Grant Agreement no.: 226310

Project acronym: REDD-ALERT

Project title: Reducing Emissions from Deforestation and Degradation through Alternative Landuses in Rainforests of the Tropics

Funding Scheme: Collaborative Project

Deliverable reference: D.7.2

Deliverable title: Annual Project Meetings 2

Due date of deliverable: Month 14.

Actual submission date: 17 November 2010.

Organisation name of lead contractor for this deliverable: Macaulay Land Use Research Institute (MLURI), UK.

Project co-funded by the European Commission with the Seventh Framework Programme (2009-13)		
Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including the Commission Service)	
RE	Restricted to a group specified by the consortium (including the Commission Service)	
CO	Confidential, only for members of the consortium (including the Commission Service)	

Deliverable reference: D.7.2

Deliverable title: Annual Project Meetings 2.

Deliverable evidence: Report

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The second Project meeting of the REDD-ALERT (Reducing Emission from Deforestation and Degradation through Alternative Land Uses in Rainforests of the Tropics) Project was organised in Peru from 13-16 October 2010. Thirty three participants representing the 11 partners from UK, Belgium, the Netherlands, Germany, Indonesia, Vietnam, Kenya, Cameroon, Peru and Columbia attended the meeting. The minutes of the meeting have been attached bellow for the details.

2nd Annual Meeting of REDD-ALERT Project
13-16 October 2010
Lima, Peru

Objectives

1. To review progress in each work-package
2. To coordinate activities between work-packages
3. To resolve issues arising from the above
4. To review the plan of work for Year 2.
5. Plan for specific upcoming events: Annual Project Meeting in Cameroon, Mid-Project Review

Programme:

Tue, 12 Oct:	**Arrive Lima**
Wed, 13 Oct:	**Meeting Day-1**
0830-0900:	Registration and coffee
0900-0915:	Inauguration speech by Project Coordinator: Robin Matthews
0915-0930:	Welcome speech by local host: Manuel Sigueñas, Director of Research at INIA.
0930-1000:	Overview of project – Robin Matthews
1000-1030:	*Tea/Coffee*
1030-1130:	WP1 Progress report (20 min) & discussion (40 min) – Patrick Meyfroidt
1130-1200:	WP2 Progress report (20 min) & discussion (40 min) – Meine van Noordwijk
1200:1300:	*Lunch*
1300-1400:	WP3 Progress report (20 min) & discussion (40 min) – Ed Veldkamp
1400-1500:	WP4 Progress report (20 min) & discussion (40 min) – Constanze Haug
1500-1530:	*Tea/Coffee*
1530-1630:	WP5 Progress report (20 min) & discussion (40 min) – Robin Matthews
1630-1730:	WP6 Progress report (20 min) & discussion (40 min) – Meine van Noordwijk
1930:	Dinner
Thurs, 14 Oct:	**Meeting Day-2**
0900-1000:	Project administration issues, reporting, etc – Madhu Subedi
1000-1030:	*Tea/Coffee*
1030-1230:	Breakout groups to draw up workplans for next year
1230-1330:	*Lunch*
1330-1530:	Plenary: Presentation of country workplans (15 mins each). Discussion of resources.
1530-1600:	*Tea/Coffee*
1600-1700:	AOB
Evening	Travel to Pucallpa
Fri, 15 Oct:	**Field visit: Day-1**
Sat, 16 Oct:	**Field visit: Day-2**
Evening	Return to Lima
Sun, 17 Oct:	**Return home**

Participants:

1. Dr Robin Matthews	MLURI, UK	
2. Dr Madhu Subedi	MLURI, UK	
3. Dr George Dyer	MLURI, UK	
4. Dr Shibu Muhammed	MLURI, UK	
5. Dr Innocent Bakam	MLURI, UK	
6. Dr Patrick Meyfroidt	UCL, Belgium	
7. Dr Onno Kuik	VU, The Netherlands	
8. Ms Constanze Haug	VU, The Netherlands	
9. Prof. Edzo Veldkamp	UGOE, Germany	
10. Dr Meine van Noordwijk	ICRAF, Indonesia	
11. Dr Peter Minang	ICRAF, Kenya	
12. Ms Joyce Kasyoki	ICRAF, Kenya	
13. Ms Elizabeth Kahurani	ICRAF, Kenya	
14. Ms Florence Bernard	ICRAF, Kenya	
15. Dr Jim Gokoski	IITA, Cameroon	
16. Dr Valentina Robiglio	IITA, Cameroon	
17. Dr Glenn Hyman	CIAT, Columbia	
18. Dr Douglas White	CIAT, Columbia	
19. Dr Fahmuddin Agus	ISRI, Indonesia	
20. Mr. Setiari Marwanto	ISRI, Indonesia	
21. Mr. Edi Husen	ISRI, Indonesia	
22. Dr V.T. Phuong	RECFEE, Vietnam	
23. Dr. Nguyen Hoang Nghia	RECFEE, Vietnam	
24. Dr Martin Tchienkoua	IRAD, Cameroon	
25. Mr Assoumou Mezui Remy	IRAD, Cameroon	
26. Dr William Vivanco Mackie	INIA, Peru	
27. Mr Eloy Cuellar	INIA, Peru	
28. Mr Ymber Flores	INIA, Peru	
29. Dr Rosa Cosio	INIA, Peru	
30. Mr Roberto Porro	ICRAF, Peru	
31. Dr Ramon Gerrits	ICRAF, Peru	
32. Dr Julio Ugarte	ICRAF, Peru	
33. Ms Gaby Garcia	ICRAF, Peru	
Guests		
1. Mr Jorge Alcantara	Director of genetic resources, Peru	
Apologies		
1. Prof Joyeeta Gupta	VU, The Netherlands	
2. Dr Lou Verchot	CIFOR, Indonesia	
3. Dr. Minh Ha Hoang	ICRAF, Vietnam	

Day I: Wednesday, 13 October 2010

The meeting started with a welcome note by Dr Robin Matthews, Coordinator of the REDD-Alert Project. He described the rationale of the REDD process and the issues the project is addressing. He presented the provisional agenda and asked the participants if they wanted to include any other issues not covered in the agenda.

Then, on behalf of Mr Segundo Manuel Sigueñas Saavedra (Director of Research at INIA), Mr Eloy Cuellar welcomed the participants to Peru and extended his best wishes for the success of the meeting.

This was then followed by an introduction event, in which the participants were grouped in pairs, given ten minutes to get to know each others experience and interests, and then take turns to introduce their partner to the whole group.

Mr Jorge Alcantara, Director of Genetic Resources then gave a presentation about the aims, objectives and activities of INIA. He provided an overview about of INIA.

Dr Robin Matthews then presented an overview of the REDD-ALERT Project for the benefit of participants who had joined the project since its inception. He discussed the objectives of the project and its partners, workpackage structure, project sites, activities and expected outcomes. He also presented a diagrammatic structure of the interlinkages between different workpackages, and how these related to the current REDD debate/issues.

Then WP Coordinators each presented a summary of work done under their WPs.

WP1 - Dr Patrick Meyfroidt presented the overview of WP activities aimed at 'understanding the drivers of land-use change'. These included:

- A study on how reductions in deforestation and increases in forest cover in some countries was causing displacement of GHG emissions abroad due to increased timber and food imports.
- The initial information about the drivers of land use change were achieved through the collection of time series of remote sensing, GIS and socio-economic census data; mapping of forest-cover change using remote sensing; multivariate statistical analyses based on landscape and socio-economic variables; and, Identifying generic pathways of deforestation and reforestation based on statistical analyses, field surveys and published case studies.
- Presented overview, results from country activities and cross-country comparison.
- Cameroon (V. Robiglio, M. Tchienkoua, R. Assoumou, D. Bruggeman)
  - Satellite images and initial interpretation of those images had been carried out
  - National land use change maps for Cameroon had been produced (D. Bruggeman) but there was some discussion of the accuracy of these
  - Household surveys were being initiated (in association with WP5 work). V. Robiglio, M. Tchienkoua and R. Assoumou led selection and delineation of study sites in Cameroon. The process was accomplished by stepwise identification of study areas: 3 areas of particular areas of interest (South/Centre/East) were identified for the study. Based on spatial data and selected criteria: 2 priority study areas and 12 clusters of villages were identified for activities under WP1, WP2 and WP5; rapid reconnaissance survey was carried out on the ground. Based on these works a working document entitled "Report on site selection for ASB – REDD ALERT sites" is being prepared by M. Tchienkoua, V. Robiglio and others.
  - Focus Group interviews are being carried out in 12 selected villages in Cameroon for the identification of drivers, land use change, intensification, demographical dynamics and preliminary op-cost analysis – farmgate prices for commodities (WP1/WP5).
  - The study in Cameroon also focuses on interactions and feedbacks between land use changes and the policy process of land zoning.
- Activities in Peru (coordinated by G. Hyman and E. Cuellar)
- Vietnam (coordinated by Vu Tan Phuong and Hoang Viet Anh)
  - Focussed on identification and delineation of study sites
  - Time series images, groundtruthing, image processing and analysis of secondary data on population and land use are being used.
- Indonesia (coordinated by A. Ekadinata and M. Van Noordwijk)
  - Identified four zones, viz. Zone1: high access – non peat; Zone2: low access – non peat; Zone3: high access – peat; Zone4: low access – peat. Activities in these study sites are continuing.

- Cross-country analysis explored the association forest transition and displacement of land use abroad. The initial conclusions from the study are:
  - In FT countries, significant association were found between reforestation and displacement of land use abroad;
  - Net balance of reforestation is positive, but decreasing over time; and,
  - Payments for reduced deforestation have positive effects, but compensated farmers or final consumers will have to buy food from somewhere.

WP2 - Dr Meine van Noordwijk presented the overview of WPs.

- Presented the study on 'land cover changes ~C accounting'.
- Discussed GAMA, NAMA and LAAMA actions to reduce emissions.
- Present temporal changes in emissions during 1990-2005.
- Forest based emission: lots of countries are suffering due to this but only few countries (Brazil, Indonesia and few others) are primarily responsible for the emission.
- Emission reduced by 26% from BAU to NAMA-unilateral and by 15% from NAMA-unilateral to NAMA-support.
- Indonesia has the potential to reduce CO_2 emission by up to 2.3 GT per year by 2030.

W3 - Prof Edzo Veldkamp presented the overview of WP.

- Presented the initial findings of the review on 'belowground carbon and greenhouse gas emissions of major land use options in the tropical forest margins'.
- Discussed C losses from different land types (mainly peat, mineral soils) and outlined the research plan.
- He also discussed C-stock dynamics in the soil and the importance of the depth parameter in improving the accuracy in C accounting in land use change assessment processes.
- He mentioned the problem of available databases as they have not been systematically collected and maintained. Most of the data are confined to the topsoil ignoring subastantial amount of C stored in lower portion of soil profiles.

WP4 – Dr Constanze Haug presented the overview of WP.

- Presented the overview of WP4 including activities completed, deliverables submitted and works in progress.
- Presented the studies on:
  - D.4.1. Graphical overview of global forest governance.
  - D.4.2. Interlinkages between global forest-related regimes.
- She also presented the progress on deliverables (D.4.3. Generic table of forest policy options) to be submitted.
- Discussed about the planned activities:
  - REDD-ALERT policy discussion' exercise
  - REDD and its impact on international timber and food markets.
  - Regional case studies to analyse incentive and disincentives of forest related policies on the behaviour of local stakeholders.
  - Publication of book summarising the outputs from WP4.

W5 - Dr Robin Matthews presented the overview of WPs.

- Progress on the integration and modelling work included:
  - Model of Land use dynamics in Cameroon (PALM), followed by a discussion of 'decision-making rules' (Innocent Bakam)
  - agent based modelling to explore REDD benefit chains from national level through to regional, district, village, groups and finally to household levels (Innocent Bakam)
  - Field data collection in Indonesia for ECOSSE modelling studies (Jenny Farmer)
  - Household modelling in Peru (George Dyer)
- Presented the outline of activities planned for Year-2.

WP6 - Dr Meine van Noordwijk presented the overview of WPs.

- Presented the progress with the development of Negotiation Support Systems.
- Presented the REDD scenario at global level and factors associated with REDD and discussed the appropriate mitigation actions at various levels (e.g., GAMA, NAMA and LAAMA).
- Discussed FALLOW model as a tool to assess the ecological and economical impacts of a development strategy in rural area.
- Presented his study on 'land cover changes ~C accounting'.
- Discussed trade-off between ecology and economy.

Day II: Thursday, 14 October 2010

WP7- Dr Madhu Subedi presented the overview of WPs.

M. Subedi presented detailed information related to management and financial issues, including:

- A brief update of the Project administration.
- Partners were informed about the forthcoming reporting obligations and requested for the submission of Periodic Report before 15 November 2010 so that the Project Manager will have sufficient tome to collate, format and submit the reports to the EU within the deadline, i.e. by 30 December 2010.
- Partners were informed about the recent updates of Project website and plans for future improvement of Project website. Development of 'Secured Area' in the website was discussed. The 'Secured Area' was created to share the project related internal/confidential materials among the partners only. Partners were requested to provide their comments and suggestions on the current update. In addition, partners were requested to provide any Project related information appropriate for inclusion in the website.
- Partners were updated with the progress with the on-going documentation work of Project publications. Partners were requested to provide a copy or reference details of any future publication produced by the Project. The Project Officer will then document the publication and update the publication list. The publication list and abstract of the paper will also be uploaded on the website.
- Partners were updated with the financial situation of the Project. Details of budget allocation and overall budget situation was presented.

Planning activities for Year-2

Firstly, the WP leaders presented their planned research activities in study countries. This was followed by in depth discussions of the details of activities in each of the four study countries (Peru, Vietnam, Cameroon and Indonesia) under different workpackages. The following are notes taken by RBM during the discussions:

Peru

WP1

- Remote sensing data: 1990, 1997, 2007. Aguitia region. 17,000 km.
- Digital classification starting (REALU)
- Landscape changes – have data, need to do analysis.
- Village level data: two dates. 200 villages
- Eloy has done work on illegal logging. Linking local illegal logging with international? Need to calculate value of logging?
- Household survey data: 1997. RAVA: 2008. 500 surveys. (Currently being cleaned, should be available in Jan 2011. One recently (2010).

- Driver information. Peru synthesis report 2004. Could be updated. Concessions, oil palm.

WP2

- OpCost tool – generates MACC curves. On ALREDDI website.
- INIA have basic data on C stock densities.
- Could be checked against earlier ASB data, and combined. – Doug, Glenn, Eloy to work on this.
- Update OpCost calculation – including selective logging.
- Creating maps of carbon by combining land use maps and C stock
- Asner paper. Only half of what ASB found previously. Not clear what conversion factors used – could check this.

WP3

- Transitions – forest to shifting cultivation – chronosequence. Rice, maize, cassava.
- Forest to pasture. Encouraged in 1980s, subsidies in 1990s.
- Pasture to oil palm. Forest to oil palm. (new planting up to oldest about 25 years old)
- Soil analysis. Soil lab in Ucayali. Staff available to do this.
- Vehicles available from INIA.

WP4

- Mapping of actors/stakeholders in REALU for 3 different areas. Is this available?
- Identification of policy - Julio conference proceedings. Doug/Julio/Glenn to update this and get a paper ready for publication.
- ICRAF energy policy in Ucayali region.
- Glenn to circulate all of these.
- Interviews – May next year. Masters student. NGOs, academia, etc. at the regional level. CH to circulate content of interviews.
- Small offices to be provided by INIA, and other logistics.
- Constanze and Roberto to talk and harmonise questionnaires.

WP5

- Daily weather data – Glenn to find some weather data. MARKSIM.
- Model economy of the region – how would move to high-C landscape affect the economy of the region? Multiplier effect – others dependent on the timer economy.
- Three classification of forest: indigenous forest (selectively logged); protected areas; concessions.
- Reforestation like Bosques Amazonicas – effect on local livelihoods – employment opportunities
- Tribal areas in Pulcallpa – Indians are paid by loggers per tree. How would they be affected by REDD? Eco-tourism? Protected areas?

Cameroon

WP1

- CAMflores data – data not validated. Many assumptions made. Opportunity costs data based on that.
- Work with 12 villages with drivers. 6 villages – detailed household analysis of decision-making.
- GIS locations of field sizes – walk the perimeters.
- Images – forest /agriculture mosaic. Not able to distinguish fields at this level. How to upscale?
- Opportunity costs at field level.
- Questionnaire on management of fields.
- NPV calculation over period of time.
- Vehicles need to be sorted out. ASB/IRAD have other vehicles. IITA selling used vehicles – may be possible to have some of these.
- 1 weeks of surveying.

WP2

- Fallow – still has lots of trees in it. This not done in earlier work. Large trees ignored. Current work needs to focus on getting better estimates of these.
- Logging C densities – getting better estimates of different degrees of logging.
- Talk to Renee Senaf – has done work on C densities within logged concessions. Valentina to try and collate these.
- Costings?

WP3

- Land use transitions – cocoa – how much is coming from old fallows and how much from new forest.
  - Forest into shifting cultivation
  - Shifting cultivation into cocoa
  - Forest into cocoa
- Oil palm – chronosequences.
- Logistics can be provided by ICRAF.

WP4

- What are the key policies affecting forests in Cameroon at the moment? Who are the main actors? Identify success and non-success of these policies.
- Need assistance in setting up interviews.
- Martin will identify relevant people by Feb – produce document for interviews by March. Interviews in May.
- Logistics – rent a taxi for the day $30-40/day.

WP5

- Weather data from Baimoyo.
- Soil data. Shibu and Martin to talk about this.

WP6

- Identify what initiatives are going on. How can REDD-ALERT results feed in to this? How can this then be fed into these initiatives.
- What would a future landscape look like? This will inform the scenario analysis for the models in WP5.

Vietnam

WP1

- Image processing – LANDSAT, SPOT: 2000, 2005, 2010. Should be completed by 2011.
- Household surveys – to discuss with George Dyer and Robin. Phuong will check on previous socio-economic surveys. Commune level only – very little household data. Patrick has census data. RCFEE have socio-economic survey people who could do the job.
- JICA – technical focus. REDD-Reddiness project. REALU project (Min Ha).
- Min Ha has been doing Opportunity Cost work with ASB.
- Can collaborate with Thaiwin University (close to field sites).
- Drivers. Commune level data, other GIS information. First of all at the commune level, then when household data becomes available, then more detailed analysis. Migration. Profitable tree crops - coffee. Rubber price going up – increasing important driver. Opportunity costs very high.
- Need to compare new householders (migrants) and old householders.

WP2

- Need to get more op-cost data. – Lots of assumptions used, literature data. Need to collect more empirical data. Meine/Peter to share with REALU1 report. Peter to send also to me.
- Working with Lou on C estimation. Allometric estimation. CIFOR project.
- REALU2 – but focused on another site (Bac Khan).

WP3

- No activities planned.

WP4

- Good linkage with policy people. Policy reviews available. Need to find right persons for interviews. Talk to different ministries (Forestry, Land Use).
- Policy inventory by beginning of May to Constanze. MSc student to go in May. Can provide an interpreter from existing staff. Need to get permission from provincial government at least 3 weeks before going there.
- Renting a scooter!

WP5

- Will look for weather data close to study site.
- Soils data. Quite a few systems available. Russian – can convert.

Indonesia

WP1

- Three main players have done much work already ICRAF, CIFOR, ISRI.
- Andree going to Louvain in Nov. Remote sensing and land use.
- Work on drivers – what tree cover at different population densities (refer to Sonya's' work).
- Road networks, elevation, river network, land use zoning plans, etc.
- Trade issues of Patrick.

WP2

- Include lowland peats. Opportunity cost work. In Jambi area. (Input/output data).
- Oil palm 40 tC/ha. Remote sensing of other land uses of areas around this figure – can this be estimated with accuracy?
- Peats of less than 3m can be converted, but policy question is of how this can be minimised?

WP3

- Continue CO2 measurements – water table depth (Setiari's work). Four month's data already. Freq every 2 months.
- Continue microbial work with Atiek. 82% of emissions.
- Assessment of phytotropic respiration from peatlands (20-40% of total respirations), esp. recently converted land. Increases with older the oil palm plantation.
- Jenny's work.
- CH4 emissions from mineral soils. Lou might follow this up with Fitri.

WP4

- Policy inventory work – ISRI don't really have expertise for this. But Herry could perhaps take this on. Central and provincial levels. Help with facilitating MSc student. Interpreter (1.5 months) will be provided by ISRI.
- Oil palm is the hottest issue at the moment.

WP5

- Herry's work. Desai.
- FALLOW – new rubber technology
- Grace's work.
- ECOSSE work. N2O emissions under oil palm. Can we improve this over the IPCC emission figures.
- Klaus Butterbach has good datasets on N2O emissions (Australia, Kenya). Perhaps tie in with Atiek's work on N2O in mineral soils.

WP6

- Scenario analysis. Stakeholder negotiation. Link with REALU. Hutan Paraman. Full of conflicts.
- Provincial level policies – reconciling development planning policies with GHG emissions.
- Conflicts of resource access.

Each country team agreed to use these discussions to develop a detailed workplan for circulation to other team members by the end of the workshop. These will be provided as separate documents.

In the evening, participants travelled to field site (Pucallpa) to observe the field activities of INIA and ICRAF.

Day III: Friday, 15 October 2010 (Field Visit)

Objective: Establishment and Management of Agroforestry Systems in the Peruvian Amazon: Cases at the Von Humbold National Forest and the districts of Curimana, C. Tournavista and Yarinacocha.

Field trip coordinators: Julio Ugarte and Abel Meza

Programme: Establishment and Management of Agroforestry Systems in the Peruvian Amazon: Cases at the Von Humbold National Forest and the districts of Curimana, C. Tournavista and Yarinacocha.

Field trip coordinators: Julio Ugarte and Abel Meza.

Time	Activity	Subject of visit	Presentation
0730	Departure from Pucallpa		
0730-0 830	Bus travel		
0830-1100	Visit to EEA Alexander von Humboldt - INIA	1. AFS INIA Agrobosque 1 - Age: 6 years Components: • Tornillo (*Cedrelinga catenaiformis*), • Pijuayo (*Bactris gasipaes*), • Sangre de grado (*Croton draconoides*), • Capirona (*Caycophyllum spruceanum*), • Guaba (*Inga sp.*) 2. AFS INIA Agrobosque 2 - Age: 5 years Components: • Shihuahuaco *(Dipterix sp),* • Tornillo *(Cedrelinga catenaiformis),* • Quillobordón (*Aspidosperma sp.*) • Caoba*(Swietenia microphylla),* • Tahuarí *(Tabebuia serratiflora);* • Cocoa *(Theobroma cacao)*	Y. Flores y/o W. Angulo
1100-1200	Bus travel		
1200-1300	Visit to the property of Mr. N. Damian Km 56 CNC	Seed Plot of Bolaina (*Guazuma crinita*) and Capirona (*Caycophyllum spruceanum*) Age: 11 years	J. Ugarte y/o A. Meza
1300-1400	Lunch		
1400-1500	Bus travel		
1500-1600	Visit to Forestry nursery of Amazonian Forests, Km 13 C. Tournavista	Seedling production for the installation of AFS Models Components: • Caoba (*Swietenia microphylla*) • Capirona (*Caycophyllum spruceanum*) • Guaba (*Inga sp.*) • Pijuayo (*Bactris gasipaes*) • Sangre de grado (*Croton draconoides*) • Cocoa (*Theobroma cacao*)	J. Chávez y/o A. Meza
1600-1700	Return to Pucallpa		

Observations:

Alexander von Humboldt Experimental Center

Alexander von Humboldt National Forest was established in June 1965 as a permanent production unit of timber and wildlife on a area of 645,000ha. The Centre is situated in the Amazon river basin about 86 km from Pucallpa city. Reserach at the Centre focuses on the conservation of forest genetic resources,

scientific research, education & training and ecotourism & scientific tourism. During 1974-78, FAO implemented a project entitled 'Demonstration of Integrated Management and Utilization of Tropical Forests' with the goal to develop the first forest management plan for the Amazon region of Peru. Then after, other funding agencies also contributed to its development. The team observed research on six different agro-forestry models in detail.

Location 1: Agroforestry System 'Agrobosque'

Edaphic requirements of forest species for planting on degraded lands

Objective: To assess initial performance of 7 forest species with 3 organic and 1 inorganic fertilizers in degraded soil.

Organic fertilizer: Chicken manure, Earthworm humus, Woodchip compost (1 kg)
Inorganic fertilizer: Phosphate rock (200 g)
Ground cover: kudzu (*Pueraria phaseoloides*) – Centrosema (*Centrosema macrocarpum*)
Soil: abandoned land, flat topography but with some undulation, acidic soil, deficient in phosphorus with high concentration of aluminium.
Installation cost and first year of operation: US$ 800.00
Plantation age: 10 years

SPECIES	FERTILIZATION	HEIGHT(m)	DBH* (cm)
Shihuahuaco (*Dipteryx odorata*)	Woodchip compost + Phosphate rock	16.5	22.2
Tahuarí amarillo (*Tabebuia serratifolia*)	Earthworm humus + Phosphate rock	13.3	17.6
Estoraque (*Miroxylum balsamun*)	Earthworm humus + Phosphate rock	13.5	17.6
Capirona (*Calycophyllum spruceanum*)	Chicken manure + Phosphate rock	7.9	8.6
Quillobordon colorado (*Aspidosperma sp.*)	Chicken manure + Phosphate rock	12.6	15.4
Huayruro rojo (*Ormosia macrocalix*)	Chicken manure + Phosphate rock	12.5	16.3
Caoba (*Swietenia macrophylla*)	*Hypsipyla grandella* attack	3.3	9.6

* DBH: diameter at breast height

Preliminary results: "Shihuahuaco" treated with 1 Kg of woodchip compost and 200 g of phosphate rock, after a period of 10 years, reached on average of 16.5 m height and 22.3 cm diameter, followed by "tahuarí amarillo" and "estoraque". Nevertheless, "huayruro" reached 100% of survival after treatment with chicken manure and 200 g of phosphate rock. "Capirona" did not respond to the treatments; mahogany was attacked by *Hypsipyla*; "quillobordón" shows a vertical and not ramified growth, appropriate for agroforestry systems.

Location 2: Agroforestry System 'Agrobosque'

Continuous and diversified production in multi-strata agroforestry system

Objective: To assess performance of 2 forest species associated to pijuayo (*Bactris gasipaes*) and annual crops in multi-strata system in degraded soils.

Sequential crops: Soybean – Corn
Organic fertilizer: Woodchip compost (1 kg)
Inorganic fertilizer: Phosphate rock (200 g)
Ground cover: Centrosema (*Centrosema macrocarpum*)
Soil: Abandoned land, flat topography, acidic soil, deficient in phosphorus and with high concentration of aluminium.

Installation cost and first year of operation: US$ 820.00
Plantation age: 12 years

SPECIES	FERTILIZATION	HEIGHT (m)	DBH* (cm)
Tornillo (*Cedrelinga catenaeformis*)	Woodchip compost + Phosphate rock	16.4	24.3
Capirona (*Calycophyllum spruceanum*)	Woodchip compost + Phosphate rock	---	---
Pijuayo (*Bactris gasipaes*)	Woodchip compost + Phosphate rock	18.0	19.5

* DBH: diameter at breast height

Preliminary results: "Tornillo" treated with 1 Kg of woodchip compost and 200 g of phosphate rock, after a period of 12 years, reached 16.4 m of height and 24.3 cm of diameter. "Pijuayo" reached 18.0 m of height and 19.5 cm of diameter; "capirona" did not survive as a result of the shadow caused by the "pijuayo" extensive leaves.

Location 3: Agroforestry System 'Agrobosque'

Diversification of annual crops, perennial fruit, timber and non timber species in a continuous production system

Objective: To assess initial performance of 6 forest species with organic and inorganic fertilizers, associated to annual crops in degraded soils.

Sequential crops: Rice – Bean (3 varieties of each)
Organic fertilizer: Woodchip compost (1 kg)
Inorganic fertilizer: Phosphate rock (200 g)
Ground cover: Centrosema (*Centrosema macrocarpum*)
Soil: Abandoned land, undulated topography, acidic soil, deficient in phosphorus and with high concentration of aluminium.
Installation cost and first year of operation:
US$ 850
Plantation age: 5 years

SPECIES	FERTILIZATION	HEIGHT (m)	DBH* (cm)
Shihuahuaco (*Dipteryx odorata*)	Woodchip compost + Phosphate rock	9.5	12.2
Tahuarí amarillo (*Tabebuia serratifolia*)	Woodchip compost + Phosphate rock	12.3	14.6
Pumaquiro (*Aspidosperma macrocarpon*)	Woodchip compost + Phosphate rock	11.3	14.4
Marupa (*Simarouba amara*)	Woodchip compost + Phosphate rock	9.9	8.0
Tornillo (*Cedrelinga catenaeformis*)	Woodchip compost + Phosphate rock	---	---
Sangre de grado (*Croton lechleri*)	Woodchip compost + Phosphate rock	11.7	13.5

* DBH: diameter at breast height

Preliminary results: "Shihuahuaco" treated with 1 Kg of woodchip compost and 200 g of phosphate rock, after a period of 5 years, reached 9.5 m of height and 12.2 cm of diameter. "Tahuarí" reached 12.3 m of height and 14.6 cm of diameter; "pumaquiro" reached 11.3 m of height and 14.4 cm of diameter; "marupá" reached 9.9 m of height and 8.0 cm of diameter; "sangre de grado" reached 11.7 m of height and 13.5 cm of diameter. "Tornillo" did not survive because of competition for light with "sangre de grado".

Location 4: Agroforestry System 'Agrobosque'

Introduction of Brazil-nut in Agroforestry Systems

Objective: To introduce Brazil-nut (*Bertholletia excelsa*), in association with timber species, in agroforestry systems in degraded soils.

Ground cover: Centrosema (*Centrosema macrocarpum*)

Soil: abandoned land, flat topography but with some undulation, acidic soil, deficient in phosphorus with high concentration of aluminium.

Installation cost and first year of operation: US$ 800

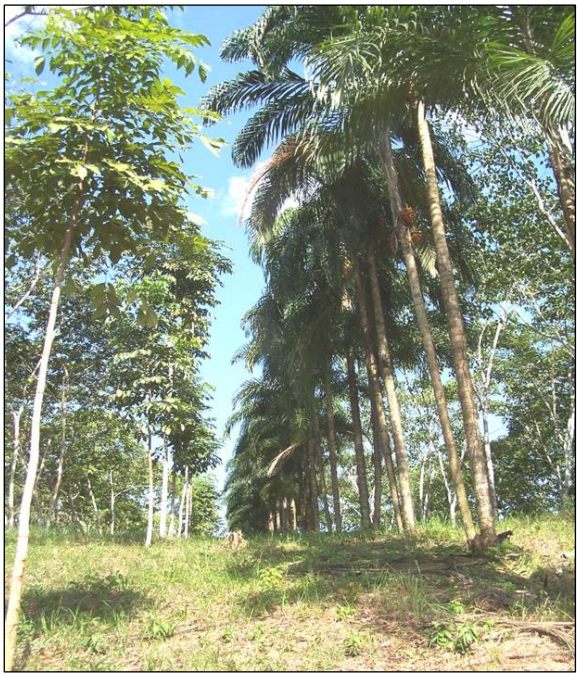
Plantation age: 12 years

SPECIES	FERTILIZATION	HEIGHT (m)	DBH* (cm)
Brazil nut (*Bertholletia excelsa*)	Phosphate rock	16.7	19.6
Pumaquiro (*Aspidosperma macrocarpon*)	Phosphate rock	13.7	14.6
Caoba (*Swietenia macrophylla*)	Phosphate rock	3.4	6.6
Pijuayo (*Bactris gasipaes*)	Phosphate rock	16.7	22.0

* DBH: diameter at breast height

Preliminary results: Brazil nut under a treatment of 200 g of phosphate rock, after a period of 12 years, reached on average 16.7 m of height and 19.6 cm of diameter, followed by "pumaquiro" with 13.7 m of height and 14.6 cm of diameter and "pijuayo" with 16.7 m of height and 22.0 cm of diameter. Mahogany was attacked by *Hypsyphylla*, reducing its growth. The first Brazil nut fructification was over 10 years of age; currently Brazil nut trees produce an average of 30 fruits per tree; "pijuayo" produces 300 fruit bunches per crop.

Location 5: Agroforestry System 'Agrobosque'



Agrobosque system for continuous production of food, medicinal and commercial timber products

Objective: Continuous and diversified production of timber species, resin, pijuayo, pineapple, and citrics with organic and inorganic fertilizers in degraded soils.

Organic fertilizer: Woodchip compost (1 kg)
Inorganic fertilizer: Phosphate rock (200 g)
Sequential crops: Rice – Bean – Corn – Soybean
Fruits: Citrics – Pineapple
Ground cover: Kudzu (*Pueraria phaseoloides*) – Centrosema (*Centrosema macrocarpum*)
Soil: abandoned land, slightly hilly topography, acidic soil, deficient in phosphorus with high concentration of aluminium.

Installation costs and first year of operation: US$ 700

Plantation age: 9 years

SPECIES	FERTILIZATION	HEIGHT (m)	DBH* (cm)
Tornillo (*Cedrelinga catenaeformis*)	Woodchip compost + Phosphate rock	13.6	13.3
Sangre de grado (*Croton lechleri*)	Woodchip compost + Phosphate rock	12.8	14.6
Guaba (*Inga edulis*)	Woodchip compost + Phosphate rock	12.3	16.6
Pijuayo (*Bactris gasipaes*)	Woodchip compost + Phosphate rock	14.5	20.6

* DBH: diameter at breast height

Preliminary results: "Tornillo" treated with 1 Kg of woodchip compost and 200 g of phosphate rock, after a period of 9 years, reached on average of 13.6 m height and 13.3 cm diameter, followed by "sangre de grado" with 12.8 m of height and 14.6 cm of diameter; "guaba" with 12.3 m of height and 16.6 cm of diameter; "pijuayo" with 14.5 m of height and 20.6 cm of diameter. "Pijuayo" produces 400 fruit bunches per crop; resin of "sangre de grado" will be extracted at the tenth year.

Location 6: Agroforestry System 'Agrobosque'

Agrobosque system for continuous production of annual crops, Perennial fruit, and commercial timber

Objective: Continuous production of timber species with organic and inorganic fertilizers in agroforestry system in degraded soils.

Organic fertilizer: Woodchip compost, Chicken manure (1 kg)
Inorganic manure: Phosphate rock (200 g)
Temporary crop: Rice – bean - corn
Annual crop: Plantain
Perennial crop: Cocoa (*Theobroma cacao*)
Ground cover: Mucuna (*Mucuna pruriens*) – Centrosema (*Centrosema macrocarpum*)
Suelo: abandoned land, hilly topography, acidic soil, deficient in phosphorus with high concentration of aluminium.
Installation cost and first year of operation: US$ 850
Plantation age: 8 years

SPECIES	FERTILIZATION	HEIGHT (m)	DAP (cm)
Shihuahuaco (*Dipteryx odorata*)	Compost + Rock phosphate	16.5	22.2
Tahuarí Amarillo (*Tabebuia serratifolia*)	Poultry manure + Rock phosphate	13.3	17.3
Quillobordon colorado (*Aspidosperma sp.*)	Poultry manure + Rock phosphate	12.6	15.7
Tornillo (*Cedrelinga catenaeformis*)	Poultry manure + Rock phosphate	14.3	13.7
Caoba (*Swietenia macrophylla*)	*Hypsipyla grandella* attack	3.6	12.5

Preliminary results: "Shihuahuaco" treated with 1 Kg woodchip compost and 200 g phosphate rock, after a period of 8 years, reached an average of 16.5 m height and 22.2 cm of diameter, followed by "tahuarí amarillo" which was treated with chicken manure and phosphate rock and reached 13.3 m of height and 17.3 cm of diameter; quillobordón red was treated with chicken manure and phosphate rock and reached 12.6 m of height and 15.7 cm of diameter; "tornillo" was treated with chicken manure and phosphate rock and reached 14.3 m of height and 13.7 cm of diameter; mahogany was attacked by *Hypsyphylla*. Cocoa is cultivated in the plantation low stratum reaching an average yield of 1,000 Kg of dry almond per crop.

In the six plots, the ground cover with *centrosema* contributes nitrogen fixing, maintaining soil moisture and controlling invading weeds.

Briefing at Alexander von Humboldt experimental center by Ing. Auberto Ricse. SDNIF - INIA. AVH. October 15, 2010

In addition, the team also visited Balaina (*Guazuma crinita*) and Capirona (*Calycophyllum spruceanum*) seed orchards established under ICRAF- PROSEMA programme.

Farmer:	Nemecio Damian
Location:	Km.26 Neshuya-Curimana Road
Plantation age:	11 Years
Forestry component of the system:	Balaina (*Guazuma crinita*), and Capirona (*Calycophyllum spruceanum*)
Distance:	3m * 3m
Agricultural component of the system:	Centrosema (*Centrosema macrocarpum*)
Background area:	Purma (secondary forest) eight years old

Then the team visited the forest nursery at Tournavista in Amazon forest. The nursery aimed at producing seedlings for the establishment different models of agroforestry testing and demonstration sites. The site was located at Campo Verde farm. The farm is owned by Bosques Amazonicos SAC, which is a private company dedicated to reforestation and conservation of forests for production of timber and carbon-credits. The company is working in Ucayali and Madre de Dios areas. There were five plots showing different agro-forestry model using nine different species, as;

1. Caoba (*Swietenia microphylla*)
2. Capirona (*Calycophyllum spruceanum*)
3. Guaba (*Inga sp.*)
4. Pijuayo (*Bactris gasipaes*)
5. Sangre de grado (*Croton draconoides*)
6. Cocoa (*Theobroma cacao*)
7. Tornillo (*Cedrelinga catenaeformis*)
8. Shihuahuaco (*Dipteryx sp.*)
9. Tahuarí (*Tabebuia serratiflora*)

The plots varied from 3.5 to 15 ha in size. Most of the plots were established degraded lands due to overgrazing and annual fires.

Day IV: Saturday, 16 October 2010 (Field Visit)

Objective: The Camu Camu Route (*Myrciaria dubia*).

Field trip coordinators: Marjorie Ávila y Arturo Reátegui

Programme:

Time	Activity	Subject of visit	Presentation by
0800	Departure from Pucallpa		
0800-0930	Boat Travel		
0930-1030	Visit to the Native Community(CC.NN) of San Francisco	1. Handicraft exhibition and agricultural Systems of the Native Community. 2. Camu camu (*Myrciaria dubia*) Plantations by the Amazon Herb Company Age: 12 years	M. Ávila y/o A. Reátegui
1030-1130	Transfer by boat		
1130-1300	Visit to the property of Mrs. M. Shupingahua at the Native Community (CC.NN) of San Juan	1. Camu camu Plantations Age: 9 years 2. Demonstration of the processing & planting of Camu camu seedlings (Participation by all)	M. Ávila y/o A. Reátegui
1300-1330	Walking time		
1330-1500	Lunch	1. Touristic lunch at Shachamama hostel. Dishes made of camu camu 2. Exhibition of typical dances of the Peruvian Amazon.	M. Ávila y/o A. Reátegui
1500-1630	Return to Pucallpa		
1630-2100	Free time		
2100	Departure bus to the airport		
2215	Departure to Lima (flight LP357)		
2320	Arrival in Lima		

Observations:

On the second day of field visit, the team observed Camu camu plantations plots and processing demonstrations.

Camu camu (*Myrciaria dubia*) is also known as Camu camu/camo camo (Peru), Arca/arca d'agua (Brazil), Guava (Columbia), Guayabito (Venezuela) and Camu plus (USA). The plant has a high tolerance to flood and adapted to acidic soil. The fruit has high concentration of Ascorbic acid (vitamin C). It is also considered as an important antioxidant. Its bark and stem infusion are consumed as medicine for diabetes. The Camu camu fruit is highly demanded by industries for the production of Vitamin C from natural sources. As a result, local people have planted Camu camu trees in flood plane areas of Ucayali River (one of the major tributary of Amazon River).

Local people in support with ICRAF, the EPCP Project, IIAP, INIA, state agencies and local tour operator have developed **The Camu camu Route** to provide glimpse of Camu camu production systems, processing methods, people from Mestizo, Conibo Shipibo and San Juan communities (who are associated with the Camu camu production) and their culture.

The team also had opportunity to walk in the dense Amazon forest and acquire first hand experience of tropical forest diversity.

Day V: Sunday, 17 October 2010

Depart to home destinations.

Glimpse of 2nd Annual Project Meeting and field visit, Peru, October 2010.

Prepared by M. Subedi with the contribution from R. Cossio, J.E.C. Bautista and R Matthews.
Photos by M. Subedi, E. Kahurani and INIA.