INFAPRO – 18 years experience of large scale forest rehabilitation for Carbon Offset Project in Sabah, Malaysia

Jood Evening

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Malaysia - Designated as one of the Top 12 mega-diverse countries

Global Ranking DIVERSITY OF LAFE

World Class

NATIONAL GEOGRAPHIC SOCIETY

SABAH In the heart of Indo Pacific & Malesia Eco Regions A MEGA BIODIVERSITY HOT SPOT



INFAPRO – Innoprise-Face Foundation Rainforest Rehabilitation Project)

- A CO₂ offset and avoided Deforestation project situated near Danum Valley Conservation Area, Sabah, Malaysia.
- Made possible through financial assistance from Yayasan Sabah (YS), Malaysia and Face the Future (formerly, FACE Foundation), The Netherlands.
- Yayasan Sabah was established in 1966 by the act of the Sabah State Legislation Assembly to enhance the quality of life of Malaysians in Sabah by supplementing and complementing government efforts – particularly in education and welfare. YS is custodian of a million ha of forestland. (www.ysnet.org.my)
- Face promote planting to offset CO₂ thus, providing CO₂ offset services to voluntary markets. (www.face-thefuture.com)

Innoprise-Face Foundation Rainforest Rehabilitation Project (INFAPRO)

- Objective:
 - To rehabilitate 25,000 ha of severely degraded forest to offset carbon dioxide emissions from atmosphere through enrichment planting and tending of indigenous species

Degraded forest that have been logged once from year 1978-1992





INFAPRO Rehabilitation technique - improved forest management

- Enrichment line planting consists solely of indigenous species : dipterocarps, commercial species and forest fruit, and several pioneer species
- Tending of natural regeneration (more than 129 species)



Seed Preparation



Wildings



Innoprise - FACE Project Nursery Capacity: 1 million seedlings

Operational Activities

- Site selection Boundary survey Compassing Climber cutting (2x) Ground truthing (lining, tagging & recording)
- Renticing (1 m width) Beating up
- Holing

CIRP application (only on very severely degraded sites)

- Planting (10 m x 5 m)
- Liberation thinning (2x)
- Census (2x)
- Maintenance (7-18x)

Planting on severely degraded sites – open and pioneer dominated areas

A cross sectional view of the planting line



10 m

1 m

Layout by Yap Sau Wai

Carbon Quantification Studies since 2000

Remnant forest (RF)

Intermediate forest-pioneers without regeneration (IP)

Open canopy (OC)



Cutting of selected vines & climbing bamboo





Line Planting of Dipterocarps



LESSONS LEARNT

Nursery management

- Simple & dynamic nursery operation without pesticides & weedicides
- Improve Growth Performance
- Seed collection, timing, processing
- Seedlings and wildings storage
- Seedlings planted out (30 cm 1.5 m)

Field operation

- Dynamic guidelines site prep, planting, silviculture treatments (CC, GT, shade adjustment), census
- Due to short & long term focus on research & development that works side by side with the operation (both for nursery & field)
- The results of such mechanism enable the project evolved refined rehabilitation, using aerial photo interpretation for macro planning, ground truthing, and other management techniques

Data Management System

- Field data manually collected and stored in specific field books
- Data base "FACEPLAN" (in house programme) covers financial accounting, operation & monitoring (census) info
- Data base & GIS to monitor progress of project
- Data base "MONIS" & "FIELDMAP"- introduce by Face to monitor all their funded projects around the world

Research, Training & Development -Monitoring

- Experimental Phase1 (2,000 ha) learning phase, large experimental blocks, sometimes as compartment basis
- Monitoring activities to improve and troubleshoot problems during implementation
- assess & document the tended seedlings & site conditions, leads to improving SR from Contract to contract

Infapro Early Research Questions – Phase 1 (1993-1995)

- 1. When to plant or treat the forest after logging?
- 2. How to propagate the different species of dipterocarp, using different methods?
- 3. What size of seedlings would attain optimal survival and maximum initial growth?
- 4. What type of planting stock (seedlings, wildings or cuttings) attains best growth & survival?
- 5. Which species grow better and where (site species matching and species trial)?
- 6. What is the influence of rainfall on initial survival?
- 7. What light intensities offer best conditions for maximum growth and minimum mortality?
- 8. What site preparation should be used to achieve these conditions?
- 9. What is the influence of remnant vegetation and site factors on growth and mortality of planted and natural regenerated seedlings?
- 10. Is soil data useful in determining site suitability?
- 11. Can fertilisers speed growth of planted seedlings?
- 12. Is mycorrhizae a limiting factor when planting in logged over forest?
- 13. What are the roles of pioneer tree species?
- 14. What are the patterns of flowering and fruiting behaviour (phenology) of dipterocarps?
- 15. What are the main areas where human factor is important?
- 16. What is the cost structure of the project?
- 17. What is the expected timber yield (growth & yield) from the planted stands?
- 18. What is the expected carbon sequestration from the planted and tended stands?
- 19. What is the methodology for monitoring carbon from the forests?
- 20. What is the most effective and efficient database system for the project (especially in the aspects of storage and retrieval system)?

Postgraduate theses of long term studies

- Recovery of logged forest exploring when should we rehabilitate and site species matching Kishokumar Jeyaraj (1997 2000 (uncompleted))
- Raising cuttings, seedlings and wildings at the nursery to ensure best survival in field and optimum growth of seedlings during establishment in the field, manipulating different nursery techniques, studying site conditions for seedlings etc., if fertiliser can be used to enhance growth and reduce mortality Dr Yap Sau Wai (1995-1998)
- Vegetative propagation of dipterocarps as alternative in raising planting materials Dr Glen Reynolds (1997-2007)
- Shade adjustment canopy manipulation to enhance survival and growth in different field conditions Gregory Mosigil (1995 1999 (in progress))
- Exploring the use of GIS application and other database in forest rehabilitation etc. to study the factors affecting tree growth performance Dr Esther Li (2004 2007)
- And many other related Master & Bachelor studies as well as publications in proceedings and scientific journals

Research, Training & Development - Monitoring

- Phase 2 (1995-1997) long term research focus on shade adjustment, natural recovery of logged forest and vegetative propagation
- Phase 3 (1998-2000) exploring database documentation and GIS for analysis
- Phases 4 (2002-2004) quantification of carbon offset (since 2000) & carbon offset verification and validation (COV) & assessment by SGS UK & SGS the Netherlands in 2002
- Phase 5 (2005-2007) Infapro 1st Carbon Monitoring campaign (2007), FSC certification & Voluntary Carbon Standards (VCS) and Climate, Community & Biodiversity Alliance (CCBA) Standards pre-assessment by SGS the Netherlands & KL in 2008
- Phase 6 (2010) Infapro 2nd Carbon Monitoring campaign (2010), FSC certification & Voluntary Carbon Standards (VCS) assessment, verification and validation by SCS UK & Malaysia in 2011

Social Contribution

- More than 50 locals benefits currently from the project
- More than 200 locals were coached & trained & benefit from the project that have left to seek other opportunities elsewhere
- Facilities at camp provided for staff and families include staff quarters, treated water supply, 24-hour electricity supply, satellite phone and TV, internet access, outdoor games, etc. that are fully borne by the project
- Postgraduate studies opportunities for locals
- Technology transfer "FIELDMAP" (a laser technology with computer aided field mapping programme) for the project
- Continuous training for knowledge and skills enhancement tree identification, survey & mapping, research assistant skills, wildlife monitoring, forest fire, first aid, OSH etc. – INFAPRO IS CENTRE OF LEARNING FOR FOREST REHABILITATION IN THE REGION

Notable Achievements

- Pioneering a forest carbon offset project and became a model of forest rehabilitation in the region.
- To date, over 11,827 ha have been rehabilitated since started in mid 1992.
- The strong support and commitments from both top management and partners enable the project to continue for > 8 Phases.
- Successfully organised a IUFRO World Forestry Congress Year 2000 Pre-IUFRO Workshop.
- Its first 10-year Forest Management Plan (2001-2010) completed & reviewed in 2005. The Second Management Plan will be completed by 2012.
- Infapro has strong, skilled team members and research, training & development programme to support all its operation activities.
- Publications: 3 PhD (2 Malaysians, 1 Briton) and MSc & BSc (Malaysians) with >15 technical reports and >35 publications elsewhere.

Notable Achievements (cont.)

- The first forestry project in the country to initiate SGS's carbon offset verification (COV) programme in 2002.
- Undergoing FSC, VCS & CCBA, pre-assessment by SGS The Netherlands, UK & Malaysia in 2008 & in 2011.
- First of its kind in the world Improved Forest Management (IFM) with avoidance re-logging methodology approved by VCS Board (Nov 2010).
- Submitted Infapro PDD for Carbon Credit Verification & Validation (May 2011).
- Carbon credit verified and validated under VCS by SCS Auditors from USA & Malaysia. Closing of NCRs by SCS end of August 2011.
- FSC certified by SCS (13 June 2011) for the Ulu Segama Malua Project (est 240,000 ha) of which Infapro is a part of.
- First Forestry Project (AFOLU) in Asia to be validated under VCS (Sept 2011).



REDD+ Preparedness Roadmap for the State of Sabah (2011 – 2013)

Green Business Commitment by Sabah Government:

- Following the commitment announced in Nov 2010 International Conference on Realising REDD+ in Sabah; the Sabah Forestry Dept (SFD) is tasked to lead the development of REDD+ for the State.
- In realising the complexity and challenges of REDD+ development and implementation, the formulation of stepwise REDD+ "Roadmap" is mandatory that greatly helped to clarify required interventions.
- The development of this Roadmap was coordinated by the SFD with assistance from WWF-Malaysia of which Infapro is an inspiration.

The Roadmap

- Step 1: Write the Roadmap
- Step 2: Setting the Stage
- Step 3: Develop REDD+ Implementation Framework (Statewide)
- Step 4: Strengthen REDD+ Framework
- Step 5: REDD+ Full Implementation (Performance-based Payment)



Why REDD-Plus?

- Decline revenue from forestry sector SFD believes new source of forest income should be explored and developed to out-compete other agricultural crops – IT IS CRUCIAL TO MAKE TREES WORTH MORE STANDING THAN CUT DOWN WITH ECONOMIC INCENTIVES SUCH AS REDD+, TO PROTECT FORESTS.
- With the forest certification commitment made in 2009 with decades of conservation efforts, the biodiversity and/or environment factors could also be better monitored, captured and financed via REDD+.

The Sabah State Government is foregoing an estimated *RM10-12 billion* in revenue to conserve Danum Valley, Maliau Basin, Imbak Canyon, Tabin and Ulu-Segama Malua

