

MONITORING & IMPLEMENTATION ISANGI REDD+



Document Prepared By



Project Name	Isangi REDD+ Project
Project Location	Isangi territory, Yangambi District, Orientale Province, Democratic Republic of the Congo
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Auditor	Rainforest Alliance. Contact: Janice O'Brien, +1-647-899-7214, jobrien@ra.org
Project Start Date	12 – September – 2009
GHG accounting period and lifetime	Starting 12 – September – 2009 and ending 11 – September – 2039
Project Implementation Period and GHG Monitoring Period	September 12, 2009 – December 31, 2013
CCB Status History	Undergoing Initial Validation and Verification
CCB Standards Edition Used	Climate, Community and Biodiversity (CCB) Standards, Second Edition, December 2008
CCB Benefits Summary	The project seeks to address the issue of deforestation in the DRC on a local level, protecting the climate and biodiversity by maintaining and enhancing this tract of rainforest while enhancing the quality of life of the local communities through sustainable agriculture and economic development.
Gold Level Criteria	Biodiversity – The project will protect endangered and vulnerable floral species through forest conservation.
Date of MIR Completion	11/19/14
MIR Version Number	V2.2
Expected Verification Schedule	April 17-25, 2014

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1 GENERAL

1.1 Summary Description of the Project (G3)

Jadora LLC (Jadora) develops carbon offset projects to conserve and enrich environments around the world. Jadora's projects provide socio-economic opportunities for impoverished peoples while mitigating the effects of global climate change. Jadora and Safbois, Ltd have reached a formal agreement to develop carbon offsets on a 348,000 ha logging concession that Safbois leases from the Congolese government. A significant portion of this concession has been determined to be a prime area for a REDD+ project. The original Safbois concession consists **of two sections, a large concession (252,000 ha) just south of the Congo River near the town of Isangi and** a smaller, adjacent concession (96,000 ha) to the south.

The REDD+ project area contains one parcel of forest spanning both concessions totaling 187,571 ha. Active deforestation is occurring on three sides adjacent to the exterior boundaries of the project area. The coordinate centroid of the project area is 0° 24' N, 23° 55' E. The official name of the project is the Isangi REDD+ project.

The primary climate objective of the Jadora-Isangi REDD+ project is to address the issue of deforestation in the DRC on a local level, preventing emissions that would otherwise occur from the conversion of forest to areas for subsistence agriculture. The project's biodiversity and community objectives are to protect a threatened, biologically diverse forest with thousands of rare and declining species while improving the livelihoods of the area's forest-dependent people. A more detailed description of the project's climate, community, and biodiversity objectives can be seen in Section 1.1.1 below.

This Monitoring and Implementation Report (MIR) has been prepared by Jadora to demonstrate monitoring and implementation results from the project's first crediting and implementation period from the Isangi REDD+ Project. These results include the net greenhouse gas (GHG) emissions reductions and net positive community and biodiversity impacts resulting from project activities conducted during the first monitoring period (see Section 1.6 below). The project was validated under the Verified Carbon Standard (VCS) and the Climate, Community and Biodiversity Alliance (CCBA) by Rainforest Alliance on 6 September, 2014.

1.1.1 PROJECT OBJECTIVES

Jadora seeks to address the issue of deforestation in the DRC on a local level. This initiative will have positive climate, community and biodiversity impacts in the project zone.

The project reduces CO₂ emissions by preventing deforestation caused by land conversion of forests. The project prevents deforestation by addressing the drivers of deforestation in the project area through effective land-use planning and sustainable agricultural intensification. Jadora created the following climate, community, and biodiversity objectives through an analysis of the drivers of deforestation in the project area, the focal issues identified in consultation with communities and the participatory rural appraisal, and threats to biodiversity in the project zone. To achieve these objectives, the project proponent designed an array of project activities that fall under four program areas: education, improved production, improved access to resources, and land-use planning.

1.1.1.1 Climate objectives

- Reduce CO₂ emissions that result from conversion of intact forest to agricultural land.

1.1.1.2 Community Objectives

- Increase access to, relevance, and quality of education to communities in the project zone.
- Improve quality of life and alleviate poverty in project zone by promoting sustainable economic development and agricultural practices and improving public health.

- Maintain the value of resources and ecosystem services that are fundamental to the basic needs of communities in the project zone.
- Support communities in maintaining traditional, cultural, spiritual, and religious identities in the project zone.

1.1.1.3 Biodiversity Objectives

- Maintain habitat for viable, abundant, and diverse natural populations.
- Reduce threats to rare, threatened, and endangered species.
- Maintain the function of the natural ecosystem.
- Increase local and global understanding of biodiversity in the project zone and Congo River Basin.

1.2 Project Location (G1 & G3)

Country: Democratic Republic of Congo

Nearest Large City: Yangambi (100 Km West of Kisangani)

Territory: Isangi

District: Yangambi

Province: Orientale

Precise Location of Project Activities: 0°24' North, 23° 55' East

Description: Isangi Logging Concessions of *Safbois* S.P.R.L. (ID numbers: 007/11 and 008/11)

Geographic location: Located in the central northeast of the DRC, the Isangi territory resides at the heart of the Congo River basin, and is specifically described as a triangular peneplain at the confluence of the Congo River and one of its midreach ordered rivers, the Lomami. Surrounding it on the remaining sides are upland and lowland tropical forests. For an ex-post map of the project area, see Annex T. A KML of the project area can be found in Annex W.

1.2.1 PROJECT'S PHYSICAL PARAMETERS

1.2.1.1 Soil

The soil is continually wet and has very low nutrient and mineral contents other than in the shallow organic humus on the surface. The underlying base soils throughout the area are ferralsols, ferrisols and areno-ferral-undifferentiated rocks. In areas along the rivers there are also kaolisols soil types. These poor soils require significant organic and mineral inputs to support crop production, and historically, these inputs were derived from clearing forests (Brand and Pfund 1998).

1.2.1.2 Geology

The basic geology of the area is Cretaceous and Cenozoic in origin with overlying continental deposits up to 1000 meters in thickness (during Cretaceous and Tertiary periods) followed by a long cycle of low subsidence. (Kadima et al 2011, Giresse 2005). Since that time there have been recent deposits associated glacial and interglacial episodes. In general the project area has had no geologic activity such as volcanoes or earthquakes.

1.2.1.3 Climate

The climate type is AF in Koppen classification (tropical wet climate with no marked dry season) with an average rainfall of above 1,500 mm per year (Koppen 1936).

1.3 Project Proponent (G4)

Jadora LLC (Jadora) is a sustainable land and resource management company based in Kirkland, Washington, USA. Jadora is the project proponent and is solely responsible for all aspects of project design, implementation, and management. As discussed in section 3.2 below, Jadora has full right of use for all emissions reductions from the Isangi REDD+ Project (see Annex S).

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1.4 Other Entities Involved in the Project (G4)

Jadora S.P.R.L. is Jadora LLC's Congolese subsidiary responsible for processing payroll and taxes on behalf of Jadora LLC in DRC.

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Societe Africaine du Bois S.P.R.L. (Safbois) is a Congolese logging company that produces selectively logged, exotic hardwood timber and timber products. Safbois owns the timber rights to the project area and provides Jadora with in-country assistance. This assistance includes access to facilities and equipment in Yafunga, as well as transportation and other logistics inside the DRC. Jadora entered into an agreement with Safbois in August 2009 to be the sole project developer for the Isangi project in exchange for in-country (DRC) logistical support during the project's development and a revenue share of the sale of carbon credits resulting from the development of the project. This agreement grants Jadora all carbon rights associated with the project area (see Annex S). No changes in ownership have occurred.

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Ecological Carbon Offset Partners, LLC (ecoPartners) is a consulting firm based out of Berkeley, California, USA. As a leader of carbon-financed conservation, ecoPartners works with project developers, forest owners and verification bodies to build successful carbon offset projects. They are experts in the technical aspects of project design, planning and development including biometrics, accounting methodologies and remote sensing. ecoPartners has extensive experience validating and verifying projects under the California Air Resources Board (ARB), Climate Action Reserve (CAR) Standard, Verified Carbon Standard (VCS), and Climate Community & Biodiversity (CCB) Standard. For the Isangi REDD+ Project, ecoPartners has provided technical consulting services to Jadora on project design, documentation, carbon accounting, validation, and remote sensing, as well as in drafting this Project Description. ecoPartners will provide ongoing support to fill the role of Climate Director until otherwise directed by Jadora. The role of Climate Director has specific management and monitoring responsibilities as described in Annex E.

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1.5 Project Start Date (G3)

The project start date is 12 September 2009.

1.6 Project Crediting Period (G3)

30 years starting 12 September 2009 and ending 11 September 2039. The results presented below occurred during the first monitoring and implementation period spanning from 12 September 2009 to 31 December 2013.

2 IMPLEMENTATION OF DESIGN

2.1 Sectoral Scope and Project Type

The sectoral scope of the project is 12 (agriculture, forestry, and land use change). The project type is REDD.

2.1.1 GROUPED PROJECT

The project is not a grouped project.

2.2 Description of the Project Activity (G3)

2.2.1 ACTIVITIES THAT HAVE ACHIEVED NET GHG EMISSIONS REDUCTIONS

Jadora's climate objective is to reduce CO₂ emissions that result from conversion of intact forest to agricultural land. Jadora's Isangi project's primary activity to achieve net GHG emissions reductions is to provide an alternative revenue stream to Safbois. Without that revenue stream, Safbois would have logged the project area. The logging infrastructure that would create would allow the entry of subsistence agriculturalists and the conversion of the forest to annual crops.

In this monitoring period, Jadora has maintained its agreement with Safbois to avoid logging in the forest. Documentation of that agreement is included in a confidential annex, Annex AB. Jadora has monitored the forest in this period using LANDSAT imagery of the project area for any deforestation event in the project area. Approximately 292 hectares were deforested within the project area during this monitoring and implementation period.

2.2.2 ACTIVITIES THAT HAVE ACHIEVED COMMUNITY AND BIODIVERSITY BENEFITS

Jadora's community objectives are to:

- Increase access to, relevance, and quality of education to communities in the project zone.
- Improve quality of life and alleviate poverty in project zone by promoting sustainable economic development and agricultural practices and improving public health.
- Maintain the value of resources and ecosystem services that are fundamental to the basic needs of communities in the project zone.
- Support communities in maintaining traditional, cultural, spiritual, and religious identities in the project zone.

These objectives were obtained through community consultation and the identification of three focal issues affecting the communities in the project zone:

1. Lack of Sustainable Food Security
2. Lack of Employment Opportunities
3. Inadequate Health Care

Jadora's biodiversity objectives are to:

- Maintain habitat for viable, abundant, and diverse natural populations.
- Reduce threats to rare, threatened, and endangered species.
- Maintain the function of the natural ecosystem.
- Increase local and global understanding of biodiversity in the project zone and Congo River Basin.

Activities to achieve these objectives are numerous, and are grouped into four major program areas:

- 1) Improved access
- 2) Education
- 3) Land-use Planning
- 4) Improved production

The implementation plan for the phased project activities is provided in Annex AC as an annex to the Project Description. The budget and implementation schedule can be found in Annex AD and Annex AE, respectively. In this monitoring period, Jadora has achieved its objectives, implementing project activities in every program area.

2.2.2.1 Community-oriented project activities

Notable implemented programs to improve the community quality of life include an aquaculture program that improves nutrition and quality of life in the community, a road and bridge construction program in the project area, which have improved access to markets and resources outside the project area for community members, and funding the salaries of six primary school teachers and one school headmaster in the project zone. See Section 6.1 for community monitoring results and demonstration of net positive community impacts for this monitoring period.

2.2.2.2 Biodiversity-oriented project activities

There is often synergy in the project activities undertaken by Jadora which target the community and the climate objectives with those that target biodiversity. Jadora's protection of the project area through its agreement with Safbois to forgo logging has preserved habitat for fauna and avoided the conversion of forest occupied by native tropical forest flora—including endangered plant species. In addition, its activities to improve quality of life and nutrition, the training of community members in aquaculture and demonstration farms to inculcate improved farming techniques, have begun to reduce bush meat hunting pressure.

In this monitoring period, Jadora has also implemented the faunal survey program to increase local and global understanding of biodiversity in the project zone. The procedure for monitoring animal populations is provided in the Annex AH. The records of biodiversity monitoring are provided in Annex AF and Annex AG. See Section 7.1 for biodiversity monitoring results and an assessment of net-positive biodiversity impacts for this monitoring period.

2.2.3 NEW PROJECT ACTIVITIES

There were no project activities in this monitoring period that deviate from the monitoring plan.

2.3 Management of Risks to Project Benefits (G3)

Jadora is committed to long-term enhancement of the community, climate, and biodiversity benefits of the project beyond the project lifetime. The primary avenue to ensure the permanence of the benefits to the community, and to a certain extent to biodiversity, is to increase the human capacity and access to opportunity for the people in the project area. Education is a key component of this, and Jadora's finance of seven teacher's salaries this monitoring period has ensured that children in that area will grow up with a higher level of education than they could have reached otherwise.

The project proponent has applied the VCS Non-Permanence Risk Tool version 3.2 and calculated an initial risk rating of 15. The project proponent will deposit the required number of credits into the buffer pool upon issuance of credits. The Non-Permanence Risk Report and calculations are available separately as Annex F.

A summary of risk ratings for this monitoring period is as follows:

Risk Category	Rating
a) Internal Risk	14
b) External Risk	1
c) Natural Risk	0
Overall Risk Rating (a + b + c)	15

Table 1. VCS Non-Permanence risk results.

Natural Risks to carbon stocks

- **Fire:** While fire is often used to clear small fields prior to cultivation, the project area is composed of wet tropical rainforest with very low risk of significant fires. Potapov et al (2011) found that while very small fires from subsistence agriculture are a major driver of forest loss in DRC, no major forest fires (other than those caused by volcanic eruptions in Nord-Kivu) were observed from 2000-2010 using remote sensing techniques. Project activities are designed to discourage small fires used in subsistence agriculture. Through the cessation of logging, access to primary forest through the road network is greatly reduced. No evidence of large-scale fires in the project area exists.
- **Pest and Disease Outbreak:** Due to the project area's wet tropical climate, high biodiversity levels, and natural distribution of native species, the forests have low susceptibility to losses due to pest and disease compared to forest plantations. No evidence of pest or disease outbreaks has been identified in the project area. The FAO profile for DRC does not show any forest areas affected by insects, disease, or fire (<http://www.fao.org/forestry/country/32267/en/cod/>). Furthermore, the two most common pests identified by FAO to occur in DRC are the cypress aphid (*Cinara cupressivora*) and the eucalyptus canker (*Chrysoporthe cubensis*). The project proponent has cross-referenced the hosts of these two pests with the forest inventory and found no individuals identified in the project area. (See <http://www.fao.org/3/a-i0640e/>)

- Extreme Weather: The primary weather risk in the project area is from flooding and/or drought. Both occur naturally throughout the project zone and life in the region has adapted to the natural cycles of flooding and drought. These disturbances pose a very low risk to the project.
- Geological Risk: While there are active volcanos and seismic activity in Eastern DRC, there is no risk of loss due to geologic forces in the project area. This assertion is confirmed by the United States Geologic Survey (USGS): <http://earthquake.usgs.gov/earthquakes/world/africa/gshap.php> and <http://earthquake.usgs.gov/earthquakes/world/africa/seismicity.php>.

Human Risks to carbon stocks

Jadora has identified multiple risks to project benefits and designed measures to mitigate them. The following table summarizes the risks to climate, community, and biodiversity benefits. Each risk and relevant mitigation measures are described in greater detail below. Internal and external human risks affecting climate benefits are described in greater detail in the completed VCS Non-Permanence Risk Report (see Annex F and Section 2.3.2 of the Jadora Isangi Project Description).

Risk	Climate Benefits at Risk	Community Benefits at Risk	Biodiversity Benefits at Risk
Political Instability	Loss of forest protection due to change in ownership or carbon rights	No in-kind community benefits or development projects due to overall project implementation failure	Loss of habitat protection due to changes in ownership or carbon rights
Social Instability/ Unequal Distribution of Project Benefits	Failure of agreements with communities leading to loss of forest protection	Unequal distribution of project benefits to community members	Increase in hunting pressure due to unequal distribution of alternative protein sources and education initiatives
Failure of the Project to Issue Carbon Credits	Project failure due to lack of revenue source	Loss of in-kind project benefits and development projects funded by credit issuance	Loss of habitat protection and funding for surveys and biodiversity-related project activities
Customary Use Rights	Loss of forest protection due to communities opting out or not participating in project	Project may infringe on customary use rights to clear land for agriculture and hunt animals	No reduction in threats to biodiversity due to lack of community participation in project. Customary rights allow for hunting and forest clearing
Stakeholder Trade-Offs	N/A	Project activities may impact some community members more than others (e.g. hunters and Safbois employees may be negatively affected)	N/A
Hunting Leakage	N/A	N/A	Reduction in threats to faunal diversity may lead to increase in hunting animals outside project zone
Activity-Shifting Leakage	Communities may re-locate or travel outside project area to convert forest for agriculture, leading to an increase in CO ₂ emissions (see Section 5)	N/A	If deforestation activities shift outside of project area, floral species and habitats will not be protected
Natural Risks	See Non-Permanence Risk Report	Pests, disease, fire, and flooding could negatively impact crop yields from new agriculture and aquaculture projects	Pests, disease, fire, and flooding could lead to habitat destruction or failure of alternative protein source project activities

Table 2. Risks to project benefits.

Political Instability

Over the last 50 years the DRC has been one of the least politically stable countries in the world. The most recent conflict, the Second Congo War, lasted from 1998-2003 and included several major conflicts in the Orientale Province. However, the country is emerging from these past conflicts, as the first free elections under a new constitution were held in 2006, in which the current president Joseph Kabila was

elected with 58% of the vote. Furthermore, forest concessions have rarely been affected by conflict and are rarely subject to extra-legal third party takeover.

The DRC government submitted a Readiness Preparation Proposal to the UN-REDD Programme in July 2010 and an Emissions Reductions Program Idea Note to the World Bank's Forest Carbon Partnership Facility Carbon Fund in May 2013. Jadora has sought cooperation and agreement with the Ministry of Environment, Nature Conservation and Tourism of the DRC, and these agreements should be recognized independently of the status of politicians in power. By cooperating with outside groups such as the World Bank and UNDP, Jadora is recognized as a viable entity with internationally binding agreements in place, regardless of the administration.

Political risks largely relate to the overall implementation of the project and its climate benefits as demonstrated in the project's Non-Permanence Risk Report (Annex F). However, these operational risks have implications for the project's community and biodiversity benefits as they are made possible through the issuance and sale of VCUs. By mitigating the political risks to climate benefits through engaging and partnering with communities, the various levels of government, and civil society, Jadora has mitigated the associated risks to community and biodiversity benefits. During the monitoring period, Jadora has maintained close relationships with local, regional, and national government officials. This support is evident from the approval and support granted to Jadora by the Ministry of Environment, Natural Resources, and Tourism (see Annex AS).

Social Instability/Unequal Distribution of Project Benefits

In the UNDP's most recent Human Development Report, the DRC ranks 186 out of 187 countries. Military and social unrest are at critical levels, particularly in eastern DRC as regional troubles have crossed the border. Jadora recognizes this risk, and alleviation of critical social ills is one of the primary goals of the Isangi REDD+ Project. The integrated program has a focus on social capacity building. By focusing on education, healthcare, and economic well-being, Jadora has improved the social stability of the region and meets regularly with local chiefs of the project region to ensure open discussion that will help ward off social uprising in certain circumstances.

There is a risk that project benefits will not be distributed equally among participating communities in the project zone as a result of social instability or a lack of oversight in community benefits allocation. This risk has been mitigated by holding open meetings with representatives from Jadora, local government officials, and an outside representative in making decisions on community benefit projects. Furthermore, the process is fully transparent and has provided communities with explicit feedback on how and why community development projects are funded. Equality and transparency are central to the community benefits process fully described in Annex G. Jadora also has a robust grievance process for responding to community feedback such as the perception of unequal project benefit distribution.

Support from the community for the project is strong. Community engagement and consultation has been ongoing and will continue throughout the life of the project. These participatory methods allow for feedback from communities and allow adjustments to be made in the event that communities express concern over unequal distribution of benefits. As the project has yet to issue credits and distribute project benefits, this risk is not applicable for the current monitoring period. However, Jadora has continued to develop an equitable benefits sharing mechanism to mitigate this risk in the future.

Failure of the Project to Issue Carbon Credits

The project's success hinges on the issuance and sale of carbon credits. As such, the failure to issue credits poses a risk to climate, community and biodiversity benefits. The project proponent has mitigated the risk to climate benefits by hiring and retaining experts to ensure the project meets the requirements of the methodology and the VCS program (see Section 1.5.1 of the Jadora Isangi Project Description). Jadora has also procured adequate funding to implement the project prior to credit issuance and sales and used conservative VCU prices in the project's financial model. For more information see the Non-Permanence Risk Report (Annex F) and project net revenue and cash flow worksheet (Annex H). The risks and mitigation measures for these climate risks also apply to the related biodiversity risks.

For each VCU (tCO₂e) sold, Jadora contributes \$0.50 to the community benefits fund for use in in-kind services to communities. There is a risk that Jadora will fail to issue and sell credits through VCS over the project lifetime due to funding, capacity, or technical issues. As a for profit entity, Jadora is reliant on income from the sales of VCUs. This risk is mitigated by the fact that community benefits are directly aligned with Jadora's interests in recouping its upfront investments and generating income over the project lifetime. Despite not issuing credits yet, Jadora has maintained project activities with upfront investments, and this risk will be further mitigated when verification is complete and credits are issued.

Customary Use Rights

There was a risk that the project would infringe on the communities' customary use rights to use land for agriculture and hunt animals in the project zone. Jadora has mitigated this risk by taking a voluntary approach to project activities approved by communities through a thorough free, prior, and informed consent process (see Section 3.7.1 of the Jadora Isangi Project Description). The project does not infringe on communities' rights to use the forest; however, it does create alternatives to activities that deplete forest and biodiversity resources.

Furthermore, customary rights pose a risk to climate and biodiversity benefits because communities may opt-out or not participate in the project. This could lead to adverse effects on GHG emissions and biodiversity resources in the project zone. Jadora has mitigated this risk by making attractive incentives to participating in the project. Over time, ongoing stakeholder consultation and an adaptive management process will continue to ensure project activities and incentives effectively meet the needs of communities in the project zone and encourage continued participation in the project. During the first monitoring period, Jadora's programs have received wide community support, and Jadora has not received any claims that the project has infringed on customary use rights in community consultation meetings, the public comment period, or through the grievance process.

Stakeholder Trade-Offs

Project activities had the potential to affect some individuals more than others. For example, the cessation of logging in the project area affected employment in and around the concession. While many people benefited from learning and practicing new agricultural techniques, some Saffois employees have been negatively affected by the change in forest management. While the project has had a net positive impact on communities and biodiversity resources, some individuals were disproportionately affected by the project. Jadora has mitigated this risk by attempting to identify people most affected by the project and assisting them accordingly. This included having a preference for hiring former-Saffois employees to assist in agricultural programs and hunters and trappers to work for the biodiversity teams. Jadora's grievance process (see Section 2.7.4 of the Jadora Isangi Project Description) and Community Consultation Team also have helped to identify and resolve negative impacts on individuals that have occurred as a result of the project.

Hunting Leakage

While the project discourages hunting, it does not prohibit hunting in the project zone. It is possible, however, that hunters have relocated their activities to areas outside of the project zone due to social or other pressures, leading to offsite impacts on biodiversity. Jadora has mitigated this risk by taking a non-confrontational approach to education and monitoring. Hunters are not chastised or punished in any way. Moreover, Jadora has created access to alternative protein sources through activities that require less time and fewer financial resources than hunting. These incentives have encouraged community members to obtain protein and food from sources other than wild animals without having to leave their homes or travel outside the project zone. At this early stage of implementation, it is difficult to assess how this program has affected hunting within or outside of the project zone. While the project is well underway, the causal link between the aquaculture program and a reduction in hunting has yet to be made—thus hunting leakage is a minimal risk at this time.

Activity-Shifting Leakage

Activity-shifting leakage poses a threat to climate and biodiversity benefits. By changing land use behaviors in the project area, individuals may choose to relocate their homes or farms to areas outside the project area. This can cause a reduction in forest area protected from conversion to cropland resulting in an increase in GHG emissions and/or a loss of habitat. Jadora actively monitors and has mitigated activity-shifting leakage (see Sections 5.2 and 5.5 of the Jadora Isangi Project Description). While leakage occurred in the monitoring period, this deforestation largely occurred in established buffer zones and is dwarfed by the amount of area that was protected in the project area compared to the baseline scenario. Project activities related to land use planning have been designed to reduce the effects of activity-shifting leakage and are slated to be implemented further in the next monitoring period.

2.4 Measures to Maintain High Conservation Values (G3)

The project area is of high conservation value, particularly for leopards; it also has the potential to contain elephants and has a floral diversity which has yet to be fully characterized. Jadora has ensured that the forest habitat in the area remains intact through its contract with Saffois to avoid logging.

2.5 Project Financing (G3 & G4)

Jadora's current arrangement with Saffois (Annex AB) states that Saffois arranges logistics and security support in the project area, as well as forgoes logging in the project area in exchange for payment of the concession fees by Jadora. In addition to the concession fees for the project, Jadora pays for the other community and biodiversity project activities and monitoring. To date Jadora's payment for these activities has been privately financed. After verification, Jadora has contracts in place for the sale of VCUs and augmentation of project activities with those funds.

2.6 Employment Opportunities and Worker Safety (G4)

Jadora provides employment opportunities to persons in the project area during the course of annual monitoring of forest carbon stocks and in biodiversity monitoring. In the first monitoring and implementation period, Jadora employed more than 30 persons from the project area as team members. Jadora has trained more than 20 members of the community in the technical and managerial components of project implementation, listed in Annex AJ. Health and safety trainings are provided to all forest workers and the SOP for said trainings can be found in Annex AI.

Jadora is committed to providing employment opportunities for under-represented groups, especially women. In the first monitoring period, Jadora hired several women from the project zone and created three women's focus groups to ensure the project is meeting the needs of women and fully include them in the project (see Annex AY). Jadora intends to hire a women's coordinator in the next monitoring period to continue progress towards this goal.

2.7 Stakeholders (G3)

2.7.1 STAKEHOLDER ENGAGEMENT STRUCTURE

Stakeholders had direct involvement with the development of the PD, and continue to provide input in project implementation. Stakeholders are identified and engaged by the Community Consultation Team, and the results from stakeholder involvement are presented to the Jadora Leadership Team. The Jadora Leadership Team and Isangi Project Manager are responsible for overseeing stakeholder involvement in the project and ensuring that stakeholder feedback is integrated into the project. Jadora engages stakeholders in initial design of the project, its implementation, and to gauge if the project has been effective in achieving its objectives. As noted in the Isangi Implementation Plan (Annex E) ongoing consultation and community monitoring feed directly in the adaptive management process for the project. For more information on the project's stakeholder engagement process, please Section 2.7 of the PD.

2.7.2 PUBLIC COMMENT PERIOD

This document was posted to the CCBA website along with the PD (<http://www.climate-standards.org>) and held open for public comment. The project proponent also posted a summary of this document in accordance with the *Rules for the Use of the CCB Standards* (December, 2013). Summaries of the PD have been translated into Lingala, the language most prevalently spoken in the project zone, and posted on the CCBA website. French words are used to fill gaps in Lingala vocabulary in these summaries. In addition to communities in the project zone, Jadora notified the Isangi Territory Administrator (administrateur du territoire) and the DRC Minister of the Environment.

The Community Consultation Team has also publicized the comment period by visiting villages in the project zone and distributing copies of the summaries. Because internet is unavailable throughout the project area, the villagers were informed that they may come to the Jadora base camp to access the internet and documents and translators were available to assist them in uploading their comments. The generator providing electricity for the VSAT internet system is available from 17:00 to 21:00 daily. Community members can also submit written comments that will be scanned by the Community Consultation Team and submitted to CCBA.

2.7.3 STAKEHOLDER CONFLICT AND GRIEVANCES

Isangi maintains a complex web of both traditional and territorial authorities. Jadora's carefully cultivated relations with local, regional, and national authorities have helped Jadora understand how local conflicts are resolved. Jadora has been judicious to comply with the local rules and customs in designing its processes for conflict resolution. To reduce the occurrence of conflicts, Jadora is proactive about the equitable distribution of opportunities and benefits from the project. The grievance process involves building systems for early conflict detection into the larger project design and educating Jadora employees on conflict mediation. When possible, Jadora aims to resolve conflicts promptly and at the local level. Jadora's entire grievance process is included in Annex D. There is a translated summary and poster outlining this process posted at Jadora's basecamp in Yafunga.

3 LEGAL STATUS

3.1 Compliance with Laws, Statutes, Property Rights and Other Regulatory Frameworks (G4 & G5)

A summary of Jadora's compliance with relevant laws is included here. A Congolese attorney has performed a thorough legal analysis and found Jadora to be in full compliance with all applicable laws. This legal opinion is available as Annex I.

Bakajika Law (Ordinance number 66-343, June 7, 1966)

This law restricts all forms of private land ownership, asserting to the State "full ownership rights over its domain and full sovereignty in conceding rights to land to up to 20 kilometers, forests and mines through the extent of its territory."

Land Tenure Law (Law number 73-021, July 20, 1973)

The Land Tenure Law allowed for certain types of 'permanent private concessions', and also recognized that customary laws apply to user rights over 'non-allocated lands in rural areas'.

Forest Code (Law number 011/2002, August 29, 2002 and Decree number 11/27, May 20, 2011)

Forest ownership and user rights are now subject to the 2002 Forest Code, which sets out the basic 'framework' for the DRC Government's forest policy. The Code does not modify the 1973 Land Law, and continues to assert state ownership over all areas of forest, however, it also broadly defines certain categories of forest, such as for 'exploitation', 'community use' and 'conservation'.

Under the 2002 Forest Code, forestry concessions of up to 500,000 hectares can be granted, within which the operator has the right to exploit all timber. Concessions cannot be sold, rented or exchanged and these concessions' are subject to various stipulations which are detailed in the Code and implementation decrees. The planned legal arsenal in the Land and Forest Codes gives guarantees sufficient for the implementation of the project, after obtaining the required authorizations and titles of occupations, without risk of eviction for the time they are in effect.

Ministerial Order number 033, October 2, 2006,

This order establishes the organization and operation of a national forest *cadastre*. Article 2 requires that the *cadastre* conserve a copy of the concession contract. Jadora has provided the provincial *cadastre* with two copies of the concession contract.

Interministerial Order numbers 006/CAB/MIN/ECN-EF/2007 and 004/CAB/MIN/FINANCES/2007, May 8, 2007

This order requires concession holders to pay annual taxes based on the area of forest leased. Saffois has paid all concessions fees and is in full compliance with the terms of the concession lease.

Forest Code and its related Ministerial Order number 024/CAB/MIN/ECN-T/15/JEB/08, August 7, 2008

This order establishes a public inquiry procedure when granting forest concessions.

Decree number 08/08, April 8, 2008

This decree establishes the procedure for classifying and declassifying forests. Article 17 states that an Environmental Impact Assessment is only necessary when decommissioning a forest, and therefore an Environmental Impact Assessment is not required for the Isangi REDD+ Project.

Ministerial Decree number 11/27, May 20, 2011

This decree outlines specific rules for the allocation of forest conservation concessions. Chapter III establishes the process of awarding forest concessions.

Ministerial Order number 004/CAB/MIN/ECN-T/012, February 15, 2012

This order establishes the accreditation procedure for REDD+ projects. Jadora has followed this procedure and will continue to follow this procedure through the life of the project. Jadora has submitted the Isangi REDD+ Project and been accepted by the national registry.

Law number 10/008, February 27, 2010

This law amended and supplemented the Decree of the King Sovereign of February 27, 1887 and the Decree of March 6, 1951. The law established the Commercial Register. Jadora is registered to the new commercial register.

Investments Code (Law number 004/2002, February 21, 2002)

The Investment Code outlines the legal structure for foreign investment in the DRC, which Jadora follows.

The Constitution of the Democratic Republic of the Congo, February 18, 2006 and amendments of Law number 11/002, January 20, 2011

The 2006 Constitution divides power between the central government and the provinces. Article 203 establishes forest rights to be the concurrent jurisdiction of the central government and the provinces.

Even though there has been legal precedent for developing concessions and monetizing carbon offsets generated from those concessions, stability around those terms and conditions were not necessarily established during this time period.

Thus, the Ministry of the Environment, Conservation of Nature, and Tourism (MECNT) has engaged in several activities and ratified several international conventions to ensure the transparent and sustainable of REDD projects with the Congo Basin, including developing and presenting a Readiness Preparation Plan to the UN-REDD Programme Policy Board in March 2010 and an Emissions Reductions Program Idea Note to the Forest Carbon Partnership Facility (FCPF) Participants Committee in May 2013.

Within these legal frameworks, there are several stakeholders that Jadora regularly interacts and cooperates with such as local and provincial officials, officials from the MECNT, representatives from the UN-REDD National REDD Committee, USAID, UNDP, and local Congolese NPO/NGOs. Jadora actively engages all stakeholders to provide input and feedback within the scope of the project and its design. Over the course of the nearly three (3) year engagement with various stakeholders, Jadora or Safbois have met with representatives of the UN-REDD National REDD Committee, USAID, and UNDP over 12 times and have been specifically asked to participate in the National REDD Committee's new REDD registry and provide strategic guidance on the development of the national REDD strategy. Jadora also directly engages with each of the 21 villages in the project area through outreach and communication programs, but more importantly by directly employing foresters from each village in the area.

Jadora warrants that all actions and documentation for the project establishment as a carbon sequestration project have and will be met. The Isangi project has received government endorsement, and Jadora has provided its verifier with its *letter d'attestation* from the Congolese government

3.2 Evidence of Right of Use (G5)

Safbois and Jadora were granted the rights to develop the Isangi concession to commercialize and sell carbon credits resulting from the development of the property in a Letter du Attestation from The Ministry of the Environment, Nature Conservation and Tourism and the Minister of the Environment in 2010, signed by Jose E.B. Endundo (the Minister of the Environment in 2010). The Ministry agreed to provide complete support of the project, including the development sale of carbon credits, under several conditions:

1. Ensure appropriate reporting of project activities to the Ministry of the Environment, Nature Conservation and Tourism and registration of the project with the appropriate REDD registries,
2. Integrate with additional National activities and ensure National Coordination of REDD with Isangi activities, and
3. Ensure coordination with local activities including provincial efforts.

The original Letter du Attestation from the Ministry of the Environment is present in Annex AT. The project proponent has also secured approval from MCENT in accordance with Ministerial Order 004, demonstrated by signature of Annex 4, the Model for Valorization of Environmental Services in the DRC (Annex AS).

Based on the above documentation, a Congolese attorney provided a legal opinion demonstrating right of use as defined in Section 3.11.1 of the VCS Standard, see Annex I.

3.3 Emissions Trading Programs and Other Binding Limits (CL1)

The emissions reductions and removals generated by the project will not be used for compliance with any emissions trading program or to meet any binding GHG emissions limit. To avoid double counting, emissions reductions will only be issued as Verified Carbon Units (VCUs).

3.4 Participation under Other GHG Programs (CL1)

The Isangi REDD+ project has not been, and will not be, seeking registration under any other GHG programs other than VCS and CCB. CCB verification will demonstrate positive climate, community and biodiversity impacts, but does not produce any registered emissions reductions or credits.

3.5 Other Forms of Environmental Credit (CL1)

The Isangi REDD+ project has not and does not intend to generate any related environmental credit for GHG emissions reductions or removals other than those claimed under the VCS Program. As mentioned in Section 3.4, the project is seeking verification under the CCB Standard. No other forms of environmental credit will be sought by the project proponent.

3.6 Projects Rejected by Other GHG Programs (CL1)

The Isangi REDD+ project has not been submitted to any other GHG programs nor has it been rejected by any such programs.

3.7 Respect for Rights and No Involuntary Relocation (G5)

The project does not require or involve the involuntary relocation of people or of the activities important for their livelihoods or culture. As such, Jadora does not seek to relocate communities or people in the project zone. Jadora's commitment to working with communities in the project zone and the policies that inform these practices are included in Jadora's Policy Document, Annex AA.

The project did not encroach uninvited on private property, community property or any other government property. The land in the project area is owned by the government of the Orientale Province of the DRC and occurs within a logging concession leased to Safbois.

Land use in the project zone is governed by village chiefs according to customary rights and laws. Jadora works with communities in the project zone to adopt land-use practices that do not rely on forest conversion for agricultural practices. Jadora's Community Consultation Teams are responsible for implementing the project's ongoing stakeholder consultation process described in Section 2.7 of the Joint VCS-CCD Project Description. This process was designed to allow communities to give free, prior, and informed consent in participating in the project in accordance with the UN-REDD Programme's *Guidelines on Free, Prior and Informed Consent* (2013). Consent is provided through agreements made between Jadora and villages in the project zone (cahier de charges).

For more information on Free, Prior and Informed Consent and Jadora's community consultation process, please see Section 3.7.1 of the Joint VCS-CCB Project Description.

3.8 Illegal Activities and Project Benefits (G5)

3.8.1 IDENTIFICATION OF ILLEGAL ACTIVITIES

There are few illegal activities that could affect the project's climate, community, and biodiversity impacts. Illegal logging poses a very low risk to climate benefits due to the lack of equipment necessary for extracting timber. Safbois has agreed to halt all legal, commercial logging in the project area. Although the Forest Code grants the concession holder all rights to forest use within the concession boundaries, it also permits agriculture and customary use by communities. Though technically not illegal, the overlap between use rights could have an effect on climate impacts in the project area through forest conversion.

3.8.2 DEMONSTRATE PROJECT'S LEGALITY

Within the project zone, none of the project activities violate any current law or regulation of any type. The project proponent is actively engaged and working with governmental and non-governmental

stakeholders in the region and country, and will continue to proactively engage with any individual or group necessary for the successful completion of the project. The legal analysis presented in Annex I attests to the project's sound legal standing.

4 APPLICATION OF METHODOLOGY

4.1 Title and Reference of Methodology

VCS Methodology VM0006, Version 2.1. *Methodology for Carbon Accounting for Mosaic and Landscape-scale REDD Projects*

4.2 Deviations from the Monitoring Plan

There is one deviation to the monitoring plan.

First Deviation	
Requested Deviation:	Soil organic matter has not been measured this monitoring period and is conservatively assumed to be zero.
Justification:	As the baseline scenario is agriculture, carbon in soil organic matter in baseline scenario is expected to be lower than in the project scenario as the baseline is annual crop. Table 2 of AFLOLU requirements indicates soil organic matter is an optional pool because carbon in soil organic matter under cultivation is expected to be lower than for forest. It is expected that soil organic matter will be measured the next monitoring period.
Compliance with Applied Methodology:	Table 2 of VM0006 indicates that soil organic carbon is an optional pool. The deviation is in compliance with the methodology.

4.3 Project Boundary (G1)

Carbon Pool	Included?	Justification/ Explanation of Choice
Aboveground tree biomass	Yes	Major carbon pool affected by project activities, included as AGL.
Aboveground non-tree biomass	No	Baseline land cover is annual crop or pasture grass.
Belowground biomass	Yes	Major carbon pool affected by project activities, included as BG.
Dead wood	Yes	Major carbon pool affected by project activities, included within cropland and settlement strata as LDW (lying dead wood) and SDW (standing dead wood).
Litter	No	Excluded as per VCS AFOLU requirements.
Soil organic carbon	Yes	Major carbon pool affected by project activities, included but conservatively excluded for the first monitoring period as per monitoring deviation in 4.2.
Wood products	Yes	Major carbon pool affected by project activities relative to the baseline scenario.

Table 3. Selected carbon pools

Source		Gas	Gas	Included?
Baseline	Baseline Deforestation and Forest Degradation	CO ₂	Yes	CFE activities are not implemented
		CH ₄	No	CFE activities are not implemented
		N ₂ O	No	CFE activities are excluded.
Project	Cookstove and Fuel Efficiency (CFE) activities	CO ₂	No	CFE activities are not implemented
		CH ₄	No	CFE activities are not implemented
		N ₂ O	No	CFE activities are not implemented
	Biomass burning from unplanned large and small scale fires	CO ₂	Yes	Emissions are already included in the changes of carbon pools
		CH ₄	No	CH ₄ emissions of burning woody biomass from unplanned fires are insignificant. If the fires are catastrophic, CH ₄ emissions must be estimated and demonstrated negligible or otherwise accounted for.
		N ₂ O	No	N ₂ O emissions of burning woody biomass from unplanned fires are insignificant, unless fires are catastrophic, N ₂ O emissions must be estimated and demonstrated negligible, or otherwise accounted for.
	Fossil fuel used during harvesting	CO ₂	No	Emissions from fossil fuel combustion is considered de-minimis for REDD.
		CH ₄	No	Insignificant
		N ₂ O	No	Insignificant
	Removal of woody biomass for fire prevention and suppression activities	CO ₂	No	Fire prevention and suppression is not an included activity
		CH ₄	No	Fire prevention and suppression is not an included activity
		N ₂ O	No	Fire prevention and suppression is not an included activity.
	Removal of woody biomass during assisted natural regeneration (ANR) activities	CO ₂	No	ANR is not an included activity
		CH ₄	No	ANR is not an included activity
		N ₂ O	No	ANR is not an included activity
	Fertilizer used during enrichment planting for assisting natural regeneration	CO ₂	No	ANR is not an included activity
		CH ₄	No	ANR is not an included activity
		N ₂ O	No	ANR is not an included activity
	Increased area of rice production systems	CO ₂	No	Rice production is not an included activity
		CH ₄	No	Rice production is not an included activity
		N ₂ O	No	Rice production is not an included activity
	Increased fertilizer use	CO ₂	No	Not applicable
		CH ₄	No	Not applicable
		N ₂ O	No	N ₂ O emissions related to increased fertilizer use are de minimis
	Increased livestock	CO ₂	No	Not an included activity

	stocking rates	CH ₄	No	Not an included activity
		N ₂ O	No	Not an included activity

Table 4. Emissions sources.

4.4 Baseline Scenario (G2)

See Section 4.5, Additionality, for a detailed description and justification of the baseline.

Generally, the baseline scenario is the conversion of forest to cropland driven by the expansion, improvement and maintenance of roads in the project area, which was taking place within the project zone immediately before the project start date. Forest clearing for agriculture provides the greatest economic benefit for individual farmers and their families who are the agents of deforestation. The primary drivers of conversion are the expansion of subsistence agriculture, driven by extensive agriculture and population growth, and enabled by improved access to the forest interior via logging roads. This is evident as it has been carried out routinely throughout the reference area and project zones (see Annex AM for a map of the reference area, and Annex T for a map of the project area). Alternative land uses in the region include oil palm plantations and extensive logging. These land uses are precluded by the distance of the project area from the Congo River (> 50 kilometers over poor roads) (Pérez et al., 2006). Conservation by the owner of the logging concession, Saffois, would be uneconomic; Saffois has not attempted to slow the conversion of forest to subsistence crop or plantation agriculture to date because the cost of forest protection would exceed logging revenues. Forest protection is thus not economically viable without carbon funding.

4.4.1 COMMUNITY BASELINE

Guidance for social impact assessment (Richards and Panfil, 2011) has been used for projecting future community social conditions in the absence of the project. This has included the identification of focal issues, i.e. current social conditions of priority for the project communities, and the current trends of these conditions in the absence of the project interventions. Focal issues were identified through the stakeholder engagement process carried out by the Community Consultation Team (see 2.7.2 of the PD). The focal issues identified are as follows:

1. Lack of Sustainable Food Security
2. Lack of Employment Opportunities
3. Inadequate Health Care

Problem flow diagrams have been used to conceptualize the factors that contribute to existing focal issues and potential points of intervention by the project to improve focal issue conditions. Issues and contributing factors have been considered with a focus toward those with connections to land-use change as well as forest conditions, and conditions and processes within the influence of the project. Also considered are the likely impacts of future community conditions on water, soil, and other ecosystem services. Please see Section 4.5.2 of the PD for more information.

4.4.2 BIODIVERSITY BASELINE

The lack of permanent farmland, low fertility soils and the threat of livestock disease outbreaks would lead to high hunting pressure on forest fauna for protein. Dozens of large vertebrate species, including ungulates, primates, birds and herpetofauna are hunted, and comprise a significant portion of the diet of most families living in the project zone. Hunting for bushmeat in African moist forests proceeds at unprecedented levels, with depletion of the resources at levels orders of magnitude higher than in other comparable ecosystems (Fa & Brown, 2009). Without the project and its efforts to develop alternative protein sources, bush meat hunting would likely have significant negative effects on biodiversity in the project area and surrounding region.

Although current deforestation rates are not high enough to isolate forest patches or even come close to eliminating primary forest habitat, our projected baseline deforestation rates will approach 1% within 15 years, a rate associated with rapid deforestation, habitat loss, and habitat isolation in Indonesia. Such consequences might greatly accelerate the negative impact of bush meat hunting already evident under low deforestation rates. Increased edge effects would compound these effects and lead to a cascade of extirpations in the project area (Brook, Sodhi, & Bradshaw, 2008).

4.5 Additionality (G2)

Within the Project Area, none of the proposed project activities violate any law. The land in the project area is owned by the government of Orientale Province of the DRC, and occurs within two forest concessions leased to Saffois S.P.R.L. who has transferred all carbon rights to the project proponent. Jadora has used the VCS Tool for the Demonstration and Assessment of Additionality in VCS AFOLU Project Activities (VT0001) version 3.0 to assess additionality of the project and select the baseline scenario.

4.5.1 IDENTIFICATION OF ALTERNATIVE LAND USE SCENARIOS TO THE PROPOSED VCS AFOLU PROJECT ACTIVITY (VT0001 SUB-STEP 1A)

4.5.1.1 Identify realistic and credible land use scenarios that would have occurred on the land within the project boundary in the absence of the AFOLU project activity (VT0001 sub-step 1a.(a))

i) Continuation of pre-project land use

The following land uses occurred simultaneously in the project area prior to project initiation:

1. **Selective Logging** – The project area is sited on two logging concessions leased to Saffois, S.P.R.L for a period of 25 years. The concession was used exclusively for selective logging, primarily of two species *Pericopsis elata* (Afromosia) and *Chlorophora sp.* (Iroko). The continuation of logging in the project area would require Saffois to build and maintain logging roads to access and remove timber throughout the concessions.
2. **Subsistence Agriculture** - Subsistence farmers, following traditional practices, periodically cut down forest in order to provide land for annual crops. These farmers continue to utilize the logging road network to access primary forest.

ii) Project activity on the land within the project boundary performed without being registered as the VCS AFOLU project

3. It is possible, though highly unlikely, that the DRC national or Orientale provincial government or non-governmental organizations could cease logging and encourage sustainable intensified agriculture in the project area without registering as a VCS AFOLU project.

iii) Activities similar to proposed project activity on at least part of the land within the project boundary resulting from legal requirements or observed similar activities

4. This scenario is not applicable because there are no legal requirements (see section 3.1 for legal requirements) for preventing deforestation through the proposed project activities and there are no similar activities occurring in the project's geographic area. This is the first REDD project in Orientale Province. Since the project start date, two other REDD initiatives have been registered with the DRC national REDD registry in the surrounding area. However, these projects began after the Isangi REDD+ Project and thus were not occurring ten years prior to the project start date (see <http://www.rdc-snsf.org/>).

4.5.1.2 Credibility of identified land use scenarios (VT0001 sub-step 1a.(b))

Scenarios 1 and 2 above were present in the project area prior to the with-project scenario and are thus considered credible. While palm oil plantations are a land use observed in the project area within 10 years of project start date, the scale of this use is quite small. Scenario 4 is not considerable credible because NGO's and the national and provincial governments do not have the financial resources to undertake the project.

4.5.1.3 List of credible alternative land use scenarios (VT0001 sub-step 1a.(c))

1. Continuation of pre-project selective logging (scenario 1 above)
2. Continuation of pre-project subsistence agriculture (scenario 2 above)

4.5.2 CONSISTENCY OF CREDIBLE LAND USES WITH ENFORCED MANDATORY LAWS AND REGULATIONS (VT0001 SUB-STEP 1B)

4.5.2.1 VT0001 Sub-step 1b.(a)

- i) Both scenarios 1 and 2 comply with all mandatory applicable legal and regulatory requirements. Scenario 1 is fully compliant because the project area occurs on a legally sanctioned forest concession issued to Safbois S.P.R.L. Scenario 2 is fully compliant because communities are given customary use rights to the forest by the 1973 Land Tenure law (see section 3.1)
- ii) Not applicable, scenarios comply with all mandatory applicable legislation and regulations.
- iii) Not applicable, scenarios are in compliance so no scenarios are removed from analysis.

4.5.2.2 VT0001 Sub-step 1b.(b)

The following are the outcomes of sub-step 1b.:

1. Continuation of pre-project selective logging (scenario 1 above)
2. Continuation of pre-project subsistence agriculture (scenario 2 above)

4.5.3 SELECTION OF THE BASELINE SCENARIO (VT0001 SUB-STEP 1C.)

Continuation of the pre-project land use as logging concession, followed by deforestation caused by subsistence agriculture:

For the decade prior to the implementation of the REDD project on the Isangi concessions, Safbois has conducted low-impact selective logging of mature trees. Larger-scale forms of logging, such as clear-cutting for raw lumber or pulp are not economically feasible due to the lack of suitable roads and the infeasibility of transporting large volumes of wood on the Congo River. Safbois has not attempted to slow the conversion of forest to swidden crop or plantation agriculture because the cost of forest protection would have exceeded logging revenues. Forest protection is not economically viable without carbon funding and is likely to continue in the project area.

Continued clearing of forest for agriculture and selective logging is evidently the most likely baseline scenario, as it has been carried out routinely throughout the Reference and Project areas. Forest clearing for agriculture provides the greatest economic benefit for individual farmers and their families, while selective logging, which accounts for less than 1% of forest degradation and deforestation, remains the most profitable option for concession-holder Safbois.

4.5.4 INVESTMENT ANALYSIS (VT0001 STEP 2)

The project proponent has chosen to use the investment analysis (VT0001 Step 2)

4.5.4.1 Determine appropriate analysis method (VT0001 Sub-step 2a.)

The project generates no financial or economic benefits other than VCS related income, so the simple cost analysis is applicable.

4.5.4.2 Simple Cost Analysis (VT0001 Sub-step 2b. Option I)

VCS related income is the only revenue the project proponent will receive from project activities. Project costs are listed in the implementation budget (Annex J) and VCS revenue and cashflow are estimated in Annex H.

4.5.5 BARRIER ANALYSIS (VT0001 STEP 3)

Not applicable. Only the investment analysis (VT0001 Step 2) has been applied.

4.5.6 COMMON PRACTICE ANALYSIS (VT0001 STEP 4)

As mentioned above, there are two other REDD initiatives in the surrounding area. One of these is a project implemented by Concerted Organization of Environmentalists and Nature Friends (OCEAN) with a project start date of July 2011 and the other is regional initiative led by the Ministry for Environment, Conservation of Nature and Tourism (MCENT) that began in 2013 (for information on other REDD initiatives in DRC, please see the DRC REDD Registry: <http://www.rdc-snsf.org/>). The Isangi REDD+ Project differs from these projects in the following ways:

- The Isangi REDD+ Project is privately financed (instead of funded by the African Development Bank) and will use revenue from the sale of VCUs to finance project activities. The project proponent is not aware of any government subsidies or other financial flows that would make a similar project feasible in the Isangi REDD+ project area.
- The Isangi REDD+ Project takes place on two privately held forest concessions while the OCEAN project does not. Because the other project area is not zoned as a forest concession, the feasible baseline scenarios are significantly different than those of the Isangi REDD+ Project.
- The regional initiative covers a large area surrounding Kisangani and focuses on addressing wood energy supply in the region. This priority is very different from the Isangi REDD+ Project due to the differences in the drivers of deforestation.
- The Isangi REDD+ project predates the other two projects.

Given the differences above, the proposed project activities cannot be considered common practice.

Summary of Additionality Test

- The Isangi REDD Project is not the only credible alternative land use consistent with enforced mandatory applicable laws.
- One of those alternative land uses, that of logging followed by subsistence agriculture, is by far the most likely baseline land use.
- The Isangi REDD Project passes the Investment Analysis Test as it is not a financially viable land use without the AFOLU VCS project revenues.
- The project activities are not common practice.

Therefore the Isangi REDD Project is additional under the rules of VT0001 Tool for the Demonstration of Additionality.

4.5.7 COMMUNITY AND BIODIVERSITY BENEFITS

The community and biodiversity benefits that are project objectives would not have occurred without the project. The project area is in a remote area, unserved by the national or regional government and with no recourse available to the community other than unsustainable use of the natural resources of the area.

There has been no significant government or donor-funded initiative in the project area since settlement, nor has there been a plan to do so, other than the one developed by the project proponent.

5 MONITORING DATA AND PARAMETERS

5.1 Description of the Monitoring Plan (CL3, CM3 & B3)

In the context of Jadora's Isangi VCS/CCBA REDD+ project in the DRC, the purpose of the monitoring plan is to measure and record data and indicators used to measure the climate, community, and biodiversity effect of the project compared to the baseline, without project, scenario. The data and information collected and origin of the data are enumerated in sections 5.2 and 5.3. Methodologies used to estimate and model values correspond to those proscribed by VM0006 v2.1, and are detailed in sections 4, 5, 6, and 7 of the Joint VCS-CCB Project Description. Periodicity of monitoring is enumerated for each parameter in sections 5.2 and 5.3. Roles and responsibilities for monitoring are in section 5.1.1. GHG information management systems are described in section 5.1.2.

The climate impact on the project and other areas was monitored using remote sensing, permanent plots measuring the carbon content of the forest, and a suite of monitoring strategies to track farming activity within the leakage buffer and the concession itself. While models of carbon savings will be created to predict the impacts, empirical evidence from the concession and similar control areas outside of the project will be used at verification to confirm the carbon savings generated.

Jadora monitored five dimensions of the community's perception of its well-being: human, social, physical, natural, and financial.

Biodiversity impacts of the project were measured using the key indicators of bushmeat availability in the market, hunting, and faunal abundance of key species in the forest. Change in intact forest was used as a proxy for floral diversity.

5.1.1 ORGANIZATION

Jadora's organizational structure is divided into the leadership, implementation and oversight, community consultation, biodiversity, and natural resources teams. The CEO is advised by the climate, community, and biodiversity directors. The community, biodiversity, and implementation managers and the forestry and agriculture team leads report to the project manager. The project manager reports to the CEO.

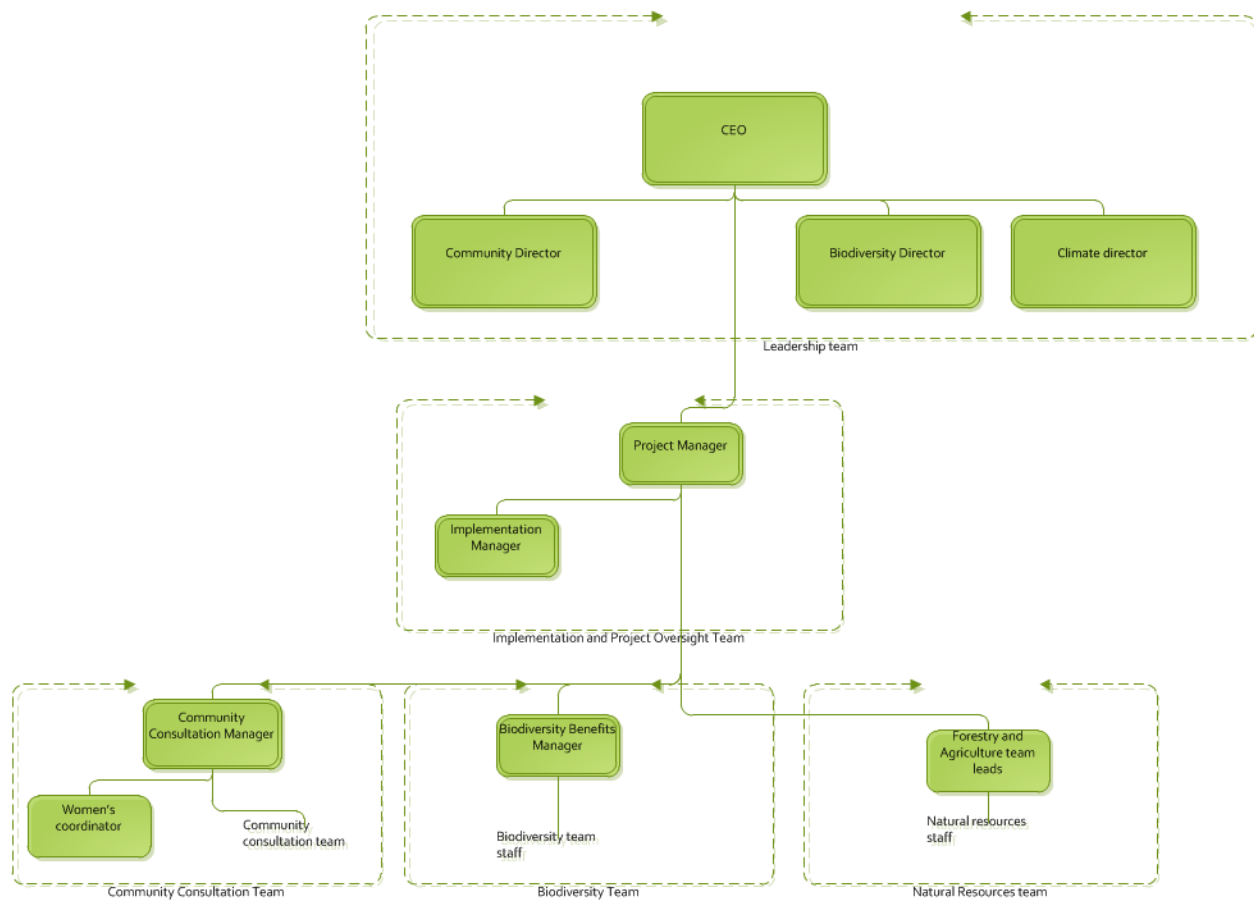


Figure 1. Organizational structure. The directors of each sector (community, biodiversity, and climate) are responsible for the SOPs, QA/QC and adaptive management of their sector, without directly supervision of the sector managers and team leads.

Role	Responsibility	Competency
CEO	Direction of the Project manager	
Project manager	Oversight of subordinate teams	At least a bachelor's degree or equivalent Experience managing teams Experience in the same country Common language with subordinate managers
Community Consultation Manager	Collection of data for parameters related to community monitoring Oversight of the women's coordinator	Literate/numerate Experience managing teams
Biodiversity Benefits Manager	Collection of data for parameters related to biodiversity monitoring	Literate/numerate Experience in a related field Experience managing teams
Forestry and Agriculture leads	Collection of data for parameters related to climate monitoring	Literate/numerate Experience in a related field Experience managing teams

Table 5. Roles, responsibilities and competencies for the team leaders and managers implementing monitoring.

5.1.2 DATA

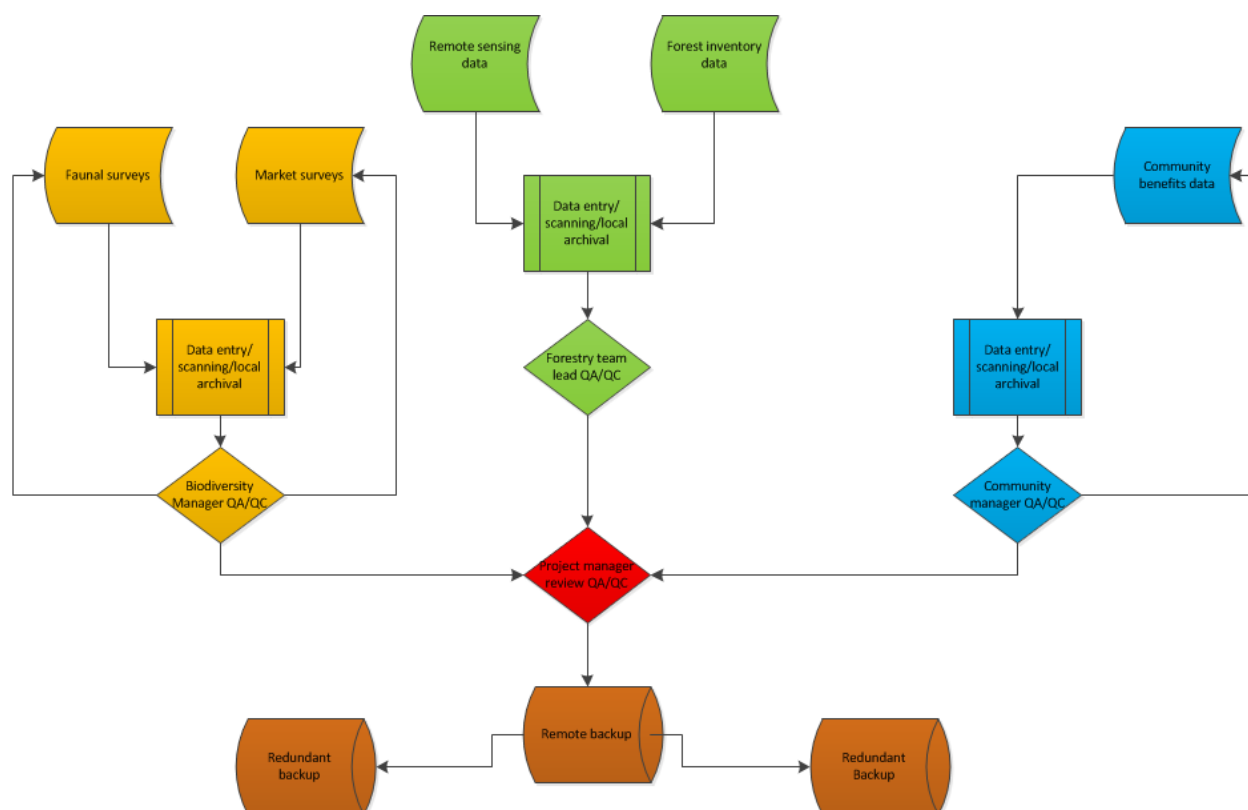


Figure 2: Data QA/QC, management and archival system.

5.1.2.1 Methods for generating data

See sections 5.2 and 5.3 for a description of methods for generating monitored data and parameters.

5.1.2.1.1 Methods for recording data

See sections 5.2 and 5.3 for a description of equipment to be used methods for recording monitored data and parameters.

5.1.2.1.2 Methods for storing data

Data monitored in sections 5.2 and 5.3 are stored at multiple locations within the United States, in hard and soft copy. The field notebooks are stored at the Jadora office in Seattle, Washington USA, and photocopies are stored at three separate locations. Jadora is currently soliciting bids for cloud (i.e. multiple networked servers in distributed networks) storage and multiple redundant backup of its inventory of biomass, biodiversity and community information collected in the field.

5.1.2.1.3 Methods for aggregating data

See sections 5.2 and 5.3 for descriptions of methods used for aggregating monitored data and parameters.

5.1.2.1.4 Methods for collating data

See sections 5.2 and 5.3 for descriptions of methods used for collating monitored data and parameters.

5.1.2.1.5 Methods for reporting data

See section 5.2 for data and parameters set at validation. Data collected every monitoring period is included in the monitoring report for that period.

5.1.2.2 Management System

Each parameter measured will have an associated measurement SOP for each monitoring period, created by the Director for each sector. If an SOP is adapted from one monitoring period to the next, the documents shall be versioned and archived and the monitoring report reference the version and title of the SOP used for that monitoring period. All updates to SOPs shall be approved by the sector director in the leadership team. The project manager is responsible to ensure that all SOPs are adhered to by the team managers.

5.1.2.3 Internal audits

The team managers for community, biodiversity and climate are responsible for an internal audit of approximately 10% of the measurements for data and parameters monitored, using a risk-based assessment for selection. If there is a deviation of more than 5% in the measurement and re-measurement of the parameter, the deviation is to be investigated and resolved. When updating plot sheets, data should be crossed out so the original number is legible. When updating data stored electronically, the file should be versioned.

5.1.2.4 Quality Assurance and Control

The directors of the Climate, Community, and Biodiversity teams are responsible for creation and adaption of QA/QC protocols as required, and for any technical direction of the project manager or teams. The project manager is responsible to make sure the QA/QC protocols are carried out by the sector managers.

The Jadora field teams minimize error by working as teams to check the identification of tree species and diameter measurements, and community and biodiversity data collected. These teams verify each other's readings. Managers for each team verify a subset of the data recorded using risk-based assessment. The project manager also sample a subset of data recorded on a periodic basis, using a risk-based assessment.

To reduce and eliminate transcriptional error spreadsheets are proofed by re-reading the field notebooks and comparing it to the data that has been entered.

All data was reported to project proponents and local stakeholders and any discrepancies or disagreements were rectified by explanation or joint visitation of activities in question. All publically available satellite data used in monitoring, validation, verification and certification is archived and available to auditors.

5.1.2.4.1 Field Measurements

All persons involved in the field measurement work were fully trained to the current measurement SOP before measurements. The dates of training sessions and the persons trained are recorded and stored. The team member names and team leader taking the measurements are recorded for each plot measurement (see Annex X, Annex U) .

The initial training of the field teams was conducted at the beginning of March 2010. A single field team was trained during a daylong session on how to use the equipment and record data. After training the team did a series of 10 experimental plots to verify the accuracy of their data collection. After the initial ten plots the team started the actual data collection with Ethan Freid Ph.D. overseeing the field activities while data was collected. At the end of March the forest team collected data for a three-week period. During that three-week period additional team members were added and did on-the-job training. At the

end of March the initial forest team and new team members were divided into two separate teams with Jacque Likakambula and Emmanuel Alongoli as the team leaders.

The team responsible for the initial field training consisted of the following individuals:

- Ethan Freid, Ph.D, Climate Director
- Joe Wasilewski, Biodiversity Director
- Duncan Earle, Ph.D, Community Director
- Noah Herland, Project Manager
- Philemon Epaka Liombo, Community Consultation Manager

The leadership team continually performed training to update the forest teams' field techniques.

5.1.2.4.2 Calibration

All measurement and monitoring equipment was calibrated per the relevant SOP (Annex AL) and the manufacture's manual for that equipment.

5.1.2.4.3 Data Handling

Data handling is covered by the Data handling and management SOP. Data entered on data sheets was archived using redundant electronic copies and in hard copy. All data entry was reviewed using a risk-based sampling approach by another party than the person originally doing the data entry. The SOP for each set of measurements specified the spreadsheet template used for data collation with a description of the fields for each template.

Data checks were performed per the relevant SOP.

Values recorded or estimated were compared with those in other comparable areas or in the literature to verify reasonableness.

5.1.2.5 Initial Monitoring Plan

The initial monitoring plan encompasses the requirements and methodologies of ISO 14065-2, the CCBA Standard v2.0, the VCS Standard, AFOLU requirements, and VM0006 v2.1 for a REDD+ project.

Procedures for measurement and calculation of data and parameters monitored are included in sections 5.2 and 5.3.

5.1.2.6 Community

All communities in the project zone (Annex AK) were monitored on a weekly, informal basis, overseen by the community consultation manager. The impacts of the program were monitored through informal and formal consultative conversations with the people of the villages by way of surveys in households, at markets and paths to markets, and in health clinics (Annex AN, Annex AO, Annex AP). This process allowed the program to map out economic shifts away from forest products and toward sustainable alternatives.

Additionally, monitoring was conducted by a yearly review of Jadora programs as they reflect a Sustainable Livelihoods Framework (SLF). Jadora monitored five dimensions of the community's perception of its well-being: human, social, physical, natural, and financial. As the project proceeds, Jadora used the input gathered by the CCT to continually adapt and improve the monitoring process and ensure changes to the process have positive impacts on the populations within the project area.

The procedures for community monitoring are detailed in the community monitoring SOP and the community subsection of the data and parameters monitored in sections 5.2 and 5.3 including

- Types of measurements taken

- Frequency of monitoring
- Sampling methodology
- Questionnaire
- Trainings
- QA/QC
- Data entry
- Analysis

Results of the community monitoring are publically available, published on the internet and disseminated to the communities in the project zone.

5.1.2.7 Biodiversity

Biodiversity impacts are monitored both within the project area and zone. The design of the data and parameters monitored is such that the project will be able to quantify its impact on biodiversity on a regional and local level. The focus of biodiversity monitoring is on CITES-listed fauna, judged to be at high risk and regionally or globally endangered. These are considered to be indicator species (i.e. they provide an indication of the effects of the project's efforts at protecting biodiversity in the project zone).

Three primary foci for monitoring species selected were

- Forest faunal monitoring, meaning counts of animals and their signed in the forest on a per hectare basis
- Monitoring of hunting apparatus, monitored on transects and quadrats in the forest
- Monitoring of the volume and types bush meat available in local markets.

Periodicity of surveys was bimonthly. The procedures for monitoring each of the three foci, including types of measurements, training, sampling methods, QA/QC and data analysis are detailed in the biodiversity survey SOP (Annex AH). The data and parameters monitored are in section 5.3.

Floral diversity was assessed using the proxy of intact canopy cover, monitored as part of climate monitoring.

Results of the surveys were used in an adaptive framework to evaluate the effectiveness of the project activities in providing a net biodiversity benefit, and the metrics and project activities modified as needed by the sector director.

Results of the biodiversity monitoring are publically available, published on the internet and disseminated to the communities in the project zone. Records of hunting and related activity may need to be edited before dissemination to preserve anonymity and maintain community relations.

5.1.2.8 Climate

Jadora quantified the net climate benefit of the Isangi REDD+ Project through monitoring according to the methodology prescribed by VM0006 v2.1, including monitoring the required areas using remote sensing techniques and permanent forest plots installed and maintained in the project area.

Selected pools included and excluded in the project scenario and a justification for that decision are as follows:

Included/ excluded	Included/ excluded	Justification
Above-ground tree biomass	Yes	Major Pool
Above-ground non-tree biomass	No	Baseline land use is not perennial tree crop, optional

Below-ground biomass	Yes	Major pool
Litter	No	Excluded per VM0006
Dead Wood	Yes	Major pool, standing dead wood and lying dead wood monitored
Soil	Yes	Major carbon pool affected by project activities, included but conservatively excluded for the first monitoring period as per monitoring deviation in 4.2.
Wood Products	Yes	Major Pool affected by project activities

Table 6. Selected pools monitored.

5.1.2.8.1 Stocks

5.1.2.8.1.1 Land-use land-cover classification and stratification of the project area.

The project, reference, and leakage area are delineated and monitored for LULC and LULC change using remote sensing techniques approved per the requirements of VM006 v2.1 as in Sections 5.3, 5.4, and 5.5 of the Joint VCS-CCB Project Description and in the remote sensing SOP (see Annex R). Class transitions in all the areas are validated using ground-truthing data. Natural disturbances are monitored and areas severely affected re-classified as necessary. See Section 5.1 of this report for a more detailed description of image pre-processing, classification and accuracy assessment procedures.

5.1.2.8.1.2 Emissions factors

Emissions factors based on plot data are used to calculate the net carbon effect of a transition between LULC. Emission factors for above-ground biomass are calculated per VM0006 v2.1. Soil organic matter has been conservatively estimated to be 0. For a greater explanation concerning this deviation from the project description, please see Section 4.2.

LULC Transition	AGL (tCO ₂ e/ha)	AGD (tCO ₂ e/ha)	BG (tCO ₂ e/ha)	SOM* (tCO ₂ e/ha)	CE_transitio n	U_transition
Forest to Forest	0	0	0	0	2.7176E+14	0
Forest to Crop	671.937493	-0.2710686	24.86169	0	0.048425245	1
Forest to Settlement	637.724523	0.5637995	23.59581	0	0.060431633	1
Forest to Water	720.715233	0.716629833	26.66646	0	0.025012367	1
Crop to Forest	-671.93749	0.2710686	-24.86169	0	0.048425245	1
Crop to Crop	0	0	0.00000	0	3.19901E+16	0
Crop to Settlement	-34.21297	0.8348681	-1.26588	0	1.549183411	0
Crop to Water	48.77774	0.987698433	1.80478	0	0.480212357	0.519787643
Settlement to Forest	-637.72452	-0.5637995	-23.59581	0	0.060431633	1
Settlement to Crop	34.21297	-0.8348681	1.26588	0	1.549183411	0
Settlement to Settlement	0	0	0	0	5.2622E+15	0
Settlement to Water	82.99071	0.152830333	3.07066	0	0.407518396	0.592481604
Water to Forest	-720.71523	-0.71662983	-26.66646	0	0.025012367	1
Water to Crop	-48.77774	-0.98769843	-1.80478	0	0.480212357	0.519787643
Water to Settlement	-82.99071	-0.15283033	-3.07066	0	0.407518396	0.592481604

Water to Water	0	0	0	0	0	1
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Table 7: Calculated Emission Factors and uncertainties for each LULC transition2 (*SM is conservatively excluded for this monitoring period per Section 4.2).

5.1.2.8.1.3 Field Inventory

5.1.2.8.1.3.1 Sampling plot size and layout rationale

Five hundred and forty eight (541) permanent plots are located in the forest LULC class (Annex Y) of the Isangi Territory, Democratic Republic of Congo. The sample size for the plot design was based on industry standards for sampling tropical forests. The rationale for the number of plots was to oversample throughout the forest to provide the most conservative estimates of the carbon stocks throughout the forest and within and between the forest strata identified.

Plots were allocated on a grid with a random start point. The location of each of the allocated points were used as the plot center and located by field teams using GPS units with pre-programmed coordinates.

5.1.2.8.1.3.2 Summary of the standard operations procedure for field sampling

Procedures for measurement of the forest carbon plots are given in the climate and forest measurement SOP (Annex AL). They are summarized here:

Teams of Congolese foresters are trained to conduct the monitoring with oversight from the project management team as necessary to achieve the precision required by best practices (e.g. MacDicken 1997). Each team consists of fifteen men. The teams are given predetermined permanent plots to measure before each excursion.

- **Design of plots & regime for sampling:** Upon arriving at the predetermined plot location, a Haglof distance transmitter is erected at the center point and a series of nested fixed-radius circular plots is established. Within the circular plots, tree diameter, height, species ID and lying dead wood are measured using standard forest measurement devices (DBH tapes, Clinometers). Each plot is permanently marked using a metal spike and flagging around trees within a few meters of the center point.
- **Diameter at Breast Height (DBH):** The biomass of trees correlates most strongly with DBH. A series of nested circular plots are sampled. The plots are 4, 14, and 20 meters in radius. Within the 4 meter radius plots, all trees 5.0 cm or greater in DBH are measured. Within the 14 meter radius plots, all trees 20.0 cm or greater in DBH are measured. Within the 20 meter radius plots, all trees 50.0 cm or greater in DBH are measured. All measured trees are permanently marked with a numbered aluminum tag at DBH point on the south side of the tree. Jadora foresters identify trees to species when possible.
- **Height of Trees:** Height is measured using a Suunto % secant PM5/SPC clinometer (precision = 1/5%) for all trees 20.0 cm or greater in DBH. The canopy height and bowl to first major branch point is measured.

5.1.2.8.1.4 Accounting and estimation of carbon in selected pools

Carbon on a per-tree basis for the above-ground live tree pool is estimated using the allometric equations published by (Djomo, Ibrahima, Saborowski, & Gravenhorst, 2010). Below-ground live tree biomass is estimated using the root/shoot ratios published in the IPCC's guideline for GHG inventories (Aalde et al., 2006). Carbon stocks are then put on a unit area basis using the relevant plot radius and extrapolated to the level of the stratum using that stratum's area.

5.1.2.8.2 Emissions

Emissions inside the project area and inside the leakage area were monitored and documented using the procedures prescribed by VM0006, i.e. using remote sensing of LULC tied to emissions factors for the selected pools in the project boundary.

Non-CO₂ emissions from burning are conservatively excluded from the accounting and monitoring.

5.1.2.8.3 Leakage

Leakage monitoring occurred in the leakage area per the procedures prescribed by VM0006 v2.1.

5.1.2.9 Reporting

A GHG report was prepared this monitoring period, intended to summarize evidence of the net project benefit for the selected VCS/CBBA auditor.

5.1.2.9.1 Frequency

Jadora tracked both the rate of deforestation and changes in LULC every monitoring period. Woody live and dead biomass in intact forest will be measured every three years. Rates of deforestation in the project area and leakage belt, methane emissions from livestock, and assisted natural regeneration were measured annually. The project baseline deforestation rate will be reassessed and submitted every ten years for third party verification. Jadora expects a rapid increase in deforestation rates with the post-conflict expansion of human activity in the RDC and rapid human population growth in the reference region. Jadora will conduct an annual internal review of deforestation rates to produce data-driven models of deforestation in relation to project activities. The models will allow Jadora to better understand which project activities and locations have been effective at reducing reforestation rates. Additionally, these reviews will help Jadora better understand which areas need greater focus and resources to further reduce deforestation.

5.1.2.9.2 Dissemination

Monitoring reports are publically available on the VCS and CCBA websites. Results of monitoring were communicated in an appropriate language and format to the communities and stakeholders in the project zone (Annex AQ, Annex AR).

5.2 Data and Parameters Available at Validation (CL3)

Data/parameter [EA1]:	CF
Data unit:	[Mg C (Mg DM) ⁻¹]
Description:	Carbon fraction of dry matter in wood
Sources of data:	Default value of 0.5 (IPCC GPG-LULUCF 2003)
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied:	According to the IPCC, the default value of 0.5 Mg C (Mg DM) ⁻¹ is applicable for all three tiers when remaining forest land, forest land or biomass carbon is a key or non-key category.
Any comment:	

Data/parameter [EA2]:	E
Data unit:	[-]
Description:	Average combustion efficiency of the aboveground tree biomass
Sources of data (*):	Project-specific measurements Regionally valid estimates Estimates from Table 3.A.14 of IPCC GPG LULUCF If no appropriate combustion efficiency can be used, use the IPCC default of 0.5
Value applied:	0.3
Justification of choice of data or description of measurement methods and procedures applied:	IPCC 2006 gives this value for tropical moist primary forest types.
Any comment:	The value of 0.40 is provided as an average combustion efficient for aboveground tree biomass in tropical moist secondary forests.

Data/parameter [EA3]:	P
Data unit:	[-]
Description:	Average proportion of mass burned from the aboveground tree biomass.
Sources of data:	GPG-LULUCF Table 3A.1.13
Value applied:	83.9
Justification of choice of data or description of measurement methods and procedures applied:	83.9 is the mean provided by the IPCC for the average proportion of mass burned from the aboveground tree biomass in primary tropical forests which is the forest type the project for the most part, aligns with.
Any comment:	For secondary tropical forests, 8.1 is provided as an average value for young secondary tropical forests, 41.1 for intermediate secondary tropical forests, and 46.4 for advanced secondary tropical forests. These are provided here because some of growth within the project area is secondary but as a majority, it is still primary forest.

Data/parameter [EA4]:	GWP _{CH4}
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Data unit:	[-]
Description:	Global Warming Potential for CH ₄
Sources of data:	IPCC default value of 25
Value applied:	25
Justification of choice of data or description of measurement methods and procedures applied:	IPCC 2007 Fourth Assessment Report: Climate Change 2007 states that over a 100 year time horizon, the GWP for CH ₄ is 25.
Any comment:	

Data/parameter [EA5]:	ER_{CH_4}
Data unit:	Proportion
Description:	Emission ratios for CH ₄
Sources of data:	Table 3A.1.15 in IPCC GPG-LULUCF 2003
Value applied:	0.012
Justification of choice of data or description of measurement methods and procedures applied:	IPCC default value of 0.012 provided.
Any comment:	(0.009-0.015) Delmas, 1993 asterisked in IPCC table

Data/parameter [EA6]:	sc_1
Data unit:	[-]
Description:	First shape factor for the forest scarcity equation; steepness of the decrease in deforestation rate (greater is steeper).
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Value applied:	-6.6
Justification of choice of data or description of measurement methods and procedures applied:	Use procedure from VM0006 v2.0
Any comment:	

Data/parameter [EA7]:	sc_2
Data unit:	[-]
Description:	Second shape factor for the forest scarcity equation; relative deforested area at which the deforestation rate will be 50% of the initial deforestation rate.
Sources of data:	Statistical fitting procedure. Using remotely sensed forest cover data in heavily deforested areas close to the project area such as neighboring provinces, states or countries
Value applied:	0.83
Justification of choice of data or description of measurement	Use procedure from VM0006 v2.0

methods and procedures applied:	
Any comment:	

Data/parameter [EA8]:	$wwf(ty)$
Data unit:	[-]
Description:	Fraction of carbon in harvested wood products that are emitted immediately because of mill inefficiency for wood class ty . This can be estimated by multiplying the applicable fraction to the total amount of carbon in different harvested wood product category.
Sources of data:	The default applicable fraction is 24% and 19% respectively for developing and developed countries (Winjum et al. 1998).
Value applied:	24%
Justification of choice of data or description of measurement methods and procedures applied:	Winjum et al. 1998 states that the default fraction is 24% for developing countries.
Any comment:	Any new updates from locally generated results can be used instead of the default values.

Data/parameter [EA9]:	$slp(ty)$
Data unit:	[-]
Description:	Proportion of short lived products
Sources of data:	Default values are 0.2, 0.1, 0.4 and 0.3 respectively for wood class ty , i.e., sawnwood, wood-based panel, paper and paper boards and other industrial round woods as described in Winjum et al. (1998).
Value applied:	0.2, 0.1, 0.4, 0.3
Justification of choice of data or description of measurement methods and procedures applied:	Winjum et al. provides the above values for sawnwood, wood-based panel, paper/paper boards and industrial roundwood
Any comment:	Any new updates from locally generated results can be used instead of the default values. The methodology assumes that all other classes of wood products are emitted within 5 years.

Data/parameter [EA10]:	$fo(ty)$
Data unit:	[-]
Description:	Fraction of carbon that will be emitted to the atmosphere between 5 and 100 years of harvest for wood class ty .
Sources of data:	See (Winjum et al. 1998).
Value applied:	0.84, 0.97, 0.99, 0.99
Justification of choice of data or description of measurement methods and procedures applied:	Winjum et al. provides these values for the fraction of carbon that will be emitted into the atmosphere between 5 and 100 years after harvest for tropical wood classes.

applied:	
Any comment:	Any new updates from locally generated results can be used instead of the default values.

Data/parameter [EA11]:	$\rho_{wood,j}$
Data unit:	[Mg DM m ⁻³]
Description:	Average basic wood density of species or species group <i>j</i>
Sources of data:	GPG-LULUCF Table 3A.1.9. or published data/literature.
Value applied:	See section 5.3.4, emissions factors, for the vector of densities used
Justification of choice of data or description of measurement methods and procedures applied:	IPCC table 3A. 1.9-2 provides average basic wood densities for multiple species in tropical Africa.
Any comment:	

Data/parameter [EA12]:	BEF_2
Data unit:	[-]
Description:	Biomass expansion factor for converting volumes of extracted round wood to total aboveground biomass (including bark).
Sources of data:	IPCC GPG LULUCF Table 3A.1.10 or published data from scientific peer reviewed literature
Value applied:	Broadleaf = 3.4 (2.0 – 9.0)
Justification of choice of data or description of measurement methods and procedures applied:	BEF2 value for tropical broadleaf trees values according to IPCC LULUCF table 3A.1.10.
Any comment:	

Data/parameter [EA13]:	$EF_{rice,max}$
Data unit:	[kg CH ₄ ha ⁻¹ day ⁻¹]
Description:	Maximal emission factor for methane
Sources of data:	By default, an emission rate of 36 kg CH ₄ ha ⁻¹ day ⁻¹ must be used, which is 25% greater than the maximal value found in a review study comparing 23 studies of CH ₄ fluxes in rice fields (Le Mer and Roger, 2001). Project proponents may use a smaller emission rate if it can be demonstrated from empirical data or other supporting information such as published data that the rate remains conservative for the project conditions.
Value applied:	36
Justification of choice of data	Default provided by Le Mer and Roger, 2001.

or description of measurement methods and procedures applied:	
Any comment:	Only to be included if rice production is increased as a leakage prevention measure.

Data/parameter [EA14]:	$NCV_{biomass}$
Data unit:	[TJ (Mg DM) ⁻¹]
Description:	Net calorific value of non-renewable biomass that is substituted.
Sources of data:	0.015 TJ (Mg DM) ⁻¹ IPCC default value.
Value applied:	0.015
Justification of choice of data or description of measurement methods and procedures applied:	IPCC default provided
Any comment:	

5.3 Data and Parameters Monitored (CL3, CM3 & B3)

5.3.1 CLIMATE

*: Lower-ranked options may only be used if higher-ranked options are not available.

5.3.1.1 Sizes, areas, and transitions

Data/parameter [MN1]:	$size_{projectArea}, size_{leakageArea}, size_{referenceRegion}, size_{referenceForest}$
Data unit:	[ha]
Description:	Size of project area, leakage area, reference region, and forest area in the reference region
Sources of data:	Project design
Description of measurement methods and procedures to be applied:	Coverage and demarcations will be monitored and created through the use of satellite imagery and on-the-ground monitoring teams making observations and taking measurements in terms of forest cover, class cover, total area and tree classifications.
Frequency of monitoring/recording:	$size_{projectArea}$ and $size_{leakageArea}$ may be adjusted during crediting period per the rules for grouped projects and updated at verification, but only for the additional instances that were added after the project start date..
Value applied:	Project area – 187,571 ha Leakage area – 43,082 ha Reference region – 1,814,578 ha Reference forest - 1,814,578 ha
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	TIFF files were converted to shapefiles. Area was calculated for each shapefile and compared to calculations based on TIFF file.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel ⁻¹ for area in hectares.
Any comment:	No change in Project Area

Data/parameter [MN2]:	$\Delta area_{projectAreaEAH, projectScenario}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the project area, excluding ANR and harvest areas, under the project scenario during year t . [ha yr ⁻¹].
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Follow the procedures described in MR section 6.2
Frequency of monitoring/recording:	At least once before verification
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made

	available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel-1 for area in hectares.
Any comment:	

Data/parameter [MN3]:	$\Delta area_{projectAreaEAH,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the project area, excluding the ANR area, and harvest areas, under the baseline scenario for year t .
Sources of data:	Land-use change modeling
Description of measurement methods and procedures to be applied:	Follow the procedures described in MR section 6.1
Frequency of monitoring/recording:	At least once before every baseline. For added instances, may be recalculated at verification.
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel-1 for area in hectares.
Any comment:	

Data/parameter [MN4]:	$\Delta area_{projectAreaWithANR,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the leakage area under the project scenario for year t .
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	

Any comment:	Not applicable. ANR not included
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Data/parameter [MN5]:	$\Delta area_{leakageArea,projectScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>i</i> within the leakage area under the project scenario for year <i>t</i>
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Follow the procedures described in MR section 6.2
Frequency of monitoring/recording:	At least once before verification
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel ⁻¹ for area in hectares.
Any comment:	

Data/parameter [MN6]:	$\Delta area_{leakageArea,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition <i>i</i> within the leakage area under the baseline scenario during year <i>t</i>
Sources of data:	Land-use change modeling
Description of measurement methods and procedures to be applied:	Follow the procedures described in MR section 6.1
Frequency of monitoring/recording:	Once every baseline update. May also be updated at the time of instance inclusion that requires new leakage area.
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made

	available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel ⁻¹ for area in hectares.
Any comment:	

Data/parameter [MN7]:	$\Delta area_{historical}(CS_1 \rightarrow CS_2, t_1 \rightarrow t_2)$
Data unit:	[ha yr ⁻¹]
Description:	Area of transition from LULC class or forest stratum 1 to 2 from time 1 to 2 during the historical reference period
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the remote sensing-based classification and stratification procedures detailed in MR section 6.2.2
Frequency of monitoring/recording:	At least once before every baseline update
Value applied:	See MR section 5.3.1
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel ⁻¹ for area in hectares.
Any comment:	

Data/parameter [MN8]:	$RFRGrate(CS_1 \rightarrow CS_2)$
Data unit:	[yr ⁻¹]
Description:	Relative annual forest cover increase and regeneration factor for the transition from class or stratum 1 to 2.
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the remote sensing-based classification and stratification procedures detailed in MR section 6.2.2. Multiply with 100 to obtain a forest cover increase and regeneration rate in percentage per year.
Frequency of monitoring/recording:	At least once before every baseline update
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed

	and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Calculated using EQ39 of VM0006 v2.1
Any comment:	It can be used for producing baseline transition matrix for new instances to be added into the project area.

Data/parameter [MN9]:	$area_{historical}(CS_1, t_1)$
Data unit:	[ha]
Description:	Total area of LULC class or forest stratum 1 at time 1
Sources of data:	Remote sensing analysis
Description of measurement methods and procedures to be applied:	Calculate based on the remote sensing-based classification and stratification procedures detailed in MR section 6.2.2.
Frequency of monitoring/recording:	At least once before every baseline update
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	GIS software, Landsat imagery, 30 meter tape, GPS, compass, clinometer, notebooks, water, writing utensils
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Multiplication of number of pixels (30m by 30m) in each region by 0.09 hectares pixel ⁻¹ for area in hectares.
Any comment:	

Data/parameter [MN10]:	$area_{biomassLoss}(i)$
Data unit:	[ha yr ⁻¹]
Description:	Total annual area of LULC class i that was cleared for creating firebreaks
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	

applied:	
Calculation method:	
Any comment:	Not included as a Project Activity; there were no firebreaks created in project area.

Data/parameter [MN11]:	$area_{fireBiomassLoss}(i)$
Data unit:	[ha yr ⁻¹]
Description:	Annual area of forest stratum i that was cleared by using prescribed burning
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Not included as a Project Activity; there was no prescribed burning in the project area.

Data/parameter [MN12]:	$area_{fireBiomassLoss,ANR}(t, i)$
Data unit:	[ha]
Description:	Area of biomass removed by prescribed burning within ANR stratum i during year t
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Not included as a Project Activity; there was no prescribed burning in the project area.

Data/parameter [MN13]:	$area_{projectAreaWithANR,projectScenario}(t, i)$
Data unit:	[ha]
Description:	Amount of land on which ANR activities are planned under the project scenario for year t and in stratum i
Sources of data:	

Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	ANR activity not included in project area.
Any comment:	

Data/parameter [MN14]:	$area_{harvest}(t, i)$
Data unit:	[ha]
Description:	Area of forest in harvest stratum i that is harvested at time t .
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN15]:	$area_{projectAreaWithHarvest, projectScenario}(t, i)$
Data unit:	[ha yr ⁻¹]
Description:	Size of strata i within the project area with harvest activities during year t under the project scenario.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN16]:	$\Delta area_{projectAreaWithHarvest,baselineScenario}(t,i)$
Data unit:	[ha yr ⁻¹]
Description:	Hectares undergoing transition i within the harvest areas under under the baseline scenario during year t .
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity within project area.

Data/parameter [MN17]:	$BetaReg_{DF}(t)$ and $BetaReg_{DG}(t)$
Data unit:	[ha yr ⁻¹]
Description:	Beta regression model describing the relationship between time and deforestation/degradation rate in the reference region during the historical reference period.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Beta regression model not used; used average regression model.

5.3.1.2 Locations, Descriptions, Qualitative and Social Data

Data/parameter [MN18]:	Area under agricultural intensification
Data unit:	[ha]
Description:	Size of the area of agricultural intensification separated for each agricultural intensification measure
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	0
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No agricultural activities in project area.

Data/parameter [MN19]:	Yields under agricultural intensification
Data unit:	[Mg ha ⁻¹]
Description:	Harvested yield for agricultural intensification practices
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	0
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No agricultural activities in project area.
Data/parameter [MN20]:	NTPFP harvest rate
Data unit:	[m ³ yr ⁻¹] or [kg yr ⁻¹]
Description:	Annual volumes of non-timber forest products extracted
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	

QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activities in project area.

Data/parameter [MN21]:	Local NTFP price
Data unit:	Local currency
Description:	Price of non-timber forest products on local markets
Sources of data:	
Description of measurement methods and procedures to be applied:	NA
Frequency of monitoring/recording:	
Value applied:	
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activities in project area.

5.3.1.3 Dates on Drivers and Actions

Data/parameter [MN22]:	$CFW_{baseline}$
Data unit:	[m ³ yr ⁻¹]
Description:	Annual volume of fuel wood gathering for commercial sale and charcoal production in the baseline scenario
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area.

Data/parameter [MN23]:	$DFW_{baseline}$
Data unit:	[m ³ yr ⁻¹]
Description:	Annual volume of fuel wood gathered for domestic and local energy in the baseline scenario
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area.

Data/parameter [MN24]:	$DFW_{project}$
Data unit:	[m ³ yr ⁻¹]
Description:	Biomass (dry matter) of fuel wood collected by project participants under the project scenario.
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	

Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area.

Data/parameter [MN25]:	$DFW_{allowed}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Biomass (dry matter) of allowed fuel wood collection in the project area under the project scenario. This amount is typically fixed in a management plan. $[m^3 yr^{-1}]$
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area.

Data/parameter [MN26]:	$VG_{baseline}$
Data unit:	$[m^3 yr^{-1}]$
Description:	Biomass (dry matter) of understory vegetation extraction by project participants under the baseline scenario. $[Mg DM yr^{-1}]$
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Understory biomass not an included pool in project.

Data/parameter [MN27]:	$VG_{project}$
Data unit:	$[Mg DM yr^{-1}]$
Description:	Biomass (dry matter) of understory vegetation extraction by

	project participants under the project scenario.
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	At least once before verification
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Understory biomass not an included pool in project.

Data/parameter [MN28]:	$VG_{allowed}$
Data unit:	[Mg DM yr ⁻¹]
Description:	Biomass (dry matter) of allowed as understory vegetation extraction under the project scenario. This amount is typically fixed in a management plan
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Understory biomass not an included pool in project.

Data/parameter [MN29]:	$CT_{baseline}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of harvested timber round-wood for commercial on-sale under the baseline scenario during harvest h by species j and wood product class ty during year t
Sources of data (*):	Participatory rural appraisals conducted by project proponents. Recent (<10 yr) literature in the reference region Recent (<10 yr) literature in an area similar to the reference region Recent (<10 yr) non peer-reviewed reports by local organizations
Description of measurement methods and procedures to be applied:	Calculate based on the baseline emissions determination analysis outlined in the Project Design Document, Section 5.3.

Frequency monitoring/recording:	of	At least once before every baseline update
Value applied:		See spreadsheet submitted to validator
Monitoring equipment:		None
QA/QC procedures to be applied:		Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:		Calculated using EQ4 of VM0006 v2.1
Any comment:		

Data/parameter [MN30]:		$CT_{allowed}$
Data unit:		[m ³ yr ⁻¹]
Description:		Annually allowed volume of harvested timber round-wood for commercial on-sale under the project scenario
Sources of data (*):		
Description of measurement methods and procedures to be applied:		
Frequency monitoring/recording:	of	
Value applied:		NA
Monitoring equipment:		
QA/QC procedures to be applied:		
Calculation method:		
Any comment:		No harvesting activity in project area.

Data/parameter [MN31]:		$CT_{project}(h, j, ty, t)$
Data unit:		[m ³ yr ⁻¹]
Description:		Annually extracted volume of harvested timber round-wood for commercial on-sale inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):		
Description of measurement methods and procedures to be applied:		
Frequency monitoring/recording:	of	
Value applied:		NA
Monitoring equipment:		

QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN32]:	$DT_{baseline}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of timber for domestic and local use, round wood under the baseline scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	Participatory rural appraisals conducted by project proponents Recent (<10 yr) literature in the reference region Recent (<10 yr) literature in an area similar to the reference region Recent (<10 yr) non peer-reviewed reports by local organizations
Description of measurement methods and procedures to be applied:	Calculate based on the baseline emissions determination analysis outlined in the Project Design Document, Section 5.3.
Frequency of monitoring/recording:	At least once before every baseline update
Value applied:	See spreadsheet submitted to validator
Monitoring equipment:	None
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Calculated using EQ5 of VM0006 v2.1
Any comment:	

Data/parameter [MN33]:	$DT_{allowed}$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually allowed volume of harvested timber round-wood for domestic and local use under the project scenario
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	

applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN34]:	$DT_{project}(h, j, ty, t)$
Data unit:	[m ³ yr ⁻¹]
Description:	Annually extracted volume of timber for domestic and local use, round wood inside the project area under the project scenario during harvest h by species j and wood product class ty during year t .
Sources of data (*):	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN35]:	$contribution_{DF}(d)$ and $contribution_{DG}(d)$
Data unit:	[-]
Description:	Relative contribution of driver i respectively to total deforestation and forest degradation.
Sources of data:	Use procedure from VM0006 v2.0
Description of measurement methods and procedures to be applied:	Remote sensing LULC analysis and emissions factors
Frequency of monitoring/recording:	At least once before baseline update.
Value applied:	$contribution_{DF}(d) = .9$ and $contribution_{DG}(d) = .1$
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	VM0006 v2.1 8.1.3.2
Any comment:	

Data/parameter [MN36]:	$RelativeDriverImpact_{DF}(t, d)$ and $RelativeDriverImpact_{DG}(t, d)$
Data unit:	[-]
Description:	Relative impact of the geographically unconstrained driver d at time t of the crediting period respectively on deforestation and forest degradation.
Sources of data:	Use procedure from VM0006 v2.1
Description of measurement methods and procedures to be applied:	Remote sensing LULC analysis and emissions factors
Frequency of monitoring/recording:	At least once before baseline update.
Value applied:	$RelativeDriverImpact_{DF}(t, d) = .9$ and $RelativeDriverImpact_{DG}(t, d) = 1$
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	VM0006 v2.1 8.1.3.2
Any comment:	

Data/parameter [MN37]:	$leakage_{unconstrained}(d)$
Data unit:	[-]
Description:	Leakage cancellation rate for avoiding deforestation/degradation from geographically unconstrained drivers.
Sources of data:	Valid sources to substantiate a smaller leakage rate include social assessments, scientific literature, and reports from civil society or governments. Sources have to be reliable and based on scientific methods and a good statistical design.
Description of measurement methods and procedures to be applied:	NA
Frequency of monitoring/recording:	At least once before baseline update.
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.

	available to auditors.
Calculation method:	NA
Any comment:	Unless a lower rate can be justified, a default rate of 100% must be used.

Data/parameter [MN38]:	$effectiveness(a, d)$
Data unit:	[-]
Description:	Effectiveness of every project activity a in decreasing any deforestation driver d relative to that driver's contribution to deforestation and forest degradation,
Sources of data:	Literature or expert opinion.
Description of measurement methods and procedures to be applied:	NA
Frequency of monitoring/recording:	At least once before baseline update.
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	The $effectiveness(a, d)$ factor represents the maximal effectiveness during the crediting period.

Data/parameter [MN39]:	$\Delta A_{rice}(t)$
Data unit:	[ha]
Description:	Annual increase in harvested area of rice due to leakage prevention measures.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting of rice in project area.

Data/parameter [MN40]:	$t_{flooded,max}$
Data unit:	[days yr ⁻¹]
Description:	Maximal period of time a field is flooded
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No harvesting activity in project area.

Data/parameter [MN41]:	$GR_{baseline}$
Data unit:	[-]
Description:	Number of grazing animals of type g within the project boundary baseline
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No grazing activity in project area.

Data/parameter [MN42]:	$GR_{allowed}$
Data unit:	[-]
Description:	Number of grazing animals of type g allowed for grazing within the project boundary in the project scenario
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA

Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No grazing activity in project area.

Data/parameter [MN43]:	$Fuelwood(t)$, $Fuel(t)$
Data unit:	$[m^3 yr^{-1} HH^{-1}]$
Description:	Average annual volume of biomass fuel consumed by households in the absence of the project activity in year t for cooking purpose.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area. Cook stoves not included as activities in project area.

Data/parameter [MN44]:	$HH_{non-CFE}(t)$
Data unit:	[-]
Description:	Total number of household in the project area that collect biomass fuel from the project area and do not use CFE in year t .
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No fuel wood activity in project area. Cook stoves not included as activities in project area.

Data/parameter [MN45]:	η_{old}
Data unit:	$[-]$
Description:	Efficiency of the project cook stoves or appliances.

Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No cook stove activity in project area.

Data/parameter [MN46]:	η_{new}
Data unit:	[-]
Description:	Efficiency of the baseline cook stoves or appliances.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No cook stove activity in project area.

Data/parameter [MN47]:	$U_{CFE}(t)$
Data unit:	[-]
Description:	Fraction of cumulative usage rate for technologies in project scenario in year t. [-]
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	

Any comment:	Technology usage rates not included in project area.
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Data/parameter [MN48]:	$DF_{LeakageCFE}(t)$
Data unit:	[-]
Description:	Leakage discount factor applicable to GHG emissions reduction benefits from CFE activities [-]
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	No leakage discount factor included in project area.

Data/parameter [MN49]:	$EF_{non-CO2,fuel}, EF_{CO2,fuel}$
Data unit:	[t CO ₂ TJ ⁻¹]
Description:	Respectively, non--CO2 emission factor of the fuel that is reduced and CO2 emission factor for the substitution of non-renewable woody biomass by similar consumers.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	Non-CO2 emission factors and CO2 emission factors for substitution of non-renewable woody biomass not included in project area.

Data/parameter [MN50]:	EF_{forest}
Data unit:	[t CO ₂ e]
Description:	Emission factor related to leakage.
Sources of data:	If comprehensive national-level statistics on biomass densities are available, EF_{forest} must be calculated based on the average biomass of the country, if local data is not available. Sources of the data allowed are (1) academic research papers and (2)

	studies and reports published by the forestry administration or other organizations, including the FAO's Forest Resource Assessment reports, (3) the upper range of biomass in the GPG-LULUCF (2003) Table 3A.1.2.
Description of measurement methods and procedures to be applied:	NA, literature value applied
Frequency of monitoring/recording:	At least once before verification
Value applied:	Africa wet – 210 tonnes dry matter/ha
Monitoring equipment:	NA
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	

5.3.1.4 Data on Organic Matter and Carbon Densities

Data/parameter [MN51]:	$OM_o(i)$
Data unit:	[Mg DM ha-1]
Description:	Plant-derived organic matter of LULC class or forest stratum i in pool o . [Mg DM ha-1]
Sources of data:	Field measurements using sampling plots in forest strata or LULC classes.
Description of measurement methods and procedures to be applied:	The average biomass stock density in applicable organic matter pools: aboveground tree - $OM_{AGT}(i)$, aboveground non-tree - $OM_{AGNT}(i)$, lying dead wood - $OM_{LDW}(i)$, standing dead wood $OM_{SDW}(i)$, belowground $OM_{BG}(i)$, and soil organic matter $OM_{SOM}(i)$
Frequency monitoring/recording:	of At least once before every baseline update
Value applied:	901.5
Monitoring equipment:	See Annex AL
QA/QC procedures to be applied:	Follow uncertainty deduction procedures described in methodology. Re-measure plots by independent teams.
Calculation method:	See section 6.1
Any comment:	Summed across multiple pools and divided into $OM_{plant}(i)$ and $OM_{soil}(i)$

Data/parameter [MN52]:	$proportion_{DF}(d)$ and $proportion_{DG}(d)$
Data unit:	[-]
Description:	Proportion of the gradual carbon loss that leads to deforestation or forest degradation, respectively, due to driver d
Sources of data:	Estimate using the procedure detailed in Table 9.
Description of measurement methods and procedures to be applied:	LULC and emissions factors
Frequency monitoring/recording:	of At least once before every baseline update
Value applied:	100%, 100%
Monitoring equipment:	NA
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	Na
Any comment:	

Data/parameter [MN53]:	$C(t, i)$
Data unit:	[Mg C ha ⁻¹ yr ⁻¹]
Description:	Carbon stock density at time t in stratum i .
Sources of data:	Estimate within the biomass inventory plots
Description of measurement methods and procedures to be applied:	See section 6.1
Frequency monitoring/recording:	of At least once before verification
Value applied:	Forest - 196.5587 Crop - 13.30302 Settlement - 22.63383 Other - 0
Monitoring equipment:	Annex AL
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	See section 6.1
Any comment:	Used in estimating change in carbon stock density for emissions factors given in Section 5.1.2.8.1.2 of this report. These data do not include carbon in the SOM pool (see Section 4.2 of this report).

Data/parameter [MN54]:	$f_{allometric}(y)$
Data unit:	Equation
Description:	Allometric relationship to convert a tree metric such as DBH or tree height into biomass
Sources of data (*):	Allometric equations developed for forest types that are similar to the ones in the project as found in found in Tables 4.A.1. and 4.A.2. of the GPG LULUCF
Description of measurement methods and procedures to be applied:	NA
Frequency monitoring/recording:	of May be updated at baseline update
Value applied:	$\ln(AGB) = \alpha + \beta_1 \ln(D) + \beta_2 \ln \rho + \exp\left(\frac{RSE^2}{2}\right)$
Monitoring equipment:	NA
QA/QC procedures to be	Data is to be entered into internal archive. Archive is accessed by

applied:	qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	

Data/parameter [MN55]:	$f_{belowground}(y)$
Data unit:	Equation
Description:	Relationship between aboveground and belowground biomass, such as a root-to-shoot ratio
Sources of data (*):	Standard root-to-shoot ratios as found in Table 4.A.4 of the IPCC GPG-LULUCF 2003
Description of measurement methods and procedures to be applied:	NA
Frequency of monitoring/recording:	May be updated at baseline update
Value applied:	.37
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	

Data/parameter [MN56]:	$C_{Harvest}(t, i)$
Data unit:	Mg C ha-1
Description:	Biomass carbon stock density at time t in stratum i in harvested areas.
Sources of data:	
Description of measurement methods and procedures to be applied:	

Frequency monitoring/recording:	of	
Value applied:		NA
Monitoring equipment:		
QA/QC procedures to be applied:		
Calculation method:		
Any comment:		No harvesting activity in project area.

Data/parameter [MN57]:		$CE_{inventory,harvest(t,i)}$
Data unit:		[-]
Description:		Combined error in estimate of average biomass stock density in harvest areas in stratum i at time t .
Sources of data (*):		Field inventory
Description of measurement methods and procedures to be applied:		NA
Frequency monitoring/recording:	of	At least once before verification
Value applied:		NA
Monitoring equipment:		
QA/QC procedures to be applied:		Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:		NA
Any comment:		Uncertainty estimate in carbon stocks in harvested strata must come from sampling of plots in harvested areas.

Data/parameter [MN58]:		$CE_{inventory,ANR(t,i)}$
Data unit:		[-]
Description:		Combined error in estimate of average biomass stock density in ANR areas in stratum i at time t .
Sources of data (*):		
Description of measurement methods and procedures to be applied:		
Frequency monitoring/recording:	of	
Value applied:		NA
Monitoring equipment:		

QA/QC procedures to be applied:	
Calculation method:	
Any comment:	ANR areas not included in project area.

Data/parameter [MN59]:	$u_{classification}$
Data unit:	$\square$
Description:	Discounting factor for NERs from avoided deforestation, based on the accuracy of classification, i.e. dividing land into broad land use types.
Sources of data:	
Description of measurement methods and procedures to be applied:	VM006 v2.1, 8.1.2.7
Frequency of monitoring/recording:	At least once before verification
Value applied:	0.9
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	

Data/parameter [MN60]:	$u_{stratification}$
Data unit:	$\square$
Description:	Discounting factor for NERs from avoided degradation, based on the accuracy of stratification, i.e. dividing forest into individual forest biomass classes.
Sources of data:	
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	NA
Monitoring equipment:	
QA/QC procedures to be applied:	
Calculation method:	
Any comment:	The NER discounting factor based on stratification not included in

	project area.
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Data/parameter [MN61]:	$u_{transition}(i)$
Data unit:	[]
Description:	Discounting factor for the emission factor for the transition from LULC class or forest stratum 1 to class 2 according to the uncertainty of the biomass inventory.
Sources of data:	LULC analysis, classification
Description of measurement methods and procedures to be applied:	Section 8.1.2.4.3
Frequency of monitoring/recording:	At least once before verification
Value applied:	1
Monitoring equipment:	
QA/QC procedures to be applied:	Data is to be entered into internal archive. Archive is accessed by qualified, authorized technical experts. All documents for monitoring, validation, verification and certification are reviewed and signed off by several team members. Data will be reported to project proponents and stakeholders. Discrepancies or disagreements will be justified by explanation or by visitation of the activities in question. All available satellite data for monitoring, validation, verification and certification will be archived and made available to auditors.
Calculation method:	NA
Any comment:	All measurements within allowed threshold

5.3.2 COMMUNITY

Community monitoring indicators are presented in Section 6.1 below.

5.3.3 BIODIVERSITY

Biodiversity monitoring indicators are presented in Section 7.1 below.

6 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS (CLIMATE)

6.1 Baseline Emissions (G2)

Baseline emissions remain unchanged from the project description (PD Section 5.3.6) other than those emissions conservatively excluded from the SOM carbon pool (see Section 4.2). For the monitoring and implementation period, the selected carbon pools (with the exception of the SOM pool), emission factors, reference area as well as historical and projected activity data were the same as what was used in the project description.

As described in Section 4.2, the only deviation from the monitoring plan that effected baseline emissions was exclusion of the carbon pool for soil organic matter for this monitoring period (see Tables 8 and 9). While soil organic matter was included as a carbon pool in the project description, it was conservatively excluded for this first monitoring period (but intended to be included thereafter) in the monitoring and implementation report. The conservative effect of this deviation can be seen in Tables 8 and 9 where the ex-ante baseline emissions are greater than the ex-post baseline emissions. This monitoring plan deviation is further justified in Section 4.2.

Date	Baseline Emissions in Project Area – Ex Ante (tCO ₂ e)	Baseline Emissions in Project Area – Ex Post (tCO ₂ e)
2009	186,379	186,284
2010	589,025	587,759
2011	600,988	598,785
2012	593,513	590,418
2013	584,720	580,784

Table 8. Baseline Emissions in project area for the monitoring period from 2009 to 2013.

Date	Baseline Emissions in Leakage Area – Ex Ante (tCO ₂ e)	Baseline Emissions in Leakage Area – Ex Post (tCO ₂ e)
2009	42,795	42,774
2010	135,285	134,995
2011	140,222	139,712
2012	-403,693	-403,524
2013	-422,970	-422,115

Table 9. Baseline Emissions in the leakage area for the monitoring period from 2009 to 2013. Negative emissions represent projected emissions removals due to regeneration in the leakage area.

6.2 Project Emissions

Data used to analyze deforestation in the project area was all Landsat 8 satellite imagery and followed Chapter 3A.2.4 of the IPCC 2006 GL AFOLU document. Landsat for the first monitoring period was chosen during the dry season from December 2013 to February 2014. See Table 10 for a list of all imagery used in the LULC analysis.

Scene Number	Image Number	Date	Image Name
4	177_59	1/17/2014	LC81770592014017LGN00
4	177_60	12/16/2013	LC81770602013350LGN00

Table 10. Imagery used in LULC analysis for the first monitoring period.

All Landsat imagery was pre-processed before being used for the creation of LULC maps and the analysis of land cover change. Images with less than 20% cloud cover throughout the whole image or less than 20% cloud cover within the project area and reference region were selected for use in the analysis. All selected images were coregistered in order to reduce location error (RMSE) to less than one pixel. Images then underwent a radiometric calibration and atmospheric correction process before being used in the development of LULC class maps, as described in more detail within the Annex AS document.

Pre-processed imagery was used in the classification process. The six IPCC LULC classes consisting of forest land, crop land, grassland, wetlands, settlements, and other land were considered in the LULC analysis of the project area, reference region, and leakage area. Image pixels were classified as forest, cropland, settlement, haze, water, cloud, cloud shadow, and off image based on maximum likelihood. See Table 11 for a count of subclasses per image in Scene 4. An algebraic opening was applied to meet a minimum mapping unit of 0.5 hectares. The LULC classification was not sub-pixel based. Areas classified as no data, cloud, and cloud shadow were masked out for subsequent processing of map products, as described in the Annex AR document.

The accounting of GHG benefits in the project area only included cloud-free imagery. No credits from avoided degradation were claimed or accounted for, thus no forest stratification model was used.

Image Number	Cloud	Cloud Shadow	Crop	Forest	Haze	Off Image	Settlement	Water	Grand Total
Scene 4	7	2	10	23	2	4	7	6	61
177_59	3	1	4	11	2	2	2	1	26
177_60	4	1	6	12		2	5	5	35
Grand Total	7	2	10	23	2	4	7	6	61

Table 11. Subclass counts per image for the first monitoring period.

6.2.1 ACCURACY ASSESSMENT

The accuracy for imagery used to calculate baseline emissions was evaluated via the horizontal and thematic accuracy assessments carried out during the quantification of GHG emission reductions and removals. Using composited images of Landsat imagery acquired from the USGS's free data platform, a horizontal accuracy assessment was completed which determined that all the images of each scene (for all tiles) were aligned within half a pixel (approximately 14.4 meters) of one another in the horizontal position. For more details on the horizontal accuracy assessment, please refer to Annex AV.

Accuracy for imagery used to calculate baseline emissions was also assessed thematically. Examination of thematic accuracy was used to show how true the LULC classifications made by the analyst were to the actual LULC classifications on ground level. After interpretation of all classified points for each scene, matrices were created in order to summarize the precision and possible error of each classified point in each scene. The error results for scene 4 were compiled in a confusion matrix and are presented in the table below. Scene 4 represents the time period from 2013 to 2014 and encompasses the combined project and leakage areas.

	REF_forest	REF_crop	REF_settlement	REF_water	REF_total
CLS_forest	643	43	0	0	686
CLS_crop	6	44	2	0	52
CLS_settlement	3	24	22	1	50
CLS_water	10	1	0	50	61
CLS_total	662	112	24	51	849

Table 12. Confusion matrix for scene 4.

By summing the number of correctly classified points (identified as the bolded numbers) and dividing that value by the total number of points interpreted (the value in the lower right hand corner) the overall accuracy percentage for scene 4's thematic alignment was calculated. For scene 4, this value was roughly 89%, which exceeds the minimum required percentage of 85% accuracy. For more details on the thematic accuracy assessment for scene 4 and for all scenes, please see Annex AW.

After establishing the predominately accurate horizontal and thematic alignment of all scenes, project and leakage emissions calculations were completed along with all other GHG emission reduction and removal quantifications as demonstrated in the project description.

For greater detail concerning the calculation of emissions reductions and/or removals, please refer to Section 5 of the project description document, Annex Z.

6.2.2 OBSERVED LANDUSE CHANGE

Emissions from the project area are quantified using the LULC transitions in the project area, scene 4 relative to the benchmark map. These transitions are calculated in Annex C and presented in the tables below. Table 14 shows the predicted LULC transitions in the baseline scenario over time as originally described in the project description (Annex Z). Table 13 shows transitions in the project scenario as interpolated from the benchmark map to those observed in scene 4. As calculated in Annex C, the total amount of forest converted to cropland in the project area during since the time of the benchmark map was 292.26 hectares. This quantity was distributed linearly from the time of the benchmark map (31 December 2008) to the end of the monitoring period (31 December 2014).

LULC Transition	2009	2010	2011	2012	2013
Forest to Forest	187550.7644	187503.3992	187503.2907	187503.2472	187503.2876
Forest to Crop	20.48555867	67.8507667	67.95927128	68.0027699	67.96238379
Forest to Settlement	0	0	0	0	0
Forest to Water	0	0	0	0	0
Crop to Forest	0	0	0	0	0
Crop to Crop	0	0	0	0	0
Crop to Settlement	0	0	0	0	0
Crop to Water	0	0	0	0	0
Settlement to Forest	0	0	0	0	0
Settlement to Crop	0	0	0	0	0
Settlement to Settlement	0	0	0	0	0
Settlement to Water	0	0	0	0	0
Water to Forest	0	0	0	0	0
Water to Crop	0	0	0	0	0
Water to Settlement	0	0	0	0	0
Water to Water	0	0	0	0	0

Table 13. LULC transitions (hectares) of the project scenario (monitored ex-post) in the project area during the first monitoring period.

LULC Transition	2009	2010	2011	2012	2013
Forest to Forest	187296.48	186460.65	185624.82	184802.31	184021.74
Forest to Crop	263.7	801.99	801.99	802.35	801.9
Forest to Settlement	11.07	33.84	33.84	33.84	33.75
Forest to Water	0	0	0	0	0
Crop to Forest	0	0	13.23	53.37	92.88
Crop to Crop	0	263.7	1052.1	1799.1	2505.87
Crop to Settlement	0	0	0.36	1.62	2.79
Crop to Water	0	0	0	0	0
Settlement to Forest	0	0	0.45	1.8	3.15
Settlement to Crop	0	0	0	0	0
Settlement to Settlement	0	11.07	44.46	76.86	109.08
Settlement to Water	0	0	0	0	0
Water to Forest	0	0	0	0	0
Water to Crop	0	0	0	0	0
Water to Settlement	0	0	0	0	0
Water to Water	0	0	0	0	0

Table 14. LULC transitions (hectares) of the baseline scenario (predicted by spatial model) in the project area during the first monitoring period.

6.2.3 MONITORING OF HIGH EFFICIENCY COOKSTOVES

The distribution of high efficiency cookstoves is not a project activity.

6.2.4 MONITORING OF LONG-TERM AVERAGE CARBON STOCKS IN HARVEST AREA

No harvest areas were included in the project area.

6.3 Leakage

The format of the data used to analyze deforestation in the leakage area is identical to that used in the project area (see section 6.2). The images provided in Table 10 cover the entire benchmark map, the project area and the leakage area.

Emissions from leakage are quantified using the LULC transitions in the leakage area, scene 4 relative to the benchmark map. These transitions are calculated in Annex C and presented in the tables below. Table 15 shows the predicted LULC transitions in the baseline scenario over time as originally described in the project description (Annex Z). Table 16 shows transitions in the project scenario as interpolated from the benchmark map to those observed in scene 4. As calculated in Annex C, observed LULC changes were distributed linearly from the time of the benchmark map (31 December 2008) to the end of the monitoring period (31 December 2014).

LULC Transition	2009	2010	2011	2012	2013
Forest to Forest	25188.93482	24588.39417	24587.01845	24586.46693	24586.97899
Forest to Crop	259.4150058	859.2153779	860.5894051	861.1402416	860.6288198
Forest to Settlement	0.320171645	1.060449069	1.062144902	1.062824748	1.062193548
Forest to Water	0	0	0	0	0
Crop to Forest	406.6125631	1346.752344	1348.906023	1349.769416	1348.967803
Crop to Crop	16186.59487	15242.70352	15240.54124	15239.6744	15240.47922
Crop to Settlement	1.62256478	5.374140197	5.382734335	5.386179655	5.382980862
Crop to Water	0	0	0	0	0
Settlement to Forest	13.36580954	44.2692552	44.34004905	44.36842974	44.34207981
Settlement to Crop	42.31149695	140.1410405	140.3651492	140.4549925	140.3715779
Settlement to Settlement	983.1926935	854.4597043	854.1648018	854.0465777	854.1563423
Settlement to Water	0	0	0	0	0
Water to Forest	0	0	0	0	0
Water to Crop	0	0	0	0	0
Water to Settlement	0	0	0	0	0
Water to Water	0	0	0	0	0

Table 15. LULC transitions (hectares) under the project scenario (monitored ex-post) in the leakage area during the first monitoring period.

LULC Transition	2009	2010	2011	2012	2013
Forest to Forest	25385.58	25480.71	26161.92	26831.88	27468.27
Forest to Crop	60.57	184.23	184.23	184.32	184.23
Forest to Settlement	2.52	7.74	7.74	7.74	7.74
Forest to Water	0	0	0	0	0
Crop to Forest	273.24	831.15	820.08	786.78	753.3
Crop to Crop	16313.4	15518.07	14857.74	14231.7	13640.22
Crop to Settlement	8.19	24.75	24.48	23.49	22.5
Crop to Water	0	0	0	0	0
Settlement to Forest	13.86	42.12	41.94	41.58	41.13
Settlement to Crop	0	0	0	0	0
Settlement to Settlement	1025.01	993.69	984.24	974.88	964.98
Settlement to Water	0	0	0	0	0
Water to Forest	0	0	0	0	0
Water to Crop	0	0	0	0	0
Water to Settlement	0	0	0	0	0
Water to Water	0	0	0	0	0

Table 16. LULC transitions (hectares) under the baseline scenario (predicted by spatial model) in the leakage area during the first monitoring period.

6.3.1 EX-POST LEAKAGE FROM GEOGRAPHICALLY CONSTRAINED DRIVERS

The LULC change for the leakage area was calculated exactly the same as for the project area. Maps of the LULC data for the project and leakage areas as of the end of 2013 are provided in Annex U and Annex V. The baseline rate of deforestation has not been adjusted this monitoring period to reflect a change in the rate for the leakage area, as allowed by the methodology.

6.4 Summary of GHG Emission Reductions and Removals (CL1 & CL2)

6.4.1 EX-POST ACTUAL NET GHG EMISSION REDUCTIONS

Net GHG emission reductions were quantified using equation 105 (See table immediately below) of the methodology and calculated in Annex C. Vintages were established by year, 2009 vintage were prorated from August 2009 to the end of the year using equations 107 and 108 of the methodology. Net GHG emissions reductions are presented in Table 18 while VCU in Table 19 per equation 106 of the methodology. The risk rating remains at 20%, unchanged since validation.

Individual Term of Equation 105	Description	Value (tCO ₂ e)	Explanation
①	ΔGHG from avoided deforestation excluding ANR and harvest areas	-2,095,900	Included, major source of emissions reductions.
②	ΔGHG from deforestation due to leakage	355,315	Included as described in section 5.5.
③	ΔGHG from avoided degradation	0	Degradation is omitted as the drivers are for deforestation, as discussed in section 5.3.3.
④	ΔGHG from degradation due to leakage	0	Degradation is omitted as the drivers are for deforestation, as discussed in section 5.3.3.
⑤	ΔGHG from leakage by unconstrained geographic drivers	0	There are no unconstrained geographic drivers, see section 5.5.3.
⑥	ΔGHG from assisted natural regeneration	0	Omitted as ANR is not an included project activity.
⑦	ΔGHG from changes in long-lived wood products	40,678	Included per calculations in section 5.6.2.
⑧	ΔGHG from improved cookstoves	0	Omitted as CFE is not an included project activity.
⑨	ΔGHG from other and secondary sources	0	No other secondary sources exist.
⑩	ΔGHG from avoided deforestation from areas under harvest	0	Omitted as harvesting is not an included project activity.
NERs		1,699,905	Over entire crediting period

Table 17. Terms of equation 105 in VM0006 for the entire crediting period.

Years	Emission reductions from avoided deforestation (tCO2e)	Project emissions (tCO2e)	Leakage emissions (tCO2e)	Estimated net GHG emission reductions or removals (tCO2e)
2009	155,131	13,917	43,378	113,240
2010	485,996	47,764	106,740	380,473
2011	494,349	49,508	102,027	393,068
2012	485,286	51,212	81,710	402,286
2013	-475,138	52,853	60,938	410,838
Total	2,095,900	215,254	394,793	1,699,905

Table 18. Ex-post Net GHG Emission Reductions

Years	Estimated GHG emission reductions or removals (tO2e)
2009	90,398
2010	308,993
2011	320,334
2012	330,912
2013	340,986
Total estimated VCUs	1,391,623

Table 19: VCUs; Total ex-post estimated emissions reductions, net of the allocation to the buffer pool.

6.5 Climate Change Adaptation Benefits (GL1)

The project is not seeking Gold Level verification for climate change adaption benefits this monitoring period.

7 COMMUNITY

7.1 Net Positive Community Impacts (CM1)

The project intends to achieve net-positive, long term impacts for communities in the project zone. The cause and effect logic behind these impacts is presented in the project's theory of change model described in detail in the Project Description and Annex K.

The achievement of long-term impacts takes time, and given the early stage at which the project is currently, this report focuses on progress made to date through the implementation of activities across the project's four program areas: education, access to resources, improved production, and land-use planning (see Annex E for more information on current and future project activities).

The monitoring results below demonstrate that outputs from project activities have already had a positive effect on communities in the project zone and are expected to contribute to long-term positive impacts as the project continues to implement and expand project activities. The project's full list of community monitoring indicators is available in Annex Q. As these indicators will be adjusted according to the development of new project activities and some current indicators are slated for monitoring in future phases of the project, only results from phase one monitoring indicators are presented here. The project's impact on community and biodiversity HCV's is addressed in Section 7.1 below. Locations of project activities implemented in this monitoring period are available in Annex AX.

While many of the activities implemented in this monitoring period were focused on demonstrating improved and new techniques to communities, Jadora staff has begun to facilitate community adoption of new techniques. For example, Jadora agricultural team members have followed up with individual farmers looking to incorporate new farming practices on their fields, and many villages are starting to build tilapia farms after seeing the results of the five built in this monitoring period. Communities are beginning to look to Jadora to provide materials and technical information for community driven projects.

7.1.1 EDUCATION

The education program area is designed to address the lack of primary and adult educational opportunities in the project zone. During the monitoring period, Jadora hired and trained seven new teachers for the primary school in Yafunga, and hosted many workshops ranging from agricultural techniques to tilapia farm construction and maintenance. As a result of keeping the school running, 104 students were enrolled in December 2013 (see Annex L). While the school operated throughout the monitoring period, permanent funding for teachers has not been possible and the school has been temporarily closed. Jadora hopes to secure permanent funding for teachers and re-open the school in the next monitoring period. Jadora also began its research partnership with Yangambi Agricultural Research Station by hosting three researchers over the period. Monitoring results for the educational program area are presented below.

As depicted in the theory of change model for this program area, these early program outputs are anticipated to result in longer term outcomes and impacts that will be beneficial for the communities. The hiring and training of teachers, for example, will result in higher quality education for youth in the project zone. It is expected that over time, community well-being will improve from better educated community members through gains in employment and entrepreneurial activities. Tilapia and agricultural workshops are the first step in building community capacity to produce greater agricultural yields and alleviate poverty in comparison to the baseline scenario. Education is the vital first step towards achieving positive long-term community impacts in the project zone. The achievement of these early project outputs as scheduled in the Implementation Plan signifies how the project is on track toward achieving the community benefits anticipated in the theory of change model.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Focal Issue(s)	Phase 1 Results
Education	1	Hiring and training teachers	1	Output	# of teachers hired	1,2,3	Six teachers and one headmaster
Education	7	Tilapia Farming Worksh ops	1	Output	# of workshops held	1	5
Education	8	Tilapia Farming Worksh ops	1	Output	# of people attending workshops	1	50+
Education	9	Tilapia Farming Worksh ops	1	Outcome	# agreements to build tilapia farm	1	2
Education	13	Agricult ural Worksh ops	1	Output	# of workshops held	1	5
Education	15	Agrofore stry Worksh ops	1	Output	# of workshops held	1	
Education	14	Agricult ural Worksh ops	1	Output	Attendance of workshops	1	
Education	16	Agrofore stry Worksh ops	1	Output	Attendance of workshops	1	50-100 people/workshop
Education	21	Radio Station Program ming	1	Output	Radio station funded	N/A	Funded radio station for whole monitoring period
Education	23	REDD Worksh ops	1	Output	# of workshops held	N/A	17
Education	24	REDD Worksh ops	1	Output	Attendance of workshops	N/A	5-30/workshop
Education	25	Public Health Educati on	1	Output	# of workshops held	3	11 workshops in 2 villages to prevent cholera outbreak
Education	26	Public Health Educati on	1	Output	Attendance of workshops	3	Data not available.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Focal Issue(s)	Phase 1 Results
Education	29	Yangambi Research Station Partnership	1	Output	# of guest researchers hosted	1	3 (see Annex M)

7.1.2 IMPROVED ACCESS TO RESOURCES

This program area is designed to ensure that community members in the project zone have the resources to implement newly learned skills and practices or address latent needs of the communities. In this monitoring period, Jadora provided materials to create three community-led and operated tilapia farms, disease resistant manioc seeds from the demonstration garden, medical supplies for local health posts, and facilitated the formation of three women's focus groups to create female spaces and opportunities in the project zone. Monitoring results of these activities are provided below. Again, as depicted in the theory of change for this program area, these early program outputs are anticipated to result in longer term outcomes and impacts that will be beneficial for the communities.

The supply of disease resistant seeds for example, will result in greater agricultural yields and promote food security. The formation of women's focus groups will help Jadora better serve the needs of women and create opportunities for women to develop their skills and capacity. The results of this program area are essential to enabling communities to implement new skills they have learned from Jadora's educational and demonstration programs. The achievement of these early project outputs as scheduled in the Implementation Plan signifies how the project is on track toward achieving the community benefits anticipated in the theory of change model.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Focal Issue(s)	Phase 1 Results
Improved Access	78	Tilapia Framing Supplies	1	Output	Amount of stock (fry) provided to communities	1,2	Fully stocked 5 tilapia ponds with fry (3 demonstration, 2 community ponds)
Improved Access	79	Tilapia Framing Supplies	1	Output	Amount of pond building materials provided	1,2	Provided all materials and tools needed to build 2 new community tilapia ponds and 3 demonstration ponds
Improved Access	80	Tilapia Framing Supplies	1	Output	Amount of tilapia feed provided	1,2	Provided feed for 5 new tilapia ponds
Improved Access	83	Improved Seeds	1	Output	Weight of seeds provided to farmers by Jadora	1,2	26 kg of rice seed given to people in 3 villages, 75 pineapple starts distributed
Improved Access	84	Improved Seeds	1	Output	# of strains of crop varieties provided to communities	1,2	1 strain of disease resistant manioc distributed
Improved Access	87	Medical Supplies /Medications	1	Output	Amount of medical supplies provided by Jadora	3	Jadora supplied basic first aid supplies (bandages, braces, topical and oral antibiotics, and pain medication).
Improved Access	88	Medical Supplies /Medications	1	Output	# of villages receiving medical supplies	3	3 (Yafunga, Yaboila, Bolembé)
Improved Access	97	Female centers/spaces	1	Output	# of women's groups formed	N/A	3 groups formed

7.1.3 IMPROVED PRODUCTION

The improved production program focuses on demonstrable changes in material production in the project zone compared to the without-project scenario. Outputs and outcomes in this program area are designed to ensure increased production of food, products, or other types of community infrastructure to improve the lives of communities in terms of household income and general well-being. Over this monitoring period, Jadora's agricultural demonstration projects and supported aquaculture ponds yielded significant results that were distributed to community members. Some of these products have immediate benefits (food produced), while others will take time to mature (e.g. cacao, caterpillar trees).

The results from the activities in this program area are provided below, along with the location of the activities. Several of the results monitored in this program area are early stage outcomes resulting from activities and outputs in the Education and Access to Resources program areas. Again, as depicted in the theory of change for this program area, these early program outputs and outcomes are anticipated to result in longer term outcomes and impacts that will be beneficial for the communities. For example, as the tilapia ponds and cacao plants mature, it is expected that well-being and food security will improve. The achievement of these early project outputs as scheduled in the work plan signifies how the project is on track toward achieving the community benefits anticipated in the theory of change model

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Focal Issue(s)	Phase 1 Results
Improved Production	135	Tilapia	1	Early Outcome	Weight of Tilapia harvested	1,2	39 kilograms/year per pond
Improved Production	136	Tilapia	1	Early Outcome	# of tilapia farms built	1,2	5 (2 demonstration and 3 in other communities)
Improved Production	140	Agricultural Products	1	Early Outcome	Weight of food harvested in demonstration farms	1,2	2000+ kilograms/year of pineapple, 1.5 bags of rice harvested/season
Improved Production	141	Agricultural Products	1	Output	# of varieties planted in demonstration farms	1,2	7 varieties :Pineapple, manioc (two varieties), rice, beans, cacao, and coffee
Improved Production	142	Agricultural Products	1	Output	# of agroforestry trees planted	1,2	2,652 Cacao, 34 Afromosia, and 1104 Bomanga (caterpillar) trees planted
Improved Production	148	Fuel Wood	1	Output	# of fuel wood trees planted	N/A	139 acacia trees planted with cacao
Improved Production	153	Infrastructure	1	Output	# of bridges or trails built/repaired	2	3 bridges built
Improved Production	156	Nursery Baskets	1	Output	# of nursery baskets produced and bought by Jadora	2	1000+ nursery baskets made
Improved Production	157	Tree Tags	1	Output	# of tree tags produced by community and bought by Jadora	2	8000+

7.1.4 POTENTIAL NEGATIVE IMPACTS

While Jadora does not anticipate that the project will have significant negative impacts on communities, it is possible that some will arise throughout the project lifetime. These impacts, if they occur, are estimated to be small in comparison to the positive impacts created by the project. Jadora has identified the following potential negative impacts as a result of compiling common community concerns and the risks identified to project benefits:

- *Unequal distribution of benefits* – This risk is mitigated by providing community benefits through in-kind development projects selected by communities in a transparent manner. Project activities related to gender equality and complaint mechanisms as well as conflict resolution also contribute to mitigating this risk. To date there have been no complaints or other indications of the presence of unequal benefit distribution.
- *Project activities may impact some community members more than others* – Hunters and Safbois employees may be negatively affected by project activities. This is mitigated by Jadora by preferentially hiring former Safbois employees to work on forest and agriculture teams and hunters to work on biodiversity teams. Moreover, hunting is not prohibited; Jadora seeks to provide voluntary incentives to reduce threats to wildlife. See comments below.
- *Reduction in land or forest resources available to communities (NTFPs)* – This is primarily mitigated by project activities that increase productivity of existing cropland, develop alternative employment opportunities, and increase production of forest resources (such as caterpillars and fuelwood trees planted on degraded land). The project has also included buffer areas around each community where agriculture is permitted. Due to the existence of these buffer areas there has been no restriction to land available for agriculture to date. In addition, extraction of traditionally used NTFPs is still permitted in the project area.

Jadora has included monitoring indicators to assess these negative impacts over the life of the project. Most of these monitoring procedures are scheduled to begin in the second phase of project implementation because these types of impacts are difficult to identify early on in project development. The only clear negative impact that has occurred is the loss of jobs as a result of ceasing logging operations in the project area. Before the project began, Safbois employed approximately 80 people in the project zone. Of those 80, Jadora was able to hire 30 to assist in the project's operations. Several other former Safbois workers have retired due to age or have taken work with the Busira Palm Plantation, and Jadora expects to hire more workers in the next implementation period.

Rather than relying on work that depletes natural capital overtime such as logging, Jadora workers contribute to a sustainable enterprise. Everyone in the project zone is dependent on the forest for food, building materials, and other uses—thus while there may be a net decline in employment in the project zone, Jadora workers contribute to maintaining vital natural systems rather than degrading them. Furthermore, project activities are designed to alleviate poverty across all of the communities in the project zone through relevant education that will assist in developing local entrepreneurial initiatives and higher agricultural yields. As carbon credits are sold, funds will be used for locally sourced development projects initiated through the project's community benefits process. Activities eligible for funding include infrastructural improvements and capacity building initiatives—both of which will provide employment opportunities.

7.1.5 DETERMINATION OF NET POSITIVE IMPACT

In assessing net community impacts for this verification period Jadora considered the cumulative effect of the above noted project outputs and early outcomes compared to the most likely circumstances in the project baseline scenario. Through community consultation, Jadora has concluded that in the absence of the project, food security, employment opportunities, and health care in the communities would continue to decline due to lack of resources and capacity--especially due to limited educational opportunities (Section 4.5.2 of the Project Description). The project's theory of change model hinges on addressing the root causes of these focal issues through the four program areas. In this monitoring period, Jadora has made meaningful progress in implementing these activities and has laid the ground work for continued progress.

Therefore these outputs and early outcomes are a clear benefit to the communities. In addition, forest conservation outcomes associated with the project ensure a greater level of natural capital in the form of timber, soil fertility and erosion control, water quality and habitat conditions for NTFPs important to many community members. These will be available to the communities in the long term.

For this first implementation period, determination of net-positive versus negative community impact has relied significantly on the evidence of the early, positive achievements described above, which demonstrate that the project is on track to delivering anticipated community benefits detailed in the theory of change. The project has also relied on feedback from communities themselves during the public comment period, at community meetings, and through the availability of the existing grievance process. The communities have expressed overwhelming support for the project through these meetings as seen in the comments received. In subsequent implementation periods Jadora's grievance process and regular consultation with community members, as well as the monitoring of indicators established in Annex Q will help with the further assessment of any potential negative impacts.

Type of monitoring	Number	Project Phase	Indicator	Phase 1 Results
Potential Negative Impacts	189	2	Reported conflicts due to unequal benefits distribution	N/A project has yet to issue credits, so community benefits have not been distributed
Potential Negative Impacts	190	1	# of workers displaced or affected by project activities	80
Potential Negative Impacts - Mitigation	191	1	# of displaced workers hired by Jadora or trained in another field	30
Potential Negative Impacts	192	2	Reduced access to new cropland and forest resources	N/A to be assessed in phase 2
Potential Negative Impacts - Mitigation	193	2	Communities are aware of buffers around communities where farming is allowed	N/A to be assessed in phase 2.

7.2 Negative Offsite Stakeholder Impacts (CM2)

Potential negative stakeholder impacts sometimes associated with REDD projects include increased threat to natural capital and ecosystem services due to leakage of deforestation and/or hunting related activities, impacts related to dislocation of peoples or increased migration as a result of project activities, and increases in the price of agricultural commodities due to reduction in availability of agricultural land.

It is expected that the project has had a positive offsite impact on stakeholders based on initial project outputs and safeguards designed to mitigate negative impacts. Project safeguards include the implementation of a buffer adjacent to communities which ensures the continued availability of agricultural land and NTFPs. This, in addition to early project outputs including the introduction of new agricultural technologies, e.g. tilapia farming and disease resistant seeds, further mitigate the possibility of a decrease in the availability of agricultural produce in the project zone, and any associated price increases. In addition, project activities are designed to ensure the inclusion of all socioeconomic and gender groups, precluding the possibility of displacement of peoples to adjacent areas and lead to offsite conflict over land or resources.

As part of validation and verification under CCB, project documents were posted online and summaries were distributed to communities in the project zone. During the public comment period, no comments were received that indicated the project has had a negative impact on offsite stakeholders. Furthermore, Jadora continues to engage with local, regional, and national governmental leaders—all of whom have expressed continued support for the project.

Public meetings are open to communities outside of the project zone, and representatives from neighboring villages outside of the project boundaries attended the community meeting convened as part of the validation and verification field audit. During that meeting, there was a broad consensus in support of the project, and an opportunity for offsite stakeholders to express concerns about the project.

The community consultation process has built-in provisions for the resolution of grievances, which will be used in the event that any negative impact occurs. Grievances are to be recorded by the aggrieved in the grievance log which can be found in Annex D. A written response to the aggrieved must be provided within 30 days of entry into the log. For more details on the grievance process, please see Annex D.

7.3 Exceptional Community Benefits (GL2)

Jadora is not seeking gold level verification for community benefits.

8 BIODIVERSITY

8.1 Net Positive Biodiversity Impacts (B1)

Much like community impacts, the project's biodiversity impacts are monitored by collecting data on outputs, outcomes, and impacts of project activities. In addition, the project uses a pressure-state-response method to evaluate biodiversity in the project zone:

- Pressure: Identify and monitor pressures and threats to biodiversity in the Project Zone using indicators including hunting levels, bush meat for sale in local markets, and activities resulting in habitat loss.
- State: Identify and monitor the status of biodiversity values using appropriate indicators or proxy indicators.
- Response: Monitoring of project activities designed to reduce threats to biodiversity.

Forest and fauna conservation are achieved through the combination of multiple project activities as demonstrated in Annex K.

However, a central goal of the project is reducing baseline deforestation and forest degradation levels in the project area. The habitat provided by intact forests is critical for the conservation of native species in the forest area, and forest loss results in a net biodiversity loss (Turner, 1996). A primary focus, therefore, for the demonstration of net-positive biodiversity impacts is the documentation of forest cover maintained in the project versus baseline scenario. Results from the first monitoring period demonstrate that project activities have resulted in a net gain of 2,786 hectares of forest compared to what would have happened without the project (net reduction in deforestation minus leakage). As identified by Turner, such a gain in intact forest cover can be associated with positive biodiversity impact. A summary of biodiversity related project activities implemented in this monitoring period are presented below for each program area.

8.1.1 LAND USE PLANNING

The land use planning program area includes activities designed to encourage communities to curb deforestation and protect primary forest. In this monitoring period, Jadora signed agreements to limit deforestation with 12 villages in the project zone, and signed an agreement with Safois to stop all logging and road building in the project area. In the absence of the project this new road network would have been further exploited by local communities, resulting in the deforestation of an estimated 3,626 ha of forest in this monitoring period. Jadora recognizes that it will take time to bring all communities onboard with the project (thereby increasing effectiveness of reducing deforestation and protecting biodiversity), but these initial results have been pivotal in reducing threats to flora and faunal species in the project zone.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Phase 1 Results
Land Use Planning	1	Forest Protection	1	Response Output	Area of forest protected from logging or road building	Signed agreement with Saibois to stop logging and road building in all 187,571 hectares of forest in the project area
Land Use Planning	2	Forest Protection	1	Response Output	# of community land use agreements signed to prevent forest conversion to agriculture	12 Agreements signed with villages in the project zone. See Annex P.
Land Use Planning	3	Forest Protection	1	Response Outcome	Area of forest in project area undergoing transition	See MN2 in Section 4.8.1.1

8.1.2 EDUCATION

Education is a fundamental aspect of reducing the threats to wildlife and protecting biodiversity. This involves educating communities on REDD to protect primary forest (see community indicators 23 and 24 above) and teaching community members how to sustainably produce protein sources through aquaculture as a way to reduce hunting pressure on animals in the project zone. The first step in reducing hunting threats to faunal species lies in education of alternatives. These initial outputs are crucial to having a long-term positive effect on biodiversity. The results from education activities relevant to tilapia farming are presented below.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Phase 1 Results
Education	6	Tilapia Farming Workshops	1	Response Output	# of workshops held	5
Education	7	Tilapia Farming Workshops	1	Response Output	# of people attending workshops	50+
Education	8	Tilapia Farming Workshops	1	Response Outcome	# agreements to build tilapia farm	2 (other 3 are demonstration ponds)

8.1.3 IMPROVED ACCESS TO RESOURCES

This program area is designed to provide access to materials necessary to implement alternative employment or create food systems that reduce pressure on animals in the project zone. In the monitoring period, tools and materials needed to construct two new tilapia ponds were provided to

community members. As tools and resources to build tilapia farms or other sources of protein increase, Jadora expects community members to shift time and energy investments away from hunting.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Phase 1 Results
Improved Access	23	Tilapia Farming Supplies	1	Response Output	Amount of stock (fry) provided to communities	Fully stocked 5 ponds
Improved Access	24	Tilapia Framing Supplies	1	Response Output	Amount of pond building materials provided	Tools and materials to build 5 ponds
Improved Access	25	Tilapia Framing Supplies	1	Response Output	Amount of tilapia feed provided	Feed for 5 ponds

8.1.4 IMPROVED PRODUCTION

This program area is designed to produce and distribute alternative protein sources in order to reduce threats to biodiversity in the project zone. In this monitoring period, Jadora constructed five new tilapia farms resulting in approximately 39 kilograms of tilapia provided for community consumption per pond per year.

Program Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Phase 1 Results
Improved Production	34	Tilapia	1	Response Output	Weight of Tilapia harvested	39kg/year/pond
Improved Production	35	Tilapia	1	Response Output	# of tilapia farms built	5

8.1.5 BIODIVERSITY SURVEYS

As stated in Section 1.1.5 of the Project Description, one of Jadora's biodiversity objectives is to "increase local and global understanding of the biodiversity in the project zone and Congo River Basin." Jadora conducts ongoing surveys of faunal species in the project zone as one way to fulfill this objective. Surveys also aid the leadership team in identifying priorities for conservation based on species abundance and location. These results will be useful in identifying priority species for further study and developing more robust activities to reduce threats to biodiversity in the project zone.

In the monitoring period, Jadora biodiversity survey teams have identified 85 faunal species in the project zone in this monitoring period over 972 survey-hours. All faunal survey results are available in Annex O and geospatially in Annex N. In this implementation period, Jadora established the protocol for bush meat market surveys and obtained initial data on where and when bushmeat markets occur. Jadora looks forward to further developing this survey program in the next period.

Monitoring Area	Number	Project Activity	Project Phase	Indicator Type	Indicator	Phase 1 Results
Biodiversity Surveys	45	Faunal Transects	1	Response and State Output	Surveys to identify state of faunal species in project zone	85 faunal species identified in 2 surveys, see Annex O
Biodiversity Surveys	46	Quadrats	1	Response and State Output	Surveys to identify state of faunal species in project zone	
Biodiversity Surveys	47	Trap Cameras	1	Response and State Output	# of cameras installed and species identified using trap cameras	4
Biodiversity Surveys	48	Hunting Pressure	1	Pressure Output	Evidence of hunting recorded during quadrat and transect surveys	Approximately 350 signs of hunting found over two surveys (traps, hunting camps, hunting trails)
Biodiversity Surveys	49	Bush Meat Market Pressure	1	Pressure Output	Species of animals available in market, number of vendors at market	Initial survey data include times and locations of markets

High Conservation Values (HCVs)

Jadora is committed to maintaining and enhancing Community and Biodiversity HCVs in the project zone. As stated in the Project Description, the project zone contains populations of species considered rare, threatened, endangered, or endemic (HCV 1) and is a significantly large intact forest landscape supporting species in their natural distribution (HCV 2). As regards to community HCVs, Jadora identified areas that provide critical ecosystem services (HCV 4), resources that are fundamentally important to meeting community needs (HCV 5), and are vital for the cultural identity of communities in the project zone.

Maintenance of each of these HCVs is strongly associated with intact, functional forest systems and resources. By protecting primary forest from deforestation, Jadora has reduced the threat to functioning ecosystem services such as water filtration and protection from flooding, and contributed to the protection of vulnerable and endangered plant species in the project area. By ceasing logging in the project area, Jadora has protected endangered and threatened floral species that were previously selected for harvest—and would have been harvested in the without-project scenario.

Through agroforestry activities, Jadora has proactively planted crops and trees that will provide future sources of food and materials that are culturally important and meet the fundamental needs of community members. Agriculture and aquaculture activities begun in this implementation period will play an important role in reducing threats to faunal species in the project zone. These activities, as shown above, have demonstrated a positive impact on HCVs in this monitoring period.

Given that the project is focused toward conserving forest ecosystems there is relatively low risk that the project will have unanticipated negative impacts on HCVs. Jadora has developed several monitoring indicators to identify potential negative impacts on HCVs, though most of these are scheduled to occur in subsequent implementation phases. Much like long-term community or biodiversity impacts, impacts to HCVs may not be immediately apparent. The following are the monitoring results for HCVs conducted in this monitoring period.

Monitoring Area	Number	HCV	Project Phase	Indicator Type	Indicator and results
HCV Maintenance	1	HCV 1 - Endangered and Vulnerable Species and Endemic Species; HCV 2 - Landscape level biodiversity (intact forest cover)	1	State and Response Output	See Biodiversity indicators 1-5
HCV Maintenance	2	HCV 1 Endangered and Vulnerable Floral Species	1	State and Response Output	State of protected endangered /vulnerable tree species monitored by re-visiting forest plots. Plots initially measured in phase 1 and identified vulnerable and endangered species (see Section 7.3.1)

Monitoring Area	Number	HCV	Project Phase	Indicator Type	Indicator and results
HCV Maintenance	3	HCV 4 - Ecosystem Services	1	State and Response Output	See Biodiversity Indicators 1-5

In addition to habitat conservation, the project has built 5 Tilapia ponds and provided education that has resulted in the construction of one more pond. These aquaculture projects provide needed alternatives to bushmeat, a major source of faunal depletion in West Africa (Fa & Brown, 2009).

The agricultural program has not introduced invasive plant or animal species to the area. The plant agricultural program aims to increase productivity through “no burn” techniques, cross cropping, and crop rotation. Crops include *Zea mays* (Corn), *Oryza glaberrima* (African Rice), *Glycine max*, (Soy Beans) *Vigna unguiculata* subsp. *unguiculata* (Niebe), *Ipomoea batatas* (Sweet Potatos), *Arachis hypogaea* (Peanuts/Ground Nuts), *Ananas comosus* (Pineapple), and *Manihot esculenta* (Casava). All of these species are globally widespread and are not invasive.

All animal species in the program are common agricultural species already in use in the project area: *Capra aegagrus hircus* (Goat), *Ovis aries* (sheep), *Gallus gallus domesticus* (chickens), Family *Anatidae* (Ducks), *Sus scrofa domesticus* (Pig), and *Tilapia nilotica* (Tilapia). The program will aim to reduce animal loss from disease rather than introduce new species. The only animal species bred or used in this monitoring period is *Tilapia nilotica* (Tilapia)—a native to Central Africa including the DRC.

No genetically modified organisms (GMOs) have been used to generate GHG emissions reductions or removals.

8.2 Negative Offsite Biodiversity Impacts (B2)

Potential negative offsite biodiversity impacts are related to the displacement of deforestation activities outside the project area (i.e. leakage). For this monitoring period the following results were calculated:

- Deforestation in baseline scenario within the project area: 3,618 hectares
- Deforestation in project scenario within the project area: 292 hectares
- Deforestation in baseline scenario within the leakage area: 831 hectares
- Deforestation in project scenario within the leakage area: 3,705 hectares
- Regeneration in baseline scenario within the leakage area: 3,645 hectares
- Regeneration in project scenario within the leakage area: 5,992 hectares
- Net deforestation avoided: 2,799 hectares

While the leakage area had a higher deforestation rate in the project scenario than the baseline there was also significant regeneration from non-forest to forest in the leakage area. In addition, the project area had a much lower occurrence of deforestation in the project scenario compared to the predicted baseline resulting in a total of 2,799 hectares of avoided deforestation. Thus, the net impact on primary, intact forest has been positive. Deforestation in the leakage area occurred primarily in the buffer zones created during the land use planning process. Jadora’s land use planning activities are still being implemented and are designed to limit activity-shifting leakage and maintain intact primary forest both inside and outside of the project area.

It is also possible that hunting pressure on fauna outside of the project zone will be increase as a result of project activities; however, Jadora does not restrict hunting in the project zone. Because Jadora does not infringe on hunting access, there is little risk that hunting pressure will be displaced outside of the project

zone. Jadora promotes alternatives to hunting that will likely spread beyond the project zone, resulting in a positive offsite impact on biodiversity.

Mitigation of offsite biodiversity impacts is realized through existing project activities described above:

- Project activities to reduce bushmeat market pressure on fauna inside and outside the project zone:
 - 5 Tilapia farms
 - Planting 1104 Caterpillar trees
- Project activities for agricultural intensification
 - Provision of improved seeds
 - Agricultural workshops
 - Agroforestry workshops
 - Planting 2652 Cacao starts
 - Establishment of 5 demonstration farms

It is not possible to precisely quantify the net result of these activities for offsite biodiversity impact. The implementation of these activities, however, combined with the results of the leakage assessment, and no indication of negative impacts during the stakeholder consultation process is sufficient to demonstrate that there are no early indications of negative offsite impacts to biodiversity. More precise assessment will take place during the subsequent project implementation period.

8.3 Exceptional Biodiversity Benefits (GL3)

The protection of forest area is protecting the following species, identified in the Joint VCS-CCB Project Description:

8.3.1 CRITICALLY ENDANGERED (CR) AND ENDANGERED (EN) SPECIES

Critically endangered species:

The Jadora-Isangi REDD project has historical evidence of forest elephants. While there is no current evidence the forest elephants still exist the area is large enough that a remnant population may still exist deep within the project area. Protection of the project area allows for future studies and possible reintroduction to the area.

Endangered floral species:

- Afromosia/African Teak (*Pericopsis elata*) – 37 individuals identified in forest inventory
- Tola/Tola-blanc (*Gossweilerodendron balsamiferum*) – 11 individuals identified in forest inventory
- Wenge (*Millettia laurentii*) – 1 individual identified in forest inventory
- Douka (*Tieghemella africana*) – 2 individuals identified in forest inventory

By ceasing logging in the project area, the project proponent has contributed to the protection of these high conservation value species during this monitoring period.

8.3.2 VULNERABLE SPECIES (VU)

8.3.2.1 Vulnerable floral species

The following floral species were identified within the project area and are listed as vulnerable on the IUCN's Red List:

- Bosse Clair/Scented Guarea (*Guarea cedrata*) – 21 individuals identified in forest inventory
- Bosse Fonce/Black Guarea (*Guarea thompsonii*) – 144 individuals identified in forest inventory
- Dibetou/African Walnut (*Lovoa trichilioides*) – 3 individuals identified in forest inventory
- Doussie bipindensis (*Afzelia bipindensis*) – 2 individuals identified in forest inventory

- Kosipo/Cedar Kokoti (*Entandrophragma candollei*) – 8 individuals identified in forest inventory
- Sapele/Sapelli (*Entandrophragma cylindricu*) – 3 individuals identified in forest inventory
- Sipo/Sipo Mahogany/Utile (*Entandrophragma utile*) – 1 individuals identified in forest inventory
- Tiama (*Entandrophragma angolense*) – 5 individuals identified in forest inventory

By ceasing logging operations in the project area, the project proponent has protected these high conservation value species during this monitoring period.

8.3.2.2 Vulnerable faunal species

The project has two vulnerable faunal species that have breeding populations within the project zone, including:

- Dwarf crocodiles (*Osteolaemus tetraspus*)
- African Grey Parrots (*Psittacus erithacus*)

While the precise effect that the project has had on these species is not known, the project, by protecting habitat, contributes to the conservation of these species.

9 ADDITIONAL INFORMATION

There is no additional information.

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