



PROJECT IMPLEMENTATION REPORT NFS001_2

Trocano Araretama Conservation Project
Projeto Conservação Trocano Araretama



Reporting Period
21st May 2013 to 31st July 2013

Report Date
8th August 2014



CELESTIAL GREEN
Ventures

For presentation to the Natural Forest Standard





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Project Developers



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Project Partners



NOTE:

The project-specific logo on the cover page of this report was developed in March 2014 and was carefully designed based on the local meaning of “Trocano Araretama” and reflects the importance of local history and tradition to all participants of the project.



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: 10 th June 2011 End: 9 th June 2031
Project Duration	20 years
Project Area	1,346,541.26 hectares
Project Location	Municipality de Borba, Amazonas, Brazil

ii. Report Information

Report Number	NFS001_2
Reporting Organisation	Celestial Green Ventures
Reporting Period	21 st May 2013 to 31 st July 2013 ¹
Quantification Period	1 st August 2012 to 31 st July 2013
Crediting Period (20 years)	10 th June 2011 to 9 th June 2031
Author(s) and main contributors	Celestial Green Ventures Instituto Amazonia Livre
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¹ These dates bring the reporting period in line with the quantification period; the period 1st August 2012 to 20th May 2013 was reported in the PIR NFS001_1 dated 26th August 2013 and is available at: <http://www.naturalforeststandard.com/projects/>



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 periodic review to ensure the relevance and skill-sets required by the project.

Name: Antônio José do Nascimento Fernandes

Responsibility: Project Leader

Functions: 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.

Name: Waldemar de Lima

Responsibility: Project Co-ordinator

Functions: 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.

Name: José Souza dos Santos

Responsibility: Finance Officer

Functions: 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.

Name: Rodrigo da Costa Lima

Responsibility: Project Operations Officer

Functions: 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.).



Name: **Fabiola da Costa**

Responsibility: **Administrative Manager - Brazil**

Functions: 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.

Name: **Juliana Terezinha da Silva**

Responsibility: **Legal Advisor**

Functions: 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.

Name: **Paula Torres Cofré (Senior Administrator CGV)**

Responsibility: **Project Administrator – Head Office, Dublin**

Functions: 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.

Name: **Patrícia de Almeida Santos**

Responsibility: **Coordinator for Biodiversity Monitoring**

Functions: 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.

Name: **Charles Oliveira do Valle**

Responsibility: **Training Activities Coordinator**

Functions: 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.

Name: **Antonio Fonseca Picanço**

Responsibility: **Environmental Monitoring Analyst**

Functions: 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.



Name: Cibele Lopes Bastos

Responsibility: Manager of Remote Sensing and GIS – Brazil: Ground Teams Training Coordinator

Functions: 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.

Name: Jenifer Castilho Marques Pereira

Responsibility: GIS Analyst – Brazil

Functions: Process, sort and geo-reference information collected in the project.

Name: Rodrigo Pimenta César

Responsibility: GIS Analyst – Brazil

Functions: Process geo-referenced data; Provide use of geo-referenced database; Prepare maps and spreadsheets of geographical coordinates.

Name: Renan Rodrigues Albuquerque

Responsibility: Technical Consultant – Socio-Economic

Functions: Assess and evaluate social impacts of the project; Evaluation of the economy and society of the Amazon; Implementation of communication in project area.

Name: Mariana Castro

Responsibility: IT Designer

Functions: Develop the visual and online presentation and communication of the project.

Name: Ariovaldo de Souza Junior

Responsibility: IT Developer

Functions: Develop educational materials through computational resources.

Name: Marcelo Nascimento Fernandes

Responsibility: IT System Developer

Functions: Organise and structure overall project database including data collection records, communication records, centralised access to appropriate documents and information.

Name: Enf. Lizandra Livia Farias Monteiro

Responsibility: Consultant – Health

Functions: Organize health actions; Plan activities for health in partnership with key people in the project; Provide information and activities related to personal health.

Name: Francisco Ferreira das Chagas Filho

Responsibility: Consultant – Education



Functions: 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.

Name: **Edilson Batista da Fonseca**

Responsibility: **Consultant – Rural Production and Supply**

Functions: 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.

Name: **Jorge Machado**

Responsibility: **Consultant – Sports, Culture, Tourism and Environment**

Functions: 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.

Name: **Raimundo dos Santos Machado Neto**

Responsibility: **City Hall Co-ordinator**

Functions: 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.



iv. Abbreviations

ACEU	Accessible, Cultivable, Extractive value, Unprotected
BDM	Benefit Distribution Mechanism
CBERS	China-Brazil Earth Resources Satellite
CGV	Celestial Green Ventures
CL	Clarification Request
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
INPE	National Institute for Space Research (Brazil)
IPAAM	Instituto de Pesquisa Ambiental da Amazônia
NBM	Normative Biodiversity Metric
NCC	Natural Capital Credit
NCR	Non-Conformity Request
NFS	Natural Forest Standard
OTG	On-the-ground
PDD	Project Design Document
PIR	Project Implementation Report
PIT	Project Implementation Team
PMC	Project Management Council
UFAM	Universidade Federal do Amazonas (Manaus)



1. EXECUTIVE SUMMARY

This report describes the continued progress made on the implementation of the Trocano Araretama Conservation Project for the remainder of the second quantification period of the project, in order to bring both the reporting and quantification time periods into alignment. The initial Project Implementation Report (PIR) documented the progress made throughout the initial 23 months of the project implementation, being 10th June 2011 to 20th May 2013, despite the initial quantification period for the project being from the 10th June 2011 to 31st July 2012. This was due to the initial verification of the project being carried out in June 2013 and the Project Implementation Team's (PIT) desire to report as completely and transparently as possible for this process.

The Trocano project has now completed the monitoring and reporting for the second quantification period of the project (1st August 2012 to 31st July 2013), and it is necessary for the remainder of the project activities corresponding with this period to be documented, reported and submitted in the form of a PIR, to allow both the reporting and carbon quantifications time periods to align. For this reason, it has resulted in the requirement for this subsequent PIR to report only on the remaining period that relates to the quantification period that was not previously reported on, which is from 21st May 2013 to 31st July 2013; this revised reporting period has been agreed in writing by the NFS Secretariat.

During this reporting period, the Trocano Araretama Conservation Project was undergoing the verification process for the initial quantification period, including the project site visit by the verifier. Although most of the Project Implementation Teams' energies at this time were focused on completing this process successfully, there are a number of important project implementation developments to be reported.

The timespan being reported falls within the second year of the Trocano Araretama project being an active project and as such, the activities of the project are still in early stages of implementation. 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 phase.

The quantification period is 1st August 2012 to 31st July 2013, the second year of the 20 year duration, and corresponds with the availability of deforestation data available from PRODES, which is utilised in the Geospatial Platform, alongside other methods (as discussed in the PDD) as part of the monitoring of the project. For the purposes of alignment of this report with the corresponding credit issuance period, this document should be read in conjunction with the sections of the initial PIR report, dated 26th August 2013, that refer to activities undertaken and progress made within the second quantification period to achieve an overall picture of progress made by the project during this time.

This report continues to identify key project events, actions and activities that have been implemented during this time period. 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, Instituto 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 continues to focus on the progress of the broad-term project activities in terms 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, best available data received from PRODES, for the period August 2012 through July 2013. The activities reported in this category include the successful mitigation of deforestation within the project area, through encouraging the participation of inhabitants of the project area in mitigation activities and their willingness and enthusiasm to be part of a successful project.

At the time of writing this report, the Trocano Araretama Conservation Project continues to be an active project, further implementing the project activities and continuing to work with the project partnerships to ensure the success of the project. Events of note outside of the reporting period herewith include successfully achieving verification on 17th September 2013, and subsequently having the initial issuance of Natural Capital Credits for the project; providing emergency and effective flood relief to the communities of the Municipality of Borba most affected by unusually severe rainfall in March 2014 and subsequent flooding of the Madeira River; and opening a fully operational project office in in Borba Town, which fulfils a number of important roles for the project including employing local people as its staff, providing training and information exchange workshops and a central drop-in centre for raising any questions, concerns or suggestions regarding the project.



2. PROJECT IMPLEMENTATION DEVELOPMENTS, EVENTS AND CHALLENGES

CGV, IAL and the Municipality of Borba have continued to work together during this time period to initiate the 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 for the given reporting period of 21st May 2013 to 31st July 2013; for details of the period 1st August 2012 to 20th May 2013 please refer to the initial PIR dated 26th August 2013.

Meeting reports, photos and other documentation of these actions have been kept and are held between the CGV office in Dublin and the IAL office in Manaus.

2.1 Timeline of Key Developments, Meetings and Events

30th May 2013 – The opening meeting for the commencement of verification occurred this day, between representatives from CGV and Environmental Services Inc. who are the verification body carrying out the process. This meeting was to approve the sampling plan for carrying out the verification and to agree on the timeline for working through the process, including the required site visit to the project area which was agreed would occur during June 2013.

4th June 2013 – A Project Management Team meeting was held in the IAL offices in Manaus. During the meeting, it was discussed about the upcoming verification site visit, the arrangements to be made with regards the transportation, meetings arranged with important members of the Municipality, and the itinerary of the visit. It was also discussed about the best way to document the future project activities and the main challenges the group had encountered so far, and how to learn from them in future activities and approaches.

6th June 2013 – Representatives of CGV and IAL were present at the City Council meeting where Law number 113/2013 was approved. The law was created in order to reinforce the commitment of the Municipality with the project in the long term, to ensure that its activities will continue to run smoothly through different administrations. All 9 councillors (who were elected by the local population and had started working for the Municipality in January) voted in favour of the law, which authorises:

“The Executive Power of Borba to celebrate contracts with international companies and organisations and international states for the transfer of capture of carbon credits, created the Municipal Management Body for the observation and monitoring of the activities for the protection of the environment, and reduction of the activities that damage the environmental patrimony” (translation from original Portuguese)².

² The official journal where the law was published can be supplied upon request, or accessed via: <http://www.diariomunicipal.com.br/aam/>



Photo 1: Meeting held at the City Council when Law 113/2013 was approved

On the same day, the CGV and IAL representatives attended an event in the main square of Borba town as part of the Saint Anthony Festival, which takes place for approximately 15 days every June. At the occasion, an informal meeting was held with the Mayor, Baía; city councillors Denes Coimbra and Didi; the representative of the Rural Producers Union, Goiano; and the former Vice-Mayor, Edivar Souza, among other businessman from Borba. The conversations focused on how the project was evolving and also planning a few of the activities that would be undertaken during the forthcoming verification site visit.



Photo 2: Meeting held in the square of Borba's Cathedral, during the Saint Anthony Festival

20th June 2013 – Members of CGV and IAL had a meeting with engineer Pedro Albuquerque Filho in Manaus during which Pedro presented details about a potential new port structure for the area of Manaus which could ultimately help decrease prices of sending products from more remote areas, such as Borba, to Manaus. This would allow local producers to offer products with a more competitive price, and also reduce the need for using middlemen during the sale process. Instead of normal ships, the new port would be built to receive flat boats which could travel along the Madeira River. The port structure would be similar to the one built in the area of Porto Velho, in the State of Rondônia.

20th June 2013 – Member of CGV and IAL visited the Maternity Ana Braga in Manaus. Elizabeth Hardman, coordinator of the Mother's Milk Bank at the Maternity Centre, gave updated information on a recent campaign to encourage the donation of breast milk, for which CGV made a financial donation. She explained how the milk bank works in Borba, with donated milk being sent to and from Manaus for proper treatment on a weekly basis. Borba is the location outside Manaus in the



Amazonas State to get a Mother's Milk Bank. Mothers are encouraged to donate milk in order to feed children whose mothers, for all sorts of reasons, cannot breastfeed them.



Photo 3: Visit to Banco de Leite (Human Milk Bank)

21st to 28th June 2013 – The site visit for the verification of the Trocano Araretama Conservation project was held during these dates. This involved the verifier conducting a review of the project and included observations by air, road and river and on-the-ground interviews with a number of community members as well as members of the PIT, IAL and CGV.

22nd June 2013 – CGV and IAL met with Professors Ph.D. Rubem Souza, Director of the Centre for Energy Development, and Guilherme Lima Filho, from the College of Education, both from Federal University of Amazonas (UFAM). The meeting was held to discuss the potential of Babaçu for biomass production in the project area.



Photo 4: Professors Guilherme Lima Filho and Rubem Souza, both from Federal University of Amazonas, together with Ciaran Kelly, from CGV

23rd June 2013 – Members of CGV and IAL took part at the celebrations for Saint John the Baptist, the patron of Axinim community, where they met with city councillors, secretaries and the Mayor of Borba. The celebrations on this day ended a full week of festivities and therefore received a number of visitors from other communities within the project area, which was an opportunity to discuss the project with some of these community members. During the event, a video about the project was displayed on the main screen, setup in front of the local church.



Photo 5: Saint Joseph Party in Axinim Community, during which a video about the project was displayed

24th June 2013 – Meeting held at the City Council in Borba with approximately 30 people attending, including members of CGV and IAL, for a round of questions submitted by the verifier for the verification of the project. The Mayor of Borba, Baía, was representing the Municipality, together with all the Municipal Secretaries, and all 9 members of the city council. There were also people representing the indigenous communities, the Rural Producers Union and the local office of IDAM. The members of the Municipality were questioned about their understanding of the project, its activities and the duties of the Municipality. The project team also had the opportunity to answer questions from the Municipality and update its members on recent developments of the project.

25th June 2013 – José Tarcisio Souza, manager of the local office of IDAM in Borba, invited the CGV representatives, the verifier and IAL members for a meal at his house. Also in attendance were representatives of the Municipality, such as the Mayor and the Secretary for Culture, Otávio di Borba. During the meal Otávio, who had recently started working with the Municipality, talked about his plans for the near future and encouraging cultural activities that value local traditions. He was very enthusiastic about the possibilities that the project can bring to the area, especially to local children, and made himself fully available to help with any planned activities.



Photo 6: Meeting at the house of IDAM's Manager, José Tarcisio Souza, with live music played by the Secretary for Culture, Otávio di Borba



26th June 2013 – On this day, a fly-over of the project area was carried out as part of the verification process, with members of CGV and IAL accompanying the verifier. Taking the flight from Manaus, the flight headed towards the west area of the project, taking approximately 1 hour 30 minutes, following the BR-319 highway, which marks the boundary of the project area, allowing the team to observe both the project area and parts of the leakage area. The plane then headed towards the central area of the project to fly over the Upper and Lower areas of the Madeira River, as well as roads around Borba town. Some of these areas had been visited in the previous days on the ground, so enabled the team to build a complete picture of the current status of the region. The flyover was a non-stop trip lasting 3 hours 30 minutes.



Photo 7: Airplane used for flyovers of the project area



Photo 8: BR-319 on the West border of the project area; 26th June



Photo 9: Above part of the Central Zone of the project, where communities such as Awará and Awarizinho are located; 26th June

27th June 2013 – Meeting was held with IDAM's technical director, José Ramonilson Gomes, in the head office of IDAM in Manaus. After months of working with IDAM in Borba, the meeting was held between the head directors of both CGV and IDAM in order to discuss the best way to formalise the partnership between the institutions for the future.

15th July 2013 – Meeting held of the Project Management Council with the Municipal lawyer, Dr Fabio Castelo Branco. The meeting discussed the work and role of the Project Management Council and their contribution to the project.



Photo 10: Meeting with Fábio Castelo Branco, 15th July 2013

There was also a meeting held with Dr George Pestana, the Public Prosecutor from the Municipality of Borba to discuss the project processes and how his responsibilities within the Municipality can help and is very favourable about the project and the benefits it can bring to the Municipality. Further authorities of the Municipality were also in attendance, including the President of the Municipal Chamber and the Vice-Mayor.

17th July 2013 – Representatives from IAL took part in the first Seminar of Journalism for Health and Environment in the Amazon, organised by Institute Leônidas e Maria Deane (FIOCRUZ), with the Foundation for the Support of Research in the Amazonas State (FAPEAM), the Federal University of Rio Grande do Sul (UFRGS) and the Federal university of Amazonas (UFAM). At the event, IAL made a presentation on the development of the project, in the presence of the local media, to help bring more information about the project.

2.2 Summary of Community Visits

During this reporting period, a number of community visits were carried out by members of the Project Implementation Team. These visits were mainly for the purpose of the verification activities, and allow the assessment of local knowledge about the project, however with the members of the PIT accompanying the verifier; however it was also an opportunity for the team to continue their commitment to providing on-going communication and interaction with the communities. These visits allowed the team to give the communities further information about the project, updates on the development of the project, and discuss the project activities and the active role communities have in avoiding deforestation.

These visits also allowed the reinforcing of the project message and to understand the reality of major problems in the communities. It was also discussed as to what improvements the project inhabitants would like to see and could expect from the implementation of the project, and as a result of their participation in the project.

Records of the community visits and minutes of meetings have been kept by the PIT and are held between the CGV office in Dublin and the IAL office in Manaus.

The communities visited during this reporting period are demonstrated in the following table:



No.	Name	Report	Minutes	Observation Sheet	Date of Visit
1	Novo Horizonte	x		x	24/06/2013
2	Assentamento do Incra	x		x	24/06/2013
3	Vicinal	x		x	24/06/2013
4	Puxurizal	x		x	24/06/2013
5	Piaba	x		x	24/06/2013
6	Axinim	x		x	25/06/2013
7	São José	x		x	25/06/2013
8	Caiçara	x		x	25/06/2013
9	Castanhal	x		x	25/06/2013
10	Flechal	x		x	25/06/2013
11	Jauari	x		x	25/06/2013
12	Santa Helena	x		x	25/06/2013
13	Awará	x		x	25/06/2013
14	Ponta Alegre	x		x	25/06/2013
15	São Joaquim	x	x	x	25/06/2013 and 13/07/2013

Table 1: Communities visited during this reporting period

Relevant details about these community visits are given below.

24th June 2013 – As part of the on-site verification process, CGV representative Paula Cofré, and IAL representative Antônio Fernandes, visited a number of communities together with the verifier. The communities of Novo Horizonte, Vicinal, Puxurizal, Piaba and Assentamento do Incra were accessed by road from the town of Borba, with Goiano (from the local Rural Producers Union) acting as the guide for this visit.



Photo 11: Goiano, from the Rural Producers Union, talks to a local producer, 24th June 2013



Photo 12: Milena Pantoja, community leader from the community of Novo Horizonte, giving updates on their community development, 24th June 2013



Photo 13: Family from Assentamento do Incra shows the project team how they produce cassava flour, 24th June 2013

25th June 2013 – On this day of community visits, CGV representatives Ciaran Kelly and Paula Cofré, IAL representative Antônio Nascimento, the verifier and local representative Goiano again as guide, the group travelled by boat along the Lower Madeira River, as part of the verification process – a short video of travelling by boat can be viewed here: [Trocano Project by Boat](#).

In the morning, the communities visited were São José, Axinim, Caiçara, Castanhal, and Flechal. The PIT representatives again had the opportunity to share information about the progress of the project with the community members and also discuss with community representatives details of the benefits that they would like to see happen within their communities.



Photo 14: Papaya plantation in Flechal Community, 25th June 2013



Photo 15: Conversation with the Health Agent and Community Leader of São José, 25th June 2013



Photo 16: Discussion with the Community Leader of Caiçara, 25th June 2013



Photo 17: Members from the Castanhal community participating in the discussions, 25th June 2013

In the afternoon, the group visited communities along the Upper Madeira River, which included Jauari, Santa Helene, Awará, Ponta Alegre and São Joaquim. During these visits, the community representatives had the opportunity to enquire with the project team about the next developments planned for the project and also raise concerns and ideas with the PIT. One of the main concerns raised from communities in both the Upper and Lower Madeira River areas was finding sustainable ways to produce their food and the products that they sell to generate their income. In general it was found that people are keen to use sustainable alternatives wherever possible and learn new techniques in order to reduce deforestation.

Throughout all these communities it is clear through the discussions held there is an overall feeling of pride for the forest, especially among the older members of the communities there is a visible concern on what the future will be for the new generations.

During the visit to the São Joaquim community, the CGV team discussed the implementation of the pilot project (see section 10.1 for further details) with Dilson Almeida, a teacher at the Maria Borges School, and Jonildo Soares, the School Manager.



Photo 18: Meeting with the members of Ponta Alegre, during which the members spoke about their willingness to find sustainable alternatives for agriculture, 25th June 2013



Photo 19: Visit to the Maria Borges School, in São Joaquim, 25th June 2013



Photo 20: Conversation with one of the community leaders in the Upper Madeira area, 25th June 2013

13th July 2013 – A community leaders meeting was convened by PMC representatives in the São Joaquim community, whereby leaders from over 20 communities attended. Some community leaders were travelling for many hours in small boats along the rivers to attend the meeting, and to this end, the PMC team offered all attendees snacks and refreshments.

The purpose of the meeting was to present provide informative materials and information about the project that the leaders could take away and disseminate throughout their communities, and also to discuss the pilot project plans for the São Joaquim community, and the benefits this will bring.



Photo 21: Follow-up meeting with São Joaquim community, 13th July 2013

2.3 Further Key Information

Dedicated Trocano Project Website

A specific website dedicated to the project has been developed and designed and was launched on 1st June 2013: www.trocanoproject.com or www.projetoTrocano.com for the Portuguese version. This is an interactive site where anyone within the project area can submit content and it is an invaluable 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

Communication is an essential and integral part of the Trocano project, and 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.

It has been useful to engage the participation of the Municipality's healthcare workers, Municipal Secretaries and IDAM to assist in providing 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.

The one-on-one interviews carried out as part of the on-site visit of the verifier gave community members a chance to convey their support and enthusiasm for the project, and their hopes and expectations of what the project may achieve for them. This conveyed to the PIT the effectiveness and importance of the communication that had been, and continues to be, carried out with the inhabitants of the project area. Engaging the inhabitants and facilitating effective communication channels with the communities is fundamental for the success of the project and the reliance on their support and involvement has truly been demonstrated.

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. This document details key targets for the project activities, and provides structure to the goals and objectives that were set out in the



PDD. This document will serve as the internal overall indicator of progress made within the project each year, and will allow the PIT and PMC to build on lessons learned over time. 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.

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, who are the contractual partners of the project proponents (CGV). The second partnership is with IAL (Instituto Amazonia Livre). 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 do Amazonas – SEPROR); SEPROR is an Amazonas State institution. During this implementation period, on 27th June, a meeting was held between senior members of IDAM and CGV in Manaus. This meeting laid the foundations for a formal partnership between both parties to achieve aligned goals for the future.

2.4 Challenges

The biggest challenge for the implementation of the Trocano project is the sheer vastness of the project area and the accessibility to some of the more remote areas and communities. Maintaining constant communication with all residents within the project area is obviously an ongoing challenge for the project. To this end, CGV is exploring various options and new technologies that can facilitate communication in the entire project area. To this end, partnerships are an invaluable asset to the project, providing local knowledge and access to even the most remote of areas.

With this in mind, there have been a number of mechanisms and targets included within the Management Plan that are designed to 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 10.1 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.



2.5 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

Table 2: Implementation Status of Project Activities outlined in the PDD dated March 2013



3. MONITORING REPORT OVERVIEW

As detailed in the previous PIR, the full implementation of the monitoring plan outlined in the PDD will only be possible through the availability of carbon financing, but during this reporting period, rudimentary monitoring activities have been possible, as in the previous PIR detailing the preliminary implementation period. These are discussed in the following sections.

The primary monitoring application for the project is satellite monitoring via PRODES (see section 4), however the PDD describes that on-the ground-monitoring will also occur. At the time of writing, there are 6 completed monitoring observation sheets held in the CGV office in Dublin relating to this reporting period; these can be made available digitally upon request.

The following section details the monitoring progress made for this reporting period.

3.1 Project Monitoring Activities

The monitoring detailed in the Management Plan is to be actioned over the ongoing timeframe of the project, with initial activities detailed through to August 2014 and is yet to be wholly implemented; however this is one of the main priorities of the project team for the coming year, with full frequency and capacity of the monitoring activities being made possible through the availability of carbon funding. Implementation of the activities detailed in the monitoring plan were not fully actioned during this reporting period due to the PIT concentrating on the verification process; this will not impact the project in the long-term, when full frequency of aerial and responsive ground monitoring will bring the project in line with the Monitoring Plan.

Progress against the plan will be addressed in the next reporting period, and as scheduled, a maintenance and evaluation review will be conducted 1st July to 31st August 2014 to assess appropriateness and progress made and will be outlined in the corresponding PIR report for this period.

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. 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 reported previously, it is the intention of the project to focus on the short-term achievements of the project within the first 5 years of activity, to give some context to the long-term success of the implementation - the long-term outcomes and impacts of the successful implementation of the activities related to the project will be difficult and impractical to measure prior to this, and it should be expected to have achieved significant benchmark achievements after this time. The report



submitted for the next reporting period will be able to identify some short-term results and impacts, which will have been implemented during the first year of carbon financing, that are more tangible and demonstrable at this initial stage of the project, but that will lead to the longer-term measurement of success and impacts.

Monitoring through Partnerships

Throughout the initial project phase, there has been an informal working association with 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 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 personally and via his officers, who are based in Borba town, Axinim community and in Foz do Canumã community. 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.

3.2 On-the-ground Monitoring

As stated in the previous Project Implementation Report, it was the original intention of the project to engage a team of on-the-ground rangers to patrol and monitor the project areas. However, it was felt that the term and presence of rangers had negative connotations for the inhabitants of the project area. Community participation was found to be a more acceptable manner in which to implement the initial on the ground monitoring of the project area. In the future, there will be 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 monitoring is carried out by way of completing forms that have been designed specifically to be easily understood and straight forward to complete (as previously reported), but also give the project management team important and relevant information, which can then be reacted upon if there is a need. The completed forms are collected and processed to be compiled into a central database. It has also been encouraged to include any photographic evidence of observations made to enhance and record the monitoring observations carried out.

On-the-ground observations have been carried out by project participants and representatives throughout the duration of the project. 6 observation sheets in total have been completed during this reporting period and submitted to the project team. Where possible, observations also recorded with photos and GPS co-ordinates, although until now this has not always been 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 correctly and accurately, as well as supplying GPS equipment and cameras to key monitoring participants.



A summary of the completed observation sheets for this reporting period is given in the following table:

Date	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	
07/06/2013	Borba to Nova Olinda	Motorboat	x		Typical deforestation noted, on a small scale, mostly on the approach to Nova Olinda	Axinim was not monitored on this route.	x		x		CGV Server
23/06/2013	Lower Madeira	Motorboat	x		Deforestation around settlements along the Madeira	High incidence of deforestation around Axinim for cattle. Little occurrence of recent deforestation in the area	x		x		CGV Server
24/06/2013	Road network south of Borba	Car	x		Smallholdings deforesting for subsistence farming	Visited areas around the INCRA settlement, Novo Horizonte and Vicinal	x		x		CGV Server
25/06/2013	Upper Madeira	Motorboat	x		Visiting the communities of Axinim, Castanhal, Sao Jose, Caiçara, Flechal	Communities have subsistence farming, mostly banana and manioc	x		x		CGV Server

Table 3: Summary of On-the-Ground Observations

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



*Photos 22 and 23: Examples of fires observed on the Upper Madeira River
25th June 2013*



*Photos 24 and 25: Deforestation Observed along the Road to the Mapiá River
24th June 2013*

A majority of deforestation instances observed within the project area during monitoring activities since the start date of the project have comprised of only historical small scale deforestation (2-4 hectares) and are mainly relating to cattle-farming and burning. This observation data was gathered to assist in compiling complete project area records and to contribute towards the selection of areas to be chosen for medium to high resolution remote sensing analysis when appropriate. Although exact co-ordinates have not been gathered for these observation instances, the reference points for the locations within the records are meaningful to the inhabitants of the project area who carried out the observations, and are therefore able to be located again easily using their local knowledge, when exact georeferencing co-ordinates can be gathered as required.

3.3 Aerial Monitoring

As detailed in the PDD and Management Plan, the intention of the project is to carry out periodical monitoring via air. As of this reporting period, limited aerial monitoring has been carried out, however during this reporting period, one aerial flyover was carried out as part of the verification process.



This flyover was conducted on 26th June 2013, with members of CGV and IAL accompanying the verifier. The flight headed towards the west area of the project, taking approximately 1 hour 30 minutes, following the BR-319 highway, which marks the boundary of the project area, allowing the team to observe both the project area and parts of the leakage area. The plane then headed towards the central area of the project to fly over the Upper and Lower areas of the Madeira River, as well as roads around Borba town. Some of these areas had been visited in the previous days on the ground, so enabled the team to build a complete picture of the current status of the region. The flyover was a non-stop trip lasting 3 hours 30 minutes. Short video footage of the flight can be viewed here: [Trocano Project by Air](#).



Photos 26, 27 and 28: Historical Deforestation Observed in the Central Zone and along the Road to the Mapiá River
Date: 26th June 2013

A sample summary of aerial observations can be seen in the table below:



Date	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	
05/06/2013	Manaus to Borba (Central Zone)	Aeroplane	x		Deforestation is centralised around the borders of roads and rivers.	Very little of this deforestation is recent. Much of it is contained to areas near settlements	x		x		CGV Server
26/06/2013	Central and Western Zone	Aeroplane	x		Recent deforestation along BR 319 and Road south of Borba	Older deforestation sites along the Madeira River	x		x		CGV Server

Table 4: Summary of Aerial Monitoring Observations



3.4 Main Threats Identified by Monitoring Activities

The main threats that have been identified through the monitoring activities of the project are agriculture, illegal logging and urban expansion.

Agriculture, in particular cattle, puts heavy pressure on the land. The quality of soil is poor, and therefore new pasture or areas for crop plantation need to be cleared on a rotational basis. Large scale deforestation is unusual in the area and could be contained or avoided through partnership with IDAM. Through agricultural education and assistance, more efficient methods of farming will reduce the need for further deforestation.

The threat of illegal loggers is contained to areas where access has an easy link to demand. This means close proximity to rivers and roads. Previous illegal logging sites have a correlative relationship to further deforestation occurring.

Urban expansion can be seen along road systems, where the road offers access and opportunity in previously unclaimed areas. This leads to land grabbing on previously unexploited land. Increased urban growth also creates indirect deforestation, as the demands and needs of Borba's growing population put increased pressure on the surrounding area, in terms of needs for construction material, housing space and food supply.

Through the further implementation of the project and when funding becomes available, the Trocano project will be able to further assist stakeholders in Borba to make sustainable decisions and practices the norm. The funding resulting from the project will also allow both IDAM and the Municipality to develop better structure to develop in a sustainable manner, both for their livelihood of the local population and the success of the project.

3.5 Mitigation of Threats Identified by Monitoring Activities

Initial measures to mitigate deforestation threats have been actioned through communication during community visits, encouraging their engagement and participation in the project and providing information on the planned activities, programs, projects and benefits that are available through their participative actions.

Where threats are identified through monitoring, the project team, together with IDAM will work closely with community members, farmers or other involved parties to establish the reasons why the deforestation has occurred and provide education and training in suitable, practical and appropriate measures that can be adopted to mitigate the need for any further deforestation in the future. This will include community-level activities such as providing training and education in sustainable farming practices as agricultural training will increase productivity on current lands, therefore reducing the pressure to expand farmlands in previously non-deforested areas. Other mitigation actions will include education and training in capacity-building opportunities, incentivising communities to participate in introducing home-gardens within their communities, ensuring project awareness and engaging the communities through their awareness of the potential benefits they can achieve through participating in the project activities and objectives.

The project team will continue to visit the identified areas where and when appropriate, as part of the monitoring implementation activities and will focus project time and resources on educating the people involved as to the benefits of taking alternative actions.



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.

4. CARBON STOCKS MONITORING REPORT

Carbon stocks lost through Deforestation or Degradation

Quantification Period	tCO2	
	Project Area (tCO2)	Leakage Area (tCO2)
1 – 2011-2012	0	53,555
2 – 2012-2013	0	167,705

Table 5: Carbon Stocks Summary of Carbon Lost in Project and Leakage Areas

Full quantifications are detailed in section 7 of this report.

Carbon stocks monitoring activity is predominantly carried out via satellite monitoring, using PRODES data which is published annually. When the data is released, it is obtained, analysed and included as a data layer in the Geospatial Platform.

The data that has been obtained for the quantification year 1st August 2012 to 31st July 2013 shows that there has again been no detected deforestation within the project area.

The emissions for this quantification period have again only occurred from within the leakage buffer zone, in particular Leakage Areas 1 and 4, which are historically areas at high risk of deforestation. For conservativeness, these total leakage emissions have been deducted from the final carbon calculations, which is detailed in section 7.

As a result of the remoteness of this area and limited project implementation due to awaiting carbon funding, this leakage activity has been attributed to the project. In future reporting and quantification periods, where leakage emissions are identified, and project funds are available to fully operate and mobilise the monitoring teams and activities, monitoring patrols will be increased to this area, and will also carry out full analysis as to whether it is a result of activity shifting from the project area, or whether the source originates from outside the project area.

During the initial reporting period, and as part of the verification process, it was necessary to carry out data correction procedures on the data layers present in the Geospatial Platform to accurately and conservatively calculate the carbon benefits of the project from the project start date of 10th



June 2011 through to 31st July 2012³. The same appropriate adjustments identified for the previous quantification period have been consistently applied for this current quantification period, in accordance with the NFS methodology AM001.1b, using the same processes and procedures as were outlined in the initial PIR.

4.1 Description of work undertaken for Carbon Stock Calculations

Full description of the calculation work can be found in the '*Calculations and Methodology for the Quantifying of Annual Emissions and Natural Capital Credits*' document under the Science tab within the Geospatial Platform. For completeness and clarity, summary details of these processes are detailed as follows and further in section 7 of this report:

4.1.1 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., 2011⁴). 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.

4.1.2 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.

i. Adjusted Carbon Map

It was necessary to create a base year adjusted carbon map to account for deforestation that may have occurred prior to project commencement. To update the NASA JPL layer to the project start

³ Note: Carbon benefits for the project are calculated for this time period due to the availability and release of PRODES data.

⁴ 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.



date, carbon losses were subtracted as detected by PRODES from 2001 to July 2011. This has been done by creating and uploading a new carbon layer in the Geospatial Platform for the project area, which covers an area of approximately 37 million hectares around the Trocano project sites.

The adjusted carbon map showing carbon values for the project start date has been quantitatively assessed and the queries for each project area now provide results for adjusted carbon, vegetation types and credits per risk category, based on this data. For completeness, the results generated from the original data layers are also presented for each query area.

The extent to which the carbon layer within the Geospatial Platform has been adjusted is illustrated below:



Map 1: Showing the Extent of the Adjusted Carbon Layer in the Geospatial Platform

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

The full methodology for the adjustment of the NASA JPL Carbon and AGB maps to account for deforestation that occurred prior to project commencement is provided in the **'Carbon Map Adjustment for Deforestation Methodology'** document under the Science tab of the Geospatial Platform, or upon request.

4.1.3 Risk of Deforestation - ACEU Deforestation Risk

Risk of deforestation is based on the ACEU risk mapping method and in accordance with the NFS Methodology AM001.1b. 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 within the Geospatial Platform 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). Risk Indices for the risk categories are: 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).

Total Carbon stock and density in the areas under each risk category within each project area are reported and calculated as follows:

$$Vc = \{[AvgC - (2xStdDevC)] \times Vf\} + VSoilC$$

Where,

Vc = Vulnerable Carbon [tC/ha]

$AvgC$ = Average carbon density [tC/ha]

$StdDevC$ = Carbon Standard Deviation [tC/ha]

Vf = Vulnerable fraction of woody biomass [0.9]

$VSoilC$ = Vulnerable Soil carbon [8 tC/ha]

The outcome of this calculation is then applied as part of the ‘Calculations for Potential Natural Capital Credits Earning’, which is also detailed in the methodology, and for clarity is included in section 7 of this report.

It is important to note that the extent of the adjusted NASA JPL Carbon map in the Geospatial Platform 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.

4.1.4 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 two layers within the Geospatial Platform (i) deforestation detected prior to the project start date between August 1999 and July 2011 and (ii) deforestation that occurred after the project start date in 2011 for each quantification period (i.e. the 12 month period/mapping year from August to July). The datasets included in the Geospatial Platform to date are for the two quantification periods that the project has completed (labelled 2012 and 2013 respectively).

Details on the creation of the deforestation layers before and after the project start date are included in the ‘**PRODES Deforestation Layers Methodology**’ document, available under the Science tab of the Geospatial Platform.



Within the data layer, 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 Date**

This data later 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 data layer combines the INPE PRODES deforestation data for each quantification period (the August to July mapping year determined by PRODES and applied as the corresponding quantification period for the project) 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 AM001.1b methodology specifies the calculation for emission resulting from deforestation occurring after the project start date. Further details for this calculation are included in section 7 of this report.

This data layer does not quantify the undetected emissions (Ud); this calculation is applied as an offline calculation. See section 4.1.6 and section 7 for details of applying this adjustment.

- **Display Layer for Detected Deforestation prior to 2011**

For reference, the past deforestation layer shows areas where deforestation has occurred in the past, by year, 2000 to 2011. Mapping years run from August to July, e.g. deforestation from 2000 shows deforestation between Aug 1999 and Jul 2000. The dataset therefore shows deforestation detected between Aug 1999 and July 2011.

- **Display Layer for Detected Deforestation after 2011**

This layer provides data for areas where deforestation has occurred since the start of the project. Mapping years run from August to July, so the 2012 dataset within the display layer therefore shows deforestation detected between August 2011 and July 2012 and the 2013 dataset within the display layer shows deforestation detected between August 2012 and July 2013, which is the dataset corresponding to this quantification period. This data is shown in the Geospatial Platform; however the deforested areas are very small, so to view these areas it is necessary to zoom in significantly to see them clearly. (Source: PRODES INPE Brazil).

For the full methodology and details on the creation of the deforestation layers both before and after the project start date, please refer to the '**PRODES Deforestation Layers Methodology**' under the Science tab of the Geospatial Platform, or upon request.

4.1.5 RapidEye Imagery

To provide an additional check on the accuracy and completeness of the PRODES data we have included two high resolution images (5m pixel from RapidEye) at different periods covering the south west corner of the project area and the adjacent leakage zone.

The high resolution RapidEye satellite data was acquired for 2 moments in time, 2009 and 2011 for an area of approximately 179,000 hectares that has had considerable deforestation activity in the past. The mosaicked scenes that make up the 2009 data were acquired on 30 July 2009, with the exception of the image in the north-western corner which was acquired on 13 May 2009. The 2011



mosaic is comprised of 5 scenes acquired between 25 May 2011 and 13 September 2011, with some areas in the north-western corner obscured by clouds and haze.

A visual interpretation and quantitative analysis was carried out on these two sets of high resolution data to assess whether significant areas of deforestation were missed or incorrectly detected and mapped by INPE's PRODES product.

4.1.6 Undetected Emissions

The NFS methodology AM001.1b specifies that adjustments are applied for 'Undetected Emissions' values, which are for smaller areas of deforestation undetected by the PRODES INPE data, but visible using the RapidEye high resolution imagery. These were for quite small extents and did not change any of the values significantly. In order to account for emissions undetected by the PRODES INPE Amazon Annual Monitoring Program, an additional 9% is added to any deforested areas identified. Please refer to the '**Assessment of PRODES data and Undetected Deforestation**' document for the full methodology under the Science tab of the Geospatial Platform, or upon request.

Please also refer to the Geospatial Platform and section 7 of this report for details of applying this adjustment to the quantifications.

Please refer to the '**Assessment of PRODES data and Undetected Deforestation**' document for full details, available under the Science tab of the Geospatial Platform, or upon request.

- **Important note on the deforestation queries within the Geospatial Platform:**

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.

4.1.7 Regularly and Permanently Flooded Areas

An update was included in the Geospatial Platform for regularly and permanently flooded areas.

The data layer within the Geospatial Platform that details vegetation types within the areas of interest are based on the ESA Globcover V2.3⁵ land cover map for the year 2009 derived from MERIS

⁵ Source: [ESA Globcover V2.3 land cover map 2009](#)



sensor (300m) observations. For general information purposes for the project, 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.

The results from this layer are used to define the 'regularly or permanently flooded areas' that are required as part of the Natural Capital Credit calculations within the methodology AM001.1b.

The results generated show areas categorised as regularly or permanently flooded according to the ESA Globcover V2.3 land cover map for 2009. 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.

ESA Globcover Categories included in these results are:

- 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

4.2 Annual Monitoring Actions

4.2.1 Quantification of Annual Emissions

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 (in the case of this quantification period, August 2012-July 2013), it is added 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 is several months' delay after the end of the monitoring calendar year as PRODES data typically becomes available towards the middle of the following year, for example the data for August 2012 to July 2013 was made available in April 2014.

4.2.2 Closer Monitoring for Signs of Degradation near Human Settlements and Roads

Following an in-depth analysis study into the accuracy of PRODES deforestation data during the previous reporting period⁶, it is now known that the accuracy produced by the medium resolution satellite data (approximately 30 m resolution) is such that calculating an additional 9% for undetected emissions (*Ud*) is deemed reasonable and conservative; adjustments for which are taken into account during the carbon quantification calculation process.

In order to monitor thinning and small scale disturbance we utilise high resolution inspection every 1-2 years to identify areas of change, as high resolution satellite data can be costly. As this was carried out in relation to the previous quantification period, it was not deemed necessary for the project to apply this technique in this reporting period. It will be repeated during the next reporting period – 1st August 2013 to 31st July 2014 and reported accordingly.

⁶ Report available on the Geospatial Platform and publicly at: <http://www.celestialgreenventures.com/geospatial-platform>



4.3 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 AM001.1b. 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. Using the Geospatial Platform provides consistency during monitoring and the process can be demonstrated to the verifier illustrating steps carried out to run the calculations and the results, to show they conform to the NFS AM001.1b methodology.

4.4 Further Monitoring Implementation Activities

4.4.1 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.

4.4.2 Providing GPS Equipment to Observation Participants

During this reporting period, the PIT was provided with a GPS unit to assist in their monitoring. This allows the project to take accurate geo-referenced points for communities, deforestation locations and monitoring routes. The CGV team uses a geo-referencing camera, which can take pictures for a detailed desktop analysis after a visit to the area. These pictures maintain the exact GPS coordinates of the photo, allowing for the creation of a detailed database of community and deforestation images.

4.4.3 High Resolution Imagery

To provide an additional check on the accuracy and completeness of the PRODES data we included two high resolution images (5m pixel from RapidEye) at different periods covering the south west corner of the project area and the adjacent leakage zone in reference to the initial quantification period.

On the 11th June 2013, high resolution RapidEye satellite data imagery was acquired for 2 moments in time in 2009 and 2011 for an area of approximately 179,000 hectares that has had considerable deforestation activity in the past. The mosaicked scenes that make up the 2009 data were acquired on 30 July 2009, with the exception of the image in the north-western corner which was acquired on 13 May 2009. The 2011 mosaic is comprised of 5 scenes acquired between 25 May 2011 and 13 September 2011, with some areas in the north-western corner obscured by clouds and haze.

A visual interpretation and quantitative analysis was carried out on these two sets of high resolution data to assess whether significant areas of deforestation were missed or incorrectly detected and mapped by INPE's PRODES product.



This allowed 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 and for the accuracy of quantification.

In order to monitor thinning and small scale disturbance we utilise high resolution inspection every 1-2 years to identify areas of change, as high resolution satellite data can be costly. As this was carried out in July 2013 in relation to the initial quantification period and for the initial verification process, it was not deemed necessary for the project to apply this process again within this current reporting period. It will be repeated for the subsequent reporting period – 1st August 2013 to 31st July 2014 and reported accordingly.

5. SOCIAL IMPACT ACTIVITY REPORT

During this reporting period, visits were made to the 15 communities identified in section 2.2. As seen during previous visits. It was reiterated that issues such as health, infrastructure, and electricity for communities primary needs. Manioc and banana plantation are the staple crops of the region, and technical agricultural assistance in this areas could greatly improve the yield, and subsequently the livelihood of the local population. A partnership program with IDAM would be able to provide this to the local population. 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, meaning up to two hours for some students.

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.

The PIT visited many small local farms within the communities. These farms produce fruits and vegetables sold at the market in Borba town. The city has a good infrastructure of sewers and pavements, and a newly resurfaced tarmac.

The livestock sector is poorly developed in the area but in two of the visited communities, Novo Horizonte and Awará, with herds ranging from 15 to 30 heads of cattle maximum.

The Awará Grande Lake, 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.

The anticipation of what benefits the project can bring continues to grow in every community. It is generally felt by the communities that the project could be a solution to improving their lives, and the inhabitants are eager to take an active role in the sustainable development of their communities and livelihoods; an immense sense of pride prevailed from the conversations, meetings and discussions held with all community members.



5.1 Social Impact Monitoring Activities

The initial phases for the social monitoring has taken place through community liaison meetings and discussions regarding the participation of inhabitants in the project activities and discussions to understand community needs and which benefits would be most appropriate. Sustainable projects, programs and activities will occur through the Benefits Distribution Mechanism when funding allows.

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 types of benefits that were identified during this period, through consultation with various liaison group meetings and field visits were, in general terms, as follows:

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

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.

At this early stage in the project and considering the short period of this implementation report, it is not practical to carry out a full social impact monitoring exercise. 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 implementation 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 community workshops will be recorded and reported in subsequent project implementation reports. The questions and measures of social impact will also be under a constant review to improve the quality and analysis of our data.

5.1.1 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.



5.1.2 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. 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 using sustainable methods of production.

5.2 Dispute Resolution Report

During this reporting period, there were no reported disputes or complaints regarding the Trocano Araretama Conservation project.

6. BIODIVERSITY IMPACT ACTIVITY REPORT

	Reporting Year	Previous Year
Normative Biodiversity Metric (NBM) Score ⁷	5.08	5.08

Table 6: Summary of NBM Score

This Normative Biodiversity Metric (NBM) score is calculated on the same basis as was shown in the initial Project Implementation Report, dated 26th August 2013, and is deemed to be an accurate reflection of the project for this given reporting period, with the result as such remaining constant (see section 4 for details of carbon reporting for this period). The NBM score will be re-evaluated and re-calculated on an annual basis and will include ground-based data when these activities are mobilised through the enablement of carbon funding.

The NBM score has been calculated using the NBM data layer of the Geospatial Platform. This data 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.

6.1 Normative Biodiversity Metric and Pristineness Scores in the Geospatial Platform

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

⁷ Calculated using the NBM data layer within the Geospatial Platform



been adapted from Ellis and Ramankutty (2008) 'Putting People in the Map: Anthropogenic Biomes of the World', doi: 10.1890/070062.

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.

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 ⁸	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

Table 7: Breakdown of NBM Score by Project Area

As stated above, the NBM layer in the Geospatial Platform gives an approximate indication for the land areas, so it can be deemed reasonable that, when available and as detailed above, on-the-ground data and more project-specific detail will be incorporated into the calculations of the NBM for the project, therefore resulting in the calculation being more accurately reflective of the projects actions within the project area. The NBM layer in the Geospatial Platform will still be used as an indicative tool for this process and can be improved as improved data becomes available.

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.

6.2 Biodiversity Monitoring Activities

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.

⁸ Area 5 is deemed too small (1,442ha) to generate a meaningful result using the given data, however this area of the project is almost 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.



As per the previous reporting period, there have not been any major development projects, programmes or activities implemented through the benefits distribution mechanism, nor are there any plans in the pipeline that need to be considered, therefore the need to assess any potential negative effect on the biodiversity from such activities has yet to be applied. However the project team are able to carry this out when appropriate for future reporting periods.

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.

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.

As the local inhabitants possess the expert knowledge of the land and biodiversity within the project area, their role will be fundamental to carrying out effective biodiversity monitoring. 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, project partners and the technical members of the project team that are experts in the field of biodiversity and its monitoring.

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.

6.2.1 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.



7. QUANTITATIVE ASSESSMENT FOR VERIFICATION PERIOD

The following section details the quantitative assessment for the Natural Capital Credit calculations relating to the quantification period 1st August 2012 to 31st July 2013. The Geospatial Platform holds all relevant data layers and maps, and this section should be read in conjunction with the data supplied within the Geospatial Platform and the documents included within the science tab therein.

All calculations for the quantification period 1st August 2012 to 31st July 2013 have been carried out consistent with the NFS approved methodology AM001.1b⁹. The '**Calculations and Methodology for the Quantifying of Annual Emissions and Natural Capital Credits**' document available within the Science tab of the Geospatial Platform gives full details of the processes undertaken.

7.1 Natural Capital Credit Calculations and Adjustments for Quantification Period 1st August 2012 to 31st July 2013

7.1.1 Calculation of Natural Capital Credits to be Issued

The Geospatial Platform calculates the Q_p (potential credits) as set out in the approved AM001.1b methodology. These calculations of NCCs to be issued for the given quantification period (Q_i) are as follows:

$$Q_i = Q_p - \{E_{def} + E_{leak}\} (tCO_2)$$

Where:

$$Q_p = \text{potential credits (tCO}_2\text{)}$$

$$E_{def} = \text{Emissions from deforestation (tCO}_2\text{)}$$

$$E_{leak} = \text{Emissions from leakage (tCO}_2\text{)}$$

Now within each eligible area:

$$Q_p = \sum \text{Area} \cdot R \cdot V_c \cdot \frac{44}{12} \cdot 0.05$$

(potential annual credits for a given area = sum of pixel areas multiplied by the vulnerable carbon at risk multiplied by CO₂ conversion divided by 20 years)

Where:

$$R = \text{Risk Index (for each pixel derived from approved Risk Map, a value from 0 to 0.8)}$$

$$V_c = \text{Vulnerable Carbon (for each pixel derived from approved Carbon Map)}$$

And within any given area the vulnerable stock of carbon was estimated on a conservative basis as follows:

⁹ See NFSAM001.1b_19_06_2014 for full methodology



$$Vc = \{[AvgC - (2.StdDevC)]. Vf\} + VSoilC^{10}$$

Where:

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

StdDevC = the Standard Deviation of carbon in woody biomass from the mean

Vf = the vulnerable fraction of woody biomass

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

The methods used to quantify R in the Brazilian Amazon were consistently applied in accordance with and as described in Annex 1 of the methodology. The source of carbon factors for this area - AvgC, Vf, and VSoilC, were consistently applied in accordance with and as described in Annex 2 of the methodology and the method applied for quantifying Edef and Eleak were consistent with the method described in the Annex 3 of the methodology¹¹.

The values used for *Area*, *AvgC*, and *StdDevC* as well as the calculated value for Vc can be obtained from the query reports generated within the Geospatial Platform under “Risk of Deforestation (~2011 carbon values)”.

Within the “Calculation of Natural Capital Credits to be issued” section of the approved methodology, there are 2 options for conservatively estimating the vulnerable stock of carbon within any given area. The option given here for calculating the Vulnerable Carbon (Vc) is the appropriate calculation to be applied for the Trocano Araretama Conservation Project quantifications. For full details of the calculation methods, please refer to the NFS approved Methodology AM001.1b document.

The methodology processes were carried out consistently to ensure the completeness of the quantification process for calculating the number of Natural Capital Credits due for the Trocano Araretama Project for this quantification period.

7.1.2 Calculations of Emissions from Deforestation

Emissions were quantified for deforestation occurring in the given quantification year consistently with the NFS approved methodology AM001.1b using the calculation below:

$$Emissions = Area \times \{ [AvgC \times Vf] + VSoilC \} \times 3.667 \times Ud \quad (tCO2)$$

Where:

AvgC = carbon stocks in biomass (tC)

¹⁰ Within the “Calculation of Natural Capital Credits to be issued” section of the approved methodology, there are 2 options for conservatively estimating the vulnerable stock of carbon within any given area. The option given here for calculating the Vulnerable Carbon (Vc) is the appropriate calculation to be applied for the Trocano Araretama Conservation Project quantifications. For full details of the calculation methods, please refer to the NFS approved Methodology AM001.1b document.

¹¹ Ibid



V_f = vulnerable fraction

V_{SoilC} = vulnerable soil carbon (tC)

U_d = factor to account for deforestation undetected by PRODES monitoring

The vulnerable fraction of carbon lost on deforestation was estimated at 0.9 consistent with the methodology, 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, V_f , and V_{SoilC}) 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.

7.1.3 Undetected Deforestation and Emissions¹²

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, and as is consistent with the methodology, 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 is done offline (i.e. not directly on the Geospatial Platform, but in the Excel sheet with final calculations, which can be viewed in the **'2012/2013 Credit Calculations and Adjustments for Trocano Araretama Project Sites'** document available under the Science tab of the Geospatial Platform, and in section 7.2 of this document

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

7.1.4 Regularly Flooded Areas per ACEU Risk Category

In accordance with the NFS Methodology AM001.1b, an adjustment of the potential credits assigned to areas categorised as regularly or permanently flooded according to the ESA Globcover V2.3 land cover map for 2009 is also applied to the quantifications. 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.

Potential credits are calculated for areas categorised as regularly or permanently flooded according to the ESA Globcover V2.3 land cover map for 2009:

¹² Note that the results of this work are not shown directly on the Geospatial Platform, but are given in section 7.2 and in the Excel spreadsheet that is available separately under the Science tab in the Geospatial Platform.



- **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

Credits associated with seasonally flooded areas are deducted from the total potential credits calculated per area for the quantification period.

Please refer to section 7.2 for the final credit calculations and adjustments for the Trocano Araretama project, which are also available on the Geospatial Platform in the '**Credit Calculations for Trocano Araretama Project Sites**' document, under the Science tab.

It is again important to 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.

7.1.5 Accounting for the Loss of Vulnerable Soil Carbon due to Deforestation 2000 to 2011 (prior to the project start date)

In accordance with the NFS Methodology AM001.1b, in order to account for the Vulnerable Soil Carbon (VSoilC) assumed lost due to past deforestation prior to the start date of the project, the credits associated with VSoilC are subtracted from the total credit potential for every hectare that was previously deforested within the project areas.

The adjustment calculation for potential credits associated with loss of Vulnerable Soil Carbon due to deforestation before project start date is calculated offline (i.e. not directly on the Geospatial Platform, but in the Excel sheet with final calculations, which can be viewed in the '**2012/2013 Credit Calculations and Adjustments for Trocano Araretama Project Site**' document available under the Science tab of the Geospatial Platform, and which is also detailed in section 7.2.2 of this document). The equation used for this calculation is consistent with the approved method within AM001.1b, and for clarity is detailed herewith:

$$\text{Soilcredits} = \text{VSoilC} \times \text{Area} \times 3.667 / 20$$

Where,

$$\text{VSoilC} = 8 \text{ tC/ha}$$

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

$$3.667 = 44/12; \text{ Carbon to CO}_2$$

20 years = period of crediting



7.2 Results of the Calculations for the Quantification Period 1st August 2012 to 31st July 2013

Project Area	tCO2				
	Potential Credits	Credits Excluded for Flooded Areas	Credits Excluded for Soil Carbon in Deforested Areas 2000-2011(i)	Emissions 2013	Credits Due 2014
1	224,016	0	0	0	224,016
2	104,357	0	0	0	104,357
3	90,170	0	0	0	90,170
4	640,297	1,259	0	0	639,038
5	10,863	0	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	76,526	603	0	2,862,894
Total	7,927,741	155,270	10,280	0	7,762,191
Undetected Emissions 9%(ii)				0	

Leakage Area	tCO2	
	Emissions 2013	
1	160,617	
2	0	
3	0	
4	7,088	
5	0	
6	0	
7	0	
8	0	
9	0	
Total	167,705	
Undetected Emissions 9%(ii)		15,093

Total Emissions	182,798
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Project Credits Total (tCO2)	7,579,393
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Table 8: NCC Calculations for Quantification Period

7.2.1 Notes to Calculations for the Quantification Period

There are two assumptions that are applied to the quantifications, as detailed in the approved methodology. For clarity, these assumptions are noted below:



(i) Consistent with the approved NFS methodology, vulnerable soil carbon fraction was conservatively estimated at 8tC/ha over 20 years and subtracted for every hectare deforested prior to the project start, between 2000 and 2011. Vulnerable soil carbon fraction is included in the calculation for emissions after the project start date. The calculations for this are detailed in section 7.2.1.

(ii) Consistent with the calculations for the previous quantification period, 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.

7.2.2 Calculations for Credits Assigned for Soil Carbon in Deforested Areas 2000-2011

These figures, shown in the following table, are the calculations for the "Credits Excluded for Soil Carbon in Deforested Areas 2000-2011" shown in the calculations table above. These figures have been calculated offline based on the deforestation figures generated in the Geospatial Platform, and using the adjustments detailed in section 4 and 7:



Project Area \ Year	Deforestation (ha)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
2000								261	75	373	1,938	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	1,083	4,397	37	411

Table 9: Deforestation in the Project Areas 2000-2011

Soil Carbon Assigned to Deforested Area per Project Area (iii), (iv)

Project Area	tCO2												
	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

Table 10: Soil Carbon Assigned to Deforested Areas

7.2.3 Notes to Calculations for Credits Assigned for Soil Carbon in Deforested Areas 2000-2011

(iii) Vulnerable carbon fraction which in case of below ground fraction was conservatively estimated at 8tC /ha over 20 years, which is consistent with the NFS approved methodology AM001.1b.

(iv) 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 in the Geospatial Platform:

SC_DOC_001_2014_Assessment of PRODES Data and Undetected Deforestation
SC_DOC_002_2014_Summary of Quantification Calculations and Methodologies
SC_DOC_003_2014_Carbon Map Adjustment for Deforestation Methodology
SC_DOC_004_2014_PRODES Deforestation Layers Methodology
SC_DOC_005_2013_Trocano Araretama Credit Calculations_2011/2012
SC_DOC_006_2014_Trocano Araretama Credit Calculations_2012/2013

All the above referenced documents are available within the Geospatial Platform, or upon request.

8. FINANCIAL STATEMENT

For the duration of the project to date, Celestial Green Ventures has made significant investment into establishing, developing and implementing the Trocano Araretama project to the current operating level. This has provided the necessary funding to bring the project through this initial project phase and continues to do so through the process.

The funding provided to date has ensured the project has been able to achieve its current implementation status, and has included all aspects of the project development stages including the initial project activities on the ground, the development of the Geospatial Platform, initial monitoring and reporting activities, as well as the successful validation of the project in March 2013. For this reporting period, the project was undergoing the initial verification process, and sufficient funding was provided to fully support and facilitate this process.

The funds provided for the current quantification period have been sufficient to develop and maintain the project throughout this timeframe. The project is, and always has been reliant on achieving financial sustainability through carbon funding to achieve full implementation of the project. CGV continues to be committed to providing sufficient funding to enable the project to successfully achieve NCC issuance and subsequently fulfil the NCC sales process, after which point the project will become self-funding and be able to fully implement the project goals and fully functional activities, objectives and commitments through the carbon financing achieved from the sale of the issued NCC's.

The operating budget for the 2012/2013 quantification period was \$623,741 (€458,499).

9. NATURAL CAPITAL CREDIT STATEMENT

The Natural Capital Credits achieved by the project for the initial credit issuance period of 10th June 2011 to 31st July 2012, were issued on 27th September 2013 and as such falls outside of the reporting period herewith. However, for completeness and transparency, the following table shows details of the initial issuance of NCCs that relate to the initial quantification period, although as at the end of this current reporting period (31st July 2013), the credits were still awaiting final verification and issuance (achieved 17th September 2013 and 27th September 2013 respectively).



NCC Issuance for Previous Reporting Period of 10th June 2011 to 31st July 2012	
Total NCCs Issued	7,702,808
Buffer Requirement (10%)	770,280
Total NCCs made available to Project	6,932,528

Table 11: NCC issuance for Initial Quantification Period

10. PLANNED IMPROVEMENTS AND PROJECT DEVELOPMENTS FOR NEXT REPORTING PERIOD

The project aims to become fully operational during the next reporting period, as this will be the reporting period following the issuance and sale of the first issued NCCs. The project has not been able to be fully functional without the carbon funding that will be generated from this. Once this funding is in place and available, it will mean that the project can proceed with all the objectives, activities and benefits that have been detailed previously in the PDD.

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.

10.1 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 installed in the community; however they do not have sufficient 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.

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.

10.2 Providing Solar Energy in the Project Area

Currently, many of the communities in the project area have no energy supply, while others such as São Joaquim have a diesel generator which has been provided by the Municipality. However, they do not usually have fuel to run it. For improving the quality of life of the inhabitants, an important factor is to provide 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. The project area has huge solar energy potential, with a higher solar radiation than Texas, Spain or Italy, so there is an important opportunity to install solar arrays for the local communities who will not have to resort to the continued use of oil or diesel to meet their energy needs.

For these reasons, a photovoltaic solar array is to be installed in the São Joaquim community as part of the pilot program and will include the installation of a solar array to meet the energy requirements of the school, and a second one would supply the basic electricity demands of the whole community.

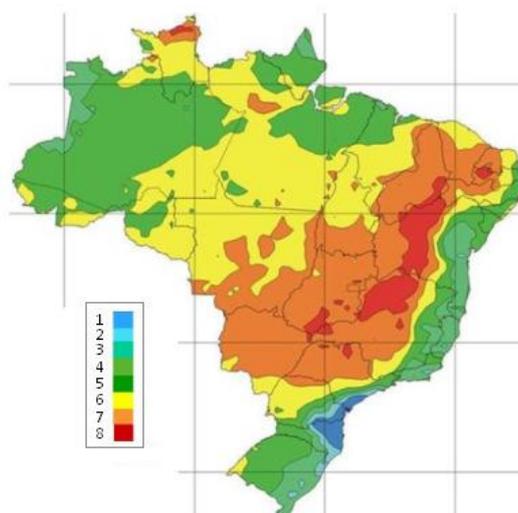
The CGV technical team have carried out extensive research and development into the potential for providing solar energy to the project area, and the possibility for this to be implemented is a certainty.

Solar Energy Potential

In the project area, solar energy is a good option. An analysis carried out by the Mines and Energy Minister of Brazil¹³, states 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.

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



Map 2: 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 12: 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.

Installation of Solar Panels

The objective is to create a communal area without shade to install solar panels, for electricity and for the water extraction which can provide for the whole community. Solar panels would be placed in metal structures outside the buildings, since the roofs would not be able to support them. Their optimal inclination angles and the distance between them to avoid shadowing have been calculated in order to obtain the maximum amount of energy throughout the year.

There are opportunities available to construct the solar panels on site, by the inhabitants of the communities at a relatively inexpensive cost. The maintenance of the installation by people from the communities has also been proposed.

Conclusion

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



10.3 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.

10.4 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.

10.5 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 alternatives that, given the right training and support, will benefit them long into the future.



11. OUTSTANDING CORRECTIVE ACTIONS FROM PREVIOUS VERIFICATION PERIOD

As per the Verification Report issued by Environmental Services Inc. dated 17th September 2013, there were 13 NCRs/CLs identified during the verification process for the quantification period 10th June 2011 to 31st July 2012; all were addressed satisfactorily during the verification process, and the responses are all included in the Verification Report, Appendix B. There are therefore no outstanding corrective actions for the Trocano Araretama Conservation Project to be addressed.

12. VERIFIERS REPORT FOR PREVIOUS VERIFICATION PERIOD

The full Verification Report and Statement for the verification of the quantification period 10th June 2011 to 31st July 2012 can be accessed via the Natural Forest Standard website:

<http://www.naturalforeststandard.com/projects/>

The verification report relating to the quantification period, 1st August 2012 to 31st July 2013 will be published following the completion of the annual verification process, in accordance with the Natural Forest Standard requirements.