THE MAI NDOMBE REDD+ PROJECT SECOND MONITORING & IMPLEMENTATION REPORT (M2)

Document Prepared by Wildlife Works Carbon

Project Title	The Mai Ndombe REDD+ Project
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Project Proponent(s)	Wildlife Works Carbon Jeremy T. Freund Jeremy@wildlifeworks.com; 415-331-8081
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Validation/Verification Body	EPIC Sustainability Services K. Suryanarayana Murthy director@epicsustainability.com +91 9845759000
GHG Accounting/Crediting Period	14 March 2011 – 13 March 2041 30-year crediting period
Monitoring Period of this Report	01 November 2012 – 31 December 2016
History of CCB Status	Validation: 06 December 2011 Verification (m_1): 06 December 2011
Gold Level Criteria	**Climate and Biodiversity Gold Level Criteria** The Project will conserve flora and fauna within the Project Area. Protecting these 2 former logging concessions will maintain critical forested area and the ecosystem services that it provides, as well as rehabilitate habitat for endangered charismatic animals such as the Bonobo and Forest Elephant. By protecting the native forest, the Project will also increase the resilience of the ecosystem to the effects of climate change. Section GL1.4 of the CCB PDD exemplifies many additional Project Activities that will help both local communities and biodiversity to minimize and adapt to expected climate change impacts. Improved seed distribution and training on improved agricultural methods will lead to increased yields and adaptation to changes in rainfall, the timing of growing seasons, and changing temperatures. Educational activities to increase literacy and diversify livelihoods will enable communities to adapt to expected increases in the number of and severity of natural disasters caused by climate change, and the resulting potential for increases in food insecurity and disease. Through forest protection by providing alternatives to destructive forest pathways, the Mai Ndombe REDD+ Project will also provide habitat for the bonobo (Hominidae Pan paniscus), an IUCN red-list endangered species as well as enable the return of the forest elephant.

Acknowledgements

We extend our heartfelt thanks to the following people and organizations, without whom conservation in the Lac Mai Ndombe region would not be possible:

WWC team Mill Valley

Jeremy Freund, Mike Korchinsky, Simon Bird

ERA-WWC team Kinshasa

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Victor Kabengele wa Kadilu, Frédéric Jacquemont

Lastly, we extend our thanks to the communities of the Lac Mai Ndombe REDD+ Project Zone, for it is them that this project serves, and it is due their trust, acceptance and support that the project ultimately owes its success.

Acronyms

ACoGS	Avoided Conversion of Grasslands and Shrublands
AFOLU	Agriculture, Forestry and Other Land Use
APD	Avoided Planned Deforestation
APC	Avoided Planned Conversion
AUC	Avoided Unplanned Conversion
AUDD	Avoided Unplanned Deforestation and/or Degradation
BEM	Biomass Emission Model
CCB	Climate, Community and Biodiversity
CEPF	Critical Ecosystem Protection Fund
DNA	Designated National Authority
ER	Emissions Reductions
FAO	Food and Agricultural Organization
FCPF	Forest Carbon Partnership Facility
FPIC	Free, Prior and Informed Consent
GHG	Greenhouse Gas
GIS	Geographic Information System
HCV	High Conservation Value
IBA	Important Bird Area
KBA	Key Biodiversity Area
MNRP	The Mai Ndombe REDD+ Project
MRR	Monitoring Report Requirements for the VM0009 V2.0 VCS methodology
MRV	Measuring, Reporting and Verification
NGO	Non-Governmental Organization
NPA	Natural Protected Area
NTFP	Non-Timber Forest Products
PAA	Project Accounting Area
PD	Verified Carbon Standard and Climate, Community and Biodiversity Project Description document
REDD	Reducing Emissions from Deforestation and forest Degradation
REDD+	Reducing Emissions from Deforestation and forest Degradation, plus Conservation, Sustainable management of forests, and enhancement of forest carbon stocks

R-PP	Readiness Preparation Proposal
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
WWC	Wildlife Works Carbon

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1 SUMMARY OF PROJECT BENEFITS

1.1 Unique Project Benefits

The Mai Ndombe REDD+ Project, located in western Democratic Republic of the Congo, is an ecologically rich and diverse area previously zoned for commercial timber extraction. It provides habitat to bonobos and forest elephants, and includes some of the most important and endangered wetlands in the world. It is also home to some 50,000 people, most of whom live on the shores of Lake Mai Ndombe, and along the main roadway leading from the lakeshore city of Selenge towards the northwest project area boundary.

The conservation concession now contains over 3.5 million cubic meters of merchantable hardwood, highly valued by logging companies. The project addresses logging and the other leading drivers of deforestation - subsistence agricultural practices and aggressive fuel wood / charcoal use.

The Mai Ndombe REDD+ Project leverages carbon offset revenues to achieve the climate, community, and biodiversity objectives listed below. Community and biodiversity objectives, along with corresponding project activities outlined in section G3.2 in the CCB PDD, have been designed to correspond to, and address, issues identified by communities within the project zone (see section 4.3) as important to their well-being, and which have been identified as key factors contributing to present and anticipated future project area conditions in the absence of the project (baseline scenario). Project activities have been identified and implemented according to results from the theory of change (causal model) Social Impact Assessments (SIAs), which indicated the need for several initiatives. The implemented activities have stopped logging, reduced unsustainable agricultural practices, improved education, increased nutrition, enhanced infrastructure / access to markets and vastly improved health care.

Climate

- Reduce CO_2 emissions within the project area by stopping planned legal and illegal forest degradation (logging).
- Reduce local destructive forest pathways by providing alternatives to unsustainable slash and burn agriculture.

Community

- Provide access to and increase quality of education.
- Improve land-tenure status through participatory mapping.
- Promote sustainable agriculture, livestock management and fishing.
- Provide training in, and demonstrate improved agricultural techniques to simultaneously enhance food security, promote all-around nutrition and conserve natural resources.
- Reduce poverty by increasing access to markets, improving infrastructure and creating jobs.
- Improve access to, and quality of, health and medical response systems.

Biodiversity

- Retain intact forest habitat and ecosystem integrity at the landscape level for native flora and fauna.
- Raise local and outside awareness of the area's intrinsic biodiversity value through education and outreach.
- Protect rare and ecologically valuable species.

Table 1 Unique project benefits

Outcome or Impact	Achievements during the Monitoring Period	Section Reference	Achievements during the Project Lifetime
1) Reduce CO_2 emissions through conservation management of 2 former logging concessions	• Forest monitoring / protection • Sustainable job creation • Plantations (tree nurseries) established • Logging prevention enforced	3.2	Former timber concession managed as a conservation concession and proposed legal logging extraction halted. Wood extraction greatly reduced through halting of large scale logging practices (e.g., road building, logging trails).
2) Sustainable agriculture, fishing and livestock introduced	• Agricultural intensification / diversification and demonstration gardens	2.1.1	Improved agriculture, fishing and livestock management, agroforestry systems, animal enclosure and vaccination system.
3) Improved health and social services	• Multiple schools constructed and improvements made • Mobile medical clinic established and re-stocked • Emergency medical response system established • Bridges repaired / bridge access improved • Lake transport system established	2.1.1	Educational infrastructure development, access to potable water, medical system improvements, better nutrition, improved infrastructure and access to markets.
4) Improved governance and building of local governance and administrative capacities	• Re-establishment and reinforcement of LCDs • Participatory mapping planning	2.1.1	Participatory mapping for improved land tenure, establishment and management of LCDs, local and provincial governance improvement.

5) Biodiversity conservation and monitoring	• Biodiversity inventories	5.3.2	Biodiversity inventories, biodiversity education and awareness raising.

1.2 Standardized Benefit Metrics

Table 2 Standardized benefit metrics

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
GHG emission reductions & removals	Net estimated emission removals in the project area, measured against the without-project scenario	N/A	N/A	N/A
	Net estimated emission reductions in the project area, measured against the without-project scenario	10,773,562	3.2	13,322,277
Forest[1] cover	For REDD[2] projects: Number of hectares of reduced forest loss in the project area measured against the without-project scenario	246,216.2	2.1.7	246,216.2
	For ARR[3] projects: Number of hectares of forest cover increased in the project area measured against the without-project scenario	N/A	N/A	N/A

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

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

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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Improved land management	Number of hectares of existing production forest land in which IFM[4] practices have occurred as a result of the project's activities, measured against the without-project scenario	N/A	N/A	N/A
	Number of hectares of non-forest land in which improved land management has occurred as a result of the project's activities, measured against the without-project scenario	N/A	N/A	N/A
Training	Total number of community members who have improved skills and/or knowledge resulting from training provided as part of project activities	8,067	4.3.2	8,067
	Number of female community members who have improved skills and/or knowledge resulting from training provided as part of project activities of project activities	Not Available		Not Available
Employment	Total number of people employed in of project activities,[5] expressed as number of full time employees[6]	112	4.3.2	112
	Number of women employed in project activities, expressed as number of full time employees	15	4.3.2	15

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

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

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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
Livelihoods	Total number of people with improved livelihoods[7] or income generated as a result of project activities	594	4.3.2	594
	Number of women with improved livelihoods or income generated as a result of project activities	Not Available		Not Available
Health	Total number of people for whom health services were improved as a result of project activities, measured against the without-project scenario	2,988	4.3.2	2,988
	Number of women for whom health services were improved as a result of project activities, measured against the without-project scenario	Not Available		Not Available
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	960	4.3.2	960
	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	320		320
Water	Total number of people who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	0	4.3.2	0

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

Category	Metric	Achievements during Monitoring Period	Section Reference	Achievements during the Project Lifetime
	Number of women who experienced increased water quality and/or improved access to drinking water as a result of project activities, measured against the without-project scenario	0		0
Well-being	Total number of community members whose well-being[8] was improved as a result of project activities	11,036	4.3.2	11,036*
	Number of women whose well-being was improved as a result of project activities	Not Available		Not Available
Biodiversity conservation	Change in the number of hectares significantly better managed by the project for biodiversity conservation,[9] measured against the without-project scenario	299,645	2.1.1	299,645
	Number of globally Critically Endangered or Endangered species[10] benefiting from reduced threats as a result of project activities,[11] measured against the without-project scenario	2	5.3.4	2

**As this table is newly introduced in the combined CCB/VCS Monitoring Report template during this monitoring period (m_2), only a few of the standardized metrics were collected last monitoring period. The*

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

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

[10] Per IUCN's Red List of Threatened Species

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

metric that we did monitor in the format appropriate for this table is included above: 418 people were ferried across the lake last monitoring period (m1).

2 GENERAL

2.1 Project Description

2.1.1 Implementation Description

Throughout this second monitoring period (m2), The Mai Ndombe REDD+ Project has continued to implement its core conservation activities to reduce emissions in the Project Area. Community benefit activities that were initially established according to the theory of change results obtained from 3 social impact assessment (SBIA) workshops were refined subsequently via adaptive management. Climate, community and biodiversity project activities for m2 are described as follows:

Climate benefit implementation

The MNRP continued to reduce CO_2 emissions within the Project Accounting Area (PAA) by stopping planned legal and unplanned illegal logging, charcoal production and slash and burn agriculture. ERA Congo / WWC maintained the 299,645 ha concession under conservation status by implementing activities to offset the opportunity costs provided by both commercial and artisanal logging interests operating in the DRC. WWC also helped to design and implement the world's first Jurisdictional and Nested REDD+ (JNR) Emission Reduction Program (ER Program) in Mai Ndombe Province. By securing its nested status in the Mai Ndombe ER Program, the Mai Ndombe REDD+ Project's future ability to reduce emissions has been ensured. 247 forest biomass plots were measured in the Project Accounting Area (PAA) during m2. Disturbance monitoring for m2 was applied, as required by the VCS monitoring plan utilizing a temporal remote sensing evaluation of deforestation in the PAA. Project emissions (removals) were deducted from overall NERs accordingly. Overall, the MNRP reduced 11,970,624 tonnes of CO_2e throughout the PAA.

Community benefit implementation

School construction, repair and supply

School design and construction remained a priority for the MNRP during m2 as the main community activity. A new school was started and nearly completed in Mbale using a brand-new design and two schools were completed to meet safety standards in Kesenge and Lokanga. Desks were also replaced in these two locations. We have concentrated on fabrication efficiency and sustainability during this monitoring period, and locally-sourced blocks have been made for schools in several villages. Block construction commenced for the pygmy village of Ikita, a focal point for the project, and full-fledged construction will begin shortly after verification with proceeds from carbon credit sales. School supplies were distributed in 23 villages around the Project Area.

Community engagement – Local Development Committees (CLDs)

During the m2 monitoring period, capacity for 23 CLDs was augmented, with 10 receiving capacity building and maintenance efforts over the past 3 months along two geographic axes (Lobeke - Selenge and Bakele - Mankaba) in the southern part of the Project Area. While in m1 the MNRP sought to locate the CLDs fairly and equitably across the Project Zone, the focus during m_2 was concentrated on reinforcement / maintenance and in some cases, resuming activities in the CLDs, including collection of

stakeholder concerns, preparation of workshops and establishment of local development plans. The two Social and Biodiversity Impact Assessment (SBIA) workshops conducted for the Project Area were held at and managed by the CLDs. They have also become the focal point for village meetings and participatory mapping efforts, which begun in earnest in the Ntomba-Nzale Groupement.

Health Care improvements - Mobile Medical Clinic and Emergency Response System

In addition to HIV testing, distribution of mosquito nets and general medical response, a mobile clinic program was stocked and rolled out during m2 in collaboration with the Territory Health Commissioner to fight epidemics in villages and provide basic medical services. Focusing mainly on fighting malaria and water related illness, this mobile clinic has successfully run many times in several villages along the lake. A recent unknown epidemic was addressed using the mobile clinic, which can be deployed rapidly and on-demand. In addition, an emergency medical response system was established to aid communities with access to hospitals and ensuing medical costs.

Agroforestry & Demonstration Gardens

During m_2, 14 agricultural intensification sites were established, with 2 new sites in Lobalu and Lobeke added most recently. While the core objective remains intensification and diversification of nutrition, during m_2, activity was augmented from demonstration of new vegetable varieties to suitability for and establishment of cash crops capable of producing revenue for local communities. 303 ha of land was planted to onion, tomatoes, cucumber, eggplant, cabbage and chili peppers, all of which are new to communities in the Project Zone.

Tree nurseries were established at several sites where Leucaena leucocephala was successfully intercropped with beans. A transportation system was established to relocate saplings to far-reaching areas of the Project Zone.

Additional Activities

- Participatory mapping was continued in m2, with workshops planned for Lobeke and Mbale.
- Bridge repair and road clearing was performed along two main routes in the Project Area.
- The company purchased a new large motorized boat as well as a smaller craft to provide lake transportation to local communities.

<u>Biodiversity benefit implementation</u>

Fauna biodiversity was monitored during m_2 throughout the Project Area using line transects and camera trapping techniques, focusing on estimating density of large mammals. Market surveys were also conducted at two major ports and the grand market in Inongo to analyse the problem of poaching and endangered animal trading.

2.1.2 Project Category and Activity Type

The Mai Ndombe REDD+ Project (hereafter referred to as "MNRP") falls under VCS sectoral scope 14 - Agriculture, Forestry and Other Land Uses (AFOLU), under project category Reduced Emissions from Deforestation and Degradation (REDD) and most specifically under the activity Avoiding Planned Deforestation (APD). The project falls into this category by the definition provided in the VCS AFOLU Requirements Document Version 3 published 1 February 2012, by virtue of the fact that it prevents emissions that otherwise would have taken place under a legally commissioned logging concession.

The MNRP is not a grouped project under the VCS standard or the CCB programmatic approach.

2.1.3 Project Proponent(s)

Table 3 Project proponent

Organization name	Wildlife Works Carbon LLC
Contact person	Jeremy T. Freund
Title	Vice President, Carbon Development
Address	242 Redwood Highway, Mill Valley, CA 94941
Telephone	415-331-8081
Email	jeremy@wildlifeworks.com

2.1.4 Other Entities Involved in the Project

Table 4 Other project entities

Organization name	ERA Congo, a subsidiary of Wildlife Works Carbon LLC
Role in the project	Project implementation, operation and management
Contact person	Jean-Robert Bwangoy Bankanza Bolambée
Title	Administrateur Gérant (A.G.)
Address	32B Ave Colonel Lukusa, Kinshasa-Gombe, DR Congo
Telephone	+243 822 877 712
Email	jrbwangoy@wildlifeworks.com

2.1.5 Project Start Date (G3.4)

MR.2 The Project Start Date

The project start date is 14 March 2011.

2.1.6 Project Crediting Period (G3.4)

MR.3 The project crediting period start date, end date and length.

The Project crediting period is 14 March 2011 – 13 March 2041. The crediting period is 30 years in length.

2.1.7 Project Location (G3.3)

The MNRP area is located in the central part of the Congo River basin of the Democratic Republic of Congo (DRC, formerly Zaire). Administratively, it is located in the province of Bandundu, District of Lake Mai Ndombe, and the territory of Inongo, and encompasses three sectors: Ntomba, Baselenge, and Bolia. The conservation concession covers 299,645 hectares (ha) of terra firma forest (upland non-inundated forests), swamp forest (inundated and seasonally inundated forests), savanna, and inundated grassland (see section G1.2 of the MNRP VCS PD for further definition of these land cover types). The concession is located approximately 395 km northeast of the national capital, Kinshasa. It can be accessed from

Kinshasa by air via the town of Inongo, by boat along the Congo and Fimi rivers, or by land via a recently repaired road that runs from the village of Selenge southward through Bandundu province to Kinshasa. The concession runs along the western shore of Lake Mai Ndombe (formerly Lac Leopold II), with the nearest major population center of Inongo (pop 110,000) situated 20 km across the lake and accessible to the concession by boat.

The Project is situated in Inongo Territory in the Mai Ndombe Province (formerly Bandundu Province). The project area is located on the West shore (to the East) of Lake Mai Ndombe, between the lake itself and the Bolipa Mpe (Boruampe) River to the West, and between the Lokeke River to the South and the Bolog'o Lule River to the North. The project area is bound between 1°43' S, 17°50' E (NW corner), 1°43' S, 18°00' E (NE corner), 2°23'S, 18°15' E (SE corner), and 2°22'E, 18°00' E (SW corner).

Table 5 Project location and administrative jurisdictions

Conservation concession area:	**299,645 ha**
Province	Mai Ndombe
District	Mai Ndombe
Territory (Territoire)	Inongo
Sectors (Secteurs)	Bolia, Basengele, Inongo
Groupments (Groupements*)	Bolia (Lokanga), Ngongo (Basengele), Ntomba-Nzale (Inongo)

** The Groupement is the traditional, smallest level of government in the DRC. Groupements are governed by traditional "Chefs des Terres" (Heads of the Land).*

Please refer to the MNRP PD for a more detailed description of the project location, including the geology, geomorphology, climate, and the vegetation.

Additionally, Project location maps containing the VCS methodology (VM0009 V2.0) Monitoring Report Requirements (MRR) listed below are provided in the following appendices. **Appendix A** –Project Area, **Appendix B** – Topography, **Appendix C**, Infrastructure – roads and water bodies, and **Appendix D** – land use / vegetation Cover.

According to VM0009 V2.0 MRRs, the geographic / physical boundaries of the project area must be clearly delineated and include, at minimum, the following:

- Project area name (compartment or allotment number, local name)
- Digital maps of the area, including geographic coordinates of Project area vertices
- Total Project area and Project accounting land areas
- Details of ownership, including user rights and/or land tenure
- Project area topography
- Roads
- Major rivers and perennial streams
- Land use / vegetation type classification

MRR.1 A digital (GIS-based) map of the project area with at least the above minimum requirements for delineation of the geographic boundaries

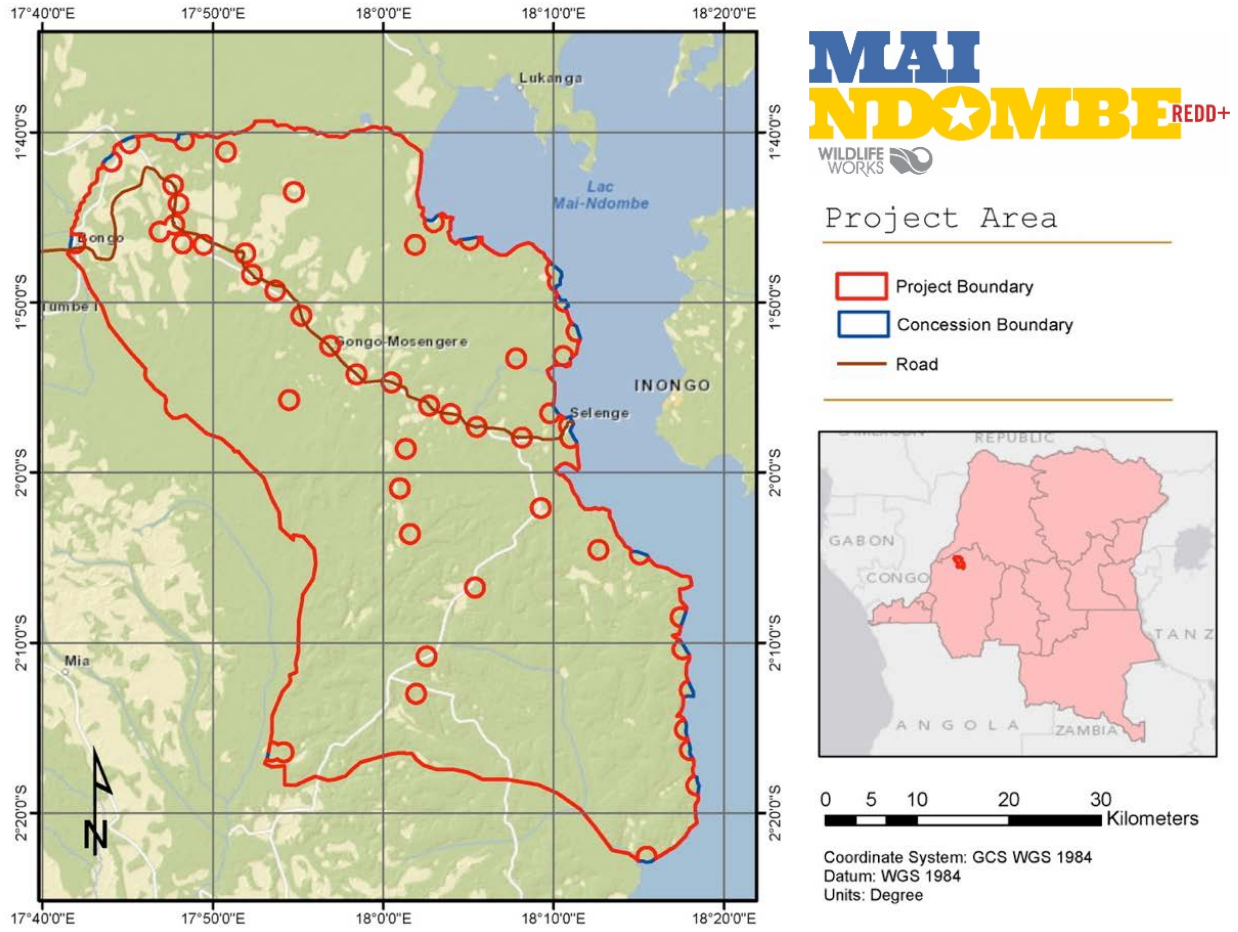


Figure 1 The Mai Ndombe REDD+ Project Area

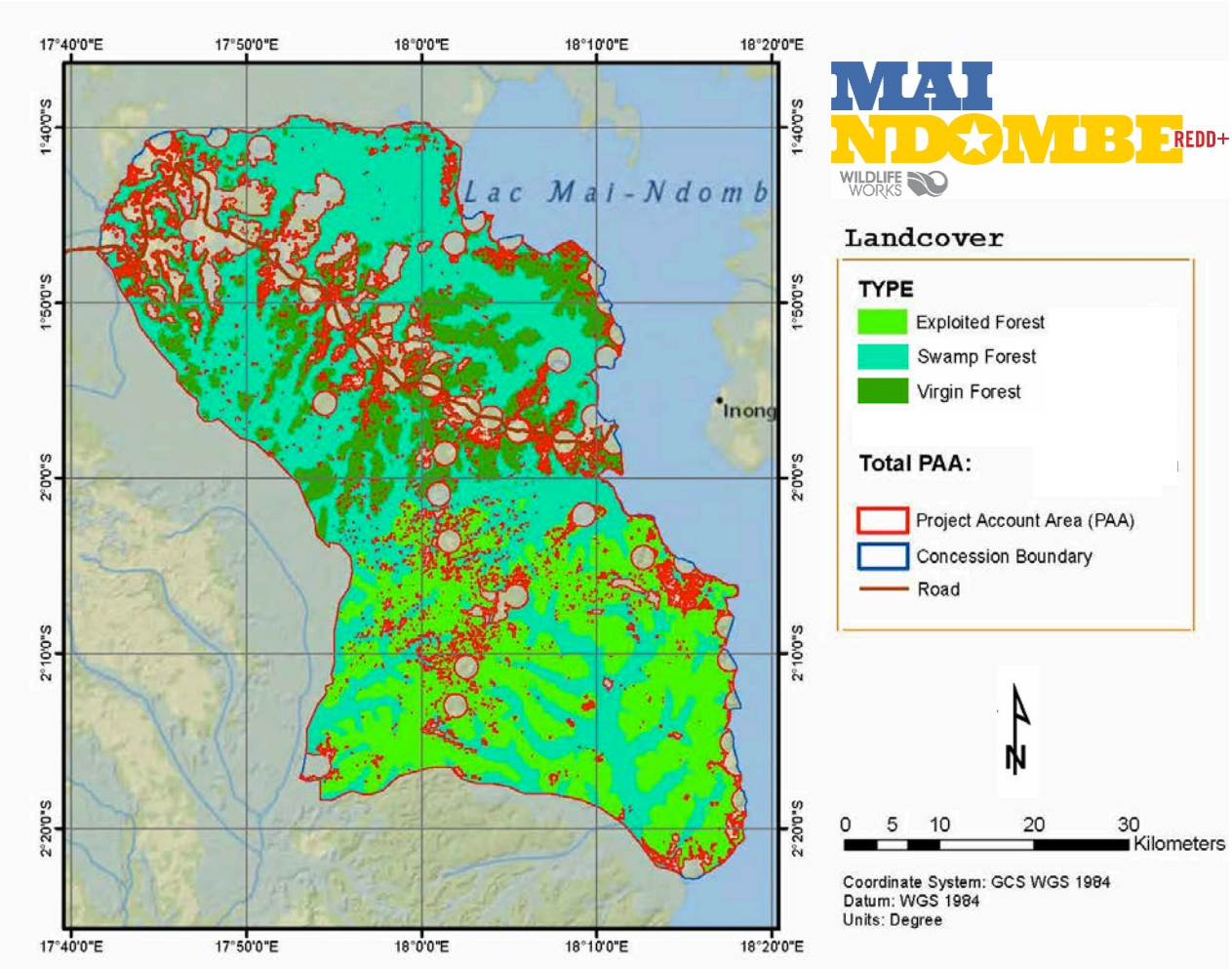


Figure 2 The Lac Mai Ndombe REDD+ Project Accounting Area and land cover classes.

MRR.6 A digital (GIS-based) map of the project accounting areas with at least the above minimum requirements for delineation of the geographic boundaries.

2.1.7.1 Project Area Boundaries

The MNRP replaced two timber concessions and was re-gazetted as a single conservation concession. The Project Area consists of the terra-firma forested parts of the two former logging concessions, now forestry certificate (permit) numbers 004/84 and 014/2004 shown below in Figure 3. The Project Area is located on the west shore of Lake Mai Ndombe.

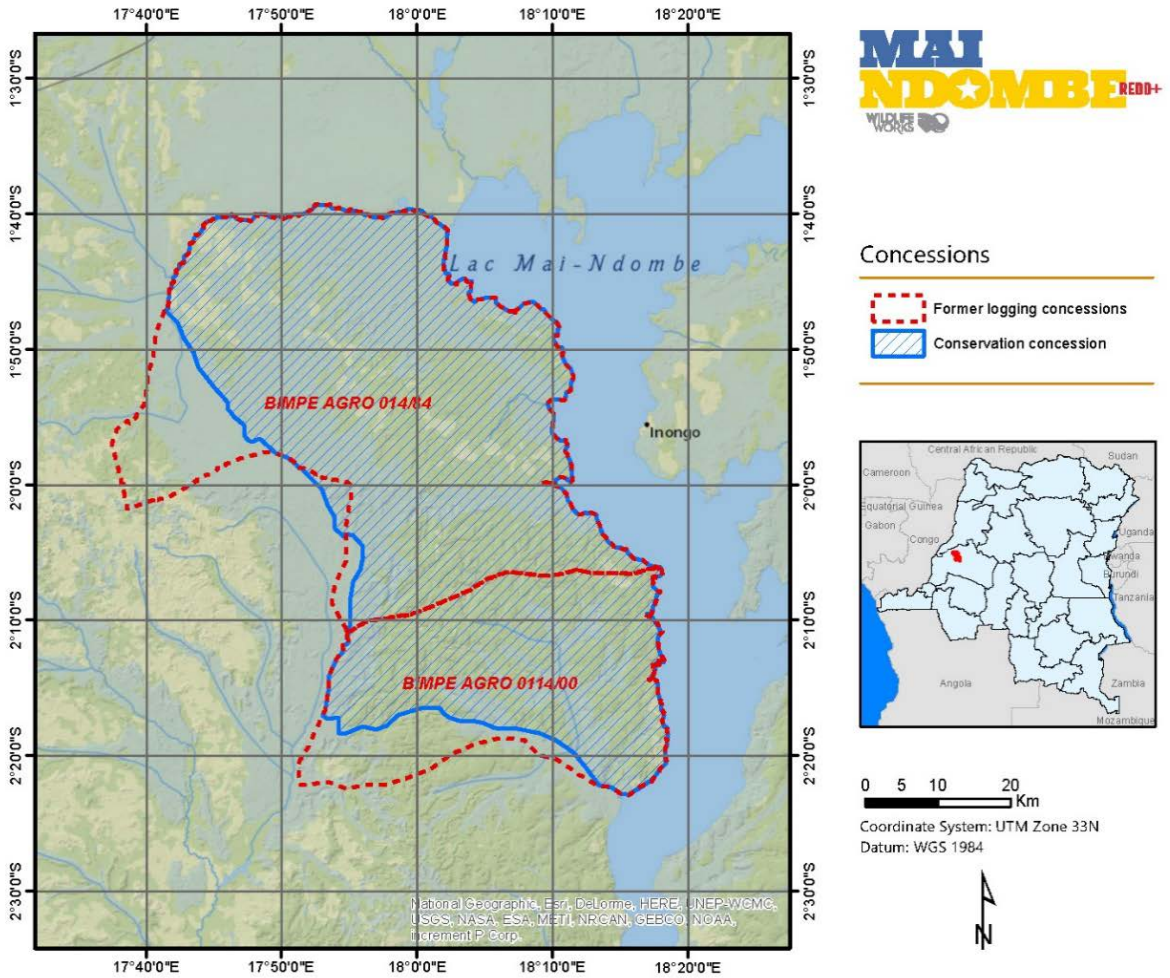


Figure 3 Lac Mai Ndombe REDD+ Project Area and the 2 former logging concessions it replaced

Table 6 Project Area boundaries

Boundary	Location
Northern Boundary	Olong'O Lule River
Northern Extent	Lat 1°39'2.87" S Long 17°52'9.95" E
Southern Boundary	Lobeke River
Southern Extent	Lat 2°22'52.04" S Long 18°15'28.95" E
Eastern Boundary	Lake Mai Ndombe
Eastern Extent	Lat 2°19'21.90"S Long 18°18'36.78"E
Western Boundary	Montaba River (which becomes) Boruampe River
Western Extent	Lat 1°45'50.43" S Long 17°41'45.20" E

2.1.7.2 Project Zone Boundaries

The project area is bordered by rivers or the lake for most boundaries; however, a number of villages were identified to be included in project activities and therefore selected for inclusion in the Project Zone. Table 7 lists reasons for inclusion in and a map of the Project Zone is shown below in Figure 4.

Table 7 Project Zone boundaries and justification

Boundary	Location	Justification for Inclusion or Exclusion
Northern Boundary	Olong'O Lule River	Runs along the north of the project area.
Northern Villages Included	Lukanga, Ikita, Nsongo, Belee1, Belee2, Ndonga	Lokanga is the seat of authority for the Lokanga Groupement. Ikita is a Pygmy village located between the project area boundary and Lukanga. Some project activities will be located in these villages and some migration in and out of the project area may occur.
Southern Boundary	Lobeke River	Runs along the south of the project area.
Southern Villages Included	Bosenge, Mbuba	Much of the Lobeke River is a government-recognized administrative boundary between two secteurs as well as the boundary between two tribes. The villages included in the project zone are the southernmost villages of the Ntomba Groupement.
Eastern Boundary	Lake Mai Ndombe	Eastern boundary of project area.
Eastern Villages Included	Inongo	A city of over 100,000 residents, and trading hub as well as the location of the Mai Ndombe project head office.
Western Boundary	Montaba River which becomes Boruampe River	Runs along western boundary of project area.
Western Villages Included	Villages within 15 km on the road running to the northwest out of the project area	Most of the communities outside of the project area are isolated by distance and lack of infrastructure. However, communities located on or near the roads heading northwest out of the project area will be included up to 15 km (estimated as a day's walk).

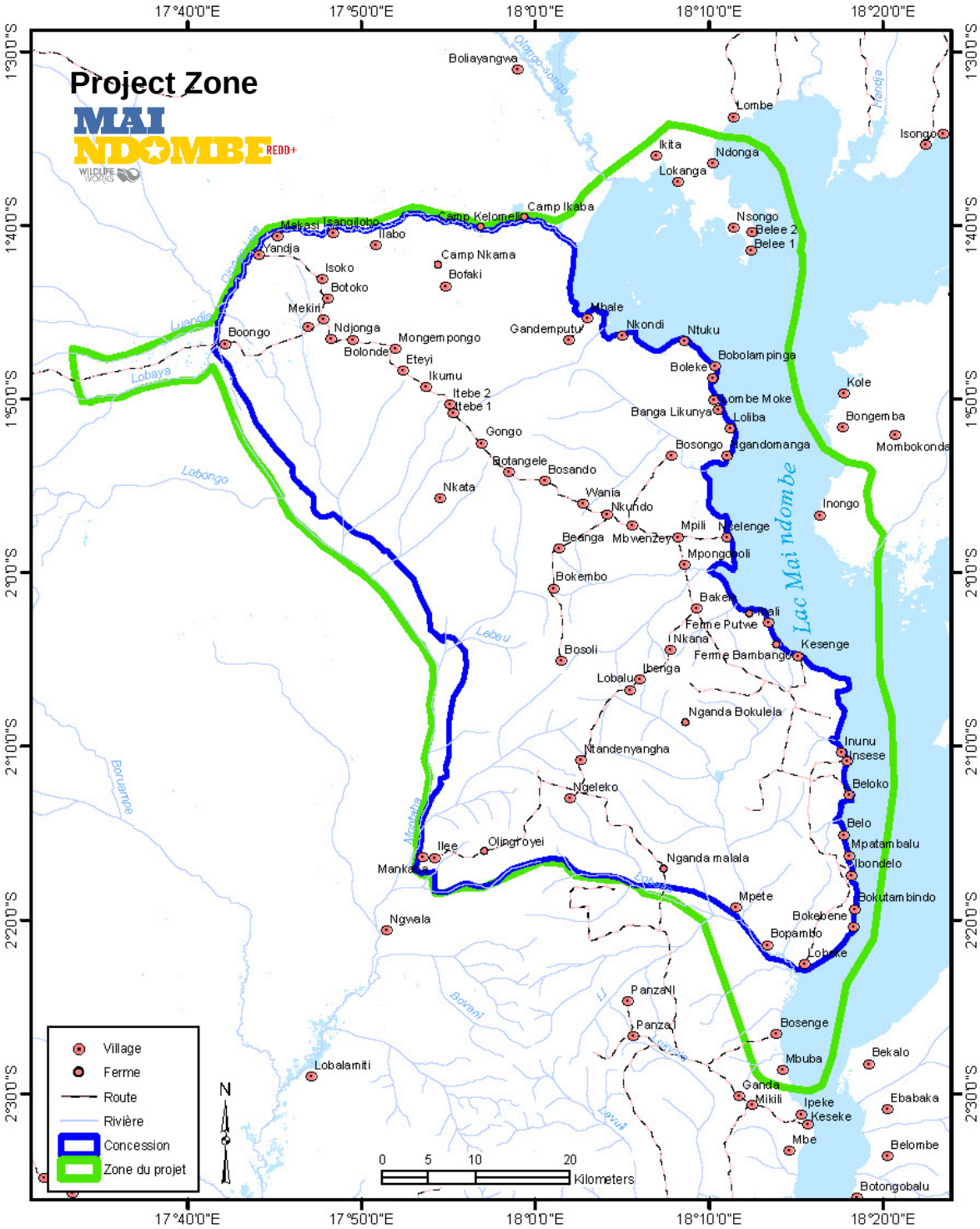


Figure 4 The Lac Mai Ndombe REDD+ Project Zone

2.1.8 Title and Reference of Methodology

The MNRP utilizes the VCS VM0009 V2.0 Methodology for Avoided Ecosystem Conversion, version 2.0. This methodology quantifies greenhouse gas emission reductions generated from avoiding either planned or unplanned (or both) deforestation as well as protection from native grassland conversion as initiated by a variety of agents and drivers.

2.1.9 Other Programs (CL1.5)

The MNRP and the Project Area in general is not currently participating in any other emission trading, social or environmental credit or other GHG program. The Mai Ndombe province is the first sub-national jurisdiction to be accepted into the World Bank Forest Carbon Partnership Facility. This REDD+ program started on January 1st, 2017. The MNRP will be nested into the sub-national REDD+ program. However, at this time, and for the period covered under this monitoring period, the sub-national jurisdictional REDD+ program was not in operation, and no GHG were generated or claimed.

2.1.10 Sustainable Development

The overall project goal is to address sustainable development indicator themes (poverty, governance, health, education, demographics, natural hazards, atmosphere, land, freshwater, biodiversity, economic development, global economic partnership, consumption and production patterns).

1. Extreme Poverty

The project area is among the poorest on earth, with approximately 100,000 people living off subsistence agriculture and with less than 1$ per household per day; and lacking everything of their basic needs while the potential and desire for economic development clearly exist. Health and nutrition status is extremely poor in the area and have deteriorated over the past decades. Over one-third of under-five years old children are chronically malnourished (stunting), and 16% suffer from acute malnutrition (wasting), reflecting wide vulnerability to short-term crises according to a report from the local public health authorities.

The national strategy document for poverty reduction identified focus areas for poverty alleviation. Enhancing agriculture production and providing clean water in villages and improving health are among the main actions to be undertaken in this regard. The project is promoting sustainable development through advancement of sustainable agriculture through agriculture intensification. Improving agricultural production and producing economically viable crops is one of the most effective ways to improve community economic situation and livelihood. During this monitoring period, 13 demonstration gardens have been created in different villages and qualified agronomists have been working with community members across the entire project area for commercial crop production (e.g. onion and tomatoes). These agronomists have also trained 27 members of the community who are going to oversee agricultural activities and agroforestry.

2. Governance

Poor governance is an important characteristic of the government system in the Democratic Republic of the Congo. The monitoring period has seen the creation of the New Lake Mai-Ndombe Province and the effective installation of the provincial government with 5 ministries out of an allowed and recommended 10 ministries total already in place. Lack of sufficient financial and human capabilities makes it difficult to effectively run that government. A lack of financial capabilities does not enable the local government to fulfill their basic needs. Area taxes from forest concessions are almost the only tangible asset available

for the Government. The economic crisis that has contributed to slowing down timber extraction activities has led to non-payment of area taxes from most of the timber logging companies in the Mai-Ndombe. This results in a very poor management at the provincial and local levels. Our company has struggled through a difficult financial situation during this monitoring period. As our situation improves at the company level, our contribution to improving government assets will also improve, especially with improved market sale for carbon credits. However, throughout this challenging period, our company has been maintaining close collaboration with the provincial and local government agencies.

Corruption is also one of the crucial factors that holds back the country. Our company has a zero-tolerance policy for corruption at all levels and for all departments and sectors of activities.

3. Health

The health situation is still extremely poor during this monitoring period. Under-five years old mortality, is in the range of 220 per 1,000 or greater, one of the highest in the world. Maternal mortality is similarly among the highest anywhere, estimated at 1,300 per 100,000 live births. However, the total fertility rate remains very high, which poses a challenge to forest and biodiversity conservation.

Malaria is the number one killer, especially for children. It is highly endemic in the area. It has been blamed for more than 40% of child deaths and a considerable proportion of mortality at all ages. Our company has been spending thousands of dollars monthly to fight malaria and save children in the area as support from local and national governments are critically lacking. Partnership with the local government has led to the implementation of a Mobile clinic aimed at fighting epidemics, supporting vaccination and providing medication for local health care facilities and improving these facilities.

Figure 5 Child drinking water from a river

4. Education

Recent surveys in the Democratic Republic of the Congo have linked household-level determinants of health and nutrition outcomes with mothers' education. Except for fever incidence (which is highly linked to Malaria), most studies of the determinants of many health outcomes (child mortality, malnutrition, diarrhea, and respiratory infection) show DRC-wide, that children of mothers with any education are at lower risk and that communities with more educated young people are less destructive of the forest. This is the most important reason why WWC / ERA Congo and local community focus is on building schools and in encouraging girls' primary and secondary school education.

WWC / ERA Congo has planned to build 28 schools in the project area over the life of the project. For this monitoring period, a complete school has been built in Mbale and two schools where construction began in our first monitoring period have been completed in Lokanga and Kesenge. The company has also equipped these schools with school benches for students. To address the general situation in the project area characterized by extreme poverty, the company has provided the students with school supplies in 2013, 2014 and 2015. More school building activities have been started in the villages of Lobeke, Mpata

Mbalu, Nsongo and Ikita. These are expected to be completed in 2017 and 2018. So far, high schools in Lokanga and Mbale that received support from the project have achieved excellent results during the national state exams.

5. Demographic situation

More than 28 villages are located within the project area and some 100,000 people live on the shores of the lake Mai Ndombe. As said in the previous section, under-five years old mortality is one of the highest in the world. However, the total fertility rate remains very high (3% per year), which poses challenges to forest and biodiversity conservation. Family planning methods exist including usage of preservatives (condoms). The project has been helping in providing these family planning tools to community members during this second monitoring period.

6. Water

Water is abundant in the project area thanks to the presence of two rainy seasons, linked to the ascendant and descendent movement of the Inter Tropical Convergence Zone (ITCZ). However, water related illness is the second leading cause of mortality in the area (after malaria). Many children die every year from disease associated with lack of access to safe drinking water. Despite the magnitude of the problem, little or no progress has been made towards solving this problem; showing sharp contrast between the abundance of water and lack of drinking water in villages. Villagers dig shallow wells or pull water out of streams that are usually contaminated by wildlife or other. currently, it is practically impossible to count how many children die each year, simply because such records are rarely kept in villages or even because those who are affected never see a doctor.

The company is exploring different approaches needed to provide solutions that are affordable, allowing communities to meet their need for potable water. The use of low-cost drilling machines has proven its usefulness and effectiveness in some parts of the African continent as a means of increasing the availability of potable water in remote villages. Hydrogeology is highly favorable for light equipment drilling and the secure water table can be reached at less than 50 meters from the surface in most of Mai Ndombe.

7. Biodiversity

Threat: The Mai-Ndombe REDD+ project area has undergone forest logging three times in the past, with the state-owned company, FORESCOM, first in the 1920's, then Bimpe Agro in the 1980's, and most recently by SOFORMA from 2003 to 2008. While logging activities do not usually directly result in total stand destruction, the removal of large trees and forest openings facilitate clearing for cassava and corn cultivation by locals. SOFORMA's logging intensity is particularly destructive as it leads to a high number of trees being removed. This creates important openings that favor extension of slash and burn

Figure 6 Unsustainable slash and burn agriculture leading to deforestation in the project area. Pictured: Prince EA's visit to the project area

agriculture, forest degradation and eventually complete deforestation (cascade of deforestation) (Figure 6).

This legal and illegal logging is the principle threat to the forest and biodiversity in the project area. The climax ecosystem of this area is a tropical semi-deciduous forest characterized by the dominance of deciduous species; specifically, Milletia laurentii (Wenge) in the upper canopy layer in mixture with evergreen species in the upland, while dense swamp forests dominate water-logged areas covering 42% of project area. Wenge (false Ebony) is one of the most valuable timbers in the world. Extensive conversion of primary terra firma forests has occurred mostly in the southern part of the Mai Ndombe province due to combined effects of timber extraction and population pressure through unsustainable slash and burn agriculture. This conversion has not yet reached swamp forest but evidence provided during project validation from another SOFORMA concession shows that eventually even the swamp forest is logged, as it is seasonally drained.

Addressing these deforestation drivers and biodiversity disturbance, the company has implemented a zero-tolerance policy towards illegal logging and worked with local community members to monitor poaching from people coming from outside the project area during this monitoring period. This policy has contributed to lowering the threat to the forest and to maintaining the intactness of most of the project area forest. As a result, some endangered species have made their return to the project area and some other are now approaching villages.

8. Agriculture and economic development

Unsustainable extensive slash and burn agriculture has been identified as the main deforestation driver in the area. However, this is the most reliable source of income for local communities. According to recent surveys, local community income from cassava cultivation is in the order of 400 dollars per household per year. This is not enough to sustain their livelihood and to create any economic progress for the community. As agriculture and fisheries are the only source of economic and monetary resources, the company has designed a program for agriculture intensification with a focus on effective and rational use of areas under fallows or land occupied by young secondary forests thus, addressing the deforestation drivers while increasing the economic potential for local community members. This program has led to introduction of crops that have not been produced in the past and that are more commercially valuable locally and nationally such as onions and beans. The company has 13 demonstration plots across the entire project area and has trained local community members to use sustainable agriculture.

2.2 Project Implementation Status

2.2.1 Implementation Schedule (G3.4)

The main project activities are described in the Concession Contract under the Social Clause (Cahier de Charge) that was signed between the Minister of the Environment and the project proponent in August 2011. These activities include:

1. Construction of 4 large school buildings in Lokanga, Kesenge, Ngongo and Lobeke to accommodate public schools (mostly unhoused) for these villages; construction of 6 medium-sized schools in 6 more villages and 10 buildings to accommodate elementary schools in small villages.

2. Improve the health care network in the project area through 1) rehabilitation of the secondary hospital of Lokanga and Ngongo and 2) construction of buildings for 1 secondary hospital in Lobeke and 5 small clinics throughout the project area.
3. Improve local community livelihood through improved, intensive and enhanced sustainable agriculture and high agriculture productivity.
4. Maintenance and capacity building for Local Development Committees (CLDs) in each village and Groupement.
5. Organize 10 sale points for manufactured goods and commodities and provide information access points (satellite television) for some villages (a special request from the Mpata Mbalu village).

Table 8 Project implementation schedule

Date	Milestone(s) in the project's development and implementation
Sept. 2009 – March 2011	Consultation for Free Prior Informed Consent (FPIC) process
14 March 2011	Signature of the Carbon Right Agreement
26 March 2011	Signing of Social Chapter by local communities
August 2011	Signature of the Forest Conservation Concession Contract
2 August 2011	Inauguration of activities (Minister of Environment) with the construction of the first school in Kesenge
October 2011	Debut of school construction in Lokanga and Kesenge
February 2012	Inauguration of the first school in Lokanga (Minister of Environment)
February 2012	Organization and capacity building for Local Development Committees in villages (Start date)
February 2012	Information, Education and Communication (EIC) program (Start date)
September 2012	Agriculture Intensification and Agroforestry (Start)
15 September 2012	First field audit
April 2012	Technical Review of the first two schools
May 2012	Acquisition of construction materials for schools in Lobeke, Mpata-Mbalu, Mbale and Ikita.
June 2012	Fabrication of blocks for schools in Mbale, Lobeke and Mpata-Mbalu
m2	Mobile medical clinic in selected villages in the project area
m2	Biodiversity monitoring reveals return of elephants in the project areas

1.1.1.1 Sales points for manufactured goods and commodities and providing communication points for villagers

The sale point activity has not started yet due to difficult access to and from the market. The company is now partnering with local businesses who are selling manufactured goods in the Inongo market. The company provides foreign currency in Inongo in exchange for local payment in Inongo in order to avoid transferring local currency to Kinshasa using unsecure money transfer methods and to facilitate availability of foreign currency for payment.

Regarding communication access for villages, the project has provided television access point to 14 villages in the project area including satellite TV dishes and television. Most of this equipment is working properly. However, electricity is still an issue for operation. The company is discussing with a private entity now in Kinshasa that will provide with electricity from solar energy to villages at the communication access point and for charging telephone.

2.2.2 Methodology Deviations

Not Applicable

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

Not Applicable

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

Modification of CCB monitoring indicators

For the MNRP, the CCB monitoring indicators as per CCB v2 were required to be validated as part of the CCB monitoring plan prior to implementation of the project activities that they describe. As part of our adaptive management plan, we evaluate the indicators themselves for appropriateness and ease of quantification. During m2, several indicators were identified as difficult / impossible to quantify and for others, the reporting frequencies were determined to be unrealistic. As such, we have opted to modify the CCB monitoring indicators as follows:

1. modify the reporting frequencies for those indicators where the frequency was observed to be inappropriate;
2. modify the reporting units for those indicators where the units were previously observed to be difficult to quantify and
3. remove those indicators that were observed as difficult / impossible to quantify.

Details for the modified or discarded indicators have been provided to the VVB and are reflected in Table 24 below.

Modification of the project proponent

In the Project Description of the MNRP the Project Proponent is listed as being jointly Wildlife Works Carbon and ERA Ecosystem Restorations Associates. In 2013 Wildlife Works Carbon bought out ERA's share of the project, to become the sole Project Proponent. The Deed of Partial Release was filed with the VCS on 16 December 2013.

2.2.5 Risks to the Project (G3.5)

Civil and political instability

The Democratic Republic of the Congo is still emerging from a prolonged period of instability and civil unrest. The Lake Mai-Ndombe area, however, has been minimally affected by this war and other upheavals that have recently occurred in the country. The last four years have been relatively free of unrest throughout the country. The effective administrative subdivision of the country into 26 new provinces has translated to a new provincial government including an executive branch and a local parliament. In fact, the Mai-Ndombe and Plateau Districts have merged to form the new Mai-Ndombe province. This has added to a slight political stability in the area. However, corruption and administrative harassments have been still significant in the entire country and specifically along the transportation water ways in the Mai-Ndombe province.

Even in this challenging time, the project has provided greater benefits to the community and to the new province above and beyond benefits brought by other interests. ERA Congo / WWC has provided a robust and fair benefit sharing procedure that provides protection for both the Carbon Rights Agreement and conservation concession contract. With the ongoing project activities, community support for the project has grown as the project management team has gained experience handling and resolving conflicts and dealing with a difficult administrative system.

Land tenure

A legal land concession over 299,640 hectares of land has been granted to Wildlife Works and its subsidiary ERA Congo for conservation purposes by the DRC Government, who are the legal forest and land owners (Land Tenure Act - Loi Fonciere). To comply with the law and regulation, the Government has signed the Carbon Rights Agreement and the Forest Conservation Concession. In addition, the country has clearly shown its commitment to support forest conservation activities and specifically REDD+ programs as it is now the first country in the world to negotiate an Emission Reduction Purchase Agreement (ERPA) with the World Bank's Forest Carbon Partnership Facility. The country was among the first of 7 readiness countries and has satisfied all required conditions for entering Emission Reduction (ER) purchase negotiations. WWC and its subsidiary ERA Congo SARL have been among the leaders in supporting the DRC Government to fulfill requirements from the FCPF rules.

The Mai-Ndombe REDD+ project has been fully integrated in the program and fits into the broad national REDD+ strategy which involves access to bilateral and multilateral donors such as the World Bank and the Central African Forest Initiative (CAFI) funded through a USD $200 million grant from the Government of Norway. As part of this initiative, CAFI is funding forest conservation activities in the Mai-Ndombe which will certainly benefits the project, local communities and the provincial Government.

Local communities have customary land use rights for using local community land inside of the forest concession and for goods derived from working the land. These rights have however not been clearly articulated in the Forest Code nor have they been clarified in the recently signed Decree related to Community Forests as no specific provision relates to industrial and/or Conservation Concessions. There is clearly a duality between the Government declared ownership to the forest and the practical and on-site claim for forest and land ownership from local communities. This situation is a source of conflicts between community members and forest projects proponents in the entire country. Free Prior and Informed consent is a way of getting community members involved in the REDD+ process. In accordance with provisions of our Concession Contract, local leadership and community members have been consulted in the process prior to the project start and consultation has been continued and will extend throughout the project life. Through the FPIC process and the process of signing Cahiers de Charges, community members have given their consent to develop a REDD+ project in their customary lands. ERA-Congo has

been maintaining close contact and collaboration with these community members which has significantly minimized risks for community members to turn against the project. However, some resistance was encountered early in the project especially in the village of Mbale in the Lokanga Groupement, and Mbwenzey, Mpili and Ngongo in the Ngongo Groupement. The project has instituted a permanent dialogue with community members in these villages which have now fully accepted the project. The project is now working with community members to build a school in Mbale and on sustainable agriculture while working in Mpili and Mbwenzey for agriculture intensification and building CLD capacities.

Illegal activities

The project has been monitoring any illegal activity for the last four years. Five attempts for illegal timber logging have been detected in some villages of the project area, namely Kesenge, Bosongo, Nkondi, Mpata Mbalu and Mpi. These activities have been stopped at an early stage, thanks to a close collaboration with local communities and local authorities. This shows that working alongside community members and local authorities helps minimize risks related to illegal logging in the project area. Moreover, the company has partnered with small logging companies that hold small concessions in the area. Some have decided to embrace the conservation path as they see better opportunities and other have decided to supply the company with timber needed for school and clinic construction from their owned lands.

Small scale unsustainable wood extraction for fuelwood, charcoal and local building supply have continued on a very reduced pace outside of the project accounting area, in close proximity to villages, an area that has been agreed to as “community forest land” where agricultural activities are conducted and such timber extraction is allowed. This area has already been excluded for carbon accounting. Therefore, these activities will not affect the carbon quantification. Moreover, the ongoing agriculture intensification program will further help reduce extensive agriculture and therefore contribute to increase conservation land.

Fire, disease and other natural risks

The project area consists mostly of dense humid and semi-deciduous heterogeneous forests with a very low percentage of resinous trees. As such and because of the Congo Basin’s climatic regime which, unlike the amazon has no ENSO-like drought event these forests have inherently low susceptibility to catastrophic fire, insect disease and blow-down event.

However, as reported in the CCBA PD (see page 71), the project area experienced an exceptionally dry year in 2011 that led to important forest fires; mostly in the south-western part of the concession. That event is comparable to the amazon like burn-event extensively described by Cochrane in numerous studies (See PD page 71 for references). Rampant forest fire from neighboring savannas outside the project area spread out to the forest in the project area, after crossing a dried-out swamp forest. Other fires expanded from burned savannas to neighboring forests in the same manner as described above and led to some forest loss.

It is difficult to fully address such a stochastic and unusual event in a very efficient way. However, going through meteorological archives available in Inongo may allow for monitoring the frequency of that event. Using this data, the project proponent is trying to understand the frequency to prepare to alleviate adverse effects of such a phenomenon in the future. The main mitigation measure is to work with local community members to raise awareness of the potential damage done to the forest by fire in order to avoid forest fires during dry years. In addition, we will actively monitor fire activities using satellite data (MODIS data has been used to document this event) and take corrective measures if necessary.

2.2.6 Enhancement of High Conservation Values (G3.6)

The MNRP's activities aim to protect habitat landscape in order to ensure the maintenance and even enhancement of high conservation value (HCV). We achieve this goal by protecting species and their habitat ecosystems by minimizing fragmentation within the project area. Several project activities ensure that these conservation goals are achieved, including: increasing local awareness and capacity for conservation, generation of livelihood alternatives to reduce pressures on the forest (including agricultural intensification), and active biodiversity monitoring.

Fulfilling these goals remains a great challenge. However, biodiversity monitoring in the project areas has shown a decrease in annual deforestation rate and an increase in biodiversity HCV. In fact, before and after project analysis shows important contrast in animal distribution and poaching levels. Our forest is home to endangered pygmy chimpanzee (bonobo), one of humans' closest relatives. However, while biodiversity assessment in the previous monitoring period has reported Bonobo's presence in most of the project area, geographic analysis located them far from villages and away from the lake shore. Toward the end of m2, however, trap cameras have shown bonobos approaching villages because of reduced poaching (Figure 7).

Figure 7 Bonobo pictured by a camera trap less than 7 km from Kesenge village

Home to forest elephants in the past, poaching has contributed to a complete depletion of forest elephant in the area. Signs of elephants returning to the area (measured by dung counts) are more common nowadays, following conservation efforts by ERA-Congo / WWC (Figure 8).

These elephants may have migrated from the westernmost forest in Yumbi and Lukolela territories to our project area, following disturbance and poaching in the western forest, to enjoy a quiet and relatively peaceful environment within our project area.

Figure 8 Dung counts and elephant trails in the Project Area

A more endangered mammal species has also been identified inside of the project area: the giant pangolin. A study is currently underway to understand its migration and/or survival strategy during fragmentation and disturbance.

Finally, no change has been reported for plant species from the biomass inventory. We have continued our forest protection mission during this monitoring period, in addition to closely monitoring flora and fauna biodiversity. The conversion of the project area from a logging concession to conservation has continued to act as the key activity that ensures the maintenance / enhancement of high conservation value, by maintaining the landscape and ecosystem integrity.

Increasing local awareness and capacity for conservation has greatly contributed to reaching these goals, especially in the southwestern part of the project area. Also noted in the CCB PDD, generation of livelihood alternatives to reduce pressures on the forest (including agricultural intensification), and active monitoring will continue to achieve these goals in highly populated areas.

As in the previous monitoring plan, the following biodiversity- and ecosystem-related HCVs were closely monitored and special consideration was provided to ensure their integrity:

- Forests critical to water catchments and forests that provide barriers to destructive fire
- Areas fundamental to meeting the basic needs of local communities: food, medicines, fuelwood, and raw material for building and crafts
- Areas critical for communities' traditional cultural identity: sacred sites, resources for artistic and traditional purposes, and importance to local worldview.

Forest conservation supports a direct mitigation strategy against deforestation. Promoting forest conservation in water catchment locations in turn maintains natural fire barriers, which lowers risk of uncontrolled fire events. On the other hand, ERA Congo / WWC's agriculture intensification program represents a critical step towards identified HCV categories, by protecting community forest fundamental

to food security, medicines, fuelwood, material for building and crafts, sacred sites and providing resources for artistic and traditional purposes.

2.2.7 Benefit Permanence (G3.7)

Empowerment and the building of capacity for local communities is the best guarantee of activity / benefit permanence beyond the project life time. Stakeholders have identified poverty is the most important enemy of conservation. By promoting education and providing novel techniques and economic benefits through improved agriculture and fisheries, the MNRP is empowering local community members, enabling them to produce goods and services in a sustainable manner. Communities have eagerly welcomed agricultural intensification and agroforestry activities. They have enjoyed producing valuable crops in areas close to their houses rather than spending vast amounts of energy for unsustainable, extensive cropping systems far away from villages that also contribute to the destruction of their forests.

While ERA Congo / WWC may request a renewal of the conservation concession beyond the project life time, we believe local communities will choose to further continue these activities as they enjoy reduced hard labor and increased benefit. Conservation of biodiversity and forests of course follows as a natural biproduct of these sustainable socio-economic activities, which is of course the very aim of REDD+.

2.3 Stakeholder Engagement

2.3.1 Community Consultation (G3.8)

Consultation began in 2009 before the official project start date on a multiphase approach which includes communication of important project information to insure full involvement of stakeholders to the project design and implementation and address grievances in the channeled process and most importantly addresses their concerns regarding the projects impact to their activities and livelihood. This process is a permanent one and last throughout the project life time.

The company has been providing information and education to the community and also maintained direct and constant communication with local community members and CLDs. Two main workshops on Education, Information and Communication have been organized in the Groupements of Ntomba-Nzale and Lokanga, following the successful installation of their Local Development Committees. During these workshops, community members have been provided information regarding REDD+ projects and programs and their rights pertaining thereof and the grievance policy. This has improved local knowledge and skills with respect to participatory, democratic decision-making and management-oriented processes related to community development.

The company has in addition hired and trained two local community members in each village to serve as permanent community trainers (local animateurs) in addition to 2 local agronomists helping the community for agriculture intensification and sustainable agriculture production. A total of 25 local animateurs and an additional 27 local agronomists work in each village of the Ntomba-Nzale and Lokanga Groupements to raise awareness for conservation and to assist community members on biodiversity conservation and agriculture improvement. Short- and medium-term impacts resulting from this increase in knowledge and skills include the communities' ability to collectively and locally respond to community issues and an increased local capacity for governance, administration, and problem solving. Ultimately, as these skills are developed, assisted, and enhanced, the long-term impact will be improved community well-being especially with improved agricultural production.

During the m_2 monitoring period, the following activities have been organized:

- Training of trainers in Agronomy and Agroforestry
- Training of trainers (local animateurs) in community engagement;
- Education, information and Communication;
- Social and Biodiversity Impact Assessment (SBIA) workshop

2.3.2 Public Comment Period Publicity (G3.9)

The aim of the public comment period is to allow primary stakeholders to voice their opinion of the MNRP, including any grievances or concerns. The following steps were taken to ensure all stakeholders are aware of and provided a means to comment on the documents required for the public comment period:

- Notices announcing the dates of the auditors' visit, their names and contact information was posted in English, French and Lingala at the project office in Inongo, and at the CLDs within the villages.
- The Project animateurs and the CLDs announced to community members the start of the public comment period at all recent community outreach meetings and encouraged them to file comments. Project animateurs will also make note of any verbal comments and ensure that these are transcribed and registered.
- All members of the public may visit the project office to review comprehensive project documentation, or receive verbal details re: the MNRP, the audit and public comment period and / or the public comment process. If requested, MNRP staff gladly assists any community members in submitting comments directly to the CCB standard via their website. All public comments received in writing are scanned and provided directly to the VVB and sent to the standard via email.

There were no public comments received from project stakeholders at the community level during the m2 public comment period. However, a set of comments were submitted in a single document by an international NGO which has no affiliation with the MNRP. These comments were nonetheless taken seriously and assessed independently by the VVB, the results of which can be found in the verification report Appendix 1. None of the comments were found to have a material effect on the project, and all were resolved satisfactorily by the VVB.

2.3.3 Distribution of Project Information (G3.9)

The following steps were taken to ensure all stakeholders have access to the project monitoring report document and other project documentation.

- An executive summary of the monitoring report was made available in English, French and Lingala at the project office in Inongo and through the CLDs in the villages.
- The project animateurs and the CLDs communicated to community members the start of the public comment period at all their community outreach meetings and details of the project, and other key project documents verbally during meetings.
- All members of the public may visit the project office to review comprehensive project documentation or receive verbal details re: the MNRP.

2.3.4 Conflicts and Grievances (G3.10)

The MNRP has an open-door policy toward grievances related to project operation and activities. We maintain a close link with stakeholders by working actively with each and every community on a daily basis. The MNRP also offers the same policy for staff wishing to talk about issues they may be facing.

The project enacted a grievance redress procedure at validation that is designed to address grievances between stakeholders and WWC / ERA-Congo, the MNRP project proponent. The procedure provides an accessible, fair and efficient mechanism for resolving complaints and grievances, and ensuring that the process is transparent and comprehensive. The grievance redress document was provided to community members upon establishment of the CLDs. It was translated in Lingala, the local mother tongue and publicized (available at the CLDs and the project office in Inongo) to ensure accessibility for all community members. Public meetings have been organized at the CLDs to ensure broad distribution. Two types of issues are addressed in the grievance redress procedure:

- Grievances or complaints between communities in the MNRP project zone and the project proponent, WWC / ERA Congo
- Concerns regarding worker rights, work practices, and worker safety raised by WWC/ERA Congo employees or contractors

The detailed process for dealing with grievances and complaints is also comprehensively described in the CCB PDD (pg. 84).

All complaints or grievances received during this monitoring period (m2), were recorded and handled following our policy. There were no complaints or grievances submitted for this monitoring period.

2.4 Management Capacity and Best Practices

2.4.1 Required Technical Skills and Expertise (G4.2)

The MNRP is owned by Wildlife Works Carbon (WWC) and managed by ERA Congo, a wholly-owned subsidiary of WWC. WWC is a community- and conservation-focused private organization established in 1997. It is the world's leading REDD+ project development and management company, with an effective approach to applying innovative market-based solutions to the conservation of forest and biodiversity. WWC's headquarters are in Mill Valley, California, but its operations are focused in Africa, Asia and Latin America. In 2011, WWC's Kasigau Corridor REDD+ Project became the world's first dual VCS & CCB validated and verified project. WWC followed this in 2012 with the validation and verification of the MNRP in the Democratic Republic of the Congo, another first of its kind. Wildlife Works Carbon has two decades of experience in operating successful conservation projects in East and Central Africa.

The principle management team for the MNRP is comprised of both members of WWC's headquarters staff, staff from the Kinshasa office that manages project finance and administration and the MNRP local staff who manage project operations and all other activity on the ground. Most of the employees in these offices, including most of the principle management, have been involved in the MNRP since its initial development. This has served to maintain the large amount of technical, geopolitical and socio-economic skill and expertise needed to implement and operate the MNRP. The MNRP additionally maintains robust SOPs and monitoring plans that provide detailed instruction for carbon accounting, community and biodiversity assessment. New and existing employees receive training on these SOPs and monitoring plans, ensuring that they are implemented properly and consistently.

There are no other entities involved in the development or implementation of the Mai Ndombe REDD+ Project.

2.4.2 Worker Training (G4.3)

MRR.81 Documentation of training for field crews.

Community and employee education and capacity building related to payment for ecosystem services, climate change, the carbon offset industry, measurements, and monitoring is on-going and continues in the form of meetings, workshops, and open discussion. Training mentioned below will therefore continue to benefit existing and future employees in the form of training for trainers. Newly hired animateurs and foresters are provided training and orientation by current experienced employees in the same field during their initial employment periods. The MNRP maintains SOPs and work plans for all project activities which serve to guide training for new employees. They are modified as management practices and activities are adapted. Initial carbon inventory was administered by Jeremy Freund, WWC's VP Carbon Development and Jean-Robert B. Bwangoy-Bankanza, WWC's DRC Country manager and ERA Congo's Administrateur Gérant (Managing Director) for the MNRP. The MNRP maintains ongoing collaboration with universities for forester training. Training in forest inventory methods relating to remote sensing and Geographic Information System (GIS) was provided to the foresters by the University of Maryland department of Geography, in conjunction with OSFAC (Observatoire Satellital des Fortês d'Afrique Centrale) and the University of Kinshasa department of agronomy.

m2 training activity

For carbon accounting, WWC's Director of Forest Science Simon Bird, and Field Forestry Manager Gordon Smith provided a training on forest inventory methods and tree allometry determination.

Also during m2, there were several training workshops held in a variety of areas for both the Kinshasa and Inongo employees:

- There was a Red Cross safety training session held February 26th – 28th, 2014 for the Inongo office in first-aid and general public health matters.
- There was a safety, hygiene and cleanliness workshop held in Inongo on April 8th, 2014
- There was a fire extinguisher training workshop held in Kinshasa on May 16th, 2014.
- The foresters received important training in improved biomass measurement techniques and species identification in a field/office training conducted in the Project Area on March 18th – 24th, 2014.
- The animateurs, agronomists and foresters received training in Social, Biodiversity Impact Assessment analysis (EISB in French) in September 2013 from Dr. Mwangi Githiru, director of biodiversity for Wildlife Works.
- The animateurs (both principal and local), the agronomists and select members of the CLDs received participative micro-zoning (cartography) training May 2013.
- The local agronomists received agronomy training from our lead agronomist, Eddy Mbabila July 2014.
- Kinshasa staff received training by the National Institute for Professional Preparation (INPP) in the areas of accounting, bookkeeping and general office procedures, mechanics and logistics between 2013-2014.
- Several employees received English language training from Congo-American Language Institute (CALI) during 2013.

2.4.3 Community Employment Opportunities (G4.4)

As detailed in the CCB PDD, the MNRP is committed to hiring employees based on the principle of equal opportunity regardless of gender, race or religious belief. According to Social Chapter of the conservation concession contract known in French as "Cahier de Charge", for candidates with equal qualification,

experience and test scores, preference has to be given to local candidates. In accordance with these requirements the Project has been hiring local people whenever possible for all levels of unskilled, technical, and management positions. As of now, 112 full time positions in all skill and pay levels have been offered to locals: from boat drivers and construction workers to the managing director. Of these employments, more than 53 positions are being directly held by community members in the project area, not included construction workers and forest and biodiversity inventory crew. In fact, the project has hired 25 local animateurs from different communities (two in each village of the Ntomba-Nzale and Lokanga Groupement) in addition to 27 local agronomists in the same villages. This has been a substantial contribution for the wellbeing of these communities in addition to the ongoing activities.

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

All employee rights and employer regulations and responsibilities in the DRC are covered by the "Code du Travail", the Labor Law. In keeping with the code du travail, MNRP has developed and received government approval for its own internal employee policy. This policy has been distributed among all employees and is presented and explained to prospective employees. All documents concerning the adherence to the above two policies are on file at the ERA offices in DRC.

2.4.5 Occupational Safety Assessment (G4.6)

The MNRP ensures that workers' health and safety are protected to the best of its extent at all times and across all sites. Risks are identified, mitigation strategies produced and appropriate measures adopted to minimize the risks.

Given the nature of the MNRP and its geographical surroundings, it is recognized that certain occupations inherently present a risk to the health and safety of workers, particularly those that require spending long periods in relatively remote and rugged areas. These include foresters and biomass sampling teams, local researchers and community relations officers (animateurs), who may be faced with challenging terrain as well as the risk of encountering wild animals or people involved in illegal activities such as poaching, wood cutting or illicit cultivation who could pose a risk to their safety. In addition, forest fires may also pose a safety risk if they spread rapidly and unexpectedly. The MNRP has created a comprehensive Health and Safety Plan that ensures that all workers' health and safety is protected to the extent possible, and that all workers are fully informed about workplace risks and safe practices to mitigate those risks. These include training in safe working practices, first aid training for appropriate staff members as well as the enforcement of requirements for safe handling of equipment and other materials. This Health and Safety Plan additionally provides a comprehensive list of the measures that will be taken to inform employees of their rights, to assign roles and responsibilities to supervisors and workers and provide a safe workplace culture. This document is revisited regularly and adaptively managed as needed to ensure that it contains current information and includes all job categories and potential risks. The plan will be updated periodically to ensure that it covers all current positions and safety risks, and that it utilizes the most up-to-date safety best practices. A copy of the plan has been provided to the verifier and will be kept at the project office and be readily available for any consultation. In addition, the MNRP provides detailed orientation for new employees, ensuring that in addition to their responsibilities, they are fully aware of their rights.

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

Wildlife Works Carbon LLC. is a Delaware registered Limited Liability Corporation in good standing, majority owned by Wildlife Works, Inc. and Michael A. Korchinsky.

Wildlife Works, Inc. is a US registered corporation and, as such, is governed by the corporation laws of California which ensure that, at all times, the company remain financially solvent and able to meet its liabilities.

The company is owned by independent shareholders of good standing and has a Board of Directors of 4 members. WWC is sufficiently capitalized through the sale of carbon credits and investment to ensure completion of the Project. Wildlife Works Carbon LLC has also received several high-profile investments from international corporations who support Wildlife Works' mission and believe wholly in its cause. Such deals include multi-million-dollar investments from Allianz SE and PPR as well as advance purchases from BNP Paribas, Nedbank SA and PPR Home. For more information on the details of these investments and pledges, visit the following links:

PPR Home Invests in Wildlife Works

Wildlife Works / Nedbank Agreement

BNP Paribas Invests in Wildlife Works

Allianz Invests in Wildlife Works

All project financial information is held at WWC Kinshasa, DRC office. Documents supporting these assertions are available for the VVB to analyze at their request.

2.5 Legal Status and Property Rights

2.5.1 National and Local Laws (G5.1)

The NMRP complies with all applicable local, district, and national laws, regulations, and standards. Within the Project Area, none of the project activities violates any law. The DRC government owns the land in the Project Area, and has granted permission to the project through award of the conservation concession. ERA Congo, a subsidiary of WWC, legally owns the rights to the sequestered carbon in the Project Area.

Laws Regulating the Forest Conservation Concession Contract and the Lac Mai Ndombe REDD+ Project

The Land Tenure Act (Loi N° 73-021 du 20 juillet 1973 portant régime général de biens, régime foncier et immobilier et régime de suretés telle que modifiée et complétée par la Loi N° 80-008 du 18 juillet 1980**)**

Forest Code (Loi n°011/2002, August 29, 2002) and its related implementation decree, Decree n°11/27, May 20, 2011, concerning specific rules on the allocation of forestry conservation concessions, determine the legal framework under which the forest conservation concession contract was allocated to ERA Congo.

Forest Code and its related Ministerial Order n°024/CAB/MIN/ECN-T/15/JEB/08, August 7, 2008, establishing a procedure for public enquiry prior to the granting of forest concessions. This procedure was followed by ERA Congo prior to the signature of the forest conservation concession contract.

Ministerial Order n°004/CAB/MIN/ECN-T/012 February 15, 2012, establishing an approval procedure for REDD+ projects. This procedure didn't apply at the time the MNRP was approved (see above). Nevertheless, some of these new dispositions apply to the project (Art. 21), such as:

- Register the REDD+ project to the DRC National REDD+ Registry (the MNRP is registered).
- Notify the Registry of carbon transactions that have taken place under a standard recognized by the DRC and submit PD and validation/verification reports on time.
- Submit a yearly progress report with audited financial statement at the latest by March 31 the year following the concerned financial year.

The Forest Code and its related Inter-Ministerial Order n°006/CAB/MIN/ECN-EF/2007 and n°004/CAB/MIN/FINANCES/2007 establishes the area tax and amount to be paid by forestry concession holders yearly.

Corporate Laws

Loi n° 10/008 February 27, 2010 modifying and supplementing the King Decree February 27, 1887, relative to commercial corporations and law **Loi n° 10/009, February 27, 2010**, modifying and supplementing the March 6, 1951, decree establishing a commercial and companies register. ERA Congo is registered to the new commercial and companies register under the registered number KM3087M.

Investments Code Loi n°004/2002 of February 21, 2002, establishes the legal and taxation framework for foreign investment in the DRC. It allows some tax exemptions to ERA Congo.

Labor Laws

Employment law "Loi n°015/2002" and its related Ministerial Decree n°070/0016, August 11, 1970, on working conditions; Ministerial Decree n°68/13, May 1968, relative to women's wages and working conditions; Ministerial Order n° 12/CABMIN/TPS/AR/KF/059/02, September 27, 2002, determining implementing measures of Ministerial Order n° 080/2002 July 3, 2002, establishing a minimum wage; and Ministerial Order n°12/CAB.MIN/116/2005, October 26, 2005, relating to employee dismissal procedures. ERA Congo has adopted an internal employment conditions regulation in conformity with these labor regulations.

National Security Law Loi n°75/028 September 19, 1975, modifying Decree-Law of June 29, 1961, establishing the National Social Security Institute (INSS), covering employee pensions, occupational risks and accidents, and family allowances. Benefiting the members (employees/employers), it is a compulsory savings scheme into which the employer pays a statutory contribution for every employee who is a member. ERA Congo is being registered to the INSS.

Health Benefits Decree-Law 67/310 August 9, 1965, states that companies have to cover health care needs of their employees. This obligation is reflected in the internal employment regulation (Art. 51) of ERA Congo.

Local Laws

The 2006 Constitution of the Democratic Republic of the Congo provides for the decentralization of powers from the central government to provinces, and forests rights are to be shared between the central government and the provinces (Art. 201).

Ministerial Decree n°11/27, May 20, 2011, concerning specific rules on the allocation of Forestry Conservation Concession (Art. 7) requires that the request be submitted to the provincial governor. Though not in force at the time of ERA's request, ERA Congo obtained an approval from the provincial governor and local authorities. This authority is given with the signing of the forest conservation

concession contract terms of reference (cahier de charges) between the province, district, local communities, and ERA Congo on March 26, 2011.

Ministerial Decree n°033 October 2, 2006, concerning cadaster functioning and organization (Art. 2), requests that a copy of the concession contract be sent to the provincial cadaster. Two copies were sent by ERA Congo.

International Agreements

Article 215 of the 2006 Democratic Republic of Congo Constitution, February 18, 2006, states: "Treaties and international agreements have regularly reached, from their publication, an authority superior to that of laws, provided for each treaty or agreement its implementation by other party."

DRC is party to the United Nations Convention on Biological Diversity since December 3, 1994, and signed its two related Cartagena and Nagoya Protocols on June 6, 2012, and September 9, 2011, respectively; party to the United Nations Framework Convention on Climate Change on January 9, 1995, and its related Kyoto Protocol March 23, 2005; to the Ramsar Convention on Wetlands on May 18, 1996, and party to the Treaty on the Conservation and Sustainable Management of Forest Ecosystems in Central Africa and to Establish the Central Africa Forest Commission (COMIFAC) on January 24, 2005.

The MNRP aims to assist the DRC with attaining its objectives in terms of climate change; the conservation of biodiversity, fauna, flora, and wetlands; and sustainable use of forest ecosystems. MNRP is within an area listed on September 9, 2008, as wetlands of international importance under the Ramsar Convention (also see Section G1.8).

Legal Agreements

Carbon Rights Agreement signed on March 14, 2011, between Wildlife Works Carbon LLC and the DRC government by its representative, the Minister of Environment, Conservation of Nature, and Tourism (MECNT). This agreement transfers the carbon rights to WWC / ERA Congo, and states the roles and obligations of the two parties to that agreement, the project time-period, revenue sharing with the government, payments to communities (benefit sharing), and taxes to be paid by WWC / ERA Congo to the government. In this case only, the area tax is to be paid; WWC / ERA Congo is exempt from other taxes established by the Forestry Code.

The forest conservation concession contract was signed on July 30, 2011, by ERA Congo and MECNT representatives, which allocates the conceded lands to ERA Congo and defines ERA Congo's social, environmental, and management obligations.

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

The land in the project area is owned by the Government of the DRC. The project has been granted the management rights for the concessions by the Ministry of the Environment, Conservation of Nature, and Tourism (MECNT), as further described in sections G1.6, G3.8, G5.1, G5.2, and G5.6 of the CCB PDD. Communities in the project area govern resource use and access through customary laws and rights managed by local chiefs. WWC has adopted a multi phased approach to stakeholder engagement and consent which includes communication of important project information to stakeholders as it becomes available, and allows stakeholders to impact project design, air grievances, and give or withhold free prior and informed consent (FPIC) to participation in project activities. This multi phased stakeholder engagement and consent process is designed to continue throughout the project lifetime. Documented consultations are described under each phase listed below. Further details of these phases are provided

in section G3.8 of the PDD. Dates, attendees, topics, and often photos of significant community meetings are available for review in the Mai Ndombe project offices.

Information sessions were held in each of the 23 major villages in the project area. In these meetings ERA Congo (subsidiary of WWC) was introduced, including its history and the concept of REDD, with a discussion of global climate change. Meetings typically lasted between 2 and 6 hours and were attended by between 20 and 100 adults. Villagers were encouraged to ask questions of ERA Congo and continued to discuss the project in community wide, traditionally held, “palabres” (deep discussions). After visiting the community a few times, would introduce a consent form and encourage stakeholders to debate the merits of consenting to project development without the company present. After at least two days had elapsed, ERA returned to each village to answer further questions, continue with information sharing, and collect consent forms if they had been signed. Consent forms were signed in 100% of communities where they were proposed. Following these meetings, the Free Prior Informed Consent was been granted from the following clans:

Ipokyetoyi, Ikoli, Basanza, Mpama, Mpatambalu, Mpatambalu, Bomwanza, Kesenge, Bomwanza, Mpama, Ibali, lonka, Botongambela, Lobalu, Boongo, Boliombale, Boondo II, Mpenge, Mbongo, Ndomandala, Basobe, Ilee, Nyatotonga, Mpototonga, Ngelibenga, Bangaya, Mpama, Kesenge, Bompengo, Bokolo II, Kundo, Bopombo.

These clans have been allocated USD $500 annually, as customary payment, in keeping with the Cahiers de Charge signed by ERA Congo with these communities, pending credit.

2.5.3 Property Rights Protection (G5.4)

No involuntary relocations have ever been, nor shall be ever be, carried out in association of the MNRP within the MNRP project zone, within which the project area and project accounting area are entirely located. All villages that signed consent agreements have were assigned a mutually-agreed-upon 2.5 km buffer that was excluded from the protected area used to calculate carbon credits (PAA). Additionally, all secondary forest was voluntarily and conservatively removed from the protected area to provide a recognizable delineation between community use areas and intact forest (see VCS PD, Section 1.9.1). The MNRP does not practice community enforcement in any, way shape or form. Communities are not required to halt or alter their agricultural or hunting practices, but rather informed of their right to garner income from the REDD+ Project via benefit sharing should they choose to conserve their forests and the biodiversity therein. As such, any encroachment beyond the community buffers is simply measured and any emissions subsequently deducted from NERs.

2.5.4 Identification of Illegal Activity (G5.5)

Illegal activities related to the MNRP are defined as illegal and unauthorized logging, destruction of biodiversity (illegal killing of animals or destruction of vegetation cover) beyond the conditions permitted by law. The DRC Forest Code defines "local community forest." Agricultural activities are permitted in this area and, therefore, deforestation or forest degradation for agriculture and/or customary activities (i.e., fuelwood for local consumption, construction wood for the village) in these areas is not illegal. These community use areas have been excluded from the project accounting area (see above) to conform with the legal definition of community forests inside of a concession. As the local community forest boundaries are not yet defined, due to lack of a national forest management plan, the Forest Code and its related implementation decrees and rules prescribe a participatory mapping procedure to be carried out by the concession contract holder and local communities under the framework of their CLDs. The Forest Code states that "the Concession Holder has all the rights pertaining to the forest use and conservation except

the usage rights of the local communities." Land usage within the conservation concession area, other than for local communities and other types of concessions (such as agriculture or forestry) awarded prior to the signing of the concession contract, is not legally permitted. Concessions granted prior to the present concession Contract have therefore been subtracted from the project area. Such concessions exist in three different areas: two concessions in the Bosongo and Mbwenzey forest, one concession in the Mbale forest at Bobola Mpinga, and a 25 km^2 agricultural rubber plantation in the triangle between Kesenge, Mpili, and Nselenge. At Bobola Mpinga, logging activities have been happening that have supplied the project with material for school construction. In recent days, the concession holder has expressed his interest in converting his concession to a conservation concession.

Hunting is illegal only during periods of hunting closure. Hunting using traditional methods is not viewed as illegal at any time as it does not significantly contribute to the depletion of animal populations.

During the present monitoring period, five attempts to illegally log inside of the project area have been stopped in Mpili, Bosongo, Kesenge, Nkondi and Mpata Mbalu, thanks to the collaboration between the company, local communities and local authorities.

3 CLIMATE

3.1 Monitoring GHG Emission Reductions and Removals

3.1.1 Data and Parameters Available at Validation

Table 9 Data and parameters available at validation

Data Unit / Parameter:	α
Data unit:	Unitless
Description:	Combined effects of β and θ at the start of the historic reference period for the Project Accounting Area
Source of data:	Reference area and historic reference period
Value applied:	0.9488756
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	β
Data unit:	Unitless
Description:	Effect of time on the cumulative proportion of conversion over time for Project Accounting Area
Source of data:	Reference area and historic reference period

Value applied:	0.0006167
Justification of choice of data or description of measurement methods and procedures applied:	Time and place in which the logistic model is fit
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	γ
Data unit:	days
Description:	Time shift from beginning of historic reference period to Project Start Date
Source of data:	Historic reference period
Value applied:	-8720
Justification of choice of data or description of measurement methods and procedures applied:	Time in which the logistic model is fit. The start of the historic reference period is 9 May 1984 and the Project Start Date is 19 September, 2013.
Purpose of the data	Determination of baseline scenario.
Any comment:	

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

Data Unit / Parameter:	λ_{soc}
Data unit:	proportion (unitless)

Description:	Exponential soil carbon decay parameter
Source of data:	Value from the literature. Davidson, E., and Ackerman, I. 1993. Changes in soil carbon inventories following cultivation of previously untilled soils. Biogeochemistry, 20(3), 161-193.
Value applied:	0.2
Justification of choice of data or description of measurement methods and procedures applied:	Default value from VCS methodology VM0009 V2.0
Purpose of the data	Determination of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\widehat{\sigma}_{EM}$
Data unit:	standard deviation (unitless)
Description:	The estimated standard deviation of the state observations used to fit the logistic function for the Forest Project Accounting Area BEM
Source of data:	Remote sensing image interpretation
Value applied:	0.00892887
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\mathcal{B}$
Data unit:	set
Description:	The set of all selected carbon pools in biomass. This is a subset of $\mathcal{C}$
Source of data:	PD
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline emissions.

Any comment:	

Data Unit / Parameter:	$\mathcal{C}$
Data unit:	set
Description:	The set of all selected carbon pools
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\mathcal{I}$
Data unit:	set
Description:	The set of all observations of conversion. When superscripted with a monitoring period, the conversion observations are taken for leakage analysis.
Source of data:	Remote sensing image interpretation or field observations in the leakage area.
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\mathcal{M}$
Data unit:	set
Description:	The set of all monitoring periods
Source of data:	Monitoring records
Value applied:	N/A

Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\mathcal{T}$
Data unit:	ha
Description:	The set of all species/categories of livestock
Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of project emissions.
Any comment:	Parameter not used

Data Unit / Parameter:	A_{PAA}
Data unit:	ha
Description:	Area of Project Accounting Area
Source of data:	GIS analysis prior to sampling
Value applied:	248,956
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	A_{PX}
Data unit:	ha
Description:	Area of proxy area for the Project Accounting Area
Source of data:	GIS analysis prior to sampling

Value applied:	29,361.2
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	$c_{L\,p}$
Data unit:	tCO_2e/ha
Description:	Carbon stocks in project leakage area
Source of data:	Leakage area sampling
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Direct measurement
Purpose of the data	Calculation of leakage.
Any comment:	Parameter not used

Data Unit / Parameter:	$f_{LS\,i}$
Data unit:	kg CH_4 $head^{-1}$ yr^{-1}
Description:	Emission factor for the defined livestock population, i
Source of data:	IPCC default values
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Obtained directly from IPCC default values
Purpose of the data	Calculation of project emissions.
Any comment:	Parameter not used

Data Unit / Parameter:	m
Data unit:	tCO_2e/ha

Description:	Average carbon in merchantable trees cut each year as a result of legally-sanctioned commercial logging
Source of data:	Timber harvest plans or measurement of carbon stocks in merchantable trees in the Project Accounting Area.
Value applied:	1,288,795.4
Justification of choice of data or description of measurement methods and procedures applied:	the most accurate of the two data sources should be used if both are available
Purpose of the data	Calculation of baseline emissions.
Any comment:	

Data Unit / Parameter:	$\boldsymbol{n_d}$
Data unit:	unitless
Description:	Number of spatial points in the Project Accounting Area reference area
Source of data:	Remote sensing image interpretation
Value applied:	1,572
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	$\boldsymbol{o_i}$
Data unit:	unitless
Description:	State observation for the ith sample point in the Project's reference area
Source of data:	Remote sensing image interpretation
Value applied:	See the document BEM Export Grid PAA, available on request
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.

Any comment:	

Data Unit / Parameter:	$p_{L\,ME}$
Data unit:	unitless
Description:	Portion of leakage related to market
Source of data:	VCS methodology VM0009 V2.0 Section 8.3.3
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	No market leakage from the Project
Purpose of the data	Calculation of leakage.
Any comment:	Parameter not used

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

Data Unit / Parameter:	$r_{CF\,b}$
Data unit:	unitless
Description:	Carbon fraction of biomass for burned wood or herbaceous material b
Source of data:	Literature estimates or direct measurement
Value applied:	N/A
Justification of choice of data or description of	No burning of wood or herbaceous material in the Project.

measurement methods and procedures applied:	
Purpose of the data	Calculation of project emissions.
Any comment:	Parameter not used

Data Unit / Parameter:	r_{RS}
Data unit:	unitless
Description:	Expansion factor for above-ground biomass to below-ground biomass (root/shoot ratio)
Source of data:	IPCC Guidelines for National Greenhouse Gas Inventories, 2006, Volume 4: Agriculture, Forestry and Other Land Use, Chapter 4: Forest Land, Table 4.4
Value applied:	0.37
Justification of choice of data or description of measurement methods and procedures applied:	IPCC default value for Wet Tropical Forest Ecosystems.
Purpose of the data	Calculation of baseline emissions.
Any comment:	

Data Unit / Parameter:	r_U
Data unit:	unitless
Description:	Onset proportion of conversion immediately adjacent to Project Area
Source of data:	GIS analysis and image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Positions the baseline emissions models relative to the instantaneous rate of deforestation
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	t
Data unit:	days
Description:	Time since Project Start Date

Source of data:	Monitoring records
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	t_i
Data unit:	days
Description:	The point in time of the observation made at point i
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	*Indicate one of the following:* • *Determination of baseline scenario (AFOLU projects only).* • *Calculation of baseline emissions.* • *Calculation of project emissions.* • *Calculation of leakage.*
Any comment:	

Data Unit / Parameter:	t_{PA}
Data unit:	days
Description:	Time prior to the Project Start Date when the primary agent began commercial logging in the Project Accounting Area.
Source of data:	Harvest plans prepared for the Project Accounting Area, or by public record
Value applied:	-2,901
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the two data sources if both are available

Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	t_m
Data unit:	days
Description:	Length of project or logging in baseline scenario
Source of data:	PD
Value applied:	9,125
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

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

Data Unit / Parameter:	t_{PAI}
Data unit:	days
Description:	Number of days after the Project Start Date for the start of a Project Activity instance in a grouped project
Source of data:	PD
Value applied:	N/A
Justification of choice of data or description of	N/A

measurement methods and procedures applied:	
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	$\boldsymbol{w_i}$
Data unit:	unitless
Description:	weight applied to the ith sample point in the Forest Project Accounting Area reference area
Source of data:	Remote sensing image interpretation
Value applied:	See the document BEM Export Grid, available upon request
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	$\boldsymbol{x}$
Data unit:	unitless
Description:	Covariate values
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of the data	Determination of baseline scenario.
Any comment:	Parameter not used

Data Unit / Parameter:	$\boldsymbol{x_i}$
Data unit:	geographic coordinates

Description:	Latitude of the ith sample point
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

Data Unit / Parameter:	$\boldsymbol{x_o}$
Data unit:	unitless
Description:	Covariate values as of the Project Start Date
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of the data	Determination of baseline scenario.
Any comment:	Parameter not used

Data Unit / Parameter:	x_{PAI}
Data unit:	unitless
Description:	Covariate values as of a project activity instance start date
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of the data	Determination of baseline scenario.

Any comment:	Parameter not used

Data Unit / Parameter:	x_{SA}
Data unit:	unitless
Description:	Covariate values as of the arrival of the secondary agents
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	Should use the most accurate of the data sources if both are available
Purpose of the data	Determination of baseline scenario.
Any comment:	Parameter not used

Data Unit / Parameter:	y_i
Data unit:	geographic coordinates
Description:	Longitude of the ith sample point
Source of data:	Remote sensing image interpretation
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied:	N/A
Purpose of the data	Determination of baseline scenario.
Any comment:	

3.1.2 Data and Parameters Monitored

MRR.78 List of parameters from VCS Methodology VM0009 V2 Appendix H, their values and the time last measured.

MRR.79 Quality assurance and quality control measures employed for each.

MRR.80 Description of the accuracy of each.

Table 10 Data and parameters monitored

Data Unit / Parameter:	$w^{[m]}$
Data unit:	set
Description:	The set of all burned wood or herbaceous material
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	N/A
Any comment:	Parameter not used

Data Unit / Parameter:	$A_{B\,\Delta\,PAA}^{[m]}$
Data unit:	ha
Description:	Area of avoided conversion
Source of data:	Generated from equation
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.3.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.52]
Any comment:	Parameter not used

Data Unit / Parameter:	$A_{P\,1}^{[m=0]}$
Data unit:	ha
Description:	Area of Forest Project Accounting Area stratum 1 prior to first verification event – Semi-deciduous forest, Logged FORESCOM
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	55,244.75
Monitoring equipment:	GIS
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions.
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P\,2}^{[m=0]}$
Data unit:	ha
Description:	Area of Forest Project Accounting Area stratum 2 prior to first verification event – Semi-deciduous forest, Logged SOFORMA
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	23,205.02
Monitoring equipment:	GIS
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions.
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P\,3}^{[m=0]}$
Data unit:	ha
Description:	Area of Forest Project Accounting Area stratum 3 prior to first verification event – Semi-deciduous forest, Unlogged
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	49,476.66
Monitoring equipment:	GIS
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions.
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$A_{P\,4}^{[m=0]}$
Data unit:	ha
Description:	Area of Forest Project Accounting Area stratum 4 prior to first verification event – Swamp Forest
Source of data:	GIS analysis prior to sampling
Description of measurement methods and procedures to be applied:	GIS analysis of best available data
Frequency of monitoring/recording:	First monitoring period
Value applied:	121,030.00
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Cross-check of GIS analysis
Purpose of the data	Calculation of baseline emissions.
Calculation method:	GIS analysis
Any comment:	

Data Unit / Parameter:	$B_b^{[m]}$
Data unit:	tonnes
Description:	Biomass in burned wood or herbaceous material b
Source of data:	Measurements of biomass
Description of measurement methods and procedures to be applied:	Scale
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Summation
Any comment:	Parameter not Used

Data Unit / Parameter:	$c_B^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline carbon stocks at the end of the current monitoring period for the Forest Project Accounting Area
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 6.4 and Appendix B.4
Frequency of monitoring/recording:	At Project Start
Value applied:	100.64
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [B.33]
Any comment:	

Data Unit / Parameter:	$C_{B\ BGB}^{[m]}$
Data unit:	tCO_2e
Description:	Carbon not decayed in BGB at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.7
Frequency of monitoring/recording:	Every monitoring period
Value applied:	479,303
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.32]
Any comment:	

Data Unit / Parameter:	$C_{B\ DW}^{[m]}$
Data unit:	tCO_2e
Description:	Carbon not decayed in DW at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.6
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5,182,903
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.36]
Any comment:	

Data Unit / Parameter:	$C_{B\,SOC}^{[m]}$
Data unit:	tCO_2e
Description:	Carbon not decayed in SOC at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	249,051
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Subtraction
Any comment:	

Data Unit / Parameter:	$C_{B\,WP}^{[m]}$
Data unit:	tCO_2e
Description:	Carbon not decayed in WP at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix C
Frequency of monitoring/recording:	Every monitoring period
Value applied:	600,011
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [C.1]
Any comment:	

Data Unit / Parameter:	$C_{B\ AGMT}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline carbon stocks in above-ground merchantable trees at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	1.52
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Weighted per ha average
Any comment:	

Data Unit / Parameter:	$C_{B\ BGMT}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline carbon stocks in below-ground merchantable trees at the end of the current monitoring period
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0.56
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Weighted per ha average
Any comment:	

Data Unit / Parameter:	$C_{P\ AGMT}^{[m=0]}$
Data unit:	tCO_2e
Description:	Project carbon stocks in above-ground merchantable trees at Project Start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.1
Frequency of monitoring/recording:	At Project Start
Value applied:	24,755,965
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Summation across plots
Any comment:	

Data Unit / Parameter:	$C_{P\ BGMT}^{[m=0]}$
Data unit:	tCO_2e
Description:	Project carbon stocks in below-ground merchantable trees at Project Start
Source of data:	Project accounting area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.3
Frequency of monitoring/recording:	At Project Start
Value applied:	9,159,707
Monitoring equipment:	Equipment list in Annex 11
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Summation across plots
Any comment:	

Data Unit / Parameter:	$c_{B\,b}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline scenario average carbon stock in selected carbon pools
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.1.5
Frequency of monitoring/recording:	At Project Start
Value applied:	See Annex 16 – Proxy Area Carbon Model
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Weighted per-ha average
Any comment:	

Data Unit / Parameter:	$c_{B\,BM}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline carbon stocks in biomass at the end of the current monitoring period for the Project Accounting Area
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	At Project Start
Value applied:	100.64
Monitoring equipment:	Equipment list in Annex 11
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.18]
Any comment:	

Data Unit / Parameter:	$c_{B\,SOC}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Baseline soil carbon stocks at the end of the current monitoring period for the Project Accounting Area
Source of data:	Proxy area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.6
Frequency of monitoring/recording:	At Project Start
Value applied:	57.0
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.32]
Any comment:	

Data Unit / Parameter:	$c_{P}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks at the end of the current monitoring period for the Project Accounting Area
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	1039.34
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [B.31]
Any comment:	

Data Unit / Parameter:	$c_P^{[m-1]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks at the beginning of the current monitoring period
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	1,061.1
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Already reviewed
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [B.31]
Any comment:	

Data Unit / Parameter:	$c_P^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks prior to first verification event for the Project Accounting Area
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	1,061.1
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Already reviewed
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [B.31]
Any comment:	

Data Unit / Parameter:	$c_{P\ 1\ BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 1 at project start – Semi-deciduous forest, Logged FORESCOM
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	1,087.15
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\ 2\ BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 2 at project start – Semi-deciduous forest, Logged SOFORMA
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	917.37
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\,3\,BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 3 at project start – Semi-deciduous forest, Unlogged
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	1,049.49
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\,4\,BM}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in biomass in Project Accounting Area stratum 4 at project start – Swamp Forest
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	1,036.75
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\ AGMT}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project carbon stocks in above-ground merchantable trees prior to first verification event
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	99.44
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\ BM}^{[m=0]}$
Data unit:	tCO_2e
Description:	Project carbon stocks in biomass prior to first verification event
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	264,166,731
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.17]
Any comment:	

Data Unit / Parameter:	$c_{P\,b}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Average carbon in biomass in the Project Accounting Area
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2
Frequency of monitoring/recording:	Prior to first monitoring event
Value applied:	1,036.75
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$c_{P\,SOC}^{[m=0]}$
Data unit:	tCO_2e/ha
Description:	Project soil carbon stocks prior to first verification event in the Forest Project Accounting Area
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.6
Frequency of monitoring/recording:	At Project Start
Value applied:	79.8
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Average of plot measurements in a given stratum
Any comment:	

Data Unit / Parameter:	$C_{P\,\Delta\,WP}^{[m]}$
Data unit:	tCO_2e
Description:	Project carbon stocks in wood products at the end of the current monitoring period
Source of data:	Project Accounting Area sampling
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix C
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [C.2]
Any comment:	

Data Unit / Parameter:	$E_{\Delta\,GER}^{[m]}$
Data unit:	tCO_2e
Description:	GERs for the current monitoring period
Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.4.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	11,970,624
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of GER calculations
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.53]
Any comment:	

Data Unit / Parameter:	$E_{\Delta GER}^{[i]}$
Data unit:	tCO_2e
Description:	GERs for monitoring period i
Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.4.1
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	11,970,624
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of GER calculations
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.53]
Any comment:	

Data Unit / Parameter:	$E_{\Delta NER}^{[i]}$
Data unit:	tCO_2e
Description:	NERs for monitoring period i
Source of data:	Area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.4.3
Frequency of monitoring/recording:	prior monitoring period
Value applied:	10,773,562
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of GER calculations
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.55]
Any comment:	

Data Unit / Parameter:	$E_{B}^{[m]}$
Data unit:	tCO_2e

Description:	Cumulative baseline emissions at the end of the current monitoring period
Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	19,919,574
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.16]
Any comment:	

Data Unit / Parameter:	$E_B^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions at the beginning of the current monitoring period
Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1
Frequency of monitoring/recording:	Prior monitoring period
Value applied:	3,401,416
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.16]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta}^{[m]}$
Data unit:	tCO_2e
Description:	Change in baseline emissions

Source of data:	Proxy area measurements
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	16,518,158
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.15]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,BGB}^{[i]}$
Data unit:	tCO_2e
Description:	Change in baseline emissions from below-ground biomass during monitoring period i
Source of data:	Monitoring the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.3
Frequency of monitoring/recording:	Already Monitored
Value applied:	5,182,903
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.30]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,DW}^{[i]}$
Data unit:	tCO_2e
Description:	Baseline emissions from dead wood in monitoring period i

Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.2.4 and B.2.5
Frequency of monitoring/recording:	Already Monitored
Value applied:	479,187
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.34]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,SOC}^{[m]}$
Data unit:	tCO_2e
Description:	Baseline change in emissions from soil carbon
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6
Frequency of monitoring/recording:	Every monitoring period
Value applied:	375,640
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions
Calculation method:	Equation [F.26]
Any comment:	

Data Unit / Parameter:	$E_{B\,\Delta\,SOC}^{[i]}$
Data unit:	tCO_2e
Description:	Baseline emissions from soil carbon in monitoring period i
Source of data:	Measurements in the proxy area

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.2.1, 8.1.2.2, 8.1.2.3 and Appendix B.2.6
Frequency of monitoring/recording:	Every monitoring period
Value applied:	375,640
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.26]
Any comment:	

Data Unit / Parameter:	$E_{B\ AGMT}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from above-ground commercial trees at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.6.1, 8.1.6.2, 8.1.6.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	7,395,725
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.37]
Any comment:	

Data Unit / Parameter:	$E_{B\ BGB}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from below-ground biomass at the end of the current monitoring period
Source of data:	Measurements in the proxy area

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	5,182,903
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.30]
Any comment:	

Data Unit / Parameter:	$E_{B\,BGB}^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from below-ground biomass at the beginning of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	1,330,110
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.30]
Any comment:	

Data Unit / Parameter:	$E_{B\,BM}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from biomass at the end of the current monitoring period
Source of data:	Measurements in the proxy area

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.1, 8.1.1.5.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	26,053,941
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.22]
Any comment:	

Data Unit / Parameter:	$E_{B\ DW}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from dead wood at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	495,334
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.34]
Any comment:	

Data Unit / Parameter:	$E_{B\ DW}^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from dead wood at the beginning of the current monitoring period
Source of data:	Measurements in the proxy area

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.3
Frequency of monitoring/recording:	Already monitored
Value applied:	174,056
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.34]
Any comment:	

Data Unit / Parameter:	$E_{B\ SOC}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from soil carbon at the end of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.2.1, 8.1.2.2, 8.1.2.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	375,640
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.27]
Any comment:	

Data Unit / Parameter:	$E_{B\ SOC}^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative baseline emissions from soil carbon at the beginning of the current monitoring period
Source of data:	Measurements in the proxy area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.2.1, 8.1.2.2, 8.1.2.3

Frequency of monitoring/recording:	Already monitored
Value applied:	65,546
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.27]
Any comment:	

Data Unit / Parameter:	$E_{BA}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions allocated to the buffer account at the end of the current monitoring period
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.4.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,047,416
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Multiplication
Any comment:	

Data Unit / Parameter:	$E_{L}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from leakage at the end of the current monitoring period
Source of data:	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A

Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Equation [F.45]
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_L^{[m-1]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from leakage at the beginning of the current monitoring period
Source of data:	Measurements in the leakage area(s)
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3
Frequency of monitoring/recording:	Already monitored
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Equation [F.45]
Any comment:	

Data Unit / Parameter:	$E_{L\,\Delta}^{[m]}$
Data unit:	tCO_2e
Description:	Change in emissions due to leakage
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.

Calculation method:	Equation [F.44]
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_{L\,AS\,F}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from activity-shifting leakage in forested strata at the end of the current monitoring period
Source of data:	Measurements in the activity-shifting leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Equation [F.46]
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_{L\,ASG}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from activity-shifting leakage in native grassland strata at the end of the current monitoring period
Source of data:	Measurements in the activity-shifting leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.3.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Equation [F.47]

Any comment:	Parameter not used.

Data Unit / Parameter:	$E_{LME}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative emissions from market leakage at the end of the current monitoring period
Source of data:	Measurements in the market leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Equation [F.51]
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_{P\Delta}^{[m]}$
Data unit:	tCO_2e
Description:	Change in project emissions
Source of data:	Monitoring records for forest fire, burning, logging, wood products, and natural disturbance events
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Equation [F.41]
Any comment:	

Data Unit / Parameter:	$E_{P\,\Delta BRN}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative project emissions due to burning at the end of the current monitoring period
Source of data:	Monitoring plots in the project
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.2.2
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Equation [F.42]
Any comment:	

Data Unit / Parameter:	$E_{P\,\Delta\,LS}^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative project emissions due to livestock grazing within the Project Area.
Source of data:	Monitoring in the Project Area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.2.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Equation [F.43]
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_{P\,\Delta\,SF}^{[m]}$
Data unit:	tCO_2e

Description:	Cumulative project emissions due to the use of synthetic fertilizers within the project area.
Source of data:	Monitoring in the Project Area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.2.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	CDM A/R methodological tool *Estimation of direct and indirect (e.g. leaching and runoff) nitrous oxide emission from nitrogen fertilization*
Any comment:	Parameter not used.

Data Unit / Parameter:	$E_U^{[m]}$
Data unit:	tCO_2e
Description:	Cumulative confidence deduction at the end of the current monitoring period
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.4.1.1
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.57]
Any comment:	

Data Unit / Parameter:	$n_{LS\,i}$
Data unit:	count

Description:	The number of head of livestock species/ category i in the Project Area
Source of data:	Monitoring in the Project Area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.2.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Use of literature or expert knowledge
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{L\,DEG}^{[m]}$
Data unit:	proportion (unitless)
Description:	Portion of leakage due to degradation in forest at the end of the current monitoring period
Source of data:	Monitoring in the leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.2.3
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Summation across leakage plots
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{L\,DEG}^{[m=0]}$
Data unit:	tCO_2e
Description:	proportion (unitless)

Source of data:	Portion of leakage due to degradation prior to first verification event
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.2.3
Frequency of monitoring/recording:	At Project Start
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Project verification
Purpose of the data	Calculation of leakage.
Calculation method:	Summation across leakage plots
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{L\,CON\,G}^{[m]}$
Data unit:	proportion (unitless)
Description:	Portion of leakage due to native grasslands conversion at the beginning of the current monitoring period
Source of data:	Monitoring in the leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.2.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Summation across leakage plots
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{L\,CON\,G}^{[m=0]}$
Data unit:	proportion (unitless)
Description:	Portion of leakage due to native grasslands prior to the first verification event
Source of data:	Monitoring in the leakage area

Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.2.4
Frequency of monitoring/recording:	At Project Start
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Project verification
Purpose of the data	Calculation of leakage.
Calculation method:	Summation across leakage plots
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{L\,CON\,G}^{[m-1]}$
Data unit:	proportion (unitless)
Description:	Portion of leakage due to native grasslands conversion at the end of the current monitoring period
Source of data:	Monitoring in the leakage area
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.3.2.4
Frequency of monitoring/recording:	Every monitoring period
Value applied:	N/A
Monitoring equipment:	Equipment list in Annex 20
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of leakage.
Calculation method:	Summation across leakage plots
Any comment:	Parameter not used.

Data Unit / Parameter:	$p_{SL}^{[m]}$
Data unit:	proportion (unitless)
Description:	Proportion of AGMT that is not merchantable and goes into slash estimated from inventory
Source of data:	Estimated from inventory
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 8.1.6.3

Frequency of monitoring/recording:	Every monitoring period
Value applied:	0.0905
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of project emissions.
Calculation method:	Conservatively used volume of a cone
Any comment:	

Data Unit / Parameter:	$t^{[i-1]}$
Data unit:	days
Description:	Time from Project Start Date to beginning of monitoring period i
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	Monitoring records
Frequency of monitoring/recording:	Already monitored.
Value applied:	597
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records.
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Subtraction
Any comment:	

Data Unit / Parameter:	$t^{[m]}$
Data unit:	days
Description:	Time from project start date to end of current monitoring period
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	2,119

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

Data Unit / Parameter:	$t^{[m-1]}$
Data unit:	days
Description:	Time from Project Start Date to beginning of current monitoring period
Source of data:	Monitoring records
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	597
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Subtraction
Any comment:	

Data Unit / Parameter:	$U_B^{[m]}$
Data unit:	tCO_2e
Description:	Total uncertainty in Proxy Area carbon stock estimate
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	15.62
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.

Calculation method:	Equation [B.32]
Any comment:	

Data Unit / Parameter:	$U_{EM}^{[M]}$
Data unit:	tCO_2e/ha
Description:	Total uncertainty in Baseline Emissions Models for the Project Accounting Area
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Section 6.8.10
Frequency of monitoring/recording:	Every monitoring period
Value applied:	0.0089
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [F.13]
Any comment:	

Data Unit / Parameter:	$U_{P}^{[m]}$
Data unit:	tCO_2e/ha
Description:	Total uncertainty in the Project Accounting Area carbon stock estimate
Source of data:	N/A
Description of measurement methods and procedures to be applied:	VCS Methodology VM0009 V2.0 Appendix B.1.5
Frequency of monitoring/recording:	Every monitoring period
Value applied:	32.17
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	Equation [B.32]
Any comment:	

Data Unit / Parameter:	$wc_{Pi}^{[m=o]}$
Data unit:	tCO_2e
Description:	Weighted average carbon stocks for biomass or SOC in the Project for the set of selected strata
Source of data:	Biomass inventory
Description of measurement methods and procedures to be applied:	Inventory or GIS
Frequency of monitoring/recording:	Every monitoring period
Value applied:	See Annex 21 – Soil Carbon Model
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	N/A
Any comment:	

Data Unit / Parameter:	$x^{[m]}$
Data unit:	varies
Description:	Covariate values
Source of data:	Participatory Rural Appraisal, analysis of public records, and/or expert interpretation of inventory data or remotely sensed imagery
Description of measurement methods and procedures to be applied:	N/A
Frequency of monitoring/recording:	Every monitoring period
Value applied:	
Monitoring equipment:	N/A
QA/QC procedures to be applied:	Review of monitoring records
Purpose of the data	Calculation of baseline emissions.
Calculation method:	N/A
Any comment:	Parameter not used.

3.1.3 Monitoring Plan

MRR.83 Documentation of data quality assessment such as a check cruise and plots of the data such as diameter distributions by strata or plot.

Per VM0009 V2.0 MR.83, the QA/QC SOP was employed during the m2 monitoring period to re-measure 5% (12) of the biomass plots measured (247). QA/QC re-measurement was carried out by teams different than those whom originally measured the plots. A t-test is used to determine if there is a significant difference between plot-level measurements of the QA inventory and that same 5% of the original inventory. The t-test was passed (no difference exists between 1% and the paired differences between QA and original measurements at 90% confidence level). This result verifies that the mean estimate of carbon from QA plots is not significantly greater than or less than the mean estimate from their counterparts in the original inventory and per the QA/QC SOP no additional training or re-measurement is required. Table 11 below depicts results from the t-test.

Table 11 QA/QC Results for 5% of m2 biomass plots

Result	QA Plots	Original Inventoried Plots
1% of Estimated Mean (tCO2e)	8.884079768	8.880114559
Estimated Mean of Paired Differences (tCO2e)	0.396520903	0.396520903
Standard Error of Paired Differences (tCO2e)	6.889086034	6.889086034
Difference between 1% and Paired Difference (tCO2e)	-8.487558865	-8.483593656
t Statistic	-1.232029738	-1.23145416
Degrees of Freedom	11	11
p Value (1 - alpha)	0.878187701	0.878084312
H0: No difference between 1% and Paired Difference at 90% Level	TRUE	TRUE
H1: Difference greater than or equal to 1% and Paired Difference at 90% Level	FALSE	FALSE

MRR.84 Maps of a stratification (if any) and references to plot allocation.

Please refer to the MNRP VCS PD Appendix A for maps of Project Area land cover stratification, biomass sample plot locations and soil plot locations.

MRR.85 List of plot GPS coordinates.

Please refer to the Climate Monitoring Plan for a comprehensive list of all sample plots and their GPS coordinates.

MRR. 86 Description of plot sizes and layout (such as the use of nests and their sizes) for each carbon pool.

A permanent circular nested plot design was used for the biomass sample plots. The tree plot radius for this project is 15 meters, which corresponds to a 0.07 ha plot area. The minimum diameter for considering an individual plant as a tree for the project is 10 cm diameter at 1.3 m above the ground (DBH). All smaller woody plants are considered shrubs. Shrubs are not an included carbon pool in the MNRP.

Table 12 Tree plot radii

Area	Plot Radius
Tree Plots in all Strata	15 meters

MRR.87 If applicable, a detailed description of the process used to develop allometric equations, to include:

a. Sample size

b. Distribution (e.g. diameter) of the sample

c. Model fitting procedure

d. Model selection

Please refer to Annex 6 – Development of Allometry – Mai Ndombe REDD+ Project

MRR. 88 The estimated carbon stock, standard error of the total for each stock, and the sample size for each stratum in the area selected.

Please refer to Annex 17 – MNRP NER Worksheet

MRR. 90 Deviations from the measurement methods set out in VCS Methodology VM0009 V2.0 Appendix B or the monitoring plan, per current VCS requirement.

There were no deviations from the VCS Methodology VM0009 V2.0 Appendix B or from the Project Climate Monitoring Plan in Annex 4.

MRR.91 The frequency of monitoring for each plot for all plots – all plots should be measured for the first verification. All leakage plots should be measured every verification, and all proxy and project accounting area plots at least every five years, or after a significant event that changes stocks.

For this Monitoring Period (m2) a total of 247 plots were measured. The MNRP remeasures 100% of the plots every 5 years. For the frequency of monitoring for the biomass plots please refer to the Climate Monitoring Plan.

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

The climate monitoring plan was established and accepted by the Project Proponent. The plan has been made available for public review at the project office, and was made available to each CLD in the Project Zone during the first monitoring period (m_1). Full climate monitoring results are included in this document and also publicly available for review at the Project Office (hard copy). A monitoring report summary was written and provided to communities throughout the project zone in English, French and Lingala. The monitoring report has additionally been posted to the website of the VCS and CCB for public review and comment.

3.2 Quantification of GHG Emission Reductions and Removals

3.2.1 Baseline Emissions

MRR.10 Calculations of current baseline emissions $EB_{\Delta m}$ as of the current monitoring period.

MRR.11 Calculations of baseline emissions EB Δm-1 from prior monitoring periods.

Table 13 Baseline carbon emissions and reductions from Mai Ndombe REDD+ Project

Component	First monitoring period (m1)	Second monitoring period (m2)	Total to date
Gross ERs (t CO2e)	3,401,416	11,970,624	15,372,040
Buffer tonnes to VCS (t CO2e)	850,354	1,197,062	2,047,416
Net ERs (t CO2e)	2,551,062	10,773,562	13,324,624

MRR.12 Calculations of cumulative baseline emissions for each selected pool (E_B BMm and EB SOCm) and undecayed carbon (CB BGB_m, CB DW_m, CB SOCm and CB WPm), as of the current monitoring period.

3.2.1.1 Calculating Baseline Emissions from Biomass

Cumulative baseline emissions from biomass $E_{B\,BM}^{[m]}$ are estimated for both the PAA using equation [F.19] of the VCS methodology VM0009 V2.0:

$$E_{B\,BM}^{[m]} = BEM_{P1}\left(c_{P\,BM}^{[m=0]}, c_{B\,BM}^{[m]}, t^{[m]}, x^{[m]}\right)$$

This estimate employs a Biomass Emissions Model (BEM) for baseline P1 using equation [F.2] of the VCS Methodology VM0009 V2.0:

$$BEM_{P1}(c_P, c_B, t, x) = \frac{m(t - t_{PA})}{365(1 + e^{t - t_{SA} - t_{PA} - t_{PAI}})} + \frac{A_{PAA}(c_P - c_B)e^{t - t_{SA} - t_{PA} - t_{PAI}} + \frac{HA_{P1}(c_P, c_B)t}{t_{PL} - t_{PAI}}}{(1 + e^{t - t_{SA} - t_{PA} - t_{PAI}})\left[1 + e^{\ln\left(\frac{365A_{PAA}(c_P - c_B)}{m(t_{SA} - t_{PAI})} - 1\right) - \beta(t - t_{SA} - t_{PA} - t_{PAI}) - \boldsymbol{\theta}(\boldsymbol{x} - \boldsymbol{x_{PAI}} - \boldsymbol{x_{SA}})^T}\right]} - HA_{P1}(c_P, c_B)$$

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

Please refer to Annex 17 – MNRP NER Worksheet

MRR.14 Calculations of cumulative baseline emissions from biomass EB $E_{B\,BM}^{[m]}$ for all prior monitoring periods.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.2 Calculating Baseline Emissions from SOC for Baseline Types P1

Cumulative baseline emissions from SOC $E_{B\,SOC}^{[m]}$ for baseline types P1 are estimated using equation [F.25] of the VCS Methodology VM0009 V2.0:

$$E_{B\,SOC}^{[m]} = SEM_P\left(c_{P\,SOC}^{[m=0]} c_{B\,SOC}^{[m]}, t^{[m]}, x^{[m]}\right)$$

The estimate employs the Soil Emissions Model (SEM) for baseline type P1 using equation [F. 6] of the VCS Methodology VM0009 V2.0:

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

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

Please refer to Annex 17 – MNRP NER Worksheet

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

Please refer to Annex 17 – MNRP NER Worksheet

MRR.20 Calculations of cumulative baseline emissions from SOC $E_{B\,SOC}^{[m]}$ for all prior monitoring periods.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.3 Calculating Carbon Not Decayed in DW

MRR.27 An estimate of carbon stored in non-decayed DW $C_{B\,DW}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.28 An estimate of cumulative baseline emissions from DW $E_{B\,DW}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.30 Calculations of cumulative baseline emissions from DW $E_{B\,DW}^{[m]}$ for all prior monitoring periods.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.4 Calculating Carbon Not Decayed in BGB

Carbon that has not yet decayed in the below ground biomass (BGB) carbon pool is estimated using equation [F.10] of the VCS Methodology VM0009 V2.0:

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

The Decay Emissions Model (DEM) for carbon in the BGB and deadwood carbon pools is based on the default VCS decay models for those pools.

MRR.32 An estimate of carbon stored in non-decayed BGB $C_{B\,BGB}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.33 An estimate of cumulative baseline emissions from BGB $E_{B\,BGB}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.34 Calculations of cumulative baseline emissions from BGB $E_{B\,BGB}^{[m]}$ for all prior monitoring periods.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.5 Calculating Carbon Not Decayed in SOC

Carbon that has not yet decayed in the SOC carbon pool is estimated using equation [F.33] of the VCS Methodology VM0009 V2.0:

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

This estimate employs the Decay Emissions Model (DEM) for carbon in the SOC for baseline type P1 using equation [F.9] of the VCS Methodology VM0009 V2.0:

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

MRR.35 An estimate of carbon stored in non-decayed SOC $C_{B\,SOC}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.6 Calculating Cumulative Emissions from AGMT for Baseline Type P1

MRR.29 An estimate of cumulative baseline emissions from AGMT $E_{B\,AGMT}^{[m]}$ for the current monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR. 31 Calculations of cumulative baseline emissions from AGMT $E_{B\,AGMT}^{[m]}$ for all prior monitoring periods.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.1.7 Determining Carbon Stored in Long Lived Wood Products

MRR.36 Carbon stored in long-lived wood products $C_{B\,WP}^{[m]}$ after 100 years.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.37 Calculations to determine $C_{B\,WP}^{[m]}$.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.2 Project Emissions

3.2.2.1 Calculating Emissions from Changes in Project Stocks (G1.4)

Carbon stocks have been estimated using the Verified Carbon Standard (VCS) methodology VM0009 'Methodology for Avoided Ecosystem Conversion' v2.0. Version 1 of this methodology was originally validated with VCS in January 2011, with version 2 validated in 2012. A third major revision was conducted to include the AFOLU (Agriculture, Forestry and Other Land Uses) category Avoided Conversion of Grasslands and Shrublands (ACoGS). Version 3 of VM0009 was successfully validated in June 2014 under the VCS double approval process.

Biomass plots must be re-measured every five years at a minimum. For this monitoring period, which extends from 1 November 2012 to 31 December 2016, the proportional number of plots measured was 247, representing 55% of the original 449 plots. Biomass plot locations are depicted below in Figure 9. Changes in project carbon stocks are calculated as the difference in project stocks in each stratum for each PAA between the current and prior monitoring periods, as determined from in-situ measurement of biomass plots:

$$A_{PAA}\left(c_P^{[m-1]} - c_P^{[m]}\right)$$

Carbon stocks that are lost to burning, wood products, and leakage are accounted for using the procedures and equations listed below.

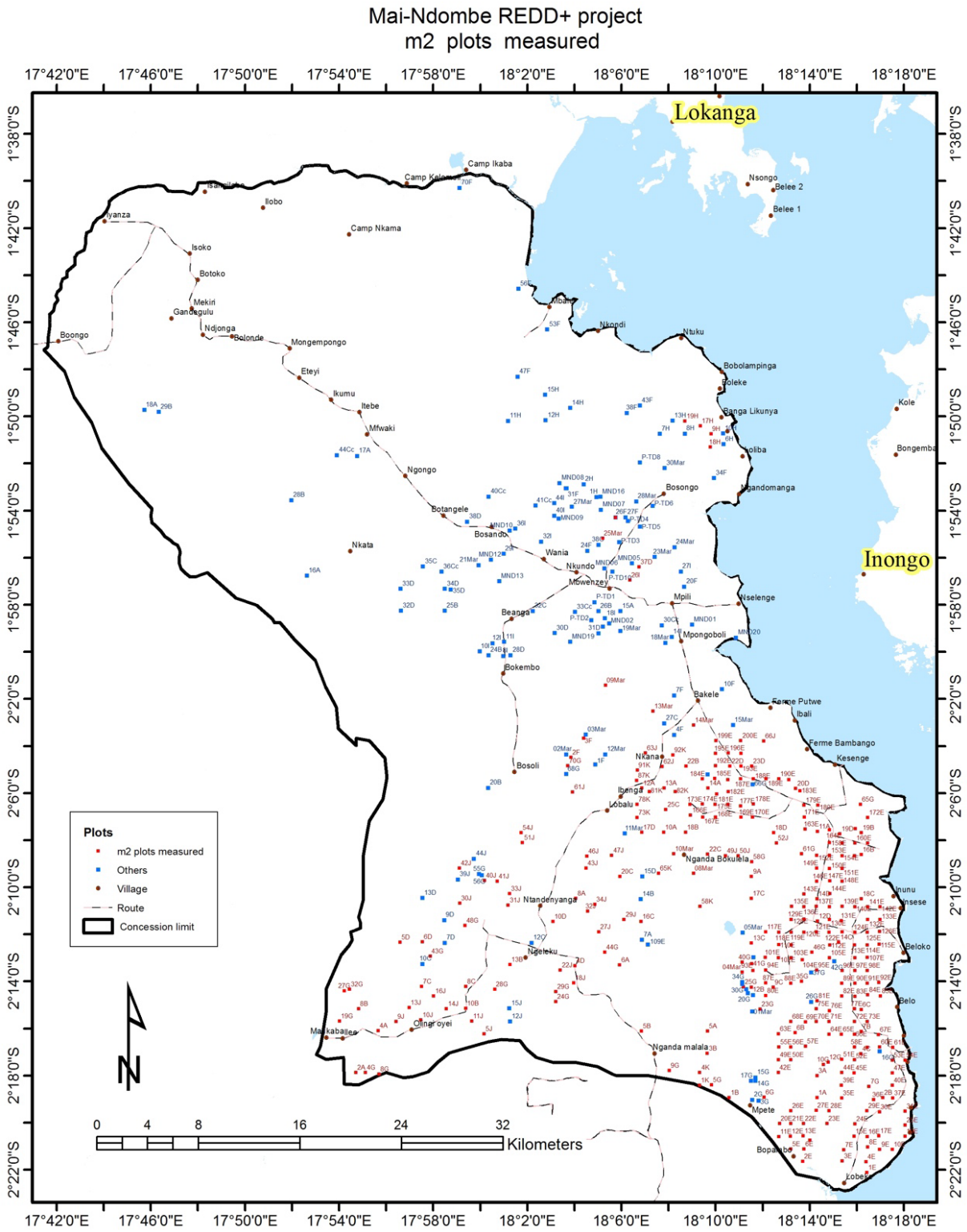


Figure 9 Biomass sample plot locations for the second monitoring period (m2) in The Lac Mai Ndombe REDD+ Project

Table 14 depicts current measured above- and below-ground biomass carbon stocks by land cover stratum and Table 15 the soil carbon stocks by PAA within the Project Area. Values below have been calculated using the methods of carbon accounting detailed in the VCS Methodology VM0009 V2.0 and this Project's VCS / CCB validated PD.

Table 14 Summary of current carbon stocks within the Project Accounting Area (PAA)

Stratum	Area (ha)	Mean carbon stock (t CO_2e / ha)	Standard error (t CO_2e / ha)	Mean dbh (cm)	Average height (m)
Semi-deciduous forest, Logged FORESCOM	55,244.75	1,087.15	41.82	28.92	N/A
Semi-deciduous forest, Logged SOFORMA	23,205.02	917.37	24.94	25.40	N/A
Semi-deciduous forest, Unlogged	49,476.66	1049.49	44.20	26.64	N/A
Swamp Forest	121,030.00	1036.75	60.55	23.63	N/A

Table 15 Summary of current soil carbon stocks within the Project Accounting Area (PAA)

PAA	Soil accounting area (ha)	Mean carbon stock (t CO2e / ha)	Standard error (t CO_2e / ha)
Project Area	248,956.43	79.8	N/A

3.2.2.2 Calculating Emissions from Burning

Currently, no planned Project Activities involve the burning of biomass burning in any manner. As such, emissions from burning are included in carbon accounting. However, if future Project Activities should include this emission type, project emissions from burning of biomass shall be calculated using equation [F.42] of the VM0009 V2.0 methodology.

3.2.2.3 Calculating Emissions from Disturbances

There were no disturbances within the Project Area that met the criteria of "significant disturbance" as described in the Monitoring Plan. There were however many small disturbances, driven by anthropogenic fire events initiated locally at villages or savanna clearings. The project team established that most of these events result in temporary loss to leafy biomass, that then recovers over the course of the following few rainy seasons. Following remote sensing analysis, we determined that emissions from these disturbances did not exceed the de minimis value in the disturbance monitoring plan (contiguous area larger than 250 ha or an event that results in greater than 5% loss in Proejct carbon stock).

However, to accurately capture emissions from the deforestation extending beyond the PAA community buffers, we delineated all fire events into

a. those which temporarily burned leafy biomass and quickly regenerated; and
b. events which showed permanent loss of woody biomass (deforestation).

This was done by observing temporal Landsat imagery for the m2 monitoring period and delineating areas that burned, but that quickly (within 2 years) reverted to their pre-burn vegetative state. All areas that remained non-forest after burning were considered to be permanently deforested. We applied a conservative emission factor for each category and calculated total emissions as the sum of emissions (removals) for both categories. Total disturbance emissions were calculated to be 4,547,533 tCO2e.

3.2.3 Leakage (CL2.1 & CL2.2)

3.2.3.1 Activity Shifting Leakage

As is discussed in section 3.3.1 of the MNRP VCS PD activity shifting leakage is not applicable to this project. Please refer to the VCS PD for more information.

3.2.3.2 Market Leakage (CL3.1.)

As is discussed in section 3.3.2 of the MNRP VCS PD market leakage is not applicable to this project. Please refer to the VCS PD for more information.

3.2.4 Net GHG Emission Reductions and Removals

3.2.4.1 Determining Reversals

MRR.65 A description of the reversal including which pools contributed to the reversal and reasons for its occurrence.

There have been no reversals in the MNRP M_2 monitoring period.

3.2.4.2 Determining Reversals as a Result of Baseline Re-evaluation

MRR.66 A description of the reversal including a summary of new data obtained in the reference area.

There have been no reversals in the MNRP M_2 monitoring period and the next baseline re-evaluation period will be in 2022.

3.2.4.3 Quantifying Net Emission Reductions for a PAA

3.2.4.3.1 Determining Deductions for Uncertainty

MRR.61 The confidence deduction $E_U^{[m\}}$ and estimated standard errors used to determine the confidence deduction.

In accordance with VM0009 v2.0, section 8.4.1.1, the confidence deduction is determined by linearly combining weighted uncertainties (standard errors) from the project accounting area, proxy area and the baseline emission model (BEM). Per VCS AFOLU Requirements, if the total combined error is above 15%, a deduction is applied as the difference between the calculated combined error and 15%. Otherwise, the confidence deduction is zero. The calculated standard errors used for the determination of the confidence deduction were:

- Uncertainty in carbon stock estimates in the project accounting area, ($\boldsymbol{U_P}$): 32.17 tCO2e
- Uncertainty in carbon stock estimates in the proxy area, ($\boldsymbol{U_B}$): 15.62 tCO2e
- Uncertainty in the baseline emissions model (BEM), ($\boldsymbol{U_{EM}}$): 0.0089 tCO2e

For m2, the confidence deduction, as per VM0009 v2.0 equation [F.51] was:

- Cumulative confidence deduction, $\boldsymbol{E_U^{[m]}}$: 0 tCO2e

MRR.62 Reference to calculations used to determine the confidence deduction.

The cumulative confidence deduction, $E_U^{[m]}$, was calculated using VM0009 v2.0 equation [F.51]:

$$E_U^{[m]} = E_{B\,\Delta}^{[m]} \left[\frac{1.64}{E_{B\,\Delta}^{[m]} + A_{PAA} c_P^{[m]} + A_{PX} c_B^{[m]}} \sqrt{\left(U_{EM}^{[M]}\right)^2 + \left(U_P^{[m]}\right)^2 + \left(U_B^{[m]}\right)^2} - 0.15 \right]$$

where:

$c_P^{[m]}$ is total measured carbon stock in the project accounting area;

$c_B^{[m]}$is total proxy area carbon stock;

$E_{B\,\Delta}^{[m]}$ is total change in proxy area emissions;

$U_{EM}^{[M]}$ is the total uncertainty for the baseline emissions model (BEM);

$U_B^{[m]}$ is the total uncertainty in the proxy area;

$U_P^{[m]}$ is the total uncertainty in the project accounting area;

A_{PAA} is the area of the project accounting area and

A_{PX} is the area of the proxy area.

All reference calculations can be found in Annex 17 – MNRP NER Worksheet.

3.2.4.3.2 Determining Buffer Account Allocation

MRR.70 Reference to the VCS requirements used to determine the buffer account allocation.

The buffer account allocation for the MNRP is calculated according to the requirements stated in the VCS Standard Version 3.4, VCS Registration and Issuance Process Version 3.4, and the VCS Non-Permanence Risk Tool Version 3.2.

For m2, the non-permanence risk score was reduced from 25% in m1 to 10% in m2. The change in score was mainly due to the increased community engagement achieved during m2, as the MNRP has now been able to consult with more than 50% of households with the project area who are reliant on the project. This resulted in a change in score for total community engagement from 10 to -5. Total external risk, which includes total community engagement, therefore dropped from 14 to 0. There was also a more modest drop in the total internal risk category due to a change in the project proponent's financial viability, which resulted in the calculated financial break-even point being closer in time to the current risk assessment (see justification details in the MNRP non-permanence risk report) and also the implementation of an adaptive management plan (SBIA / causal model) during m2.

MRR.71 Reference to calculations used to determine the buffer account allocation.

The non-permanence risk score is calculated using the non-permanence risk tool v3.2 (see Annex 23 – Non-Permanence Risk Tool) which combines risk ratings for internal risk, external risk and natural risk. Risk ratings per category were calculated as follows:

Internal Risk

- Project Management: -4
- Financial Viability: 0
- Opportunity Cost: 6
- Project Longevity: 5
- Total Internal Risk: 7

External Risks

- Land Tenure and Resource Access/Impacts: 0
- Community Engagement: -5
- Political Risk: 4
- Total External Risk: 0

Natural Risks

- Total Natural Risk: 1

Overall Risk Rating: 10

Per VCS Registration and Issuance Process v3.4, the percentage of emission reductions equal to the overall risk rating shall be deducted from net calculated emission reductions and placed in the non-permanence buffer pool. As such, for m2, the overall buffer credits were calculated to be 10% of net emission reductions, 11,970,624 tCO2e:

Overall m2 risk of reversal buffer contribution: **1,197,062 tCO2e**

Please refer to Annex 17 – MNRP NER Worksheet for calculation details.

3.2.4.3.3 Net Emission Reductions for a PAA

MRR.67 Quantified NERs for the current monitoring period including references to calculations.

Please refer to Annex 17 – MNRP NER Worksheet

MRR.68 Quantified NERs for the prior monitoring period.

Please refer to Annex 17 – MNRP NER Worksheet

MRR. 69 A graph of NERs by monitoring period for all monitoring periods to date.

Please refer to Annex 17 – MNRP NER Worksheet

3.2.4.4 *Ex-Ante* Estimation of NERs (CL1.2 & 1.4)

MRR.75 Quantified NERs by vintage year for the current monitoring period including references to calculations.

Table 16 The GHG reductions, Project Emissions, Leakage Emissions and Net Emission Reductions (NERs) for the monitoring period, specified by vintage

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions(tCO_2e)	Project Gross Emission Reductions	Buffer Contribution emissions	Net GHG emission reductions

				(tCO_2e)	reductions (tCO_2e)	or removals (tCO_2e)
Year 2012	672,882	185,248	0	487,634	48,763	438,870
Year 2013	3,961,319	1,090,571	0	2,870,748	287,075	2,583,673
Year 2014	3,961,319	1,090,571	0	2,870,748	287,075	2,583,673
Year 2015	3,961,319	1,090,571	0	2,870,748	287,075	2,583,673
Year 2016	3,961,319	1,090,571	0	2,870,748	287,075	2,583,673
Total	**16,518,158**	**4,547,533**	**0**	**11,970,624**	**1,197,062**	**10,773,562**

3.2.4.5 Evaluating Project Performance

MRR.76 Comparison of NERs presented for verification relative to NERs from ex-ante estimates.

The NERs presented for the verification of the m_2 monitoring period are greater than the ex-ante estimates at m_1.

MRR.77 Description of the cause and effect of deviations from ex-ante estimates.

The NERs presented for the verification of the m_2 monitoring period are greater than the ex-ante estimates at m_1. The first reason for this is that this monitoring period covers more elapsed time than was estimated at m_1. As well, the biomass inventory plots are designed to capture both the regrowth of degraded forest and any deforestation or forest degradation that may occur within the Project Area. With the re-measurement of the plots at this monitoring period the carbon stock values were found to be a little lower than at m_1 monitoring period. This is the result of a small number of plots having been degraded by extractive activities. As well, the Project has lowered the risk rating for the project using the VCS Non-Permanence Risk Tool, as a result of stronger financial conditions and more extensive community engagement, resulting in a lower buffer pool contribution, and greater NERs. Therefore, on balance the Project is receiving more credits at this monitoring period than was predicted by the ex-ante estimates at m_1.

3.3 Optional Criterion: Climate Change Adaptation Benefits

Not Applicable

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

The Project has implemented many project activities that will assist communities and biodiversity to adapt to the most probable impacts of climate change. The foremost of these is the protection of the forest from deforestation, degradation and fragmentation. This will protect important healthy habitat for the biodiversity, providing greater population resilience to the effects of climate change. As well this will provide the communities with greater resources, help support more sustainable hydrological systems, and help moderate the impacts of severe weather. The Project is additionally supporting the improvement to and diversification of agricultural methods. This will help support greater nutrition and better yields despite shifting climate driven weather patterns. The Project is also supporting new and diversified income generating opportunities, reducing the communities' reliance on forest resources, fishing and agriculture.

With a more diversified array of income sources, they will be better able to handle any climate change related impacts to fishing and agriculture.

4 COMMUNITY

4.1 Net Positive Community Impacts

4.1.1 Community Impacts (CM1.1)

4.1.1.1 Result Chain Diagrams (CM1.1)

Please refer to the section below, for displaying the result chains produced by the SBIA Working Groups. Additionally, please refer to MNRP PD section 6.1.1.1 for detailed result chains utilizing the Theory of Change procedure.

4.1.1.2 Risks and negative impact analysis (CM2.1)

The SBIA Working Groups were tasked to outline any possible unexpected side effect(s) that might arise because of the Project successfully realizing the desired result. Additionally, they were also required to gauge the likelihood and magnitude of these unintentional side effects then propose possible mitigation. (NB: the western workshop ran out of time and could not complete this assignment before closure.

4.1.2 Net Positive Community Well-Being Impacts (CM1.1)

This project is designed from the ground up to provide net positive community well-being impacts. The prospects for these communities in the without project scenario was evident from the condition they were in as of the project start date. The logging company had been active in this concession for nearly 5 years, and there were no schools, no medical supplies or clinics, no jobs other than as labor for the logging company, the only agricultural product being grown was cassava which is incredibly low financial value and nutritional value. Since the project start date, and through the second monitoring period covered in this report, WWC has provided wellbeing to over 8,000 local residents, in the form of new schools and school materials for students, access to life saving health resources through our mobile medical clinic, income earning jobs supporting the REDD+ project directly, access to markets via our baliniere (ferry boat), and capacity building and governance work for 23 CLDs and 17 annex village committees.

4.1.3 Protection of High Conservation Values (CM1.2)

The MNRP will not have any negative effects on the identified community HCVs. Section CM1.2 of the MNRP CCB PDD discusses the HCV's that have been identified for the Project, and demonstrates that they cannot have negative impacts from the Project Activity.

4.2 Offsite Stakeholder Impacts

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

Please see the CCB PD section 2.2 for a description of the Project's plan to mitigate negative impacts on stakeholders. Two expected negative impacts from the Project on the stakeholders is change in volume and availability of extracted resources from the forest and increased competition in marketable produce. The Project Activities already implemented during this monitoring period include agricultural improvements and creation of new income generating opportunities, including direct employment by the Project.

4.2.2 Net Impacts on Other Stakeholders (CM2.3)

As described in the CCB PDD sections CM2.1 and CM2.2 the Project will have minimal negative impact on offsite stakeholders. Potential negative impacts center on a reduction in revenues due to reduced resource extraction, and potential market competition due to increases in agricultural activities and exports. The Project Activities have been designed to mitigate negatives in both of these areas, and this has been already implemented. Therefore, no net negative impacts on other stakeholder groups are expected due to project activities.

4.3 Community Impact Monitoring

4.3.1 Community Monitoring Plan Development (CM3.3)

The Climate, Community and Biodiversity Alliance stipulates that carbon projects should generate net-positive impacts for local communities and for biodiversity. To be approved against the CCB Standards, the “with-project” scenario must show an improvement over the “without-project” scenario. However, measuring social impact is tricky, both because of the challenge of attribution (how to be certain the impacts are only due to the project) and because social impacts are long-term in nature. The MNRP applies the theory of change causal model to think about, formulate and justify the various project activities, strategies and outcomes.

4.3.1.1 Theory of change

Logic

A theory of change is a hypothesis about how a project intends to achieve its intended objectives. In other words, a roadmap of how it plans to get from Point A (project activities) to Point Z (project impacts). As such, a project will have several theories of change – one for each of the key issues it is hoping to address. Obviously, theories of change are not guarantees: they are based on several assumptions about the cause-and-effect relationships which sometimes may not work out in reality. However, carefully selected indicators help monitor these assumptions in a causal chain analysis which points out to points of deviation early enough. The main strength of this logic lies in presenting a credible response to the challenge of attribution: indicators measure progress towards achieving the desired project outcomes and impacts from project activities and strategies.

Development

Some key steps in the development of a project’s theory of change include:

1. Identifying and prioritizing the main social problems facing the project: Focal Issue(s)
2. Describing the focal issue problem and the desired result or future condition for each focal issue: Focal Issue Statement(s)
3. Undertake a diagnostic analysis of each focal issue problem: Problem Flow Diagram
4. Develop a flow diagram using cause-and-effect logic to show how the desired result addressing the problems identified above will be achieved by the project: Results Chain
5. Identify key risks (assumptions) along these causal chains and negative impacts on stakeholder groups or environment: internal or external Risks and Negative Impacts

Table 17 The 7 Social Impact Assessment stages

Starting conditions	• Stakeholder Identification • **Focal Issue** identification and Vision statements
Without-project projections	• Reference or Baseline scenario • **Problem flow** diagrams
Theory of change	• With-project projections: how will objectives be achieved? • Key assumptions between Outputs, Outcomes, & Impacts = **Results Chain**
Negative impacts & Risks	• Mitigation and prevention measures • Re-analysis of Results Chains
Identification of indicators	• WHAT to measure: ideally linked to the Theory of Change
Monitoring plan	• HOW to measure: Sampling design
Data analysis, and reporting	• Publication & Dissemination: Feedback workshops

SIA Workshop

Pre-SIA workshop training

Before holding the community workshop, the whole MNRP social monitoring team was trained by Wildlife Work's Director of Biodiversity and Social Monitoring on the CCB-recommended process of undertaking SIA workshops for forest carbon projects, where they were introduced to impact analysis using the theory of change thinking. This was the same process and agenda as they would use to undertake the community workshops. They were also provided with copies of the SBIA manual to read prior to the workshop. During the training, they also went over Annexes 1 and 2 of the Social and Biodiversity Impact Assessment (SBIA) manual in detail, as well as going over the entire workshop and its expectations. This was important because each facilitator would be "in-charge" of a Working Group during the workshop.

Those included in the training held at Inongo were:

i. Operations Director at MNRP
ii. Coordinator responsible for the administration and logistics MNRP
iii. Coordinator of the socio-economic department and community engagement MNRP
iv. Coordinator of the communication & PR department PR MNRP
v. Deputy Coordinator of the technical department at MNRP
vi. Four Team Leaders socio-economic department MNRP
vii. One official with the biodiversity component at MNRP
viii. Three facilitators at the department of communication and public relations at MNRP
ix. Three Engineers at the department of biomass inventories and agroforestry at MNRP

SIA community workshops

Wildlife Works' Mai Ndombe REDD+ Project (MNRP) organised three SIA workshops (one on Lokanga and two in Ntomba-Nzale) that focussed on the first four stages of undertaking SIA above. In addition to the overall workshop coordinator from MNRP, there were also four animateurs from MNRP Project Office.

The SIA workshops targeted communities living within or adjacent to the Mai Ndombe REDD+ Project (MNRP) area. Three 3-day SIA workshops were held on Lokanga and Ntomba-Nzale sides of the MNRP. Lokanga workshop was held between 14 and 17 September 2013 at the local primary school while two workshops were held at Ntomba-Nzale Groupement, given the long distances between the different clans and villages but also their characteristics in this Groupement; the first was held in Mpatambalu between 6 and 10 June 2014 and the second in Lobalu (about 65 km inland) between 12 and 15 June 2014. It is worth noting that although these three separate workshops were held, exactly similar processes and activities were undertaken on all workshops. Multiple workshops were held to include more people and maximize the chances of capturing the full spectrum of community views concerning the REDD+ project, the focal issues the project can help improve, and the most appropriate strategies and activities that could be undertaken towards this end.

Workshop goal

The SIA workshop focused on the first four stages of undertaking SIA above. Specifically, the two main objectives were:

i. Produce a general, shared understanding of the project goal and vision for the entire project area
ii. In smaller Working Groups work through stages 2-4 (i.e., problem flow, results chain and risks and negative impacts) for the focal issues identified.

Participants

The workshop participants comprised members or representatives of the different stakeholders across the MNRP living in or around the project area Groupements. These included local chiefs, members of the CLDs (Local Development Committees), representation from both genders, and representatives of the youth and elderly in the society; we also strived to obtain a wide representation from the clans and villages within each Groupement. In total, there were 174 participants: 50 from the Lokanga workshop and 82 and 42 from the Mpatambalu and Lobalu workshops in Ntomba-Nzale, respectively.

4.3.1.2 Stage 1: Starting conditions

Visioning process

The participants were taken through introduction into climate change and REDD+. Besides basic definitions, they were taken through climate change mitigation, carbon offsetting and carbon markets, especially as pertains to REDD+ and the MNRP. The project scope was also introduced in the form of a map (Figure 10) which elicited animated discussions about the boundary delineations and proposed project communities.

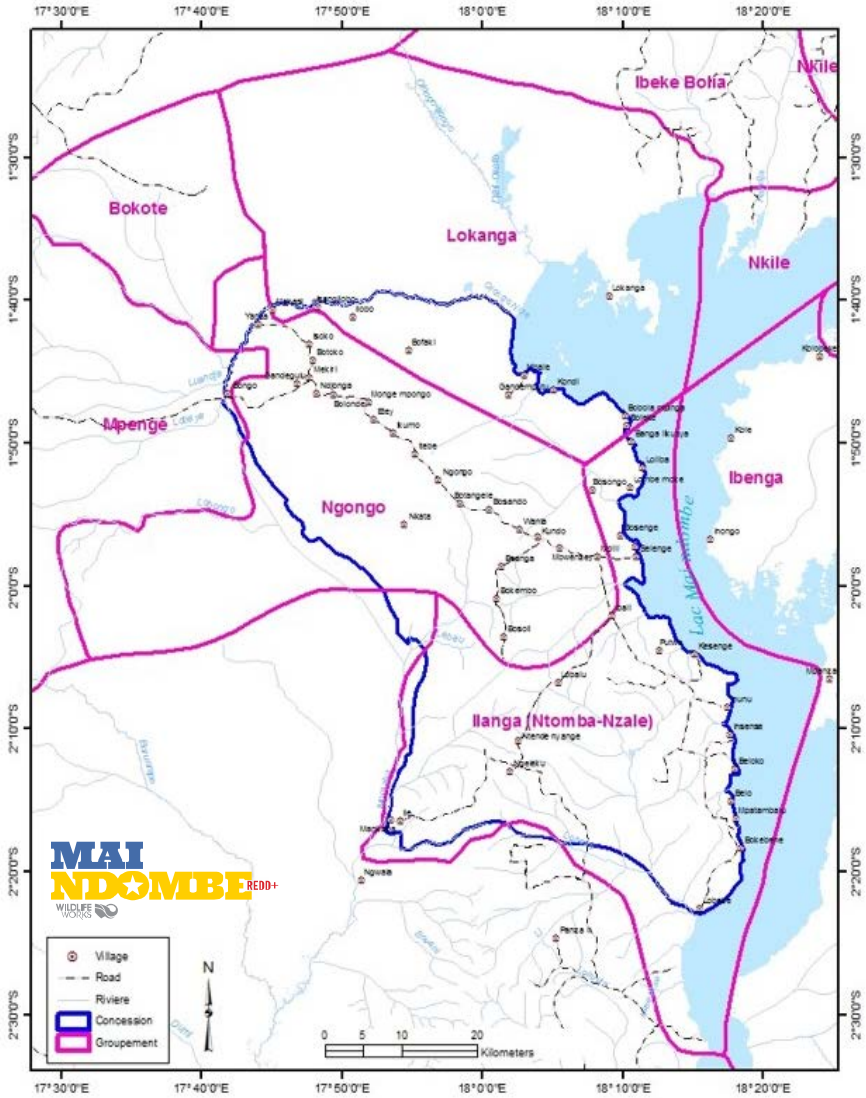


Figure 10 MNRP Project Area and the Groupements making up the Project Zone

To conceptualize the project vision, the participants were asked to think about this question: "*If the Mai Ndombe REDD+ Project is successful – what does it mean to you or what would you like to see*?"

In small groups, they wrote brief suggestions of 1-3 ideas that they felt represented long-term changes that they desired the project to fulfil so that they consider it successful.

Lokanga

The main items that were mentioned included improved infrastructure for transport, health and education, job creation and more employment opportunities, greater incomes and improved agriculture.

Ntomba-Nzale

The main items mentioned from the Mpatambalu workshop included: Improving health care, education and agriculture, job creation and development of agricultural feeder roads. From the Lobalu one, the main

items were: Improving education and health care, improvement of agricultural feeder roads and access to employment for all

Focal issue: identification and prioritization

Focal issues are social factors or issues that are most important for the project or social problems that could prevent project success. Participants were reminded that in thinking about these issues, they should always consider those that could be realistically expected from the MNRP itself. To help them identify and prioritize these issues, the following three questions were used:

i. What social issues or problems in the project area could prevent the MNRP from achieving its (carbon) objectives?
ii. What social issues or problems in the project area are most strongly related to the process of deforestation or forest degradation?
iii. What social issues or problems in the project area could the MNRP have most influence on (even a side-effect)?

In plenary, all participants were requested to identify social or biodiversity issues within their areas or villages that they considered most important for project to address for it to be considered successful. This exercise was done by writing down each idea on a manila card which were then tallied to help determine the priority Focal Issues.

Lokanga workshop

To do this the participants were divided into 5 groups at the Lokanga Workshop as follows:

- Delegates from the village of Lokanga
- Delegates from the village of Mbale
- Delegates from the village of Ikita
- Delegates annexes villages Lokanga: Ndonga Nsongo, Bake, Bele I and II
- Delegates annexes villages in Mbale: Nkondi, Ntuku, Bobolampinga and Boleke

Each group listed the key issues which they felt were critical for the project to address in order to achieve its community and biodiversity objectives. Next, through an open and all-inclusive process of re-phrasing, grouping similar issues and prioritizing (through voting), the plenary settled on the following overall Focal Issues (listing is not an indication of priority):

i. Forest degradation
ii. Excessive exploitation
iii. Extreme poverty
iv. Unsustainable agriculture and fishing
v. Poor health

Ntomba-Nzale workshop

The Mpatambalu workshop identified the following seven priority issues:

i. Non-compliance with environmental legislation
ii. Poverty
iii. Deforestation
iv. Poor education standards

v. Lack of agricultural extension
vi. Poor health
vii. Poor transport infrastructure.

The Lobalu workshop identified the following five priority issues:

i. Non-compliance of forest conservation
ii. Poor health
iii. Lack of agricultural feeder roads
iv. Poor education
v. Lack of jobs.

For each of the workshops, the participants were then randomly divided into Working Groups, one for each of the selected Focal Issues. Although this formation was random, gender, leadership (Chiefs) and youth representation in each group was considered hence necessitating a bit of reshuffling in the end to ensure that as far as was possible:

- Each WG had at least 6 members in total, with at least 1 woman and a youth representative
- Each WG had at least one representative from each village
- Each WG had a Chief or other leader amongst them.

Stage 2: Without-project projections

Focal issue description

Each working group was assigned one of the focal issues to work with throughout the remaining part of the workshop. First, they were asked to think the issue they were handling as a problem then formulated a focal issue problem statement and its vision statement where they envisioned how things will be when the particular problem was solved. This was meant to give the group a collective understanding of the issue assigned to them and start developing ideas and notes that would be used for the subsequent stages of the process.

Lokanga workshop

The problem and vision statements for each Focal Issue:

Forest degradation

- *Problem statement*: in Lokanga, the community is not adequately sensitized which, together with increasing population, leads to encroachment for the traditional slash-and-burn agriculture and use of fire for hunting, causing high levels of forest degradation.
- *Vision statement*: Communities in Lokanga are trained and sensitized leading to adoption of new agricultural techniques, which together with improved education and revenues from the REDD+ project, improves their social wellbeing, leading to improved conservation of forests.

Excessive exploitation

- *Problem statement*: The misuse of fisheries equipment (fishing nets), non-compliance to hunting rules and norms, leads to overexploitation, population declines and local extinction of some species.

- *Vision statement*: A Groupement where good educational infrastructure, improved access to health care and employment opportunities lead to alternative livelihoods away from the forest, hence reduced resource exploitation.

Extreme Poverty

- *Problem statement*: low salaries for officials, a lack of infrastructure and adequate means transportation, lack of appropriate agricultural techniques, lack of proper education, little access to markets and employment, all escalate poverty levels across the Groupement.
- *Vision statement*: Having access to a good education, health care, food self-sufficiency, high income and employment will lead to a reduction in poverty in these communities.

Unsustainable farming and fishing

- *Problem statement*: poor (traditional) agricultural techniques, poor livestock husbandry and unsustainable fishing lead to poor farm productivity and little income
- *Vision statement*: communities in the Lokanga Groupement practicing improved agriculture practices including good animal husbandry, sustainable and socio-economically viable fishing practices leading to improved productivity and higher incomes from farms.

Poor health

- *Problem statement*: lack of good sanitation infrastructure, poorly equipped and skilled nursing body, limited access to clean potable water, and high levels of malnutrition adversely affects the health of the community
- *Vision statement*: a Lokanga Groupement where a program on sanitation and access to potable water is operational, where built and equipped health facilities with skilled health personnel produce a healthy and productive community.

Ntomba-Nzale workshops

Since the two workshops returned very similar focal issues, they are combined into seven issues from this point forward in this report, and thus unified conceptual models, theories of change, indicators, and monitoring plans were formulated.

The problem and vision statements for each Focal Issue:

Breach of the forestry legislation

- *Problem statement*: lack of jobs, malnourished communities and lack of new farming techniques, results in laws on forest conservation not to be respected
- *Vision statement*: A Ntomba-Nzale Groupement where there is availability of employment and food security, and the use of new farming techniques reduces need for encroachment, and thus forest conservation laws are respected.

Poor education

- *Problem statement*: a lack of adequate buildings and school facilities, and poorly paid and unmotivated teachers results in poor education standards

- *Vision statement*: A Ntomba-Nzale where school infrastructure and facilities are well developed, and where skilled and well-paid teachers are adequate, leading to high education standards.

Poor health

- *Problem statement*: heavy (manual) work, little permanent power (electricity), and a lack of money to spend on health, together with health centres in poor condition, lack of qualified nursing staff and non-compliance with hygiene rules, leads to overall poor health status of the communities
- *Vision statement*: A Ntomba-Nzale Groupement where work is lighter, people are well-nourished and have money to spend on improving health, health facilities are built, equipped and adequately staffed, resulting in healthy communities.

Poor agricultural feeder roads

- *Problem statement*: poor maintenance of rural roads by communities and weak support from the State, has led to deterioration and few roads in the Groupement
- *Vision statement*: A Ntomba-Nzale Groupement where financial and technical resources are available, rural roads maintained and where communities support themselves through a well-maintained road network.

Lack of employment

- *Problem statement*: lack of start-up capital for business, poor education, poor roads and inadequate agricultural extension services to train farmers, results in a lack of job opportunities
- *Vision statement*: A Ntomba-Nzale Groupement where there in investment from external companies, better education, a well-developed road infrastructure and well-trained farmers, leads to diverse job opportunities.

Extreme poverty

- *Problem statement*: poor state of rural roads, high levels of unemployment, lack of new farming techniques or access to markets and poor health infrastructure all contribute to high levels of poverty
- *Vision statement*: A Ntomba-Nzale Groupement where there are good roads and job creation, new farming techniques and good market access, plus good health infrastructure resulting in the improvement of living conditions.

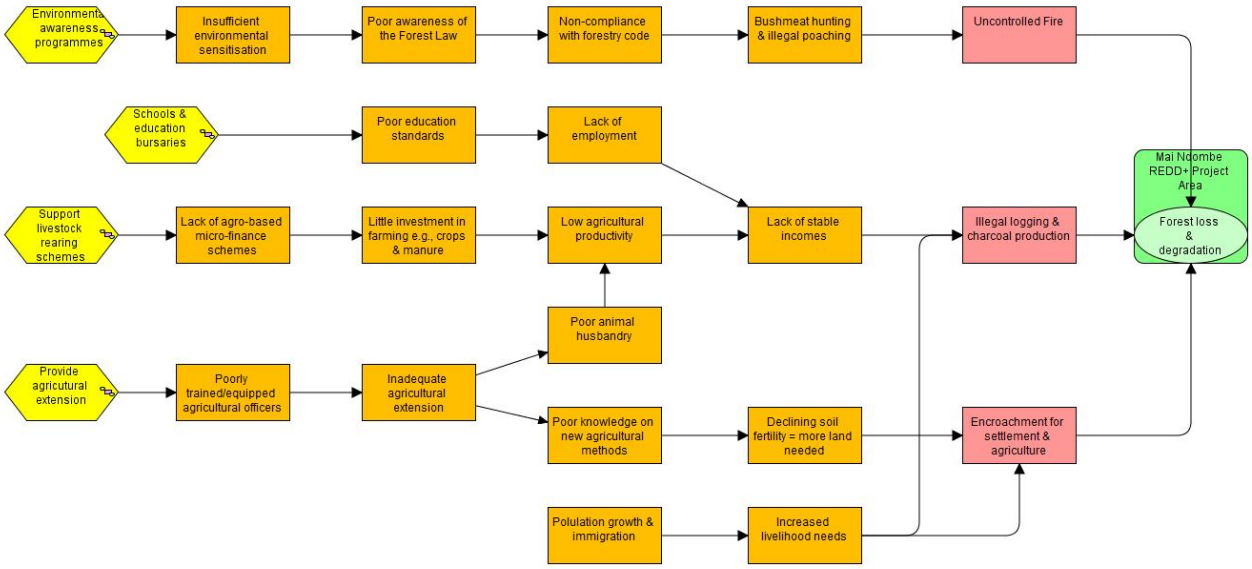
Forest loss

- *Problem statement*: lack of environmental awareness, increasing population and lack of employment opportunities, declining soil fertility with shifting cultivation leads to encroachment and deforestation.
- *Vision statement*: A Ntomba-Nzale Groupement where the community is aware and sensitized about the importance and fragility of the environment, jobs are created, and new farming techniques are practiced leading to reduced encroachment and deforestation.

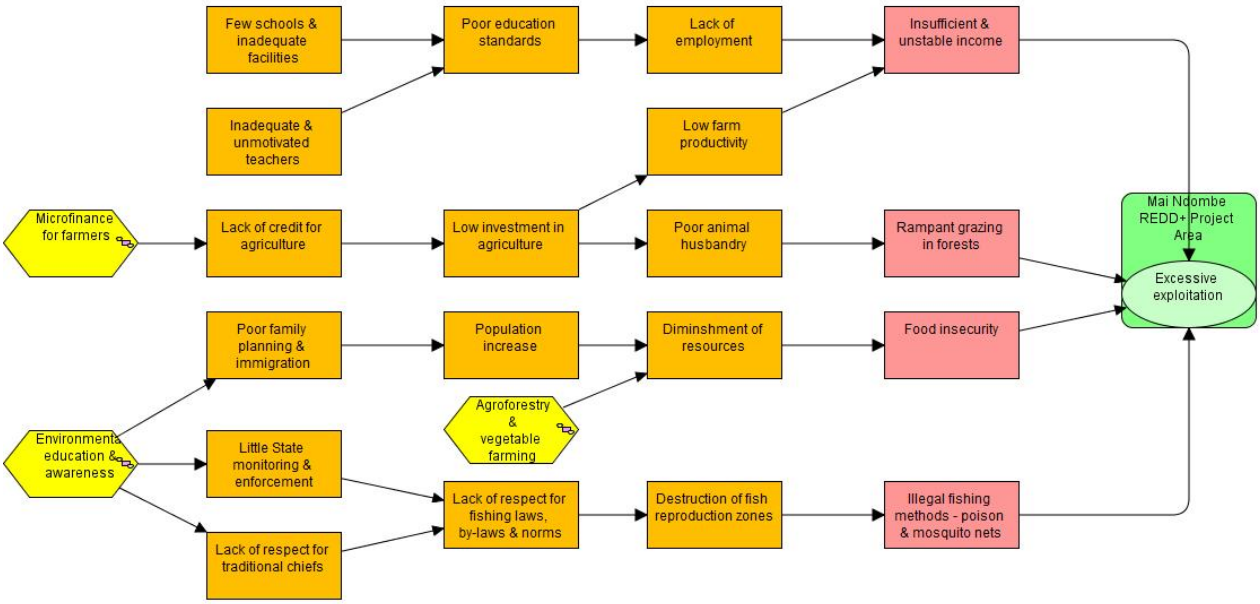
Development of Problem Flow Diagrams (PFD)

For the without-project (baseline) scenarios, firstly, participants were required to produce a Problem Flow Diagram for each Focal Issue in their respective Working Groups. However, to ensure a consolidated report and document for the MNRP, we combined the PFDs for both Groupements (Figure 11) from which the results chains and indicators were derived and a monitoring plan developed.

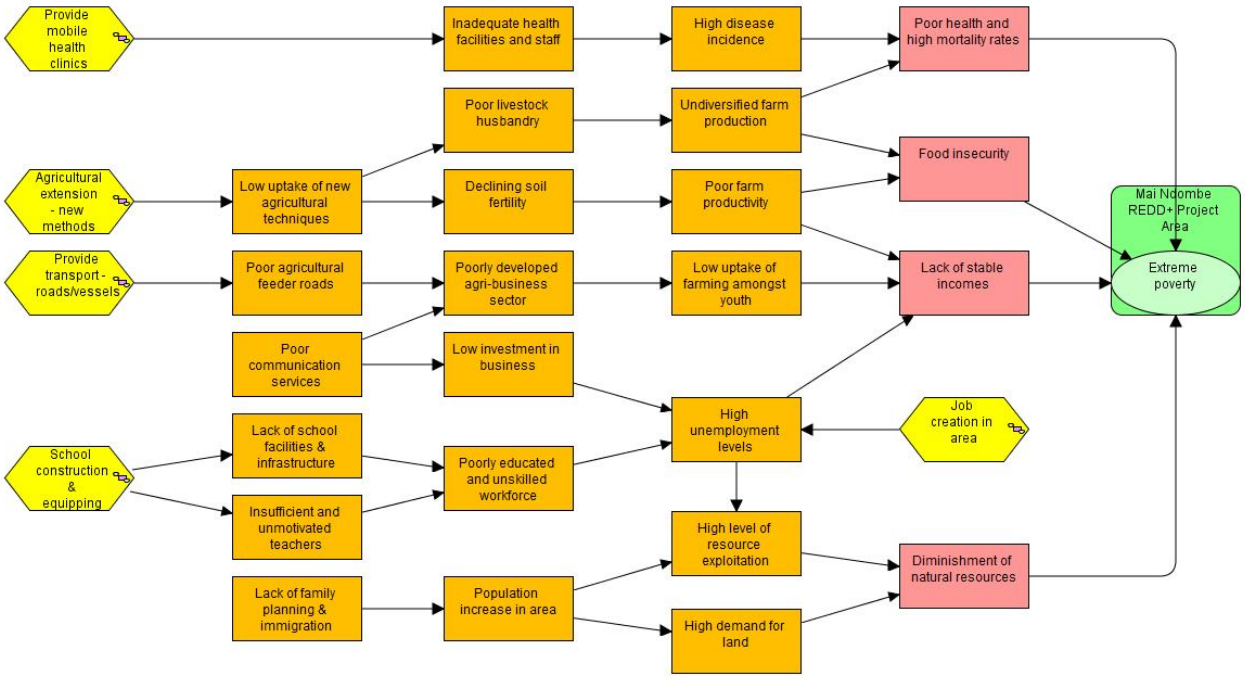
1. Forest degradation, including non-compliance of forest conservation



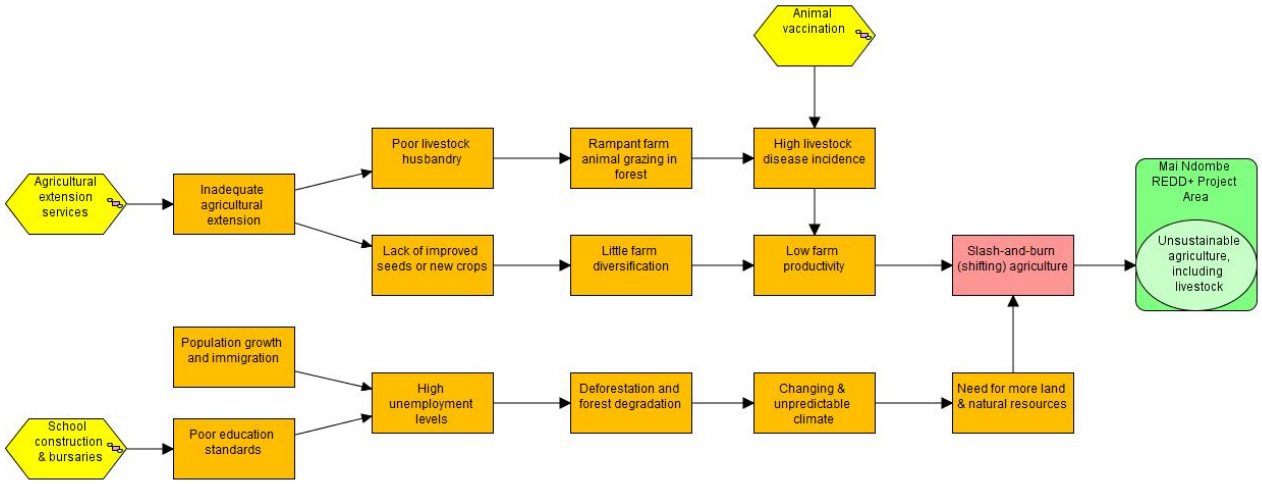
2. Excessive exploitation, including fishing and non-compliance with environmental legislation



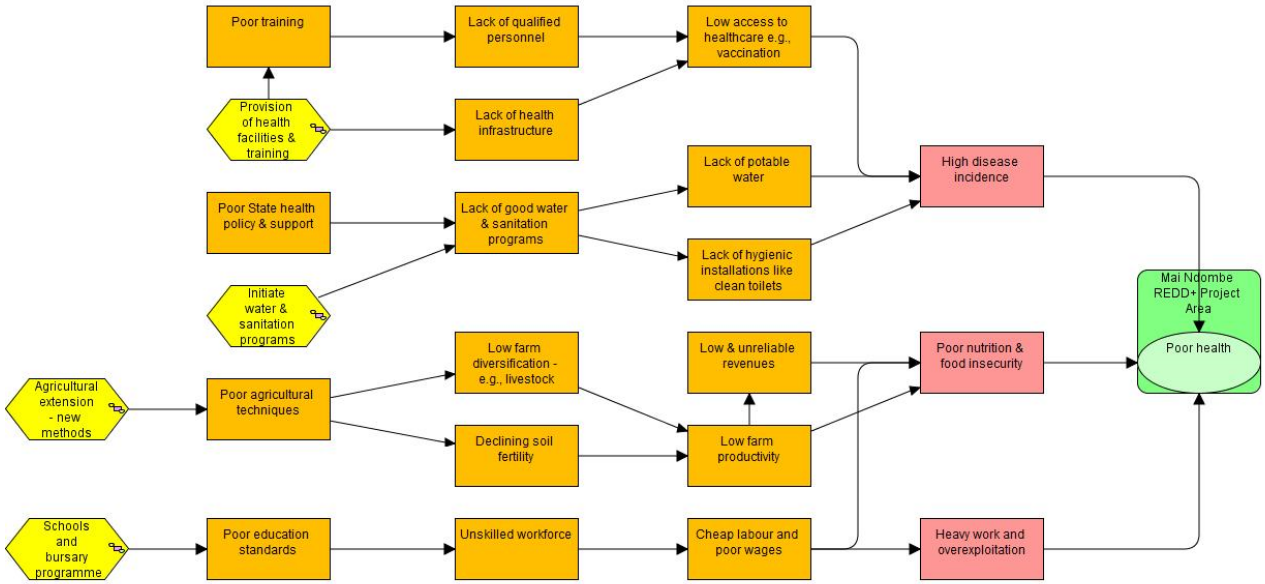
3. Extreme poverty, including lack of jobs



4. Unsustainable agriculture, including lack of agricultural extension and agricultural feeder roads



5. Poor health



6. Poor education standards

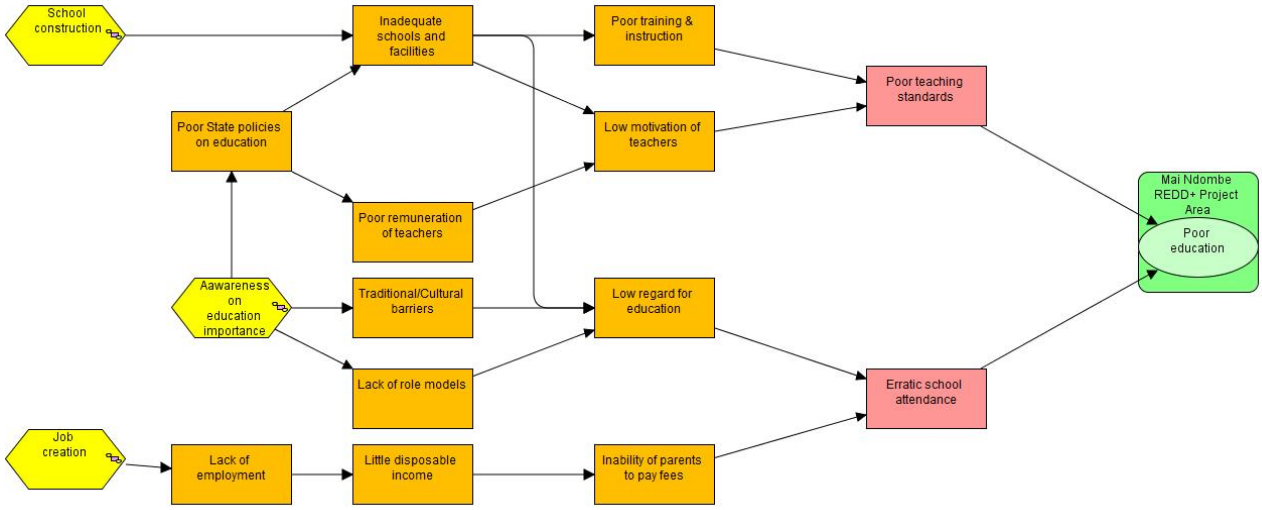


Figure 11 Problem Flow diagrams for the consolidated community focal Issues

Stakeholder identification and analysis

After creating PFDs, working groups discussed briefly about who should be considered a stakeholder within the project zone mainly by considering those who will be impacted by the project directly or indirectly, either positively or negatively (Table 18).

Future projection of current situation

After preparing the PFDs and identifying the project's stakeholders, the WGs then projected what would happen with the major direct threats identified for each Focal Issue in the short-to-medium term (5-10 yrs.) in the absence of the REDD+ project (Table 19).

Table 18 Stakeholder analysis & without-project projections

Focal Issue	Direct factor	Who benefits?	How they gain	Who loses?	How they lose	Will factor deteriorate, improve or remain unchanged in the next 5 years??	What will cause the change?
Forest Degradation	Wildfire	Hunters, Fishermen	Facilitate hunting (+fish and turtles)	Community State	Reduction or extinction of flora and fauna	Deteriorate	Lack of alternative sources of income; Lack of awareness
	Poverty	--	--	Community	High vulnerability and lack of resilience	Deteriorate	Minimal State and external (e.g., NGO) support
	Shifting cultivation in forest	Farmers	More land Extra production	The State Community	Loss of natural resources	Deteriorate	Population increase; Disregard of forestry laws
	Poor law enforcement	The law-breakers in community	Source of income	State Community	Loss of forest resources	Remain Unchanged	Increasing sensitisation of communities
Excessive exploitation	Lack of jobs	Businessmen	Low salary Breach of workers' rights	Youth	Low wages, No social security	Deteriorate	Lack of initiative from State and community
	Poor animal husbandry	--	--	Community	Loss of opportunities	Remain Unchanged	Insufficient agricultural extension
	Famine	--	--	Community	Malnutrition, Biodiversity loss	Deteriorate	Inadequate State support; Breach of forest laws

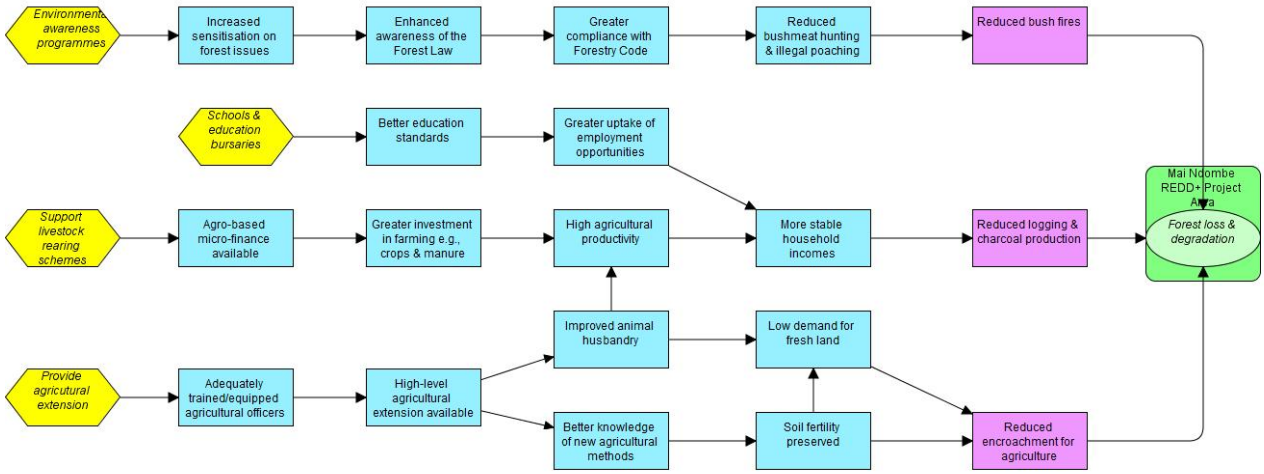
	Overfishing	Fishermen	More catches and sales	Community State	Decline in fish populations and species loss	Deteriorate	No respect for laws Resistance to change and few options
Extreme poverty	Malnutrition	Traders	Increasing food prices	Community	More costs for food	Deteriorate	Declining soil fertility
	Low agricultural productivity	--	--	Farmers Community	Food insecurity; High food prices	Remain unchanged	Inadequate agricultural extension services
	Low education standards			The youth Community	Lack of skilled workers	Remain unchanged	Inadequate monitoring and rigour in teaching
	Lack of job or business opportunities	The wealthier in society	Cheap labour	Youth Community	Unemployment or poor pay Social problems from idleness	Deteriorate	Minimal external or State investment initiatives in the area
	Lack of money	Traders and middlemen	Purchase produce cheaply	Farmers Community	Selling products at low prices Low revenues	Deteriorate	No initiatives for creation of alternative activities
	Lack of agricultural feeder roads	--	--	Community	Difficulty in transporting agricultural products	Deteriorate	Little road maintenance initiatives by State
Unsustainable agriculture	Slash-and-burn agriculture	Community	Livelihood options	Community State	More effort and time spent farming; Deforestation	Deteriorate	Population increase; Decline in productivity
	Declining soil fertility and productivity	Wholesale traders	Price increase	Community	Malnutrition, Lack of money, Loss of life	Deteriorate	Lack of oversight and price controls
Poor health	Disease epidemics	Pharmacies and chemists Nurses and care-givers	Earn more income	Ailing community members	More spending on drugs; Loss of assets Death	Deteriorate	Poor national health insurance and systems
	Heavy manual	Businessmen	Cheap labour	Youth Community	Poor wages and salaries	Deteriorate	Inadequate State oversight;

	labour without OHS				Deaths and ailments		Poor national health insurance and systems
	Poor nutrition	Nurses and Pharmacists	High charges for drugs & advice	Community	Buying expensive food Drug purchases; Greater disease incidence	Deteriorate	Little State support and health education
Poor education	Few training opportunities	Traders and businessmen	Cheap labour especially from youth	State Parents Pupils	Lack of optimal labour force Waste of money Lack of a good future	Deteriorate	Poor State systems and institutional framework Lack of qualified staff
	Low attendance of students in schools	--	--	State Community	Lack of skilled citizens Lack of opportunities	Deteriorate	Poor State policies on education access

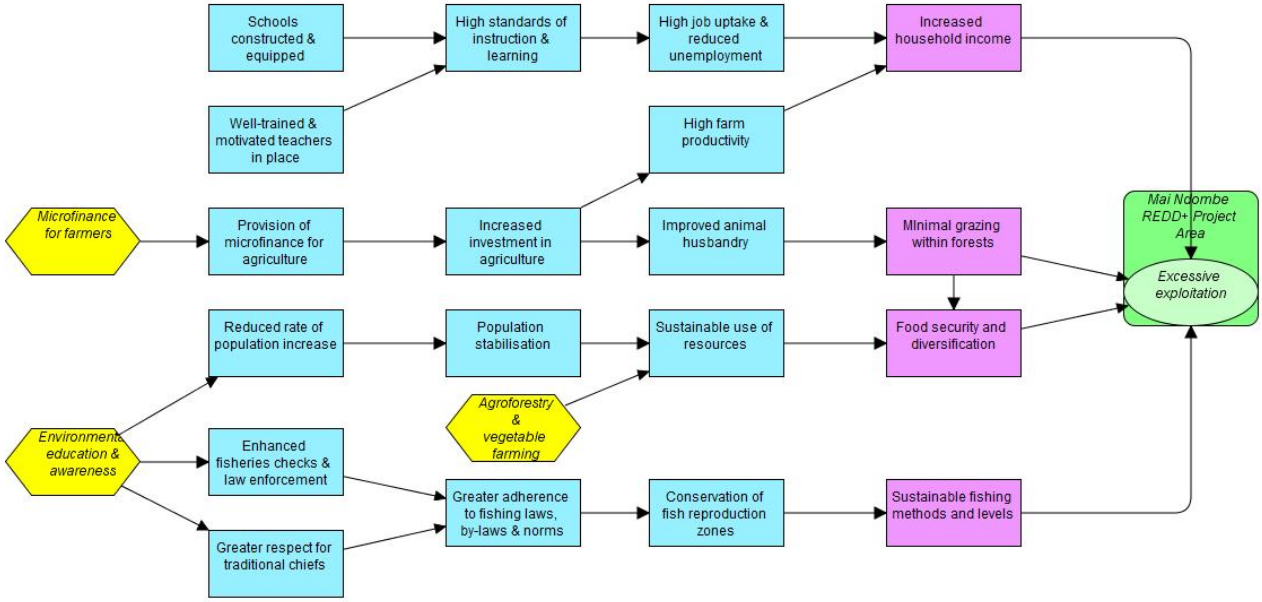
Stage 3: Results chain & Draft Theory of Change

Next, WGs were required to undertake a with-project analysis in which they sought the solutions to the problems identified in the conceptual models or PFDs above. Here, a chart was constructed with the results that would produce the desired project outcomes and the activities (project entry points identified from the PFDs) that would trigger these results using a cause-and-effect logic. The Result Chains for six consolidated Focal Issues are shown below (Figure 12).

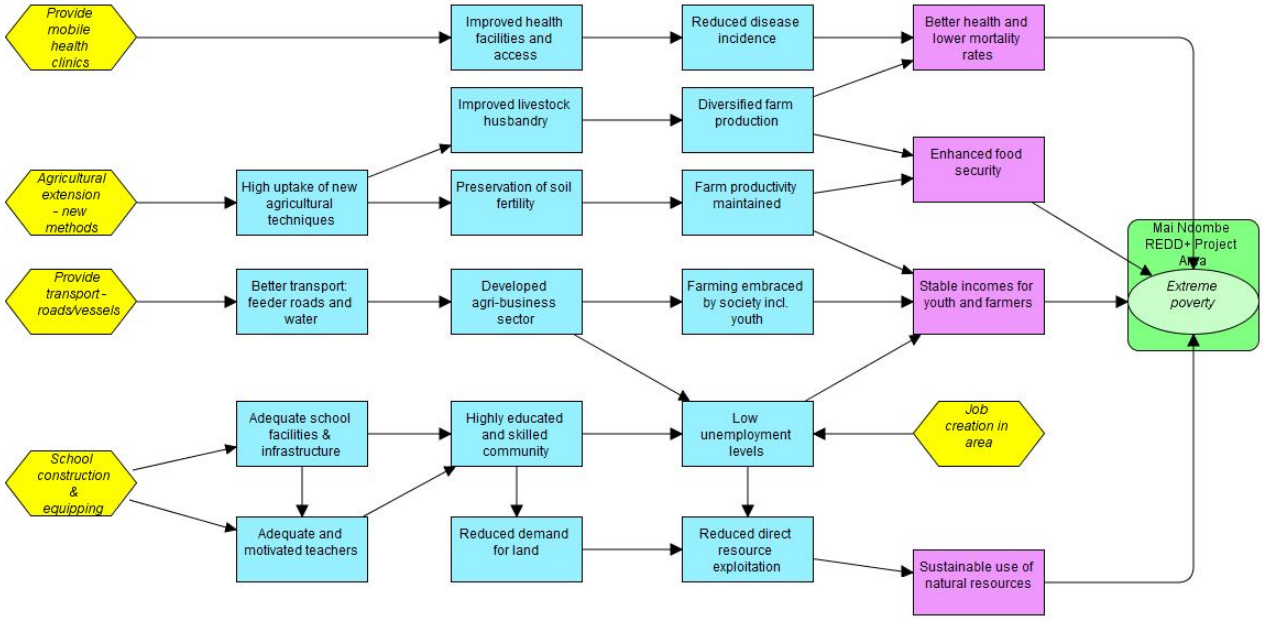
1. Forest degradation, including non-compliance of forest conservation



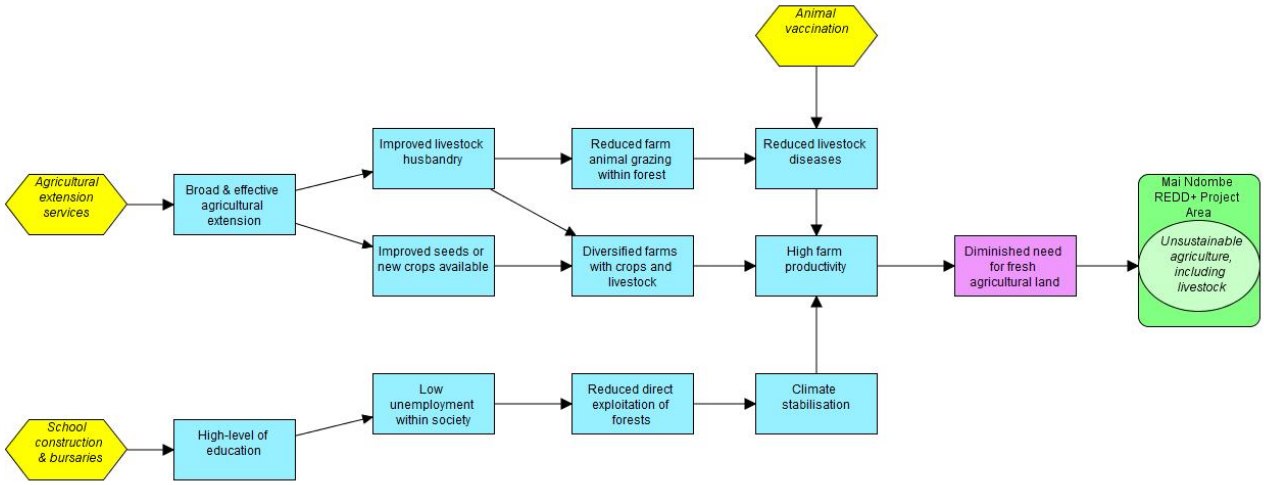
2. Excessive exploitation, including fishing and non-compliance with environmental legislation



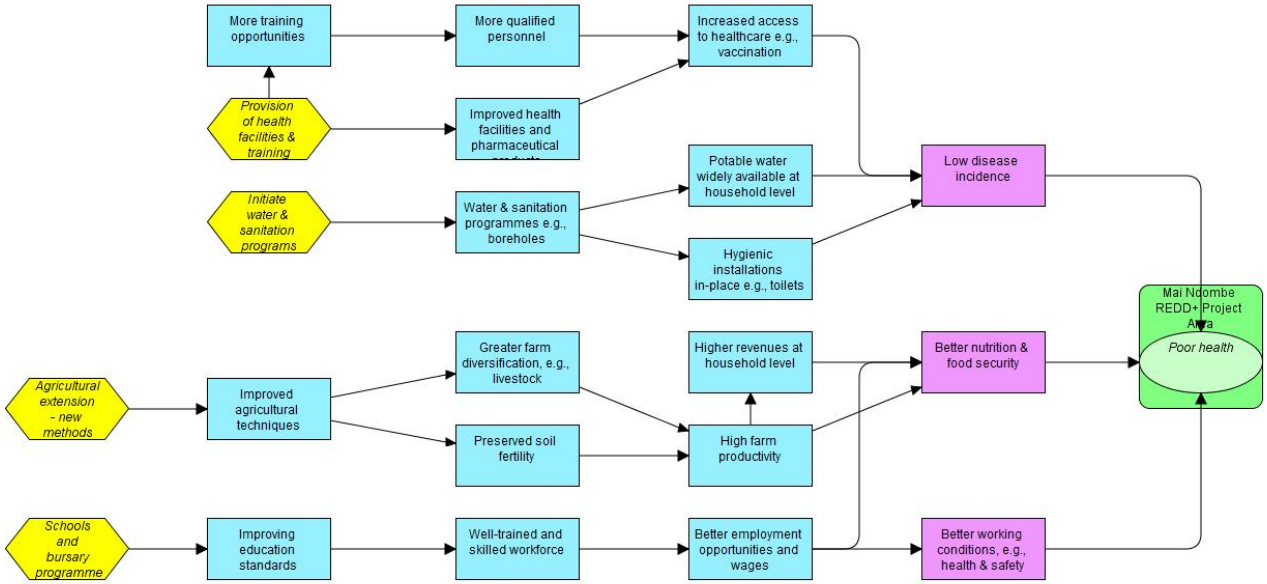
3. Extreme poverty, including lack of jobs



4. Unsustainable agriculture, including lack of agricultural extension and agricultural feeder roads



5. Poor health



6. Poor education standards

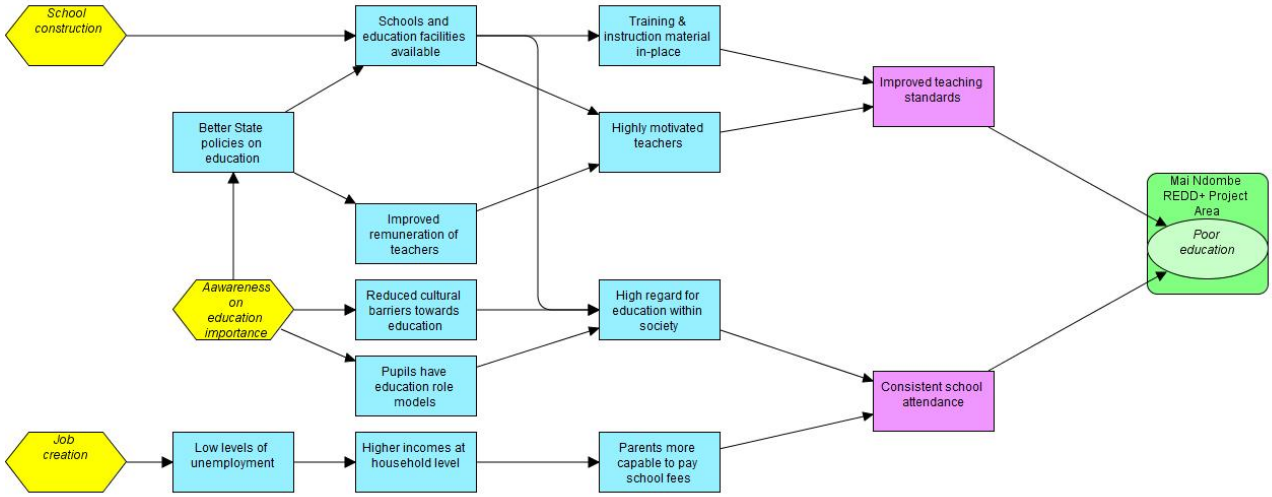


Figure 12 Results chains for community based focal issues

Theories of Change

Through a brainstorming session, WGs discussed the most important results identified along the result chain they developed that needed to be achieved in order to realize the desired focal issue condition, then develop a theory of change statement. From this exercise, the final theories of change were:

1. *Reduced forest loss and degradation:* **IF** new farming techniques are adopted and agricultural production increases, **IF** forest protection laws are disseminated and enforced, **IF** the community is sensitized on the protection of forests, and **IF** employment opportunities are increased, **THEN** forests will be preserved
2. *Sustainable exploitation of forest resources and fishing:* **IF** education is improved and jobs created, **IF** microfinance and seed capital is available, **IF** communities are trained on sustainable agriculture, **IF** fishermen use stipulated mesh sizes and adopt good fishing habits, **THEN** there will be sustainable exploitation of natural resources
3. *Reduced poverty levels:* **IF** agricultural production and market access is enhanced, **IF** education standards are improved and jobs created, IF food security is enhanced, and **IF** health infrastructure is improved, **THEN** poverty will be reduced
4. *Sustainable agriculture:* **IF** awareness, outreach and capacity building are conducted, **IF** new farming techniques like agroforestry crop rotation and good livestock husbandry are adopted, **IF** financial and technical resources are accessible to local communities, **THEN** agriculture will be more sustainable and environmental friendly
5. *Improved health standards:* **IF** health centers are built, equipped and staffed, **IF** diseases are properly diagnosed and treated, **IF** the population is food secure with healthy diet and clean water, **THEN** health standards will be raised
6. *Improved education standards:* **IF** school facilities are constructed, equipped and adequately staffed, **IF** incomes are improved through jobs or access to agricultural markets, **IF** school fees are regularly paid and school attendance improves, **THEN** education standards will be improved.

Stage 4: Risks & Negative Impacts

Then, to help the WGs with thinking 'what could go wrong' with the Results Chains produced above, two main things were done. First, a few questions were presented to them to help think critically about the potential risks, assumptions and problems including:

- What will happen to local livelihoods if restrictions are placed on the extraction of forest products?
- What will happen to the nutrition of poorer families who were dependent on bushmeat?
- What will happen to customary grazing rights?
- Will these problems affect the rich and poor similarly?
- How will the project affect landless people?
- Will the problem affect men and women differently? Do they spend their money the same?

Next, all groups were switched such that risks and negative impacts were identified by a different group from the one that developed the Results Chain. Two members of each WG explained their thinking and noted all the issues raised by the rest of the workshop participants. Afterwards, each WG returned to their stations to address the issues raised and revise the results chains if necessary.

From these exercises, the WGs were then asked to outline what could go wrong hence hinder the project from realizing the desired results, the likelihood of that risk happening and any mitigation measure(s) they would implement. Similarly, they were tasked with outlining any possible unexpected side-effect(s) that might arise because of the project realizing the desired result. (Table 19).

Table 19 Risk and negative impact assessment for key results in the community result chains

Focal issue	Result	Potential Risk or Negative Impact	Likelihood	Magnitude	Mitigation strategy	Explanation
Excessive exploitation	School construction and improved instruction	Poor attendance	Low	Medium	Reduce	Sensitization and mobilization
	Improved husbandry and vaccination	Lack of veterinarians	High	Medium	Reduce	Training and recruitment of veterinarians
	Increased agricultural production	Lack of market access	Medium	Medium	Minimize	Diversify for consumption and market access
Unsustainable agriculture	Farm animals under good husbandry	Lack of forage or foraging areas	Low	High	Reduce	Training on forage crops and feed enhancement

	Awareness and changing farming culture	Resistance to change	Medium	High	Reduce	Awareness-raising from project, Chiefs and State
Extreme poverty	High farm productivity	Lack of buyers	Low	Medium	Minimize	Broaden access to external markets
	Agriculture intensification	Climate change and desertification	Low	Medium	Reduce	Land-use planning and zoning
	Improvement of transport infrastructure	Overcrowding	Low	Medium	Minimize	Sensitization and respect of transport code
Poor health	Well-sanitized villages	Overpopulation	Medium	Low	Do nothing	Clean up surrounding villages
	New crops and diet change	Resistance to change of food	Medium	Medium	Reduce	Sensitization for cultural shifts
	New hospitals and health facilities	Immigration into area due to better facilities	Low	Medium	Minimize	Expansion of project benefits
	Hospital construction	Lack of qualified personnel	Medium	High	Reduce	Training and recruitment of nurses by project and State
Forest degradation	Improved livestock husbandry	Failure due to lack of enclosures	Medium	Medium	Reduce	Farmers trained and supervised
	Increased incomes	Population increase and school desertion	Low	Low	Minimize	Support social organization and provide bursaries
	Reduction of bush fires	Hunters persist and use traditional techniques	Medium	Medium	Reduce	Job creation and employment of hunters as eco-guards

Stage 5&6: Indicators and Monitoring Plan

Finally, the MNRP staff used the Results Chains created by the community and the community indicators proposed to formulate the indicators that the MNRP would use to monitor the social impacts, and put together the monitoring plan for collecting the metrics for the indicators. The indicator set and plan for monitoring them are shown in the community monitoring plan (Annex 5).

Final session & closure

After WGs were through with this final exercise, group exchange visits were carried out to present the work and have final deliberations from the plenary. During group presentations, question and answer session dominated with each group making clarifications sought, incorporating suggestions and making amendments as necessary. Overall, most of the participants in these community workshops had some previous introduction and varied understanding of the REDD+ process and the MNRP in particular. They were all pleased to leave with an improved understanding of the project and its planned implementation. This was especially useful because most of the participants were opinion leaders (being selected as representatives) and they were urged to pass the information to the community members they represented.

From these workshops, more than 170 local community members were well-equipped on the SBIA process and would be good project ambassadors to the rest of the community. Comprehensive indicator set and a detailed monitoring plan data was developed from the three workshops. The workshops were challenging due to the need to use multiple languages including French, Lingala and Lolia to ensure the messages were understood. Additionally, debates were at times heated in some working groups and accordingly the initial timing was disrupted (but this showed participants cared about the outcomes from the process which is good).

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

Summary of Community Activities Implemented for m2 (1 November 2012 - 31 December 2016)

Indicators and monitoring results for community-related project activities were initially based on the theory of change models. As the MNRP continues into m2, we have employed an adaptive management approach for each activity, allowing for stakeholder feedback and suitable adaptation in response to practical topics (see section 2.2.4). Community activities for the second monitoring period (m2) are described as follows:

1. School design and construction

School design and construction, being the MNRP's most significant and costly project activity, is a multi-year process. As such, design, construction, maintenance and improvement occurs throughout multiple monitoring periods. Extreme conditions in the project area demand constant upkeep for the schools long after they have been built. Maintenance (painting, roof repair, etc.) as well as replenishing of supplies and school furniture are therefore part in parcel of the school design and construction process.

School construction for two large schools began in m1 for Kesenge and Lokanga. The mandatory audit required by the Ministry of Education upon the completion of all school buildings was conducted by two independent engineers to determine if the buildings met safety and quality standards. Their report showed some deficiencies in the roofing systems, prompting us to contract a new engineering firm to modify the Kesenge roof and ceiling. Construction for schools in both Kesenge and Lokanga was started during m1.

m2 Activity

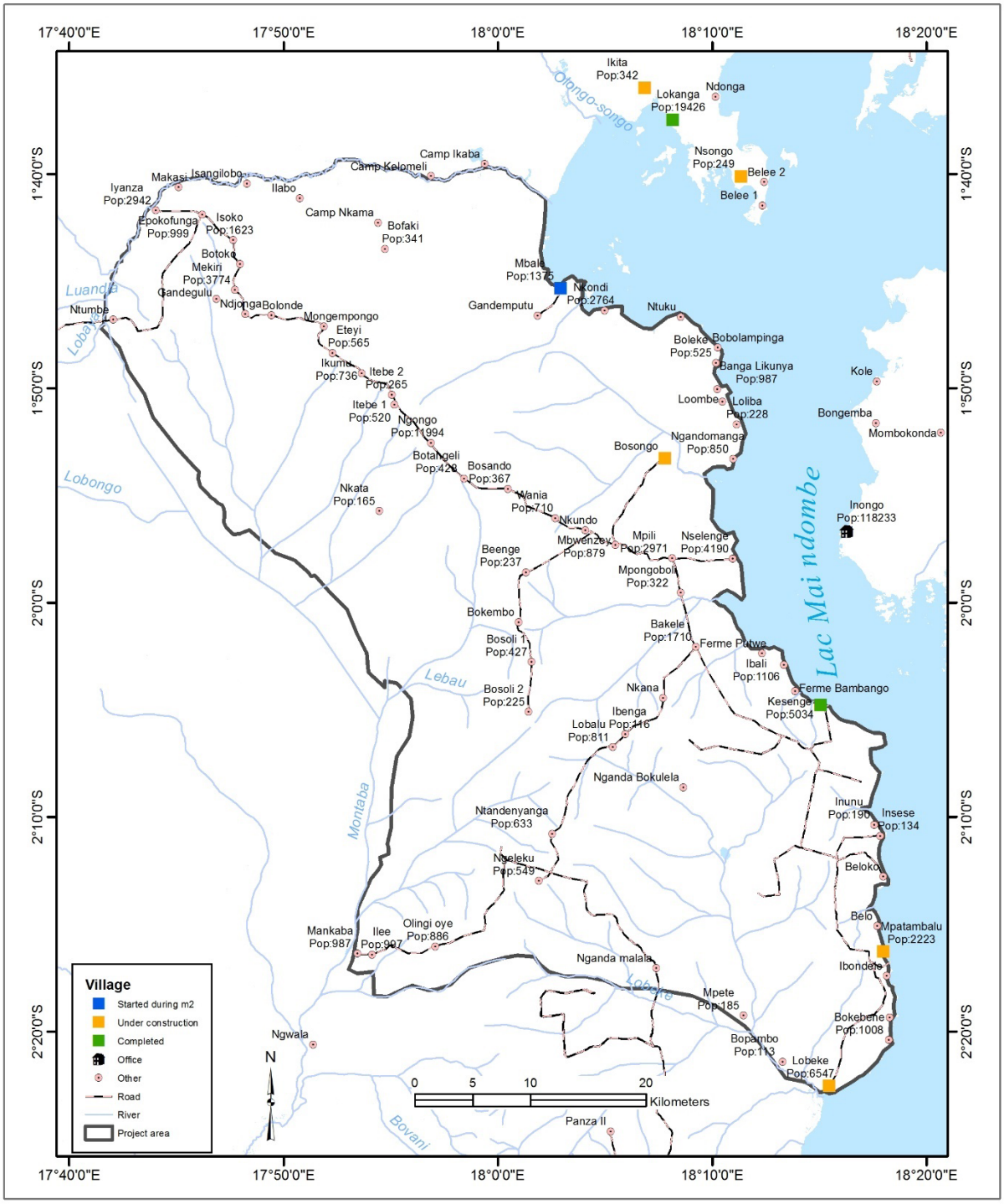
During the second monitoring period, 1 school in the village of Mbale was started (October 2015) and nearly completed. The mandatory Ministry of Education audit will be conducted for this school upon its completion. However, using the recommendations from the audit mentioned above, local management opted to overhaul the design, which required a complete staff / procedure re-alignment and new construction procedures. The schools in Lokanga and Kesenge, which were started in m1, were completed during m2, and maintenance has begun for both. Bricks for 5 schools were fabricated during m2 and furniture was fabricated and installed at the school in Kesenge (March 2015):

Table 20 m2 school activities

School building planning, construction and maintenance		
Started	**Construction in progress**	**Completed**
Mbale	Ikita (Pygme Village)	**Lokanga**
	Lobeke	**Kesenge**
	Mpata-Mbalu	
	Bosongo	
	Nsongo	

School supplies distribution by Groupement		
Ntombe N'zale	Basengele	Bolia
Selenge	Mpili	Mbale
Ibali	Mbwenzey	Lokanga
Kesenge	Kundu	Nkondi
Bakele		Ikita
Lobalu		Boleke
Ngeleku		
Ntandenyanga		
Inunu		
Mpatambalu		
Bokebene		
Lobeke		
Loliba		
Bosongo		
Furniture fabrication and installation		
Kesenge		

Figure 13 School Activity during m2 – top left: Lokanga school completed; top right: benches fabricated and installed in Lokanga; middle left: school supplies being delivered in Ibali; middle right: bricks covered for protection; bottom left, right: Mbale school



Source : Service statistiques/Territoire d'Inongo
Statistiques des populations 2015

Figure 14 Map of schools built, under construction or redesigned during the m2 monitoring period

2. Health Care

The health care system is broken in the Democratic Republic of the Congo, especially in the Lake Mai-Ndombe area. While we needed to concentrate in secondary hospital rehabilitation and building, a number of circumstances prevent us for doing so. Since 2012, flu and malaria epidemics erupted in most of villages in the project area killing hundreds of people. Malaria is the number one killer, especially for children. It is highly endemic in the area. It has been blamed for more than 40% of child deaths and a significant proportion of mortality at all ages. MNRP had to fight epidemics due to flu and malaria in order to save children in the area, as support from the local and national government are critically lacking. A mobile clinic program has been set at the company level in collaboration with the Territory Health

Figure 15 Mobile clinic in the Project Area organized in close collaboration with the Health Commissioner

Commissioner to fight epidemics in villages, to provide basic medication and to improve the health care (Figure 15). This program has focused mostly on fighting malaria and water related illness.

m2 Activity

In 2013 - 2014, Era Congo / WWC, in partnership with the INNO Rural Health Zone, accelerated routine immunization days in four (4) intervention zones, including the Selenge, Kesenge, Lobeke and Lokanga pool. Accelerated vaccination was given to the children of between 0 and 11 months of age in 9 villages: Likwangola, Bosongo, Ngandomanga, Loliba, Banga likunya, Loombe, Boleke, Bobolampinga and Ntuku. Through financial collaboration of the Territory Health Zone and ERA Congo / WWC, free surgery was administered in Bobolampinga for gentleman suffering severely for several months.

The mobile clinic was successfully instantiated during 2 missions, covering several villages along the lake (see Table 21 below). Most recently, an epidemic erupted in the village of Mbale, killing dozens of children. The MNRP funded the evacuation of affected children to the Inongo General Hospital to administer medical care and halt the spread of the disease. Throughout m2, 2988 people received vaccination, emergency care and/or evacuation as a result of this important project activity.

In addition to mobile clinic, the company has supported expenses related to treatment of community members at the Inongo General hospital and most recently, a clinic in Inongo. Improving health infrastructure and supporting the Lokanga, Lobeke and Ngongo secondary hospitals and clinic building will be the focus of our work in m3.

Table 21 Mobile clinic mission results for m2

Mission 1	**F**	**M**	**Total**
Lobeke			53
Mpatambalu			36
Inunu			20
Bamboka			13
Kesenge			72
Ibali			36
Ntotonkomele			11
Nselenge			38
Mbale			64
Bobolampinga			20
Nkondi			30
Mission 1 total	247	182	**429**
Mission 2	**M**	**F**	**Total**
Bake	10	19	29
Bele1 et 2	3	6	9
Ikita	18	30	48
Nkondi	17	21	38
Bobolampinga	14	21	35
Mission 2 total	62	97	**159**
Total m2 medically treated	309	279	**588**
Total vaccinated			**2400**
Grand total			**2988**

3. Agricultural intensification and diversification

Figure 16 Agricultural intensification / diversification gardens

The project area is among the poorest places on earth, with approximately 100,000 people living of subsistence agriculture and with less than USD 1 per household per day; and lacking everything of their basic needs while the potential and desire for economic development clearly exist. Health and nutrition status is extremely poor in the area and have deteriorated over the past decades. Over one-third of under-five years old children are chronically malnourished (stunting), and 16% suffer from acute

malnutrition (wasting), reflecting wide vulnerability to short-term crises according to a report from the local public health authorities.

Unsustainable extensive slash and burn agriculture is the main activity for local communities in the area with cassava as the main crop. This system is unsustainable and economically not viable due to its extensive nature and the low pricing of the main crop (cassava) in the market. The company has then designed a program for agriculture intensification with a focus on effective and rational use of areas under fallows (and therefore to stop extensive slash and burn) or areas occupied by young secondary forests. This program has led to introduction of crops that have not been produced in the past and that are more commercially valuable locally and nationally such as onions and beans (Figure 17)

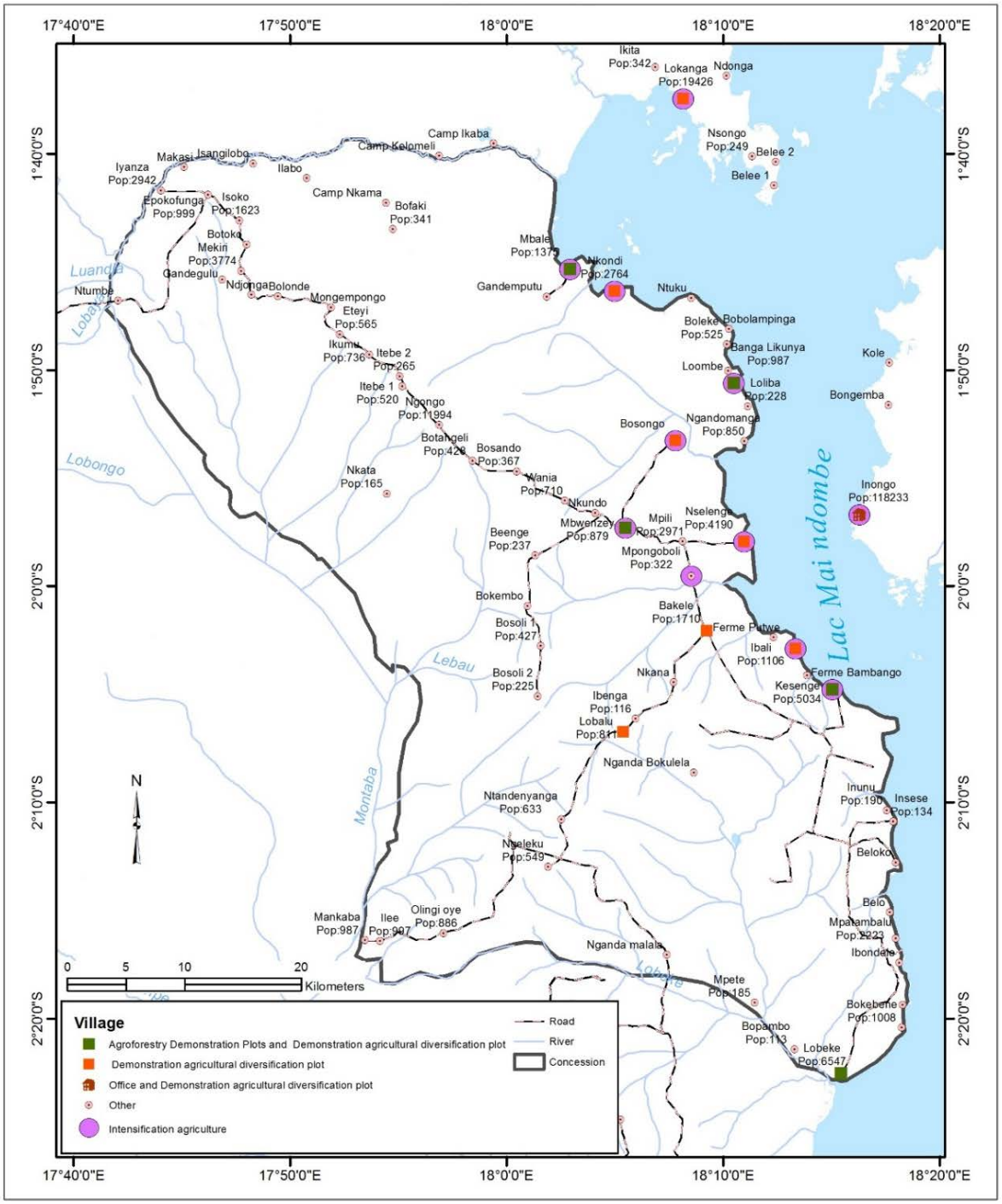
This activity has been organized in Lokanga, Mbale and Nkondi in the Lokanga Groupement; Loombe, Bosongo, Nselenge, Ibali, Kesenge, Bakele, Mpongo Boli and Lobeke in the Ntomba-Nzale Groupement and finally in Mbwenzey in the Ngongo Groupement (Figure 18 Agricultural intensification activity map).

Agriculture intensification features new cropping systems and a variety of new crops as specified above. A number of community members have joined the program by cropping in the above-mentioned villages. The maximum onion production by community members was reached in Mbale in the season of 2015 which was sold in Kinshasa market.

This activity has contributed to a slight increase of revenues for local community members who joined the program. Because of agriculture intensification and other conservation incentive, a slight decrease of the

Figure 17 Agriculture intensification, harvest in Kesenge (onions, top) and Mbale (beans, bottom)

deforestation rate has been observed for the last three years as evidenced by results of deforestation analysis (2013, 2014, 2015 and 2016 change detection analyses).



Source : Service statistiques/Territoire d'Inongo
Statistiques des populations 2015

Figure 18 Agricultural intensification and diversification locations

4. Local Development Committees

Capacity for Local Development Committees (CLD's) in the Lokanga and Ntomba-Nzale Groupements was reinforced, both at the village and the Groupement levels. These CLDs have been the most important partner for the company in supporting all project activities on the ground as local members represent the Groupements for all major decisions related to the MNRP.

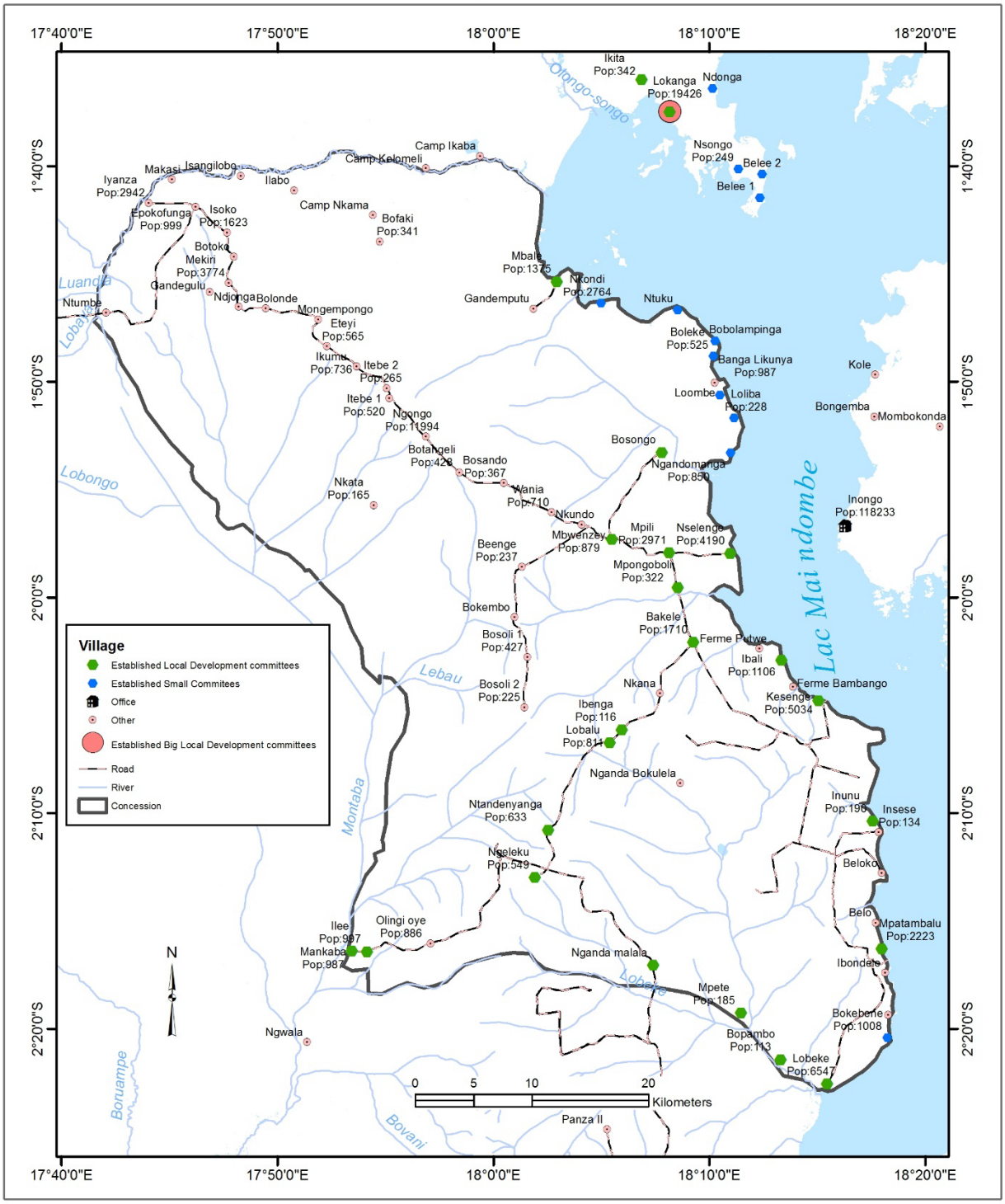
Figure 19 Local Development Committee (CLD) meeting in Inunu

The process for building capacity for the CLDs is now moving to the Ngongo Groupement where two CLDs have already been established in the villages of Mbwenzey and Mpili. Work is moving towards villages of Ngongo, Wanya and Nkundo currently.

CLDs are instrumental in conveying information from important community meetings, especially for the participatory mapping exercise held in Inunu for the Ntomba-Nzale Groupement. Local community members from the entirety of the Ntomba-Nzale Groupement gathered in Inunu to convene on land tenure issues and begun to delineate community forests. This work is ongoing in the Ntomba-Nzale Groupement and will start soon in the Lokanga Groupement.

Figure 20 SBIA Workshop held in Lokanga

Another milestone reached for CLDs involves the Social and Biodiversity Impact Assessment (SBIA) workshops for the first two Groupements of the project area. Many villagers gathered in Lokanga and Kesenge in September 2013 to build the causal models for project impacts on biodiversity in the project area and social livelihood for community members.



Source : Service statistiques/Territoire d'Inongo
Statistiques des populations 2015

Figure 21 Comités Local de Développement (CLDs) maintained and reinforced during m2

5. Participatory mapping

In 2013, a participatory mapping workshop was held in the village of Inunu, with the following technical objectives:

- Training on the concepts and stages of participatory mapping;
- Conduct practical GPS coordinate exercises in Inunu village.

Result from this activity are as follows:

61 participants in the concession consisting of CLD members and local animateurs were reinforced in capacity on the different stages of participatory mapping and its importance in relation to the REDD+ project and land tenure rights / establishment. Practical exercises for working with GPS technology in Inunu village were also completed.

Figure 22 Participatory Mapping in Inunu for the Ntomba-Nzale Groupement

In addition to those activities that can be attributed to specific locations, the following activities were implemented as either a general activity for the Project Zone or were in between villages:

6. **Lake transport for communities**

In the Mai Ndombe region, lake transport is the main barrier to improved livelihoods, especially for access to healthcare in Inongo. Identified as a critical need in the causal model, and facing a general lack of affordable public lake transport, the MNRP has endeavored to improve the situation by offering free, safe voyages to community members in need. During m2, the MNRP funded the purchase / construction of 2 passenger boats to allow community members in crossing the lake. The first, a “coque” nominally holds 15 passengers and features an outboard Mercury 40 hp engine to reliably support emergency rapid transport. The second, a “baleinière” holds 50 passengers and with a Yamaha outboard 75 hp engine

serves to transport community passengers in bulk. Overall, the MNRP made 118 voyages transporting 1464 community members across Lake Mai Ndombe. The following summarizes passenger transport for m2:

Table 22 Lake transport during m2

Year	Voyages	Community Passengers
2013	53	592
2014	41	509
2015	20	318
2016	4	45
Total	***118***	***1464***

Figure 23 Lake transport in the 15-passenger "coque"

7. **Animal enclosures**

During m2, it was agreed mutually with the communities to halt development of animal enclosures after animal epidemics outbreaks ensued. Consulting with our in-house veterinarian, Guylain, we made the decision to continue with enclosure activities after we could develop a robust and comprehensive animal inoculation/disease prevention system. This will require significant panning and capital investment which we do not possess during the m2 monitoring period. We plan to apply the proceeds from credit sales for the current verification event to the augmentation and eventual re-establishment of the enclosure program for future monitoring periods.

8. Bridge building and route clearing

Routes were cleared along two major axes in the Project Area: (Kesenge – Lobalu and Kesenge – Lobeke) to improve lake access and inter-village travel. Bridges in Lobalu and Bakele were also repaired.

m2 Community Project Activity locations

The Mai Ndombe REDD+ Project Zone consists of 3 Groupements in which 82 separate clans are distributed over 49 villages and 22 village annexes. Throughout each of these locations, capacity for 23 Local Development Committees (CLDs) was augmented to promote local development using proceeds from the REDD+ project. Table 23 below indicates the details of the major activities carried out during the m2 monitoring period, along with their locations.

Table 23 Location of m2 major community activities

Groupement		Villages /Annexes	CLD reinforced / SBIA Workshop	School Construction	Agricultural Intensification	Bridge building / route repair	Participatory Mapping
BOLIA		Lokanga	CLD, SBIA	school redesign	new cropping system		
	Annexes	Ndonga					
	Annexes	Nsongo		bricks, roofing sheets			
	Annexes	Baké, Bélé I & II					
		Ikita (pygme village)	CLD reinforced	bricks			
		Mbale	CLD reinforced	new school	new cropping system		
	Annexes	Nkondi			new cropping system		
	Annexes	Wanga, Bondo et Ntuku					
	Annexes	Bobolampinga et Boleke					
		Isangi ilobo					
	Annexes	Ilobo					
	Annexes	Iyatu					
NTOMBA-NZALE		Inongo			new cropping system		
		Bosongo	CLD reinforced	bricks	new cropping system		
	Annexes	Ngandomanga					
	Annexes	Kengela					
	Annexes	Loliba					
	Annexes	Lolioliko, Loombe et Bangalikunya			new cropping system		

(N)selenge		CLD reinforced		new cropping system		
Annex	Likwangola					
Ibali		CLD reinforced		New cropping system		
Annex	Ntontokomele					
Kesenge		CLD reinforced, SBIA	School redesign	New cropping system		
Annexes	Basombele					
	Loningisa					
Inunu		CLD reinforced				Workshop, GPS exercises
Annexes	Insense					
	Bamboka					
	Bokebene					
Mpatambalu		CLD reinforced	bricks			
Bukulutambindo						
Lobeke		CLD reinforced	bricks	New cropping system		
Bopambo		CLD reinforced				
Ngandamalala						
Annexes	Mpete					
Mpongoboli		CLD reinforced		New cropping system		
Bakele		CLD reinforced		New cropping system	Bridge repair	
Ibenga		CLD reinforced				
Lobalu		CLD reinforced		New cropping system	Bridge repair	

	Ntandenyanga	CLD reinforced				
	Ngeleku	CLD reinforced				
	Ilée	CLD reinforced				
	Annex Olingioye					
	Mankaba	CLD reinforced				
BASENGELE / NGONGO	Mbwenzey	CLD reinforced		new cropping system		
	Ikumu					
	Kundo					
	Mekiri					
	Mpili	CLD reinforced				
	Ntumbe					
	Epokofunga					
	Isoko					
	Mongempongo					
	Etey					
	Ngongo					
	Nkanza					
	Wania					
	Bosoli 1					
	Bosoli 2					
	Beenge					
	Botangele					
	Bosando					
	Nkata					
	Itebe 1					
	Itebe 2					
	Bolondo					
	Ndjonga					
	Ngandegule					
	Botoko					
	Iyanza					
	Boongo					

Table 24 below presents the results of the monitoring plan, including community indicators, dates and frequency of data collection and corresponding results.

Table 24 Community monitoring plan results

No.	Indicator	Activity category	Monitoring frequency / date	Result type	m2 result
1	A signed forest conservation concession contract and supporting TOR, MOU	Change of land-use of concession from logging to conservation	Once before validation and 1st verification (m1)	boolean (complete/not complete)	**complete as of 2011**
2	# community awareness and sensitization meetings held	Environmental Education and awareness raising in communities	Each Monitoring Period	# meetings	**240**
3	# Net tonnes CO2e emissions avoided	Emission reduction	Each Monitoring Period	According to VM0009 requirements* (tCO2e)	**10,773,562**
4	# of CLDs and annex committee members Elected & Trained	Benefit sharing	Each Monitoring Period	# people	**312**
5	# of CGs elected & trained	Election & Training of Groupement Committees (CGs)	Each Monitoring Period	# people	**15**
6	# of people attending SBIA (EISB in French) workshops	Social & Biodiversity Assessment (EISB) Workshops	Once at project start	# people	**187**
7	# of attendees for PLD development workshops	Local Development Plan (PLD) development & execution	Each Monitoring Period	# people	**135**
8	# of PLD written & approved	Community development	Each Monitoring Period	# plans	**2**

9	# of projects executed under the PLD	Community development	Each Monitoring Period	# projects	**0**
10	# local people trained in biomass sampling, flora & fauna and community research	Training for carbon, flora & fauna surveys	Each Monitoring Period	# people	**80**
11	# local people employed in biomass sampling, flora & fauna and community research at Wildlife Works	Job creation	Each Monitoring Period	# people	**20**
12	Total # community members involved in SIA#5 to SIA#13	Engagement of community members in planning, implementatio n and monitoring	Each Monitoring Period	# people	**751**
13	# OHS workshops/se minars held and people trained	Safety training, procedures, safety plan created and followed	Each Monitoring Period	# people	**52**
14	# OHS-related incidents reported across all project operations	Safety training	Each Monitoring Period	# people	**0**
15	# of schools built, renovated, planned or ongoing improvements within the Project Zone	School Construction	Each Monitoring Period	# schools	**8**

16	# new or newly-trained teachers working in the local schools	Education	Each Monitoring Period	# people	**21**
17	# students from the Project Zone attending new schools	Education	Each Monitoring Period	# people	**1,983**
18	# of students received school supply kits	Education	Each Monitoring Period	# people	**11,594**
19	# of individual school fees paid	Education	Each Monitoring Period	# people	**111**
20	# community or school meetings held on education matters	Education awareness and sensitization	Each Monitoring Period	# meetings	**25**
21	% enrollment of girls in schools within the Project Area	Education / gender	Each Monitoring Period	%	**41%**
22	# students from local community graduating with a state diploma	Education	Each Monitoring Period	# people	**108**
23	# times mobile clinics deployed across the Project Zone	Mobile medical clinic providing vaccinations, emergency response and evacuations	Each Monitoring Period	# deployments	**62**
24	# of patients treated or vaccinated at mobile clinics	Mobile medical clinic providing vaccinations, emergency response and evacuations	Each Monitoring Period	# people	**2,988**

25	# of new, repaired or equipped healthcare facilities	Construction & Repair of Health Care Centers	Each Monitoring Period	# facilities	**1**
26	# potable water wells built or repaired	Construction and improved wells & water hygiene education	Each Monitoring Period	# wells	**0**
27	# people with access to potable water	Construction and improved wells & water hygiene education	Each Monitoring Period	# people	**0**
28	# km of road constructed or repaired	Infrastructure improvement	Each Monitoring Period	km	**116**
29	# community members transported across lake Mai Ndombe by the project	Facilitation of water transport	Each Monitoring Period	# people transported	**1,464**
30	# training workshops by agricultural extension officers in project zone	Agricultural Intensification, improved nutrition	Each Monitoring Period	# workshops	**26**
31	# of staff employed for agricultural community outreach	Agricultural Intensification, improved nutrition	Each Monitoring Period	# people	**21**
32	# of demonstration gardens established and functional	Agricultural Intensification, improved nutrition	Each Monitoring Period	# gardens	**13**
33	# of ares of agroforestry fields planted	Agricultural Intensification, improved nutrition	Each Monitoring Period	ares	**300**

34	Total # local jobs created under the REDD+ project	job creation	Each Monitoring Period	# jobs	**183**
35	# of animal enclosures created	Livestock	Each Monitoring Period	# enclosures	**0**

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

The Community Monitoring Plan has been established and accepted by the Project Proponent. The Plan has been made available for public review at the Project Office, and was made available to each CLD in the Project Zone during the first monitoring period (m_1). The full results of the community monitoring are included in this project monitoring report, which is being made publicly available in the Project Area by having a hard copy available for review at the Project Office. Additionally, a monitoring report summary has been written and provided to communities throughout the Project Area in English, French and Lingala. The monitoring report has additionally been posted to the website of the VCS and CCB for public review and comment.

4.4 Optional Criterion: Exceptional Community Benefits

Not Applicable

The MNRP was not validated at the Gold Level for exceptional community benefits. This section is not applicable.

4.4.1 Barriers to Benefits (GL2.3)

The MNRP was not validated at the Gold Level for exceptional community benefits. This section is not applicable.

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

The MNRP was not validated at the Gold Level for exceptional community benefits. This section is not applicable.

5 BIODIVERSITY

5.1 Net Positive Biodiversity Impacts

5.1.1 Biodiversity Changes (B1.1)

As with estimation of changes to socioeconomic well-being as outlined in the CCB PDD section CM1.1, changes to biodiversity due to the project have been estimated using the theory of change method, also known as the causal model. The theory of change process provides a structured, cause-and-effect-oriented approach to estimatie how project activities result in specific outputs, leading to outcomes and eventuslly long-term impacts.

The theory of change model for biodiversity-related project activities is shown below in Figure 24. It depicts the cause and effect relationship between project activities defined to date, their anticipated resulting outputs and outcomes, and expected short-, medium-, and long-term impacts.

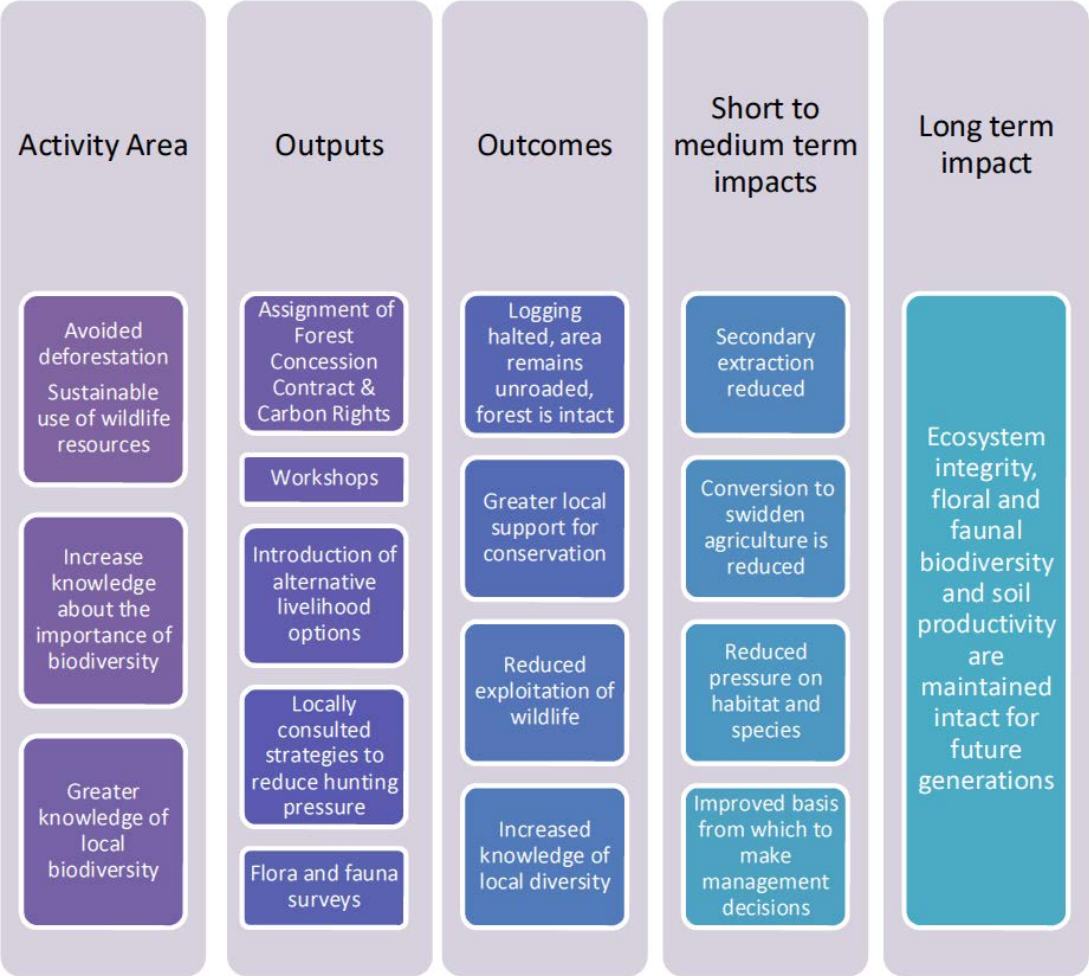


Figure 24 Theory of Change Model for Climate and Ecosystem Conservation Related Activities

As with any REDD+ project there is a possibility that negative, and/or unforeseen impacts from project activities may occur. The MNRP team reviewed the full range of potential negative impacts from REDD projects (Richards, 2011; Richards & Panfil, 2011). These impacts are generally related to negative changes in socioeconomic conditions, for example, reduced availability of land for agricultural activities and reduced availability of timber and non-timber forest products (see full discussion in section CM1.1). Due to the Mai Ndombe project's conservation focus, there will be limited if any net negative changes to biodiversity that result from project activities. Monitoring activities will nonetheless assess for the occurrence of potential negative or unforeseen impacts to biodiversity.

The theory of change model for Activity Area 1, climate and biodiversity activities, focuses on activities that have been fully defined at this point in the project. Due to the project's 30-year lifetime, additional activities will continue to be defined and determined through the CLD consultation process

During this monitoring period, the changes in and impacts to the biodiversity have generally followed those predicted in the causal model. As a result of the discontinuation of logging activity due to the project, and protection of the Project Area against unplanned deforestation there has been an increase in the sightings of forest elephants and bonobos (Section 5.3.2). The Project has begun the implementation

of the biodiversity monitoring plan, which will provide a greater level of data on the Project's impacts on biodiversity in future monitoring periods.

5.1.2 High Conservation Value Protection (B1.2)

Demonstrate that that no High Conservation Values related to biodiversity identified in the validated CCB project description were negatively affected by the project.

The following biodiversity-related HCVs were identified in section G1.8 of the CCB PDD:

- Endangered and vulnerable plant and animal species
- Endemic plant species and subspecies
- Significant concentrations of a species during any time in its life cycle
- Viable populations of plants and animals in natural patterns of distribution and abundance
- Threatened ecosystems.

By protecting habitats and reducing fragmentation, disturbance, and conversion of primary forest at a landscape scale, these high conservation values will not have any negative effects in the 'With Project' versus the 'Without Project' scenario. As is noted in section 5.1.1 above, there were no habitat disturbances in the Project Area, and no areas of large-scale deforestation. Therefore, under the theory of change analysis this demonstrates that the Project's net impact on biodiversity, including HCVs, for this monitoring period was positive in comparison to the with-out project scenario. Therefore, beyond the Project Activities of protection of the Project Area, and other conservation focused activities no other measures are needed or taken for the maintenance or enhancement of the biodiversity HCVs.

5.1.3 Invasive Species (B1.3)

Agroforestry demonstration activities currently underway will utilize the following species: Leucaena leuococephala, Acacia sp., and Morinda lucida. While two of these species are not native to the DRC, they were successfully introduced to the country four decades ago for reforestation and agroforestry projects. Therefore, none of them have been imported for the purposes of the project. They have shown an ability for restoring and fertilizing marginal lands and improving yields when associated with crops. They have also shown a high level of adaptation to the environment, and they are non-invasive. It is possible that over the 30-year life span of the project, other species will be used. In no cases will these be invasive, and their use will be monitored and reported during project reporting and verification activities.

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

The species noted above were introduced to the area more than 30 years ago and to date there are no known problems with disease introduction, facilitation or otherwise. They have been selected over native species due to their nitrogen-fixing capabilities and their ability to restore fertility in marginal lands such as secondary forests. The MNRP will actively consider the use of, and will conduct trials with, native species as a priority where feasible.

Table 25 Agroforestry species

Species	Leucaena leuococephala
Justification of Use	They have shown an ability for restoring and fertilizing marginal lands and improving yields when associated with crops. They

	have also shown a high level of adaptation to the environment, and they are non-invasive.
Adverse Effect	The species noted above were introduced to the area more than 30 years ago and to date there are no known problems with disease introduction, facilitation or any other adverse impacts on native species.

Species	Acacia sp.
Justification of Use	They have shown an ability for restoring and fertilizing marginal lands and improving yields when associated with crops. They have also shown a high level of adaptation to the environment, and they are non-invasive.
Adverse Effect	The species noted above were introduced to the area more than 30 years ago and to date there are no known problems with disease introduction, facilitation or any other adverse impacts on native species.

Species	Morinda lucida
Justification of Use	They have shown an ability for restoring and fertilizing marginal lands and improving yields when associated with crops. They have also shown a high level of adaptation to the environment, and they are non-invasive.
Adverse Effect	The species noted above were introduced to the area more than 30 years ago and to date there are no known problems with disease introduction, facilitation or any other adverse impacts on native species.

5.1.5 GMO Exclusion (B1.5)

No GMOs will be used to generate GHG reductions or removals.

5.2 Offsite Biodiversity Impacts

5.2.1 Negative Offsite Biodiversity Impact Mitigation (B2.2)

As is discussed in Section B2 of the MNRD CCB PDD, mitigation is not applicable for offsite impacts as there is no activity-shifting leakage.

5.2.2 Net Offsite Biodiversity Benefits (B2.3)

As there are no anticipated negative offsite impacts to biodiversity, evaluation of unmitigated offsite impacts is not applicable.

5.3 Biodiversity Impact Monitoring

5.3.1 Biodiversity Monitoring Plan Development (B3.3)

Stratification

The MNRP area was divided into five distinct strata. These were selected on the basis of having distinct habitat/vegetation types and composition due to previous usage or biophysical qualities, as well as being relatively homogenous internally. They include:

- Secondary forest previously exploited by the logging company SOFORMA
- Secondary forest previously exploited by the logging company FORESCOM
- Primary (undisturbed) forest
- Swamp forest
- Savannah grassland.

Sampling Design

For surveys, we employed the line transect (with DISTANCE sampling where possible) method, and for logistical reasons chose to have 3 km long transect to ensure they remained in the same habitat and were walkable. We elected to have 30 transects in total for the Project Area, thus 6 per stratum. We used a grid system to randomly pick the 30 points which would form the centre of a transect line i.e., the '*points_depart_transect*' (Figure 25). The sampling plan was designed and implemented using GIS ArcGIS 9.3 software. It has been designed primarily to estimate densities of large mammals like the bonobo and duikers, large birds like raptors, and human activities.

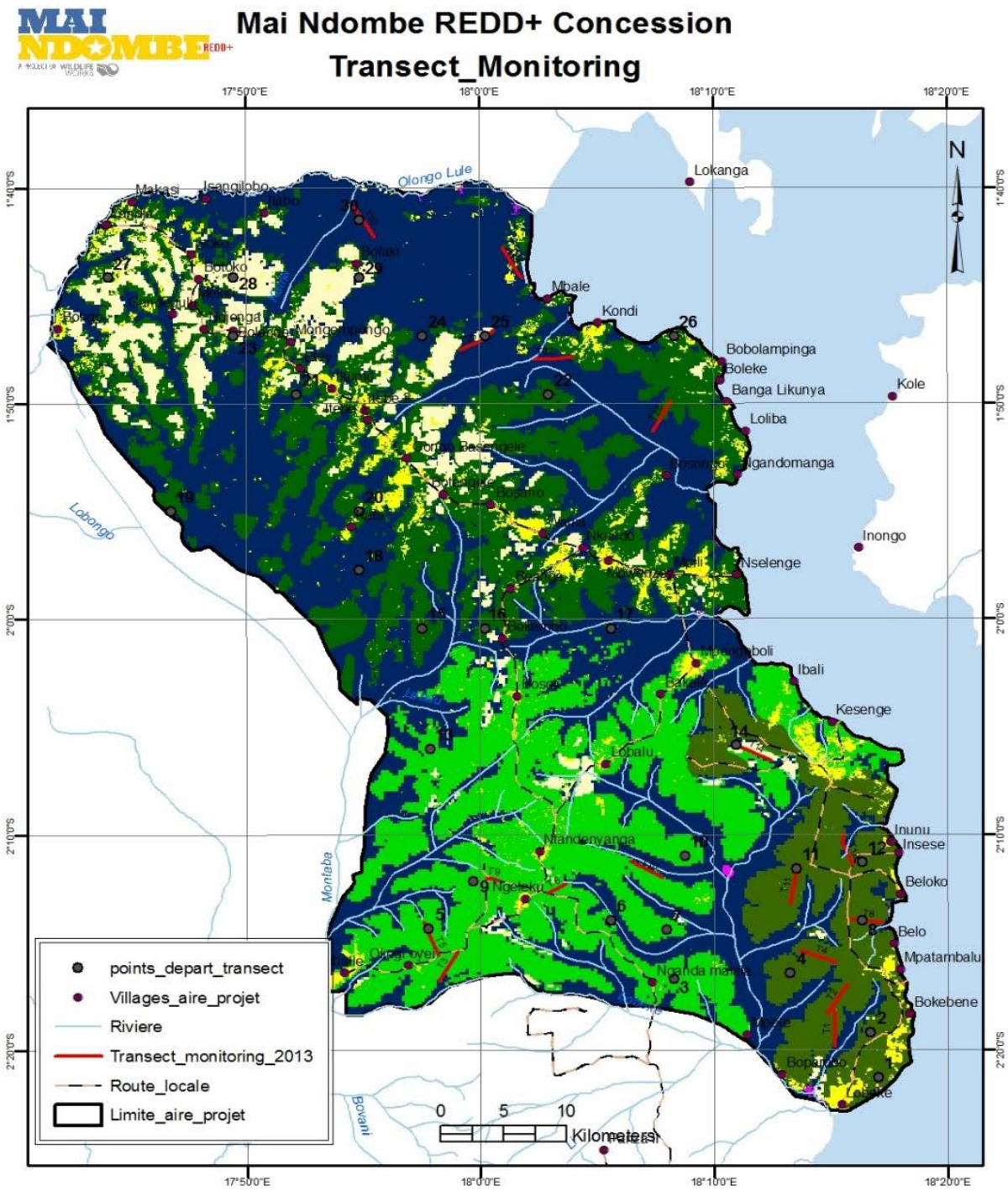


Figure 25 Map of the random points used as transect mid-points; also shown are some transect lines walked in several strata

Data Collection

We used a combination of line transects and guided recces to collect data. Line transects are described further while guided recces were simply walks in the forest either as reconnaissance or in between transects where data were opportunistically collected but without the rigour of the line transect e.g., measurement of perpendicular distances and maintaining speed and direction.

Figure 26 Members of the biodiversity monitoring team marking distance and measuring perpendicular distance

Field Methods: Line transect

Line transects involve walking straight lines while recording all the signs of large mammals, birds and humans. When recording a species or incident, it requires accurately measuring the perpendicular distance from the transect to the species or sign. These perpendicular distances are used to calculate the probability of detection curve, one of the parameters necessary to calculate the densities of the objects such as species, droppings or nests in a sampled area.

Figure 27 Droppings elephants and their footprints, and example of tracks and signs used during transect counts

Field Methods: Camera traps

The camera trap is a tool to allow photographs of wildlife without human intervention (Figure 28). This tool is increasingly used in the context of scientific research on discrete animals, and allows the counting of species in a given geographical area. For the MNRP, we are currently testing two camera traps in various strata to assess their functionality. This will inform the design and implementation of a camera trap component of the monitoring plan across in the project area to further build on our biological inventory (e.g., Figure 29)

Figure 28 Camera trap installed during the transect surveys in the forest of Kesenge

Figure 29 A male bonobo and Sitatunga taken by the camera trap during the mission in the forest of Kesenge

Data Analysis: determination of the relative abundance of species

Line transect methods enabled us to determine the relative abundance of each species of large mammals and human activities. For this, we calculated the Kilometric Abundance Index (IKA), which is a simple measure of number of encounters for every kilometre of transect line walked.

Density determination

The density of great apes is essentially based on censuses line transect. The nest decay rate is used to convert the nest sites of density estimates in absolute density of bonobos as follows:

$$DPAP = \frac{dSN \cdot Xgpe}{Tdn}$$

where;

$DPAP$: Bonobo density per km²

dSN : Nest sites density

$Xgpe$: Average group size

Tdn : Nest degradation time (99 days Van Krunkelsven 2001).

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

Transect data

Large mammals: by species

For the wildlife surveys reported for the m2 monitoring period, the biodiversity monitoring team travelled to 17 transects. Using a combination of sight, vocalisation, dung, footprints, nests and leftover food, they inventoried 19 large mammal species belonging to 9 Families and 5 orders (Table 26). Overall, Bovidae was the most represented with 6 species followed by 5 species for Cercopithecidae, with the Manidae family having 2 species; the rest had one species per family. Overall, Bay Duiker *Cephalophus dorsalis* had the highest IKA value followed by *Potamochoeurus porcus* and *Tragelaphus spekei*. *Cercopithecus ascanius* was the most sighted species, being seen in 11 of the 17 transects; *Pan paniscus* was sighted in two of the 17 transects. Thus, the MNRP retains important wildlife, although some remain uncommon. The forest elephant, bonobo and giant pangolin were all recorded.

Table 26 List of all large mammal species inventoried during transect surveys in the MNRP

Scientific Name	Common Name	Vernacular Name	Family	Order
Cercopithecus ascanius	Red-tailed monkey	Nsoli	Cercopithecidae	Primates
Cercopithecus angolensis	Black and White Angola Colobus	Iwuka		
Cercopithecus wolfi	Wolf's Mona Monkey	Ngeye		
Cercopithecus sp	Monkeys	Mbise		
Lophocebus atterimus	Black Crested Mangabey	Ngila		
Pan paniscus	Bonobo	Elya	Homidae	
Cephalophus callipygus	Peter's Duiker	Mbengele	Bovidae	Artiodactyles
Cephalophus dorsalis	Bay Duiker	Kulupa		
Cephalophus monticola	Blue Duiker	Mboloko		
Cephalophus sylvicultor	Yellow-backed Duiker	Mbende		
Cephalophus nigrifrons	Black-fronted Duiker	Pambi		
Tragelaphus spekei	Sitatunga	Mbuli		
Aonyx congica	Congo Clawless Otter		Mustelidae	Carnivora

Herpestes naso	Long-nosed Mongoose		Herpestidae	
Loxodonta africana	African forest elephant	Nzou	Elephantidae	Proboscidea
Potamochoerus porcus	Red River Hog	Nsombo	Suidae	Artiodactyla
Atherurus africanus	African Brush-tailed Porcupine	Eiko	Hystricidae	Rodentia
Manis gigantea	Giant Pangolin	Ikaka	Manidae	Pholidota
Manis tetradactyla	Long-tailed Pangolin	Nkalabondjo		

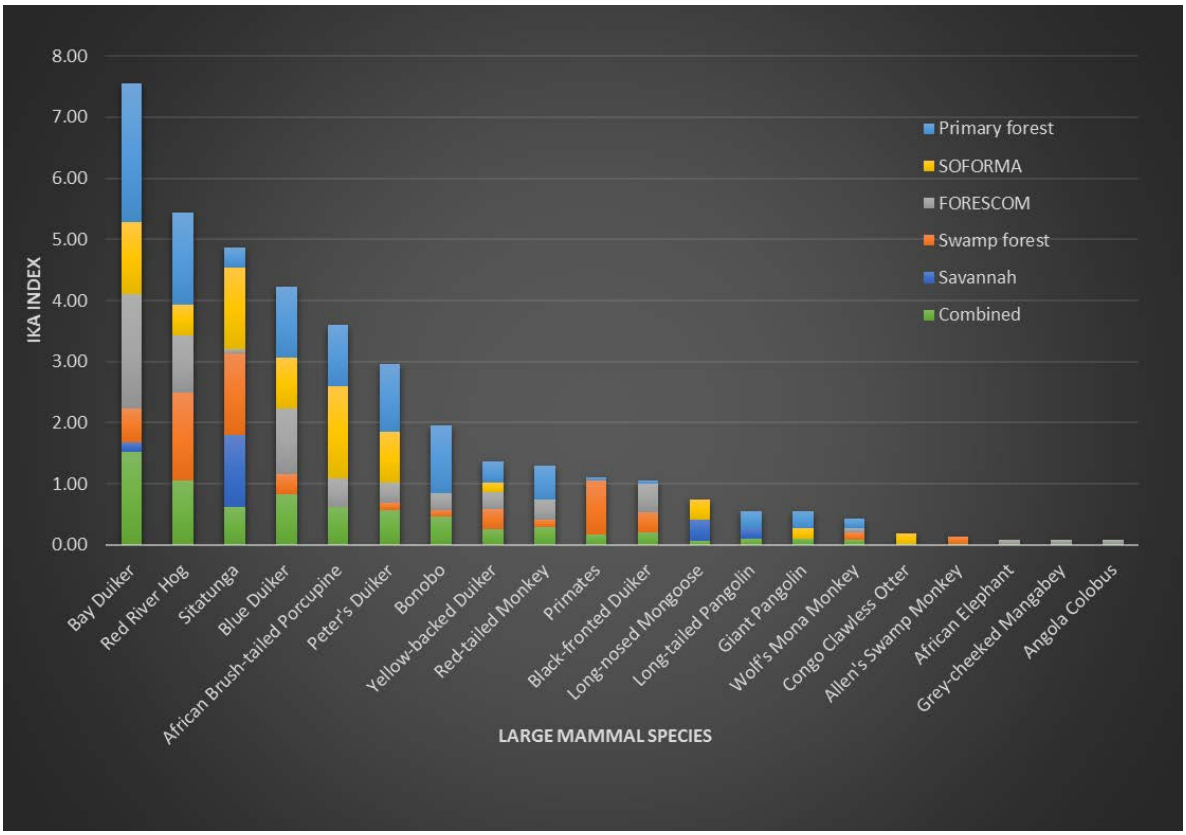


Figure 30 The Kilometric Abundance Index (IKA) for all large mammal species encountered during transect surveys in the MNRP

Large mammals: by strata

Species such as Cephalophus dorsalis (Bay duiker), Cephalophus monticola (Blue duiker) Potamochoerus porcus (Red river hog), Pan paniscus (Bonobo), Tragelaphus spekei (Sitatunga) and Atherurus africanus (African brush-tailed porcupine) showed a marked increase from the baseline study performed in 2012, while we continue to see a low encounter rate for Loxodonta Africana (African elephant), Herpestes naso (Long-nosed mongoose), Lophocebus albigena (Grey-cheeked mangabey) and Manis gigantean (Giant pangolin).

The five strata showed some marked differences both in species richness and composition including relative abundances. The secondary forests of SOFORMA and FORESCOM had the highest species richness perhaps indicating a wide variety of habitats and niches in the regenerating forests; primary

forest had high abundance of fewer species while in the marécage (swamp forest) the water-dependent *Tragelaphus spekei* (Sitatunga) was very commonly encountered (Figure 30).

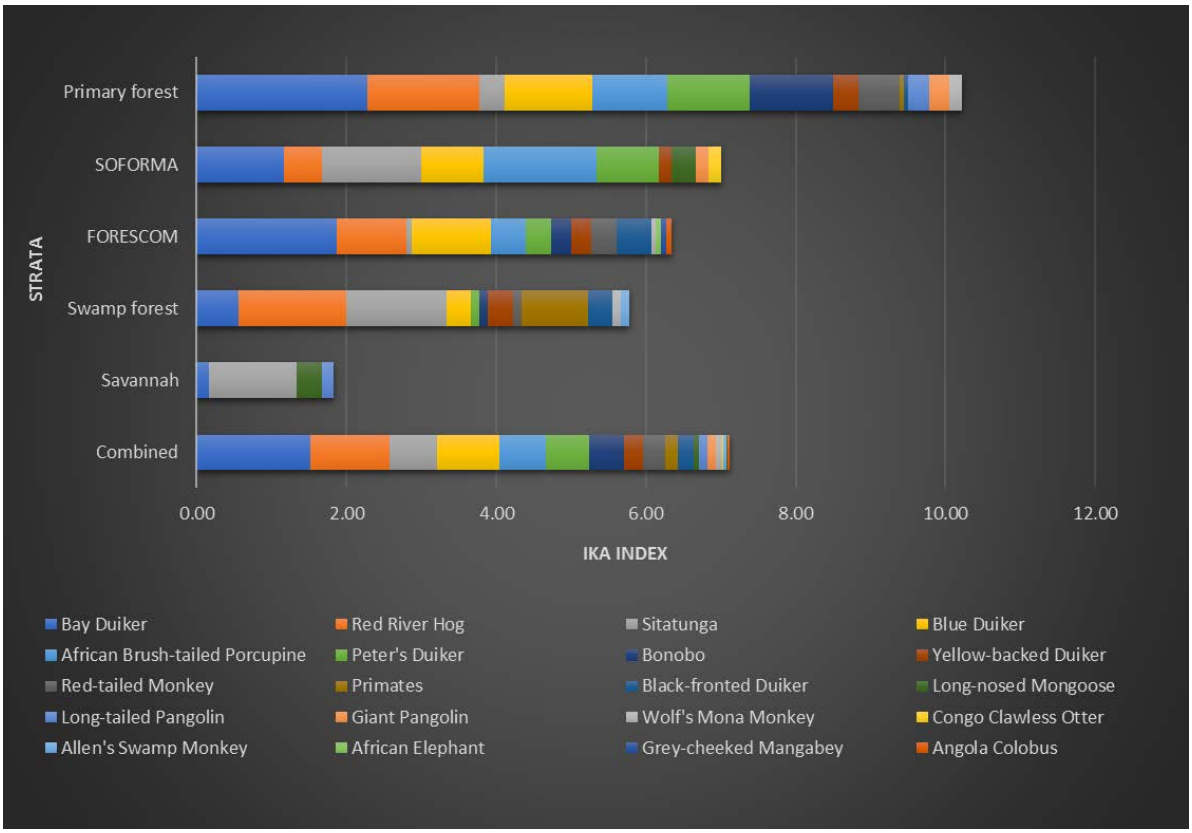


Figure 31 The Kilometric Abundance Index (IKA) for all large mammal species encountered in each stratum during transect surveys in the MNRP

Avian species

Overall, we recorded 14 bird species comprising 11 families. The family of Accipitridae had 3 species and Bucerotidae had two while the rest had one species each (Table 27). The Black-casqued hornbill and Wooly-necked stork were commonest, followed by the White-thighed hornbill (Figure 32).

Table 27 List of bird species recorded during the transect surveys in the MNRP

Scientific name	Common Name	Local Name	Family
Ceratogymna atrata	Black-casqued hornbill	Mpwa	Bucerotidae
Bycanistes albotibialis	White-thighed Hornbill	Iyata	
Merops apiaster	European bee-eater	Insuge	Meropidae
Corythaeola cristata	Great blue turaco	Lokolongu	Musophagidea

Centropus senegalensis	Senegal coucal	Bokoko	Cuculidae
Nicator chloris	Western Nicator	Elembo	Nicatoridae
Macrodipterys vexillarius	Pennant-winged nightjar	Lobuabota	Caprimulgidae
Gypohierax angolensis	Palm-nut vulture	Mponga	Accipitridae
Milvus migrans	Black kite	Kombekombe	
Milvus aegyptius	Yellow-billed kite	Nkoli	
Ardea purpurea	Purple heron	Waba	Ardeidae
Ciconia episcopus	Woolly-necked stork	Enkanko'bango	Ciconiidae
Numida meleagris	Helmeted guineafowl	Lokoku	Numididae
Pogoniulus bilineatus	Yellow-rumped tinkerbird	Imbondoko	Lybiidae

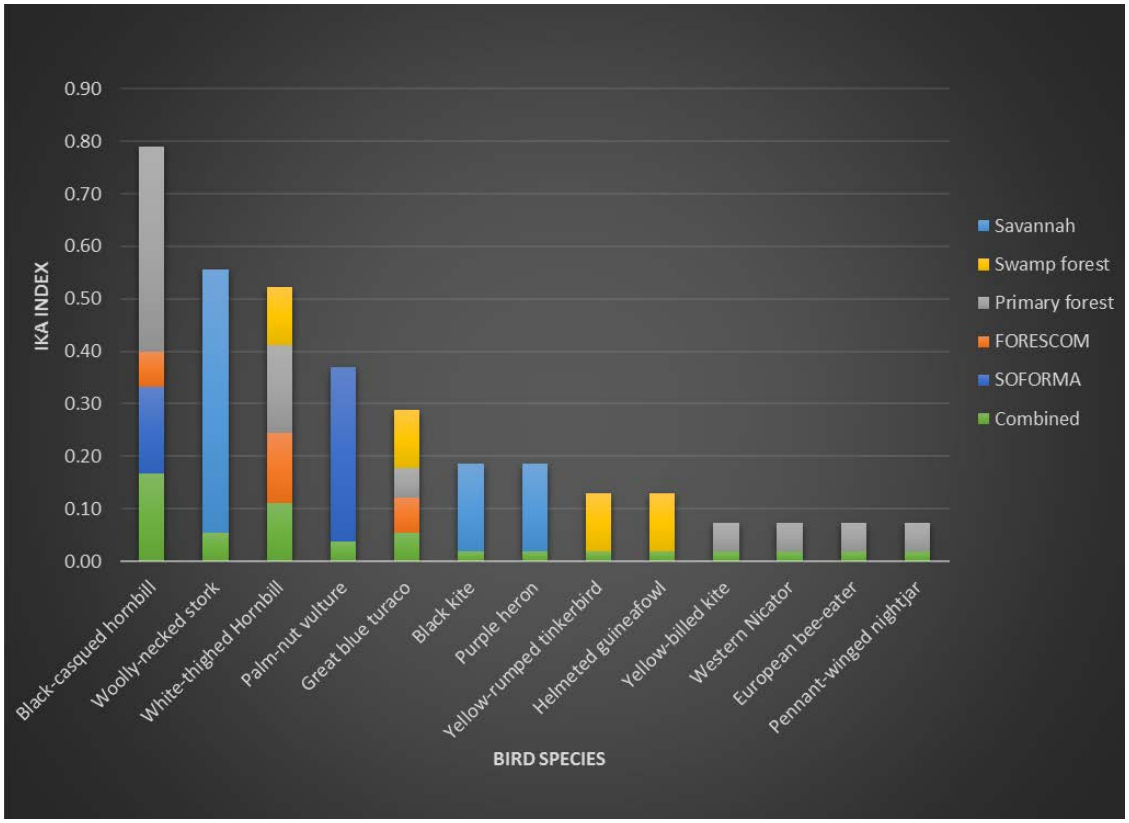


Figure 32 The Kilometric Abundance Index (IKA) for all bird species encountered during m2 transect surveys in the MNRP

Human activity

Although the fishing and firearms practices are the main activity income for most local communities, the Project Area shows a low rate of habitat degradation. As shown below in (Figure 33), despite a low rate of encounter, there is a strong hunting activity due to trapping, fishing signs and hunting trails were the commonest human signs recorded along the transects, followed by snares (traps) and fishing tracks.

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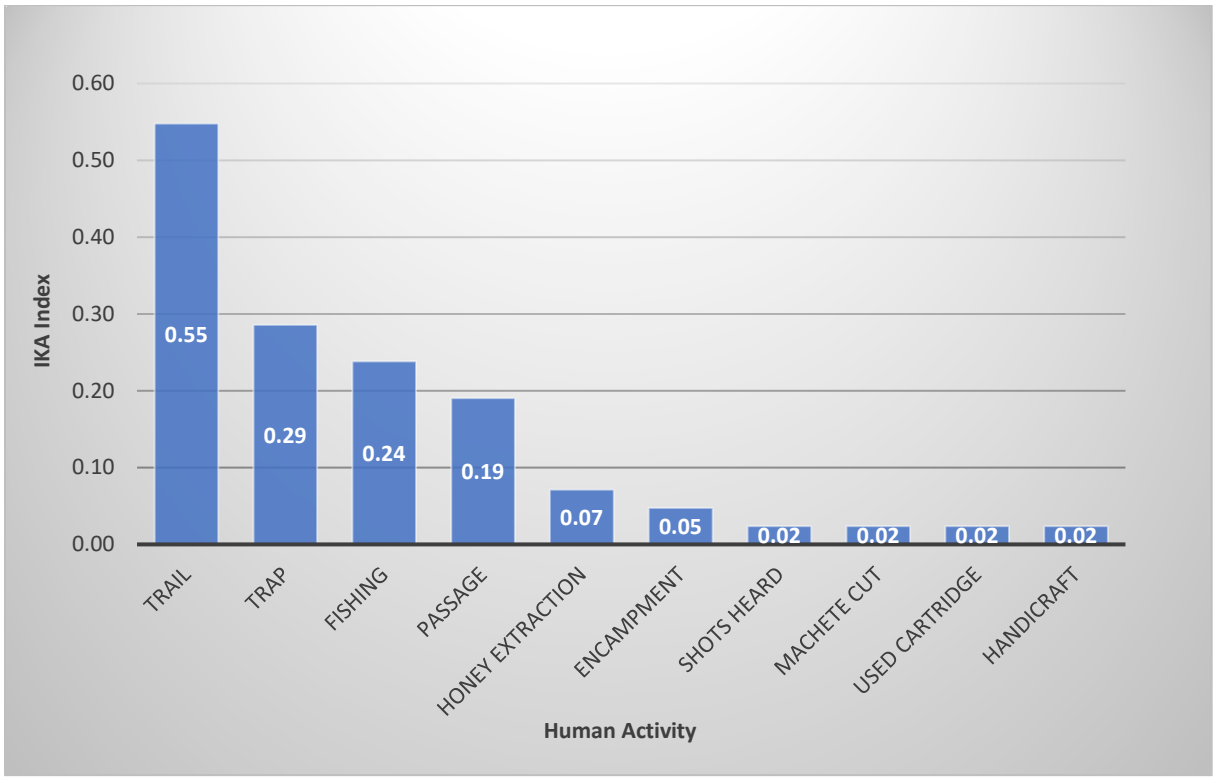


Figure 33 The Kilometric Abundance Index (IKA) of all human activities and signs recorded along the transects surveyed in the MNRP

Market survey data

Surveys were conducted from August 2013 to October 2015 to count the number of wild animals that were offloaded at the two major ports (Nkolenzoba and TSF), or that were displayed at the big Inongo market (Grand marche Inongo). All surveys were conducted in the morning hours, between 07:00 and 13:00h. During this period, observations were done in a total of 65 days representing about 1571 observation-hours. Most observations were made at the GMInongo market (35 days, 6 hrs) then Port TSF (17days, 12hrs), then Nkolenzoba (12 days, 17 hrs). The number of animals encountered (incidents) and the number of individuals counted was closely related to the amount of time spent observing (Figure 34 & Figure 35). The highest number of incidents throughout the observation period occurred in the month of April (16%), followed by September (15%) and February (13%). A consistently high number of incidents occurred during the dry season (July to September, 37%) which is a notoriously difficult time for local villagers.

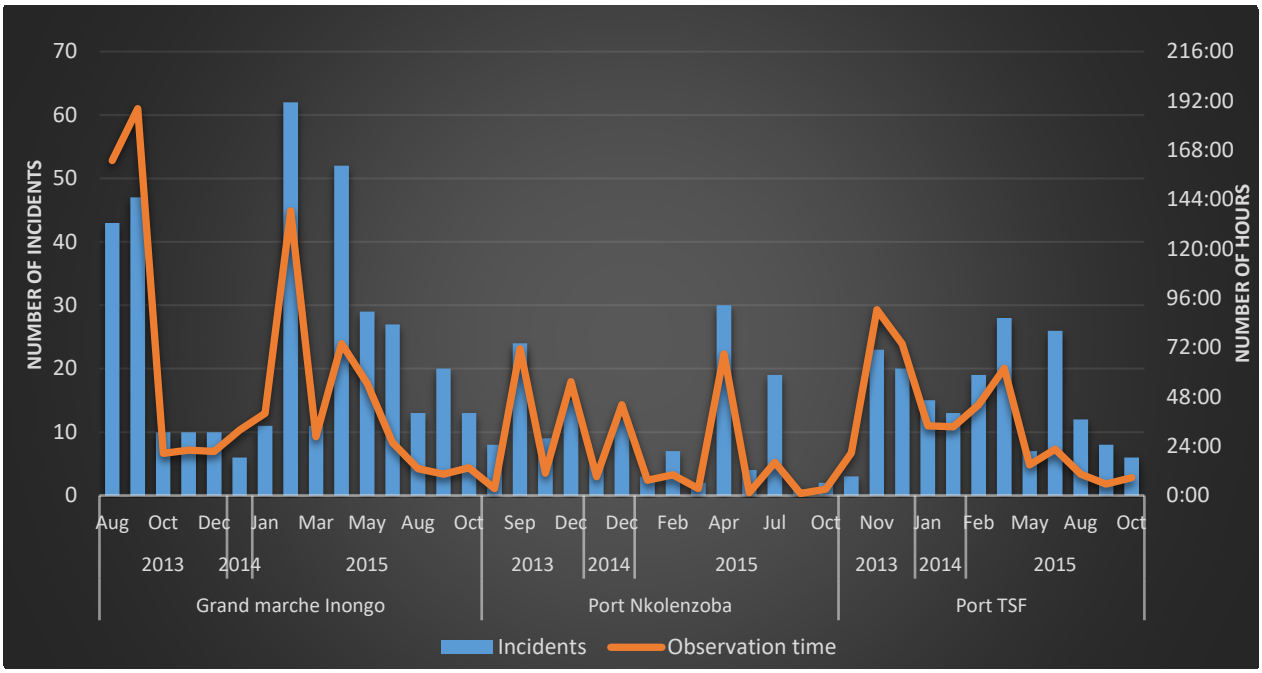


Figure 34 Comparison of effort (number of observation-hours) and number of incidents reported during m2

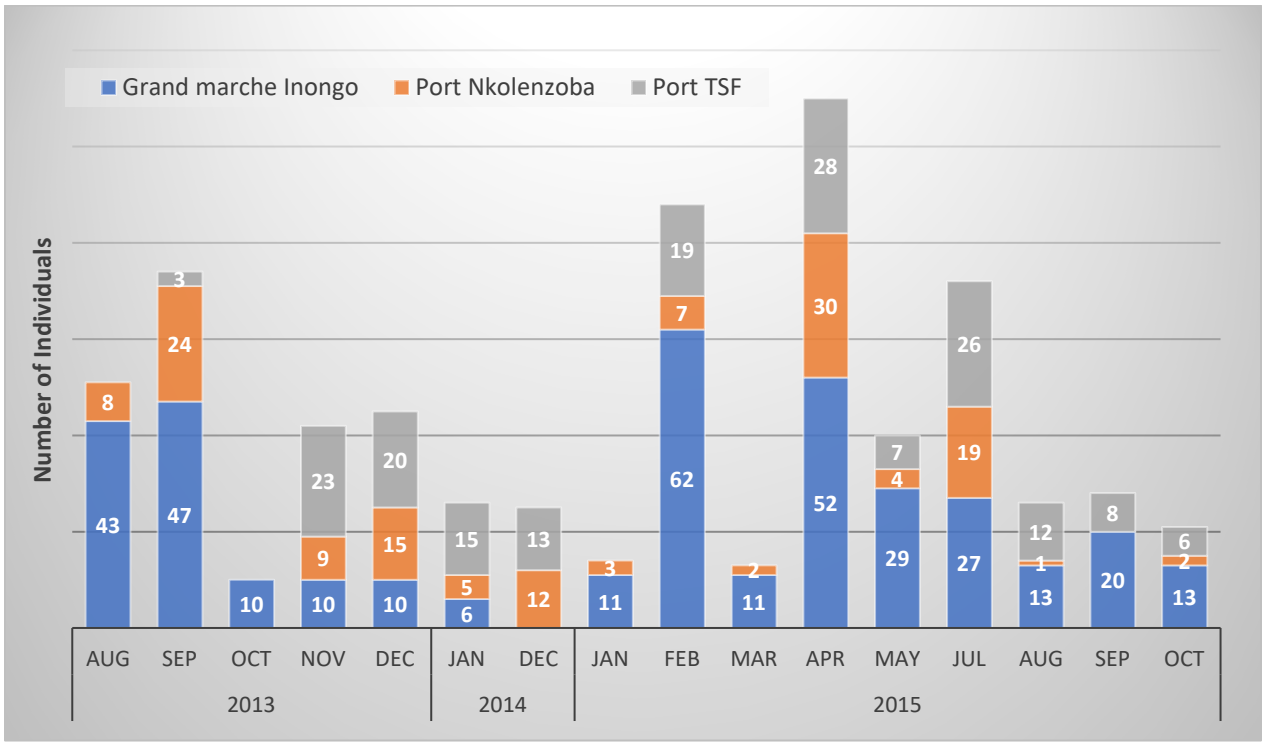


Figure 35 Number of individuals counted in each market/port during m2

Out of the 11 species (excluding several unidentified primate species) recorded at the market and ports, the Red-tailed monkey was the most hunted species across the board representing 32% of all incidents

recorded; the red river hog, bay duiker and blue duiker also featured prominently (Figure 36). A similar pattern was found when these trends were summarised by number of individuals recorded. Crucially, this hunted species also included bonobo *Pan paniscus* and giant pangolin *Manis gigantean*, which are considered Endangered and Vulnerable, respectively, in the IUCN Red List.

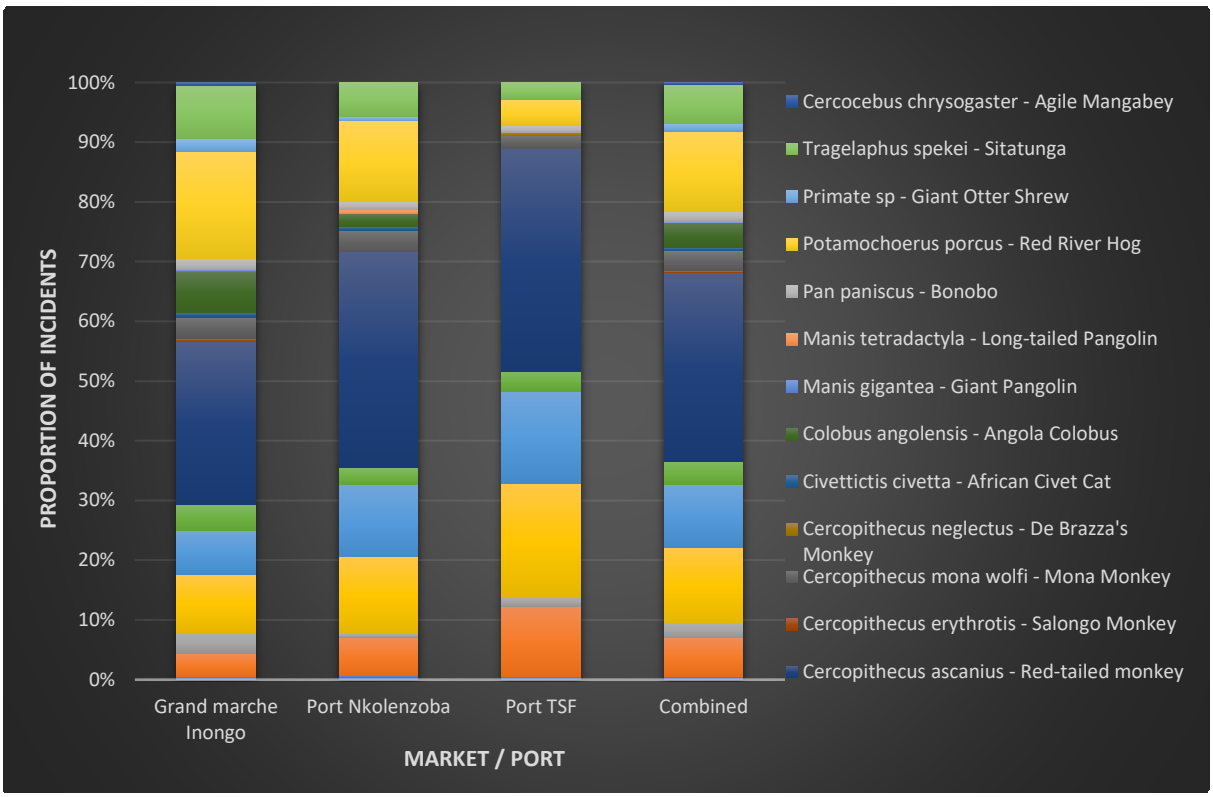


Figure 36 Composition of the species traded by market/port

Overall, the port and village of Kesenge was cited as the location where most of the traded wildlife originated, but this differed considerably by Port/Market (Figure 37). Most of the wildlife at PortTSF was from Kesenge, whereas Nkolenzoba was mainly fed by Mbale; items in the Inongo market arrived from various sources but Lobalu, Ngongi / Iyembe and Lokoro featured predominantly. Lastly, the traders reported that a majority were shot (91%) while traps and snares made up most of the rest of hunting methods (9%); less than 1% were reported hunted by use of fires.

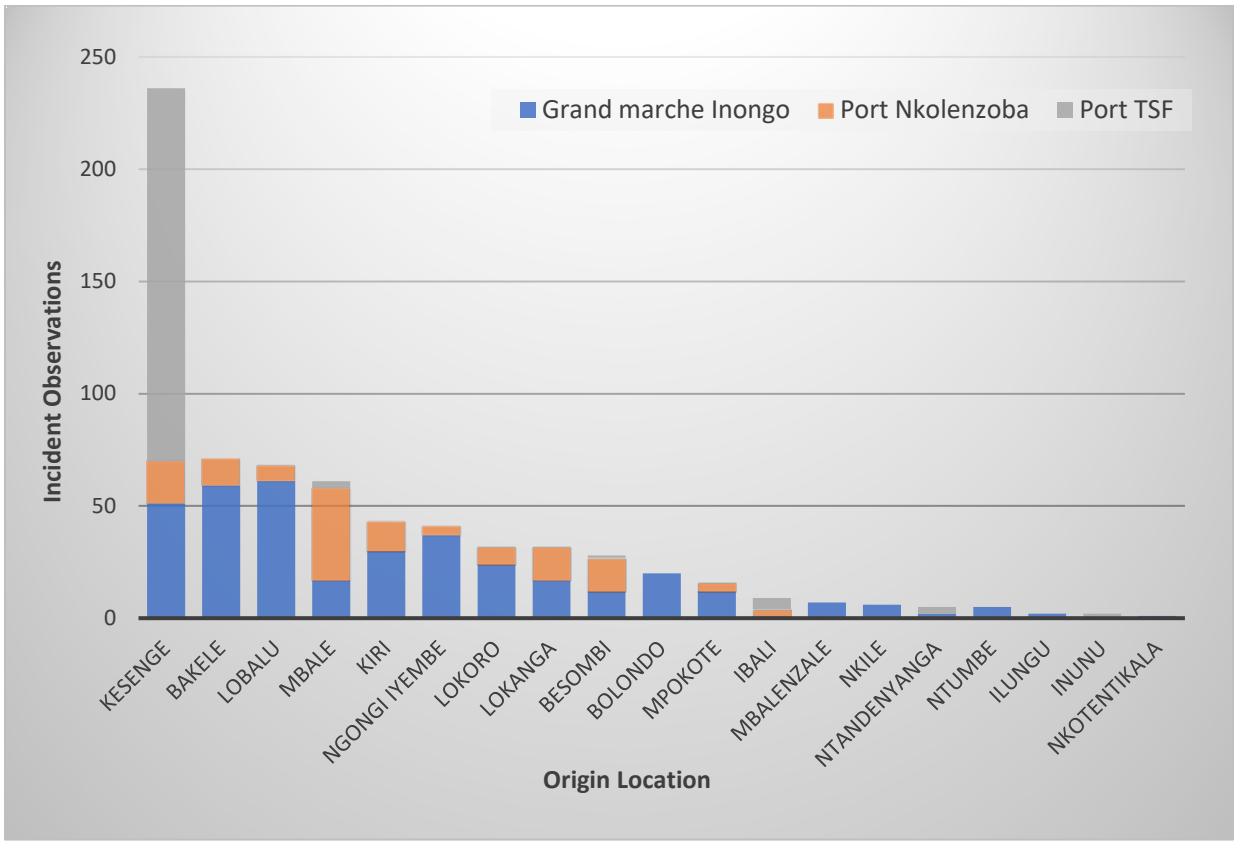


Figure 37 Sources/origins of the wildlife traded combined for the three markets/ports

5.3.3 Monitoring Plan and Results Dissemination (B3.3)

The Biodiversity Monitoring Plan has been established and accepted by the Project Proponent. The Plan was made available for public review at the project office and each CLD in the Project Zone. The full results of the biodiversity monitoring are included in this project monitoring report, a hard copy for which is available for review at the MNRP Project Office. A report summary has been provided to communities throughout the Project Area in English, French and Lingala. The monitoring report has additionally been posted to the VCS / CCB website as part of the 30-day public comment process.

5.3.4 Optional Criterion: Exceptional Biodiversity Benefits

Vulnerability: Critically Endangered (CR) and Endangered (EN) species - presence of at least a single individual (GL3.1)

As is discussed in the CCB PDD Section GL3.1., the Project Area is home to significant populations of bonobos (*Pan paniscus*), which is a IUCN Red List Endangered species. The Project Area additionally has small populations of forest elephant (*Loxodonta cyclotis*), a IUCN Red List Vulnerable species.

6 ADDITIONAL PROJECT IMPLEMENTATION INFORMATION

Not Applicable

7 ADDITIONAL PROJECT IMPACT INFORMATION

7.1 Allometric Equations

MRR.92 A list of all selected allometric equations used to estimate biomass for trees and non-trees.

Please refer to Annex 6 - Development of Allometry.

MRR.93 For each selected allometric equation, a list of species to which it being applied and the proportion of the total carbon stocks predicted by the equation.

Please refer to Annex 6 - Development of Allometry.

MRR.94 For each selected allometric equation, indication of when it was first employed to estimate carbon stocks in the project area (monitoring period number and year of monitoring event).

All allometric equations were first employed in the first monitoring period (M_1) in 2012.

MRR.95 For each selected allometric equation, indication of whether was validated per sections 9.3.1.1 or 9.3.1.2.

Please refer to Annex 6 - Development of Allometry.

MRR.96 Documentation of the source of each selected allometric equation and justification for their applicability to the project area considering climatic, edaphic, geographical and taxonomic similarities between the project location and the location in which the equation was derived.

Please refer to Annex 6 - Development of Allometry, which includes the source in the literature as well as the region and ecosystem type in which the respective allometric equations were developed.

Specific gravities were determined primarily using data available from Simpson (1996)12 and the Global Wood Density Database.13 Species-specific values for specific gravity or wood density were identified from these two sources, with priority given to values given in Simpson (1996). An average wood density value (weighted by basal area) was derived from the project inventory was applied to all other species.

MRR.97 A list of allometric equations validated by destructive sampling.

We chose to validate the allometric equation from Chave et al. (2005):

$$ABG = e^{-1.602+(2.266\ln(DBH))+(0.136\ln(DBH)^2)+(-0.0206\ln(DBH)^3)+(0.809\ln(\rho))}$$

Where *AGB* is aboveground biomass in kg, *DBH* is diameter at breast height in cm, and ρ is wood density in gm/cm^3. Please see MR Annex D – Development of Allometry for detailed information on Allometry validation.

MRR.98 For each, the number of trees (or non-trees) destructively sampled and the location where the measurement were made relative to the project area.

[12] Simpson, William T. 1996. Method to estimate dry-kiln schedules and species groupings: Tropical and temperate hardwoods. Res. Pap. FPL–RP–548. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory.
[13] Global Wood Density Database: http://datadryad.org/repo/handle/10255/dryad.235.

Although 30 trees at minimum are required by VM0009 V2.0 to validate an existing allometric equation, 86 trees were measured to validate allometry for this project. A list of the trees and their locations can be found in 'MR Annex D – Development of Allometry', Table 2.

MRR.99 A field protocol used to measure destructively sampled trees (or non-trees).

Please refer to Annex 9 - Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field

MRR.100 Justification that the field protocol for the destructive measurement method is conservatively estimates biomass.

MRR.101 For each allometric equation in the list, a figure showing all the descriptive measurements of biomass compared to predicted values from its selected allometric equation.

7.1.1 Validating Previously Developed Allometric Equations

MRR.102 A list of allometric equations cross validated.

Please refer to Annex 9 - Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field

MRR.103 For each, the number of trees (or non-trees) destructively sampled and the location where the measurements were made relative to the project area.

Please refer to Annex 9- Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field

MRR.104 A field protocol used to measure trees (or non-trees) when developing the equation.

Please refer to Annex 9 - Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field

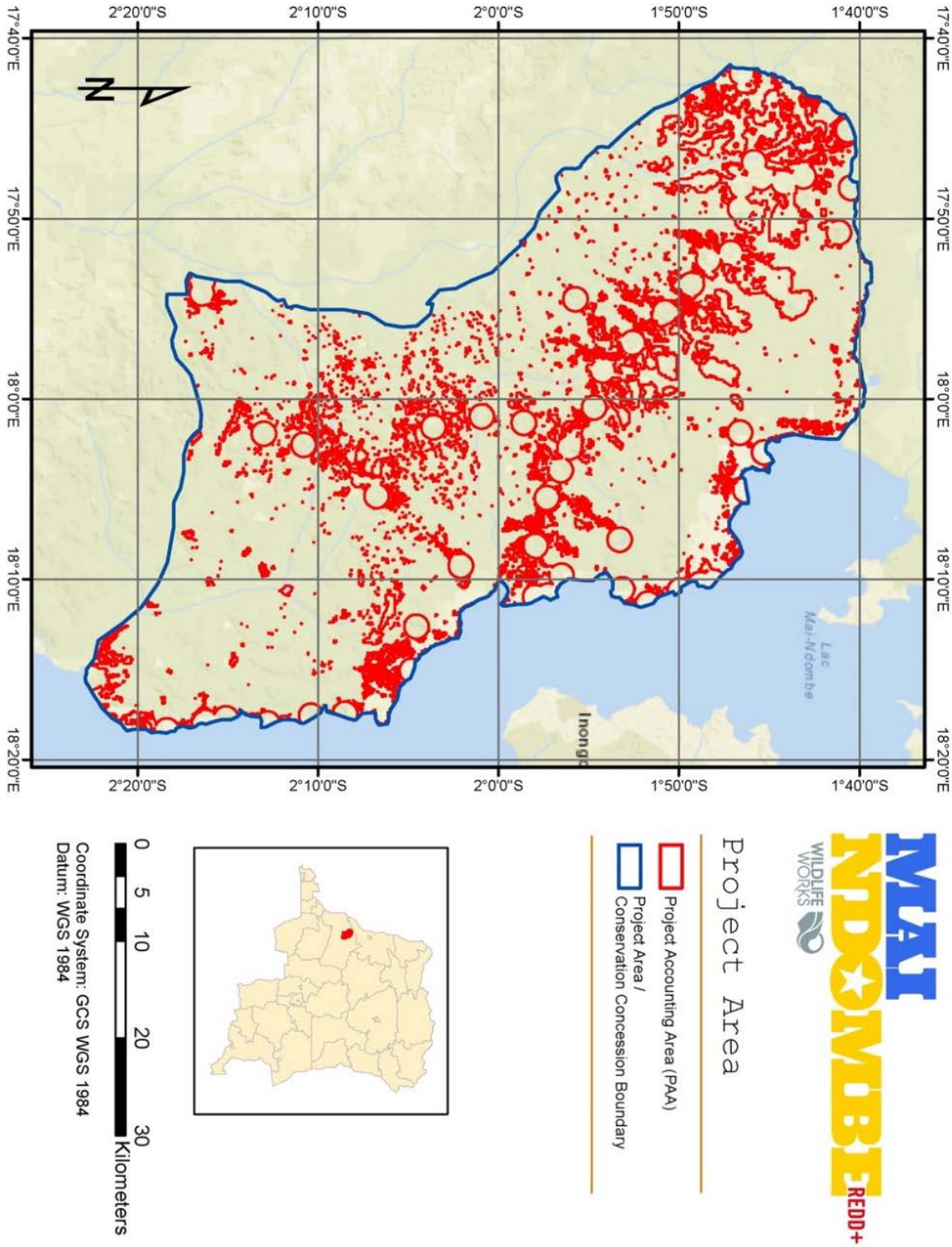
MRR.105 Justification that the field protocol for the destructive measurement method conservatively estimates biomass.

Please refer to Annex 9 - Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field.

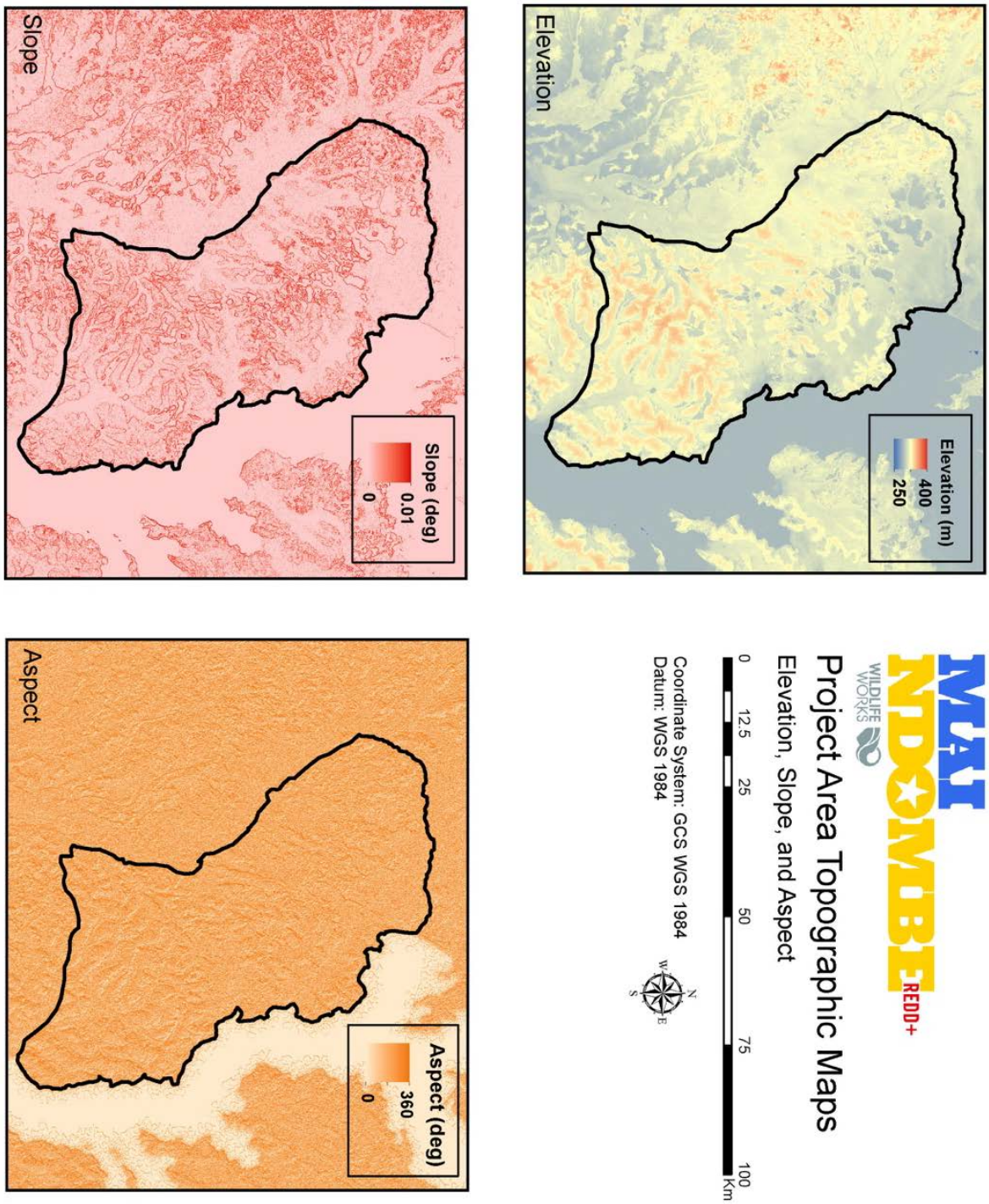
MRR.106 For each allometric equation in the list, the value of $\overline{E}$.

Please refer to Annex 9 - Standard Operating Procedure - Measuring Trees for Biomass Estimation in the Field.

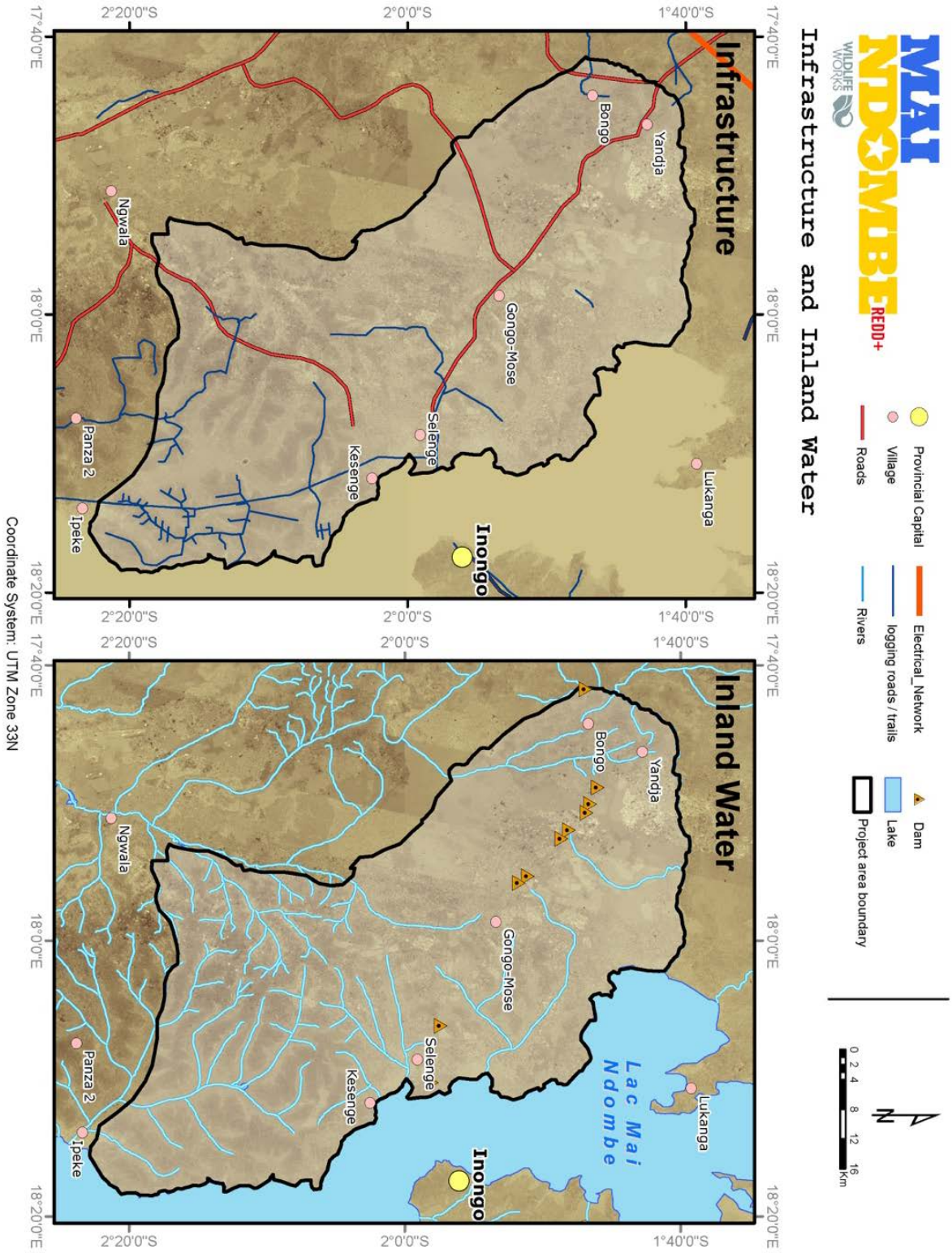
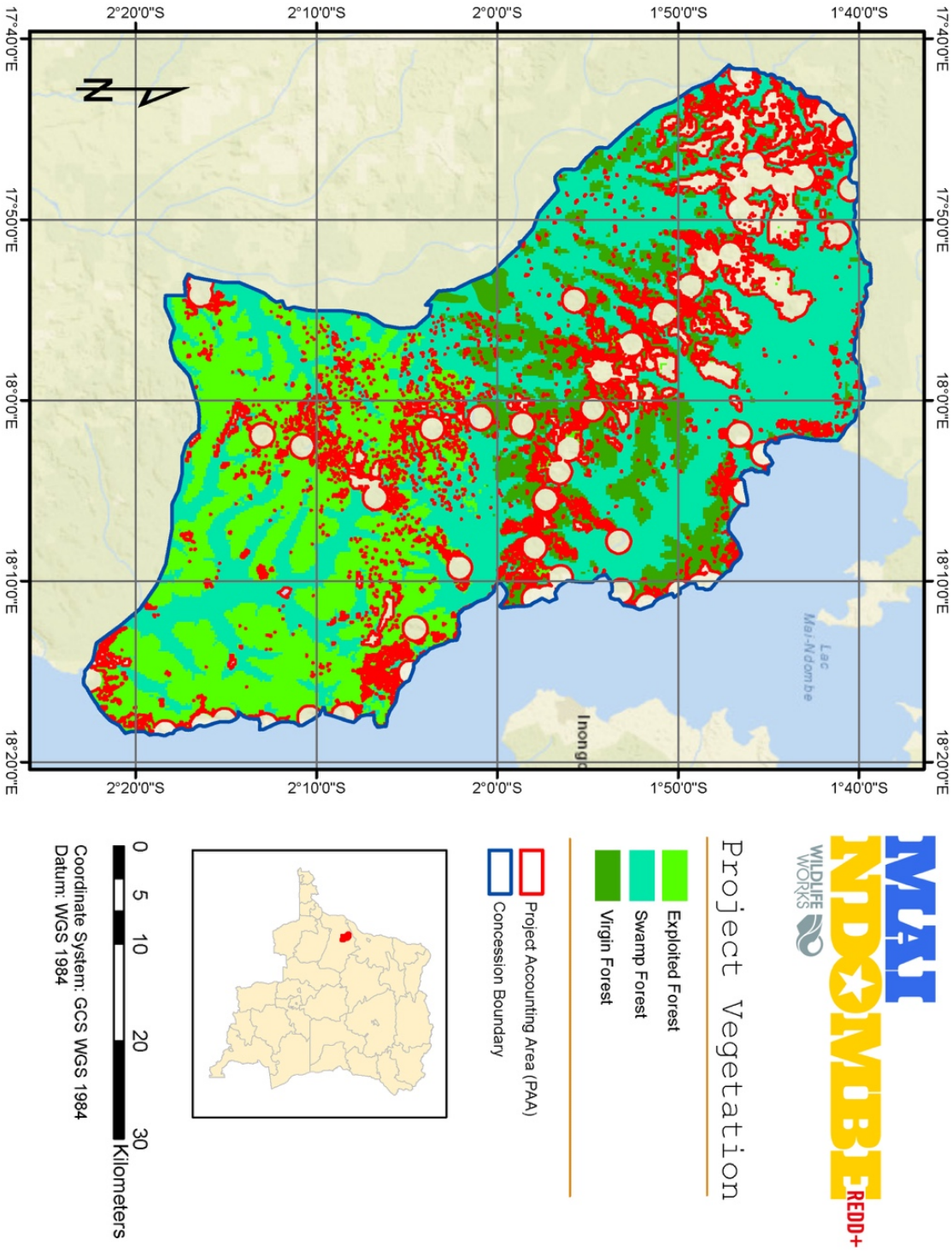
APPENDIX A: PROJECT AREA



APPENDIX B: TOPOGRAPHIC MAPS



APPENDIX C: INFRASTRUCTURE ROADS – WATER BODIES



APPENDIX D: LAND USE / FOREST COVER