

MADRE DE DIOS AMAZON REDD PROJECT

MONITORING REPORT



Document Prepared by Greenoxx NGO, Maderacre and Maderyja

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1 PROJECT DETAILS

1.1 Summary Description of Project

The proposed project activity consists of sustainable forest management in the certified timber concessions “Maderera Río Acre S.A.C. and Maderera Río Yaverija S.A.C.” in Madre de Dios department, South East of Peru, in the Peruvian Amazon.

Both timber concessions have signed long term concession contracts¹ with the Peruvian State in May 2002 for 40 years, renewable for 40 more years, totaling 80 years of contract, for an area of 98.932² hectares (49.376 hectares for Maderacre and 49.556 hectares for Maderyja), which explicitly give Maderacre and Maderyja legal rights to the whole concession area and to all the environmental services included in it. No current or future conflicts regarding the use of the land have been detected within the concessions and no people are currently living within the concessions area. According to the SCS Final CCBA Validation Report of the Madre de Dios Amazon REDD Project³, the two forest concessions, Maderacre and Maderyja, have the exclusive rights to the environmental services within the project area, including forest carbon.

The project area is located less than 30 km to the side of the inter-oceanic road that unites Brazil with the Peruvian ports, in the region that belongs to the Vilcabamba-Amboró Conservation Corridor in the Peruvian Amazon, one of the world biodiversity hotspots.

The area of influence of the Interoceanic road is characterized for still having areas of forests of great importance for their biodiversity and the environmental services they offer.

The area is different from other areas next to roads, where its presence has notoriously impacted in the landscape and natural resources.

However, the presence of the inter-oceanic road represents a great risk due to a major pressure of population from rural Andes regions that is migrating looking for lands, and the economical activities that will consequently be established. In this sense, it is relevant to consolidate the sustainable management of the area, as it is the case of forestry concessions with timber and non timber destination, private areas and protected natural areas.

¹ Both contracts will be available to the auditors.

² Total number of hectares according to the concession contracts between the concessions and the State. This information was generated by the Center of Forest Statistical Information (CIEF - Peru Digital), which was the source employed in 2002 when the concessions were granted. As will be seen in BL-UP, net forest area is 97,817.41 ha, less than this area considering that it has been based in forest map developed by IIAP and shapes from this source overlap only this extension with the project area.

³ SCS Final CCBA Project Validation Report Madre de Dios Amazon REDD Project, Puerto Maldonado, Peru, December 2009, at www.climate-standards.org/projects/files/madre_peru/CCB_Greenoxx_MM_RPT_FINAL_ValidationReport_with_VCS_Comments_011510.pdf

Another secondary source of risk for the future could come from illegal logging, which may affect in a much lower level of risk, the project area. Illegal loggers could be attracted in the future by the abundance of forestry species of high commercial value, as mahogany. Illegal logging, even though it does not necessarily deforest, if happens, could affect in the future the value of the forest and open roads that make accessibility easier, creating the conditions to future deforestation. However, it is clear from different independent studies and from the Participatory Rural Appraisal diagnosis (PRA conducted for the project) that this risk is not significant and the main reason for land use change has been, and remains, the installation of crops and pastures.

An environmental study of the Vilcabamba-Amboró Conservation Corridor was recently carried out by Peruvian NGOs⁴, which had as one of its objectives the identification of potential avoided deforestation projects to be implemented in the area.

The conclusion of this analysis was that obtaining revenue for the environmental services that the rainforest offers was the only way to preserve these areas. As a result of the abovementioned selection of projects with greater potential in the area of study, this project was identified.

The Madre de Dios Amazon REDD Project will dramatically reduce deforestation by increasing surveillance in the rainforest and benefiting local communities. The project has been validated on 2nd December 2009, according to the Climate, Community & Biodiversity Alliance (CCB Standards) by Scientific Certification Systems (SCS), which guarantees its social and environmental sustainability and validates that carbon calculations have been done following appropriate methodologies. This is furthermore enhanced by the fact that the project has obtained the maximum status within the CCB Standard: Gold.

According to the SCS Final CCBA Validation Report of the Madre de Dios Amazon REDD Project, the project is designed around the impending effects of a new trans-Amazonian, inter-oceanic road from Brazil to the Pacific Ocean and Peruvian ports. According to the public information provided by the Ministry of Transport and Communication of Peru⁵ (in Spanish Ministerio de Transportes y Comunicaciones), in the period 2008-2009 the following segments of the Inter-oceanic road were completely paved with the help of private investment:

- * Segment 2 of the IIRSA (South Inter-oceanic road), 167 km paved (Cusco). Beneficiary population: 1,328,980.
- * Segment 3 of the IIRSA, 390 km paved (Madre de Dios). Beneficiary population: 112,814.
- * Segment 4 of the IIRSA, 183 km paved (Puno). Beneficiary population: 1,432,800.

⁴ Recavarren Estares, Percy; Torres Padilla, Jorge; Sánchez Santiváñez, Marioldy: "Identificación de potencialidad de proyectos de secuestro de carbono en las zonas de influencia de la Carretera Inter-oceánica Sur", Informe Final, Junio 2007.

⁵ <http://www.mtc.gob.pe/portal/logros.htm>

In addition, until the paving of IOH, Madre de Dios was an isolated region, more integrated with Brazil than with the rest of the country. Before the construction of this highway, it could take 2-3 days to go to Cusco, while now it takes around 14 hours. This situation facilitates the immigration of new settlers into the region and the immigrant population is predicted to subsist by agricultural and agricultural livestock activities. Deforestation and forest degradation are a result of these activities. These effects are already visible in Brazil where the trans-Amazonian road has been completed for some time”.

In this sense, the SCS Final CCBA Validation Report of the Madre de Dios Amazon REDD Project mentions deforestation as the most likely land-use scenario in the absence of the project hinges, partially, on the projected population growth in the region surrounding the project area because population growth is the main driver for deforestation in the project area. Also, under the climate criteria, the projected population growth directly affects the projected deforestation and net climate benefit.

The Madre de Dios Amazon REDD Project seeks to reduce the pressure for lands by the local population in the project area and its buffer zone and to guarantee the sustainable forestry management of both timber concessions through the implementation of an avoided deforestation project that helps to generate higher commercial resources for the management of the area.

Additionality is unquestionable since current resources are not enough to cover the management of the whole area and therefore no adequate control and surveillance is being carried out. The presence of the new road will undoubtedly increment the migratory movement. If the companies do not achieve a greater presence in their concession, these areas could be invaded mainly by migratory farmers, losing as a consequence big areas of forest.

The sale of carbon credits in the international markets is the only alternative for obtaining economical resources to finance control and surveillance actions. In this sense, this additional revenue from carbon credits will be employed to contribute to the sustainable development of rural producers and indigenous people living in the buffer area through the financing of environmentally friendly productive projects and to reduce the vulnerability of the project area from external factors of deforestation and degradation through in field patrolling and satellite monitoring.

As stated in the SCS Final CCBA Validation Report of the Madre de Dios Amazon REDD Project, the projected cost of protecting the forests from impending immigration will strain the financial resources of Maderacre and Maderyja; project activities such as surveillance, community technical assistance and education are too expensive without a supplemental revenue source.

Project activities will be subsidized by the sale of carbon offset credits and will likely have measurable climate, community and biodiversity benefits.

Moreover, the management of this rainforest is done under FSC Certification which is a major and additional guarantee of the sustainability of the project and its long term permanence. All this process has been also supported by international NGOs such as WWF, CESVI and ProNaturaleza. In this sense, 96% of the area of both concessions is intended for forest production, while the remaining 4% of the area is set aside for protection.

Both timber concessions have the rights to the use of their wood for sawing and secondary transformation in their own industry and also for third parties.

In both concessions a polycyclic management system is developed based on natural regeneration to maintain the productive capacity of the forest as well as ecosystem stability. The cutting cycle is 20 years. Around 2-11 different timber species are being harvested annually at a rate of 2 m³.

As it was previously mentioned, the forest where the project is located is very important in terms of biodiversity conservation since it provides the habitat to four endangered rainforest species and eleven endangered wildlife species, as follows: Cedar (*Cedrela odorata*), Mahogany (*Swietenia macrophylla*), Wild fig tree (*Ficus anthelmintica*), Leche caspi (*Galactodendron utilisima*), Jaguar (*Panthera onca*), Red howler monkey (*Alouatta seniculus*), Giant anteater (*Myrmecophaga tridactyla*), Giant armadillo (*Priodontes maximus*), Lowland tapir (*Tapirus terrestris*), Red-and-green macaw (*Ara chloropterus*), Scarlet macaw (*Ara macao*), Blue-throated Piping-guan (*Pipile cumanensis*), Razor-billed Curassow (*Mitu tuberosum*), Sanborn's squirrel (*Sciurus sanborni*), Amazon dwarf squirrel (*Sciurus ignitus*).

From a social point of view, the project will contribute to the sustainable development of rural producers and indigenous communities (Yine and Huitoto tribes, indigenous people in voluntary isolation of Mashco Piro, Yora and Amahuaca tribes and other tribes not yet identified) living in the nearby areas.

In summary and according to the SCS Final CCBA Validation Report of the Madre de Dios Amazon REDD Project, the “without project” scenario is deforestation and degradation, while the “with project” scenario is sustainable forest management. As demonstrated by project proponents, avoided deforestation and degradation clearly have positive climate and biodiversity impacts. Moreover, project activities are specially designed to achieve positive community impacts in addition to avoiding deforestation and degradation.

As it was previously mentioned, the Madre de Dios Amazon REDD Project has been validated on 2nd December 2009 according to the CCB Standards, obtaining the maximum status Gold.

1.2 Sectoral Scope and Project Type

According to the sectoral scopes under the VCS Program⁶, the Madre de Dios Amazon REDD Project falls under the sectoral scope 14 Agriculture, Forestry and Other Land Use and according to the VCS AFOLU Requirements⁷ it falls under the definition of a Reduced Emissions from Deforestation and Degradation Project (REDD). Taking into account the definitions provided in the VCS AFOLU Requirements, the Madre de Dios Amazon REDD Project can also be broadly categorized as an Avoiding Unplanned Deforestation and Degradation (AUDD) Project (reduce net GHG emissions by stopping deforestation and/or degradation of degraded to mature forests that would have occurred in any forest configuration, can occur as a result of socio-economic forces that promote alternative uses of forest land and the inability of institutions to control these activities). In addition to this, the project occurs in a frontier deforestation, regarding the definition included in the VCS AFOLU Requirements which states that the frontier deforestation and/or degradation pattern can result from the expansion of roads and other infrastructure into forest lands; roads and other infrastructure can improve forest access and lead to increased encroachment by human populations, such as subsistence farming and fuelwood gathering on previously inaccessible forest lands.

In addition to this and as required by the REDD-MF Module⁸ of the applied REDD Methodology Modules, the following decision tree was used to identify the type of VCS-eligible REDD project activity:

⁶ http://www.v-c-s.org/sectoral_scopes.html

⁷ Agriculture, Forestry and Other Land Use Requirements (AFOLU), VCS Version 3, Requirements Document, 8 March 2011, v3.0.

⁸ According to the document: "Informe de emisiones totales en el Proyecto Madre de Dios Amazon REDD", Bosques Amazónicas Technical Area, application of the REDD-MF Module of the approved VCS REDD Methodology Modules, March 2011, which will be available to the auditors.

Is the forest land expected to be converted to non-forest land in the baseline case?			
YES ⁸		NO	
Is the land legally authorized and documented to be converted to non-forest?		Is the forest expected to degrade by fuelwood extraction or charcoal production, in the baseline case	
YES ⁹	NO	YES	NO
Avoided planned deforestation	Avoided unplanned deforestation	Avoided forest degradation	Proposed project is not a VCS REDD ¹⁰ activity currently covered by the module framework

When asked if the forest land is expected to be converted to non-forest land in the baseline case, the answer is YES, and when asked if the land is legally authorized and documented to be converted to non-forest the answer is NO. Therefore, deforestation is unplanned and the Madre de Dios Amazon REDD Project is a VCS Avoided Unplanned Deforestation project activity.

This project is not a grouped project.

1.3 Project Proponents

Maderera Río Acre S.A.C. (Maderacre), Maderera Río Yaverija S.A.C. (Maderyja) and Greenoxx NGO

Maderacre and Maderyja Forest Concessions: Private companies specialized in timber harvesting and processing. The forest concession has been given by the Peruvian State to the company in 2002, in the framework of a public auction convoked by INRENA (National Office responsible of the conservation of the natural resources).

Maderacre and Maderyja are two forestry companies, which until the first quarter of 2008 had constituted the Maderacre & Maderyja group that owned the forestry concessions for timber production of a 98,932 ha⁹ area in the region “Madre de Dios”. Since then, Maderyja was sold to a group of Chinese investors.

Although currently both timber concessions belong to different companies, they are still managed in an almost identical manner. Furthermore, the General Forestry Management Plan and most of the other tools used for the company decision making are still the same for both timber concessions.

⁹ Total number of hectares according to the concession contracts between the concessions and the State. This information was generated by the Center of Forest Statistical Information (CIEF - Peru Digital), which was the source employed in 2002 when the concessions were granted.

It is considered that the companies that have the best conditions to develop this type of projects are those which count with FSC Certification, since this guarantees that management will be sustainable, preserving the biodiversity of the forest. In this sense it is important to mention that both companies, Maderacre and Maderyja, have achieved the Forest Stewardship Council Certification in January 2007.

Both, Maderacre as Maderyja timber concessions, have the following clearly defined entrepreneurial vision: "We are an entrepreneurial strength that contributes to the development of our dreamed Tahuamanu".

Additionally, Maderacre & Maderyja are both leader companies recognized at the regional, national and international level for the quality of their wood products, characterized by the diversity of their timber and non-timber species and for the sustainable management of their forests, working under the highest forestry certification standards. They are also recognized for their contribution to improve the welfare and quality of life of their partners, workers and people in general, reinvesting some part of their profits in research and technology for the improvement of their entrepreneurial development.

Among their entrepreneurial values, it should be highlighted: leadership in quality, costs and caring for the environment; responsibility and discipline; honesty and loyalty; social responsibility and solidarity; commitment to the environmental sustainability.

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Regarding this item, the SCS Final Madre de Dios Amazon REDD Project Validation Report states that the management capacity is appropriate to the scale of the project as demonstrated by the list of project activities, size of management and experience of management. The concessions also employ and designate specific people in capacity to implement the community-based project activities. These attributes clearly demonstrate that management capacity is appropriate to the scale of the project.

It is stated also that based on the evidence provided and collected during the site visit, the technical skill set appears to be adequate to successfully implement the project.

GREENOXX NGO

Greenox's role in the project is that of project developer and seller of the carbon credits. Greenox also owns, as per the agreement with Maderacre and Maderyja the owner of 30% of the certificates of the project.

The Greenox Global Environmental Program is an environmental and forestry program created in 2003 by engineer Rocco Cheirasco and engineer Silvia Gomez Caviglia. Both are forestry engineers, specialized in environment and commercial strategy and marketing, with vast experience in the Kyoto Protocol and the Voluntary Markets.

GGEP integrates Forestry and Avoided Deforestation projects to the different markets such as the Clean Development Mechanism (CDM) of the Kyoto Protocol, regulated Voluntary Markets such as the Chicago Climate Exchange (CCX) and non regulated Voluntary Markets such as the CCB Standard, the VCS Standard, OTC, among others.

Greenox has been declared of National Interest by the Presidency of the Republic of Uruguay and of Ministerial Interest by the Ministry of Livestock, Agriculture and Fisheries and the Ministry of Foreign Affairs.

This innovative program has developed different areas, which carry out different activities such as Greenox Consulting and Greenox NGO. Greenox NGO is a non-governmental organization dedicated to combat Climate Change, an integrant of the Ammado Foundation, based in Dublin, Ireland, a network of more than 1800 non-profit organizations worldwide and a participant in the network of non-governmental organizations of the sustainable community, Wiser-Earth.

Greenox NGO was a Member of the Chicago Climate Exchange-CCX during its whole period of existence, being able to act as Offset Aggregator. As Offset Aggregator, Greenox NGO was responsible for the elaboration and registration of projects eligible for the CCX, as well as of submitting them for approval before the CCX Forestry Committee. It was also responsible for the presentation of annual reports and submission of the corresponding information to CCX officially approved verifiers. As Official Trader or Offset Aggregator, Greenox NGO was officially authorized to execute sales on the CCX Trading Platform on behalf of project owners.

At the same time, Greenox NGO integrated the CCX Forestry Committee, whose main responsibilities were the approval of commercial forestry and offset projects during Phase I and II, the technical revision of the quantification methodologies and the making of appropriate rule changes both in Phase I and II and for the future protocols that CCX is starting to elaborate. The Forestry Committee, integrated by Greenox NGO, did pioneering work in establishing new standards and protocols, being the first voluntary market which came operative worldwide.

Also, Greenox NGO was invited to integrate the CCX Technical Advisory Committee for Crediting Forest Conservation Projects. This technical advisory committee elaborated a protocol for crediting carbon preserved in forest conservation projects.

Likewise, Greenox NGO is developing REDD Projects (Reduced Emissions from Deforestation and Degradation) in different areas of the Amazon region.

In December 2009, the Madre de Dios Amazon REDD Project was approved according to the CCB Standards (Climate, Community and Biodiversity). Due to its high social and environmental sustainability the project obtained Gold Level, being one of first REDD projects worldwide to achieve said status. Madre de Dios Amazon REDD Project has been selected as pioneering and innovative project within the voluntary market and therefore has been chosen to integrate the reports elaborated by Amazon Conservation and Sustainable Development Institute – Idesam and The Nature Conservancy, which have been published during COP15. The project also integrates reports elaborated by Conservation International, the UNFCCC REDD web platform and the Woods Hole Research Center. The Madre de Dios Amazon REDD Project also counts

with FSC Certification which constitutes a requirement, in this case of Greenoxx NGO, for the development of this type of projects.

Currently Greenoxx NGO is developing two other REDD projects in Peru and Brazil.

The main objectives of Greenoxx NGO are the following:

- The promotion, development, encouragement, research and support in all its forms of the development of activities related to the Environment, Sustainable Development, Climate Change, Clean Development Mechanism of the Kyoto Protocol, Mitigation of Greenhouse Effect Gases and Ecology in General.
- Contribute to the research, studies and projects in all its stages, to make feasible the obtaining of the previously stated objects.
- Make possible an adequate technical training in different areas of these subjects, by means of courses, events, seminars, post-graduate courses of all kinds in Uruguay as well as abroad.
- To provide any tools needed for the specific training which allow placing environmental products abroad.
- To encourage a permanent updating in the environmental - commercial area, so as to understand in an adequate way the best possibilities to enter into the international market of carbon credits and others of similar characteristics.
- To foster and make feasible the study of greenhouse gases neutralization mechanisms, as is the case of forestry. To foster and make feasible studies which tend to decrease emissions of greenhouse gases, through new technologies.
- To promote and make feasible the holding of forums, seminars, symposiums, events, meetings and all kinds of actions related to the previously mentioned items.
- To make possible all kinds of actions which directly or indirectly promote improvements in life conditions of present and future generations.

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1.4 Other Entities Involved in the Project

- **BOSQUES AMAZONICOS SAC (BAM)**

BAM's role in the project: technical development of the deforestation modeling and assistance during the verification process.

BAM is a private company whose mission is to maximize the value of the forests through their conservation, recovering and sustainable management, in order to generate tangible benefits to local communities and our shareholders, while contributing to biodiversity conservation.

BAM developed a reforestation project in Ucayali, which has recovered 1000 hectares with native species, having obtained VCS and CCBA Gold Validation. In this same region, BAM has conserved 25000 additional hectares of primary forests.

In Madre de Dios, BAM is carrying out three REDD projects, together contributing to protect more than one million hectares; one of them in two Natural Protected Areas, another with chestnut concessionaires and the third with small timber concessionaires.

In all cases, the strategy is to give added value to their principal products (nuts, wood) in order to improve or increase the value of the standing forest in comparison to its alternative use. The three projects have their VCS and CCBS PDDs concluded and are in the process of initiating their validation processes.

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- **CESVI and WWF (World Wildlife Fund Inc.)**

CESVI's and WWF's role in the project: technical assistance in the process of carrying out environmental and social impact studies.

The Cooperation Agreement between Maderacre and Maderyja forest concessions and CESVI and WWF was signed in April 2005 with the main objective of working together to achieve the FSC Certification for both timber concessions. It is important to highlight that said objective was fully met and the FSC Certification was achieved with the technical and economical support of both organizations. Although this agreement was completely executed, following some details of its contents and the activities carried out are presented.

CESVI is an independent humanitarian association, founded in 1985, which works for the worldwide solidarity and social justice through humanitarian actions that contribute to consolidate the human rights.

WWF is one of the largest environmental organizations worldwide and its hard work to make a healthy, happy, thriving, living and ultimately diverse and wonderful world is globally well-known.

Hereunder, a summary of the activities that were carried out by the signing parties of the agreement is presented:

- Participate in chain of custody diagnostic evaluations within the forests and the saw-mill and give the needed logistic support for the development of said actions.

- Implement the suggested corrective actions as a result of the aforementioned diagnostic evaluations within the established deadlines and designing the adequate personnel of the concessions to do that.
- Design the contracts to be signed with any third party, in which all the obligations of each party are clearly defined.
- Comply and make others comply with the internal rules of the concessions in relation with the sustainability of the forestry management. In this sense, an internal rulebook must be developed and implemented.
- Participate actively in the accomplishment of the Organization's Handbook, which includes posts, proceedings and responsibilities.
- Cooperate in all the training courses that will be given to Maderacre & Maderyja staff on the process of implementation of the certification and its importance for the concessions.
- Acquire and give the needed security equipments for all Maderacre & Maderyja personnel, according to the work they have to develop. In this sense, Maderacre and Maderyja commit themselves to train and make their personnel comply with all the rules related to prevention and to the use of the adequate security equipment.
- Implement the correspondent corrective actions suggested by the WWF experts with respect to the needed improvements in terms of health services and camping sites of the concessions.
- Identify all the social actors neighboring the operations areas and how are they affected by them. Develop, in cooperation with CESVI and WWF, a relationship strategy with all of them and especially with the Native Community Belgium. To this end, a diagnostic evaluation, consultation, mapping and census of the neighbor population will be carried out, in order to identify and give priority to the social actors related with the forestry operations.
- Participate actively in the design and execution of the exploratory inventories. To this end, Maderacre and Maderyja commit themselves to give the needed logistic support for the infield operations and to designate the adequate key personnel to assure the internalization of these proceedings by the concessions.

- Participate in the development of the General Plan for Forestry Management of the concessions.
- Participate in the execution of the forestry census and in the setting up of the permanent plots.
- Support and participate in the training courses on directed harvesting, designing the adequate personnel to carry them out. With this purpose, Maderacre and Maderyja should provide the needed logistic support for the whole infield operations and workshops to be developed.
- Implement an accountant registry for all the operative costs of each activity (planning, construction of roads, felling of trees, extraction, transport, etc.). A responsible should be designed to be trained in handling said registry.
- Carry out an accountant registry for each production unit, with the aim to use the data from the accountant registries in the budgetary planning.
- Implement the mitigation measures as a result of the fauna evaluation that will be carried out by WWF and CESVI, and include them within the General Plan for Forestry Management of the concessions.
- Cooperate with WWF and the correspondent authorities in decreasing the occurrence of illegal activities from third parties as illegal logging, non-authorized occupation, land use changes, illegal commercialization of fauna and flora and illegal cultures of “coca” leaves.
- Respect to the native and rural communities: the signing parties recognized the importance of the mutual respect between the concessions rights and the rights and costumes of the neighbor native communities and local populations. Said mutual respect implies the development of actions that promote a healthy and proactive interaction between them.

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- **World Wildlife Fund Inc. (WWF)**

WWF's role in the project: agreement for the participation of the concessions on the Global Forest Trade Network of Peru, program managed by WWF.

The Participation on the Global Forest Trade Network (GFTN) of Peru Agreement between Maderacre and WWF was signed in August 2006 and in August 2007 for Maderyja. As the forest concession changed their owners last year (2008) both of them updated their commitments on April 2009.

Among WWF main goals in the framework of this agreement, it should be highlighted:

- ✓ to combat and eliminate all illegal logging activities in the forests;
- ✓ to promote the sustainable and responsible purchasing of forest products.

From WWF's point of view, the sustainable and responsible purchasing of forest products may play a substantial role in the extinction of illegal logging activities and in the promotion of a better management of forestry resources. Due to that, WWF has established a GFTN, which will enhance commercial relationships between companies that are voluntarily committed with the sustainable and responsible forest management. GFTN will also state some market requirements looking after the conservation of the forests in the whole world. GFTN considers the independent forest certification as an extremely useful tool to achieve these objectives.

The Global Forest Trade Network (GFTN - Peru) is part of the GFTN and is managed as a WWF Program. The participation on the GFTN is voluntary and is open to all productive, processing and commercial enterprises who participate in Peru market and which have the capacity of getting significant benefits, through their business framework, on forest conservation in the most affected areas.

Maderacre and Maderyja have signed this participation agreement with WWF and they both comply with GFTN - Peru regulations. Therefore both concessions are participants of the GFTN - Peru. As a GFTN - Peru participant, Maderacre and Maderyja have committed to:

- ✓ State policies and practices to promote the sustainable and responsible purchasing of forest products in all its operations and activities.
- ✓ Design a strategic plan with clearly defined objectives within the project duration, stating the steps to follow in order to assure that all the produced or bought wood or wood products are from responsible managed sinks and also due to achieve forest certification or chain of custody certification.
- ✓ Develop said strategic plan, monitoring the achievement of the defined objectives within the project duration.
- ✓ Assign one person responsible for the fulfillment of this agreement.
- ✓ Report annually to GFTN - Peru the progress of the strategic plan and some other required information.

As a GFTN - Peru participant, Maderacre and Maderyja have the rights to:

- ✓ Participate on the GFTN - Peru and thus on the GFTN.
- ✓ Access to demand and supply and market trends information, training courses and technical support are also available for GFTN - Peru and GFTN participants.

Undoubtedly, WWF is one of the largest environmental organizations worldwide and its hard work to make a healthy, happy, thriving, living and ultimately diverse and wonderful world is globally well-known. As a result of that, any agreement signed with them implies sustainable and responsible management of the natural and human resources.

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Rainforest Alliance, Inc. (RA)

RA's role in the project: memorandum of understanding for the support on the promotion of sustainable forest management and certification as a tool for forest conservation and improving livelihoods; achieve greater efficiency and added value to timber products; reach better market opportunities.

This Memorandum of Understanding was signed in August 2009 between Maderacre SAC and Rainforest Alliance, Inc and in July 2009 between Maderyja SAC and Rainforest Alliance.

Objective:

Promote sustainable forest management and certification as a tool for forest conservation and improving the quality of life of workers and residents who depend on them. Likewise, the two involved organizations seek for a greater efficiency and added value to timber products aiming at reaching better market opportunities for them.

Activities:

- **Rainforest Alliance:**
 - * Contribute to the development of the study in the Plant of primary processing of wood.
 - * Advice in the installation process of the Plant of primary processing of wood.
 - * Support in the searching of market niches in line to the certified supply of the concession.
 - * Support in the process of identification of loans and investment opportunities to fund the medium and long-term plan of the concessions.
 - * Facilitate the participation of the concessions in training and/or dissemination activities for complying with the FSC Standards.
- **Timber concessions (Maderacre SAC and Maderyja SAC):**
 - * Determine those responsible for the communication and implementation of this Memorandum of Understanding.
 - * Perform all necessary actions to maintain its Chain of Custody and Forest Management FSC Certification.
 - * Cover the cost of raw materials, processing and shipment of samples and prototypes required by potential buyers identified by the Rainforest Alliance.
 - * Manufacture the products agreed together with Rainforest Alliance, ensuring their quality.
 - * Participate actively in the analysis of the installed capacity and develop and implement a marketing strategy.
 - * Respond promptly to the requests for certified forest products, in coordination with Rainforest Alliance.

- * Comply with the guidelines established by Rainforest Alliance with other partners involved in the production chain.
 - * Support, with technical and logistical capabilities, the development of workshops, courses or events deemed necessary by both involved organizations.
 - * Regularly provide information required by Rainforest Alliance.
- **Both organizations:**
 - * Joint effort in the searching for market niches appropriate to the certified supply, especially for low grade wood and lesser-used species.
 - * Regular meetings to share experiences and learning and facilitate the dissemination of better business practices and added value to regional and national partners.
 - * Dissemination of information on emerging opportunities for collaboration with other donors and/or entities to leverage the resources invested by the parties to this agreement.
 - * Coordination of new initiatives to strengthen the process of added value and marketing in the region.

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- **National Forestry Chamber**

National Forestry Chamber's role in the project: bilateral cooperation agreement aiming at promoting, organizing and strengthening the creation of productive chains and promoting the production and marketing of timber products that consumers demand, taking into consideration the potential of the forest, according to the Forest Management Plans of producers through training and technical assistance.

This cooperation agreement was signed in February 2009 between the National Forestry Chamber and Maderyja SAC.

It has as background the PD Project 421/06 “Strengthening of the Productive Chain of Timber from Forest Concessions and Other Forests Under Forest Management”, which is carried out by the National Forestry Chamber since December 2007 to May 2010, with financial support from the International Tropical Timber Organization (ITTO) and the collaboration of the National Institute of Natural Resources (INRENA), which aims to strengthen the productive chain foresty-industry-consumer to consolidate a system of formal production and transparency for people linked to the forest sector and the national economy.

The scope of said project corresponds to the Central and Southern economic corridors in the country. The first covers the regions of Ucayali, Huanuco, Pasco, Junin and Lima, being the axis road the Central Highway; and the second, the regions of Madre de Dios, Cuzco, Puno, Arequipa, Moquegua and Tacna, being the axis road the Interoceanic road.

It promotes the articulation of the productive activity of forest managers with the various economic agents directly involved in the production, processing and transport of forest products to the market, through productive chains that benefit all the actors involved. The forest-industry-consumer productive chain refers to the interrelated set of activities that incorporate value to timber products, from the extraction of wood from managed forests, through the processing industry, to the product that is purchased by domestic consumers or intended for export, which implies the participation of several companies, each consisting of a chain link.

Objective:

Join efforts to establish effective collaboration in order to promote the development of legal timber production activities.

Activities:

- **National Forestry Chamber:**

- * Support Maderyja concession to be integrated in one or more timber productive chains.
- * Identify companies related with the forest activity interested in establishing and/or strengthening productive chains.
- * Organize meetings and promote and/or consolidate the productive chains, trying to involve as many related actors with each productive chain as possible.
- * Provide technical assistance and/or training, prior identification of productive hot spots or bottlenecks that prevent or hamper the development of the productive chain.

- **Maderyja SAC:**

- * Join at least one of the timber productive chains.
- * Carry out all forest operations according to the approved Forest Management Plans supervised by the correspondent authorities.
- * Make the best efforts to maintain good relationships with other members of the production chain.
- * Implement the recommendations proposed by the consultants and trainers.
- * Do not carry out illegal logging or illegal trade of wood activities.
- * Subscribe and follow the Code of Conduct.
- * Provide the information required by the Chamber.
- * Allow free access to the forests and other production facilities for personnel designated to the field visits.
- * Actively participate in training programs, information events and other meetings when they are invited.
- * Submit the report of logging trees from the plot of annual harvesting, forest transport guides, bills, buying guides, certificates and/or other documents of timber movement, to ensure known provenance.
- * Design a Coordinator.

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- **University of Leeds – School of Geography**

School of Geography's role in the project: cooperation agreement for the development of a transaction and monitoring cost analysis of a REDD Project and a scientific research on the relationship between biomass and structural variables of the Peruvian Amazon trees.

This cooperation agreement was signed in March 2010, between Maderacre SAC and the School of Geography of the University of Leeds.

General Objectives:

- * Carry out a transaction and monitoring cost analysis of a REDD Project as part of the “Capacity Building for Payments for Environmental Services - Carbon and Biodiversity in the Peruvian Amazon” Project.
- * Conduct a collaborative study of the relationship between biomass and structural variables (i.e. diameter, height) of trees in the Peruvian Amazon as part of the “Estimation of carbon stock in the Peruvian Amazon: improving the allometric equations” Project.

Specific Objectives:

- * Create a partnership between Maderacre and The School for research and development of the REDD issue in Peru.
- * Make possible a comparative analysis of different projects in design and/or being implemented within the Peruvian territory.
- * Create the first tree biomass database (directly measured) within the Peruvian Amazon.
- * Develop allometric equations for estimating carbon stocked in trees and forests of the Peruvian Amazon.
- * Facilitate the exchange of information, documents and research reports between the parties and related to climate change and the REDD issue.

Activities:

• School of Geography:

- * Comply with all laws in force in Peru for the development of scientific research.
- * Make the discussion with Maderacre and other members of the research team, analysis of information as well as the development of research results.
- * Disseminate the conducted research through publications.
- * Ensure confidentiality when required.
- * Train the Maderacre staff in the use of the tools generated under the project, so that study results are applicable to the company and the REDD project being implemented.
- * Provide to Maderacre delivery or access to information, documents and research reports related to climate change and REDD that have been developed by the School and the University of Leeds.

School representative: Dr. Tim Baker and Ms. Rosa Goodman

- **Maderacre SAC:**

- * Provide information on the REDD Project that is being implemented, both its description as the cost data available.
- * Facilitate the biomass study of trees felled in the concession, including collaboration in planning the study and providing logistic support so as to facilitate the infield work of the researchers to measure the biomass of trees. Support in the advancement of the research.

Maderacre SAC representative: José Luis Canchaya

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- **La Molina Agrarian National University - Management Forest Department (MFD)**

MFD's role in the project: agreement for the development of a research study on *Swietenia macrophylla* populations in order to enhance the knowledge of this species in the Madre de Dios region as well as in the country, which will allow the concessions to have updated and accurate information about *Swietenia macrophylla* dynamics and therefore make better decisions related to their forest operations and the sustainable management of their forests.

The Cooperation Agreement between Maderacre and the Management Forest Department (MFD) of La Molina Agrarian National University was signed in May 2007. Although this agreement was completely executed to date, it was extremely significant in terms of scientific research on *Swietenia macrophylla* populations, thus some of its details and activities are presented following.

The MFD is an educational institution of public service which carries on some social activities and projects, i.e. technical assessment of private and public enterprises, and therefore collaborates in the development of the whole country.

The MFD has conducted research studies on *Swietenia macrophylla* populations in Madre de Dios region. In order to get accurate data, they needed to measure and evaluate periodically the selected individuals of said species within the Maderacre concession area.

The main goal of this Cooperation Agreement was to share institutional strengths due to enhance the knowledge on *Swietenia macrophylla* in Peru.

With the aim to achieve said goal, Maderacre allowed free access to the technical team of MFD for the in-field measurement and evaluation of the species within the concession area and MFD provided technical and financial support for the collection and subsequent processing and evaluation of the data.

Two Coordinators were assigned on the agreement, one for each party. The MFD Coordinator was Eng. Ignacio Lombardi, Forestry Engineer and Main Professor of La Molina University. The Maderacre Coordinator was Eng. Nelson N. Kroll, responsible for the forest management of the timber concession.

As a result of this agreement, Maderacre obtained updated and accurate information about *Swietenia macrophylla* dynamics, one of the most valuable species in terms of productivity and biodiversity. This knowledge resulted in a better decision making and planning of all forest activities and in consequence in a more sustainable management of Maderacre's forests.

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- **University of the Pacific - Faculty of Economy (FEUP)**

FEUP's role in the project: agreement for the development of useful research studies by FEUP students in order to apply in practice all the knowledge and skills learned during their studies, which, in turn, represents an extremely useful technical support for the concessions in relation with varied economic and financial issues.

The Cooperation Agreement between Maderacre and the Faculty of Economy of the University of the Pacific was signed in May 2007.

The University of the Pacific is a private educational and non-profitable institution, specialized in economics and management studies, aiming at contributing to the development of Peru in the new extremely competitive global context. Through its Faculty of Economy they pretend to give their students appropriate leadership skills, which would help them in the construction and development, on solid basis, of the companies for which they will work for. The FEUP also puts emphasis on the education of ethical and moral principles as justice and honesty.

FEUP students are required to make a professional research study for the Economic Research Subject (compulsory subject of the Economy degree) and Forestry is considered as an area of interest for FEUP to develop said study. At the same time, Maderacre requires any type of economic studies in order to enhance not only their management capacity, but also the responsible management of their woods.

The main goal of this Cooperation Agreement is to share institutional strengths and to make possible the development of useful research studies for the concession by FEUP students, in which they would be able to apply all the knowledge and skills learned during their University studies. The FEUP will support them through the whole process.

Two Coordinators were assigned on the agreement, one for each party. The University of the Pacific Coordinator is Prof. Juan Francisco Castro, Coordinator of the Economic Research Subject. The Maderacre Coordinator is Mr. José Luis Canchaya Toledo, Financing Manager.

As a result of this agreement, Maderacre would receive technical support by the students and their supervisors in relation with varied economic and financial issues, thus a permanent adjustment of their procedures and operations should be made in order to optimize all Maderacre resources.

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It is important to mention that until Maderyja concession was sold to the Chinese investors, all of the aforementioned agreements were signed by Maderacre & Maderyja as a group. As can be inferred from the above, currently most of the agreements are valid for both concessions, with the exceptions stated above.

In conclusion, each one of the aforementioned agreements and institutions will contribute somehow in the improvement of the management capacity to undertake this Project. The combination of technical skills, knowledge, research and experience that each one of the involved institutions will provide for the development of the Project are a concrete demonstration of that.

1.5 Project Start Date

The project activities started to be implemented with intensity on 1st January 2009. By the end of March 2008, an agreement was signed between Greenoxx NGO and both concessions to implement the REDD Project. The project started to be effectively implemented in 2009, with the design of social plans, biodiversity studies, specific modelation and monitoring activities required for the achievement of validation according to the CCB Standard (Climate, Community and Biodiversity). Said validation was obtained by the end of 2009, with Gold Level qualification. This date coincides also with the completion of the pavement of the Inter Oceanic Highway, a fact that completely changed the dynamic of deforestation in the area, In terms of impact, the Inter Oceanic Highway has greatly intensified the risk of deforestation and therefore the measures that project proponents have to implement to be able to combat said risk.

1.6 Project Crediting Period

Crediting period start date: 1st January 2009.

Crediting period end date: 31st December 2046.

Project crediting period: 38 years.

1.7 Project Location

The project is located in the hydrographic basin of the Acre River, Iñapari district, Tahuamanu province in the Madre de Dios department, South East of Peru, in the Peruvian Amazon, in the boundary with Bolivia and Brazil.

The area is located 28 km to the side of the new inter-oceanic road that joins Brazil with the Peruvian ports, in the region that belongs to the Vilcabamba-Amboró Conservation Corridor in the Peruvian Amazon, one of the world biodiversity hotspots.

The following figures show the location of the Madre de Dios Amazon REDD Project.



Fig. 3: General location of the Madre de Dios Amazon REDD Project

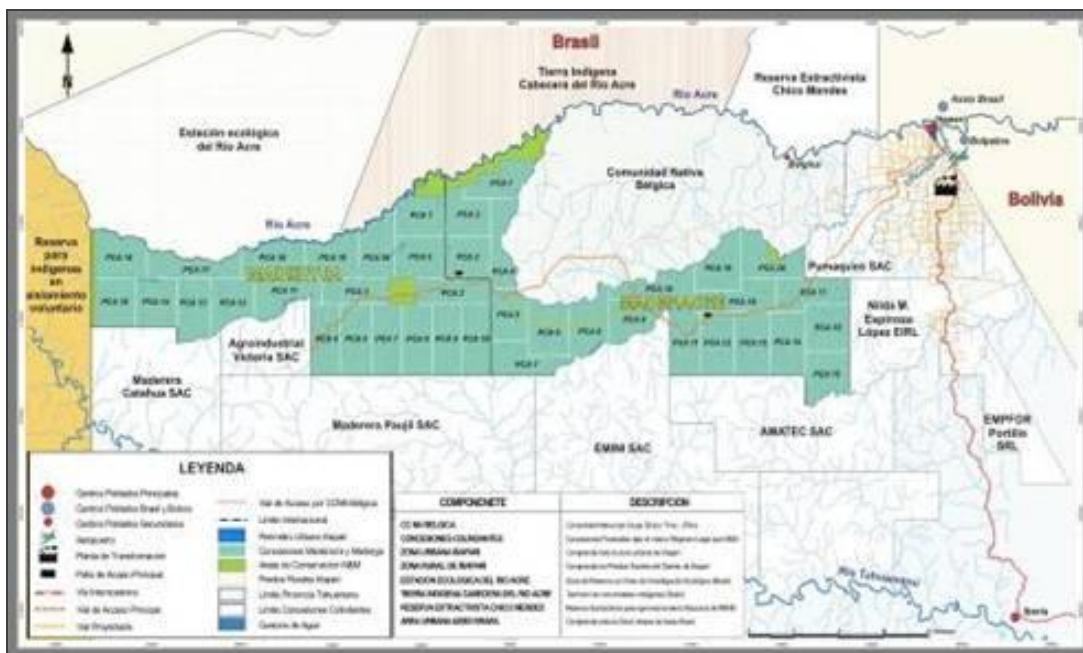


Fig. 4: Location of the Madre de Dios Amazon REDD Project and its boundaries

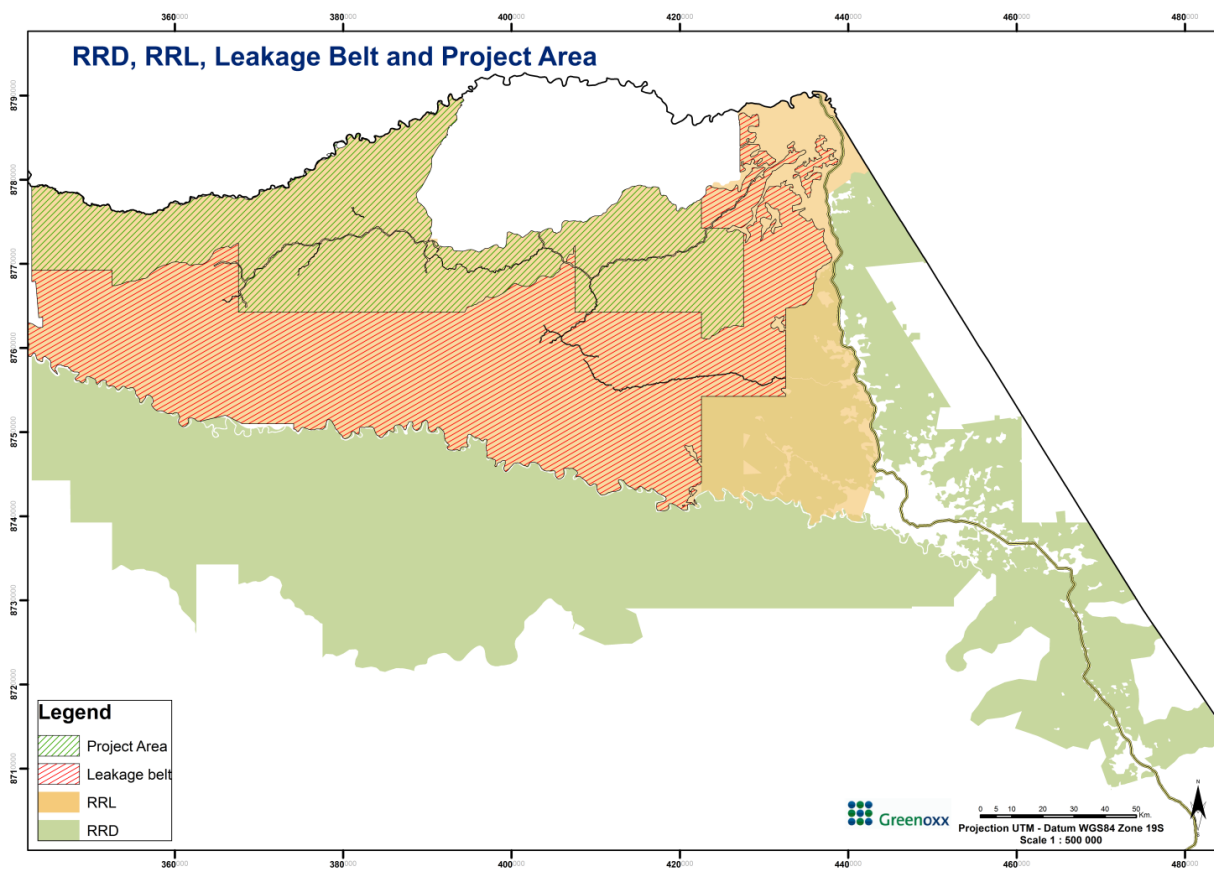


Fig. 5: Map of the project area and location of the vertices of the project zone (RRL)

In the following chart, the GPS coordinates of each polygon vertex is presented:

Chart 4: Polygon vertexes of the project area

Vertex	East	North
1	438521	8787582
2	446766	8774269
3	432562	8764691
4	432562	8754249
5	422557	8754249
6	422557	8746086
7	420910	8740962
8	322540	8777024
9	323813	8783623
10	333038	8790865

Total area of project, leakage belt and reference region:

Chart 5: Project area, leakage belt and reference regions

TOTAL	
PA	97,817.41
LB	159,018.02
RRL	307,692.66
RRD	300,333.77

The determination of the regions detailed above was carried out taking into account the requirements of the BL-UP Module of the REDD Methodology Modules. See BL-UP module for a detailed description and explanation of the project area, leakage belt and project zone determination.

1.8 Title and Reference of Methodology

Approved VCS Methodology VM0007 / Version 1.0

REDD Methodology Modules

Approved on 03 December 2010

Developed by Avoided Deforestation Partners

2 IMPLEMENTATION STATUS

2.1 Implementation Status of the Project Activity

The Project starting date corresponds to the 1st of January, 2009. This is based on the fact that 2009 was the year of the CCB Validation (with a process which began in April 2008) and to the fact that was 2009 the year in which the interoceanic highway was finished.

Nevertheless, Maderacre and Maderyja were created in 2002. Since then, they have managed 100,000 hectares of Forest Concessions. Said forests have been certified under the FSC standards since January 2007. The concessions practice forest management for timber sustainable exploitation. This contributes to reduce the deforestation index in the area, through the custody of the area, executing low impact logging and involving local population.

In this monitoring period (2009-2012), the REDD Project has kept the forest concessions FSC' certification, already for 6 years now. The following activities were carried out in the concessions as part of the forest management system:

- Fauna monitoring, with the aim of evaluating the ecosystem's performance after the forest management implementation.
- Monitoring of sample trees growth.
- Forest dynamic, structure and composition monitoring using Permanent Monitoring parcels.
- Forest natural regeneration capacity monitoring, with focus on exploited timber species.
- Identification and monitoring of High value conservation forests areas, in order to keep them free of timber exploitation.
- Forest management quality control, identifying impacts in terms of deforestation and degradation.
- Custody plan implementation in the concessions: installation of control posts, signalization, patrol routes.

- Timber chain of custody, in order to assure correct (legal) lumber origin.

All of these activities are needed to assure a good forest management of the area and therefore, to renew the FSC certification every year. As well as are needed to implement appropriately the Madre de Dios Amazon REDD Project.

The General Forest Management Plan for both forest concessions have been updated, including the REDD objectives.

Besides the forest activities, the Project has taken several actions in the social aspect. First of all, the Social Responsibility Plan has been updated for Maderacre and Maderija, based on the workshops done with the population and a new study of the social environment.

The following activities have been carried out in the social area during the monitoring period:

- Support to Belgica Native Community (details below).
- Workshops and Presentations of the REDD Project and environmental contents for local and regional students, as well as to the community in general (see table 2.1).
- Support to the local colleges (infrastructure) and specific activities related to the Community's needs.

Talking about the Project itself, and what is defined in the PDD, Table 1 shows the level of implementation of the different activities planned.

Table 2.1: Monitoring of REDD Project's Objectives

Objective	Activity	2009-2012 Monitoring
1) Contribute to the sustainable development of rural producers living in the buffer zone of the project	Socialization and dissemination of the project goals	The Project has the following permanent dissemination mechanism: - Information available in the project's website. - Conferences and workshops in which the concessions are invited to explain the REDD Project's experience. As the following cases: a) National Workshop on Climate Change National Policies: opportunities and Threats (Lima, December 2012) b) Conferences during the Forestry Week - Madre de Dios National Amazonian University (Puerto Maldonado 2012). c) Conferences during the Forestry Week - Madre de Dios National Amazonian University (Puerto Maldonado 2011). d) Environmental Education and Forest Management International Symposium. Catholic University of Peru (2011). - In the framework of the Relationship with the Community, the Madre de Dios Amazon REDD project's objectives were spread. Also, it had the following communication channels: - Presence in the DAKAR Village 2013 (January 2013). The Project had an informative Stand for a total number of 3 during 3 days. As part of the DAKAR, the Project had media exposition in the local written press and TV. - Likewise, in the framework of the Cooperation Agreement with Scotiabank, the dissemination of the Madre de Dios REDD Project through print press and a video in their service channels nationwide is being carried out (October 2012).
	Identification and selection of proposals for the environmentally friendly productive projects	The Project has a stakeholders map, which enables to identify actors related to the forest concessions, as well as the relationship with them. This is the first stage of identifying the local actors and potential beneficiaries for the environmentally friendly productive projects Program. The implementation (and speed) of this Program, will depend in the level of VERs sales. For the moment, the project is waiting for minor VERs sales, just to finance part of the initial investment for the REDD Project's validation process. Once VCU's are emitted, sales will grow, and consequently, the implementation of this objective will be done at a faster pace.
	Development of the skills and capacities of the members of the	Second stage of the "Environmentally Friendly Productive Projects" Program. It will be executed when the first VCU's are emitted.

	associations linked to the selected projects	
	Design of the project profiles of the selected projects	Third stage of the "Environmentally Friendly Productive Projects" Program. It will be executed when the second
	Look for financing and/or co-financing for the approved profiles	Fourth stage of the "Environmentally Friendly Productive Projects" Program. It will be executed when the third
	Support on the implementation of the approved projects	Fifth stage of the "Environmentally Friendly Productive Projects" Program. It will be executed when the fourth s
	Monitoring of the projects	It will be executed when the approved projects are implemented.
2) Reduce the vulnerability of the project area from external factors of deforestation and degradation	Review and update of the custody plan	The forest concessions' custody plan has been reviewed and updated for both concessions, completing the Proj
	Installation of control post PCA 5 Maderacre	The post in Maderacre's PCA 5 has been changed to a control post in the entrance of the Native Community Bel to be more efficient in the use of the resources (as it also helps the Native Community in the control of their bo contribute to the custody of the Native Community, which is an important area in the Project's buffer zone. The very good between the Project and the Native Community.
	Delimitation of 100% of the concessions boundaries	Part of the project area has natural boundaries (permanent water courses). Apart from this, a 100% of the non been marked with pedestrian trails. Annual maintenance is done in sectors of these pedestrian trails.
	Installation of "Hitos" in the concessions vertexes	"Hitos" have been installed in the concessions vertexes.

	Improve the signaling within the concessions	In this period, the following new signs have been installed: 1 on the starting point of the Maderacre concession. 1 to define the boundary between Maderyja and Maderacre concessions, on the access road. 1 to define the boundary between Maderyja and Maderacre concessions over the Acre River. 1 to define the limit between Maderacre and Belgica, in the Acre River (where Josefina water course joins the Acre River). Several signals on the prohibition of hunting, fishing and illegal logging within the concessions boundaries.
	Periodic and annual patrolling within vulnerable sectors	Patrolling actions to vulnerable sectors identified within the concessions were conducted: 1 river patrol to the Acre River sector to the level of Cashuera Uku, carried out in February 2010. 2 river patrols through the Acre River, in coordination with the Native Community, during the last year. 1 land patrol over the eastern boundary, limit with the Pumaquiro SAC concession, being this sector one of the most vulnerable because of its proximity to the Inter-oceanic road. Carried out in July 2010. Patrolling along the 100% of the non natural Project's limits, carried out in 2011 and 2012. None of the patrolling actions reported the violation of boundaries and there was no evidence of invasion.
	Annual monitoring of possible invasions using satellite images	The report of the analysis of satellite imagery, for this period, does not report the occurrence of invasions within the Dios Amazon REDD project area. Meanwhile, the patrolling in the areas of highest risk showed no invasion or violation of boundaries.
	In-field verification of sectors identified as potential points of invasion (due to deforestation)	The report of the analysis of satellite imagery, for this period, does not report the occurrence of invasions within the Dios Amazon REDD project area.
	Development and implementation of mechanisms for the dissemination of environmental education among children, adolescents and communities involved in the project	This is part of the Communicational strategies the forest concessions have (Details of presentations and workshops done in Table No. 2)

In the case of the first objective (“Contribute to the sustainable development of rural producers living in the buffer zone of the project”), it is clear that the Program related to environmentally friendly projects, needs to be implemented after raising funds from the VERs sales. For the moment minor sales have occurred, and the funds have been mainly employed to finance the validation, and now verification process.

Whereas in the second objective (“Reduce the vulnerability of the project area from external factors of deforestation and degradation”), the Project has significant improvement. A new custody control post has been installed in Belgica Native Community, which enables a better control of the project area and the buffer zone. In the case of the existing control post (Maderacre), it has a permanent operation now, throughout all the year. Before 2011 it only worked during the harvest season (six months). An investment has also taken place to improve its equipment.

It is very important to highlight that there is a very good relationship with Bélgica Native Community. On one hand, river patrols are done in coordination with them. On the other hand, the following activities (and support) were executed with the Native Community:

- Electricity support (power generator)
- Education support (computers donated)
- Health care: assistance with one nurse and funds for basic medicines.
- Engine donated for the community’s boat, for river transportation
- Specific support on special events (and emergencies).

As part of the custody activities, the following actions were carried out:

- Construction and operation of permanent Guard Posts in the concessions’ access.
- Acre River patrolling, in coordination with Belgica Native Community.
- Construction and maintenance of pedestrian trails along the concessions non-natural borders.
- Periodic patrol in the non-natural perimeter (through the pedestrian trail).
- Signals installed in the access to the concessions and in the most relevant sectors (see figure 2.1)

Figure 2.1: signals in the forest concessions

With respect to the project's dissemination, events like the last DAKAR Village (300,000 visitors) or the agreement with Scotiabank (Figures 2.2 and 2.3), have contribute to promote the REDD model and the projects objectives. In the local sphere, the companies have participate in conferences in local universities and schools, as well as local events where the REDD project was explained (see table 2.2 and figure 2.4).

Figure 2.2: DAKAR Village 2013 and Media exposition for the REDD Project



Figure 2.3: Scotiabank Agreement and Media exposition for the REDD Project



Table 2.2: REDD Presentations and workshops carried out at Iñapari

Date	Presentation	Institution/Place
23/06/2009	Information presentation about Madre de dios Amazon REDD Project	Community in general
23/09/2009	Information and workshop about Madre de Dios Amazon REDD Project	Community in general
05/08/2010	Presentation on climate warming and carbon credits	Primary school Iñapari
25/08/2010	Presentation on climate warming and carbon credits	Upper school Iñapari
10/10/2010	Presentation on climate change	Primary school Iñapari
15/11/2010	Presentation on waste management	Primary school Iñapari

21/03/2011	Information and workshop about Madre de Dios Amazon REDD Project	Community in general
01/08/2012	Community Participation Workshop	Community in general
29/08/2012	Environmental sensibility and climate change	Upper school Iñapari

Figure 2.4: workshops and presentation to the population



Regarding other potential risks apart from illegal presence in the area, the forest concessions have worked in industrial security capabilities, with annual training workshops, including all of its personnel. In the field operations, every camp has an extinguisher, fuel management guides, among other measures taken. Non fire events have occurred in this monitoring period (neither in the forest concessions registry).

It is important to notice that local formal employment has increased too. In the case of Maderacre from 9 in 2009 to 95 in 2012. In the case of Maderyja, currently they hire 69 employees. This means population well employed reduce its pressure to get land (forest) to work for its subsistence.

Finally, Tables 2.3 and 2.4 show the results on deforestation during this monitoring period.

Table 2.3 and 2.4: Results on deforestation monitoring

RRL	Types of forest	Area (ha)	Interpretation of deforestation (ha)	Total
Types of forest in the leakage belt	Hilly forest	134515.75	928.55	133587.20
	Terrace forest	17183.17	1135.88	16047.29
	Others	1622.92	443.48	1179.44
	Bamboo	3103.45	3.23	3100.21
	Tree Swamps	2592.74	20.04	2572.70
	TOTAL AREA SIG	159018.02	2531.19	156,486.83
Types of forest in the project area	Hilly forest	79290.19	0.00	79290.19
	Terrace forest	9845.75	0.00	9845.75
	Others	130.59	0.00	130.59
	Bamboo	8550.87	0.00	8550.87
	TOTAL AREA SIG	97817.40	0.00	97817.40

Leakage

Stratum	Agriculture	Farming	Secondary forest	Pastures	Infrastructure	Total Leakage
Hilly forest	95.44	8.44	38.01	79.17	707.51	928.55
Terrace forest	129.24	30.03	744.52	89.43	142.65	1135.88
Others	5.64	10.74	391.25	35.85	0	443.48
Bamboo	0.00	0	0	0	3.23	3.23
Tree Swaps	20.04	0	0	0	0	20.04
TOTAL	250.37	49.21	1173.78	204.44	853.39	2531.19

2.2 Project Description Deviations

N/A

2.3 Grouped Project

N/A.

3 DATA AND PARAMETERS

3.1 Data and Parameters Available at Validation

Data Unit / Parameter:	Regional Forest / Non-forest Cover Benchmark Map
Data unit:	ha
Description:	Map that shows the stratification and location of forest and non-forest areas in the Reference Region RRD at the beginning of the accreditation.
Source of data:	Landsat satellite images.
Justification of choice of data or description of measurement methods and procedures applied:	The Landsat images have an adequate resolution and they are an available tool to all public.
Measurement frequency:	At minimum 3 times over the 10 years leading up to baseline renewal.
QA/QC procedures to be applied:	Through the accuracy assessment.
Any comment:	The stratification was based on the Ecological and Economic Zoning of the Region of Madre de Dios. It was developed by the IIAP in 2009 and the regional government uses it as its official source. Non-forest has been determined as beach and water bodies areas. In addition, there are other areas that are access roads (rivers, bridges, alternate roads, the Interoceanic Highway).
Used in equations:	3

Data Unit / Parameter:	Project Forest Cover Benchmark Map.
Data unit:	ha
Description:	Map that shows the stratification and location of forest areas in the Project area at the beginning of the accreditation (100% forested).
Source of data:	Landsat satellite images.
Justification of choice of data or description of measurement methods and procedures applied:	The Landsat images have the adequate resolution and they are an available tool to all public.
Measurement frequency:	At minimum every 10 years prior to baseline renewal.
QA/QC procedures to be applied:	Through the accuracy assessment.
Any comment:	The stratification was based on the Ecological and Economic Zoning of the Region of Madre de Dios. It was developed by the IIAP in 2009 and the regional government uses it as its official source. Non-forest has been determined as beach and water bodies areas. In addition, there are other areas that are access roads (rivers, bridges, alternate roads, the Interoceanic Highway). To date there is no other use but forest usage.
Used in equations:	3, 8.

Data Unit / Parameter:	Leakage Belt Forest Cover Benchmark Map.
Data unit:	ha
Description:	Map that shows the stratification and location of forest in the Leakage belt at the beginning of the accreditation (100% forested).
Source of data:	Landsat satellite images.
Justification of choice of data or description of measurement methods and procedures applied:	The Landsat images have the adequate resolution and they are an available tool to all public.
Measurement frequency:	At minimum every 10 years prior to baseline renewal.
QA/QC procedures to be applied:	Through the accuracy assessment.
Any comment:	The stratification was based on the Ecological and Economic Zoning of the Region of Madre de Dios. It was developed by the IIAP in 2009 and the regional government uses it as its official source. Non-forest has been determined as beach and water bodies areas. In addition, there are other non-forested areas that used as access roads (rivers, bridges, Interoceanic Highway, alternate roads).
Used in equations:	3

Data Unit / Parameter:	A_i
Data unit:	Ha
Description:	Total area of each stratum i .
Source of data:	Landsat satellite images.
Justification of choice of data or description of measurement methods and procedures applied:	Frequency at a minimum every 10 years prior to baseline renewal.
Any comment:	Ex-ante it is assumed that strata area will remain constant.
Used in equations:	19

Data Unit / Parameter:	$A_{RRD, \text{unplanned, hrp}}$
Data unit:	Ha
Description:	Total deforested area during the term of reference (until 2008) in the RRD.
Source of data:	Value taken from the Landsat 7 satellite images, used by the Deforestation Model of Madre de Dios.
Justification of choice of data or description of measurement methods and procedures applied:	The Landsat images have the adequate resolution and they are a free and available tool to all public.
Any comment:	Monitored for purpose of baseline revisions.

Data Unit / Parameter:	CF
Data unit:	$t\ C\ t^{-1}\ d.m.$
Description:	Carbon fraction of dry matter.
Source of data:	Value taken from IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3
Justification of choice of data or description of measurement methods and procedures applied:	The value chosen is 0.49 $t\ C\ t^{-1}\ d.m.$ for Tropical Forests.
Any comment:	n/a
Used in equations:	19

Data Unit / Parameter:	CF_j
Data unit:	$t\ C\ t^{-1}\ d.m.$
Description:	Carbon fraction of biomass for tree species j.
Source of data:	Value taken from IPCC 2006 INV GLs AFOLU Chapter 4 Table 4.3.
Justification of choice of data or description of measurement methods and procedures applied:	The value chosen is 0.49 $t\ C\ t^{-1}\ d.m.$ for Tropical Forests.
Any comment:	n/a
Used in equations:	11

Data Unit / Parameter:	D_j
Data unit:	t d.m. m ⁻³
Description:	Basic wood density in t d.m. m ⁻³ for species j .
Source of data:	National species-specific densities. For species-specific wood densities not available, it is used the mean wood density value Regional average (0.60 t d.m.m-3- tropical America) from Reyes 1992 and Brown, S. 1997.
Justification of choice of data or description of measurement methods and procedures applied:	Species densities have been taken from different sources of national species-specific researches being the main ones: - Evaluation of mechanical and physical properties and probable uses of the wood of 20 species in Jenaro Herrera, Loreto – Perú (Aróstegui and Acevedo). - Summary of technical information of 32 tree species. Peruvian Confederation of Wood. 2008. CPM. CITE Madera. - Global wood density database. (Chavé et al., 2009).
Any comment:	n/a
Used in equations:	11

Data Unit / Parameter:	D_{mn}
Data unit:	t d.m. m ⁻³
Description:	Mean wood density of commercially harvested species.
Source of data:	National species-specific densities. For species-specific wood densities not available, it is used the mean wood density value Regional average (0.60 t d.m.m-3- tropical America) from Reyes 1992 and Brown, S. 1997.
Justification of choice of data or description of measurement methods and procedures applied:	Species densities have been taken from different sources of national species-specific researches being the main ones: - Evaluation of mechanical and physical properties and probable uses of the wood of 20 species in Jenaro Herrera, Loreto – Perú (Aróstegui and Acevedo). - Summary of technical information of 32 tree species. Peruvian Confederation of Wood. 2008. CPM. CITE Madera. - Global wood density database. (Chavé et al., 2009).
Any comment:	n/a
Used in equations:	19

Data Unit / Parameter:	$f_j(X,Y)$
Data unit:	t d.m. tree ⁻¹
Description:	Allometric equation for species j linking measured tree variable (s) to aboveground biomass of living trees, expressed as t d.m. tree ⁻¹
Source of data:	The Chavé formula for trees and Winrock for palm trees.
Justification of choice of data or description of measurement methods and procedures applied:	Both formulas have been taken from: - Pearson, T., Walker, S. and Brown, S. 2005. Sourcebook for Land Use, Land-Use Change and Forestry Projects. Winrock International and the World Bank Biocarbon Fund. 57pp. - Chave, J, et. Al. 2005. Tree allometry and improved estimation of carbon stocks and balance in tropical forests. Oecología 145: 87-99.
Any comment:	The validation of the equations will be performed with either of both methods presented in VMD0015 module: - Limited Measurements - Destructive sampling
Used in equations:	35

Data Unit / Parameter:	Carbon stock in all pools in the forest stratum.			
Data unit:	T CO ₂ e / ha			
Description:	Carbon stock by stratum in baseline before deforestation.			
Source of data:	Determined from carbon inventories carried out in the Project Area.			
Value applied:		Hill Forest	505.10	
		Terrace Forest	547.81	
		Bamboos	604.48	
		Tree swamp	543.42	
		DP	18.63	
		DA	31.75	
		DI	-	
		DC	31.63	
Justification of choice of data or description of measurement methods and procedures applied:	- The inventory was made inside the Project Area. - Parcels were built in the different stratum. - DBH and HT were taken from each individual found. - It was determined the aerial biomass based in the Chavé formula for trees and Winrock for palm trees. - Factor 0.24 was used to determine the root biomass according to module CP-AB.			
Any comment:	The exact data for each stratum is found in module CP-AB.			

Data Unit / Parameter:	Change in the land use.								
Data unit:	%								
Description:	Percentages of the project area that will change the land use after deforestation.								
Source of data:	Determined according to the studies of land use carried out in the region of Madre de Dios. - CDC, UNALM, SZF, INRENA 2007.								
Value applied:	<table> <tr> <td>Clean cultivation</td><td>4%</td></tr> <tr> <td>Grasslands</td><td>54%</td></tr> <tr> <td>Agriculture and livestock</td><td>40%</td></tr> <tr> <td>Infrastructure</td><td>2%</td></tr> </table>	Clean cultivation	4%	Grasslands	54%	Agriculture and livestock	40%	Infrastructure	2%
Clean cultivation	4%								
Grasslands	54%								
Agriculture and livestock	40%								
Infrastructure	2%								
Justification of choice of data or description of measurement methods and procedures applied:	The study mentioned has been carried out in areas that include the Project Area, or next to them. Furthermore, this data is updated and actors that are also in our areas have been considered.								
Any comment:	n/a								

Data Unit / Parameter:	Emissions by biomass burning.
Data unit:	T CO ₂ e
Description:	Tons of CO ₂ equivalents, coming from emissions of CH ₄ and N ₂ O by forest and agriculture residues burning.
Source of data:	Factors of module E-BB were used (table 2.6 and 2.5) for tropical forest. Likewise, it was used the combustion factor of table 2.6 by agriculture biomass burning. The deforested forest percentage that is burnt after deforestation has been taken from official sources¹⁰.
Value applied:	Used values: - 55 % of the deforested forest is burnt. - Combustion factor. Tropical Humid Forest = 0.5 Agriculture Residues (Corn) = 0.8 - Emission Factor Tropical Forest = 6.8 (CH₄) and 0.2 (N₂O) Agriculture Residues = 2.7 (CH₄) and 0.07 (N₂O).
Justification of choice of data or description of measurement methods and procedures applied:	The percentage of 55% is moderate. Some experts consulted consider that 100% of hectares that are torn down are burnt.
Any comment:	n/a

¹⁰Deforestation map of the Peruvian Amazon – 2000. MINAM (2009).

3.2 Data and Parameters Monitored

Data Unit / Parameter:	Project Forest Cover Monitoring Map.
Data unit:	
Description:	Map evidencing the stratification and location of the forest in the Project area at the beginning of each verification period. It has to be evidenced if within the Project area there are deforested areas.
Source of data:	Satellite images and field verification of deforested areas if any (GPS).
Description of measurement methods and procedures to be applied:	Analysis and Classification of Satellite Images
Frequency of monitoring/recording:	Every 5 years with images. Verification of deforested areas will be permanent in field by the surveillance carried out by the monitoring equipment.
Value applied:	See Map "jjhggf"
Monitoring equipment:	Software GIS, available satellite images, GPS, professional monitoring equipment in field.
QA/QC procedures to be applied:	Permanent verification of the area of the project surfaces.
Any comment:	Stratification is the same as the one used at the beginning of the term.
Used in equations:	3

Data Unit / Parameter:	Leakage Belt Forest Cover Monitoring Map.
Data unit:	ha
Description:	Map evidencing the stratification and location of the forest in the Leakage Belt at the beginning of each verification period. It has to be evidenced if there are deforested areas.
Source of data:	Satellite images and field verification of deforested areas if any (GPS).
Description of measurement methods and procedures to be applied:	Analysis and Classification of Satellite Images
Frequency of monitoring/recording:	Every 5 years with images.
Monitoring equipment:	Software GIS, available satellite images, GPS, professional monitoring equipment in field.
QA/QC procedures to be applied:	Permanent verification of the area of the project surfaces. Also, through the accuracy assessment.
Value monitored	See Map "vfdd"
Any comment:	Stratification is the same as the one used at the beginning of the term.
Used in equations:	3, 8.

Data Unit / Parameter:	Degradation PRA Results
Data unit:	Surveys and/or interviews.
Description:	The PRA will be executed from interviews and/or surveys to local actors with the purpose of identifying the existence of degradation potential within the area of the project due to: • Extraction of firewood. • Illegal logging If $\geq 10\%$ of the surveys indicate that there is a risk of degradation then the procedures to verify and estimate the degradation should be executed. An additional result of the PRA would be the penetration distance that should be applied to calculate the area with degradation potential (buffer area).
Source of data:	PRA
Description of measurement methods and procedures to be applied:	It would be developed according to the provisions set forth in the M-MON.
Frequency of monitoring/recording:	Every 2 years.
Value applied:	There is no degradation in this period
Monitoring equipment:	<i>PRA sociologist in charge with focusing criteria.</i>
QA/QC procedures to be applied:	There would be templates to carry out surveys and/or interviews.
Any comment:	n/a
Used in equations:	Section 5.2.2.1

Data Unit / Parameter:	Results of Limited Degradation Survey
Data unit:	Existence of stumps
Description:	Verification of degradation processes in the project area
Source of data:	Field measurements
Description of measurement methods and procedures to be applied:	If PRA indicates there is degradation potential, then the procedures to verify the degradation occurrence should take place. Sampling transects are distributed across the buffer area with the purpose of identifying if there are new tree-stumps. Transects should cover a surface of no less than 1% of the buffer area
Frequency of monitoring/recording:	Each time the PRA indicates there is degradation potential to the project area.
Value applied:	PRA indicate that evidence of degradation is non-existent
Monitoring equipment:	GPS, compass, tape line.
QA/QC procedures to be applied:	Trained staff for field measurement
Any comment:	n/a
Used in equations:	3

Data Unit / Parameter:	$A_{\text{burn}, i, t}$
Data unit:	Ha
Used in equations:	Section 2.2.2
Description:	Area burnt in stratum i at time t . The monitoring will be carried out, if there is any record of any burnt area within the project area, on each stratum and year of the project
Source of data:	Field measurements
Description of measurement methods and procedures to be applied:	If there is a record of a burning, it will be indicated the type of forest and burnt area to determine the GHG emissions (CH_4 and N_2O). If possible, the new use of the land will also be indicated
Frequency of monitoring/recording:	Every time there is an occurrence.
Value monitored	There are no burned areas in this period
Monitoring equipment:	GPS
QA/QC procedures to be applied:	n/a
Any comment:	Ex-ante burnt areas (baseline) have been determined by interviewing experts and by what it is known in the region of Madre de Dios. The obtained value will be used in the EBB module

Data Unit / Parameter:	$A_{DefPA, i, t}$
Data unit:	Ha
Description:	Deforested area in the Project area by type of forest
Source of data:	Satellite images
Description of measurement methods and procedures to be applied:	The images used will be compatible with the ones already used in the estimations ex-ante in order to be compared
Frequency of monitoring/recording:	For every verification event and no longer than every 5 years with satellite images. Constant monitoring in field
Value applied:	According with the results of satellite image analysis, there is no deforestation inside PA
Monitoring equipment:	Software GIS, available satellite images, verification in field with GPS and professional equipment
QA/QC procedures to be applied:	n/a
Any comment:	
Used in equations:	3

Data Unit / Parameter:	A _{DefLB, i, t}																																															
Data unit:	Ha.																																															
Description:	Deforested area in the Leakage belt by type of forest																																															
Source of data:	Satellite images																																															
Description of measurement methods and procedures to be applied:	The images used will be compatible with the ones already used in the estimations ex-ante in order to be compared																																															
Frequency of monitoring/recording:	For every verification event and no longer than 5 years with satellite images. Constant monitoring in field																																															
Value applied:	Results Table: <table><tr><th>Stratum / Post-defo LU</th><th>Agriculture</th><th>Farming</th><th>Secondary forest</th><th>Pastures</th><th>Infras- tructure</th></tr><tr><td>Hilly forest</td><td>95.44</td><td>8.44</td><td>38.01</td><td>79.17</td><td>707.51</td></tr><tr><td>Terrace forest</td><td>129.24</td><td>30.03</td><td>744.52</td><td>89.43</td><td>142.65</td></tr><tr><td>Others</td><td>5.64</td><td>10.74</td><td>391.25</td><td>35.85</td><td>0</td></tr><tr><td>Bamboo</td><td>0.00</td><td>0</td><td>0</td><td>0</td><td>3.23</td></tr><tr><td>Tree Swaps</td><td>20.04</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>TOTAL (ha)</td><td>250.37</td><td>49.21</td><td>1173.78</td><td>204.44</td><td>853.39</td></tr></table>						Stratum / Post-defo LU	Agriculture	Farming	Secondary forest	Pastures	Infras- tructure	Hilly forest	95.44	8.44	38.01	79.17	707.51	Terrace forest	129.24	30.03	744.52	89.43	142.65	Others	5.64	10.74	391.25	35.85	0	Bamboo	0.00	0	0	0	3.23	Tree Swaps	20.04	0	0	0	0	TOTAL (ha)	250.37	49.21	1173.78	204.44	853.39
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TOTAL (ha)	250.37	49.21	1173.78	204.44	853.39																																											
Monitoring equipment:	Software GIS, available satellite images, verification in field with GPS and professional equipment																																															
QA/QC procedures to be applied:	n/a																																															
Any comment:	Deforestation shall be confirmed at least every five years in the Leakage belt and verified with what is determined in baseline in order to assess if there is any leakage or not caused by the project																																															
Used in equations:	4																																															

Data Unit / Parameter:	$A_{\text{DegW}, i}$
Data unit:	Ha
Description:	Area under potential degradation process. Buffer area resulting from PRA, if it shows that there is potential degradation in the Project Area.
Source of data:	GIS delineation and ground trothing.
Description of measurement methods and procedures to be applied:	The buffer area shall be composed from all access points. The length is obtained from the PRA results, and the width shall be equal to the length.
Frequency of monitoring/recording:	Must be repeated each time the PRA indicates a potential for degradation
Value applied	PRA results indicates that evidence of degradation is non-existent
Monitoring equipment:	GIS software
QA/QC procedures to be applied:	n/a
Any comment:	There is no evidence of depredated areas or parcels ex-ante within the project area.
Used in equations:	8

Data Unit / Parameter:	$A_{\text{DECKS}, i, t}$
Data unit:	ha
Description:	Area of logging decks in stratum <i>i</i> at time <i>t</i> .
Source of data:	Field measurements.
Justification of choice of data or description of measurement methods and procedures applied:	Field measurements of all logging decks (100%)
Frequency measurement:	At least every 5 years.
Value monitored:	Hilly forest: 8.5 ha Terrace forest: 0.76 ha Bamboos: 1.00 ha
Any comment:	Ex-ante estimations of emissions are based on average size and number of decks produced due to logging in the region.
Used in equations:	18

Data Unit / Parameter:	$A_{DistPA, q, l, t}$
Data unit:	Ha
Description:	Area impacted by natural disturbance in the project stratum i converted to natural disturbance stratum q at time t ; ha.
Source of data:	Satellite images and GPS coordinates.
Justification of choice of data or description of measurement methods and procedures applied:	Minimum monitoring unit equal to a minimum of 11 Landsat pixels or one hectare.
Frequency measurement:	At least every 5 years.
Value monitored	Zero, there is no disturbance during this period
Any comment:	Ex ante estimations of emissions from natural disturbances will be based on historic incidence of such event in the Project region.
Used in equations:	20

Data Unit / Parameter:	$A_{ROAD, l, t}$
Data unit:	ha
Used in equations:	17
Description:	Area of roads in stratum i at time t .
Source of data:	Field measurements of all roads (100%)
Justification of choice of data or description of measurement methods and procedures applied:	Length and width of roads known in field registries
Frequency measurement:	At least every 5 years
Value applied	There are two types of roads: 1) Primary Roads: Hilly forest: 46.25 ha Terrance forest: 26.76 ha 2) Secondary Roads: Hilly forest: 56.34 ha Terrance forest: 7.87 ha Bamboos 27.23 ha
Any comment:	Ex-ante estimations are based on average length of roads produced per unit area due to logging in the region
Used in equations:	17

Data Unit / Parameter:	A_{RRL} , forest, t
Data unit:	Ha
Used in equations:	n/a
Description:	Remaining area of forest in RRL.
Source of data:	Satellite images.
Description of measurement methods and procedures to be applied:	The images used will be compatible with the ones already used in the estimations ex-ante in order to be compared.
Frequency of monitoring/recording:	Must be monitored at least every 5 years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event.
Value applied	See Map “ghhgj”
QA/QC procedures to be applied:	n/a
Any comment:	There is no evidence of degraded areas or plots ex-ante within the project area.

Data Unit / Parameter:	AP_i
Data unit:	Ha.
Used in equations:	8
Description:	Total degraded area verified by sampling plots.
Source of data:	Ground measurement.
Description of measurement methods and procedures to be applied:	The sampling plan must be designed using plots systematically placed over the buffer zone so that they sample at least 3% of the area of the buffer zone.
Frequency of monitoring/recording:	Every time the Limited Degradation Survey indicates degradation (existence of stumps), or at least every 5 years.
Value applied:	Zero, PRA showed no degradation pressure
Monitoring equipment:	GPS, field equipment: tape line, compass. And field staff.
QA/QC procedures to be applied:	Trained staff for field measurement.
Any comment:	
Used in equations:	8

Data Unit / Parameter:	$C_{\text{DegW, i, t}}$
Data unit:	T CO ₂ -e
Description:	Biomass carbon of removed trees through degradation process within the project area.
Source of data:	Field measurement.
Description of measurement methods and procedures to be applied:	With the tree-stumps identified during the evaluation of sampling parcels of the buffer area, the following procedures should be considered: - Take the diameter of the tree-stumps that will be assumed as DBH. In case they are too big (for example, due to buttress roots), then the specimen should be identified and place other individuals of the same species standing next to it. Then, measure their DBH and tree-stumps diameter. With this data, DBH should be estimated as from the tree-stumps diameter of the individuals deforested. - With DBH data, the carbon stock of individuals deforested is calculated using an allometric equation, yet to be defined. - It will be assumed that all stock will be sent to the atmosphere.
Frequency of monitoring/recording:	Every time there is a degradation event or at least every 5 years.
Value applied:	Zero
Monitoring equipment:	GPS, field equipment: tape line, compass. And field staff.
QA/QC procedures to be applied:	n/a
Calculation method:	Through an allometric equation, using the DBH as one of its variables
Any comment:	n/a
Used in equations:	8

Data Unit / Parameter:	$C_{AB_tree_dest,i}$
Data unit:	T CO ₂ -e ha ⁻¹
Description:	Carbon stock in aboveground tree biomass assumed to be killed per unit area resulting from the creation of the skid trail per stratum.
Source of data:	CP-AB and documentation stating maximum size tree able to be killed during skid trail creation.
Justification of choice of data or description of measurement methods and procedures applied:	It is assumed that $C_{AB_tree_dest,i} = C_{AB_tree,i}$ in the baseline.
Any comment:	n/a
Value used	Hilly forest 407.34 t CO ₂ /ha Terrace forest 441.78 t CO ₂ /ha Bamboo 487.48 t CO ₂ /ha Otros 0 t CO ₂ /ha Tree Swamps 438.24 t CO ₂ /ha
Used in equations:	15

Data Unit / Parameter:	$C_{BB_tree_dest,i}$
Data unit:	T CO ₂ -e ha ⁻¹
Description:	Carbon stock in belowground tree biomass assumed to be killed per unit area resulting from the creation of the d trail per stratum.
Source of data:	$C_{AB_tree_dest,i}$
Justification of choice of data or description of measurement methods and procedures applied:	Estimation of belowground biomass will be performed following the procedures set in module CP-AB.
Any comment:	The root-to-shoot ratio 0.24 is used (same used in baseline carbon stock calculations).
Value used	Hilly forest: 97.76 TCO ₂ /ha Terrace forest: 106.03 TCO ₂ /ha Bamboo: 117.00 TCO ₂ /ha Others: 0 TCO ₂ /ha Tree Swamps: 105.18 TCO ₂ /ha
Used in equations:	15

Data Unit / Parameter:	L_{sk}
Data unit:	M
Description:	Length of skid trail sk.
Source of data:	Field measurements
Justification of choice of data or description of measurement methods and procedures applied:	A systematic sampling with random start within a sampled known logged area within the project boundary will produce an estimate of the length of skid trails created. The total length of skid trails in the project area equals the mean length of skid trails per unit area times the total area logged.
Any comment:	n/a
Frequency of monitoring/recording:	At least every 5 years or prior to a verification
Value applied	Lsk was monitored in the field for PCA 10 and PCA11 (Maderacre). With this data, Lsk was estimated per each stratum based on its total extraction volume Hilly forest: 460 465.55 m Terrace forest: 157 722.12 m Bamboo: 154,281.98 m
Used in equations:	13

Data Unit / Parameter:	$V_{EXT, z, i, t}$
Data unit:	m^3
Description:	Volume extracted from logging stratum z in stratum i at time t .
Source of data:	Records and reports (based on field measurements) documenting amount of wood extracted within project boundary.
Justification of choice of data or description of measurement methods and procedures applied:	Documentation includes : • Delineation of the location. • Total area logged in the Project area. • Methods used to measure the amount of wood extracted. Both the greater and smaller diameter of the log will be measured, as well as its total length. The Smalian formula will then be used to estimate the volume of wood extracted: $V = [\pi/4 (A+a)/2] * L$ Where: V = Volume A = Area of the section with greater diameter a = Area of the section with smaller diameter L = Total length • Methods to estimate and catalog the volume of wood felled and extracted.
Any comment:	n/a
Frequency of monitoring/recording:	At least every 5 years or prior to a verification event
Value monitored	Hilly forest: 33743.68 m3 Terrance forest: 11558.14 m3 Bamboo forest 11306.04 m3
Used in equations:	10

Data Unit / Parameter:	$V_{EXT, j, z, i, t}$
Data unit:	m^3
Description:	Volume of timber extracted of species j for logging stratum z , in stratum i at time t .
Source of data:	Records of wood extracted.
Justification of choice of data or description of measurement methods and procedures applied:	Frequency: Monitored at least 5 years Procedures will be the same applied to the estimation of the volume extracted from logging stratum z in stratum i at time t ($V_{EXT, z, i, t}$).
Any comment:	n/a
Value monitored	See the excel "Cp Estimations in M&M" (spreadsheet GLG - Extracted timber)
Used in equations:	11

Data Unit / Parameter:	W_{SKID}
Data unit:	M
Description:	Mean width of skid trails.
Source of data:	Field measurements.
Justification of choice of data or description of measurement methods and procedures applied:	Systematic sampling with a random start to produce an average width of skid trails, to PCA 10 and PCA 11.
Any comment:	n/a
Value monitored	The mean width is 4.51 m taken from field data of PCA 10 and PCA 11
Used in equations:	14

3.3 Description of the Monitoring Plan

The Madre de Dios Amazon REDD Project involves two adjacent timber concessions, included within the “Permanent Production Forest” of the Madre de Dios region. It has a total official area of 98,927.38¹¹ hectares covered by natural tropical forests with the presence of “Paca” (native bamboo). This type of forest is characterized by a great diversity of flora and fauna of Amazonian species. The physiographic type corresponds mainly to “Low Hills”.

Although the management of the area for the production of forest products, mainly wood under an FSC scheme, is in charge of the two forest concessions, both constitute a single unit for the implementation of the Madre de Dios Amazon REDD Project. In this sense, the implementation of the activities related to the monitoring component of the project is performed by a single technical team.

The main goal of this Monitoring Plan is the collection of the data that allow the verification of the deforestation and the degradation within the project area and its leakage belt throughout time, regularly updating the emissions estimations as well as the generation of sufficient and timely information to make the necessary adjustments to the strategies included in the VCS Madre de Dios Amazon REDD Project PD Template.

The Monitoring Plan is focused in the following two main components:

1. Monitoring of the Madre de Dios Amazon REDD Project objectives.

- a) OUTCOME 1: Contribute to the sustainable development of rural producers living in the buffer zone of the project.
- b) OUTCOME 2: Reduce the vulnerability of the project area from external factors of deforestation and degradation.

This component will be conducted through the assessment of compliance with the activities proposed for each objective.

¹¹ * Total number of hectares stratified by the IIAP for the Ecological Economic Zoning, which was based on the Forest Map of the National Geographic Institute (IGN) and which has available shapes. This data was employed in the development of all the maps required by the applied methodology. The area according to CIEF – Peru Digital (98,932 has), which was employed for the concession contracts and therefore in the FSC Certificates, the FMP and the PDD submitted to the CCBA does not have available shapes. If the images are compared, it can be appreciated that in the upper part there is no perfect overlap between the two profiles.

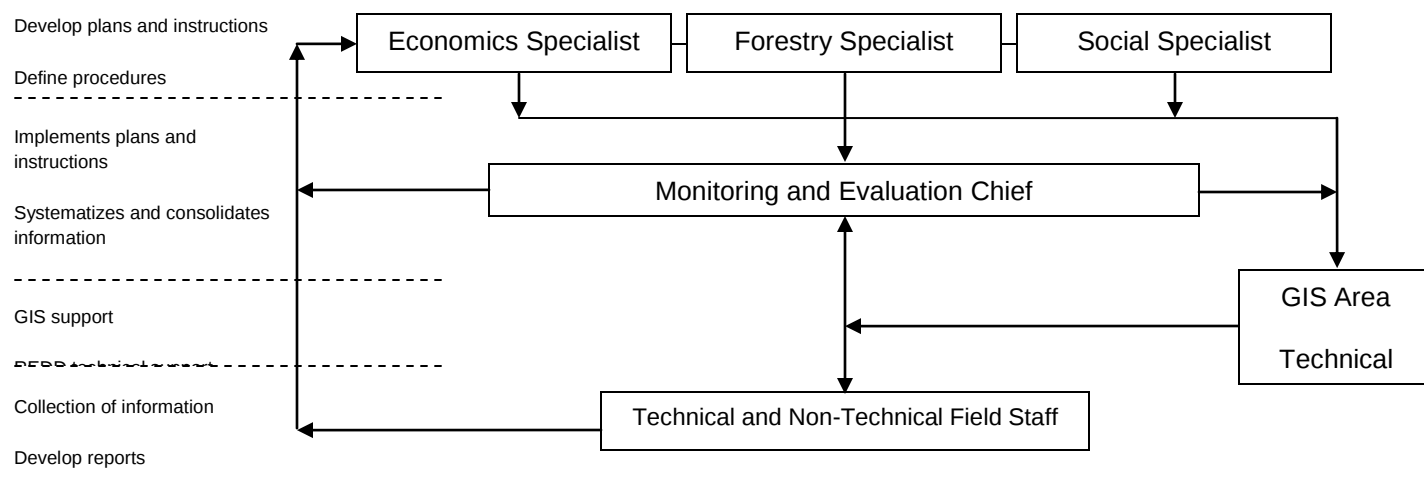
2. Monitoring of the parameters described in the item 4.2. of this Monitoring Plan (Data and Parameters Monitored):
 - a) Forest cover map – Strata within the project area
 - b) Forest cover map – Strata within the project leakage belt
 - c) Results of the PRA
 - d) Degradation results
 - e) Burned area
 - f) Deforested area within the project area
 - g) Deforested area within the project leakage belt
 - h) Potentially degraded area within the project area
 - i) Degraded area within the project area
 - j) Carbon stock loss due to degradation
 - k) Emissions due to biomass burning (if deforestation within the project area occurs – land use change to agriculture and burning of the forest)
 - l) Emissions due to nitrogen incorporation (if deforestation and fertilizer are employed in the new land uses).
 - m) Carbon stock in wood products

ORGANIZATIONAL STRUCTURE

The Madre de Dios Amazon REDD Project counts with a skilled and experienced technical team for its implementation and its monitoring component. In addition to this, it also counts with the technical advice of Greenoxx NGO, AIDER NGO and Bosques Amazónicos SAC (BAM), all of them experienced institutions in the development of conservation and sustainable use of resources projects and projects involving the use of environmental services such as REDD Projects.

The development of the Monitoring Plan is in charge of a multidisciplinary team, led by an Economist, a Forestry Specialist and a Social Specialist, allowing the integral address of the different components of the plan. Its implementation is responsibility of the Monitoring and Evaluation Chief, who must articulate it with the technical and non-technical field staff, the same that carry out the in-field measurements and the corroboration of the laboratory information. There is also a GIS Area for mapping support. Additionally, AIDER and BAM NGOs provide their support for the development of the modeling and specialized items that are required for the monitoring of the project.

Following, the information flow of the monitoring system is detailed:



INFORMATION MANAGEMENT: DATA COLLECTION, PROCESSING AND REPORT

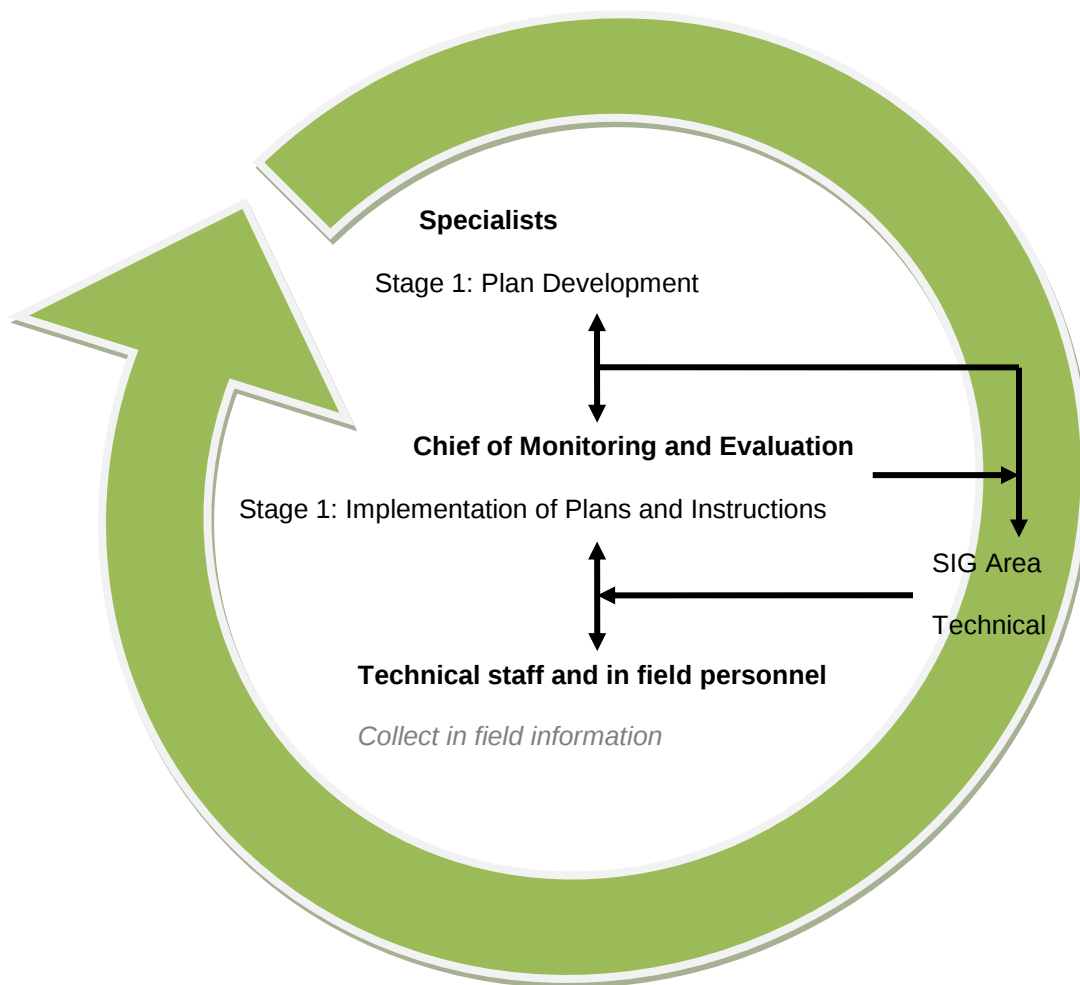
The project is based in the premise of the “Adaptative Management”, in this sense every intervention on the forest are sustained in previous information collected in field as a knowledge basis. Based on this knowledge is that Management Plans, Operative Plans and the rest of the necessary instructions for the implementation of the project, the interventions on the forest and the treatment of the social component are defined.

The permanent implementation of the Monitoring Plan allows the identification of the tendencies of the different parameters, including those that are useful to evaluate the compliance with the objectives of the Project. This knowledge that is generated allows the adaptation of the system (plans and the rest of the instructions).

The information collected in field by the technical staff is systematized by the Monitoring and Evaluation Chief, who at the end of the year (November-December) presents the Monitoring Report for the period to the specialists who together with other members of the project, will elaborate the Operative Plan of the following period, identifying additionally which manuals of instructions or protocols should be updated or adapted to the occurring changes. Since the following up in the implementation of the project is permanent, if important changes occur, the system can be updated during the same period, without having to wait for the report at the end of said period.

Following, the information flow in the framework of the adaptative management of the project is presented:

ADAPTATIVE MANAGEMENT



PLANIFICATION AND MONITORING

Forms have been defined for the collection of the field data that is currently within the concessions processes and forms will be defined for those variables to be monitored. The collected data will be systematically digitalized in Excel type spreadsheets, also designed according to the information requirements. The calculations will be made in said spreadsheets using the correspondent formulas and afterwards the necessary reports are delivered as the basis for the elaboration of the consolidated Monitoring Report.

All the field monitoring processes should be documented, all the established sample units or plots should be georeferenced and systematized within the GIS.

The physical and digital files which store the data generated during the monitoring process will be accessible in the two modalities described before (physical files and digital files), being kept in the project offices in the locality of Iñapari and in Maderacre's central office in Lima, Perú throughout the Madre de Dios Amazon REDD Project duration and for at least two years after the end of the project crediting period.

The information management comprises the following steps or processes:

Step 1: Selection and Analysis of the Source of Land Use Change

1.1. For the monitoring period of 5 years the following actions will be carried out:

- The collected and analyzed data should cover the entire project area and leakage belt. Available data for the year when verification occurs.
- For the calculation of each category of land use change:
 - The area of each category within the project area will be calculated and where required within the leakage belt.
 - The forest cover maps of reference for the project area and leakage belt will be updated.
 - The remaining forest area within the project zone will be updated.

1.2. For the monitoring period of 10 years. Baseline review:

- Use of high resolution images (30 m x 30 m or less, if available) at the end of the period where the baseline will be renewed.
- The collected and analyzed data should cover:
 - The entire reference region: available data for the year of baseline renewal or not less than a year earlier.
 - For the processing of the data change for the Great Land Use Capacity (in Spanish Capacidad de Uso Mayor de las Tierras), will be georeferenced and geometrical corrections will be made as well as clouds and shadows detections.

- The area of each category within the reference region, project area and where required within the leakage belt will be calculated.
- The forest cover maps of reference for the reference area, project area and leakage belt will be updated.
- The total deforested areas during the first 10 years will be estimated in order to adjust the baseline and the deforestation rate if necessary.

Note: The indications of the correspondent Module of the REDD Methodology Modules will be taken into account with respect to clouds for the determination of maps. A classification accuracy of 90% or more will be sought.

Step 2: Interpretation and Analysis

2.1. Monitoring of Deforestation

- a) Deforested area within the Project Area (PA) per stratum.
- b) Deforested area within the Leakage Belt (LB) per stratum.

In both cases it must be specified to what type of Land Use (LU) the deforested areas have been changed. For the baseline re-calculation it should be established or indicated if the percentages of land use change are still the same as in the initial baseline.

- c) Carbon stock in carbon pools:
 - Carbon stock in each stratum defined in the baseline is maintained. It will be reassessed for the baseline review (in 10 years).
 - Carbon stock of each land use is maintained. It will be reassessed for the baseline review (in 10 years).
- d) Volume of timber harvested in each concession, per stratum and per year.
- e) Deforested area within the Reference Region (for the baseline review).

2.2. Monitoring of Degradation

The Madre de Dios Amazon REDD Project counts with a Custody System in the process of implementation (control posts, defined boundaries, regular patrolling, etc.). In this sense, it is expected that there will be no degradation by wood extraction due to illegal logging or firewood or coal production. If this occurs within the concessions, this degradation will be discounted.

A Participatory Rural Appraisal (PRA) will be conducted in order to determine whether degradation occurs. In this sense, these steps will be followed:

1. Degradation due to illegal logging:

- a) The PRA will be conducted every 2 years. If the results indicate that the project area has no pressure from this type of degradation, then it will be assumed that: $\Delta C_{p,Deg,i,t} = 0$.
- b) If the results of the PRA indicate that there is potential for degradation, then it must:
 - Obtain a “penetration distance” in the PRA (distance that the degradation agents can enter from the nearest access points).
 - Identify the most important access points to the vulnerable area.
 - From said points, draw the distances and create a Buffer Area with a width equal to length.
 - Transects will be established to evaluate the buffer zone. The assessed area should not be lesser than 1% of the buffer area.
 - If stumps are not found (harvested trees), then it is assumed that $\Delta C_{p,Deg,i,t} = 0$ and the assessment is repeated every 2 years.
 - If stumps are found, then a systematic assessment is carried out. For this, plots are distributed systematically, being the area to assess $\geq 3\%$ of the buffer area.
 - Take into account the diameter of the stumps, which will be assumed as their DBH. If they were very large (e.g. due to buttresses), then the species of the stump is identified and standing trees of the same species are located. Afterwards, their DBH and stump diameter are measured and a ratio between DBH/stump diameter is calculated. With this ratio, the DBH from the stump diameter of the cleared individuals that were found is estimated.

- With the DBH data, the carbon stock of the harvested trees is calculated, using the allometric equation that was employed for the estimation of the tree carbon stocks in the baseline (Chavé Equation).
- It will be assumed that all stock will be lost to the atmosphere.
- This assessment must be repeated every 5 years.

2. Degradation due to fire:

- a) Burned areas must be measured in the field using GPS.
- b) In order to calculate the emissions from this, the E-BB Module of the approved VCS REDD Methodology Modules shall be followed.

2.3. Monitoring of areas of increased carbon stocks

The increase in carbon stocks is assumed to be zero, thus it does not require monitoring.

2.4. Monitoring of project emissions

The non-CO₂ GHG emissions will be calculated:

- a) N₂O and CH₄ from the burning of agricultural and forest biomass. It is carried out in those areas of land where use change occurred. For the ex-ante calculations of the biomass burned within the forest, it was estimated (through expert consultation) that 50% of the deforested forest was burned. In the case that deforestation within the project area occurs, a new percentage will be established (based on real measurements that will be made or literature support). It will be indicated what was done for the baseline recalculation (every 10 years).
- b) N₂O emissions due to the use of fertilizer within deforested areas. In the case that deforestation and N₂O use occur during the project lifetime, the amount of nitrogen fertilizer used per deforested hectare shall be determined.

SATELLITE IMAGES ANALYSIS AND INTERPRETATION:

The deforestation and the source of land use change analysis should be conducted through the use of satellite images and in-field verifications. The procedures that will be considered are the following:

1. Selection of satellite images:

The satellite images were acquired in the server of images of the INPE, which has an already established form in order to make the requests online (<http://www.dgi.inpe.br/CDSR/>). The orbit/point, date, year and percentage of cloud cover (less than 10%) were considered.

The satellite images used were `geop306r084_20120901.img` and `geop307r084_20120720.img` where the path 306 and 307, the row 084 for both images and the dates correspond to September 1st and July 20th, 2012. The above mentioned information is detailed in the attached report: `reporte_img_satellite.pdf`.

Resource Sat satellite images were used because Landsat images were not available, as the sensor has gone off work.

The Path-Row needed to cover the entire project zone area is identified.

The monitoring reports must detail the relationship between the acquired images and the use of an “Images Acquisition Form” that includes the following information: Path, Row, Date, Year, Source and Code.

Images with a cloud cover surpassing 10% of the entire area of the image must not be used, this to ensure the proper analysis of it.

2. Processing of satellite images processing:

For the processing of the selected satellite images Erdas Imagine 9.2® and ArcGis 9.3.1® type will be used.

The processing of satellite images should include the following steps:

a) Geometric Correction

This process is applied to transform images by eliminating geometrical distortions from the sensor, which means that they must be orthorectified. In this sense, approximately 40 control points were taken into account with a mean square error of 1- 2 pixels.

b) Band composition

It is applied to obtain a better quality in the classification of images by obtaining a single file per image.

c) Visual classification

IIAP methodology was used to classify the satellite images the working scale was 1:60 000 and 1:70000. The classes identified were:

- Forest
- Non forest land.

The last one was divided into sub categories:

- Pastures.
- Agriculture
- Farming
- Infrastructure
- Secondary forest

An accuracy assessment was developed to analyze the precision of the final maps.

More details of the whole procedure can be seen in the final Technical report made.

INTERNAL AUDITING

The main purpose of the management system of the project's information quality is to minimize the risks of error, obtaining reliable data on which to base the monitoring results. It includes the following steps:

1. Training

It includes the training of general staff in the different roles to play within the framework of the Madre de Dios Amazon REDD Project, however, aiming at always having quality information, the training on those critical points of the information management will be prioritized, which are field collection and its processing (Evaluation and Monitoring Chief, field staff and GIS Specialist). All staff must go through an induction process before executing any activity related to the monitoring.

2. In-field verification

It basically consists of monitoring in the field that the field staff is following the procedures set out in the methodological guidelines given in the previous process of induction. This work is in charge of the Evaluation and Monitoring Chief.

An error in following the procedures should be corrected in the field during the execution of samplings or assessments.

3. Review of the collected data pre and post digitalization

The collected data should be reviewed before (field forms) and after (electronic spreadsheet) its digitalization, so that a second eye can detect inconsistent information. This work is in charge of the Evaluation and Monitoring Chief.

If any information inconsistency is identified at the level of field forms, this information must be verified in the field. If the inconsistency is found in the digitalized information, it must be corroborated in the field forms and whether the inconsistency persists, it must be corroborated in the field.

4. Review of the monitoring reports prior to publication

The monitoring reports must be reviewed prior to publication, in order to confirm the calculations, analysis and the conclusions are accurate and measured. This work is in charge of the Project Chief or Coordinator.

If non-conformities exist during the internal or external auditing processes, the data should be reviewed and the non-conformities addressed.

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

As showed in the Project PD, the net GHG emissions under the baseline scenario in the 2009-2012 period is 4'958,228 tCO₂-e (pg 164 in PD).

T	Year	$\Delta C_{BSL,unplanned}$ (t CO ₂ -e)
1	2009	1,162,914
2	2010	1,305,876
3	2011	1,314,396
4	2012	1,175,042
Total		4,958,227.9

4.2 Project Emissions

According to the Project PD, the ex-ante emissions in the project scenario in period 2009-2012 were equal to zero.

During the monitoring, all the steps in M-MON module were followed to obtain the Net greenhouse gas emissions under the project scenario:

$$\Delta C_p = \sum (\Delta C_{p,defPA,i,t} + \Delta C_{p,Deg,i,t} + GHG_{p-E,i,t} + \Delta C_{p,Enh,i,t}) \dots \text{Equation n°1 M-MON}$$

457,844.52

Stratum	$C_{p,Def,PA,i,t}$	$C_{p,Deg,PA,i,t}$	$C_{p,Dist,PA,i,t}$	$GHG_{p-E,i,t}$	$C_{p,Enh,i,t}$	TOTAL
Hilly Forest	-	338,870.75	-	-	-	338,870.75
Terrace forest	-	62,787.34	-	-	-	62,787.34
Bamboo	-	59,066.92	-	-	-	59,066.92
Others	-	-	-	-	-	-
Tree Swamps	-	-	-	-	-	-
TOTAL	-	460,725.00	-	-	-	460,725.00

4.3 Leakage

During the monitoring of period 2009-2012 and following the steps presented in LK-ASU module, the Net greenhouse gas emissions due to leakage are equal to:

$$\Delta C_{LK-AS,unplanned} = \Delta C_{LK-ASU-LB} + \Delta C_{LK-ASU-OLB} + GHG_{LK,E} \quad \dots \text{Equation n°13 LK-ASU}$$

$\Delta C_{LK-ASU-LB}$	$\Delta C_{LK-ASU-OLB}$	$GHG_{LK,E}$	$\Delta C_{LK-AS,unplanned}$
-	1144.158701	-	1,144.16

Given that the project was only validated for avoided unplanned deforestation activity, the total emissions due to leakage are the same presented in the above table, as stated in the following equation:

$$\Delta C_{LK} = \Delta C_{LK-AS,unplanned} \quad \dots \text{Equation n°3 REDD-MF}$$

4.4 Summary of GHG Emission Reductions and Removals

The total net greenhouse gas emissions reductions of the REDD project activity were calculated as follows:

$$C_{REDD,t} = \Delta C_{BSL} - \Delta C_P - \Delta C_{LK} \quad \dots \text{Equation n°1 REDD-MF}$$

	$\Delta C_{BSL,unplanned}$	ΔC_P	$\Delta C_{LK-AS,unplanned}$	$C_{REDD,t}$
Period 2009-2012	4,958,227.99	460,725.00	1,144.16	4,496,358.83

Then, this result was adjusted to account for the uncertainty analysis:

$$\text{Adjusted_}C_{REDD} = C_{REDD} * (100\% - C_{REDD_ERROR}^{12} + 15\%) \quad \dots \text{Equation in REDD-MF, page 19}$$

$$\text{Adjusted_}C_{REDD} = 4,496,358.83 * (100\%) = 4,496,358.83 \text{ t CO}_2\text{-e}$$

¹² Uncertainty does not exceed the 15%, is 6.24%

A final discount due to Permanence Risk Buffer was made, so the final result is:

$$\text{Buffer}_{\text{UNPLANNED}} = ((4,958,277,9 - 0) - (460,725.00 - 0)) * 10\% = 449,750.30 \text{ t CO}_2\text{-e}$$

In this way, the total emission reductions due to project activity for the 2009-2012 period were obtained:

	C_{REDD,t}	Adjusted C_{REDD,t}	Buffer_{UNPLANNED}	VCU_t
Period 2009-2012	4,496,358.83	4,496,358.83	449,750.30	4,046,608.53

5 ADDITIONAL INFORMATION

All these calculations can be reviewed in the following excel documents:

- VCUs Estimations in MDD modified.xlsx
- Cp Estimations in MDD modified.xlsx
- Leakage Estimations in MDD modified.xlsx
- Uncertainty Analysis MDD modified.xlsx