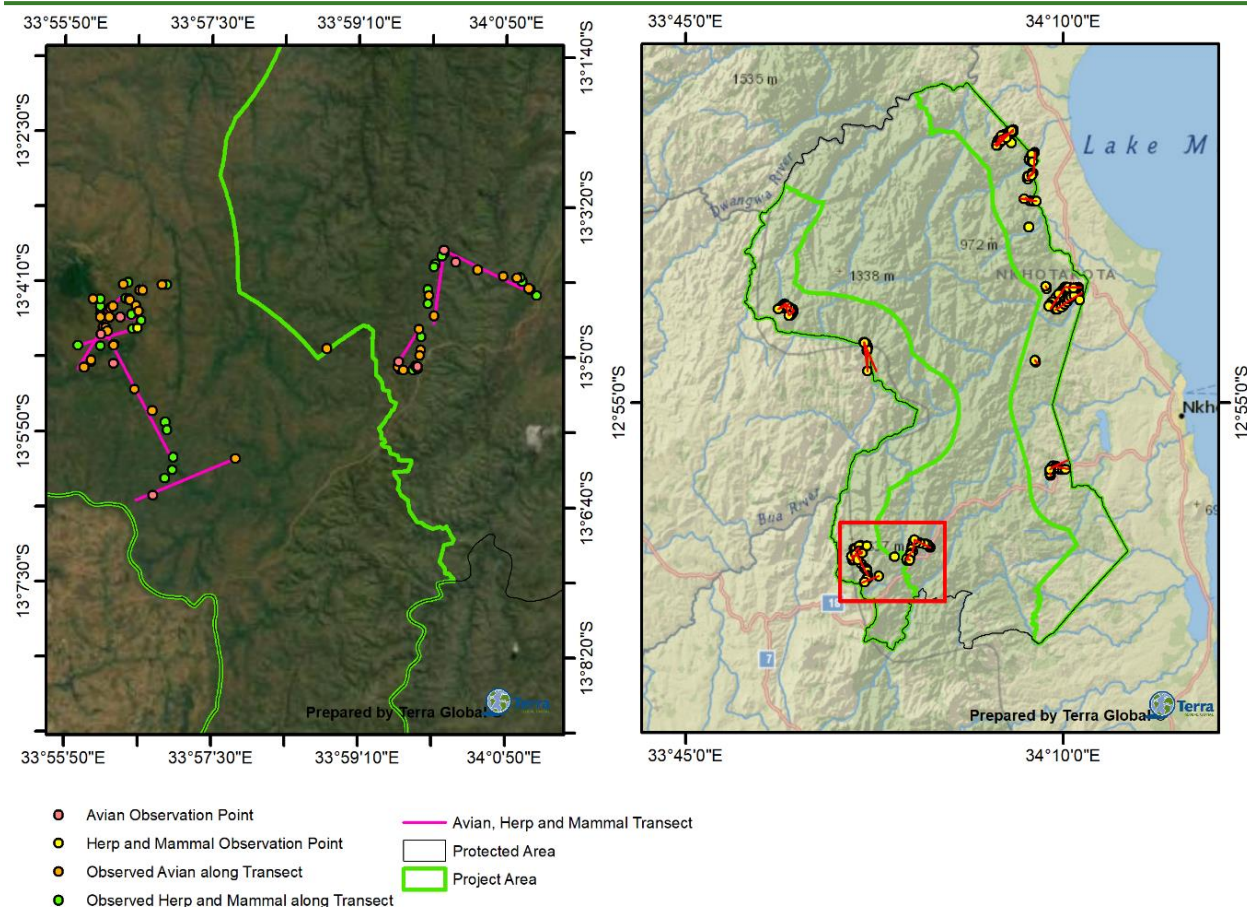
*A – Avian species, M – mammal species, H – herpetile species, blue cells meet the definition of Critical or Endangered Species.



Map 5. Example sampling points and transects from the Biodiversity Survey in Nyika National Park.



Map 6. Example sampling points and transects from the Biodiversity Survey in Vwaza Wildlife Reserve



Map 7. Example sampling points and transects from the Biodiversity Survey in Nkhotakota Wildlife Reserve

6 PROJECT IMPLEMENTATION INFORMATION

Goals implemented during this monitoring period include:

- Develop community capacity, knowledge and project management institutions
 - Capacity of Program Management Institutions Increased
 - Increased awareness and understanding of the project among all villagers
 - Increased Awareness and Improved Governance for Conservation with Communities
- Establish accurate project monitoring systems and build capacity for participatory monitoring of carbon, biodiversity and social impacts
 - Build local capacity for monitoring
 - Perform monitoring requirements as required by VCS and CCB
 - Conduct forest biomass plot inventory and satellite image analysis of carbon stocks for VCS
 - Conduct social appraisals as per VCS and CCB requirements
 - Conduct biodiversity monitoring as per VCS and CCB requirements
 - Develop and strengthen participatory monitoring
- Strengthening of land-tenure status and forest governance.
 - Seek cooperation on the project from other relevant ministries and agencies

- Create and improve governance structures to build capacity to implement protected area activities
- Maintain policies, agreements including co-management agreements, constitution and by-laws and community agreements
- Development and implementation of sustainable forest and land use management plans.
 - Strengthen and develop resource use under co-management agreements
- Forest protection through patrolling, social fencing and maintenance of forest boundaries
 - Improve Boundary Demarcation and Effectiveness
 - Increase forest protection through a combination of enforcement and community engagement and sensitization
- Fire prevention and management activities
 - Increased forest protection through fire control and management
- Reduce fuelwood consumption and increasing energy efficiency by introducing fuel-efficient woodstove
 - Introduction of cookstoves to reduce fuelwood consumption
- Creation of alternative sources of fuelwood through agroforestry, farm woodlots management
 - Village and club level woodlots established
- Sustainable intensification of agriculture on existing agricultural land for food security
 - Agricultural Intensification and crop diversification
 - Improved Water Management
 - Conservation agriculture
- Development of local enterprises based on ecotourism and sustainably harvested NTFPs such as honey, coffee, macadamia, fruit production, and livestock
 - Develop an eco-tourism program
 - Develop an apiculture program to provide an alternative source of income to local communities
 - Increase benefits stream from coffee production and expand number of small-holder producers in appropriate areas around protected areas
 - Increase benefits stream from macadamia production and expand number of small-holder producers in appropriate areas around protected areas
 - Develop small livestock program
- Deliver Small-scale HH solar systems
 - Models identified and ordered
 - Partners ready to new order
 - Sales process managed and operational and fiscal reporting
- Support Sustainable NTPF production and collection
 - Manage resource areas
 - Promote added value to raw products
 - Expand market links
- Project Verification and Monetization of VCUs
 - GHG Quantification and VCS/CCB MR Completed
 - Monitoring Report Verified by VVB
- Maintain transparent and equitable benefit-sharing mechanisms
 - Financial flows from Program to ensure equity, transparency, and accountability
- Long-term Financial sustainability secured

The Program has been implemented in accordance with the original long-time implementation plan subject to available funding. Based on carbon revenue generated from Program sales, the implementation plan was implemented at approximately 40-50% during the monitoring period based on the priorities set by the Project Proponents in 2016.

In addition to the climate, social and biodiversity impacts measured in accordance to the monitoring plan and reported in Sections 3.1.2 Data and Parameters Monitored and 5.1.1 Biodiversity Changes (B2.1), this section reports on the monitoring of the implementation of the workplan.

The workplan is comprehensive and for each defined activity, there are one or more indicators that have been defined to monitoring. For each indicator, the geographic level of monitoring is specified and the frequency as well as the disaggregates to be captured. The capacity and technology used for participatory monitoring continues to be strengthened, however not all defined variables have been monitored during this period, but many have been. The details below provide Program implementation reporting aligned with each component of the implementation plan.

The Program implementation indicators are reported by each of the Program's Sub-Objective and Outcomes that map to the Program Implementation Plan in Appendix 4: Additional Information:

6.1 Develop Community Capacity, Knowledge and Project Management Institutions

6.1.1 Capacity of Program Management Institutions Increased

6.1.1.1 Associations Staffing

Two of the core implementation partners are the community associations of NAWIRA and NVA who have co-management agreements in place with DNPW for Nyika-Vwaza and Africa Parks for Nkhatakota for implementation of Program Activities. An important indicator of success of the Associations is them having a committed Director, Association Staff, and Board of Trustees that have both the skills and the time to devote to Program. The Associations, during the monitoring period, are able to support payment for 10,800 full time equivalents (FTE) supporting the Program which facilitates the key dedicated resources needed for the Associations to operate effectively. In addition, since April 2019 a full-time local project coordinator from the Terra Global team has been dedicated to supporting the Program and delivering technical support and training.

6.1.1.2 Association Elections

NAWIRA

The Association was established in the year 2013 and registered in 2014. Since registration, the Association has worked for 5 years. According to the Association's constitution, the executive committee is mandated to work for 3 years then an election is held.

The trustees sought to conduct an election during the 2017/18-year NAWIRA should have held elections at all levels i.e. NRCs, ZNRCs and the executive as follows:

NRCs

Zone committees with support from executive members in their areas and the AP Extension Assistant will organize elections for NRCs. For NRCs that were established in the year of the constitution update 2016/17 there were no elections.

ZNRCs

For Zone committees, elections will be organized by Traditional Authorities with support from NAWIRA executive members in their areas and the AP Extension Assistant. For ZNRCs that were established this year of the constitution update (2016/17) there were no elections.

NAWIRA Executive

Elections for the Executive Committee were held during the Annual General meeting i.e. July 2018. The Board of trustees with support from the office of the Park Manager handled the process. NAWIRA has documented the election process and in 2018 voted to extend the periods between elections to 5 years.

Candidate Eligibility for the Executive Committee

- Bonafede members of:
 - The Village in which the NRC is can be elected to positions in an NRC
 - NRCs in a designated area of the T/A can be elected to positions in a ZNRC
 - ZNRCs within the area of jurisdiction of NAWIRA can be elected to positions in Executive Committee
- Candidates that have not served at that position or have served at that position for less than two terms
- Candidates that have no criminal records
- Candidates that are known in their communities for having a passion for natural resources conservation
- Candidates for the post of executive chair should:
 - Have MSCE with clear understanding of wildlife issues
 - be able to speak English
 - be computer literate
 - a self-starter
- Candidates for the post of Secretary should:
 - Be able to read and write
 - Be able to produce a report
 - Be able to take minutes of meetings
- Candidates for the post of Treasurer should:
 - have accounting knowledge and skills
 - have a track record of trust worthiness and honesty. His / her T/A and ZNRC should give evidence of these characteristics

NVA

The Association was established in November 2000 and its catchment area is the 5 KM boundary zone around Nyika and Vwaza protected areas. The aim of the Association is to conserve natural resources in and outside the parks and also to coordinate development activities in the bordering communities of the parks.

In 2016, NVA held their annual meeting and voted to extend the period of time the Executive committee and other governance bodies would serve for from 3 years to 5 years.

The following describes the NVA process for elections:

The elections are held in a secret vote at all levels where the candidate getting the highest number of votes is declared the winner and the first runner up his / her deputy. The trustees will nominate appropriate institutions to run the elections at the Executive level. At least 5 independent monitors will be nominated to monitor elections for the Executive Committee to ensure free and fair elections. Each candidate will be allowed to campaign freely for any position in the Association.

Candidate Eligibility for the Executive Committee for NVA

The Committee shall serve the Association for a term of Five years (5) years before another committee is elected into office

- An executive committee member (Chairperson, Secretary, Treasure and other Committee members) can serve the Association for two consecutive terms upon the decision of the AGM on positions.
- Members of the Executive committee shall be Malawians from and resident within the border zone areas of Nyika National Park and Vwaza March Wildlife Reserve
- The posts of Chairperson, Secretary, General and Treasurer General and their deputies shall be filled by person who have a Full Malawi School Certificate of Education and served in the ZNRC for not less than five years (5) years. Active politicians and chiefs shall not participate in these elections.
- To promote gender balance the post of Executive member may be filled by persons holding a full Junior Certificate of Education
- Aspiring candidates for posts in the executive committee shall bring their Certificate during electing elections for verification by Extension officers from Nyika Park, Vwaza Reserve and 2 appointed Trustees by the Association executive.
- The Chairperson of trustees shall preside over NVA elections while facilitated by a competent appointed person and voting shall by secret ballot

Qualification of An Office Bearer

- No person shall be appointed, or continue to act as a member of the Executive Committee if that person:
- Is under any law in Malawi, adjudged or otherwise declared to be of unsound mind;
- has, within the last seven years, been convicted by a competent court of a crime involving fraud, dishonesty, breach of trust or moral turpitude;
- has not, at the time of election, attained the age of between 21 and 60 years;
- does not reside in the Border Area;

6.1.1.3 Fiscal Management Capacity

The Program resources are provided to implementing partners based on the approved budget and workplan in accordance with the Program objectives and the REDD+ Agreement. The budget is approved by partners every 2-3 years and is based on current funds and projected funds over the period. In 2016 and 2018 a budget was adopted through consensus, after prioritizing Program activities based on available funds and will be updated again at the end of 2020. Funds are provided to local implementing partners (DNPW, NAWRIA, NVA) through a process of quarterly advances and liquidations that follow the fiscal management policy of the Program. The ability for partners to manage their own funds and have the capacity to track and provide supporting information on expenditures is an important aspect of ensuring funds are deployed to Program Activities and building are partners' operational and financial management expertise.



Image 2. Representatives of DNPW, NAWIRA and NVA (not pictured) approving the Program Year 3 Budget in July 2018

The advance and liquidation process has improved since the Program started providing funds directly to local implementing partners in 2015. Activities that demonstrate the Program's ever-increasing fiscal management capacity include:

- 2-year budget established based on REDD+ Agreement and available funds, and adopted in accordance with the governance process in 2016 and 2018
- Program Budget Liquidation tool in MS Excel has been improved over time to support streamlined entry and easy budget versus actuals analysis
- Training on use of the Liquidation tool has been provided and partners ability to provide quality data entry all the required supporting documents has increased dramatically
- DNPW consistently provides their liquidations on time and given the high quality of information, they can be closed within 5 days.
- More than 40 advances have been provided to partners over the years the project has been operating with climate finance

Years	Advances to Implementing Partners
2015	4
2016	7
2017	9
2018	8
2019	12
Total	40

- Financial review forecast in Sep 2019 was delivered by Terra Global to partners providing information on the available funds, projected revenue, and funds dedicated to the solar revolving fund.

6.1.1.4 Mobility

The ability for the Associations to communicate and mobilize their communities depends highly on the associations and the Zone NRC's ability to travel between the rural areas in the Project Zone. To support this need, the Program procured and delivered bikes and motorcycles implementing partners and in 2018 had the funding to make a large purchase of three 4x4 vehicles that are used by each of the Partners to implement Program Activities.

6.1.1.5 Bicycles

The project procured and distributed 67 push bikes to NAWIRA, 40 bicycles to DNPW and 100 bicycles to NVA in 2016. And in 2019 again distributed 57 push bikes to NAWIRA, 11 push bikes to DNPW and 66 bicycles to NVA. The bicycles are distributed to Zone-level Committee Members in the case of the Associations for their mobility within the project area facilitating and monitoring all Kulera REDD+ activities at Zone level. As for DNPW the bicycles are distributed to Parks & Wildlife Officers (PWOs) who mainly facilitate extension and education activities within the communities surrounding the protected areas as well as conducting of patrols within and around the protected areas to ensure illegal activities always under check.



Image 3. Bicycles being delivered to NVA in 2016

6.1.1.6 Motorcycles

The Program also procured and distributed motor bikes to the two Associations NAWIRA and NVA. During the monitoring Period NAWIRA received 2 motorbikes while NVA received 4 motorbikes. These bikes are used by the Executive Committee of the two Associations to assist in the day to day operations of the Program. Apart from the day-to-day office activities for which the motorbikes are used for, the motorbikes also support the field work operations to take the staff of the associations to the communities when they are facilitating community activities like trainings, monitoring visits as well as addressing community grievances as they emerge from time to time.

6.1.1.7 Vehicles

For the first time, the Program was able to purchase three Toyota Land Cruisers. These were outfitted with GIS tracking for security and to allow for tracking of location, usage times and driving patterns. A Fleet Management Manual was developed and adopted to ensure safe and legal operation of the vehicles. These vehicles have provided great value to the project to support delivering project supplies to the communities in a timely manner, taking associations members and board of directors to important



Image 4. Motorbike provided to Program Partners

meetings and workshops, and responding to problem animal control situations in the communities.



Image 5. Toyota Land Cruisers Purchased in 2018

6.1.2 Increased Awareness and Understanding of the Project among all Villagers

The Program carries out a number of on-going activities to increase awareness of the importance of conservation and forest protection among the communities in the Project Zone. This is done through the network of VNRCs (established at the village level) and ZNRC established for each Zone. In addition, to the specialized technical trainings facilitated through the ZNRCs, quarterly meetings are held where participating villages join and discuss topics relevant to Program implementation including strengthening of conservation activities like tree planting, boundary clearing, resources usage within the protected area like honey harvesting, and review of the constitutions periodically are presented and discussed.

In addition to these quarterly meetings, the Program holds an annual review at the Association level of the project status. These meetings were held on the following dates during the monitoring period:

6.1.2.1 NAWIRA

NAWIRA was formally established and registered in 2014, completed the formation of all VNRC and ZNRC in 2016/2017 and new ZNRC were added during the monitoring period to accommodate the growth in new villages resulting from increased population on the Project Zone. Some ZNRCs started conducting their quarterly awareness meetings as early as 2014.

Table 31. Total Zone Awareness Meetings (2014-2019) NAWIRA

Zone	Awareness Meeting -# of meetings	Awareness Meeting- # of people total in meetings	Awareness Meeting - # women in meetings
Chilooko A	106	1,041	553
Chilooko B	71	630	330
Kanyenda B	22	1,689	1,004
Kapelula	34	2,567	867
Kapichira	39	4,065	2,825
Khonsolo	101	2,877	980
Malengachanzi A	22	751	348
Malengachanzi B	2	345	254
Mdunga	25	69	28
Mphonde	167	1,846	1,263
Mwansambo	129	3,770	1,975
Nkhanga	36	10,294	5,551
Nthondo	51	1,172	584
Wimbe	86	3,572	1,946
Total	891	34,688	18,508
		% Women	53%

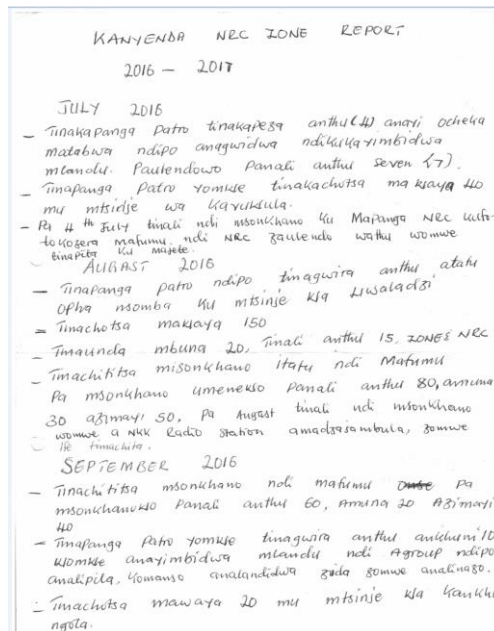


Image 6. Example of ZNRC Meeting Report

6.1.2.2 NVA

Table 32. Total Zone Awareness Meetings (2014-2019) NVA

Zone	Village Level Awareness Meeting# of meetings	Village Level Awareness Meeting # of people total in meetings	Village Level Awareness Meeting# - women in meetings
Bowe	12	164	57
Buma	12	586	198
Chakaka	12	240	143
Chankhalamu	12	182	90
Chisimuka	19	2,300	1,216
Emcisweni	71	161	37
Fulirwa	30	2,309	733
Kamphenda	12	261	113
Kawala	12	241	116
Kazovu	15	771	224
Kazuni	12	192	74
Lake Kazuni	12	144	54
Livingstonia	12	216	88
Lusani	12	174	76
Malambo	12	132	55
M'hujju	12	196	71
Mlare	12	507	223
M'phanda	12	149	67
M'phangala	12	150	63
Mtchenachena	12	140	68
Mwazisi	15	357	152
Ng'onga	8	148	58
Phoka	12	136	57
Sabi	12	280	99
Thazima	21	1,407	406
Therere	12	156	64
Thunduwike	19	1,461	604
Zaro	12	179	86
Zolokele	12	143	66
Grand Total	450	13,482	5,358
		% Women	40%

Examples of topics discussed in NRC meetings can be seen in the DNPW quarterly reporting from Nyika Table 33.

Table 33. Report of Topics Discussed in NRC Meetings in Nyika Q1 2019

Name of NRC	Topics covered	Freq	Attendance		
			M	F	Total
Sanumba	Restructuring NRC	1	17	14	31
Mahuwi	Resource Use assessment	2	28	18	46
Lubagha	Wildlife Crime	3	29	21	50
Jerekele	Permit System	2	24	15	39

Name of NRC	Topics covered	Freq	Attendance		
			M	F	Total
Phwamphwa	Resource guidelines	2	20	14	34
Mhuju	Wildlife crime	2	24	23	47
Mubanga	Permit system	1	10	4	14
Mbulunji	Permit system	1	8	5	13
Thazima	Human wildlife conflict	1	17	12	29
Kasasa	Restructuring NRC	1	9	9	18
Chisimuka	Importance of wildlife	1	33	40	73
Salala	Orchids harvesting	1	17	10	27
Kapelemera	Poaching in Nyika	1	14	17	31
Chimanga	Orchids harvesting	1	18	15	33
Kakunde	Poaching escalation	1	20	10	30
Khakhakha	Value of wildlife	1	12	9	21
Khombe	Importance of Wildlife	1	17	15	32
Dzonje	Wildlife conservation	1	10	8	18
Kawembe	Wildlife conservation	1	11	16	27
Karwe	Wildlife conservation	1	18	10	28
Luwona	Cattle grazing & Encroachment	1	12	6	18
Gonero	Resource Use programme	1	10	4	14
Dongo	Poaching	1	9	2	11
Kaziwiziwi	Poaching & TLC activities	1	8	2	10
Chirwa	Poaching	1	7	4	11
Bondi	Importance of forest	2	18	8	26
Thandala	Importance of wildlife	1	10	7	17
Lemba	Encroachment	1	9	5	14
Mphitapasi	Tree planting	1	9	5	14
Honjera	Collaborative management	1	11	12	23
Total		37	459	340	799

6.1.3 Increased Awareness and Education with Communities

To increase awareness of conservation and improve governance, the DNPW and African Parks run both outreach and protected area visits to educate school children and other groups on the importance of conservation.

During the monitoring period DNPW conducted strong outreach and “in-reach” education programs with schools, churches, and other groups around Nyika and Vwaza. The DNPW reports for the earlier years of the monitoring period could not all be located with turn-over in staff thus the reporting reflects the best information that has been taken from monthly, quarterly and annual reports over the monitoring period. These programs report at least 50% of their audiences are girls and women.

Table 34. # of People Participating in DNPW Outreach and In-reach Programs in Nyika and Vwaza

Protected Area	2014	2015	2016	2017	2018	2019
Nyika						
# students/people engaged in outreach	n/a	n/a	3,429 (2016 annual report)	4,465 (2017 annual report)	3,454 (quarterly reports)	6,553 (quarterly reports Q1-3 only)
# students/people visit PA	311 (2014 annual report)	n/a	746 (2016 annual report)	742 (2017 annual report)	721 (quarterly reports)	798 (quarterly reports Q1-3 only)
Vwaza						
# students/people engaged in outreach	552 (2014 annual report)	n/a	1,028 (2016 annual report)	1,726 (2017 annual report)	1,567 (2018 annual report)	1,397 (2019 biennial report)
# students/people visit PA	756 (2014 annual report)	n/a	1,053 (2016 annual report)	4,262 (2017 annual report)	6,244 (2018 annual report)	3,225 (2019 biennial report)



Image 7. DNPW hosts schools visit Nyika for Conservation Education



Image 8. DNPW conducts outreach Conservation Education with Schools (Q2 2019)

African Parks provided environmental education to students during the monitoring period as follows based on the monthly activity reports:

WP#		2015	2016	2017	2018	2019	Total
3.3.2	Number of schools that receive environmental education. Includes schools and youth groups that visit park, park visits to schools, and individual outreach programs.	2	14	111	161	105	393
3.3.2	Number of students that receive education	49	444	5,926	3,780	4,081	14,280

6.2 Establish accurate project monitoring systems and build capacity for participatory monitoring of carbon, biodiversity and social impacts

6.2.1 Build local capacity for monitoring

One of the goals of the Program is to build local skills for monitoring Program Impacts under the VCS and CCB Standards, as well as for capacity for monitoring the implementation effectiveness against the long-term implementation workplan. This capacity building targets the Associations, DNPW and local universities that support the field data collection required for verification.

6.2.1.1 Training and capacity building by Terra Global

As part of the data collection for the verification, biomass, social assessments and biodiversity surveys were conducted. The Ecological Assessments of Biomass and Biodiversity and the Social Assessments (Participatory Rural Appraisals and Household Surveys) were conducted by Banda College of Agriculture. These surveys were conducted in accordance with the Standard Operating Procedures developed by Terra Global, with input from our local partners and experts. Given this was for the 2nd verification, care was taken to ensure that the data could be directly compared to the field data collected during the validation/1st verification.

To prepare the local teams for field data collection, Terra Global provided training in September 2019. DNPW and two Association participated in the biomass and biodiversity training, and members from these partners were included in the field teams. This increased capacity for understanding the collection process and how this data supports the VCS-CCB monitoring reports.



Image 9. Training in Biomass Field Data Collection September 2019



Image 10. Training in Biomass Field Data Collection September 2019

6.2.2 Develop and strengthen participatory monitoring

Strong operational performance and adaptive management can only be achieved with ground and frequent tracking of results. Toward the end of the last monitoring period, the USAID program's support for M&E ended when the grant ended. Since then, all monitoring has been supported by the DNPW, African Parks, NAWIRA, NVA and Terra Global.

6.2.2.1 DNPW Monitoring

DNPW has developed regular reports providing key details, data and pictures of the activities undertaken to support the Program. These reports are good quality and very rich with data. They cover the monitoring period and as of August 2017, they have been reported on a monthly basis for both Nyika and Vwaza.

These DNPW quarterly reports on Nyika and Vwaza cover details on:

- Community Awareness Meetings (number of meetings, # people- disaggregated, key topics and level)
- Natural Resource Council (NRC) Meetings (by NRC: number of meetings, people disaggregated, key topics)
- General/Other Community Meetings (Meetings (number of meetings, people disaggregated, key topics and zone)
- Beekeeping Meetings (Clubs name, # mtgs, # people- disaggregated)
- Visits to Apiary sites (location, # people, issues encountered)
- Related projects (outside of Kulera REDD+ Program) being implemented in Project Zone.
- Any issues around conflict resolution and grievances

- NTPF Resources and Use Areas in Protected Areas (quality of resources harvested, value of resources, number of people engaged)
- Environmental Education and Outreach Program Activities:
 - Visits to Parks (which schools, groups, or churches, # people, district)
 - Groups visits by DNPW staff (name, # people – disaggregated, district and topics)
- Results of Law Enforcement (key patrolling notes, gun surrenders, poaching)
- Other topics such as financing, procurement, assets, etc.

The Monthly one-page report that DNPW develops each month mainly focuses on a number of regular activities that are planned to be implemented each month against what was actually achieved in terms of implementation. The activities mainly reported in these monthly reports include

- Number of patrols conducted in that month
- Number of arrests done as well as siting of illegal activities that may indicating to poaching being done in the PA.
- Number of PAC (problem animal control) reported and addressed
- Number outreach and in reach programs done and the number of students reached
- Awareness campaign done within the communities and the numbers of people contacted
- Fence management activities including boundary clearing by communities.

These reports provide brief but important achievement within the month that develop into the quarterly reports and ultimately into the annual reports for the PA activities.

6.2.2.2 African Park Monitoring

Africa Parks collects a significant amount monitoring information to inform their implementation. The reports that are most applicable to report for Program monitoring are their monthly reports. These reports are high quality and cover, among other things, the following indicators which have been tracked since African Parks started managing Nkhotakota in August 2015.

- Key Activities
- Management and infrastructure, which includes fencing, firebreaks and boundary maintenance
- Patrolling and Law Enforcement which includes:
 - # Patrols (short and long)
 - # incidence of human-wildlife conflict
 - # Apprehensions
 - # Arrests
 - # Animal carcasses indicating poaching
- Fire Management
 - Controlled burns (# km)
 - # illegal fires
- Boundary demarcation (Km cleared; Km fence installed)
- Environmental education (# of schools, groups that visit park, # students that received education)
- Community Awareness Meetings (# participants)
- Community Nurseries (# seedlings produced)
- Resource harvested

6.2.2.3 Association Monitoring

The Associations monitor implementation using a number of indicators. Through the structure that is setup with NRCs and ZNRCs, the Associations receive regular data that is aggregated at the zone level. Given the overall number of zones and indicators combined with technical limitations, the task of collecting, digitizing, and organizing the data in a central location can be challenging. However, the Associations have made great progress in monitoring their performance and during this monitoring period provided annual zone level data for more than 53 indicators annually during the monitoring period that map directly to the Program Implementation Workplan.

They have received support from DNPW, AP and Terra Global to build the PC skills and organizational processes to continue to improve their processes. The zone data that was provided in excel with a selection of supporting documents and pictures, has been was to present results in on Program Implementation.

For the next monitoring period more training and support will be provided to help Associations better capture, organize, digitize and store monitoring data in secure physical and electronic storage locations.

6.3 Strengthening of land-tenure Status and Forest Governance.

6.3.1 Create and improve governance structures to build capacity to implement protected area activities

The governance structure of this Program was detailed in the original Project Document. The final component to complete for the governance mechanism was to establish a local REDD+ Program Entity that is owned by DNPW and the two associations. Due to limited funding was not been completed by the end of this monitoring period, however, to ensure clear and transparent governance, a governance agreement letter was signed in March 2015 and updated in July 2018. This agreement specifies the decision-making process between the parties in accordance with the overarching REDD+ Agreement.

Toward the establishment of the local REDD+ Program entity, during the monitoring period, adequate funds were generated to start work on the development of the local REDD+ Program entity. This work included 1) legal analysis to determine the most appropriate form in Malawi for legal entity 2) drafting of the formation documents in accordance with the REDD+ Agreement, and 3) providing documents for review by the Program Partners.

It is expected that the Kulera REDD+ Entity will be fully operationalized by the end of 2020.

6.3.2 Maintain policies, agreements including co-management agreements, constitution and by-laws and community agreements

The key agreements that were maintained and enhanced during the monitoring period are:

Protected Area	Agreement	Updates During Monitoring Period
Nkhotakota	NAWIRA Association Constitution	Updated in in 2018
	Co-Management Agreement	Newly signed with Africa Parks in June 2018
Nyika and Vwaza	NVA Association Constitution	Updated in 2016
	Co-Management Agreement	Updated and signed in Dec 2017

DNPW, Terra, Associations	REDD+ Agreement	Overarching agreement maintained in-force
DNPW, Terra, Associations	Fiscal Management Agreement	Signed 2015 and in-force
AP and GoM	Letter Agreement to confirm terms of management agreement	Waiting for DNPW to provide



During the third quarter of 2017 NVA and DNPW co-management agreement was reviewed and signed to incorporate some issues which were not there in the previous document.

The final document was signed on 9th November 2017.

In attendance were NVA chair and all trustees on the other side DNPW directorate as well as northern division staff.

6.4 Development and implementation of sustainable forest and land use management plans

The effective management of the protected areas can only be successful if the communities are part of the management and have access to sustainably collect non-timber forest products. The collection is allowed in the 5km border inside the protected areas and monitoring is conducted by DNPW for Nyika and Vwaza in the North and Africa Parks for Nkhotakota. Africa Parks has a formalized Resource use program (RUP) where the communities collect various NTPFs that are tracked and reported on a monthly basis. For example, Africa Parks reports in November 2018 “bamboo (85 bundles), palm frond (38 bundles), thatch grass (40 bundles), reed (8 bundles) and mushroom (800 kgs) were harvested by local communities, all valued at MK 521,250 (\$714). MK 503,018 (\$690) was generated by beekeeping and moringa clubs through sale of moringa powder and honey.”

2.5. RESOURCE UTILISATION PROGRAMME

2.5.1. Resources Harvested

During the year 11 different types of resources were harvested in park. A total of 3926 people benefited in Chismuka Zone not all resource there is no extension worker, which is with Zone.

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Nyika Extension Annual Report 2017 – 2018

Table 1: Resources Harvested

Area	Bee wax	Honey	Thatch grass	Reeds	Fish	Termites	Mushroom	Medicine	Roots + leaves	Of people
Thama	115	3110	40	18	100	1225	446	370		
Kawadibuna	45	1059	320	41		35	862	125		
Kazovo	45	19	120	10						
Thama	15	460	1794	10	43		568	1102		
Thama	2574									
Thama	255									
Thama	1655									
Thama	100	495	138	470	141	955	2098	3003	2230	
Thama	233	13164	3158	450	475					

1.5.3 Economic value of harvested resources

Resource harvesting involved a total of 11 types of resources economic value for all the resources harvested is K 29,461.17. Honey had the highest value worth K19, 746,000.00 secondly Mushroom with K 3,003,000.00.

Table 2: Economic value of resources harvested

Resource Name	Quantity	Unit Price
Bee wax	233	1300
Honey	13164	1500
Thatch grass	3158	400
Reeds	450	1000
Fish	675	500
Palm fronds	141	1500
Bamboo	955	250
Upaca fruits	2098	1000
Termites	3003	1000
Mushroom	2230	Unknown
Medicine	Roots + leaves	
Total		

2.5.3 Resource use zone monitoring

Resource Use Zone Monitoring

EE field staff and NRCs also conducted a number of monitoring activities in the resource use zone. The following illegal activities were found:

- In Malambo 1 Eland was found dead: reported to Chilinda LE for action
- Cattle grazing around Chakaka very common.
- Trees were cut by illegal resource users very common in all zones.
- Foot print in resource use zone
- Most people are not using permits.
- Fresh poachers spoor and Poachers camps were found
- Timber Sawing place were found in mhuju Therere and Mchinda area. One NRC member was injured in chimanga during the exercise.
- Firewood collection very common in all zones
- In Chimyanga NRC confiscated 2 pangas knives, 2 saw and 1 axe.
- 8 bags of charcoal confiscated in bolero
- trees were cut by illegal resource users
- Kazovo NRC arrested women and a man, the issue was handled by NRC patron. Women were charged k1000 each and a man (victor Kapira) was charged K6000.

All these were discussed on the meeting with traditional leaders and communities promised to support in combating the above problems. However communities complained on the department's response to the reports that is not good and asked the office to respond immediately.

Image 11. Examples of NTPF Resource Management Data and Tracking

DNPW also oversees extraction of NTPF in the northern parks and track the extraction and value. This NTPF data has been collected throughout the monitoring period, but this has not been done so consistently nor digitized to allow for easy annual reporting. This is an area to target improved field-based monitoring for the next Monitoring Period.

In April 2016, with funding from the Program a fire management plan was created by DNPW and NVA. This plan covered the next 5 years and is implemented as a partnership between DNPW and the Association.

6.5 Forest protection through patrolling, social fencing and maintenance of forest boundaries

6.5.1 Improve Boundary Demarcation and Effectiveness

Boundary demarcation and management is a key component of on-going forest protection. Depending on the protected area and the location within a protected area, boundaries will include markers, fences and electrified fences. The effectiveness of the implementing and maintained of boundaries is measured in km maintained and km of fence installed. Community members support boundary maintenance which provides them a daily stipend for their time.

For the Nkhotakota Wildlife Reserve, Africa Parks reported in their monthly activity reports clearing 376 km of boundaries and installing 327 km of fence between from 2016 to 2019.

For Vwaza and Nyika, DNPW did not consistently report on the length of boundary cleared and fences repaired during the monitoring although it is clear these activities were conducted and reported on intermittently

Indicator	Units	2015	2016	2017	2018	2019	Total
Short Patrols	# Short Patrols	106	224	174	133	283	920
Long Patrols	# Long Patrols	59	129	152	276	210	826
Human Wildlife Conflict Op	Counts, # of operations, # of patrols. (Does not count number of elephant breakouts)	47	101	341	192	303	984
Apprehensions	# apprehensions	66	125	98	255	159	703
Arrests	# Initial arrests, not just convictions	50	48	20	21	50	189
Poaching	# of animal carcasses found that are suspected to be poaching	1	2	6	8	10	27

6.5.2 Increase forest protection through a combination of enforcement and community engagement and sensitization

A core component of reducing deforestation and degradation as well as poaching is supported by the patrolling teams that are deployed by African Parks for Nkhotakota and DNPW for Nyika and Vwaza. These patrols are supported by park rangers and community members.

6.5.2.1 Nyika - Vwaza - DNPW

Nyika

Indicator	units	2015	2016	2017	2018	2019	Total
Number of patrols	Patrol man days	n/a	n/a	400	1035	371	1,806
Poaching Arrests	# Initial arrests, not just convictions	n/a	n/a	14	28	22	64

Vwaza

Indicator	units	2015	2016	2017	2018	2019	Total
Long Patrols	Long patrols	n/a	n/a	42	107	65	214
Short Patrols	short patrols	n/a	n/a	47	99	47	193
Poaching Arrests	# Initial arrests, not just convictions	n/a	n/a	10	24	16	50

6.5.2.2 Nkhotakota - African Parks

Based on the Africa Parks monthly reports, significant activities were conducted in Nkhotakota to increase protection and enforcement.



Figure 3. Patrolling and Law Enforcement caught in Camera traps in 2019.

6.6 Fire prevention and management activities

6.6.1 Increased forest protection through fire control and management

Community Associations cleared many km of firebreaks along the PA boundaries to create shaded fuel breaks.

6.7 Reduce fuelwood consumption and increasing energy efficiency by introducing fuel-efficient woodstoves

6.7.1 Introduction of cookstoves to reduce fuelwood consumption

The Program implemented a total of 27,464 of cookstoves during the first monitoring period and the data collection required to verify emission reductions under VM0006 was supported by Total LandCare. When the USAID Program funding ended, the on-going monitoring was minimal, even though the stoves continued to be used. If data can be collected in future monitoring periods to the verify of emission reductions from these stoves, we will seek to get crediting. During this monitoring period there were new stoves promoted by the Program. The second Kulera Program for 20,000 new stoves was started in 2020.

6.8 Creation of alternative sources of fuelwood through agroforestry, farm woodlots management

The production of sustainable sources of fuelwood provides households access to wood without having to illegally collect wood from the protected areas. Within the Program there are two activities that promote alternative sources of fuelwood 1) planting of village/household woodlots and 2) management of woodlands to improve growth, reduce frequency of harvesting. These activities occur outside of the Program Area in the Project Zone, and both of these activities generate emission removals, but they currently not quantified or verified.

6.8.1 Village and club level woodlots established

The establishment of village woodlots is promoted with through training on nursery establishment and management and then distribution of seedlings for planting woodlots to use for fuelwood and fodder.

NVA reported conducting woodlot related trainings for 7,030 people of which 2,753 were women, in 2015 they had 279 nurseries operating and in 2018 they had 349. During the period, the produced a total of 1,620,000 seedlings and planted 1,445,876 trees. NVA did not report woodlot activities in other years during the monitoring period.

NAWIRA reported conducting woodlot related trainings for 12,669 people of which 3,128 were women, they averaged operating 25 nurseries per year. During the period, the produced a total of 283,919 seedlings and planted 315,434 trees.



Image 12. Nursery in NAWIRA 2017



Image 13. Nursery in NAWIRA 2017



Image 14. Seedlings being delivered for Woodlot Established by NAWIRA in 2018

6.9 Sustainable intensification of agriculture on existing agricultural land for food security

6.9.1 Agricultural Intensification and crop diversification

During this monitoring period, there were limited funds for the agricultural intensification and diversification. However, the Program distributed improved varieties of cassava bundles, groundnut seeds and soya addressing food security for communities in the project zone. Location of distribution and crop species is dependent on the community's needs and ecological conditions.

6.9.1.1 Soya

In NAWIRA, 340 and 600 kg of soya seeds were distributed in 2018 and 2019 respectively, these were primarily received in four zones of Kapelula, Kapichira, Nthondo and Wimbe.

Image 15. Example of Soya Seed Delivery Form for Wimbe Zone in NAWIRA

6.9.1.2 Cassava Bundles

Year	# Bundles
2015	800
2016	0
2017	160
2018	30
2019	525
Grand Total	1,515

Year	# bundles
2015	600
2016	0
2017	0
2018	17,340
2019	8,000
Grand Total	25,940

6.10 Development of local enterprises based on ecotourism and sustainably harvested NTFPs such as honey, coffee, macadamia, fruit production, and livestock

6.10.1 Develop an apiculture program to provide an alternative source of income to local communities

One of the most successful NTFP of the Program is beekeeping. The Program supports beekeeping through supporting the organization of bee keeping clubs, providing inputs of suits, hives and materials to construct hives. In NVA there are 10 zones of 39 reporting active beekeeping clubs.



Image 16. Distribution of Apiary Inputs in NAWIRA 2018

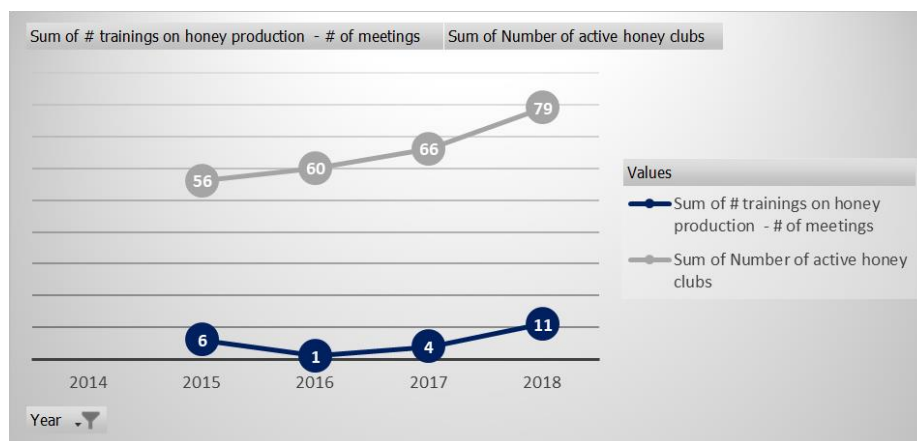


Figure 4. # of trainings for honey production and # active honey clubs – NVA

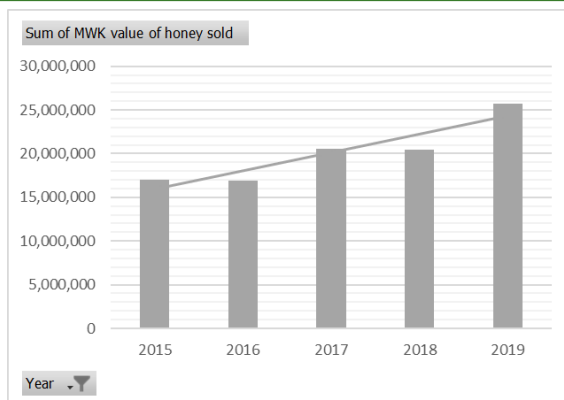


Figure 5. MWK value of Honey Sold – NVA

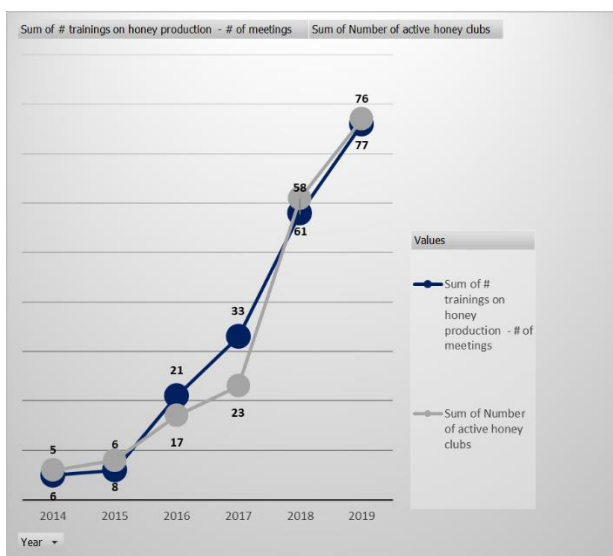


Figure 6. # of trainings for honey production and # active honey clubs – NAWIRA

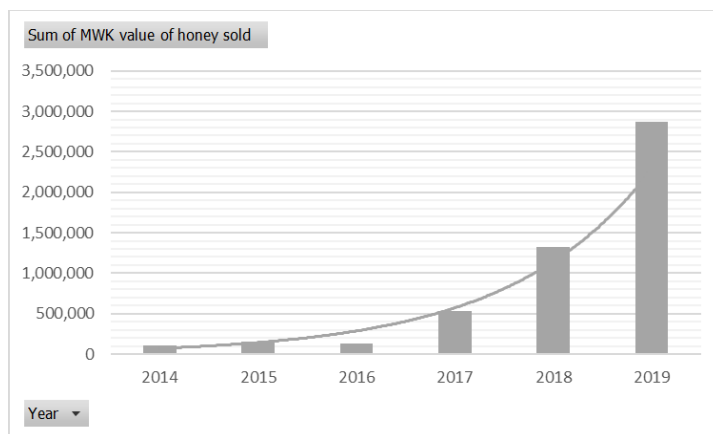


Figure 7. MWK value of Honey Sold – NAWIRA**6.10.2 Increase benefits stream from coffee production and expand number of small-holder producers in appropriate areas around protected areas**

Due to budget constraints limited activities were implemented for promotion of coffee. Resources were focused on food security, the use of improved crop varieties and agricultural diversification.

6.10.3 Increase benefits stream from macadamia production and expand number of small-holder producers in appropriate areas around protected areas

Due to budget constraints limited activities were implemented for promotion of macadamia nuts. Resources were focused on food security, the use of improved crop varieties and agricultural diversification.

6.10.4 Develop small livestock program

The small livestock activities have a significant impact on food security and access to animal protein for the communities. The activities are designed to promote a “pay it forward model” where villages/households are provided goats which they breed and pass offspring to others.

Small scale livestock includes goats, pigs and chickens. In NAWIRA there were 2,635 households receiving animals, and 5,740 households passed on animals. Nothing reported by NVA.



Image 17. Small Livestock Pass-on Program 2018

6.11 Deliver Small-scale Household Solar Systems

Kulera GotLights Solar Program operates the line of microcredit and the revolving fund bringing solar to communities and DNPW Employees across the Project Area and Project Zone. Money from sales goes to cover the cost of solar units as well as some costs of administration. Communities in the program area prefer credit over cash sales, so the second order of lights all contain Angaza Software so the light could be bought on credit or paid outright. Areas where active sales are taking place are very remote and do not have access to solar products like that of the program. Although similar solar units can be found near the project areas, they are purchased somewhere else. Careful in-country research was conducted to verify that the program would not harm or hinder any local market or local vender selling a similar solar unit.

6.11.1 Sales of Solar Lights in Project Zone

The Solar Program works directly with communities involved in the Kulera REDD+ Project living in the 5km buffer zone of the three protected areas. The solar lights reduce in the use of non-renewable batteries and wood fuel for fire for light. Having household solar light promotes income generating activities that can be done at night such as sowing, handcrafts and other indoor activities. Women are particularly impacted as there is a reduction in fuelwood collection and less smoke from the fire. This opportunity to have solar in rural villages allows for schoolchildren to study after the sun goes down, specifically impacting girls as many have domestic chores during the day and can now continue their studies at night.

Solar Sales Agents are local community members themselves and were chosen because they are upstanding members of their community. As the Solar Sales Agents live within communities targeted by the program, they intimately know what community members will be able to make

reasonable payments and what solar unit they should be able to purchase given their ability to pay.

Solar Agents are given a light, which they can pay off through solar sales commissions, and a mobile phone to sell lights through the Angaza App. Being a Solar Sales Agent is an honorable job, which can be done in addition to other household duties and traditional employment. Careful attention was given to include women as Agents and as Managers and overall 31% of the Agents and Managers are women. Women Sales Agents can more personally interact with women clients and understand the ability and capacity for women to participate. Inventory Managers, all women in this program, can monitor solar sales on the Angaza Hub and send additional text messages to recipients. If recipients are delayed in paying off a light, it is communicated to the Sales Agent that the recipient should not purchase other solar products unless they demonstrate an improved their ability to pay.

In order to improve internal management and financial oversight, all lights for the second purchase contained Angaza Software which is activated by a Sales Agent in the field but can be monitored online form anywhere with internet connectivity. All solar units sold can be bought on credit or purchased outright. In addition, All lights are sold through Airtel Mobile Money, eliminating any financial control issues.

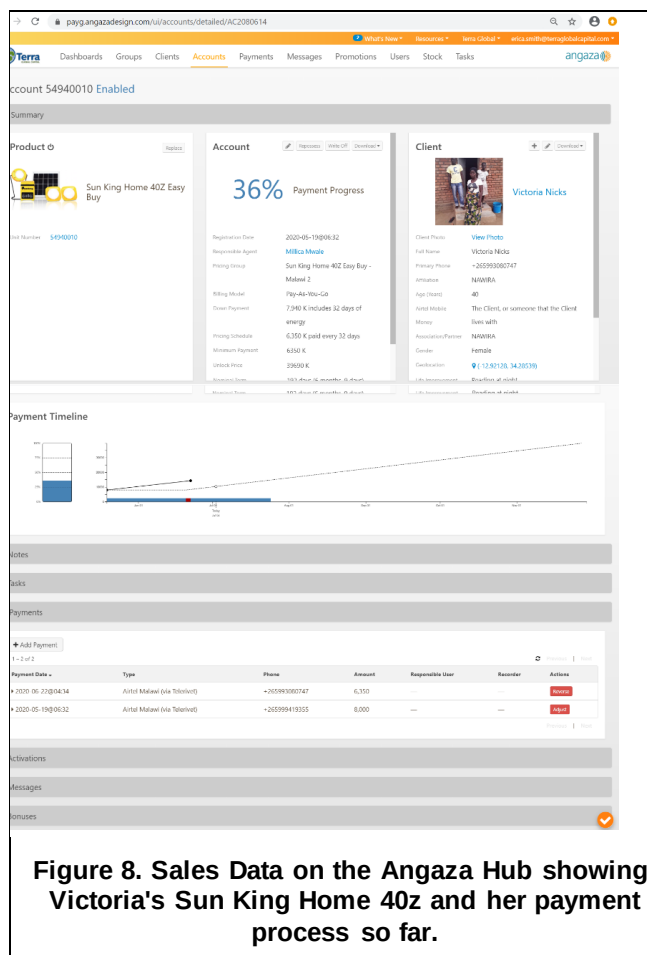


Figure 8. Sales Data on the Angaza Hub showing Victoria's Sun King Home 40z and her payment process so far.



Image 18. Terra Global Team and NVA unpacks and scans solar products, and distributes inventory to partners in Rhumpi

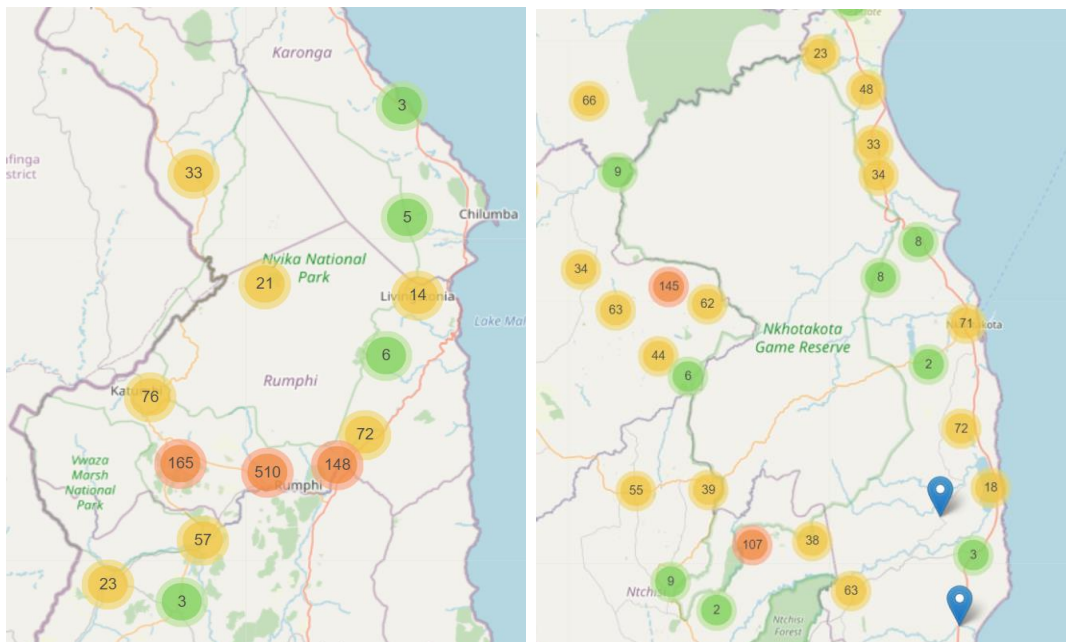


Figure 9. Example of Solar Sales Locations in proximity to the Project Area and Project Zone

The first order of Solar Sales included 2,500 units purchased in November 2016. The models purchased included a simple lamp-only model and a lamp + small-appliance charging station, each of which could be purchased outright or through pay-as-you-go (PAYG) credit.

These small individual GreenLight Planet units from the first order include:

Unit Name	Quantity
EasyBuy Eco - PAYG	500
Sun King Pro - PAYG	750
Sun King Pico Solar Lantern	500
Sun King Pro All Night	750
Total	2,500

The Solar Program has improved immensely, and new technologies have become available. Most all buyers wanted to purchase lights on credit (not paid for upfront), and the Fund Manager and Community Associations needed greater financial control. The GreenLight Planet SunKing Products held up well, but clients wanted different models as they became available. Angaza, the company making the software for lights, purchased on credit, changed their pricing scheme so that customers incur a fee each month until the solar unit is paid off. Mobile Money, which was hardly an option at the beginning of the program, became standard for commerce in Malawi.

During this monitoring period the Fund Manager, Terra Global, conducted extensive market and technical research with solar manufacturers, software Pay-as-you-go (PAYG) providers, and solar sellers in Malawi. Research was conducted to choose models and that best worked with the communities in the Kulera Project Area with very limited incomes, as well as captured the dynamics of the technology development in Malawi. Terra Global reassessed all markets and market conditions, followed strict procurement procedures before the second purchase of solar.

6.11.2 Solar Sales Process Management, Training and Operational and Fiscal Reporting



Figure 10. Chimwemwe, the Inventory Manager from NVA trains a Solar Sales Agent on the Angaza App.

The Kulera REDD+ Program is a partnership for conservation and involves and engages the government and communities around three protected areas. For the second order of solar units, the Kulera Partner DNPW joined in the training along with the Community Associations Nyika-Vwaza Association (NVA) and Nkhotakota Wildlife Reserve Association (NAWIRA).

Training for the first purchase of lights were conducted in 2016 at each Association Office.



Image 19. Maisa Chulu, the DNPW Inventory Manager, verifies sales stats shown on the Angaza Hub on her laptop match those gathered on the Angaza App and shown on her phone.

6.11.3 Impact of the use of Solar Power with Communities

This solar program was set up to be a revolving fund where community members can purchase solar units on credit and overtime, own the unit outright. The wholesale cost, cost of transport/customs, agents' commission, etc. was built into the cost of the light, hence through the sales process, funds are recollected, and the solar fund replenished. During this monitoring period all possible funds were gathered from the initial purchase of 2,500 solar units to fund a second purchase. **This solar catalyst program shows that a revolving fund is possible and that**

investing in communities and clean energy can be successful in Africa. Most importantly, this solar program has been successful in improving livelihoods, bringing clean energy and solar power to rural communities at a low cost in Malawi. Solar Agents have new technical skills, many using mobile money for the first time and driving technological development in Malawi. With the use of these solar lights, there will be a continued reduction in cheap batteries that are often burned when no longer usable. In addition, there has been a continued reduction in the use of kerosene, which is expensive, and the leading causes of dangerous household burns in Malawi.

During the registration process the recipients were asked “What do you plan on using this light for?” and were given the options:

1. Cooking at night
2. Schoolwork at night (for schoolchildren)
3. Reading at night
4. Working on value added products
5. Sewing/mending
6. Multiple activities listed here
7. None of these

Almost all recipients selected “Multiple activities listed here” demonstrating the multiple benefits the recipients received.

6.12 Non-Timber Forest Products (NTPF)

The non-timber forest products that are produced and harvested in the protected areas as well as forest areas in the Program Zone are very improve to the Program communities. However, it is critical that production and collection of these NTPFs is done in a sustainable manner and that providing communities access to the protected areas does not result in deforestation and degradation.

6.12.1 Managing Access to Project Areas for Sustainable Harvesting

All the zones around the Protected Areas are allowed periodically to be escorted into the Protected Areas to collect resources from the park for both local consumption and use as well as for economic purposes. The harvesting of resources is coordinated by the park management themselves.

The regulation and tracking of collection of NTPFs is conducted by DNPW for Nyika and Vwaza and Africa Parks for Nkhotakota. Each of these park managers tracks and reports on the types of NTPFs collected and the estimated economic value. These products are primarily consumed and sold locally for incomes.

Besides, beehives, the following NTPFs have been collected during the monitoring period which vary throughout the seasons:

- Mushrooms
- Bamboo stems
- Palm fronds
- Bundles thatch grass
- Edible termites
- Uapaca Fruits
- Fish
- Medicinal Plants

6.12.2 Promotion NTFP Harvested in Project Areas

Data on NTFP is incomplete and not easily aggregated.

Table 35. Example NTFP reporting Jan to Mar 2017 - Nyika

Table 2:Z/NRC, Number of people, Name/Amount of Resources harvested

ZONE	Bamboo (kgs)	Honey (Kg)	Uapaca (kgs)	Thatch Grass (Bundles)	Reeds (Bundles)	Fish (Kg)	Termites (kgs)	Mushrooms (Kg)	No. of Harvesters
Thazima			20	5			236	174	130
Chisimuka	44		1417			228		619	208
Kazovo			365			82	1389	21	446
Kawala					6		31	564	63
Mphanda	27			5	20	7			114
Ng'onga		67	3840	308			540	309	162
Phoka/Chakaka		530						200	25
Mhuju		110					40		26
Totals	71	707	5642	318	26	317	2236	1887	1174

6.12.3 Promotion of NTFPs for Improved Market Links

While there is some reporting of the NTFPs that are sold by communities that data is incomplete for reporting this period.

7 ADDITIONAL PROJECT IMPACT INFORMATION

Not Applicable.

8 APPENDICIES**8.1 Appendix 1: New Project Areas and Stakeholders**

There were no additional New Project Area Instances added during this monitoring period. The Project Partners identified that there has been deforestation happening inside and outside of the northern and southern part of Nkhotakota during the monitoring period. Project Proponents are working with communities to add areas of Southern Nkhotakota and Northern Nkhotakota in the future.

8.2 Appendix 2: Project Risks Table

Project risks are identified in the Non-permanent Risk Report.

8.3 Appendix 3: Well-Being Indicators

Well-being Indicators			
#	Component of Human Well-being	#	Indicators of Human Well-Being
1	Natural capital:	1.1	Access to land, water, grazing.
		1.2	Ownership of herds, trees
		1.3	Productivity (per unit of land, per unit of water, per unit of inputs)
		1.4	Soil, water, rangeland, quality
		1.5	Biodiversity
2	Financial capital	2.1	Income levels, variability over time, distribution within society
		2.2	Financial savings, access to credit
		2.3	Debt levels
3	Physical capital	3.1	Access to roads, electricity, piped water
		3.2	Ownership/access to productive equipment (oxen, tractor, irrigation pump etc.)
		3.3	Housing quality
4	Human capital	4.1	Total labor
		4.2	Educational level, skills
		4.3	Health levels
5	Social capital	5.1	Membership of organizations
		5.2	Support from kin, friends
		5.3	Accountability of elected representation

8.4 Appendix 4: Additional Information

The following data and information are made available to the VVB as requested.

Annex/ Section	Description	Commercially Sensitive
A	Household survey data (2011 and 2019) Excel	Yes
B	Participatory Rural Appraisal data (2011 and 2019) excel	Yes
C	Long-term Project Implementation Plan	Yes
D	Gross Emissions Reduction quantification workbooks (Nyika, Vwaza, Nkhotakota, and combine)	Yes
E	Quantification workbooks showing Impact to NERS for correction of Emission Factor Discounting factor error (Nyika, Vwaza, Nkhotakota, and combine).	Yes
F	Adaptive Management Draft Report (MR2)	No
G	Association Activity Monitoring data by Zone (and supporting documentation)	Yes
H	Africa Parks Monthly Reports for Nkhotakota (monitoring period summary and reports)	Yes
I	DNPW Monthly, Quarterly and Annual Reports for Nyika and Vwaza (monitoring period summary and reports)	Yes
J	2019 Kulera Financial Review	Yes
K	Verra Approval to Verification Extension	No
L	Kulera CCB Monitoring Plan	No