CELESTIAL GREEN Ventures

PROJECT IMPLEMENTATION REPORT

Trocano Araretama Conservation Project
Projeto Concervação Trocano Araretama

Municipality of Borba, Amazonas, Brazil

Reporting Period

10th June 2011 to 20th May 2013

Project Developer

CELESTIAL GREEN Ventures

Project Partners

INSTITUTO AMAZÔNIA LIVRE amazonialivre.org

BORBA NOVOS TEMPOS, MAIS OPORTUNIDADES !

Report Date

26th August 2013

eco ecosystem certification organisation

nfs natural forest standard

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i. Project Information

Project Title	Trocano Araretama Conservation Project
Project Proponents	Celestial Green Ventures
Project Partners	Municipality of Borba Instituto Amazonia Livre;
Start / End Dates of Project	Start: 10th June 2011 End: 9th June 2031
Verifier Details	Stewart McMorrow, Verifier/Senior Forester Environmental Services, Inc. Forestry, Carbon and GHG Services Division 7220 Financial Way, Suite 100 Jacksonville, Florida 32256 smcmorrow@esinc.cc +1 530 525 2232

ii. Report Information

Annual Report Number	NFS001_1
Reporting Organisation	Celestial Green Ventures
Reporting Period	10th June 2011 to 20th May 2013
Crediting Period	10th June 2011 to 31st July 2012
Author(s) and main contributors	Celestial Green Ventures Instituto Amazonia Livre
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iii. Project Implementation Team

The Project Implementation Team is a multidisciplinary team who are appropriately skilled for their given responsibilities and functions. This team will be subject to review in accordance with the annual review detailed in section F1 to ensure the relevance and skill-sets required by the project.

NAME	RESPONSIBILITY	FUNCTIONS
Antônio José do Nascimento Fernandes	Project Leader	Overall co-ordination of the project in accordance with the management plan aims and objectives; Ensure the project process occurs in a satisfactory and planned way; Monitor the operations for conformity, adopting appropriate measures and controls where necessary; Overseeing the dissemination of information regarding the project activities and project outcomes; Ensure the project is carried out in compliance to the NFS Standard.
Waldemar de Lima	Project Co-ordinator	Responsibility for the management of the organization and coordination of the PMC; Being the link between the Management Council and the rest of the project organization, providing conditions for effective decision making; Assist the PMC in tasks assigned to them; Prepare periodic analysis of the operations progress to be submitted to the Management Council; Oversee and take preventive and corrective actions to achieve the goals and strategies set out in the strategic plan.
José Souza dos Santos	Finance Officer	Coordination and supervision of the project financial resources, grants and subsidies to the PMC for overall control of the project; Managing the cooperative activities and financial training; Development of tools and reports that facilitate the control and management of the project; Monitoring of PMC programs; Statistical controls and analysis of results of subprojects; Signing cheques, along with another member of the PMC; Supervision of the financial work.
Rodrigo da Costa Lima	Project Operations Officer	Plan and organize the operations of the project; Coordinate services and project processes; Provide outputs and understanding of the needs of system and infrastructure; Operationalize the interaction and knowledge about the context in which the project falls: Environmental protection (adaptation to project activities becoming the norm); Social

		responsibility (safety of employees and the organization's relationship with neighbours); Co-ordinating all training requirements in the project areas; Technological awareness and processes; Knowledge management (documentation, learning, etc.).
Fabiola da Costa	Administrative Manager - Brazil	Coordinate and supervise the administrative area; Plan, organize, direct, evaluate, supervise and control the administrative activities and people management involved with the project; Monitor the administrative processes of the project, ensuring goals are reached.
Juliana Terezinha da Silva	Legal Advisor	Provide legal advice on Environmental and Labour Law; intermediate conversations with the Municipal legal advisors; keep the project team up to date with information about changes in Federal and State Environmental Legislation.
Patrícia de Almeida Santos	Coordinator for Biodiversity Monitoring	To plan and coordinate the activities for biodiversity monitoring; To coordinate the activities related to the inventory of the fauna and flora; To coordinate courses and training lessons for biodiversity monitors.
Charles Oliveira do Valle	Training Activities Coordinator	To develop activities in the areas of entrepreneurship; To coordinate and plan courses and training sessions to qualify businesses in the project areas; To coordinate the planning and implementation activities in the field of business management; To coordinate and guide the professionals involved in the business management.
Antonio Fonseca Picanço	Environmental Monitoring Analyst	Co-ordinate the study of environmental issues including community and project impacts reporting and analysis; Prepare reports and analysis on environmental monitoring of the communities involved in the project and biodiversity; Coordinate and monitor environmental projects conducted in the project area, especially ecotourism.
Cibele Lopes Bastos	Manager of Remote Sensing and GIS – Brazil: Ground Teams Training Coordinator	Coordinate the activities of the project geo-referencing and geo-processing; Manage and resolve the field monitoring activities in the project area; Manage the system of quality monitoring, GIS and geo-referencing of the project; Training co-ordinator for on-the-ground monitoring teams.

Jenifer Castilho Marques Pereira	GIS Analyst – Brazil	Process, sort and geo-reference information collected in the project.
Rodrigo Pimenta Cézar	GIS Analyst – Brazil	Process geo-referenced data; Providing use of geo-referenced database; Prepare maps and spreadsheets of geographical coordinates.
Cleuton de Souza	Technical Consultant – Carbon Projects	Evaluate methodologies to collect and analyse data; Check the application of methodologies and data usage.
Renan Rodrigues Albuquerque	Technical Consultant – Socio-Economic	Assess and evaluate social impacts of the project; Evaluation of the economy and society of the Amazon; Implementation of communication in project area.
Mariana Castro	IT Designer	Develop the visual and online presentation and communication of the project.
Ariovaldo de Souza Junior	IT Developer	Develop educational materials through computational resources.
Marcelo Nascimento Fernandes	IT System Developer	Organise and structure overall project database including data collection records, communication records, centralised access to appropriate documents and information.
Enf. Lizandra Livia Farias Monteiro	Consultant – Health	Organize health actions; Plan activities for health in partnership with key people in the project; Provide information and activities related to personal health.
Francisco Ferreira das Chagas Filho	Consultant – Education	Coordinate activities related to education; Plan and manage activities in the area of education; Support environmental education activities in the project area; Provide information to staff and activities related to education.
Edilson Batista da Fonseca	Consultant – Rural Production and Supply	Act together with the key people of the project, participating and collaborating with the schedules geared to the development of supply chains and sustainable extraction services in the project area; Provide database for planning activities aimed at development of rural production and supply in the project area; Provide information necessary for the preparation of development projects.
Jorge Machado	Consultant – Sports, Culture, Tourism and Environment	Coordinate and monitor activities related to sports, culture, tourism and environment; Monitor and participate in the planning of activities related to sports, culture, tourism and environment; Support the actions and activities related to sport, culture, tourism and environment.

Raimundo dos Santos Machado Neto	City Hall Co-ordinator	Spokesperson City Hall; Responsible for relations with the city hall project; Organize actions between the secretaries of the Prefeitura and the project; Spokesperson of the Prefeitura.
Paula Torres Cofré (Senior Administrator CGV)	Project Administrator – Head Office, Dublin	Upkeep of Management Plan as living document; central amendments log and carrying out of amendments; general project administration; translation work between Portuguese and English; co-ordination of all resources between Head Office Dublin and Project Team in Brazil.

iv. Abbreviations

BDM	Benefit Distribution Mechanism
CGV	Celestial Green Ventures
GHG	Greenhouse Gas
IAL	Instituto Amazonia Livre
IBAMA	Instituto Brasileiro de Meio Ambiente e Recursos Naturais Renováveis
IDAM	Instituto de Desenvolvimento Agropecuário e Florestal Sustentável do Estado do Amazonas
IPAAM	Instituto de Pesquisa Ambiental da Amazônia
NBM	Normative Biodiversity Metric
NCC	Natural Capital Credit
OTG	On-the-ground
PD	Project Developer
PDD	Project Design Document
PIT	Project Implementation Team
PMC	Project Management Council
UFAM	Universidade Federal do Amazonas (Manaus)

1. EXECUTIVE SUMMARY

This report has been prepared to describe the initial progress made on the implementation of the Trocano Araretama Conservation Project as specified in the PDD document validated by Environmental Services Inc in March 2013. The PDD outlines how the project intends to successfully implement the project in accordance with the Natural Forest Standard, and how the implementation of the project will be actioned throughout the duration of the project, and the benefits that will be available and achievable for the project area inhabitants through the successful implementation of the project, and in particular when full implementation is possible through achieving the carbon finance generated by the sale of issued NCC's from the project.

At the time of reporting, the Trocano Araretama Conservation Project is 23 months into its 20 year project lifespan, and as such the implementation of project activities is still in very early stages. The project is not yet subject to the required carbon financing to allow full implementation of the project activities detailed in the Project Design Document; however this report will outline and focus on the progress made within this initial project phase.

For the purposes of credit issuance, this document is reporting on the initial satellite carbon monitoring for the NCC crediting period from 10th June 2011 to 31st July 2012, the first year of the 20 year project duration and to correspond with the availability of deforestation data available from PRODES, which is being utilised in the Geospatial Platform, alongside other methods (as discussed in the PDD) as part of the monitoring of the project.

To show further developments that have occurred within the project area, that are relevant to the progress of the project but do not fall within the crediting period this document refers to, this report has been prepared to include project implementation information for the initial 23 months of project activity, from the start date of 10th June 2011 through to mid-May 2013, identifying all key project events, actions and activities that have been implemented up to this point. Where appropriate, additional information has been included covering the important events that occurred prior to the start date, in particular to give details regarding the signing of the carbon agreement between CGV and the Municipality of Borba. This reporting timescale corresponds with the initial verification period and it describes the progress and results of implemented activities during this time.

It outlines the initial implementation activities that have occurred in order to define the project scope and activities and to gain the awareness and acceptance within the project area. It also describes the work that has been carried out by Celestial Green Ventures, Institute Amazonia Livre, IDAM and the Municipality of Borba to ensure the governance, management and monitoring structure is in place for the successful implementation of the project once carbon financing is achieved.

This report will focus on the progress of the broad-term project activities of carbon, social and biodiversity. For the initial-phase carbon activity indicators, the Geospatial Platform will be the principle demonstrative tool to provide the evidence showing the success of the project thus far including the most up-to-date available data received from PRODES, which is for the period of August 2011 through to July 2012. The activities included in this category include the successful mitigation of deforestation within the project area through developing the participation of inhabitants of the project area and their willingness and enthusiasm to be part of a successful project.

The initial-phase presentation of social activity indicators are primarily focused on the participation of the project area inhabitants and gaining their co-operation in the monitoring activities of the project and their participation in community meetings to discuss the potential benefits that the project can bring, that would be suitable for their communities.

The biodiversity activity indicators for this project phase will be based on the similar factors of carbon, as they are linked to the mitigation of deforestation in the project area, and the additional activities which have been initially identified in the PDD, will await further progress of the project before implementation.

2. PROJECT DEVELOPMENTS, EVENTS AND CHALLENGES

Presentations of the project idea to the local authorities, Mayor, City Councillors, secretaries and representatives from the communities were held during the first half of 2010. The project was presented and everyone involved showed interest for its implementation, with the inclusion of public agents in the meetings. Following these successful discussions, and in agreement with the Municipality, the initial signing of the contract between the Municipality of Borba and Celestial Green Ventures followed on the 7th June 2010.

Following this, a number of initial implementation discussions were held between the Municipality of Borba, IAL and CGV throughout the rest of 2010 and into 2011, when an official project commencement date of 10th June 2011 was agreed. This was marked the signing of an official contractual document by both parties, detailing the payment schedule to the Municipality and activities to avoid deforestation began.

Since this start date, CGV, IAL and the Municipality of Borba have worked together to initiate these initial measures to mitigate deforestation, raise awareness and participation of the local communities and to effectively monitor the project area and leakage boundary for any occurrences of deforestation. The following section gives a timeline of key meetings and events since the start date of the project. Meeting reports, photos, audio files and other documentation of these actions are gathered in the IAL office and will be freely available during the on-site verification visit.

2.1 Timeline of Key Developments, Meetings and Events

2010 - Following initial approaches to some Amazonas Municipalities regarding the possibility of carrying out projects within their jurisdictions, on 7th May 2010 a meeting was held with a number of Municipality Prefeitos from the Amazonas State. This meeting was held to analyse the possibilities of signing the contracts for CGV to initiate these projects. Following consultations with their Municipal lawyers, the Municipality of Borba signed the contract with Celestial Green on the 7th June 2010.

Photo 1: Meeting with a number of Prefeituras from Municipalities in the Amazonas State, 7th May 2010

Throughout the remainder of 2010 there were numerous visits to the Borba Municipality, to research and gather information to build the foundation of the project, including socio-environmental diagnosis. During the initial meetings of introduction of the Trocano Project, farmers, fishermen and ranchers were involved and were committed to improving and / or changing of their activities performed in order to meet project objectives; however the constraints presented by the participants raised concern about the implementation and enforcement of agreements. These

issues were thoroughly discussed and explained how alternative and sustainable solutions would be available and implemented in agreement with their customary way of life.

In November 2010, CGV made initial discussions with IAL to discuss the possibility of a project partnership being created to carry out the REDD+ projects in the Amazonas State. The possibilities were evaluated and on the 7th November 2010, agreement was made between CGV and IAL for the development of the Trocano Araretama project.

Trips were made to riverside communities, which were part of the project assessment and analysis. These communities were used as a sample for the other communities in the project area. These communities were receptive and curious regarding the project, and were keen to play an active role in the assessment and implementation of the project. They were pleased to participate in interviews, field trips, questionnaires and other activities held by IAL. A meeting in the Municipal seat of Borba was also held for the riverside community representatives to ensure the communities were fully participative in the project and through their representative, they were able to have their questions answered and they also helped IAL get to know each community and the reality experienced by the inhabitants.

2011 - During the beginning of 2011, there were a number of meetings with Antonio J. Muniz Cavalcante, the Mayor of Borba at this time, to discuss and clarify the details of the project and the parameters that would be set in place for the success and implementation of the project.

10th June 2011 - This day saw a meeting between CGV, IAL and the Municipality of Borba to officially mark the start date of the project and to sign the payment schedule documentation.

A Stakeholder Interaction meeting was arranged for the 14th June 2011 and took place over 3 days. Those present included senior members of the Municipality and members of the communities in the project areas. The subject of this meeting was the distribution of funding in the Municipality and throughout the project areas, employment in the project for those living in the project areas and a list of basic medical and educational requirements.

Photo 2: Meeting with communities of the area of the project 14th June 2011

25th June 2011 - A meeting held between CGV and the Mayor of Borba concluded the agreement to the revision of the Municipal By-Laws to include the contract of the 7th June 2010. A letter was exchanged outlining the authorisation from the Mayor to proceed with the revision and the Mayor explained that the By-law needs to be reviewed in order to guarantee the "environmental quality in

the urban and rural areas of the municipality of Borba". He also stated that "the By-Law would be reviewed with a wide participation of the community with meetings involving different representatives from within local society."

29th June 2011 - Arriving at 16:45 pm in Borba where contact took place with Mr Rosinaldo, Chief of Staff of the City, who organised our meeting with Mrs Luiza Garcia, Secretary of Civil Defence Borba, who is reported to be the person responsible for providing design data. Mrs Luiza scheduled the hours of 10:00 am the next morning to pass us the information requested together with a map of the area established for the project.

30th June 2011 – The above meeting with Mrs Luiza took place, as well as meetings in the departments of health, education and rural production Borba for discussions regarding data collection. The records of images were made at fairs, markets, ports, schools, hospitals, kindergartens, water station and sewage, roads close to urban areas, bathhouse, public trash can, sawmills and urban roads in the municipality.

13th - 19th February 2012 - Meetings were held between CGV and IAL in Manaus to discuss the development of the project and the gathering of information for the PDD. It was also discussed how the project partnership will be developed into the future.

9th March 2012 - On this day the Mayor of Borba visited the IAL offices in Manaus, to discuss the current developments of the project.

30th - 31st May 2012 - IAL were part of the 7th Environmental Forum held at CIESA – Centre for Integrated Higher Education of Amazonas. They provided a presentation on the project to the attendees of the forum.

Photo 3: Members of IAL presenting at the 7th Environmental Forum, CIESA 31st May 2012

17th June 2012 - A meeting was held with the Mayor of Borba, Antonio Cavalcante; the coordinator of Civil Defence, Lucia Garcia; and the head of office Raimundo Machado Neto. Discussions were around the areas with major threats of deforestation, the problem of having remote areas unassisted by the government, and how the project will be part of the Municipality By-Law.

18th June 2012 - CGV and IAL meeting with Glauber Ferreira, Production Secretary and forest technician of the Municipality, and Miguel da Silva, City Councillor. Discussions focused on the

barriers for the development of local production, such as lack of access to technology, and lack of options to the people involved in deforestation.

21st -25th June 2012 - After their arrival at the municipality of Borba, the IAL and CGV teams had meetings with the Mayor of the city and the Secretary for Civil Defence to plan the activities for the municipality, IAL and CGV and to get the necessary information.

Photo 4: IAL, CGV and Municipal representatives 21st June 2012

A day after the arrival in Borba, there was a meeting with the Mayor and all the city secretaries, with the objective of clarifying the goals of the Trocano Araretama Conservation Project and to renew the commitment between the municipality and the secretaries for the validation process and planning of the project activities. This also was the time where the Mayor gave the official papers to CGV and IAL showing the amendments to the Master Plan By-Laws of the Municipality, which officially identifies the inclusion of the signed contract into the By-Laws.

Photos 5 and 6: Meeting with the Mayor and City secretaries

Next, individual meetings were held with the production, health and education secretaries of the municipality, as well as with a representative from IDAM - Instituto de Desenvolvimento do Estado do Amazonas (Development Institute of the Amazonas State) and the Secretary of the Civil Defence, in order to classify and obtain more specific and reliable data about the region.


Photos 7 and 8: Meeting with staff from IDAM, CGV and IAL

22nd June 2012 - CGV and IAL held a meeting with the Secretary for Education, Francisco das Chagas Filho. He spoke about the challenges that the education department faces in the project area, such as providing drinking water for students, difficulties in communication between schools from distant areas, and how technology can help improving the education system.

24th and 25th August 2012 - During the days 24th and 25th of August of 2012, members of IAL; Antônio José do Nascimento Fernandes and Waldemar de Lima 2 meetings were held. The objectives of the meetings were to present the characteristics of the forest conservation project in the Trocano Araretama area.

The first meeting, held on the 24th of August 2012, was with the leaders of the Flechal, Castanhal, Trocanã, São João, Puxurizal and São Francisco communities, as well as the Municipal Secretary of Rural Production. During the meeting, the concepts and characteristics of the Trocano Araretama Project were presented, as well as its activities, by Antônio José do Nascimento Fernandes, counsellor of the Instituto Amazônia Livre and the Celestial Green Ventures representative at the occasion. All the leaders agreed with the benefits that the project activities will bring to their communities. All of them collectively gave their consent for participating in the project.

The second meeting on the 25th August had the presence of the Rural Production and Health secretaries and the discussion was around the importance of the benefits in the health and education areas. The leaders of the communities Caiçara, Miriti, Iracema and Costa do Ipiranga expressed their support and gave their consent for the participation in the project.

18th September 2012 – The first meeting was held with the then-candidate for the new Mayor in Borba, Jose Maria da Silva Maia, to introduce the project to him, to discuss the benefits of implementing the project and to start to develop a working relationship with him for the future.

Photo 9: First meeting with Jose Maria da Silva September 2012

17th - 19th October 2012 - IAL had the opportunity to present the project at the 9th National Science and Technology week event. During this event, IAL presented the project activities within the sustainable development chain. They did a presentation in the Media Centre of the Amazonas State, as well as in the State University of Amazonas in Corai City.

Photos 10 and 11: 9th National Science and Technology Week

24th - 26th October 2012 - IAL visit to CGV Head Office, Dublin to hold discussions on the partnership between the companies, and also on final adjustments in the PDD of the Trocano Araretama Conservation Project, with input from Eimear Dempsey, Research and Development Co-ordinator from ECO NFS. Members presented updates on the relationship with the communities from the project area, monitoring activities, and main project activities.

Photo 12: Ciaran Kelly and Waldemar de Lima in Dublin, October 2012

10th January 2013 - The first official meeting was held between IAL and the newly elected Mayor of Borba, Jose Maria da Silva Maia, for updates on the project development. Also in this meeting, there was the signing of an important amendment to the contract plus the contract signed between IAL and the Municipality to carry out the amendments to the Master Plan By-Laws.

Photos 13 and 14: Jose Maria da Silva Maia, Mayor of Borba and Waldemar de Lima, IAL signing of contracts 10th January 2013

It was also agreed that an office within the Municipal building would be made available to the Trocano Project to act as the on-site project office.

Photo 15: Trocano Project Office in Borba Municipality

17th February 2013 - IAL and CGV meet at UFAM – Universidade Federal do Amazonas (Manaus) with Professors Guilherme Pereira and Claudia Guerra, from the Education Department in UFAM, to discuss possibilities of cooperation with the Trocano Araretama project.

18th February 2013 - CGV and IAL attended the first session of the year at the City Council of Borba, with the presence of all members of the council (including the councillors elected in October's 2012 elections and re-elected members), the Mayor and members from the local communities. This included a brief explanation about the project by the Mayor to all attendees.

Photos 16 to 18: First session of City Council 2013

19th February 2013 - There was a meeting held with the city councillors and members of the local population to discuss the updates on the project and options to continue to bring benefits to the project area. Followed by lunch, where the project team and the mayor discussed monitoring solutions for the project area, especially regarding the role of the police.




Photos 19 to 22: IAL, CGV, Mayor, City Councillors and representatives of the Municipality

CGV and IAL also met to discuss the distribution of an illustrative cartoon to be distributed during a meeting arranged for the end of the month with a number of community leaders. The cartoon explains in simple terms and using local language the benefits the project can bring (to reach those people who might still have questions about the project).

22nd February 2013 - IAL and CGV held a meeting with Eduardo Figueira, head of Magia Amazonica, a company that works with indigenous groups that produce craftwork. The idea was to find out more about how to structure craftwork production, something that could benefit artisans from the project area.

Photos 23 to 25: Meeting with Magia Amazonica

1st March 2013 - Members of IAL met with the community health workers from approximately 30 communities in the project area, giving updates on the project and handing out the cartoon leaflet to be distributed in communities, explaining about the project and to promote and discuss outreach activities of the project. Through informing these people of the project and the benefits available through participation, there is popular support for the Trocano project amongst the attendees and understanding of the environmental actions required to make the project a success.

Photos 26 and 27: Meeting held with community health workers, IAL and the Municipality, 1st March 2013

The Municipal Secretary for Production and Supply of Borba, Edilson Fonseca Batista, was also in attendance, holding a discussion about the important balance between production and protection of the land.

Photo 28: Production Secretary of Borba (right) and chairman of the IAL debate

15th April 2013 - On this day, a fly-over of the project area was carried out by CGV and IAL, with observations taken by photograph.

Photos 29 and 30: Project area flyover

CGV and IAL also met with the Mayor of Borba and City Councillors for a discussion on important aspects of the project and clarification on the developments of the project including raising awareness of the benefits that people will receive by the project being implemented.


Photos 31 and 32: Discussion held in Municipal building

17th April 2013 - CGV and IAL meet with Ronney César Campos Peixoto, and Farid Mendonça Júnior, from SEPLAN (Secretaria de Estado de Planejamento e Desenvolvimento Econômico – State Secretary for Planning and Economic Development). A meeting was also held with the Department for Research on Alternative Energy Sources in UFAM (Universidade Federal do Amazonas – Federal University of Amazonas). The meeting included Professor Rubem Souza and Professor Atlas Bacellar for the presentation of projects related to ethanol production from cassava plants, and studies about Babaçu.

18th April 2013 - Team meeting held between the IAL directors and CGV, to discuss important strategic advances, and the implementation of the project structure going forward.

19th April 2013 - A meeting was held with the president of the Fishing Union and director of Sindipesca-AM (Union of the Fishermen of the Amazonas).

20th April 2013 - CGV and IAL team meeting for a presentation of the work developed by Vivaldo Campbell de Araújo, an agronomy engineer, who researches in the area of agriculture.

24th April 2013 - A meeting was held with some community leaders from the Municipality of Borba to discuss and present the Trocano project.

Photo 33: Community leaders meeting

29th April 2013 - A meeting was held in conjunction with environmental agents from the Rural Production Secretary (SEMPRA) and staff from IDAM/Borba with the Teachers Association of the Borba Municipality. At the meeting, a presentation of the plan for activities of the Trocano project was given, including the possibility of participating in the monitoring and observation activities. Discussions on the logistics of carrying this out were had and the main points required for monitoring were presented. Staff from SEMPRA and IDAM discussed publicising the project throughout the communities and the informational leaflets were distributed.


Photos 34 and 35: Meeting with staff from IAL, SEMPRA and IDAM 29th April 2013

15th May 2013 - Many important meetings were held this day by IAL representatives. The first meeting was with the Municipal Health Secretary to discuss the work and partnership with the project. It was also discussed how the Health Secretary's role in promoting the project to the communities they are in contact with. The Secretary presented a proposal to implement a radio communication system throughout the project which would be mutually beneficial.

Photo 36: Meeting at the Municipal Health Secretary office. Lizandra Monteiro, Nurse and members of IAL 15th May 2013

There followed a meeting with the Head of Office for the seat of the Municipality, Raimundo Machado Neto, who discussed the city hall's involvement in the project schedule and discussion on the competition being held for the design of the Trocano project logo by the local children. It was also discussed how the project can be involved in the annual Festival of Santo Antônio de Borba, from the 3rd to the 13th of May 2013.

Photo 37: Head of City Office, Raimundo Machado Neto, and staff of IAL 15th May 2013

This was further followed by a meeting with the Education Secretary, where it was discussed about conducting a project for environmental awareness with the schools during the Festival of Santo Antônio de Borba and about the current schedule for the project. Arrangements were also made for IAL to join the Education Secretary on his planned trip to the communities from the Alto Madeira area of the project.

Photo 38: Meeting with the Education Secretary Prof. Francisco das Chagas Filho, with IAL staff 15th May 2013

16th May 2013 - On this day, a meeting was held with the Director of the local unit of IDAM (IDAM/Borba) to discuss the scheduling for monitoring training for the project areas that IDAM are involved in; scheduled for the 23rd and 24th May 2013. Previous monitoring data collected by IDAM staff was also collected at this time.

Photo 39: Meeting with the local director of IDAM 16th May 2013.

The next meeting was with the Sports Secretary, Jorge Machado to discuss the schedule of the project and the role of the Sports Secretary in the Trocano project.

Following this, a final meeting was held with the Rural Production Secretary to discuss the project schedule and the role of the Rural Production Secretary in the Trocano project.

17th May 2013 - Meeting held with the Secretary for Education, Francisco das Chagas Filho, and Mozart, the co-ordinator for school transportation. This was to plan the route for the visit to a number of the communities along the Madeira River, for distribution of the information leaflet about the project and for presentations about the Trocano project to these communities.

2.2 Summary of Community Visits

The project implementation team has ensured that all communities within the project area have been visited during this initial project implementation phase and that community meetings have been held. These visits and meetings have been carried out throughout 2011, 2012 and 2013 by a combination of the project team, Instituto Amazonia Livre, Secretaries and representatives of the Municipality and IDAM.

During these community visits and community meetings, it was discussed and diagnosed the major problems, the issues they face and how they affect their communities. It was also discussed what improvements they would like to see and could expect from the implementation of the project and as a result of their participation in the project. It was generally felt by the communities that the project could be a solution to improving their lives and that the inhabitants want to take an active role in the sustainable development of their communities and livelihoods, and an immense sense of pride prevailed from the conversations, meetings and discussions held with all community members.

Records of attendance and registration forms have been kept which include information such as attendee's names, date of birth and name of community, and minutes of meetings have been kept. Also, all questionnaires that were completed have also been included in the databank of project information. These records are all available for inspection and reference in the IAL office.

The communities visited during this time are demonstrated in the table below:

No.	Name	Diagnosis Form	Report	Minutes	Observation Sheet	Registration Form	Date of Visit
1	Miripiti						[*]
2	Ponta Grande						[*]
3	Sacaí		x			x	14/03/2012
4	Ponta da Areia		x			x	14/03/2012
5	Espírito Santo					x	26/09/2011
6	Vila Isabel		x			x	14/03/2012
7	Porto Figueira		x			x	14/03/2012
8	Boca do Laguinho		x			x	14/03/2012
9	Bom Jesus		x			x	13/03/2012
10	Santo Antônio					x	14/11/2011
11	Porco		x			x	14/03/2012
12	Pororoca		x			x	14/03/2012
13	São Joaquim		x			x	14/03/2012
14	Copaíba		x				14/03/2012
15	Tauari		x			x	14/03/2012
16	Floresta		x			x	14/11/2011
17	Patauá		x			x	14/03/2012
18	Santa Maria		x			x	13/03/2012
19	Catarina		x			x	14/03/2012
20	Nova Vista		x			x	14/03/2012
21	Terra Pretinha		x			x	14/03/2012
22	Arapapa		x			x	14/03/2012
23	Santa Marta		x			x	14/03/2012
24	Terra Preta Felicidade		x			x	15/03/2012
25	Itaúba		x			x	16/03/2012
26	Cantagalo		x			x	16/03/2012
27	Arapara		x			x	16/03/2012
28	Santa Catarina		x			x	14/11/2011

29	Retiro		x			x	16/03/2012
30	Fortaleza					x	13/03/2012
31	São Benedito do Arapapá		x			x	13/03/2012
32	Ponta Alegre		x		x	x	14/11/2011
33	Vera Cruz		x			x	16/03/2012
34	Miriti		x			x	16/03/2012
35	Nova Aparecida		x			x	15/03/2012
36	Rio Madeirinha São João		x			x	16/03/2012
37	Santo Antônio do Bruno		x			x	16/03/2012
38	Pau Caído					x	14/11/2011
39	São Francisco						11/3/2011
40	Alexandre		x			x	14/11/2011
41	São Felipe		x			x	16/03/2012
42	Terra Preta		x			x	15/03/2012
43	Timbó		x			x	16/03/2012
44	São Francisco		x			x	16/03/2012
45	Awará	x	x	x	x	x	14/11/2011
46	Nossa Senhora da Conceição		x			x	16/03/2012
47	São Bento					x	15/03/2012
48	Boa Lembrança		x			x	16/03/2012
49	Santa Helena/ Guaribinha		x			x	13/03/2012
50	Puxurizal		x			x	16/03/2012
51	Jacarezinho		x			x	15/03/2012
52	Iracema		x			x	16/03/2012
53	São Sebastião		x			x	13/03/2012
54	Terra Preta		x			x	15/03/2013
55	São Sebastião do Jauari		x			x	15/03/2012
56	Chumbo		x			x	17/03/2012
57	Santa Ana		x			x	13/03/2012
58	Santa Clara		x			x	13/03/2012

59	Santa Rita		x			x	13/03/2012
60	Belo Horizonte		x				14/11/2011
61	Nova Alegria					x	14/11/2011
62	Sempre Viva		x			x	15/03/2012
63	São Benedito		x			x	15/11/2012
64	Acará		x			x	13/03/2012
65	Barreirinha		x			x	17/03/2012
66	Novo Remédio						17/03/2012
67	São José		x			x	17/03/2012
68	São João		x			x	17/03/2012
69	Costa do Ipiranga						[*]
70	Castanhal		x	x		x	21/06/2011
71	Bonfim		x			x	17/03/2012
72	Ponta Alegre						14/11/2011
73	Terra Preta		x			x	17/03/2012
74	Cariri		x			x	17/03/2012
75	Flechal		x	x		x	22/06/2012
76	Boa Esperança		x			x	14/03/2012
77	Suaçú		x			x	17/03/2012
78	São Sebastião		x			x	18/03/2012
79	São José		x			x	18/03/2012
80	Santana		x			x	17/03/2012
81	São Roberto						21/06/2011
82	Caiçara	x	x	x		x	21/06/2011
83	Limão		x			x	17/03/2012
84	Trocanã		x			x	13/03/2012
85	Santa Isabel					x	[*]
86	São João		x			x	15/03/2012
87	Paricá					x	[*]
88	Chaves					x	[*]

89	Piquiá		x			x	13/03/2012
90	Volta do Timbó					x	[*]
91	Puruzinho		x			x	13/03/2012
92	Guariba					x	13/03/2012
93	Fortaleza		x			x	13/03/2012
94	Nova Fazenda		x			x	05/09/2012
95	Rio Branquinho						[*]
96	Perseverança		x			x	13/03/2012
97	Castanha						[*]
98	Anumaã		x		x	x	13/03/2012
99	Axinim	x	x	x		x	17/09/2011
100	Canumã	x	x	x		x	05/09/2011
101	Porto Paraíso						[*]
102	Santa Luzia					x	[*]
103	Ararunim					x	[*]
104	São Sebastião		x			x	15/03/2012
105	Novo Horizonte	x	x	x	x	x	14/11/2011

Table 1: Communities visited during initial project reporting period

[*] Of the 105 communities originally identified as falling within the project area, it can be seen above that 12 of these were not marked as visited. This is due to some communities migrating to other areas and joining other communities during the times when the rivers are full and their communities are flooded. Some communities return to their original habitat once the water levels have reduced, but others remain within the new communities, and therefore the community ceases to exist in its independent form.

Other communities are known to migrate for economic reasons, where they will re-locate to improve their economic opportunities, particularly from the more remote areas. The project will assume there are still 105 communities remaining in the project area until this is confirmed otherwise through consultation with the communities as part of the on-going visits.

Examples summaries of some community visits made throughout this project implementation phase are as follows:

1st July 2011 – IAL visited the Novo Horizonte to the community. This community is an INCRA settlement and is the extension of the municipal dump. Diagnosis was made with the leader of the settlement, Mrs Millena Pantoja, which outlined some major problems that affect their community and said she saw this kind of project as the solution to improving the lives of the community. Further discussion was carried out with the Awará community leader Mr Manoel Moses, about the project.

Photo 40: Interview with Mrs Millena Pantoja; community leader from the community of Novo Horizonte July 2011

22nd June 2012 - After the meetings held on this day, it was then followed by a speedboat ride along the Madeira River, with the objective of visiting the Flechal and Castanhal communities which are the nearest ones to the municipality seat.

Flechal Community: The leader of the community received information about the project activities and his duties, giving his consent together with other inhabitants. A member of the Flechal community unloading the papaya production on the river bank, where the fruits will be sold and loaded onto the intermediaries boats, which buy the products for an undervalued price and then re-sell them costing from 500% to 600% more.

Photos 41 to 44: Flechal Community Pictures 21st June 2012

Photos 45 to 48: Castanhal Community Pictures 21st June 2012

20th February 2013 - CGV and IAL made a visit to the Sao Jose community in Borba to discuss the main challenges they are facing at the moment, with the community leader (Raimundo) and other members of the community.


Photos 49 to 52: Sao Jose Community Pictures 20th February 2013

A visit was also made this day to the Axinim community to assess the development of the community and their participation in the project.


Photos 53 and 54: visit to Axinim Community 20th February 2013

15th April 2013

There were also field visits to the communities of Caiçara and Axinim to discuss the project and its development within the communities.

Photos 55 to 57: Caiçara and Axinim communities 15th April 2013

17th May 2013 - Taking a fast boat for the journey, the following communities were visited in this day: 2 de Março, Acará, Arapapá, Awarazinho, Monte Orébio, Alexandre, Awara Grande, Floresta, São Joaquim, Ponta Alegre, São Lázaro, Santa Helena, Pau Caído. In each community a presentation about the project was made and any questions the communities had were answered.

Records of all community visits are held as part of the project information database, in the IAL offices in Manaus, and are freely available for inspection during the on-site verification visit.

2.3 Further Key Information

Dedicated Trocano Project Website

A specific website dedicated to the project has been developed and designed and will be launched on 1st June 2013: www.trocanoproject.com. This will be an interactive site where anyone within the project area can submit content and it will be an additional communication tool for the project. It is the intention of the project to develop this further with the inhabitants of the project area and will also serve as a community-based news board whereby important information can be published.

2.3.1 Communication

As detailed above, there have been visits made to all communities within the project area to inform and raise awareness of the project. To date, several methods of communication have been used to disseminate information about the project. This includes formal and informal meetings with the Mayor, Secretaries and City Councillors, conversations, liaison meetings and discussion groups with communities and includes distributing leaflets produced by the project to the community members using an effective yet simple illustrative cartoon describing the project and its benefits. Visual communication is found to be an effective form of communicating with the project area inhabitants and is a useful way of getting the message of the project spread widely. There have also been banners produced and displayed in the Secretaries offices, showing different aspects of the project again in a visual way for anyone who visits the Municipal offices.

It has also been useful to engage the participation of the Municipality's healthcare workers, Municipal Secretaries and IDAM to assist in disseminating information and awareness of the project, as these groups, organisations and individuals travel around the project area as part of their usual working activities; this has proved a valuable way of ensuring that some of the more remote areas of the project area are reached.

Meetings with community leaders have also been held in the Municipal seat on a monthly basis as a further way of communicating with the communities, and also to enable any observation reports completed by members of the communities to be submitted to the project team.

2.3.2 Management Plan

The Management Plan for the project has been developed as an internal document and has been created and agreed by the senior members of the project team. The management plan will be maintained as a living document for the duration of the project, which will allow it to reflect the evolution of the project over time and to include any changes that occur during the implementation of the project. This document details key targets for the project activities, and provides structure to the goals and objectives that were set out in the PDD.

2.3.3 Partnerships

The project has 2 key partnerships involved in the implementation of the project. The main partnership is with the Municipality of Borba. The second partnership is with IAL (Instituto Amazonia Livre) who developed the PDD in conjunction with CGV. IAL will also be involved in the on-the-ground implementation of the project. Both of the project partners are actively involved in the Project Implementation Team and Project Management Council.

The project has also entered into a preliminary partnership with IDAM (Instituto de Desenvolvimento Agropecuário e Florestal Sustentável do Estado do Amazonas), who have a regional branch in Borba and whose work and goals are aligned with the objectives of the project. IDAM is the Institute for Sustainable Agriculture and Forestry in the Amazonas State and are an independent agency with administrative and financial autonomy, linked to the Secretary of Rural Production (Secretaria de Produção Rural – Sepror); Sepror is an Amazonas State institution. With the synergy between the goals of IDAM as an organisation and the goals of the project an important partnership can now be developed, to allow both parties to simultaneously achieve their objectives and strengthen the implementation of activities.

Further important project partnerships have been initiated through the engagement of the Project Management Council members (see below for details), who represent a cross-section of organisations and groups from the project area and surroundings and will be working with the project on an on-going basis, both through their participation on the PMC and also in other appropriate ways.

2.3.4 Establishment of the Project Management Council

As an integral aspect of the governance of the project, the Project Management Council has been formed to include a varied group of members representing the needs, views and best interests of the participants of the project. The members of the PMC are detailed below:

	REPRESENTATIVE 1	REPRESENTATIVE 2
Instituto Amazonia Livre	Waldemar de Lima (President)	Antônio José do N. Fernandes (Chief Executive)
Celestial Green Ventures	Ciaran Kelly (CEO)	Paula Torres Cofré (Senior Administrator)
Municipality	José Maria da Silva Maia (Mayor of Borba)	Edilson Batista Fonseca (Production Secretary)

Public Concern	João Brasil da Silva Filho (Representative of the People)	To be confirmed
Communities	Ana Lucia Garcia de Moraes (Administrator of the Municipality)	Milena Pantoja (Leader of Novo Horizonte community)
Rural Producers	José Rocha de Abreu (President of Rural Union)	Laércio Donato de Souza (Member of Rural Union)
Technical Scientific Group	Professor Guilherme Pereira Lima Filho (UFAM)	Marcondes Silva (UFAM)

It was originally set out in the PDD that there would be a representative from the Public Ministry, however this was deemed inappropriate as, due to their position in the Municipality it could possibly result in a conflict of interests. Therefore, this position on the PMC has been exchanged for a representative of Public Concern, and is reflected in the details above.

2.4 Challenges

The biggest challenge for the Trocano project is the sheer vastness of the project area and the accessibility to some of the more remote areas and communities. Although the project team have managed to visit all the communities within the project area at least once since the start date of the project, there are obviously some communities that will have less contact with the project team than others, due to their remote locations.

This is challenging for carrying out effective communication with these communities and to engage the communities to actively participate in the project, and for them to be fully informed and aware of the tangible benefits the project can bring to them. It has required the project team to think strategically in this regard, and consider careful planning of project activities, often in conjunction with the project partners to enable full coverage of the project area.

With this in mind, there have been a number of mechanisms and targets included within the Management Plan that are designed to address these challenges, and though the careful adoption of these actions the project team will ensure the project remains inclusive for all inhabitants of the project area as it is important to note that the more remote communities within the project area that are the ones that will benefit most from the positive impacts of the Trocano project. It has also resulted in the project initiating a pilot project in the São Joaquim community to raise awareness for communities throughout the project area of the opportunities and benefits that participating in the project can bring (see section 13.1 for further detail).

The accessibility of areas of the project area are also challenging when considering and implementing on-the-ground monitoring activities. By identifying the areas that are less accessible, and through some carefully designed mechanisms built into the management plan, the project team are confident that although this is one of the more challenging aspects of the project, full monitoring coverage of the project area is attainable through combination of aerial flyovers, community leader participation and specifically targeted on-the ground follow-up visits. To this end, the project team have been prudent in setting specific targets within the management plan to ensure that these areas are accessed on a systematic and appropriate basis.

The project also faced the challenge of initially intending to engage teams of rangers within the project area for carrying out the proposed on-the-ground monitoring activities. This however was met with some trepidation by inhabitants of the project area and appeared to have the potential to alienate rather than motivate some communities in participating in and embracing the project and its activities. It was therefore deemed inappropriate to instigate the teams of rangers as the on-the-ground monitoring option. This has now been adapted and replaced with engaging community leaders and representatives in the on-the-ground monitoring activities as well as establishing project zone sub-teams that are to be made up of project inhabitants trained in the relevant skills and procedures required to carry out the appropriate actions. This is discussed in further detail in the Monitoring section of this report.

3. OVERVIEW OF PROJECT ACTIVITIES AND IMPLEMENTATION STATUS

ACTIVITIES OUTLINED IN THE PDD	IMPLEMENTATION STATUS	FURTHER DETAILS
Conservation and preservation of natural forests	Initial measures in place	Underway but in basic form – to be further implemented when funding available
Biodiversity protection	Initial measures in place	Initial measures in place, but further implementation when funding in place
Socio-economic enhancements including healthcare, education, employment and infrastructure improvements	Awaiting funding	Carbon funding required but communities informed of and engaged with the project
Data collection including inventorising biodiversity, forest, flora and fauna	Initial measures in place	Basic data collection as part of monitoring exercised in place; more detailed data collection will be implemented in the next stage of the project
Development and implementation of effective management plan	Management Plan in place	The Management Plan has been developed as an internal document and will be maintained as a living document for the duration of the project (current version 1.2)
Provide viable sustainable and economic alternative practices to project area inhabitants	Discussions and meetings held	Some appropriate practices to be implemented have been identified, including craftwork and sustainable farming practices
Strengthening of local forest protection	Basic measures in place	By engaging the local communities and spreading awareness of the project has made initial progress. This will further be developed as the project goes on
Incentivise local communities to adapt their current behaviour	Initial measures in place	Meetings and discussions with local participants to explain the alternative actions and raise awareness of the benefits of participating with the project
Incentivise and reward changes in behaviour	Awaiting funding	This will be implemented when funding available – meetings and forums held to disseminate information about

		the project and benefits that can be expected
Capacity-building and environmental awareness	Basic measures in place	Initial meetings and discussion groups have been held, and basic training for monitoring participants has been implemented which has raised awareness of the environment and allowed initial capacity-building process to be implemented
Participation in project implementation, through monitoring, management, conservation and other activities	Basic measures in place	The local communities and inhabitants have, over the course of the initial project phase, been informed and engaged in these aspects of the project. This will continue to be rolled-out and further opportunities will be available
Participation in project-related training	Initial introduction	Community meetings held to explain the opportunities that will be available. Some initial monitoring training has been carried out, and informative discussions and introductions to the project have been carried out
Environmental Education Programme	Awaiting funding	This will be rolled-out as part of the benefit distribution mechanism
Raising civic pride of the natural forest	Basic implementation	Through the holding of community meetings, the importance of the forests has been highlighted, as part of introducing the project and its benefits. This will continue throughout the lifetime of the project
Understanding the nature of threats	Basic implementation	The nature of threats to the project area has been identified and basic actions to mitigate these have been put in place. These will continue and strengthen as the project develops and continues
Strengthening legal frameworks protecting natural forest	Basic implementation	The by-laws are being amended to include the project; this will ensure protection of the forests, long-

		term
Sustainable financial models	Awaiting funding	This will be implemented as a fundamental aspect of the benefit distribution mechanism and the funding available to the project, to ensure that any programs implemented are sustainable and will continue to provide benefit
Effective durable governance structures	Basic implementation	The management team have developed the appropriate structures and implemented the initial aspects required to take the project forward and be successful. The full implementation and successful governance will be developed once the funding is in place
Alignment of conservation with economic development	Awaiting funding	Through the implementation of the benefit distribution mechanism, it will be ensured that both aspects of this activity will complement each other and ensure that neither is detrimental to the other

4. FINANCIAL STATEMENT

Since the start of the project process in 2010, Celestial Green Ventures has made significant investment into establishing and developing the Trocano project. This has provided the necessary funding to bring the project through this initial project phase.

The funding provided has ensured the project has been able to achieve its current implementation status, and has included the development of the PDD, the development of the Geospatial Platform, the partnership with IAL as the Brazil-based project team and the costs of running the head office in Dublin, as well as many other operational and tangible activities.

The funds provided have been sufficient to develop and maintain the project up to this point, but the full functional ability of the project is, and always has been, reliant on achieving carbon funding. The company has ensured that the project has been able to function operationally to this point and is committed to continuing to provide sufficient funding to get the project through to NCC issuance, at which point, the project will become self-funding and able to fully implement the project goals, objectives and commitments through the carbon financing achieved from the sale of the achieved NCC's.

The operating budget for 2011 was $882,127 (€681,548).

5. SOCIAL IMPACT STATEMENT

Initial visits were made during January 2011, to carry out an initial diagnostic survey to obtain information of key issues and concerns of the communities, in particular Novo Horizonte, Flechal, Castanhal, Caiçara, Foz Canumã, Auwará, Vila do Azinim an Cidade de Borba. It was identified that issues such as health, infrastructure, and electricity for communities were of major importance. Most community inhabitant's homes are built from wood taken from the forest and the people live by extractive fishing and farming but many found problems transporting their products to a central place for distribution. Other issues identified were that there are only schools in the larger communities, which means that a large number of students have to travel to school via the school river transport, and that there is a lack of technical farming assistance and access to technology.

The implementation of the Benefits Distribution Mechanism is not yet in place due to the need for the carbon financing to make this possible. However, during this initial project phase, a number of meetings have been held with communities throughout the project area (as detailed in section 2) to gain vital information about their specific needs and desires as outcomes of the benefits that will be possible through the BDM, as well as a number of important discussions with the Municipality Mayor and the city councillors and secretaries to gain an understanding of the appropriate benefits for the communities and the Municipality.


Photos 58 and 59: Examples of inappropriate solid and sanitary sewage systems in the Castanhal Community

Communities in the floodplain have hardly seen any investments to improve social services in education and in infrastructure (sanitation, clean water, waste treatment, paving). As pointed out by numerous scientific studies, Borba communities can benefit from it only by force of political pressure and public administration.

From what we experienced with the conversations with city councillors, municipal authorities cannot invest for long-term results in relation to the living conditions of these populations. Everyone believes that the best places to live are where you can grow all year round, practicing extensive agriculture and livestock.

During the field visit carried out between 29th June and 1st July 2011, it was observed that the production of fruits and vegetables sold at the fair Borba comes from family farms located in communities near the city headquarters. The city has a good infrastructure of sewers and sidewalks, and a newly resurfaced tarmac.

In the open-air dumps it was noted the presence of scavengers using child labour. All communities visited had a borehole well and water distribution to the nearest houses. IDAM has worked with the riverine communities to develop a project of the septic tank and the communities visited were also benefitting from this.

The livestock sector is poorly developed in the area but in the two communities visited it was observed the presence of small farms where two of them are in the community and a Novo Horizonte in the community aware of which have herds ranging from 15 to 30 rezes maximum.

O Lago Awará Grande located in the community Awará has huge potential for aquaculture as it maintains an average depth of 4m in the dry season. According to diagnoses made in the communities, technical support and encouragement of associations and cooperatives is one of the keys to better use and development of communities.

Craftwork

During field visits, it has been identified that working with communities for craftwork production is an important activity to implement. A partnership with Magia Amazonica, based in Manaus has been discussed to find out more about how to structure craftwork production in the project area; something that could benefit a number of communities from the project area.

Photos 60 to 62: Craftwork examples and raw materials

Community Participation in Monitoring and Observations

Throughout all community meetings, it has been found that engaging communities in participating in the monitoring of the project area has raised awareness of their environment and increased the importance of conserving it in its natural state. By increasing the awareness of the project has had a positive impact within the project area in a very quick, short timescale, and gives an indication that this will be one of the most important activities to be implemented by the project.

Local Farmers and Sustainability

Through their knowledge of and participation in the project, the local farmers have been asking for assistance and advice from the Production Secretary or IDAM/Borba as to the most appropriate processes to adopt on their farms and their farming practices to prevent any negative impacts occurring. They are very careful as to how they proceed and where possible are beginning to adopt sustainable and environmentally-sound processes. Through the further implementation of the project and where funding becomes available, the Trocano project will be able to further assist the farmers in making sustainable decisions and practices the norm. The funding resulting from the project will also allow both IDAM/Borba and the Municipality to develop better structure to this process and will help to orientate the farmers in the correct and most appropriate sustainable practices, both for their livelihood and the success of the project.

6. BIODIVERSITY IMPACT STATEMENT

6.1 NBM Score

	Score calculated using the NBM layer of the Geospatial Platform	Score calculated as per the data sets used for the PDD
Normative Biodiversity Metric (NBM) Score of Project Area – as described in the biodiversity section of the NFS guidance document.	5.08	5.3

The original calculation of the NBM given in the PDD was based on data sets collected and analysed by IAL to create the eco-floristic zone maps shown in section 9.7 of the PDD. This was based on the data available and has not been re-calculated or reviewed since the results described in the PDD, as this was only completed for the submission of the PDD in March 2013 and so has yet to reach an annual review point, but will be carried out when appropriate and reported in the next annual report.

However, since the PDD was compiled, the NBM layer of the Geospatial Platform has been implemented. This layer generates an approximate NBM score, and is reflected by 2 scores: the first is the NBM score, and the second is a Pristineness score; these are split down so that it can be easily identified as to the pristineness of the area, and the presence of endemic species. The NBM results give an overview of the biodiversity value of the project area on a scale of 0-10. The pristineness score shows the degree of human influence on natural ecosystems, and this score ranges from 0-5.

The NBM map in the Geospatial Platform gives an approximate indication of the biodiversity significance of land areas. This is calculated by combining information on the pristineness of ecosystems and the density of endemic species. The input data for this layer is the WWF's Terrestrial Eco-Regions dataset, and Ellis and Ramankutty (2008), Putting People on the map: Anthropogenic Biomes of the World. doi: 10.1890/070062.

The Pristineness map shows the degree of human influence on natural ecosystems. The darker areas are more pristine ecosystems, while the lighter areas have been more influenced by human activity. This data is used as an input for the Normative Biodiversity Metric. The source data of this layer has been adapted from Ellis and Ramankutty (2008) 'Putting People in the Map: Anthropogenic Biomes of the World', doi: 10.1890/070062.

The scores for each of the 13 project areas, according to the NBM layer of the Geospatial Platform are detailed below:

Project Area	NBM Score	Pristineness Score
1	5.3	4.3
2	6.0	5.0
3	6.0	5.0
4	5.7	4.7
5[1]	0	0
6	4.1	4.1
7	5.4	4.3
8	4.1	4.2
9	5.0	4.0
10	5.2	3.8
11	5.0	4.0
12	5.0	4.0
13	4.2	4.2
AVERAGE	**5.08**	**4.3**

As stated above, the NBM layer in the Platform only gives an approximate indication for the land areas, so it can be deemed reasonable that the data used for the PDD calculations would provide more specific information and therefore reflect a more accurate score for the project area. As the project progresses, further data collection will be carried out in order to provide the most accurate NBM score as possible. The NBM layer in the Geospatial Platform can be used as an indicative tool for this process.

6.2 Biodiversity Monitoring

With the protection and monitoring of the project area being in initial implementation, the protection of the biodiversity of the project area has also commenced in its most basic form, and has allowed the levels of biodiversity present in the project area to remain stable.

As there have not yet been any major development projects, programs or activities that are expected to be implemented through the benefits distribution mechanism, the need to assess their potentially negative effect on the biodiversity has yet to be implemented, however the project team are primed ready to carry this out when appropriate.

[1] Area 5 is deemed too small (1,442ha) to generate a meaningful result using the given data, however this area of the project is entirely encircled by area 4; the score of which could be deemed appropriate to be applied to area 5. If this was the case, then the overall average scores of the project areas would be 5.13 and 4.3 respectively.

7. MONITORING REPORT OVERVIEW

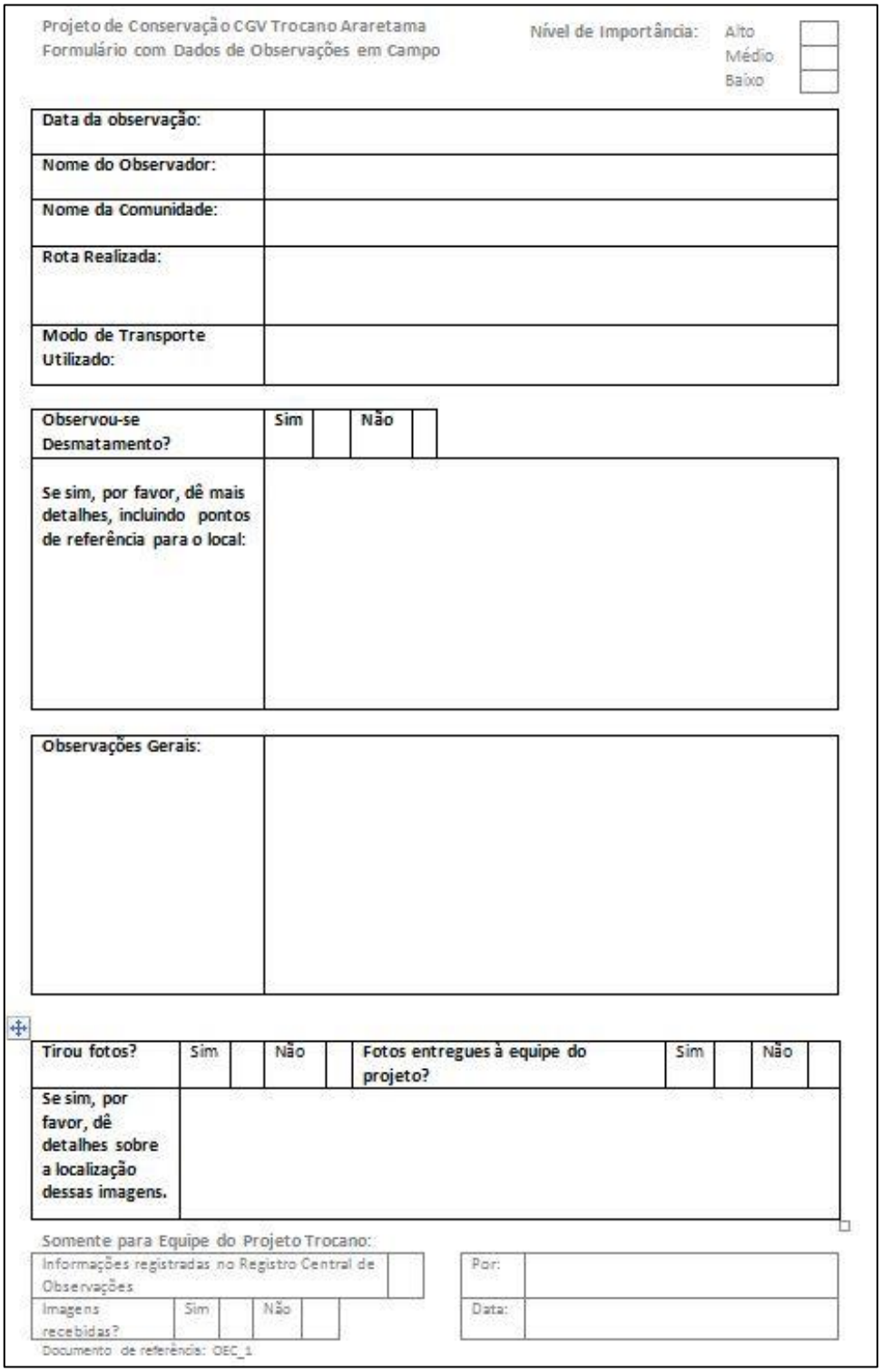
The full implementation of the monitoring plan outlined in the PDD will only be possible through the availability of carbon financing, but during the initial 23 months of the project implementation, rudimentary monitoring activities have been possible and are discussed in the following sections.

Although the primary monitoring application is satellite monitoring, the PDD describes that on the ground monitoring will also occur.

It was the original intention of the project to engage a team of on-the-ground rangers to patrol and monitor the project areas. Through the initial discussions and initial explanation of the ranger's roles to the communities through their liaison meetings, it was felt that the term and presence of rangers had negative connotations for the inhabitants of the project area, and did not appear to be the correct or appropriate direction for the project to follow. It was found in these early stages of the project, that a more acceptable manner in which to implement the initial on the ground monitoring of the project area would be through community participation. For this initial phase of the project, this is felt to be a more appropriate and effective manner of monitoring the areas; moving forward with the implementation of the project, there will be a need for a specific team of people to be responsible for carrying out regular and scheduled visits to the known high-risk areas, and for patrols of the project boundaries where possible, and access points such as roads, rivers and existing forest paths as appropriate. This is likely to also include the community participants who are actively involved and motivated to participate in the on-the-ground monitoring activities.

The on-the-ground monitoring has been implemented thus far through informally training community representatives to make observations within their own communities and on any journeys they make either between other communities or to the Municipal seat. The monitoring is carried out by way of completing forms that have been designed specifically to be easily understood and straight forward to complete, but also give the project management team important and relevant information, which can then be reacted upon if there is a need.

An example of the observation form in the native language is as follows:



Projeto de Conservação CGV Trocano Araretama
Formulário com Dados de Observações em Campo

Nível de Importância: Alto ☐ Médio ☐ Baixo ☐

Data da observação:	
Nome do Observador:	
Nome da Comunidade:	
Rota Realizada:	
Modo de Transporte Utilizado:	

Observou-se Desmatamento?	Sim		Não	
Se sim, por favor, dê mais detalhes, incluindo pontos de referência para o local:				

Observações Gerais:	

Tirou fotos?	Sim		Não		Fotos entregues à equipe do projeto?	Sim		Não	
Se sim, por favor, dê detalhes sobre a localização dessas imagens.								

Somente para Equipe do Projeto Trocano:

Informações registradas no Registro Central de Observações					Por:	
Imagens recebidas?	Sim		Não		Data:	

Documento de referência: OEC_1

The completed forms are collected and processed by the IAL team, who compile the information into a central database in their Manaus office, which will then, as of July 2013, be able to be uploaded into the Geospatial Platform, at the specific geo-referenced points. It has also been encouraged to include any photographic evidence of observations made to enhance and record the monitoring observations carried out.

At the time of writing, there are 31 completed observation sheets held in the IAL office and these are available for viewing during the verification site visit.

There is also an informal association with IDAM/Borba in place. Since 2010, there has been an informal agreement between the project and the local unit of IDAM – IDAM/Borba - that they would work in partnership with the project to provide any relevant data and information they have collected whilst working in the project areas as well as assisting in field evaluation and monitoring and submit reports of activities that were conducted within the project area. Although the informal partnership is working smoothly, it has been discussed that a more formal partnership agreement will be instigated in the near future.

The formal structure for the monitoring is yet to be implemented, however this is one of the main priorities of the project team for the coming year, and will be made possible through the availability of funding. The links between the project monitoring teams and IBAMA and IPAAM will be developed as part of this process and the project will raise awareness throughout the project area of the correct and available procedure for alerting these organisations when irregularities are observed.

The Chief of the Municipal Agents (Local/Municipal Police), Erivelton Lima, is engaged with the project and is keen to participate, both personally and his 46 officers; 3 of which are based in the Axinim community, 3 of which are based in the Foz do Canoamã community and the remainder located in the seat of the Municipality. They currently do not have any boats, cars or an office that belongs to their organisation, and rely on borrowing or using their own personal modes of transport to respond to incidents. The project will be assisting in increasing their presence in the project area and their access to appropriate and dedicated vehicles to improve their productivity.

Community and biodiversity-related activities for this early implementation project phase are at initial implementation status and the focus is mainly on getting the structure and awareness in place for when full implementation of the project activities and benefits is possible. Any monitoring of activities and improvements in communities has been informal and unrecorded, and has been incidental since it is too early in the implementation process for many of the social, economic or biodiversity-related changes and benefits that are anticipated to have taken place or indeed to have become apparent or measurable.

As the benefits distribution mechanism is yet to be implemented throughout the project area this will be the most important element to the measurability of the community and social benefits of the project. Also, whilst widespread consultation has taken place in this early project phase, with respect to determining the projects initial and appropriate community-related activities, the project also intends to further engage the communities in the development and implementation of these activities and the relating outcomes that occur. This will take place through the community participation in monitoring activities, and will be introduced to the communities as the project develops. They will be enabled to report on the relevance, appropriateness and effectiveness of the activities that are implemented and will be encouraged to give feedback to the PMC as part of the subsequent review periods.

As stated in the PDD, review of the BDM will occur through community meetings, continual project awareness and through a formal meeting of the PMC, where the effectiveness of the mechanism will be assessed. As the BDM is not currently in place, this has not occurred for this reporting period,

however it will be subject to review for the next reporting period and outcomes and impacts will be subsequently recorded.

It is important to note that the long-term outcomes and impacts of the implementation of the activities related to the project will be difficult and impractical to measure in the early stages of the project, and it should be expected to focus on the short-term achievements of the project within the first 5 years of activity, to give some context to the success of the implementation. The reports submitted for the next review period will be able to identify short-term results and impacts, which are more tangible at this stage in the project, but will lead to the longer-term measurement of success and impacts.

With regards specifically to biodiversity monitoring, the Biodiversity Impact Evaluation described in the PDD, which forms part of the project review process, has yet to be formally adopted as it is described in relation to the implementation of the BDM programs, projects and activities. Again, this will form part of the subsequent annual reviews and results and impacts will be reported.

Therefore, community and biodiversity monitoring for the Trocano project at this early stage of implementation is focused towards project awareness, consultation and initial planning for the successful and sustainable implementation. The initial observation sheets that have been completed are an important start towards the monitoring of the project area, and this will be increased and improved over time and through the further implementation of the project.

Subsequent reporting periods will include greater focus on outcomes and impacts and therefore include more details regarding the developments of these activities. The monitoring section of the management plan will be updated accordingly and where appropriate, once the full implementation strategy is actioned and will be subject to review for relevance and effectiveness as the project progresses through the initial years of implementation.

8. CARBON STOCKS MONITORING ACTIVITY

	Reporting year June 2011-July 2012	Previous year
CO2 stocks lost through deforestation or degradation within the project area	Refer to Geospatial Platform and section 14	N/A

Carbon stocks monitoring activity is predominantly carried out using the Geospatial Platform and its data layers. Since the submission and validation of the PDD for the Trocano project, it has been necessary to carry out data correction procedures on the data layers present in the Geospatial Platform to calculate the carbon benefits of the project from the project start date in June 2011 through to July 2012[2].

8.1 Description of Work Undertaken on the Geospatial Platform

Data correction procedures to calculate the carbon benefits of the project from its start date, according to the approved NFS methodology applied to the Trocano project are detailed as follows.

Correction of the base year carbon map to account for deforestation that may have occurred prior to project commencement (June 2011)

The NASA carbon map (Saatchi et al.) approved under the NFS methodology was produced using satellite data from 2000-2007. This was necessary because of persistent cloud cover in some areas. While the mean date is thought to be 2003 the researchers have informed us that there is no way of knowing which dates correspond to specific areas. To address any potential errors corrections have been made for any deforestation that may have occurred from 2000 to 2011.

Step 1 - PRODES deforestation estimates for 2000 to 2010 are being mapped and carbon values for the identified areas adjusted according to literature review and local expert knowledge.

Step 2 - Some of the deforested areas may have regenerated (regaining some of their lost carbon) and to account for this we shall use visual interpretation of Landsat data at 30 m for 2 points in time (e.g. 2005 and 2011, depending on the availability of cloud-free data). Carbon values of these areas will be further adjusted based on literature review and local expert knowledge. We envisage that all deforested areas can be checked in this way, but if this becomes unfeasible due to large amounts or the extensive pattern of deforestation detected, we propose a further step to provide a more accurate update.

Step 3 - (if deemed appropriate, as detailed above) the project shall use MODIS satellite data (at 250 m resolution) to sharpen and update the Saatchi carbon map. This will be done by correlating radiometrically normalised MODIS vegetation stratifications for the years 2000 and 2010.

[2] Note: the carbon benefits are only calculated up to this point due to the availability and release of PRODES data.

8.2 Annual Monitoring Actions

i. Quantification of annual emissions (and regrowth) since the start of the project

PRODES deforestation data is available annually and gives data in datasets from August to July. Once PRODES data is available for download for the previous year (i.e. August 2011-July 2012), we will add this to the deforestation data already available onto the geospatial platform and the query outcomes will be adjusted to reflect the carbon loss factor as estimated in the approved methodology. There will be several months' delay after the end of the calendar year as PRODES data typically becomes available towards middle of the year, for example the data for August 2011 through July 2012 was made available in April 2013. Each year we propose to visually inspect a sample of deforested areas to get a picture of the amount of regrowth.

ii. Closer monitoring for signs of degradation near human settlements and roads

PRODES deforestation data is produced by medium resolution satellite data (approximately 30 m resolution). It is understood it is accurate at detecting areas deforested >6 ha but increasingly less accurate for smaller areas, especially below 3.5ha. It should miss only a small percentage of deforestation (small patches and areas of continuous cloud cover), but it does not capture forest degradation or thinning. In order to monitor thinning and small scale disturbance we suggest the use of high resolution satellite data in high risk areas. The proposed sampling plan for high resolution inspection will involve:

- Inspection of selected vulnerable areas, e.g. 2-4 areas, of which half are located close to deforestation detected in the previous year and half are selected randomly. The number of areas selected depends on the amount of deforestation detected combined with reports from field staff. Size of the areas inspected should be at least 20 km x 20 km, but could be extended if damage in a particular year is found to be above average.
- Based on these findings, we will increase the sample size or estimate a factor for additional deforestation below the PRODES detection threshold.

To identify areas of change, it is necessary to use similar high resolution satellite data for two moments in time, e.g. the project start year (2011) and 2012 or 2013. This exercise can be repeated every 1 or 2 years. High resolution satellite data can be costly, but there is a large selection of satellite sensors available and we will choose the most cost-efficient data source for your approval before data are purchased. To keep costs of analyses low, the project will use a visual interpretation of the satellite images. Results will be submitted.

8.3 Indicators of the Effectiveness of Carbon Stock Monitoring Activity

Detailed methods for the quantification and monitoring for projects in the Brazilian Amazon operating under the Natural Forest Standard are described in the approved NFS Methodology NFS AM001.0. The objective of effective carbon stock monitoring is to ensure accurate estimates of carbon stocks and emissions reductions from the project. The carbon stocks monitoring detailed in the Geospatial Platform has been and will continue to be improved and updated as further, more recent data becomes available. This is predominantly focused on the PRODES data, as discussed above. Using the Geospatial Platform provides consistency during monitoring and it can be demonstrated to the verifier the process and steps carried out to run the calculations and the results, to show they conform to the NFS AM001.0 methodology.

8.4 On-the-ground Monitoring

On-the-ground observations have been carried out by IDAM, IAL and community members and representatives throughout the duration of the project. Not all observations have been recorded on

observation sheets, however to date, 31 observation sheets have been completed and submitted to the project team. Where possible, observations also recorded with photos and GPS co-ordinates, although until now this has not always possible. Through further implementation the project intends for observations to have normalised processes as much as possible by giving adequate training in the completing of observation sheets as well as supplying GPS equipment and cameras to key monitoring participants. A summary of the completed observation sheets is given in the table below:

Date	Community	Observer	Route	Mode of Transport	Deforestation observed		If yes, please give more details, including reference points for the location	General observation:	Pictures?		Pictures given to the project team?		If yes, please specify where the pictures are kept
					Yes	No			Yes	No	Yes	No	
08/08/2011	Ramal do Piaba	Rodrigo Lima	Through the Dumpsite Road	Car	x		Deforestation on the side of the road to increase grazing for cattle raising			x		x	
20/08/2011	Vale da Benção	Miguel Lima da Silva	Sucunduri River up to Resacado Castanhalzinho	Motorboat	x		Louro and Itauba Timber removal	There was no deforestation for big land plots, just for timber removal.		x		x	
21/08/2011	Awará	Rodrigo Lima	Flight-over with helicopter Manaus-Borba	Helicopter	x		Deforested area in the Awará community around the big Awará lake	Deforested and burnt area of =/- 1ha for livestock	x		x		Pictures in the IAL files
04/09/2011	Novo Horizonte	Rodrigo Lima	Through the road of the balenary, entering the road of the dumpsite	Car	x		Deforestation located on the road of the Incra settlement, at the Novo Horizonte community, near the house of Milena, president of the community	Deforestation of an area of approx. 3 ha for cattle raising	x		x		Data banks of IAL
15/09/2011	Grupo do Céu	Rodrigo Lima	Terrestrial / Jatuarana Road through the road of the Grupo do Céu	Car	x		Lat - 04° 24' 37.4'' Long - 059° 33' 28.3''	Area in the process of deforestation of approx. 3 ha.	x		x		Area located on the road of the Grupo do Céu community

			community										
20/09/2011	Ponta Alegre	Francinal do Garcia	Up the Madeira river up to Ponta Alegre/seat	River, small boat	x		Deforestation between the communities of Monte Orébio and Alexandre on the river bank. Deforested area of around 1/4 of an hectare, approximately 2 parts of pristine forest			x		x	
22/09/2011	Piaba Settlement	Adriana Alves Machado Graça	Novo Horizonte road, neighbourhood I, Gato road	Car	x			Charcoal production	x		x		Picture taken at the property of Mr. Sebastião Leão da Costa, lot 77.
23/09/2011	Ponta Alegre	Francinal do Garcia	Up the Madeira river Ponta Alegre/seat	River, small boat	x		Deforestation of 2 hectares on the right river bank towards the river, in front of the Awarazinho community. Obs: fire			x		x	
17/11/2011	São Pedro do Anumaã	Ana Lúcia Garcia de Moraes	Down the Madeira river, right river bank, near the Canumã river mouth	Motorboat 40hp. 4:30 hours travelling	x		Deforestation for cassava production. Cassava and watermelon, area of approximately 8 hectares at the back of the community	Deforestation for traditional practices of land plots and plantations. Deforestation within legal	x		x		Data banks of IAL

								reserve.					
17/11/2011	Monte Líbano	Ana Lúcia Garcia de Moraes	Down the Madeira river, right river bank, near the Canumã river mouth	Motorboat 40hp, 4:50 hours travelling	x		Land plots for the production of cassava and grazing for cattle ranching, area of approximately 10 ha	Deforestation under conditions determined by the law, respecting the legal reserved area	x		x		Data banks of IAL
30/11/2011	Campinarana	Miguel Lima da Silva	Sucurundi river up to the Campinarana community	Motorboat	x		Small land plots could be observed, family agriculture	Small land plots for plantation of cassava and watermelon. Exploration of timber can be observed, of species such as "itaúba", and "louro rosa" in the shape of boards and planks.		x			
Feb-12	São João do Abacaxi	Rodrigo Lima	Down the Madeira river, up the Canumã Paraná, down the Urariá Paraná and arriving to the Abacaxi river mouth	Motorboat 114HP, 12 hours travelling	x		Deforestation for the production of cassava, pineapple and watermelon		x				

Mar-12	Nova Recordação	Ana Lúcia Garcia de Moraes	Down the Madeira river, near the Canumã paraná mouth.	Motorboat 40hp	x		Land plot for the plantation of cocoa, approximately 3 blocks		x				
Mar-12	Anumaã do Levi	Ana Lúcia Garcia de Moraes	Down the Madeira river on the right side for 1 hour and 4 hours more with 114hp engine	Motorboats 40hp and 114hp	x		Passion fruit plantation, cattle raising, production of cassava and pepper	Deforestation from land plots	x				
20/03/2012	Monte Sinai (Boca do Acre)	Miguel Lima da Silva	Up the Canumã river, entering the Sucundiri river	Motorboat	x		Exploration of timber by community members for sale to traders from Maués, Parintins, Santarém/PA and Nova Olinda	The exploration of timber is caused by loggers from other municipalities					
Apr-12	Surubim	Ana Lúcia Garcia de Moraes	Up the Madeira river, entering the Madeirinha paraná, up the left side of the igapó açú river, entering the right side of the tupana river	Motorboat 114HP, 3 days travelling	x		Land plot of approx. 4 blocks for the plantation of cassava		x			x	

Apr-12	São Sebastião do Anamã	Ana Lúcia Garcia de Moraes	Down the Madeira river, left side, 1:50 hour with 40hp engine , 4 hours more with 114hp engine	Motorboats 40hp and 114hp	x		Land plot of cassava, manioc, passion fruit, fishing	Deforestation from cassava production	x				
Apr-12	Perseverança	Ana Lúcia Garcia de Moraes	Down the Madeira river, right side, 1:20 how with 40hp engine , 3 hours more with 114hp engine	Motorboats 40hp and 114hp	x		Large area of banana plantation, of more than 5 blocks, hot pepper and manioc	Productors union, deforestation from land plot	x				
Apr-12	Guariba	Ana Lúcia Garcia de Moraes	Down the Madeira river, right side for 40 minutes in the forest, 40hp engine, three more hours with 114 engine	Motorboats 40hp and 114hp	x		Production of orange, lemon and land plot for manioc, passion fruit, hot pepper	Deforestation from land plot	x				
May-12	Barra Mansa	Ana Lúcia Garcia de Moraes	Down the Madeira river, entering the Canumã river, down the Arariá river paraná, up the Abacaxi river, entering the		x		Deforestation for the production of pineapple, cassava and manioc approx. 5 blocks		x				

			Marimari to the right										
May-12	Cumatê	Ana Lúcia Garcia de Moraes	Down the Madeira river, entering the Canumã river, down the Arariá paraná, down the Abacaxi river, entering the Marimari to the right		x		Deforestation for the production of pineapple, cassava and manioc, approx. 5 blocks		x				
13/05/2012	São José do Monte Líbado	Ana Lúcia Garcia de Moraes	Down the Madeira river, following the right river banks distant 2:30 hour from the seat	Motorboat 40hp	x		Land plot for the production of manioc, passion fruit, sweet potato and cassava	Area of approx. 5ha, at the back of the community	x		x		Picture taken in front of the community
17/06/2012	Axinim	Carlos Ferreira Almeida	Down the Madeira river	Motorboat	x		Area of 2 ha at the back of the community	Deforesation for cassava production		x		x	
20/06/2012	Campinarana	Miguel Lima da Silva	Sucurundi river entering the Acari river	Motorboat	x		Larger deforestation due to the expansion in activities of cattle raising in unoccupied areas (Federal areas)	Deforestation established in small land plots, but in one farm it was expanded and then stopped by the Federal Police					

Aug-12	Divino Espírito Santo	Ana Lúcia Garcia de Moraes	Up the Madeira river, 2:30 hours with 40HP engine	Motorboat 40HP	x		Deforestation of approx. 6 blocks	Deforestation for land plot and watermelon production	x				
02/10/2012	Ponta Alegre	Francinal do Garcia	Up the Madeira river ponta alegre/seat/ponta alegre	River, motorboat	x		Low "capoeira" between the Monte Orébio and Alexandre communities, deforestation with land plots and few activities of land use			x		x	
23/10/2012	Ponta Alegre	Francinal do Garcia	Up the Madeira river ponta alegre/seat/ponta alegre	River, motorboat		x	Grazing areas in approx. 4 ha in front of the Awarazinho community, right margin towards the Madeira river			x		x	
20/04/2013	Campinarana	Miguel Lima da Silva	Sucurundi river up to the Campinarana community	Motorboat	x		At the start of the year, there was less deforestation observed by the work of rural workers. Mas logging activities were observed due to the full river.			x		x	
24/04/2013	Several	Adriana Alves Machado Graça	Mapiá river (going down)	Motorboat 15 HP		x		Big burnt area can be observed at the banks of the Mapiá river, deforested area.		x	x		Images registered on video
13/05/2013	São Paulo	Glauber	River	Motorboat	x		Lat - 03° 55' 24.3''	Deforested area	x		x		Area near

		de Souza Ferreira		15HP			Long - 059° 17' 38.6''	of approx. 4 ha					the future road Axinin-Sampaio, from Borba to Autazes
17/05/2013	Borba	Rodrigo Lima	Seat of Borba/São Joaquim/seat			x		Due to the rain season, degraded areas weren´t observed or reported	x		x		GPS coordinates taken in 13 of the visited communities

Table 2 – Summary of completed observation sheets

Original records of these observations are available in the IAL office in Manaus.

Some example observations of occurrences of deforestation are shown as follows:


Photos 63 and 64: Deforestation Observed in Leakage Zone to the right of Trocano Project Area 11
Observer: Grupo do Céu Community
Date: February 2011


Photos 65 and 66: Coal Production Deforestation Observed on Novo Horizonte track, near Assentamento do Piaba community
Observer: Adriana Alves Machado Graça
Date: August 2011


Photos 67 and 68: Deforestation Observed along the Mapiá River
Observer: Adriana Alves Machado Graça
Date: 24th April 2013


Photos 69 and 70: Deforestation Observations in Autazes area between Axinim and Sampaio communities
Observer: Glauber de Souza Ferreira
Date: 13th May 2013

Forest patrols are intended to be carried out where incidents of deforestation are identified and where the recognized high-risk areas are located. These patrols will also form part of the preventative measures and for resolving occurrences of deforestation that are in contention with the project activities and objectives. These forest patrols will consist mainly of members of the local communities who have engaged in the participation of the monitoring and observation activities of the project, following appropriate training and assistance from the project team.

A majority of deforestation instances observed within the project area since the start date of the project have comprised of only small-scale deforestation (2-4 hectares) and mainly relating to cattle-farming and burning.

There are a number of completed on-the-ground observation sheets available for inspection, which are held in the IAL office in Manaus and will be available upon request.

8.5 Further Implementation

Providing a Central Database for all Project Information

A transparent and accessible database for compiling all records will be further developed over the next year, as it becomes possible to record all observations within the Geospatial Platform. This will be by way of attributing GPS co-ordinates to where observations were gathered and uploading the relevant data that is collected. This will provide a central collection point for all data and will be easily accessible. These records will be collated centrally in the project team office, and forwarded quarterly for inclusion in the Geospatial Platform. There will also be an accurate and complete set of data records kept in the project office, which will include all original monitoring and observation documentation.

Community Participation

It is the intention of the project to continue to roll-out the community participant observation plan, and to train, inform and engage as many participants in the activity from the project communities as possible.

There will be project zone sub-teams established who will be based in the 3 project zones and responsible for reporting back to the project team. These teams will consist of members of the

communities who will receive appropriate and adequate training to be able to effectively carry out the project monitoring tasks they are assigned. A training session with IAL and IDAM/Borba is scheduled for the 27th/28th May 2013 and further training will be given to ensure all participants are equipped with the relevant skills.

Providing GPS Equipment to Observation Participants
This will be implemented once funding is available, to allow monitoring data to be geo-referenced accurately and recorded in the Geospatial Platform, and to allow for accurate dissemination of information for any actions that are required to mitigate any deforestation activity.

Structured Schedule of Visits
In this initial project phase, it has not been possible to implement the structured schedule of visits detailed in the PDD. This is due to the need for funding to fully implement this. Observation events up until this point have been sporadic and unplanned. The project will develop and implement an appropriate schedule of visits in the coming year, to ensure all appropriate areas are visited and in accordance with the details described in the PDD. This will also include ground checking of identified areas of deforestation.

A full plan and structure for the schedule of visits, and all other monitoring activities has been identified and outlined in the project Management Plan.

High Resolution Imagery
At the time of writing this report, high resolution imagery (5m) for approximately 170,000ha area of the project area is being obtained from Rapid Eye, in order to detect any deforestation that has occurred in the project and leakage areas that was not picked up by PRODES (30m). This will allow for smaller areas of deforestation to be identified that were undetected by PRODES but visible using the high resolution images obtained. These images can also be used to carry out cross-checking exercises to be carried out and also for accuracy of quantification.

9. SOCIAL IMPACT MONITORING ACTIVITY

Social-related monitoring and reporting for this implementation period focus on the initial project activities of community liaison meetings and discussions regarding the participation of inhabitants in the project activities and discussions regarding the appropriate benefits that will be provided through the implementation on the project, by way of providing sustainable projects, programs and activities through the Benefits Distribution Mechanism when appropriate.

The Natural Forest Standard requires projects to establish a mechanism that benefits local communities and that this should be designed in consultation with communities and relevant organisations within the project area. The communities have been consulted throughout this initial stage of the project, and the projects, programs and activities identified in the PDD were established through these discussions. The BDM will be implemented when the financing is available and full operation of the project activities is possible. The types of benefit that were identified through consultation with various liaison group meetings and field visits were, in general terms, as follows:

- Local craftwork opportunities
- Land Maintenance
- Infrastructure
- Healthcare improvements
- Sanitation and Housing
- Electricity Supply
- Education
- Sustainable Agriculture
- Training

9.1 Social Impact Monitoring Activities

Indicators of the social impacts of the project are based on the hypotheses drawn in the PDD of how the project intends to achieve its project objectives with regards to the benefits created and instigated for the inhabitants of the project area.

The effectiveness of social and community-related activities is focused around the implementation of awareness and participation in the project. It is the intention of the Trocano project to involve the local communities with the design, implementation and success of the project activities as well as the monitoring of its successes where possible, appropriate and applicable. At this early stage in the project, it is not practical to carry out a full social impact monitoring exercise, due to the implementation status of the project and its activities, however subsequent review period reports will give detail of these monitoring activities. It is the intention of the project to carry out focus group-type reviews, to gain community-based indicators of impacts and outcomes from the introduction and actioning of project activities and encouraging feedback and participation from as many community and project area members as possible, asking simple questions such as:

- How do you feel this project will improve your lives?
- How could this project have a negative impact on your lives?
- What benefits are you hoping for from this project for your family and/or community?
- What would make this project a success for you?
- What would make this project a failure for you?

The outcome and results of these focus groups will be recorded and reported in subsequent project implementation reports.

10. BIODIVERSITY MONITORING ACTIVITY

Where there has been carbon monitoring and monitoring of the state of the forests carried out both by satellite and on the ground processes, the biodiversity monitoring has become part of the same activity.

Specific biodiversity monitoring, as outlined in section 9.10 of the PDD will be integrated into the project monitoring activities as part of the on-going implementation of the project once the funding is available to the project, and the full implementation of the project activities is possible.

10.1 Biodiversity Monitoring

With the protection and monitoring of the project area being in initial implementation, the protection of the biodiversity of the project area has also commenced in its most basic form, and has allowed the levels of biodiversity present in the project area to remain stable.
As there have not yet been any major development projects, programs or activities that are expected to be implemented through the benefits distribution mechanism, the need to assess their potentially negative effect on the biodiversity has yet to be implemented, however the project team are primed ready to carry this out when appropriate.

10.2 Biodiversity Monitoring Activities

As described for the monitoring of social impact monitoring activities, the focus of this monitoring activity is around providing the implementation and awareness of the project and promoting participation. It is the intention of the project to focus the monitoring of the biodiversity around the activities, impacts and outcomes that occur from the full implementation of the project. At this early stage in the project, the biodiversity monitoring of the project has been minimal and where there has been monitoring, it has been part of the carbon and forest monitoring and observations.

The effectiveness of the monitoring of biodiversity will become apparent once the monitoring activities are specifically actioned and are being carried out with biodiversity specifically in mind. Biodiversity monitoring indicators of effectiveness will be implemented as part of the on-going project activities, and specific training will be carried out with groups who will be responsible for these observation and monitoring activities. It is important for the project to incorporate local participation in the design and application of the biodiversity monitoring, as the local inhabitants possess the expert knowledge of the land and biodiversity within the project area. Participation will be through workshops and focus group activities, and training will be provided. There will also be input from the members of the project team that are expert in the field of biodiversity and its monitoring.

Subsequent review period reports will give detail of the monitoring activities actioned and implemented.

10.3 Indicators of negative impacts on the project area

Indicators of any negative impacts of project implementation will be assessed as the BDM projects, programs and activities are introduced. Some of the indicators for negative impacts are focused towards assessing the effectiveness of mitigation activities that are intended to be proactive in preventing negative impacts, and this will be monitored in conjunction with these monitoring activities. Other indicators may overlap or be taken from the monitoring of project areas.

11. MAIN THREATS IDENTIFIED BY MONITORING ACTIVITIES

The main threats that have been identified through the monitoring activities of the project are agriculture and illegal loggers.

The threat of expanding agriculture is due to the use of machines, which has a proportionate effect on how much and how quickly areas of forest can be cleared for this land-use change activity.

The threat of illegal loggers is predominant in easily-accessible areas i.e. proximity to rivers and roads, and any previous deforestation sites have a correlative relationship to further deforestation occurring.

It is important to note here that most local farmers are not considered as an agent of threat of deforestation to the project area, as through their knowledge and participation of the project, they have developed the process of asking for assistance and advice from the Production Secretary or IDAM/Borba as to the most appropriate processes to adopt on their farms and their farming practices to prevent any negative impacts occurring. They are very careful as to how they proceed and where possible are beginning to adopt sustainable and environmentally-sound processes. Through the further implementation of the project and where funding becomes available, the Trocano project will be able to further assist the farmers in making sustainable decisions and practices the norm. The funding resulting from the project will also allow both IDAM/Borba and the Municipality to develop better structure to this process and will help to orientate the farmers in the correct and most appropriate practices, both for their livelihood and the success of the project.

12. MITIGATION OF THREATS IDENTIFIED BY MONITORING ACTIVITIES

Where illegal irregularities have occurred, IBAMA and/or IPAAM will become involved. There are currently no specific figures from either organisation specifically for the project area; however there has been some data collected for the Amazonas State as a whole, which suggests actions are taken where and when reported and deemed appropriate.

The links between the project monitoring teams and IBAMA and IPAAM will be developed as part of the implementation process and the project will raise awareness throughout the project area of the correct and available procedure for alerting these organisations when irregularities are observed.

The Chief of the Municipal Agents (Local/Municipal Police), Erivelton Lima, is engaged with the project and is keen to participate, both himself and his 46 officers; 3 of which are based in the Axinim community, 3 of which are based in the Foz do Canoamã community and the remainder located in the seat of the Municipality. They currently do not have any boats, cars or an office that belongs to their organisation, and rely on borrowing or using their own personal modes of transport to respond to incidents. The project will be assisting in increasing their presence in the project area and their access to appropriate and dedicated vehicles to improve their productivity.

13. PLANNED IMPROVEMENTS AND PROJECT DEVELOPMENTS FOR NEXT REPORTING PERIOD

The project intends to become fully operational in the coming year, as this will be following the issuance and sale of NCC's. The project, up until this time, has not been able to be fully functional without the carbon funding that will be generated. With this funding in place and available, will mean that the project can proceed with all the objectives, activities and benefits that have been detailed previously in the PDD, and will be able to fully implement all aspects of the project. With the funding available, the next project phase will commence and the objectives, activities and benefits that are detailed in the PDD will become able to be rolled out. This will allow the project to be fully functioning, and this will be the most important development in the life of the project so far.

With the ability to put all this into action, the PDD really highlights the developments that are expected to commence within the next reporting period, however there have also been some additional developments and improvements identified that were not included in the PDD that the project believes are important to include as additional activities to implement.

13.1 Introduction of a Pilot Project

Having visited all the communities to inform, educate and raise awareness within the project area of the project activities and the benefits that are available to communities, it became apparent that it would be beneficial to implement a pilot project to demonstrate the benefits that are available to communities from their participation in the project in a way that inhabitants of the project area could understand and realise the tangible benefits that can be achieved from participating in the project.

It was identified that the São Joaquim community would be ideally suited for the implement of the pilot project. The community has the Maria Borges School which serves a number of outlying communities, and has approximately 80 students, who travel up to 2 hours by boat per day to attend the school. Having spoken to Dilson Almeida, a teacher from the community, the biggest issue of concern for them is their lack of clean drinking water, especially for the school. The community does currently have a water pump and filtration system installed in the community; however they do not have access to electricity to be able to run it. They also expressed a wish to be able to provide computers for their students.

Therefore the objectives of the pilot project will be to provide solar power for the water pump and filtration system already within the community. Excess electricity will be provided to the school to run an agreed number of computers for the classrooms and therefore the project will also supply computers for the Maria Borges School. Although internet access will not be available, the computers can be loaded with relevant software to assist in the education of the students, such as language courses, health and nutrition advice, and environmental and sustainability education programs as well as them learning basic computer skills.

These benefits will be in response to the community participation in the project activities and by contributing to protecting the area from outside deforestation, data collection and adoption of sustainable practices.

This community has been specifically identified as the pilot project location as not only will the introduction of these benefits make a tangible difference to the community, it will also be disseminated through the students attending the school from the outlying communities and

therefore helping to spread the word of the project and its benefits to a wide number of communities. By educating students in sustainable practices from an early age, these can then be passed on through the generations and from family to family.

13.2 Change from Rangers to Community Participation Monitors

Rangers were felt to have a possible negative connotation among some of the communities, so it was felt that a more appropriate solution was to engage the community leaders in participating in the monitoring and enforcing the mitigation of deforestation in their individual areas, with the support and backing of the Project Management Council, and where appropriate, calling on IBAMA, IPAAM and the Municipal Police for support.

From an enforcement perspective, the Municipality of Borba has the Municipal Police force of 46 individuals. It is felt however that due to a lack of resources, the forces ability to quickly react to an enforcement scenario is limited. Therefore, one of the goals of the project, working together with the Municipality will be to make a more efficient force through the supply of equipment and training.

13.3 Providing Solar Energy in the Project Area

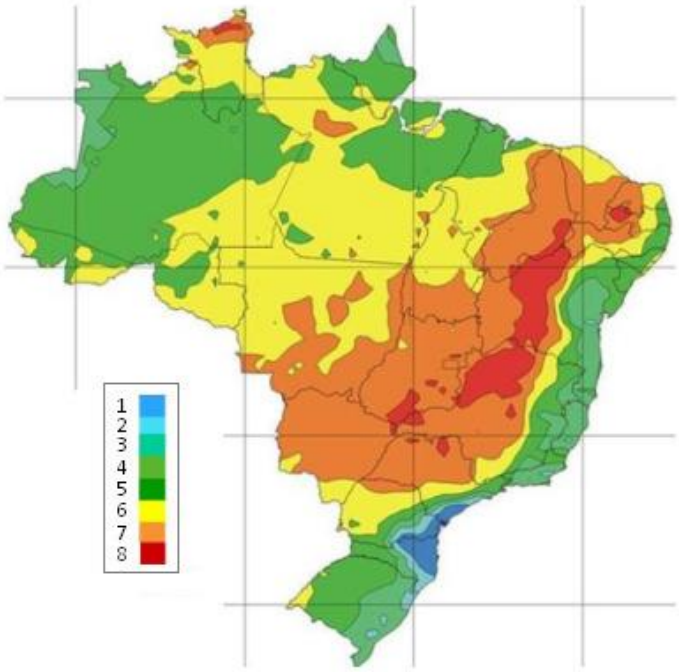
For improving the quality of life of the inhabitants, an important factor is to give them electricity, above all, light and elementary electricity for basic appliances. However, if we don't want to increase the emissions, we must think in different alternatives, namely renewable energy.

There are distinctive kinds of that, such as solar, wind power, hydroelectric and biomass. In order to choose the most appropriate renewable energy source to introduce, we would need to ascertain the electricity demand, and how much electricity would be required. These necessities change between one area to another, and they depend on the customs, kind of people and a lot of other factors. It is essential to know the potentialities in the area, so that, we could harness the natural energy with the maximum potential.

Solar energy potential

In the project area, solar energy may be a good option. An analysis carried out by Mines and Energy Minister of Brazil[1], talks about that there are several areas of sun productivity in Brazil. The results were obtained from the global irradiation map for an inclined plane, created out of Brazilian Atlas of Solar Energy (2006), which was differentiated in diverse colours depending of the various stages of radiation.

[1] http://www.epe.gov.br/geracao/Paginas/Notat%C3%A9cnicaAn%C3%A1lisedaInser%C3%A7%C3%A3odaGera%C3%A7%C3%A3oSolarnaMatrizEl%C3%A9tricaBrasileira.aspx



Map 1 - Solar intensity map for inclined panels in Brazil

According to the map above, the zones with higher solar radiation are the areas within categories 5 to 8, in which the average productivity varies between 1,260 and 1,420wh/year, resulting in a capacity factor between 14.4% and 16.2%, taken at a reference of 8,760 hours of sun per annum.

Zone	Average productivity (Wh/Wp/year)	Capacity factor
5	1260	14.4%
6	1320	15.1%
7	1370	15.6%
8	1420	16.2%

Table 3 - Solar productivity per zones in Brazil

The Borba area falls into zone 5, which identifies a positive potential of productivity for solar energy, with an average productivity of 1,260 wh/wp/year.

Factors of solar energy

The first and essential step is to know the daily electricity consumption required, because we need to know how much solar energy, we can get. For the size in the PV system, we would know the physical unshaded area available for the installation, and again, the electricity consumption. There are different types of solar panels, monocrystalline and polycrystalline, and the power production may be between 60 w/h or 130 w/h for each panel. Even though the polycrystalline panels are more effective, monocrystalline is cheaper, and its energy production is similar to the polycrystalline.

Solar necessities for water extraction and electrical appliances

The objective is to create a communal area without shadows to install solar panels, for electricity and for the water extraction which can provide for the whole community.

Although we would need to calculate the solar necessities, it is possible to estimate it. In our case, we would need energy for lights, for water extraction and the possibility of occasional other basic appliances.

With regards to lights, we could cover the houses using LED's bulbs, which lifespan is about 50,000 hours (whereas a normal bulbs lifespan is between 1,200 and 8,000 hours), and they consume 6-8 watts per hour, where fluorescent bulbs consumption is 13-15 watts, incandescent bulbs consume 60 watts. Thus, we would need just 100 watts per day to cover the light necessities.

On the other hand, for knowing the power necessities of water extraction, we need to know, between others, the consumption of the pumps, whose are fitted with a 200 watt - 3,000 watt. The motors are powered with 1,800 Wp PV arrays, which can deliver about 140,000 litters of water/day from a total head of 10 meters.

However, there is a calculation to find the power consumption of a water pump. A typical water pump's wattage can vary between 250 watts to 1,100 watts. Take the wattage of the specific water pump and multiply it times how many hours a day it runs. Then, multiply it by how many days a year it runs, and divide by 1000. This will give the amount of kilowatt-hours the pump is using.

Regarding electrical appliances, a 25' television could consume 150 watts per hour or 1411 watts per hour if we talk about a refrigerator.

Prices

The prices of solar energy are still very high. Depending on the location and design of our system, the typical home installation ranges from 3 to 7 kilowatts, and the costs are between $18,000 and $40,000. In our case, we just could need between 3 or five kw/h for each house, since we only need cover basic electricity. So costs could be different. However, there is an alternative to these prices that also, can implicate participation from the population, which is to build solar panels by ourselves.

Building solar panels

There are opportunities available to construct the solar panels on site, by the inhabitants of the communities at a relatively inexpensive cost. It has been possible to identify what is necessary to buy to complete the kit for each panel, with the following materials, and the prices:

Solar Cells (36 each panel)	$74.00
Misc. Lumber	$20.62
Plexiglass	$0.00
Screws & Misc. Hardware	$0.00
Silicone Caulk	$3.95
Wire	$0.00
Diode	$0.20
Jones Plug	$6.08
Paint	$0.00
Total	$104.85

Also, there is a list of the necessary tools:

- Drill
- Circular Saw or Table Saw
- Mitre saw

- Soldering Iron
- Router w/ 1/4" straight bit (You can still build solar panels without using a router)
- Caulk gun
- Staple gun
- Phillips screwdriver

We would need 36 cells for each panel, and it's would be good idea to use monocrystalline cells, because there are cheapest, and they have a nearly equal efficiency compared with polycrystalline ones.

Conclusion
The idea is to provide green electricity to the communities in Borba so that they can improve their conditions of life without to compromise the environmental. In addition, this project can offer employment for the inhabitants of Borba, because panels would be built by them. Population can feel that they are participating in the REDD project, and they can internalize the notion that it's better for them to help the environmental rather than destroy it.

13.4 Sustainable Fishing in Borba

It is the intention to create a partnership with the Union of Fishermen of the State of Amazonas - SINDPESCA. This activity resulted in investment of the trip to Brasilia on 05 to 07 February 2013, where a Director of IAL, Mr Jose de Souza, was in a meeting with the Minister of Fisheries and Aquaculture of the Federal Government, Marcelo Crivelli, where we presented the proposals and needs of fishermen to align goals and actions in this sector, strengthen support partnerships and develop sustainable fisheries in the project area.

The proposal is for fish production and the creation of a biotechnology centre for fish. At a distance of approximately 60 kilometres from Manaus, in the municipality of Iranduba, there is a land with 150 hectares of water pools for fish production. The place has the entire necessary infrastructure (with machines that need to be replaced, because they are 15 years old) for the production of fish for the local and external markets. With the technology centre, the local people would be able to explore this up to now basically unexplored market, using the fish itself, its skin and oils for the production of different things, including fertilizers. It will be a new alternative for the local producers and an alternative to cattle.

13.5 Craftwork

It is the intention of the project to further research the implement the creation of a place that would be like a "meeting point" for local artisans, named "Casa do Artesão". The place will host workshops for local people and also help small business to develop, helping them with business plans and guiding them on how to reach new markets. One of their ideas is to create small shops in every city that will be hosting the World Cup games, selling traditional and exclusive products from the Amazon.

13.6 Introduction of a Co-operative Scheme

Through our research within the Municipal Seat and the communities that are part of the project area, one of the main issues that arose was the lack of access to market for goods and services. It is also known that agricultural expansion and slash-and-burn are two of the main drivers of deforestation in the area. It became clear through our many discussions that a lot of these activities were carried out because communities and farmers alike felt that they needed to produce a wide assortment of crops and products because they were not aware of the most important or attractive

products that the market is demanding outside of their communities i.e. in Manaus or further afield. This led to a scattergun type of agricultural thinking.

The project believes that the development and funding of a co-operative type system that is there for the benefit of all of its members could have an important life changing effect for these smallholders. The management of the cooperative, with the help of IAL, with a good knowledge and association with Manaus, will look at the best products and best processes available in the main markets in Manaus. This information will be then given to the smallholders and the necessary help will be provided for them to grow and produce these crops in a sustainable way. This will dramatically reduce the wastage that is so prevalent in this area and allow them to achieve some sustainable economic activates that, given the right training and support, will benefit them long into the future.

14. QUANTITATIVE ASSESSMENT OF NCC'S FOR CREDITING PERIOD

14.1 Calculations and Methodology for the Quantifying of Annual Emissions & Natural Capital Credits for the Trocano Araretama Project

14.1.1 Biomass and Carbon Stocks: Totals and Average Densities from NASA JPL maps (dated early 2000)

Totals and average densities for Above-Ground Biomass (AGB), Below-Ground Biomass (BGB) and Carbon Stock, as well as the error estimate on carbon values, are obtained directly from the NASA JPL pan-tropical biomass and carbon map (Saatchi et al., 2011). The NASA JPL data was derived from a combination of in situ inventory plots, LIDAR, optical and microwave satellite imagery, acquired using satellite data from the early 2000s at a resolution of ~1km. Carbon stock was calculated as 50% of AGB + BGB.

The NASA JPL data give carbon and biomass density values in t/ha.

Average biomass and carbon density values are obtained in the Geospatial Platform by calculating the average value over all pixels of the relevant data layer within the query area. When a query area partly contains pixels with zero carbon (e.g. water bodies), the average density values will be lower because the 0 values are included in calculating the average. Where no data is available for an area, a result of NaN ("Not a number", or no data available) is shown.

Total values are obtained in the Geospatial Platform by summing the density values of all pixels within the query area and multiplying the sum by the pixel size. This gives total carbon or biomass for the query area. The Geospatial Platform uses the actual pixel size of the centre pixel within the query area.

14.1.2 Adjusted Biomass and Carbon Stocks: Totals and Average Densities from the NASA JPL maps adjusted for Deforestation between 2000 and 2011

In order to account for any deforestation that may have occurred from 2000 to 2011, PRODES land cover data from the Brazilian space agency (INPE) for the years 2000 up to approximately the time that the project started (June 2011) was used to produce Carbon, AGB and BGB maps based on the original NASA JPL carbon and AGB map values, but adjusted for 2011. For the adjustment, a conservative approach was taken and deforested areas were assumed to have lost all above-ground and below-ground biomass.

The full methodology for the adjustment of the NASA JPL Carbon, AGB and BGB maps to account for deforestation that occurred prior to project commencement is given in the Carbon Map Adjustment Methodology link under the Science tab.

The data layer that is used in these queries is the NASA JPL Carbon, AGB and BGB data adjusted for deforestation between 2000 and 2011. Average density values and totals are obtained in OE in the same way as above.

Note that the extent of the adjusted NASA JPL Carbon map only covers the Trocano Araretama project and leakage areas and immediate surroundings. Query areas that are drawn outside the extent of the data layer will give a result that indicates that No Data is available.

14.1.3 Carbon Stocks and Density per Vegetation Type

Vegetation types within the area of interest are based on the ESA Globcover V2.3[2] land cover map for the year 2009 derived from MERIS sensor (300m) observations. Calculations of the carbon stock and density present per vegetation category are obtained from the 2011 adjusted NASA JPL carbon map which accounts for deforestation between 2000 and 2011.

Differences in the original Vegetation (ESA Globcover 2009) and carbon data sources and resolutions mean that the total carbon reported in this table may be slightly different from that reported in the carbon stock totals and average density queries described above. Water bodies are identified with greater accuracy using the higher resolution vegetation map and are assigned a carbon value of 0 t/ha in these query results.

Note that the extent of the adjusted NASA JPL Carbon map only covers the Trocano Araretama project and leakage areas and immediate surroundings. Query areas that are drawn outside the extent of the data layer will give a result that indicates that No Data is available for the "Vegetation (using ~2011 carbon values)" query.

14.1.4 Deforestation in the Brazilian Amazon region

Deforestation data for the whole of the Brazilian Amazon region per year is sourced from INPE's PRODES Amazon Annual Monitoring Program, which uses moderate resolution Landsat and CBERS imagery, with spatial resolution of approximately 30m. Deforestation data is available up to and including 2012, and the yearly data covers the period from August of the previous year to July of the dataset name year.

The deforestation data is separated into deforestation detected prior to the project start date between August 1999 and July 2011, and deforestation that occurred after the project start date from August 2011 to July 2012. Details on the creation of the deforestation layers before and after the project start date are included in the document PRODES Deforestation Layers Methodology, available under the Science tab of the Geospatial Platform.

Where the Deforestation query results indicate no data is available, no deforestation was detected by the PRODES INPE's Amazon Annual Monitoring.

- **Deforestation prior to project start**

This query combines the INPE PRODES deforestation data for August 1999 to July 2011 with the NASA JPL Carbon map. The extent of past deforestation is quantified (in ha and as a % of the query area), per year. The carbon stocks mapped by NASA JPL (average density and totals) within each of the deforested areas are calculated.

- **Deforestation after project start date**

This query combines the INPE PRODES deforestation data for August 2011 to July 2012 with the adjusted NASA JPL Carbon map. As above, the extent of past deforestation is quantified (in ha and as a % of the query area), per year. The carbon stocks of the adjusted NASA JPL map (average density and totals) within each of the deforested areas are calculated.

Emissions were calculated for deforestation occurring after the project start date as follows:

[2] Source: ESA Globcover V2.3 land cover map 2009

Emission = Area x {[AvgC x Vf] + VSoilC} x 3.667 (tCO2)

Where,

Area = deforested area (ha)

AvgC = mean value of above and below-ground carbon density in woody biomass within the area ($tCha^{-1}$)

Vf = the vulnerable fraction of woody biomass (%)

VSoilC= the vulnerable soil carbon within ($tCha^{-1}$)

3.667 = 44/12; Carbon to CO2

The vulnerable fraction of carbon lost on deforestation was estimated at 0.9, while the vulnerable soil carbon relevant to deforestation occurring in the Brazilian Amazon was estimated at 8 tCha-1 based on the a review of the most relevant literature.

The method addresses emissions associated with deforestation but does not include potential emissions from degradation (in the case of Amazonia, degradation occurs mainly in the form of illegal selective logging). Further details on the reasons for not including degradation in this method as well as the source of carbon factors (AvgC, Vf, and VSoilC) are described in full in the report for ACEU Risk Based Methodology for Quantifying Natural Capital Credits under the Natural Forest Standard link available under the Science tab of the Geospatial Platform.

Note that the extent of the adjusted NASA JPL Carbon map only covers the Trocano Araretama project and leakage areas and immediate surroundings. Query areas that are drawn outside the extent of the data layer will give a result that indicates that No Data is available.

- **Important note on the deforestation queries:**

The layers for both the deforestation before and after the project start date are displayed by the Geospatial Platform at a resolution of approximately 19m. However, the data in the database, i.e. the data that is queried and returned in the above two queries, is at a lower resolution.

In order to cross-query layers within the Geospatial Platform (i.e. to combine 2 data layers in 1 query, e.g. to obtain carbon lost per deforested area, or to obtain carbon per risk category), the resolution of the data layers must be the same. In the two deforestation queries above, deforestation data is combined with the lower resolution original NASA JPL carbon map (611m pixel size) , and the adjusted carbon map (76m pixel size). Therefore the deforestation datasets showing deforestation prior to and after the project start date had to be uploaded to the Geospatial Platform database at resolutions of 611m and 76m respectively.

Due to these changes made in the resolution of the deforestation datasets, the deforestation extents and locations for the deforestation query results are estimates. The higher resolution display layers for past deforestation are a more accurate indication of deforestation extents and provide more precise locations of deforestation that occurred each year between 2000 and 2012.

Results for deforestation that occurred after the project start date in 2011 are based on higher resolution data (approximately 76m) than the past deforestation results.

- **Undetected Deforestation and Emissions**[3]

As deforestation mapping for PRODES is based on Landsat and CBERS satellite data at 20 m to 30 m resolution, a visual interpretation and quantitative analysis was carried out on high resolution (5 m) RapidEye satellite data. In order to test whether significant areas of deforestation of smaller extents are missed or incorrectly detected and mapped by INPE's PRODES product, high resolution RapidEye data for an area of approximately 179,000 ha dated 2009 and 2011 was investigated.

Based on this assessment, a conservative figure of an additional 9% undetected emissions has been applied to the emissions calculation from deforestation recorded by PRODES, in order to account for small areas of deforestation undetected or missed by PRODES. This adjustment calculation was done offline (i.e. not on the Geospatial Platform, but in the Excel sheet with final calculations, found in section 14.2 and under the Science tab of the Geospatial Platform).

Please refer to the Assessment of PRODES data and Undetected Deforestation document available under the Science tab of the Geospatial Platform for further details.

14.1.5 Past Fire Events

Fire events are recorded by the MODIS instrument on board the NASA Terra (EOS AM) Satellite[4]. A density map (no. of events/sq.km) was created based on the Global 10-day fire maps from recorded fire events in each year for 2005 to 2010. The results are given in a bar chart.

The fire data is uploaded to the Geospatial Platform database at a coarse resolution (approximately 9.7 km pixels), the query results will therefore often give a warning that you have selected a very small polygon and that the results might not be accurate. This message is automatically generated by the Geospatial Platform when a query area contains fewer than 4 pixels of a specific data layer.

14.1.6 Risk of Deforestation - ACEU Deforestation Risk

Risk of deforestation in the area of interest is based on Ecometrica's ACEU risk mapping method. The full report on the ACEU Risk Based Methodology for Quantifying Natural Capital Credits under the Natural Forest Standard is available under the Science link of the Geospatial Platform.

This query combines the adjusted NASA JPL carbon map with the ACEU Deforestation Risk map. ACEU Deforestation risk values run on a 5 point scale from very low (green) to very high (red).

Total Carbon stock and density in the areas under different risk are reported. Calculations for average Carbon Credits are done as follows:

AvgCredits = {[AvgC - (2xStdDevC)] x VulC} + SoilC

Where,

AvgC = Average carbon density [tC/ha]

[3] Note that the results of this work are not shown directly on the Geospatial Platform, but are given in section 14.2 and in the Excel spreadsheet that is available separately under the Science tab in the Geospatial Platform.

[4] Source: Data collected by the NASA Moderate Resolution Imaging Spectroradiometer (MODIS) satellite, the product used was the Global 10-day fire maps generated using the MODIS active fire locations, accessible here.

StdDevC = Carbon Standard Deviation [tC/ha]

VulC = Vulnerable component of carbon [=0.9]

SoilC = Soil carbon [8 tC/ha]

Potential Carbon Credits Earning for a given area are calculated for as follows:

Credit Potential = AvgCredits x Area x RI x CO2f / Years

Where,

Area = area of the specific risk category (ha)

RI = Risk Index for that risk category (see below)

CO2f = 3.667 (Carbon to CO2)

Years = 20 years

Risk Indices: Very High Risk (Risk Index = 0.8), High Risk (Risk Index = 0.6), Medium Risk (Risk Index = 0.4), Low Risk (Risk Index = 0.2), Very Low Risk (Risk Index = 0).

Note that the extent of the adjusted NASA JPL Carbon map only covers the Trocano Araretama project and leakage areas and immediate surroundings. Query areas that are drawn outside the extent of the data layer will give a result that indicates that No Data is available for the "Risk of Deforestation (using ~2011 carbon values)" query.

14.1.7 Accounting for the Loss of Vulnerable Soil Carbon due to Deforestation 2000 to 2011

In order to account for the Vulnerable Soil Carbon (VSoilC) assumed lost due to past deforestation, the credits associated with VSoilC were subtracted from the total credit potential for every hectare that was previously deforested within the project areas.

Potential credits associated with loss of Vulnerable Soil Carbon due to deforestation before project start date were calculated using the following equation:

Soilcredits = VSoilC x Area x 3.667 / 20

Where,

VSoilC = 8 tC/ha

Area = area deforested before the project start date (ha)

3.667 = 44/12; Carbon to CO2

20 years = period of crediting

This adjustment calculation was done offline (i.e. not directly on the Geospatial Platform, but in the Excel sheet with final calculations, which can be viewed in the Credit Calculations for Trocano

Araretama Project Sites document available under the Science tab of the Geospatial Platform, and in section 14.2 of this document).

14.1.7 Regularly Flooded Areas per ACEU Risk Category

Potential credits assigned to areas categorised as regularly or permanently flooded according to the ESA Globcover V2.3 land cover map for 2009 are also reported. Areas prone to flooding are grouped within the ACEU risk categories and show the average and potential credit values originally assigned to them. As regular flooding reduces accessibility and therefore the risk of deforestation, Potential Credits assigned to an area can be adjusted according to the extent of the regularly flooded area within a site.

This query combines the adjusted NASA JPL Carbon map and the ACEU deforestation risk map with the ESA Globcover categories listed below:

- 160: Closed to open (>15%) broadleaved forest regularly flooded (semi-permanently or temporarily) - Fresh or brackish water
- 170: Closed (>40%) broadleaved forest or shrubland permanently flooded - Saline or brackish water
- 180: Closed to open (>15%) grassland or woody vegetation on regularly flooded or waterlogged soil - Fresh, brackish or saline water

Please refer to section 14.2 for the final credit calculations and adjustments for the Trocano Araretama project, which are also available on the Geospatial Platform in the document named Credit Calculations for Trocano Araretama Project Sites document, under the Science tab.

Note that the extent of the adjusted NASA JPL Carbon map only covers the Trocano Araretama project and leakage areas and immediate surroundings. Query areas that are drawn outside the extent of the data layer will give a result that indicates that No Data is available.

14.1.8 Normative Biodiversity Metric and Pristineness Scores

The pristineness map shows the degree of human influence on natural ecosystems. The darker areas are more pristine ecosystems, while the lighter areas have been more influenced by human activity. This data is used as an input for the Normative Biodiversity Metric.

The Normative Biodiversity Metric (NBM) map gives an approximate indication of the biodiversity significance of land areas. This is calculated by combining information on the pristineness of ecosystems and the density of endemic species. Red areas represent areas of low biodiversity value, to blue representing areas of high value.

14.1.9 References

Saatchi et al. (2011) Benchmark map of forest carbon stocks in tropical regions across three continents. PNAS, doi: 10.1073/pnas.1019576108. Corresponding author e-mail: saatchi@jpl.nasa.gov.

14.2 Credit Calculations and Adjustments for the Trocano Araretama Project

	tCO2				
Project Area	**Potential Credits**	**Credits Excluded for Flooded Areas**	**Credits Excluded for Soil Carbon in Deforestated Areas 2000-2011**	**Emissions 2012**	**Credits Due 2013**
1	224,016	-	0	0	224,016
2	104,357	-	0	0	104,357
3	90,170	-	0	0	90,170
4	640,297	1,259	0	0	639,038
5	10,863	-	0	0	10,863
6	1,325,486	6,012	54	0	1,319,420
7	919,434	661	163	0	918,610
8	831,065	17,813	1,258	0	811,994
9	69,188	11,196	110	0	57,882
10	142,338	3,927	1,588	0	136,823
11	598,546	34,442	6,449	0	557,655
12	31,958	3,434	54	0	28,470
13	2,940,023	77,534	603	0	2,861,886
Total	7,927,741	156,278	10,280	0	7,761,183

Undetected Emissions 9%* 0

	tCO2
Leakage Area	**Emissions 2012**
1	51,632
2	-
3	-
4	1,923
5	-
6	-
7	-
8	-
9	-
Total	53,555

Undetected Emissions 9%* 4,820

Total Emissions	**58,375**

Project Credits (tCO2) Total	**7,702,808**

** In order to account for emissions undetected by the INPE's PRODES Amazon Annual Monitoring Program, an additional 9% was added to the deforested area extent within more intensely deforested areas. Please refer to the Assessment of PRODES data and Undetected Deforestation document available under the Science tab of the Geospatial Platform for the full methodology.*

14.2.1 Calculations for Credits Assigned for Soil Carbon in Deforested areas 2000-2011 (tCO2)

These figures have been calculated offline, based on the deforestation figures generated in the Geospatial Platform, and using the adjustments detailed below.

	Deforestation (ha)												
Project Area	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
2000								261	75	373	1938	37	75
2001								75			261		
2002								37		75			
2003						37				75	298		149
2004								112		37	522		
2005							37	112		298	261		
2006							37				37		75
2007										75	37		
2008							37	261		75	298		37
2009											37		
2010											671		75
2011										75	37		
Total	**0**	**0**	**0**	**0**	**0**	**37**	**111**	**858**	**75**	**1083**	**4397**	**37**	**411**

Soil Carbon Assigned to deforested area (tCO2) per project area*, **

Project Area	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
	0.00	**0.00**	**0.00**	**0.00**	**0.00**	**54.27**	**162.80**	**1,258.40**	**110.00**	**1,588.40**	**6,448.93**	**54.27**	**602.80**

* Vulnerable carbon fraction which in case of below ground fraction was conservatively estimated at 8tC /ha over 20 years.
** Adjusted for deforested areas between 2000 and 2011 by subtracting 8*(44/12)/20 credits for every hectare that was previously deforested within the project areas.

Internal Documentation references for Science tab Documents:
SC_DOC_001v2_2013_Assessment of PRODES data and Undetected Deforestation
SC_DOC_002v2_2013_Quantification Calculations Methodology
SC_DOC_003v2_2013_Carbon Map Adjustment Methodology
SC_DOC_004v1_2013_PRODES Deforestation Layers Methodology
SC_DOC_005v3_2013_Trocano Araretama Credit Calculations

15. CORRECTIVE ACTIONS TO BE ADDRESSED IN NEXT REPORTING PERIOD

Any corrective actions that are identified by Environmental Services Inc. during the verification process for the project will be detailed in the verification report relating to this reporting period.

All necessary and applicable actions required to complete these requests will be considered and initiated, where appropriate, by the project and reported in the subsequent annual project report.

16. VERIFIERS REPORT

The verifiers report will be submitted by Environmental Services Inc. following the completion of the verification process. This report will be presented as a separate report that will accompany, and make reference to, this document.