Apfp-SEApeat

ASEAN Peatland Forests Project - Sustainable Management of Peatland Forests in Southeast Asia

Workshop on Enhancing Sustainability of Forestry Practices on Peatlands

27-28 June 2012
Bogor, Indonesia

Organised by

Global Environment Centre

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I. Introduction

The workshop on Enhancing Sustainability of Forestry Practices on Peatlands was held from 27-28 June in Bogor, Indonesia and attended by more than 100 participants from six countries. The meeting was organised by the Global Environment Centre, ASEAN Secretariat and the Ministry of the Environment of the Republic of Indonesia. The meeting was undertaken in the framework of the ASEAN Peatland Forest project (APFP) and the SEApeat Project, and supported by IFAD-GEF, and European Union. The meeting was officiated by Ir Arief Yuwono *MA*, Deputy Minister of Environment, Republic of Indonesia.

The objectives of this workshop were to:-

i) Review the current management of peat swamp forests in the region.
ii) Identify impacts and document Best Management Practices of peat swamp forests and forest plantations on peat.
iii) Discuss the need and possible contents of guidelines for existing peat swamp forestry

A total of 21 presentations were made on a various topics including forest and plantation management on peatlands as well as rehabilitation of Peat Swamp Forest and certification of forestry activities on peatlands. Breakout groups discussed forest management/rehabilitation and plantation management on peat.

I. II. Summary of presentations

Introduction to Regional Effort of Peatland Management in Peat Swamp Forest and Existing Forest Plantation on Peatlands – Status and Trends of Peatlands in Southeast Asia.

- Mr Faizal Parish, Director, Global Environment Centre (GEC)

Peat Swamp Forests (PSF) is the main wetland forest type in Asia, covering approximately 25 million ha of land in South East Asia. It provides water and prevents floods, feeds and supports communities. Peatlands have a unique biodiversity, is able to regulate climate change and store large amounts of carbon. Peatlands in South East Asia stores 70 billion tonnes of carbon, twice as much as all forest biomass combined.

Unfortunately, only 34% of PSF remain relatively intact. 20% of peatlands have been converted to plantations and balance is degraded or fragmented.

The main drivers of peatland status change from 1960 to 1995 are commercial logging, nature conservation (establishment of nature reserves and parks) and agricultural drainage programmes-transmigration and swamp development programmes which enjoyed limited success.

Between 1995 and 2010, the threats have changed to agriculture and plantation development, illegal logging and fires.

The challenges to sustainable forest harvesting are protecting peatland forest resources, avoiding drainage, encouraging post-harvest regeneration and promoting reduced impact logging extraction methods

Up to 2010, there are 897,718 ha of forest plantations on peatlands in Indonesia and Malaysia. Peatland clearance and drainage for plantations may lead to fires GHG emissions and haze; leading to transboundary smoke haze. The problem led to various regional and national efforts to combat this pressing ASEAN problem.

One of the results is the development of the ASEAN Peatland Forest Project (APFP) which aims to support the implementation of the ASEAN Peatland Management Strategy (APMS). Some of the project targets are the development of pilot projects in 4 ASEAN countries – Indonesia, Malaysia, Philippines and Viet Nam; identification and promotion of BMPs for peatlands; reduction in peatland fire and degradation and the development of innovative Finance options. The project started in 2010 and should be completed in 2013.

In the future, unless the situation is changed, the long term scenario is of continuing degradation, fires and large scale land subsidence. It is critical that new strategies are implemented in partnership with all stakeholders to conserve remaining intact forest, rehabilitate or better use degraded land and improve management on plantation land and bring benefits to local community. There is also a need to enhance regional cooperation and partnership between government, private sector and local communities.

Session 1 : Forest Management
Moderator : Mr. Hoetomo, GEF-KLH

Paper 1. The current policy and status for forestry and plantation on peatland ecosystem in Indonesia.

- *Mr. Ruandha Agung Sugardiman, Director General of Forest Planning, Ministry of Forestry, Indonesia*

Peatlands cover approximately 15 million hectares in Indonesia. The area is utilised for various purposes, governed by Indonesian Forestry laws.

The National Forestry Plan 2011-2030 provides direction of macro-spatial forest area and forest administration in the future through the sustainable and multi-functional use of forest resources. It serves as a reference in the preparation of development plans, investment plans and business plans in various geographic scales, time frame and main functions of forests.

According to the Spatial Directive, natural forest and peatland ecosystems is geared towards the ultimate goal to protect natural forest and peatland ecosystems and the provision of carbon (carbon stock). Utilization of the future can be done with without diverting from the main goal; carbon trading projects can be implemented through the utilization of these regions. This relates to the Indonesian government's plan to reduce carbon emissions by 26% (BAU) and as much as 41% with international aid through conservation of natural and peatswamp forests

The Third dictum to the Minister of Forestry states:-

- The suspension of the issuance of new permits on primary natural forests and peatlands based on the indicative map of the New License Suspension (Moratorium Map).
- Governance Policies to permit and license the utilization of timber in natural forest.
- Effectiveness of critical land management (ecosystem restoration).

- Revision of the Indicative Map of New license Suspension (Moratorium Map) in forest areas every 6 months.

In conclusion, forest and forestry in Indonesia is the key factor in dealing with the problems of deforestation (climate change and also poverty, job opportunity and contribution to GDP.

Awareness raising on better natural forest and peatland management for forestry activities. That awareness has been significantly set forth in regulations (action plan).

Paper 2:
Policy on Protection and Management of Peatland Ecosystem in Indonesia

- Mr Hermono Sigit, Ministry of Environment, Indonesia

South East Asia has more than 25 million ha of peatland, about 15 million ha in Indonesia. This is the fourth largest peatland in the world after Canada, Russia and USA and the largest tropical peatland in the world. The total peatland hydrological unit area is about 32,656,106 ha and it stores about 46 Gigatonnes of carbon; about 8 - 14% of the total global carbon stock.

Over the years, unsustainable peatland management led to problems such as: (1) 2,669 mill ha or 37 % of destroyed and unproductive peatlands in Sumatera, (2) unsustainable Peatland development (ex-mega rice project -1 mil ha), (3) biodiversity degradation, peatland fires, smoke haze, floods, etc. (5) Socio-economic (loss of livelihood/ local business opportunity, poverty, etc.).

Constraints to peatland management include

- Limited knowledge, awareness, and commitment of related stakeholders and local community in understanding the value of sustainable peatland ecosystem and to support sustainable peatland uses.
- Population pressure and the increase of land demand for cultivation in and surrounding peatland area.
- Lack of effort in sustainable peatland development.

The policy for peatland management in Indonesia is based on Peatland Hydrological Unit and used in accordance with function and carrying capacity, supported by related policies and laws.

The strategies for sustainable peatland management incorporates i) institution and human resource development, ii) technology utilization and adaptive commodity selection, iii) community empowerment and participation enhancement, iv) data and information provision, v) peatland degradation and peatland fire control and vi) funding sources and mechanisms.

Current efforts on rehabilitation and sustainable use of peatland/forest are in line with and support peatland ecosystem management.

Paper 3:
Sustainable forestry and reduces impact logging practices of peat swamp forest in Malaysia

- Dr. Ismail Parlan et.al, Forest Research Institute of Malaysia (FRIM)

Peatswamp Forests in Malaysia covered 1.56 million hectares in 2007. The management of peat swamp forest (PSF) in Peninsular Malaysia currently adopts the selective cutting approach or called as Selective

Management System (SMS) that originally developed for dry inland forest. PSF of Sarawak is being managed by using modified Malayan Uniform System (MMUS).

Because stand conditions in dry inland forests differ from those of the PSF in term of species composition, stand structure as well as habitat conditions, it is only appropriate that PSF management prescription should be developed based on its own characteristics. The method of harvesting of PSF should use Reduced Impact Logging (RIL) to minimize impacts on residual stands. It has been shown that RIL method can be implemented successfully in the PSF environment. Thus, it should continue to be used, promoted and enforced in PSF harvesting.

In Pahang, the harvesting method used in Pekan Forest Reserve (FR) is the Rimbaka Timber Harvester or Rimbaka. The machine employs reduced impact logging (RIL) method and has been the only system used for timber harvesting since 1999. Among the critical aspects of the harvesting system is a minimized impact on the residual stands. This will then in return minimize the cost of silviculture treatment and speed the natural recovery of the trees in harvested areas.

Studies show that the implementation of the RIL method in PSF helps to minimize damage and mortality of the residual stand and therefore should continue to be used in harvesting of productive PSF areas.

Paper 4:
Assessing the Success of Tropical Peatlands Restoration: A Review

- *Mr. Alue Dohong, et.al, University of Palangka Raya*

Tropical peatlands accounts 11% of the global peatland area, and 56% of the tropical peatland is located in Southeast Asia. Indonesia has about 47% of the SE Asia peatland area (*Page et al, 2011*).

Peatlands play an important role in terms of ecological, economy & society through its functions and services such as climatic regulation. Tropical peatland is considered the biggest and most efficient carbon storage and sink in above ground biomass and peat soil. Peatlands in Indonesia store between 15.93 Gt to 58.33 GT carbon in its depths.

Tropical peatland is under threat of degradation mostly from anthropogenic activities and misguided policies. Conversion to other land uses, mainly industrial plantation and agriculture; logging, drainage and repeated fires are considered major drivers of peatland destruction and degradation in Southeast Asia notably in Indonesia. Peat oxidation and subsidence due to fires lead to huge CO_2 emissions to the atmosphere. Peatland conversion also reduces peat forest cover, causing loss of biodiversity, socio-economy and culture of the local people.

To reduce peatland degradation, it is necessary to stop drainage, rehabilitate areas and prevent fires. Restoration is generally aimed at to restore major functions and services close to its original state. Rewetting of degraded peatland is considered the most effective and efficient way to combat peatland drying and stop peatland fires

Many tropical peatland restoration activities have taken place since the last decade but it is unclear how effective these have been. Therefore, there is a need to develop an assessment framework to evaluate the success of tropical peatland restoration initiatives.

Current intervention approaches include hydrological restoration; re-vegetation; Protection of Carbon Storage and Sink; Fire prevention and control and livelihood development. They are often site-specific, project-based and not integrated. Consequently, the success and sustainability is mixed. There is a lack of comprehensive assessment and monitoring; and there is no integrated framework for assessing the success. Some examples of success indicators that can be verified are water level management, reduction of fire incidence, employment level and organic matter concentration.

The suggested major steps in measuring success are:

- Developing monitoring design and protocol
- Conducting the baseline study
- Establishing a reference site
- Implement monitoring both within reference & restored sites
- Evaluating the success (direct comparison & trajectory analysis)
- Improving restoration strategy & measures

The procedure above should be used to develop the general framework for monitoring results.

Paper 5:

Giam Siak Kecil- Bukit Batu Biosphere Reserve : A public-private sector initiative for merging biodiversity conservation and sustainable use of tropical peat swamp forest.

- *Mr. Canecio P.Munoz & Mr. Haris Surono, Sinar Mas Forestry*

To manage peatland and peatswamp forest in Riau, there are challenges such as illegal logging, forest encroachments, development pressures, fires & haze pollution, rural poverty, biodiversity loss and etc. And there are opportunities like the UNESCO Man and the Biosphere (MAB) landscape management approach.

A Biosphere Reserve (BR) is an area of terrestrial and coastal/marine ecosystems, or a combination thereof, which is internationally recognized within the framework of UNESCO's Program on Man and the Biosphere (MAB) (*Seville Strategy, 1995*). It is established to promote and demonstrate sustainable development models and balanced relationship between humans and the biosphere.

There are three functions of BR. I) in conservation - conservation of biodiversity and ecosystems; ii) in development - association of environment with development; and iii) in logistics - international network for research and monitoring.

In implementation, there are three BR zones. I) The Core area is a permanent conservation, like National Park, Wildlife Reserve or Strict Nature Reserve; ii) The Buffer zone is a forest area around the core area which may be used for economic purpose especially for local communities; and iii) The Transition area are various development areas surrounding the buffer zone.

In 2009, LIPI (Indonesia) have proposed Giam Siak Kecil to be the first Biosphere Reserve in the world to UNESCO. The Bureau of Research and Development of Riau Province, LIPI, BBKSDA of Riau, Sinar Mas Forestry and University of Riau signed an MoU for research and development in the Giam Siak Kecil-Bukit Batu landscape.

The areas of collaboration are:

- Research and development of science and technology which encompasses, among others (eco-hydrology and natural resources of the peatswamp forest, as well as the socio-economic condition of the local communities),
- Compilation and arrangement of documents, scientific publications, and the dissemination of the results of research and development, in order to formulate the management policy of the GSK-BB landscape,
- Establishment and the development of a "research station" to support the joint co-operational activities.

The GSK-BB was approved by UNESCO as a first biosphere reserve in the world and designated for inclusion in the World Network of Biosphere Reserves in Jeju City, Republic of Korea in May 26, 2009.

The development of each zone are:

- Core area development for research station in Tasik Betung (Siak Regency) and Air Raja (Bengkalis Regency); education and training; ecotourism; carbon credits; payment for environment services (PES)
- Buffer zone development is composed mainly 88% of pulpwood plantation managed by Sinar Mas Forestry and partners; well-managed pulpwood plantation forest which supports the protection of the core area
- Transition area development is dominated by oil-palm plantations, smallholder food crops and other farms, village settlements; area for collaborating and developing community-based livelihood development models.

The REDD+ project is important to maintain development of GSK-BB as it will fund the management of GSK biosphere reserve (in addition to other fund sources such as APBN and APBD). GSK-BB is an REDD+ pilot project because there are more than 100 cubic metres of sea level carbon stored within it.

The management of the GSK-BB BR is done through collaboration between the government, scientific committee and Sinar Mas Forestry.

The responsibilities of that coordinating board are to:

- Carry out and implement the coordination and communication between various authorized institution/agencies and stakeholders
- Assign and share roles and responsibilities
- Implement the management approach for GSK-BB BR; encompassing the conservation areas, natural landscapes, and cultivated areas.

GSK-BB BR is a practical public-private partnership for merging biodiversity conservation and sustainable use of tropical peat swamp forest; an effective approach where scientific knowledge and governance modalities are combined to reduce biodiversity loss, improve livelihoods, enhance social, economic and cultural conditions for environmental sustainability; through the involvement of local communities and the participation of key stakeholders in the management of the landscape.

Q&A for Session 1

Q: Is there a monitoring program to assess the progress of carbon reduction? How many per cent can carbon emissions be reduced with natural forest and peatland management?

A: We launch the calculation of land cover, deforestation rate is increasing. 1 million hectares deforestation can reduced 26% of carbon emissions. There is no big effort to increase deforestation. The Ministry of Forestry also prepare a fire-man, we called them "Manggala Agni" for forest fire.

Q : How do we measure the success of deforestation? What should be done within management of industrial plants forest to measure it?

A : We cannot separately identify the Reforestation success. Deforestation may be able to accommodate all aspects of this may be said to be a success.

Q : What is your assessment of carbon budget and how the results? Is there a carbon budget study of 3 ral system?

A : Forest fire is less than before, from the monitoring system of the land area of forest cover increased by 15% from the previous. But forest fires should still be considered. About carbon budget study of 3 ral system, there is a method to calculate it.

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Q : Conservation area is under forestry department, but there is also the governor's decree about it. How do they have any difference in interest? There is a chairman for each management, between the buffer area, core and transition areas. How you can form a collaborative management plan? How is the financing?

A : This is precisely the role of nature reserves. There are three principles in the management approaches: landscape management, multi stakeholder management and scientific base management. Different interests that must be satisfied with the 3 approaches the GSK was issued which is chaired by the governor and the regents. This was done in Riau on Giam Siak Kecil. In Indonesia there are 7 biospheres: Gunung Leuser, Taman Nasional Cibodas (Java), Taman Nasional Komodo, Lorenindo (South Sulawesi), Bukit Batu (2 wildlife reserve amalgamated with the forest), Giam Siak Kecil and the Wakatobi National Park will be a biosphere reserve in Indonesia in 2012.

Q : How Sinar Mas has 1 million available for plantation? And how is the productivity of their land?

A : The worst case we have is we use 10% of peat land and almost the entire area has a lesson for area of commercial crops. About productivity, we conducted three planting periods with three types of plants (*Acacia crassicarpa* etc.).

Q : Will any regulations be prepared to enforce the moratorium on deforestation?

A : It is still in discussion. Our moratorium will end in two years but it is up to the funders to decide if it will be extended.

Q : It is imperative to reduce emissions that have occurred, so we can intervene to stop it from increasing. Are there any plans of the government to issue a policy in order to improve water management and reduce emissions?

A : The peatland regulations is in cabinet and will be launched soon. Water management is very important to manage the buffer zones, it has been included in the draft regulations.

Session 2 : Best Management Practice and Case Studies- Forest Plantation
Moderator : Mr. Ernest Chai Oi Khun

Paper 6:
Development of Silviculture technique for native tree species of Peat Swamp forest in Indonesia

- *Dr. Cahyo Wibowo, IPB Darmaga, Bogor*

Planting of peat swamp forest with native tree species, such as belangeran (*Shorea balangeran),* ramin *(Gonystylus bancanus)*, geronggang (*Cratoxylon arborescens)* and tumih (*Combretocarpus rotundatus)* is an appropriate solution for alleviating peatland degradation. However, the procurement of planting stocks is still problematic due to difficulty in obtaining large quantity of seeds. Cheap and rapid planting stock procurement is conducted by applying the cutting propagation method to rehabilitate peatlands.

This research was conducted in Central Kalimantan.

Materials used were hormone IBA 100 ppm, NAA 100 ppm, and mixture of hormones IBA and NAA 50 – 50 ppm. The media used were coconut fiber, rice chaff and vermiculite. Hormone IBA with dosage of 100 ppm, hormone NAA with dosage of 100 ppm, hormone IBA with dosage of 50 ppm mixed with NAA with dosage of 50 ppm, young coconut water (100%) and control.

The variables that were observed are plant growth in terms of growth percentage and growth quality: plant code number, live and dead plants, plant species and plant height.

Plant propagation for ramin species through shoot cutting produced 100% survival rate, whereas the success of belangeran species ranged between 50.67 – 77.31%. Plant propagation for tumih species using shoot cuttings produced survival percentage of 82.67 – 90.67%, whereas those for geronggang species were 43.33-60.67%.

Hormone treatments of NAA 100 ppm, IBA 100 ppm and IBA 50 ppm mixed with NAA 50 ppm produced significant effect toward number of roots and shoot dry weight for belangeran species. Hormone treatments of NAA 100 ppm, IBA 100 ppm and IBA 50 ppm mixed with NAA 50 ppm produced significant effect toward number of roots for tumih species.

Plant propagation techniques with shoot cutting for species of ramin, belangeran, tumih and geronggang produced growth percentages of respectively 95%, 70%, 89% and 70%.

Tree species being planted by Provincial Forestry Service of Central Kalimantan in Sebangau National Park, in area of 400 ha with planting spacing of 3 m x 3 m, exhibited survival percentage of more than 90%.

Paper 7:
Conservation and sustainable use of Melaleuca forest on peatland and marsh area in Ca Mau, Vietnam.

- *Mr. Pham Trung Thanh, Dept of Agriculture & Rural Development, Vietnam*

Peatlands in Ca Mau cover 9,850 ha, a reduction from 30,000 ha in 1978; covered mainly by Melaleuca (*Melaleuca cajuputi*) forests. It contains 79 flora species including 11 timber species; 32 mammals, 74 birds, 36 reptiles and 11 amphibians.

Forest fires affected 28,000 ha in 1983 and 230 ha in 2010. The main causes of forest fires are field clearing, honey collection and mouse trapping.

For conservation, U Minh Ha National Park have been divided into 3 sub-areas:

(i) Conservation of peatland ecosystem (2,570 ha); (ii) restoration and sustainable use of wetland forest ecosystem (4,961 ha); and (iii) service and administration (554 ha).

Forest fire prevention activities include fire watch station , fire-level alarm board, leaflets, training and workshop, canal and sluice system to control peat hydration, green bank and availability of equipment.

The annual harvest of Melaleuca forest area is 1,385 ha with a volume of 79,650 m3. The main uses of *Melaleuca* wood are for construction poles, furniture and charcoal making**.** The Annual plantation in *Melaleuca* forest area averages 1.384 ha/year with 105 ha/year on embankments.

Improving livelihood is the key issue for sustainable management of forests. According to the 70/30 regulation, farmers are required to maintain 70% of allocated land as forest. The challenges are high poverty rate, inadequate infrastructure and public services. There is a need to improve livelihood for sustainable forest management. Some efforts taken are technical training in rice cultivation, fruit tree farming, domestic animal husbandry, aquaculture etc. for the farmers to reduce poverty.

To improve income from forestry, embankments are planted with more profitable tree species such as *Acacia mangium.*

Paper 8:
Responsibly Managed Plantations on Peatland- A positive Story

- *Mr. Toni Wenas, APRIL Indonesia*

Fibre from planted forests will need to increase from 800 million cubic metres to 2.7 billion cubic metres by 2050 (WBCSD Vision 2050).

Indonesia has a real opportunity to lead the world in this sector: tree growth rates, land availability, cost of production, ability to invest in technology and capacity, productivity and proximity to key growth markets.

Riau is a driver of national development, accounting for 6.5 % of Indonesia's national GDP in 2010. Private sector has been a key to increasing Riau's GDP by 250% in the past 5 years.

Forestry is helping the economy and helping people with a focus on education, health and infrastructure development.

RAPP operates on peatlands because of the commercial opportunity since 20 years ago to become a key plantation-based fibre supplier, Riau had a development imperative, government concessions on peatland were available and a profitable business – that supports investment in science and development of responsible land management.

Existing condition:

- 40% of Riau is on peatland - mineral soil developed first and now scarce.
- 85% of that peatland is already degraded or converted for agricultural uses.
- Just 15% of peatland remains intact and of strong conservation value.

- The real questions to our mind are therefore:

- How can the areas of peat already converted or degraded be best managed - to further Riau's agenda AND contribute to environmental goals?
- How can the peatland forest in good condition be conserved and protected – real time, real world?

After 20 years, the conservation focus is now on conservation areas that can be protected, multiple buffer zones that protect the core and water management.

In practice APRIL has been conserving forest since 2005; held 36 HCV assessments, conserved 200,000 hectares of forest, added 35% to the existing natural forest protected by government in Riau, continuously developed community, implement a no-burn policy and active fire management, practise energy self-sufficiency and reduced chemical use, continual improvement of water, soil and crop management based on science, and plantations are used as buffer zones to protect the peat dome.

In comparison, RAPP managed plantations are better than unmanaged land.

RAPP peatland management:

- Protection of critical headwater peat areas to maintain the integrity of the peat dome.
- Water management practices that ensure water levels compared to "At Take Over" levels are managed.
- Plantations that ring conservation areas discouraging encroachment, illegal logging, unmanaged drainage.
- Continually treed buffer zone between our plantation and natural forest to further influence water levels.
- Review and adjust plantation practices to maximise tree canopy cover, improve soil and water protection.

Overall goals in regard to carbon emissions and peatland:

- Establish a verifiable baseline range of carbon emissions from the concessions at the point at which we took them over and variations to current emissions levels.
- Establish a total carbon emissions footprint from all of our current operations and activities combined.
- Measure and progressively improve effectiveness of carbon emission reduction initiatives.
- Determine a carbon emissions mitigation plan for the long term, towards stable, sustainable land use – now and for the future.

There is yet more work to be done. APRIL has embarked on a comprehensive and long-range programme with a number of third-party experts to build knowledge about carbon emission. They are also commissioned or participating in a number of scientific projects to gain a more complete picture of the relationships between peatland, carbon and forestry activities.

Some see plantations and effective peatland management as contradictory, but responsible plantation development is a real-world solution – balancing development, sustainability and conservation.

Paper 9:
Peatland development challenges- A case study from Kampar Peninsula, Riau, Indonesia

- Dr. John Bathgate, APRIL Group

In 2000 drains were dug to extract timber and abandoned after brief use, lowering groundwater levels.

Before development, degraded & Non-Forest covered 51% of the study area, with a dense network of abandoned ditches and soil subsidence near the ditches. Indicative soil carbon loss 2003-10 was ~20 t ha-1 yr-1 CO2. Estimated decline in study-area forest biomass, 2005-09: 7- 8 ton CO2 ha-1 yr-1 biomass decline.

A non-intact landscape a legacy from illegal logging : Illegal logging drainage started c. 2000 has caused lasting distortion of terrain and incised valleys will likely continue subsiding until permanently flooded, in very long term

Significant loss of forest biomass : still occurring years after illegal logging has moved on, 'edge effects' to large trees from exposure – decades before recovery commences, exposure rather than soil drainage effects on forest appear the widest impact.

Land-use planning needs accurate DEM : e.g. to locate set-asides on the least distorted landforms, new technology needed to remote sense & model landscape terrain regardless of forest canopy and soil water levels

Carbon footprint: monitoring must encompass landscape scale over very long time horizons. (APRIL pulp & paper Carbon Footprint 2009; done independently by Swedish Environment Research Institution).

Set-aside Natural Forest was rehabilitated by closing abandoned illegal ditches. 12 permanent weirs were built using geo-textile sand bags. Forest collapse & peat subsidence is hopefully slowing down.

Paper 10:
Carbon budget in *A. crassicarpa* pulpwood plantation in peatland

- *Dr. Basuki Sumawinata et.al, Bogor Agricultural University*

Calculation of carbon budget in peatland using the model of ΔABG - ∑E = ? is facing uncertainty with respect to below ground carbon stock measurement/estimation due to great variation in land surface and Bulk Density.

The calculation of Carbon budget of *Acacia Crassicarpa* plantation on peatland using the alternative concept shows that the carbon budget tends to be positive depending on the plantation management, in that the highest the production bring the highest sequestration.

With constant emission from peat decomposition, high production is the reflection of best fit management is the measure for reducing emission.

Paper 11:
Plantation forest fire management and community participative approach

- Mr. Slamet Irianto, Sinar Mas Forestry

PT. Wira Karya Sakti is a plantation forest concession license holder which was incorporated in 1997. Its total area is 293,812 hectares with planted forest at 174,200 ha (85% of targeted plantable area). Pulpwood is exclusively supplied to APP Indonesia pulp and paper mills and achieved Forest Certification, LEI SFM Standard.

Challenge/vulnerability : plantation forest block areas are located adjacent to community lands, 140 villages surround forest blocks and customary slash-and-burn practice in land preparation often result in escaped fires.

Fire Management is a Stakeholder Collaborative effort. It covers prevention, control, post fire handling, and safety issues. The target is zero fire, achieved through complying with the laws and regulations with regard to forest and land fires, Organizing Community Fire Teams (Kelompok Masyarakat Peduli Api or KMPA), promote sustainable use of non-timber forest products as part of the activities in forest & fires prevention, and improve sense of responsibility to all.

The Fire Management Implementation in PT Wira Karya Sakti Forest Concession Area involves i)Strategic Policy; ii) Operational Actions ; iii) Monitoring; iv) campaigning and v) Other activities.

Peatland Management Practices Land preparation and water management practices are an integral part of fire management. Fire prevention and control activities are integrated in PT Wira Karya Sakti's Sustainable Forest Management plan.

Q&A for Session 2

Q : What is the size of the area in the field for planting the plant species that you used in your research?

A: our data is only data planting for Ramin. For the other species mentioned, seedlings are used. Total area for nursery of seedling, raising and cutting process is 265 ha and area for monitoring 0.05 ha.

Q : Are there any plans to continue planting Ramin in the future?

A: I do not know yet because it is a local agency programme.

Q : What do you mean when you mention 'open area'?

A: In open areas, there is no shade.

Q: the purpose the experiment?

A: the experiment is designed only to study the effect of plant growth. We use the media form of vermiculite mixed with coconut fiber or cocopeat, and then all of them applied in the mini propagation house. We use an ordinary water sprinkler system to water every four days.

Q : How about the survival rate of Ramin and Belangeran?

A: We did not observe the survival rate for those two species.

Q : How about the initial planting?

A: We don't know the initial planting, but we do know the schedule on the planting growth at the certain time.

Q: How do you manage fire on the peatland?

A: We spend lots of money and two helicopters for the prevention and early prevention training.

Q: How to control an area of 15 000 ha? How do we know if there is a fire?

A: Fires comes up from the outside. We have developed the team that allocation in the core, surround green field. The only ways is developed small local community who live around the land.

Q: How about future planning (20-30 years)? Does RAPP not use productive land? How about the increased demand?

A: We have an area of concern is 50 million ha. We not only want to move forward but we are also thinking about sustainability. We spend a lot of money for it. We also cooperate with researches to find a way how to sustain. With the strong demand of pulp and paper, some of the Asian country, especially Indonesia has ability and opportunity to fill in the demand. And talking about our RAPP plan in the future, we have our concession area, so far we got the amendment to the concession in 2009. So we have for RAPP area's yet. So is still have a plan to develop all the area. If you ask are we to expand? In third on concession we do not know yet, because there is some factors from government policy. Even though the land is availability and appropriate to produced more, sustainability is imperative.

Q: It would be wise if there is another option that can be compared in the plantation on your presentation (RAPP)!

A: In the plantation we adopt western pattern (concerned area). Indeed many other options, I did the controversy comparison but it did occur in the real reality.

Q: What do you do to confess challenge?

A: We work with central and local governments with existing regulations to make Riau as a modern industrial area.

Q: Sinar Mas has Giam Siak Kecil for balancing sustainability, what does RAPP plan to do to contribute to sustainability?

A: Not only RAPP, we can do something better if we are together. As the private sector we can do together to commit the initiative in creating sustainability.

Q: From your research, when is the best time to develop carbon and how is the best condition? Is it better in the wet or dry season? How do you come to a conclusion?

A: It is so difficult to measure it. But if you measure continuously, the fluctuation is look like changes because of the so many variable. For example, in rainy time soil is watering, so it is no space for O2. It cannot to measures and also if the condition is too dry. And if it's too hot, it can be pumping from soil to the air. So, when is the best condition, we still do not know. We must make average and measure it automatically, it is very expensive.

Q: What time is your measurement and what methods do you use?

A: The time of measurement is not 24 hours, but twice a day - in the morning and afternoons. We use the closed chambers method which is rather primitive/basic.

Session 3 : Best Management Practice and Case Studies - Rehabilitation
Moderator : Mr. Alue Dohong

Paper 12:
Peatlands Rehabilitation: "Limitation factors, constraints and lesson learned"

- Mr. Iwan Tri Cahyo Wibisono, Wetlands International Indonesia Programme

Project on rehabilitation of peatlands end establishment of sustainable agro-system in Central Kalimantan: LIPI and JSPS Core University program on "Environmental conservation and landuse management of wetland ecosystems in Southeast Asia". The activity is rehabilitation of intensively disturbed peatswamp forest area in Central Kalimantan. It applied different regimes (with or without clearing, fertilizer application, and with 5 different species.

PT. Dyera Hutan Lestari (PT. DHL) had planted Jelutong plantation in Jambi province. The species that were planted was *Dyera polyphylla, Alstonia pneumatopthora and Litsea spp.* The concession area is 8,000 ha. The results are SR (90%), diameter increment (2 cm). In 1997, a massive fire wiped out the planted area, putting an end to the research.

The lesson learned from this is that mass production **is** technically possible and that fire prevention is crucial to protect Jelutung plantations.

The rehabilitation of ex-burnt areas in the core zone- Berbak NP: Field implementer with local community, MoU (WIIP-PT.PIW-Berbak NP), 20 Ha (4 different sites), ex-burnt core zone of NP and 8 species.

There are 3 main stages: assessment (stakeholders assessment, biophysical assessment), preparation (determination with rehabilitation technique, community engagement, seedling preparation, training), implementation (land preparation, planting, maintenance, SR monitoring).

Planting phases:

- Phase 1 :
    - In the first month, Survival Rate exceeded 80%.
    - The planting site was later hit by floods, bringing the survival rate down to 4.9% in the third month.
- Phase 2:
    - Survival rate at 82%;
    - Best growth was recorded in *Combretocarpus rotundatus*.
    - *Gonystylus boncanus* showed promising survival in open area, but is slow growing.
    - *Syzigium* spp. and *Combretocarpus rotundatus* were found to grow very well in wet areas.

The CCFPI + CKPP Rehabilitation Program (2002-2007) was integrated with canal blocking. The total planted area was 600 ha, involving 12 species. The survival rate was 72% at the end of the project. Certain areas burnt in 2009 (2 years after the project ended). The activities involved planting with local communities, planting along dikes, at Dam construction site, inland, and alongside canals.

The CCKP Planting trial was a cooperative effort by WIIP and Palangkaraya University. 3 species (*Dyera lowii, S. belangeran, Stenomorus spp.*) were planted, 100 plants of each species. The project duration was 6 months (from June-Dec 2008).

Lessons Learnt:

- 'Hardening' is very important to support survival of the seedlings
- For drained peatlands, planting is more effective if integrated with hydrology restoration.
- There are still many promising species for rehabilitation but limited knowledge on propagation and planting techniques
- The artificial mound system is "relatively" effective but costly.
- Community involvement and training is important, primarily in sustaining rehabilitation.

Species preferences are:

- In inland ex-burnt area: *Dyera lowii, Alstonia pneumatophora, Combretocarpus rotundatus, Shoera belangeran*
- In wet areas: *Lophopetahum spp., Campnosperma spp., Shorea belangeran, Pandanus helicopus.*

In conclusion, fire prevention is the key factor for success. Understanding of Hydrology is also important to support rehabilitation programmes.

Paper 13:
Agroforestry of Jelutung on Peatland: A lesson learned from Central Kalimantan

- *Dr. Lailan Syaufina, Faculty of Forestry, Bogor Agriculture University (IPB)*

The reason Jelutung was used as the research focus was because *Dyera lowii* is an indigenous tree species in peatlands. It is a protected species**,** multipurpose tree which produces wood and latex; and has the potential to offer an alternative livelihood for communities living on peatlands.

The study locations are at Tumbang Nusa, Mentaren II, Jabiren, Kalampangan and Kereng Bangkirai villages.

Methods used were:

- Data source (primary, secondary).
- Data compilation technique.
- Jelutung's performance.
- Environmental aspects: micro climate, Temperature, Relative Humidity, soil temperature and light.

Results and discussion:

- Seedling used for degraded peatland (assumption of death in transportation of 20% and the successful planting in the field of 80% with planting spacing of 5 x 4 m).
- Jelutung nurseries were developed by the community of Tumbang Nusa, Taruna Jaya, Jabiren, and Hampangin villages. Tumbang Nusa is known as a centre for Jelutung nursery with the production of 1-3 million ready stock annually.

The development of Jelutung in agroforestry system to recover degraded peatlands is technically feasible, with the ability to supply 126,920,000 seeds per year, and ready planted seedling supply of 1 – 3 million seedlings per year. There are various agroforestry system patterns of Jelutung developed by local communities which could be considered and adapted. Furthermore, the microclimate in Jelutung agroforestry areas is better than in monoculture plantations.

Paper 14:
Proposed Restoration of Ramin (Gonystylus bancanus) in Peatlands in Sarawak, Malaysia

- Mr. Ernest Chai Oi Khun, Consultant, TropicTrees Enterprise

Sarawak has a total land area of 12.3 million ha of which 1.3 million ha are peatlands or peat swamp forest. Peatland located along costal lowland areas and lower parts of river mouths. 750.000 ha of peatlands constituted as permanent forest estates (PFE). Most common timber found in the peatlands were Ramin, Jongkong, Sepetir, swamp Meranti, Medang and others. Some peat swamp forest were typically dominated by Alan (*Shorea albida*) in the natural forest.

From 1980s onwards, most peat swamp/peatland forests were almost being logged. Silviculture treatments were carried out in the logged-over PFEs. Yield plots (YP) were established in silviculture treated PSF. Regeneration was not promising and the growth rate was slow compare to the hill species. Due to oil palm plantation development pressuring for land, peat swamp forest were excised for oil palm. Peat swamp PFE was reduced from 780.000 ha to less than 320.000 ha in 2004.

The government, legislative bodies and finance institutions should be concerned about this problem and cooperate with each other.

The proposed actions to be taken in Peatlands/PSF are:

- Cease immediate excision of peatlands for oil palm plantations
- Stop all logging & encroachment in the peatswamp forest in the PFE
- Carry out an inventory of the remaining PFE in the peatswamp forest
- Identify suitable areas in the peatlands for restoration of Ramin and other common peatswamp timber species
- Forest department to continuously conduct R&D with local and overseas institutions.
- The proposed Ramin restoration plan requires;
- Active participations of authorities such as government support and commitment, legislative support, staffing, initiate restoration of Ramin in peatlands in the permanent forest estates, continue in research & department (local and overseas institutions).
- Local community participation in restoring peatlands such as dialogue about peatswamp logging, launching of the planting project, and planting in SC areas.
- Trial planting of Ramin in oil palm estates in peatlands. Two type of forests that were planted are peatland forest and mineral soil. Ramin can be planted between two rows of oil palm.

Paper 15:
Rehabilitation of Degraded Peatland thru Commercial Pulpwood Plantation Development in Ogan Komering Ilir, South Sumatra

- Mr. Sambusir Yusuf, Sinar Mas Forestry

Only 4% of Indonesia land use allocation is given to plantation forests.

In an area in South Sumatera, before plantation development, a large area of natural forest had been razed by fires, especially in the El-Nino episodes of 1997-2002. It resulted in land subsidence, trans-boundary haze pollution and loss of economic opportunities for local communities. Locals had to leave to find an alternative source of livelihood.

After 2002, Sinar Mas forestry was given permission to rehabilitate the degraded area with *Acacia crassicarpa* for pulpwood production. 216,000 ha was planted at a cost/investment of USD 324 million.

Good plantation management practices were implemented, including

- Usage of suitable timber species (*Acacia crassicarpa*) for timber plantation.
- 4 to 6 years economic rotation.
- Development intervention.
- Water zoning for better eco-hydrological control.
- Appropriate infrastructures.
- Allocate and manage conservation area set a sides.
- Providing job and business opportunities to local people.
- Organizing/supporting community fire teams or "Masyarakat Peduli Api".
- Developing empowerment & community livelihood programs (avoiding unsustainable farming practices).

In conclusion, serious investment is required for forest rehabilitation program. A commercial pulpwood plantation development is an option to address economic, social, and environmental concerns.

And implementation of sustainable plantation forest management practices (water management, suitable species, developing partnership with local communities, well-resourced fire fighting organization is necessary to ensure success in the rehabilitation of degraded forests.

Paper 16:
Rehabilitation of Peatswamp Forest-Selangor Experience

- *Mr. Badrol Hisam bin Abdul Rahman, Selangor State Forestry Department*

The North Selangor peatswamp forest (NSPSF) is located in the north western part of Selangor State in Malaysia. It consists of Raja Musa forest reserve (23.486 ha) and Sungai Karang forest reserve (50.106 ha). NSPSF has global importance for its role in maintaining endangered and endemic species (biodiversity conservation) and as a huge carbon sink. Locally, it plays an important role in supplying water for domestic and agricultural, uses plus supporting the local wood industry.

The dominant tree species in Raja Musa forest reserve (RMFR) are *Koompassia malaccensis* (Kempas), meranti, kedondong and durian with small to medium sized crowns. Ramin, which is a common species in peatswamp forests, is now rarely found in this forest.

RMFR was intensively logged since 1950s with very little control and supervision from the forestry department and was only gazetted as a reserve in 1990.

Before forest rehabilitation began in RMFR, there were problems with the initial demarcation of forest reserves. There was a period of large forest fires followed by a problem with illegal encroachment into the forest reserve.

Issue and problems forest fires at RMFR:
There is a positive correlation between heavily drained and degraded forest areas and the incidence of fires within Raja Musa FR. Forest fires are common during prolonged dry spells in the months of February-March and June-August every year. The south-west side of RMFR which is severely degraded and dominated by grassland is prone to fire.

To mitigate these problems, the Forestry Department of Selangor took drastic measures including evacuating the illegal settlers, dismantling the houses and destroying the agricultural crops; blocking abandoned drainage canals and/or ditches; replanting and/or reforestation of degraded areas within the FR boundary; increasing patrolling and enforcement activities in the FR boundary and establishing and maintaining clear sign posts all along the forest boundary.

Challenges and Lesson learn:

- Natural or artificial regeneration?
- Building and maintenance of bund/blockages.
- Prevention of new encroachment.
- Weed infestation.
- Species selection for replanting and availability.
- Community based approach.
- Sufficient funding & trained human resources.

The next step will be procurement of planting stock; enhancing collaboration with the private sector, NGOs and the public as well as preventing any new encroachment attempts.

Paper 17:
Peatland Management-Experience and Research Findings in ASEAN Peatland Forest Projects (APFP) Pilot Site at Raja Musa Forest Reserve, Selangor-Malaysia

- Ms. Azian binti Mohti, Research Officer, Forest Research Institute Malaysia (FRIM)

Peatlands have the potential to become significant sources of CO2, resulting from human activities and forest fires. The use of satellite remote sensing, can provide local or global estimates of carbon stocks to fill the information gaps.

The APFP pilot site covers 4000 ha and is located in the southern part of RMFR. 2000 ha of this area is located outside the forest reserve, where the main land uses are agriculture and stateland PSF. RMFR was gazetted in 1990 after the stateland forest had been logged.

Two types of data was used - Secondary data the FR boundary and satellite images from 1989, 2001 and 2010. From the data, land use and changes in carbon stocks were mapped. Results show that carbon stocks fell from 1989 to 2001, and have begun to recover since 2001.

Therefore satellite imaging/remote sensing can be a faster way to estimate above-ground carbon stocks over a period of time. Fire was identified as the main threat to C stocks. It is recommended that rehabilitation should be increased and a detailed carbon assessment should be done on the site.

Q&A for Session 3

Q : Can local species be used for rehabilitation?

A : Actually we have been promoting that as an alternative because rehabilitation can not only be done with commercial species. But there is also prospective that we use a local species for the purpose of the rehabilitation. I would say that the determination of why that species are must be local species, why this is commercial species, why this oil palm. So, we have to go back to our programmed. If we are from NGO, and we are working International Park, so we are not going to do with a establish

species. But for Timber industry, it is different because they want to get the production. So, we have to set up our goals, and it will also relate to technology, for example in Berbak National Park, we didn't use regular spacing because we did not want it to grow like a plantation. So we used a random spacing for planting. But, different approaches were applied in Central Kalimantan, where we planted in regular lines. There is information that this approach has been successful in Thailand.

Q: Is there any regulation about forest fire management?

A: About the forest fire management, we use a strong regulation for example in Central Kalimantan. There is a good network in area for prevention a forest fire. If you go to that province you will see the banner "Those Who Burn the Forest Will Be Punished" erected everywhere. We have to consider and maintain the local community because they are the one who really work in the field.

Q: Can you explain more about the Jelutung?

A: About the Jelutung, there is a two kind of Jelutung, namely dry land Jelutung and wetland Jelutung. In Indonesia, Jelutung has already been planted in Sumatera. We need encouragement to use Jelutung for rehabilitation especially in the peatland area. In our study, the demand for Jelutung in the international market is increasing and the price about 10 USD per kilogram. For paper (pulpwood), the price is only IDR 3500 per kilogram for local communities, and about IDR 5500 per kilogram for companies. This is a very big difference in price. Jelutung is promising to be developed not only for rehabilitation but also for commercial markets.

Q: In your abstract you mention that commercial use will degrade the forest. Can you explain this?

A: In my abstract, I state that the commercial development is one of drivers of degradation of forests. The reason I say this is because the peat swamp area is a fragile natural ecosystem. If you try to convert it from natural to another condition, it will go through extreme change. I agree that planting Acacia will absorb CO_2, but the conversion process of peat land to other condition could produce CO_2. So I think we need to be wise before converting natural PSFs to other uses.

Q: How do you define critical lands?

A: The data for critical land is based on government data and there is a standard definition for it.

Q: In your agro-forestry model, you use fruit crops like mango, durian, rambutan and so on. Is it possible that plant can grow in conditions which are not suitable for it?

A: Yes there is fruit produced in that area. In West Kalimantan, locals plant oranges on the peatland and it produces a good yield.

Q: In your presentation you mention agro-fishery and the outcome is fishery that can protect the environment. But in agro-forestry, you use fertilizers and other chemicals. Can you elaborate on that?

A: Yes we discovered the other agro-forestry system called silva-fishery. Silva-fishery is the combination of forestry and fishery activities. In this case, the farmer surrounds the oil palm area with Jelutung and other seasonal crops in between of the Jelutung trees. As for fertilizer, before

the farmer applies chemical fertilizer to the trees, unfortunately we did not measure the chemical characteristic or the chemical content. But, in this study we also introduce to the local farmer to make compost. We have analysed the contents of compost, and it is very good for application to the land.

Q: Why do you recommend developing Ramin? What is the reason that Ramin can be a sub-rotation on a peatland and planting between oil palm?

A: If we planted Ramin, the cost is low. And we can plant Ramin in between oil palm, so after oil palm and then we plant Ramin, after that we can get a beautiful species of Ramin that can be used as a forest product. There are two palm oil companies that have started to implement it, because it is thought that by planting Ramin at the boundaries of palm oil plantations, it will not interfere with the production of palm oil. It can be used as an option if the affiliated companies do not accept the conservation suggestion.

Q: What is the step before your rehabilitation programme in wetland area in Central Kalimantan and Sumatra?

A: Normally before we start any activities in field, we always start with an assessment. So besides having a stakeholder social-economic assessment, we also did a bio-physical assessment which includes the assessment of climate in the area and its surroundings. So, the first step that we did was to list up as many species that we found in that area. And from there, we can learn from the literatures, from discussions and from our experiment to determine which one who having a final characteristic. We classified the characteristic into tolerant, semi tolerant and intolerant. It was used in order to split up a list of species. After we have the finalist species, we ask our self that do we have enough knowledge to prepare it in the field, then do that species available in this area, because different species has a different tolerance. Sometimes we should have a special cutting technique. For example, we did not prepare Belangeran seedlings from the seed.

Q: What is the reason for planting Rasau species?

A: The Rasau is a Pandanus species which is a common plant in along the river. In Kalimantan, we saw that species and wanted to plant the species at the Dam construction site. The reason is our Dam without a regular maintenance, after we leave this project so maybe the condition becoming worst. If we plant Rasau and Likopelatung, they have a big leaves. We hope that they grow very well, and they could act like or as a natural Dam. It is also a natural forest and it can help maintain the Dam.

Q : What is your criteria of measurement success regarding on the survival rates and how much the cost?

A : The survival rates is one of the indicator that we put account to measure our original program. In order to measures weather we are success or not, we also have to ask to ourselves. In this only about to measure species that survive, or there is another indicator? For example, if we work at the Central Kalimantan, and whereas in this area is habitat of Orang Utan, of course there also indicator of measurement. For example, how many species of fruit we planted, because the species is the source of the food of the Orang Utan. But, in our project, Berbak National Park, and also in

Sumatra, there are two indicators that we use. First is a survival rates and second is the biodiversity. And we always try to produce as many as species that we can. But we have to consider that species have a biology characteristic. About cost, in our case we use different approach, using bio-rights. We also calculate the seedling. Bio-rights is the way to link up the rehabilitation by improvement using microcredit. We engage with a community and offer them something we can provide, such as a loan; but they have to do something for environment in return. For example, they must plant trees to repay the amount 'borrowed'.

Conclusions:

1. Indigenous species has the potential to be used in the rehabilitation of peatlands.
2. For a successful rehabilitation effort, not only determinant that we should be concerned about, but must also consider aspects like a technique, social-economics and the land status.
3. Climate change and fires are the important things that we have to consider too, for a successful rehabilitation effort.

Session 4 : Certification and Monitoring
Moderator : Mr. Chee Tong Yiew

Paper 18:
Lessons Learned from Forest Management Certification on Peatland

- Dr. Haryanto Putro, IPB Bogor

The forest land area in Indonesia by April 2011 total forest land is 130.68 million ha. It consist of conservation forest (26,82 million ha), protection forest (28,86 million ha), production forest (32,60 million ha), limited production forest (24,46 Million ha) and conversion forest (17,94 million ha).

Certification Play-Ground (June 2011)

- NATURAL PRODUCTION FOREST = 284 FMUs (22.71 Million ha), less than half have cutting permit, probably less than 10 % currently eligible for certification. Only 1 Million ha Certified for Natural Forest (LEI+FSC).
- PLANTATION FOREST = 220 FMUs (9.68 Million Ha), 4.92 million Ha planted (probably less than half currently eligible). Only 0,54 ha for certified for plantation forest (LEI).
- CBFM (in community Lands) = approx. 3.59 million ha (mostly eligible with technical assistance/improvement).

Peatland in forest land covers roughly 10.1 million ha in production and conversion forests. Companies that have obtained the LEI Certification on peatland are DRT (90,060 ha) and WKS (246,482 ha). Approximately 46 per cent of this is peatland.

The key factors to the DRT success story are:-

- DRT Certified SFM : high commitment of FMU to continuously in management system, FMU area important for hydrological system maintained, minimum drainage of water, consistently implement selective cutting, consistently implement reduce impact logging especially using rail

road for timber transportation traditional skidding technique (kuda-kuda) and high local community “support”- minimum activities.

- Kampar Peninsula : Kampar Peninsula need landscape scale planning as single peat swamp forest ecosystem, policy-driven trade off based on identification of core area important for hydrological system and other HCVs, collaborative management = best possible approach, led by KPH Tasik-Besar Serkap and BKSDA, to improve water management based on closed drainage system and “eco-hydro buffer”, restore all degraded natural forest in core area, replace by non-timber forest product, ecotourism and environmental services product + local community based forest management.
- Certification experiences: Certification on peatland will only work if FMU is ready for performance assessment. Currently most peatland FMUs are not eligible for certification, non-certification approach, especially policy on peatland allocation and law enforcement is urgently needed to stop all forest conversion and illegal activities and create enabling conditions for better forest management, the highest priority action should focus on: (1) restoration of degraded natural forest on peatland and (2) improvement of water management system in plantation on peatland.

Paper 19:
Forest Management Certification under the MTCS with Special Reference to Peat Swamp Forests.

- Mr. Yong Teck Koon, Malaysian Timber Certification Council (MTCC)

Forest certification proposed as market-linked tool to promote & encourage effective implementation of Sustainable Forest Management (SFM).

Sustainable Forest Management is a concept of environmentally friendly, economically viable and socially acceptable.

Timber certification is a process which results in a written statement (a certificate) attesting the origin of wood raw material, and its status following validation by an independent third party.

The two components of Timber Certification are:-

i) Forest Management Certification: a process of carrying out third party assessment of Forest Management Units (FMUs) in accordance with requirements of a prescribed standard, leading to an award of a certificate.

ii) Chain-of-Custody Certification (CoC) which involves verification by independent third-party assessor that wood products (including logs) purchased are actually derived from forests which have been certified. It involves tracking of timber products from forest of origin through processing to retail point leading to an award of a certificate.

The Malaysian Timber Certification Council (MTCC) is an independent organisation which exists to develop and operate a voluntary national timber certification scheme in Malaysia. It is governed by Board of Trustees (BOT) with representatives from the timber industry, academic & research institutions, non-governmental organisations (NGOs) and the government.

The implementation of MTCS is both country and market driven.

- Country driven - as it is in the interest & well-being of a nation to ensure that its rich forest resources are sustainably managed to meet needs of present & future generations.

- Market driven - to take into consideration growing demand for certified timber products by more environmentally & socially sensitive markets as stipulated in their public & private sector timber procurement policies.

Standards for forest management certification:

- Malaysian Criteria and Indicators for Forest Management Certification (MC & I, 2002): for certification of Natural Forest, comprise 9 Principles, 47 Criteria and 96 Indicators.
- Malaysian Criteria and Indicator for Forest Management Certification (Forest Plantation): for certification of Forest Plantations, comprise 10 Principles, 55 Criteria and 107 Indicators.
- Malaysian Criteria and Indicator for Forest Management Certification (Natural Forest) : for certification of Natural Forest, comprises 9 Principles, 47 Criteria and 97 Indicators.

Management of Peat Swamp Forest (PSF) in Certified FMUs:

- The bulk of certified FMUs comprises inland forests (92.6%) with the remaining 5.2% and 2.2% comprise PSF and mangrove forests respectively.
- 242,906 ha of PSF found in four certified FMUs, with the largest extent (140,830 ha or 58%) located in Pahang FMU.
- Commercial logging of PSF carried out in two FMUs i.e. Pahang and Selangor FMUs.
- Both these FMUs have integrated Forest Management Plan (FMP) for PSF prepared through collaboration with international donor agencies.
- Overall, PSF is more extensive in Sarawak (0.95 million ha) than in Sabah (0.12 million ha) and Peninsular Malaysia (0.24 million ha).
- PSF is being managed under a modified Selective Management System (SMS).
- Prescription of minimum diameter cutting limits of 50 cm for ramin species (*Gonystylus bancanus*) and 55 cm for all other species, in the case of Peninsular Malaysia.
- Ramin species is subjected to an export quota of 10,000 m^3 for Peninsular Malaysia (listed in Appendix II of CITES).
- From certification view point, forest management planning and operations in PSF are required to comply with requirements covering social, economic and environmental aspects as stipulated in the MC&I (2002).
- The assessment for forest management certification of a FMU involves documentation review, stakeholder consultation and field verification.
- For example, Indicator 6.2.2 of the MC&I specifies the allocation of buffer strips of at least 5 m in width on either side of river/stream in PSF which are marked where the felling of trees is prohibited.
- Annual surveillance audit conducted to ensure continued compliance to requirements of MC&I.
- Forest management certification enhances forest management practices in PSF.

Chain of Custody of forest based products – requirements (PEFC ST 2002:2010). There are two mechanisms for tracing the origins of forest-based products:

- Physical separation method – requires separating certified and non-certified raw material during all phases of production/trading process to ensure that certified raw material is not mixed with non-certified raw material.
- Percentage based method – allows mixing certified and non-certified raw material during production or trading process. Percentage of certified raw material must be known and communicated to the company's customers.

- Alternatively, company can sell as certified proportion of its production which equals percentage of certified raw material used (volume credit).

By the end of April 2012, a total of 173 timber companies have been issued with PEFC Chain of Custody Certificate (accredited certificate) under MTCS. 94 of these companies have signed PEFC Logo Usage Licence agreement. To date, some 4.65 million ha of PRF including 0.24 million ha of PSF certified (about 33% of total PRF in Malaysia) under MTCS.

Paper 20:
Issues and Observation of Forestry Practice on Peatland – Case on Indonesia Mandatory Certification Independent Monitoring.

- *Mr. Mohd Zainuri Hasyim, Independent Forest Monitoring Network*

The purpose of TLAS (Timber Legality Assurance System) is to provide a reliable means to distinguish between legal and illegally produced forest products.

There are five instruments to achieve this: a definition of legally-produced timber, control of the supply chain, verification, issuance of licenses and independent monitoring of the systems.

The components of TLAS are timber Legality Verification (VLK) and Sustainable forest management (PHPL).

TLAS provides:

a. Assurance: legality and sustainable management (*During is often questionable and dubious).*
b. Improvement of forestry governance: forest destruction/illegal logging, transparency, multi-stakeholder participation, attacking corruption.
c. Consumer/market responsibility to satisfy both supply and demand.

In the case of Peatlands, peat swamp forest is an ecosystem with a fragile and endangered condition. It is vulnerable because improper use will interfere with its function, and it is hard to restore. It is endangered by the trend of peatland utilization due to the expansion of logging and conversion.

In Riau Province, there are 4 million hectares of peatlands (Wetlands International) spread over 4 corridors. There are 51 timber plantation concession covering 824,099 hectares, 17 logging concession covering 707,244 hectares, and 36 palm oil concession covering 243,611 hectares (Jikalahari, 2010).

The Main issues found by IFM are:

- Many stakeholders put a big hope on efforts to improve forest management in Indonesia.
- Permit is a major problem.
- There is limited access to information, processes, and location.
- There are not enough procedures and communication standards for the assessment and certification process.
- There is no peatland categorization on the assessment indicator.

Q&A for Session 4

Q : Sometimes the forest management unit or multi base unit or other management companies is very difficult to get certificate because it requires a long process, a long time and high cost. Beside there was no difference in approach to companies that perform voluntary certificate. What do you think about this?

A : Management certification in Indonesia has been promoting since tahun1993. Hard to get permission is not a major problem. The problem is the cost incurred for the improving industry management system because it is quite expensive. Costs incurred for the certificate is not expensive when compared to the potential benefits. The linkage between voluntary certificate and the regulation in Indonesia is not good enough. But we have recommended to provide better incentives for companies or forest management unit certified by the voluntary scheme but it has not been able to run well.

Q : Certification can be a barrier in black market because there is a market war to the extent that the local or national price are being put down. What is your opinion about this?

A : Market Certified product goes to FSC and LEI system. Plantation in Indonesia context there is no eligible for FSC certification because there are cut of our policy in 1994. So most of Indonesian certification contact is not eligible for FSC certification. LEI has understanding memorandum with FSC for plantation, but there is no a good process. Now in Europe, there are 2 acceptable schemes, PFE and FSC.

Q : What is your opinion regarding the uncertified market?

A : If we talked about uncertified market, there will be possibility of price manipulation. We have more than 20 sustainable timber, it means 10 % of forest product are certified. About 90 % of forest product are uncertified, where the illegal logging could be happen. Actually, there are 3 kinds of market, green market, legal timber market and market illegal timber market. The fact, it is also a government problem that require solutions and transparency of government.

Q : Indonesia only has one company that has certificate, how the existing policy?

A : The moratorium is not going well because sometimes there are differences in perception between the central and local government.

Group Discussion

Group 1: Peat Swamp Forest Management/Rehabilitation

Facilitator : Lailan Syaufina and Dr. Hendrik Segah

1) The key elements (parameters) on Management and Rehabilitation of Peat Swamp Forest;
   - Manual and concepts of peatland protection and management.
   - Water management (proper/ systematic canal system), ecosystem (plants i.e. endemic species that non-flammable), fire management and awareness of stakeholders.
   - Peatland allocated for resettlement, agriculture, conservation purposes etc. – sustainable development. Effective and competent managers to manage the area. Commitment of multi-stakeholders to the sustainable peatland management. Unclear institutional arrangement and cross-sectoral issues.
   - Incentives for rehabilitation. Ecosystem services. Management – hydrological management units – integrating the rehabilitation of vegetation/ peat forest as well as rehabilitating the peat.
   - Regulations (enforcement), spatial support/ planning of peatland, social issues (challenges – local communities as well as other stakeholders), ecosystem management – FSC. Private sector – production management, sustainable. Rehabilitation – social issue, water management (especially on degraded area). Coordination and working together with other sectors (local communities and NGOs for benefits sharing)
   - Sustainable management of remaining and existing peatland forests in perpetual for multiple uses and functions. ii. Sustainable management of existing and degraded peatland for continue economic production.

2) The challenges and gaps in peat swamp forest management and rehabilitation in Southeast Asia; E.g. Lack of technical guide, lack of resources etc.
   - Smart partnership of multi-stakeholders (e.g. private sector and international funders) in rehabilitating the degraded peatlands. Production sector – set aside part of concession land to fulfil promises towards REDD+ programme.
   - APMI and APMS as a guided document in conserving the peatlands (objectives and strategies – National Action Plans for Peatlands (NAPP) of each country).
   - Lack of up-to-date information, competency in managing peatland forest, REDD+ mechanism (readiness?).
   - APMS adopted by AMS. It is a living document that will be reviewed, implementation of the strategies spelled out in the APMS.
   - Coordination (mis-coordination between central government, provincial government and local government), fire management (strong commitment of local government and stakeholders in fire prevention)

3) What are the effective ways that you think can overcome these challenges and gaps? In what area is more guidance needed?
   - Water Control (Management) by water level measuring, water level control, and predicting water effects on ecosystem
   - Planning and addressing the root cause
   - Identifying appropriate management intervention – e.g. water management, reforestation, natural succession?

- Enrichment planting and Species selection
- Maintenance of rehabilitation activities/sites
- Stakeholder engagement
- Land ownership/incentive mechanism
- How to integrate and manage all data for Peat Swamp Forest Management such as using satellite data, various types of ground observation data, GIS and so on.
- Monetary (most important) – sustain funding
- Responsibility (relevant authorities, land owners)

4) Next steps:

- Institution Arrangements.
- Policy implementations.
- More detail researches.
- Networking and communication within the stakeholders.
- Compilation and dissemination of researches results and best practices.
- Solve the poverty and improve the livelihood.
- Socialisation of each country for National/Provincial Master Plans on Sustainable Peatlands Management.

Group 2: Existing Forest Plantation on Peat

Facilitators : Mr Faizal Parish and Mr. Chai Ah Sung

Challenges and problems

- Need a variety of species /sub-varieties and not just one (alternatives have lower yield /grow slowly).
- Enhance water management (future difficulties for gravity drainage)- telemetry, electronic gates and dry season irrigation.
- Reducing GHG emissions/maintain carbon stores
- Identification of suitable sites
- Adopting a landscape approach – with plantation as part of the landscape
- Adequate land allocated for conservation to be viable (In Indonesia only 10% of land allocated and normally too small/narrow - minimum 1km wide)
- Understanding nature of peat including nutrients
- How to zone and manage the entire hydrological unit and get all stakeholders to agree (important role of the government)
- Enhancing management of existing land bank

1) Key Principles for responsible/sustainable plantations on peat. Under current arrangements – plantations on peat may not be sustainable as in the medium term 30-60 years they will subside to levels where further drainage will be difficult)

- Move to sustainable plantation model – which can allow long term use (100+ years).
- Balance Economic viability with social acceptability and environmentally friendly nature.
- Early engagement of community and generate benefits for local community and stakeholders not just plantation company.
- Clear understanding of peat characteristics
- Site suitability
- Scientific based knowledge
- Adequate control of the entire unit (non-fragmentation)
- Integrated multi-stakeholder approach
- Integrated Water management
- Clear government standards/guidance to create a level playing field and promote good practice
- Maintain biodiversity

2) Best Management Practices

- Need to document and share good practice

Operational

- Fire prevention and control
- Zero burning
- Plantation
- Community
- Water management
- Health and safety issue AND worker capacity
- Zoning and management planning
- Planting zone of indigenous (beneficial)species
- Certification

- Silviculture regime – planting, harvesting, maintenance.
- Land preparation
- Harvesting/Transportation
- Management plan development

Environmental

- Managing GHG emission
- Natural forest rehabilitation techniques
- Environmental Assessment
- Conservation areas design and management
- Human- animal conflict

Social issues

- Land claims
- FPIC
- Community development
- Community based planning
- Monitor GHG flux/carbon stock
- Water management etc
- Community
- Recognizing traditional wisdom
- Livelihood for local community

3) Next Steps

- Compile a best management practice manual/guideline
- Guidelines – experience on new area
- Multi-stakeholder working group
- 2-3 meetings over 12 months with field visits and exchanges
- Standards & regulations – by governments
- Implementation/Monitoring/Reporting

II. III. Summary Statement

Conclusions

The main conclusions from the workshop included:

- Peat swamp forest is the main wetland forest type in SE Asia – originally covering about 25 million ha and provides many benefits for water resource management, climate regulation, biodiversity conservation, production of timber and non-timber forest products and support for local livelihoods.
- The area of peat swamp forest in South East Asia has been significantly reduced in the last 30 years and it is estimated that less than 34% remains in relatively intact condition in the western part of the region with 20% converted to plantations and the remaining 50% in degraded or fragmented situation. Contributing factors include; forest encroachment, heavy forest harvesting rates and poor recovery; conversion and degradation from fires especially in periods of drought. The sustainability of the remaining peatland forests (both primary & secondary forests) is critically threatened.
- Clear and strong policies for peatland protection and sustainable use are needed and the meeting supported and encouraged others to follow the action taken by the Indonesian Government to impose a moratorium on further development of plantation on peatlands and primary forest areas and put in place various regulations especially related to enhanced water management and conversion of peat swamp forest.
- Over the past 15 years, nearly one million ha of former peat swamp forests have been converted into industrial tree plantations for the pulp and paper industry in the region – mainly using *Acacia crassicarpa*. Various enhanced management practices have been developed in particular related to water management and land preparation – but further work is needed to sustain productivity of forest plantations. Plantation companies have also worked to maintain and rehabilitate adjacent peat swamp forests as well as work with local communities to enhance livelihood and prevent fires. Some plantations have been successfully developed through serious investment, on severely degraded and burnt peatlands- by focusing on good water management, appropriate silvicultural practices, fire prevention, and partnership with local communities.
- Significant experiences have been gained in recent years on the rehabilitation of peatlands with indigenous tree species including some with potentially high economic and environmental values and this has potential for both enhancing the forest as well as bringing benefits to local communities.
- Water management is the most critical issue for the sustainable management for peatlands: further drainage of natural forest should not be allowed and existing drains blocked; the water level in plantation areas should be maintained as high as possible to reduce the rate of subsidence and optimise production and prevent fires in the plantation and adjacent areas.

Recommendations

Given the serious recent decline in peat swamp forests, the meeting urged immediate action by the governments and other stakeholders to:

1. Protect all remaining intact peat swamp forests in South East Asia and not allow further conversion for agriculture or plantation purposes. Remaining Peat Swamp Forests should be protected or rehabilitated as necessary and either conserved or managed according to Sustainable Forestry Management principles and practices.
2. Manage remaining peat swamp forests in the context of environmentally sound and sustainable development to maintain their natural roles and functions as well as ensure equitable allocation of benefits to key stakeholders including local communities.
3. Any future plantation development in peatland shall be prioritised on severely degraded areas and such development shall contribute to enhancing the quality of the hydrological landscape.
4. Manage all peatlands in an integrated manner for each complete hydrological unit with water management enhanced to reduce subsidence and GHG emissions and fire risk.
5. Develop practical guidelines and best practice manuals for the sustainable management of peat swamp forests; the rehabilitation of peat swamp forests with indigenous species; and the operation of existing industrial tree plantations on peat. These should be supported with appropriate certification standards, safeguards or regulations.
6. Strengthen the implementation of the ASEAN Peatland Management Strategy and associated National Action Plans including development of incentives and financing mechanisms.
7. The private sector especially those companies involved in managing of peat swamp forests and forest plantations in peatland areas should increase their support for the conservation of peat swamp forests by supporting conservation and rehabilitation measures and development of appropriate integrated multi-stakeholder management mechanisms.
8. Undertake further action to enhance the protection and sustainable use of the Tasik Besar Serkap landscape (Kampar Peninsula) and the Giam Siak Kecil Biosphere Reserve in Riau province, and other significant similar hydrological landscapes elsewhere in the region, through integrated management and enhanced partnership between the Government, local communities and private sector.
9. Key stakeholders including national and local Government agencies, private sector, research institutes and civil society organisations need to work actively together to enhance the level of protection and rehabilitation of remaining peat swamp forest.
10. Maintain and enhance regional and national cooperation and exchange among related stakeholders to advance the sustainability of forestry practices on peatlands.

Some additional specific recommendations were made on rehabilitation and forest and plantation management.