

MONITORING REPORT FOR THE PROJECT *EVIO KUIÑAJI ESE' EJA* CUANA, TO MITIGATE CLIMATE CHANGE, MADRE DE DIOS - PERÚ



Document Prepared by Asociación para la Investigación y el Desarrollo Integral – AIDER

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1 PROJECT DETAILS

1.1 Summary Description of Project

Madre de Dios is the Amazon region of Peru that records the highest levels of biodiversity in the country, a characteristic that gave it the title of Capital of Biodiversity of Peru in 1994. It is the natural habitat of endangered animal species such as the black caiman (*Melanosuchus niger*), the harpy eagle (*Harpy Eagle*), giant otter (*Pteronura brasiliensis*) and economically important forest species such as the chestnut (*Bertholletia excelsa*).

Madre de Dios historically has had low levels of deforestation, improved accessibility due to the construction of the South Inter-Oceanic Highway, is increasing the migration and thus, changing land use and forest degradation, the impact can be huge considering the good condition in which we find this area of the country. In this scenario, the advancement of informal gold mining fueled by the rising price of gold, which mode of extraction is highly polluting and causing deforestation in areas adjacent to the rivers of the region, it's added to the problem.

The project will be developed in the area of Ese'eja Infierno Native Community and its Eco-tourism Concession located in the Madre de Dios region, these areas belong politically to the province of Tambopata and Tambopata district, adding a total area of 7749.93 hectares. The purpose of the project is to conserve forests and granting community against the advance of deforestation.

The project aims to reduce the pressure to change the use of land in the project area through the promotion of sustainable economic activities, forest governance and the establishment of conservation agreements previously identified critical areas. These actions are aimed at consolidating a "barrier" against the encroachment of economic (agricultural), carried out in partnership and ongoing coordination with institutions currently conducting conservation activities in the area.

Also strengthen the control and monitoring system of the community and its concession, emphasizing on the formation and operation of forest guards, which have an official recognition of the Regional Directorate of Forestry and Wildlife of Madre de Dios, the representing a community engagement strategy.

With these actions, the project hopes to avoid an annual average net emission of 117,676.00 tCO₂ -e according to the reference scenario projected during the first period of 10 years, in which, because of migration and occupation of the land that promotes the operation of the South Inter-Oceanic Highway, averaging 289.76ha deforested per year.

The project includes benefits for the people concerned and to the conservation of biodiversity, beyond the benefits of reducing GHG emissions. To demonstrate this, the project has applied the standards of the Climate, Community & Biodiversity Association (CCBA).

1.2 Sectoral Scope and Project Type

Sectoral scope 14 – Agriculture, Forestry and Other Land Use

AFOLU project category: Reduced Emissions from Deforestation and Degradation (REDD)

Activity type: Avoiding Unplanned Deforestation and Degradation (AUDD)

The project activity was defined according to the decision tree that is in the methodology (REDD-MF, see section 2.1). It is expected that forest land is converted to non-forest in the scenario without the project, lacking of legal authorization for conversion to non-forest.

The project is individual, not a group

1.3 Project Proponent

PDD preparation is framed in the project "Sustainable forest management and use of ecosystem services in managed forests of Ese'Eja Native Community of Infierno" executed by AIDER and funded by the International Tropical Timber Organization (ITTO), through its thematic Program on Reducing Deforestation and forest Degradation and Enhancing environmental Services in tropical Forests (REDDES).

Native Community Ese'Eja Infierno and NGO AIDER- Research and Integrated Development Association will be the project proponent.

Table 1. Description and responsibilities of the project proponents

Entity	Description	Roles/responsibilities
Ese'Eja Infierno Native Community Contact: Federico Javier Durand Torres y Rulier Aguirre Mishaja Address: La Joya Highway Km. 19 Chonta-Infierno, Puerto Maldonado City, Tambopata Province, Madre de Dios Region, Perú. Email: durandfederico@yahoo.com.pe c.n.infierno@hotmail.com	<p>The Community as a legal entity is officially recognized by Resolution N°. 61-OAJAFORAMS-VII-76 issued on April 20, 1976 issued by the Regional Sub Directorate of Agriculture and registered in the Native Communities of Cusco Records Volume 1 Folio 21 Seat 21 Agrarian Region XX. Also its legal status is duly registered under certificate N°. 11002278 of the Legal Persons Book, Peasant and Native Communities Registration of the Madre de Dios Registry Office.</p> <p>Their social and cultural composition is heterogeneous because it has various ethnic groups inside such as pure Ese'Eja natives themselves, settlers from the forest (riparian descendants from Amazonian indigenous of the northern jungle brought to Madre de Dios for rubber chiefs) highlands of the country and mestizos.</p>	<p>Forest owners committed to work to protect and manage the forest under a REDD + project</p> <p>Develop the activities involved in REDD+ strategies to avoid deforestation and forest degradation in the community forest.</p> <p>Comply with the obligations described herein, for forest conservation and generate additional revenue for the development of productive activities compatible with forest conservation.</p>

Entity	Description	Roles/responsibilities
Asociación para la Investigación y Desarrollo Integral – AIDER Contact: Jaime Nalvarte Armas Address: Av. Jorge Basadre 180 Oficina 6 – San Isidro. Lima, Perú Telephone: (51 1) 421 5835 Email : lima@aider.com.pe	Peruvian NGO leader on REDD+ and CDM projects, with over 25 years of experience in forestry projects, including forest management, reforestation and nature conservation, working with businesses, indigenous communities and promoting eco-business for small landowners.	Design and development of the project.

1.4 Other Entities Involved in the Project

N/A

1.5 Project Start Date

Project start date: July 01, 2011

1.6 Project Crediting Period

Project crediting period: 20 years (July 01, 2011 – June 30, 2031).

First period of quantified GHG emission reductions: 10 years (July 01, 2011 – June 30, 2021).

1.7 Project Location

Project Area Name: Ese'jea Infierno Native Community

The Project area is located politically in the Tambopata district, Tambopata province, department and región of Madre de Dios, Republic of Peru. It comprises an area of 7749.93 ha of forest that corresponds to the area of the community forest and the ecotourism concession.

1.8 Title and Reference of Methodology

Approved VCS Methodology VM0007, REDD Methodology Modules (REDD-MF) version 1.4, developed by Avoided Deforestation Partners. The modules used for monitoring were the following:

- Module VCS VMD0015 “Methods for monitoring of greenhouse gas emissions and removals” (M-MON); version 2.1
- Module VCS VMD0010 “Estimation of emissions from activity shifting for avoided unplanned deforestation” (LK-ASU), version 1.0.
- Module VCS VMD0013 “Estimation of greenhouse gas emissions from biomass burning” (E-BB), version 1.0.

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

Status of implementation of the project: underway. The strategy for achieving emission reductions presented in the Project Description has been consolidated in the REDD Strategy document project management "Kuiñaji Ese'Eja Evio Cuana, to mitigate climate change, Madre de Dios – Peru". The monitoring period has been initiated as part of the implementation of the document management in the following activities:

- **Economic activities:** Harvesting and management of community forests; practical training in the use and management of forests, chestnut and palm trees, agroforestry technical training.
- **Forest Governance:** Developing and/or updating the community life plan, update statutes and internal regulations of the community, developed and/or updated guidelines for the operation of the domestic institutions of the community; developing a strategy for the implementation of zoning of communal land; implementation of zoning of the territory of the community; training youth leaders and leaders of the community.
- **Communication and dissemination:** Participatory development of a communication strategy on management and use of natural resources considering cultural aspects; creating mechanisms for internal and external communication about activities in the community.

Annex 1 is the ratio of activities performed during the monitoring period, with relevant supporting documentation.

For **Leakage Monitoring** (determining the amount of deforestation in the leakage belt is actually attributable to the project activity), will implement community monitoring plan developed based on the criteria contained in the Project Design Document validated under standards of the Climate, Community & Biodiversity Alliance (CCBA), this information will be crossing every five years. The estimated proportion of deforestation caused by immigrant populations used to calculate leakage will be estimated every 5 years based on the data that can be obtained from the National Institute of Statistics and Informatics - INEI.

With regard to the **Monitoring and Non-permanence Risk Factors Management**, the following factors will be found subject to monitoring:

- **Internal Risk**
- Project Management
 - The risk of invasion by outsiders threaten over 50% of the carbon stored on which loans have been issued previously will be monitored every five years.
 - As part of the annual evaluation of AIDER staff, Institutional Monitoring will maintain a multidisciplinary team that includes individuals with all the skills necessary for the implementation of project activities.
- Financial Viability
 - The cash flow of the project will be monitored in year 5, in order to check whether the equilibrium point was reached in accordance with the provisions in the evaluation of non-permanence risk

- **External Risk**
- Populations Involvement
 - It is planned to make consultations to committees and resource user groups within the community, who make up the population potentially affected by the project in the project area¹; this will be done twice a year.
 - Implementation of community monitoring plan will evaluate the project's positive net impacts on behalf of the population.
- Political Risk: the World Bank governance rate will be monitored annually.
- **Natural Risk**
- Fire: fires are monitored annually, using the procedure described in Annex 4.
- Pests and diseases: information is collected annually by the Regional Agrarian Direction.
- Extreme weather events: data are compiled annually from the National Service of Meteorology and Hydrology - SENAMHI ²

Non-permanence risk assessment is in Annex 2.

2.2 Project Description Deviations

There were no deviations.

2.3 Grouped Project

Not applicable.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	Forest/Non-Forest Cover Regional Map
Data unit:	-
Description:	Map showing the location of forest land within the reference region, the project area and leakage belt at the start of the crediting period
Source of data:	Landsat 8. GPS points taken in the case of field verifications.
Value applied:	-
Purpose of the data:	Serve as a reference for the amount of forest cover and deforestation
Any comment:	-

¹Bounded in the project design document CCB, according to the definition in the CCB Standards

²http://www.senamhi.gob.pe/include_mapas/_dat_esta_tipo.php?estaciones=000808

Data Unit / Parameter:	<i>COMFi</i>
Data unit:	Dimensionless
Description:	Combustion factor for stratum <i>i</i> (vegetation type)
Source of data:	Default values in Table 2.6 of IPCC, 2006 (Annex 2).
Value applied:	0,5
Purpose of the data:	Used to determine GHG emissions from biomass burning.
Any comment:	-

Data Unit / Parameter:	<i>G gi</i>
Data unit:	dimensionless
Description:	Combustion Emission factor for stratum <i>i</i> for gas <i>g</i> - source of data
Source of data:	Defaults can be found in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (see Annex 2: emission factors for various types of burning for CH ₄ and N ₂ O).
Value applied:	6,80 para CH ₄ y 0,20 para N ₂ O en bosque tropical
Purpose of the data:	Used to determine GHG emissions from biomass burning.
Any comment:	-

Data Unit / Parameter:	<i>PROP/IMM</i>
Data unit:	%
Description:	Estimated proportion of deforestation caused by immigrant populations
Source of data:	INEI, 2007
Value applied:	0.0316
Purpose of the data:	Determine the area deforested by immigrants outside the leakage belt and project area under the project scenario
Any comment:	-

3.2 Data and Parameters Monitored

Data Unit / Parameter:	Forest cover monitoring map in the project area
Data unit:	-
Description:	Map showing the location of forest land within the project area at the end of each monitoring period. If within the project area some forest land is cleared, the comparison with the benchmark map must show the deforested areas in each monitoring event
Source of data:	Landsat 8 Images. Points taken on the GPS for all field checks
Description of measurement methods and procedures to be applied:	Image interpretation by software using geographic information systems.
Frequency of monitoring/recording:	Annual
Value monitored:	7 700,64 ha
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Softwares ENVI 5.0 and Arc GIS 9.3.1 GPS Garmin Oregon600
QA/QC procedures to be applied:	The deforestation map will be validated in the field through an unaligned systematic sampling and calculation accuracy and errors of commission and omission by a confusion matrix. The minimum map accuracy is 90%, according to the specifications in the module M-MON The mapping will be according to Standard Operating Procedures developed for this purpose.
Calculation method:	It will refer to the classified image of the previous year, which will be updated with new areas of "non-forest" generated by the software and knowledge in the area of remote sensing analyst, in this way, the area shall be demarcated forest for this present monitoring event. The accuracy of the map is calculated by comparing with the data field.
Any comment:	

Data Unit / Parameter:	Map of forest cover monitoring leakage belt
Data unit:	
Description:	Map showing the location of forest land within the leakage belt area at the end of each monitoring period.
Source of data:	Landsat 8 Images. Points taken on the GPS for all field checks
Description of measurement methods and procedures to be applied:	Image interpretation by software using geographic information systems.
Frequency of monitoring/recording:	Annual
Value monitored:	9 066,37 ha
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Softwares ENVI 5.0 and Arc GIS 9.3.1 GPS Garmin Oregon600
QA/QC procedures to be applied:	The map will be validated in the field through an unaligned systematic sampling and calculation accuracy and errors of commission and omission by a confusion matrix. The minimum map accuracy is 90%, according to the specifications in the module M-MON The mapping will be according to Standard Operating Procedures developed for this purpose.
Calculation method:	It will refer to the classified image of the previous year, which will be updated with new areas of "non-forest" generated by the software and knowledge in the area of remote sensing analyst, in this way, the area shall be demarcated forest for this present monitoring period. The accuracy of the map is calculated by comparing with the data field.
Any comment:	

Data Unit / Parameter:	<i>Aburn</i> , <i>i,t</i>
Data unit:	Ha
Description:	Sum of burned areas within the project area during the monitoring period
Source of data:	Landsat 8 Images. Points taken on the GPS for all field checks

Description of measurement methods and procedures to be applied:	Image interpretation by software using geographic information systems.
Frequency of monitoring/recording:	Annual
Value monitored:	17,02 ha
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Softwares ENVI 5.0 and Arc GIS 9.3.1 GPS Garmin Oregon600
QA/QC procedures to be applied:	It will validate the burned areas map through a sampling of 10% of the total analyzed area, noting that the cabinet map classes correspond to reality field. The minimum map accuracy is 90% The mapping will be according to Standard Operating Procedures developed for this purpose.
Calculation method:	Landsat 8 satellite images will be analyzed by the characteristics of their spectral signatures, the shades of color and shapes; subsequently training samples extracted from the image and assigned maximum likelihood algorithm extracting the areas of interest. Finally, there will be a post-classification to eliminate those pixels that are isolated in the area.
Any comment:	

Data Unit / Parameter:	$A_{DefPA,i,t}$
Data unit:	Hectares
Description:	Deforestation area recorded in the project area in stratum i at monitoring time
Source of data:	Landsat 8 Images
Description of measurement methods and procedures to be applied:	Image interpretation by software using geographic information systems.
Frequency of monitoring/recording:	Annual
Value monitored:	49,3 ha
Monitoring equipment:	Computer (desktop/laptop) with i7 processor with 6 GB of RAM memory. Software Arc GIS 9.3.1
QA/QC procedures to be applied:	It will validate the burned areas map through a sampling of 10% of the total analyzed area, noting that the cabinet map classes correspond to reality field. The minimum map accuracy is 90%

	The mapping will be according to Standard Operating Procedures developed for this purpose.
Calculation method:	It will refer to the classified image of the previous year, which will be updated with new areas of "non-forest" generated by the software and knowledge in the area of remote sensing analyst, in this way, the area shall be demarcated forest for each monitoring event. The accuracy of the map is calculated by comparing with the data field.
Any comment:	

Data Unit / Parameter:	$A_{DefLB,i,t}$
Data unit:	Hectares
Description:	Deforestation area recorded in the leakage belt in stratum i at monitoring time
Source of data:	Landsat 8 Images
Description of measurement methods and procedures to be applied:	Image interpretation by software using geographic information systems.
Frequency of monitoring/recording:	Annual
Value monitored:	291,26 ha
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Software Arc GIS 9.3.1
QA/QC procedures to be applied:	<p>It will validate the burned areas map through a sampling of 10% of the total analyzed area, noting that the cabinet map classes correspond to reality field.</p> <p>The minimum map accuracy is 90%</p> <p>The mapping will be according to Standard Operating Procedures developed for this purpose.</p>
Calculation method:	<p>It will refer to the classified image of the previous year, which will be updated with new areas of "non-forest" generated by the software and knowledge in the area of remote sensing analyst, in this way, the area shall be demarcated forest for each monitoring event.</p> <p>The accuracy of the map is calculated by comparing with the data field.</p>
Any comment:	Ex - ante, will be an estimate of the deforestation in the leakage belt for the project scenario, according to the procedures in the module M-MON

Data Unit / Parameter:	$A_{DegW,i}$
Data unit:	Hectares
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	Landsat 8. Forest custodian reports on opening of roads and illegal logging. Map location of the physical components of the project area and leakage belt.
Description of measurement methods and procedures to be applied:	Delimitation of the area potentially subject to forest degradation
Frequency of monitoring/recording:	Quinquennial
Value monitored:	-
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Software Arc GIS 9.3.1
QA/QC procedures to be applied:	Workshop developed throughout the five-year monitoring equipment (professional and forest guards) to redefine the area potentially subject to degradation.
Calculation method:	It is considered that the entire project area is potentially subject to degradation, due to its location, the presence of nearby settlements, roads, and previous reports of invasion of loggers. This definition will be evaluated every five years by the trustees' reports about invading forest loggers, as well as with expert knowledge of the area and degradation activities.
Any comment:	-

Data Unit / Parameter:	AP_i
Data unit:	hectares
Description:	Total area of degradation sample plots in stratum i
Source of data:	Field Measurements
Description of measurement methods and procedures to be applied:	Random systematic sampling, covering the entire surface area potentially subject to degradation.
Frequency of monitoring/recording:	Quinquennial

Value monitored:	80 has been sampled by a total of 20 000 m transects 40 m wide, distributed systematically in the area potentially subject to degradation.
Monitoring equipment:	GPS Garmin Oregon600 Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Software Arc GIS 9.3.1
QA/QC procedures to be applied:	The field survey data will be done according to Standard Operating Procedures developed for this purpose.
Calculation method:	Cabinet processing information gathered in the field, using software GIS
Any comment:	

Data Unit / Parameter:	$C_{DegW,i,t}$
Data unit:	t CO ₂ -e
Description:	Carbon biomass of trees cut and removed in the process of degradation in stratum i at time monitoring
Source of data:	Field Measurements
Description of measurement methods and procedures to be applied:	Field measurements according to the procedure described in M-MON module.
Frequency of monitoring/recording:	Quinquennial
Value monitored:	104,18 t CO ₂ -e
Monitoring equipment:	caliper
QA/QC procedures to be applied:	The collection of data in the field is done in accordance with Standard Operating Procedure developed for this purpose
Calculation method:	Allometric equations used to calculate biomass (Brown, 1997, cited by Pearson et al., 2005) and groundwater (Cairns et al., 1997, cited in IPCC, 2003).
Any comment:	

Data Unit / Parameter:	$A_{DistPA,q,i,t}$
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Data unit:	Ha
Description:	Area impacted by natural disturbances in stratum i converted to project natural disturbance stratum q at time t, ha
Source of data:	Image interpretation by software using geographic information systems. GPS points taken in the case of checks in the field.
Description of measurement methods and procedures to be applied:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Software Arc GIS 9.3.1
Frequency of monitoring/recording:	Annual
Value monitored:	0
Monitoring equipment:	Computer (desktop/laptop) with i7 processor and 6 GB of RAM memory. Software Arc GIS 9.3.1 GPS Garmin Oregon600
QA/QC procedures to be applied:	Georeferenced photographic record of the disturbance
Calculation method:	It will refer to the classified image of the previous year, which will be updated with new areas of "non-forest" generated by the software and knowledge in the area of remote sensing analyst. Field will be verified and recorded disturbance characteristics in a format
Any comment:	

Data Unit / Parameter:	$V_{EXT,j,z,it}$
Data unit:	m^3
Description:	The amount of wood from species j for use stratum z, in stratum i at time t
Source of data:	Timber harvesting Records
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Annual
Value monitored:	139,62
Monitoring equipment:	

QA/QC procedures to be applied:	
Calculation method:	Volume is divided by 424 board feet, to obtain the number of cubic meters
Any comment:	

3.3 Description of the Monitoring Plan

The purpose of monitoring is to obtain the information necessary to estimate the amount of emissions avoided during the crediting period , evaluate the effectiveness of project activities and collect all the information needed to ensure the achievement of the emission reduction targets of the project .

Monitoring activities include the use of remote sensing and in- situ inspections. The combination of both sources results in the estimates and calculations required to determine whether the project is being developed in accordance with the VCS -PD.

For monitoring of the areas subject to deforestation and forest degradation and associated emissions, we will use the VCS module VMD0015 "Methods for monitoring GHG emissions and removals "(M -MON) also report that the leakage project causes the displacement of activities are implemented according to the VCS VMD0010 Module "Estimation of emissions from activity shifting for avoided unplanned deforestation" (LK -ASU). As for the estimation of GHG emissions other than CO₂ produced by burning biomass, is used VMD0013 VCS Module "Estimation of GHG emissions from biomass burning" (E -BB). The remaining carbon stored in wood products reservoir long-term, as a result of logging activities will be calculated using the VCS module contents VMD0005 Estimating carbon in the wood products long (CP- W), and finally, we will use the "Tool for testing significance of GHG emissions in project activities a / R CDM " (T -SIG), in order to evaluate suitability rule emission sources and fugitive sources reservoir timber products long lasting.

Conservatively be considered that carbon stocks in aboveground biomass and belowground biomass remains constant, so that will not be monitored. Also omitted, conservatively, secondary forest growth (increased carbon), considering, however, the mosaic of secondary forest and agricultural activity as a single category, this is due to complications involving forests discern secondary and agricultural management areas (by similarity of visual and spectral characteristics) on the pixel size of the images to be used.

Monitoring of the change of land use, based on Landsat 8 will be held annually, involving all the changes in forest cover. We calculate the deforested area (in hectares) within the project area and leakage belt. Also, once generated the map of deforestation, it will be validated through a nonaligned systematic sampling in the field.

On the other hand, is monitored annually on fire area that may affect the project activities through the online reporting system provided by NASA, USA

Spatial information that may be provided by government entities will be updated annually.

Monitoring will be conducted by a professional team of Monitoring, to be found in the cities of Lima and Puerto Maldonado, incorporating the Trustees Forest Native community members Ese'eja

Infierno. The professional team is accountable to the Coordinator of AIDER Environmental Services, based in Lima.

Institutional Monitoring, Project Monitoring and Quality Assurance and Control are in charge of the monitoring equipment in the city of Lima. Socio- environmental Monitoring is in charge of monitoring equipment Puerto Maldonado. The work of the Monitoring of emissions is shared between the two venues.

Monitoring in- situ , by the professional team of monitoring will be conducted in coordination and collaboration with the Community Forest Guardians, who will bear primary responsibility for data collection in the field, being trained for this purpose and with advice technique while performing the assigned activities.

All monitoring activities will be implemented using Standard Operating Procedures (SOPs) will be developed by the project team. The staff will be trained continuously to ensure data quality.

The Group Assurance and Quality Control program audit visits to verify compliance with the SOPs; also choose random processes to verify the correct implementation of the SOPs.

The monitoring data are stored and processed in the cities of Puerto Maldonado and Lima.

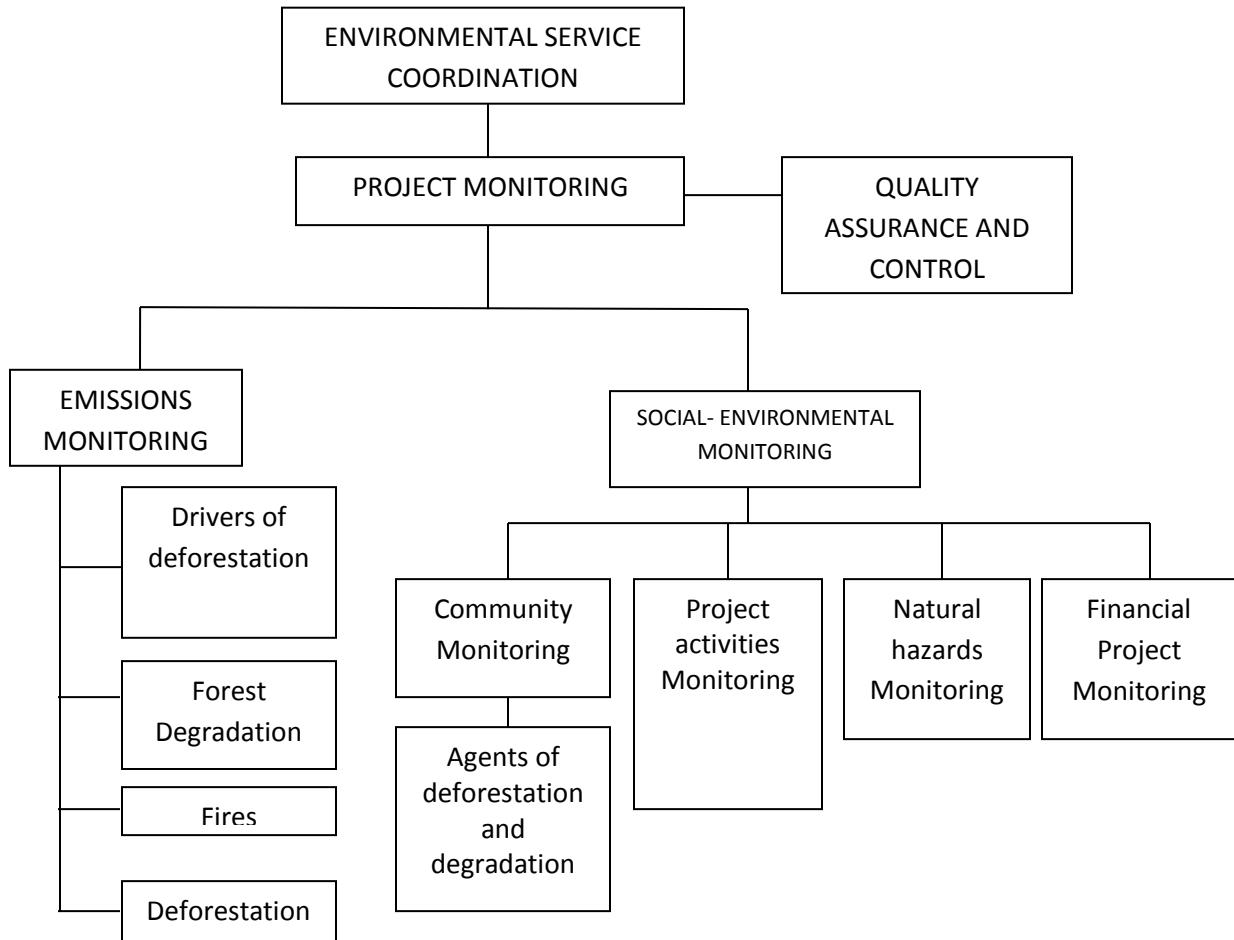


Figure 3 Monitoring Organization

- **Baseline Review**

The baseline will be reviewed every 10 years. Will update the deforestation rate for the reference region, the project area and leakage belt, as well as the drivers of deforestation also be verified carbon stored information, evaluating the 10% of the plots in each stratum raised for determining the baseline scenario. Using this update will adapt the model of deforestation in the baseline scenario for the project area and leakage belt, projecting again deforested areas and calculation of carbon emissions in the baseline scenario for the next period.

- **Monitoring of actual changes in carbon stocks and GHG emissions**

Was performed using software to process and interpret geographic satellite imagery complemented field verifications, the parameters are subject to monitoring in section 3.2. The following describes the procedure, according to the stipulations of the module M-MON.

STEP 1. Selection and analysis of data sources change of land use and coverage

The entire procedure is in Annex 3.

At the end of the monitoring period:

- Forest Cover Maps for the project area and leakage belt were elaborated (see Annex 6).
- Area categories "forest" and "non-forest" within the project area and leakage belt were obtained.

Table 2 Area of forest and non-forest in the project area and leakage belt

Category	Forest (ha)	Non-forest (ha)
Project Area	7 700,64	49,3
Leakage Belt	9 066,37	291,26

- The remaining area of forest in the reference region was updated, giving a total of 1 033 353.59 ha.

Detailed results are in Annex 3.

STEP 2. Interpretation and analysis**2.1 Deforestation Monitoring**

Monitoring deforestation is done according to the procedure described in Annex 3. Estimates of emissions from deforestation are found in Annex 7.

2.2 Forest degradation Monitoring**2.2.1 Monitoring degradation caused by extraction of trees for firewood and illegal wood**

The degradation monitoring is performed according to the procedure described in Annex 5.

2.2.2 Monitoring degradation due to selective cutting of forest management areas that have a FSC certificate

Not applicable because there are no FSC forest management areas within the project area. Emissions from forest harvesting operations within the project area have been estimated and considered de minimis.

2.3 Monitoring areas subject to natural disturbance

It is emphasized that the procedures for mapping deforestation (Step 1 and Step 2.1) take into account all changes in coverage, whether natural or human causes. To the extent that new software is available to measure small-scale changes in coverage, will be incorporated into the monitoring procedures. Moreover, field monitoring conducted by the Forest custodians, with the advice of the professional team, emphasize the detection and evaluation of natural disturbances when they occur.

In interviews to forest custodians and timber committee (see Annex 13), was determined that the main natural phenomenon that creates disturbances in the vegetation is the occurrence of strong winds, which open gaps in the canopy of the forest, but the small area of these openings, which add up to

approximately 0.25 ha, were not included in the calculation of emissions, since emissions from these disturbances do not reach 5 % of the profits generated by the project.

Emissions from burning are considered project emissions. According to the specifications in the module M-MON, any fire emissions were calculated using E-BB module (see item 2.5 *Monitoring project emissions*).

2.4 Monitoring areas subjected to increased carbon content

Carbon increased for forest regrowth was omitted conservatively, according specified in the Project Description.

2.5 Monitoring Project Emissions

Burned areas were delimited during the monitoring period, in order to calculate the emissions produced by fires according to the procedure contained in the module E-BB; a method for mapping burned areas is in Annex 4.

- Monitoring changes in carbon stocks and GHG emissions due to leakage**

The relevant parameters for monitoring activity-shifting leakage are found in section 3.2. Deforested areas will be monitored in the leakage belt, seeking as far as possible, cross the field verification information with social monitoring information across populations (according to the standards of the Climate, Community & Biodiversity Association), to confirm that leaks are indeed attributable to project activity.

- Monitoring measures to avoid deforestation and reduce the risk of leakage**

Implementation of the REDD Strategy Project "kuiñaji Ese'Eja Evio Cuana, To Mitigate Climate Change, Madre de Dios – Peru is monitored annually, this is a management document showing the project activities described in section 1.8 of PD, through the measurement of targets and indicators and based on information obtained from community monitoring.

Emissions that could produce the project activity are considered insignificant, because the level of technology selected (see section 1.7 of the PD) and selected emission sources (see section 2.3 of the PD).

- Estimate of net ex-post changes in carbon stocks and GHG emissions**

The estimated ex-post net changes in carbon stocks will be conducted according to the methodology REDD-MF. The procedure is developed in Annex 7.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Net emissions in the reference scenario for the monitoring period 2011-2012 are 83 814.32 tCO₂-e, according to the calculations presented in the Project Description.

4.2 Project Emissions

Emissions from the project activity have been considered insignificant, according to the explanation given in Section 2.3 of the Project Description and evaluation of significance of the emissions produced by burning (see Spreadsheet – Emissions the project.xls).

4.3 Leakage

Emissions produced by leaks have been considered equal to zero, according to the methodology procedure.

4.4 Summary of GHG Emission Reductions and Removals

Table 4 Total net reductions of GHG emissions for the monitoring period

Net GHG emissions in the baseline scenario; t CO ₂ -e ΔC_{BSL}	Net GHG emissions within the project area in the scenario with project; tCO ₂ -e ΔC_P	Net GHG emissions due to leakage; t CO ₂ -e ΔC_{LK}	Total net reductions of GHG emissions (tCO ₂ -e) $C_{REDD,t}$
83 814,32	35 496,12	0	48 318,20

The amount of Voluntary Carbon Units (VCUs) is shown in Table 5, for this calculation, 12% of net annual emissions reductions was subtracted, which is the reserve of credits for non-permanence risk, calculated according to AFOLU non-permanence risk tool (VCS Version 3), the development of the tool and the calculation of the reserve is in Annex 2.

Table 5 Voluntary Carbon Units

Net GHG emission reductions (tCO ₂ -e)	AFOLU pooled buffer account (13 %)	Voluntary Carbon Units
48 318,20	5 798,18	42 520,02

5 ADDITIONAL INFORMATION

- Annex 1 - List of project activities
- Annex 2 - VCS Non-Permanence Risk Report
- Annex 3 - Deforestation Monitoring Report
- Annex 4 - Burned Areas Monitoring
- Annex 5 - Degradation Monitoring
- Annex 6 - Project Area and Leakage Belt Monitoring Map 2011-2012
- Annex 7 - Calculation of emission reductions
- Annex 8 - POE Deforestation Monitoring
- Annex 9 - POE Burning Monitoring
- Annex 10 - POE Monitoring forest degradation
- Annex 11 - POE Storing Information
- Annex 12 – Forest – Non Forest Cover Map June 2011
- Annex 13 - Report of the interview with forest custodians and timber committee on natural phenomena that affect forests in Infierno Native Community.
- Spreadsheet - Emisiones del Proyecto REDD.xls