



# INTERNATIONAL SYMPOSIUM AND WORKSHOP ON TROPICAL PEATLAND

| YOGYAKARTA, INDONESIA | 27-31 AUGUST 2007 |



Secretariat: Faculty of Agriculture, Gadjah Mada University, Bulaksumur, Yogyakarta 55281, Indonesia  
Telp./Fax: +62 274 548814 Website: <http://soil.faperta.ugm.ac.id/CT> E-mail: [tropeat\\_symposium@yahoo.com](mailto:tropeat_symposium@yahoo.com)

## **STATEMENT**

Issued by participants of the

**International  
Symposium, Workshop and Seminar on Tropical Peatland,  
Yogyakarta, Indonesia,  
27 - 31 August 2007**

**"Carbon - Climate - Human Interactions - Carbon Pools, Fire, Mitigation,  
Restoration and Wise Use"**

organized by

**Department of Soil Science,  
Faculty of Agriculture,  
Gadjah Mada University,  
Indonesia**

in association with

**Indonesian Peat Association**

**International Peat Society**

**BAPPENAS**

On behalf of the

**EU CARBOPEAT AND RESTORPEAT RESEARCH PARTNERSHIPS**



## YOGYAKARTA STATEMENT ON CARBON-CLIMATE-HUMAN INTERACTIONS ON TROPICAL PEATLANDS

Problems of fire, mitigation, restoration and wise use of tropical peatland were addressed at the **International Symposium and Workshop on “Carbon-Climate-Human Interactions on Tropical Peatlands”** held in **Yogyakarta, Indonesia on 27-29 August 2007**. These meetings were attended by over 200 participants from Indonesia, Malaysia and Vietnam and 13 other countries, including scientists, politicians, legislators, land managers, representatives of national and local government, NGOs and community groups, and the private sector. The symposium consisted of seven technical sessions dealing with the following important issues concerning tropical peatlands and peat:

1. Evolution, extent and natural resource functions;
2. Biodiversity and biological, chemical and physical characteristics;
3. Restoration and water management;
4. Carbon dynamics;
5. Socio-economics and land management;
6. Fire: detection, impacts, awareness and control;
7. Carbon payments, avoided deforestation and cultivation of plantation crops.

The workshop commenced with a ‘Stakeholder Forum’ at which views were expressed by representatives of regional governments, agro-industries, researchers, and others on current and pressing issues related to tropical peatland utilization, particularly in the context of climate change and biodiversity conservation. These major issues were analysed and discussed in greater depth in four breakout sessions that prepared outline actions plans and contributed towards the symposium/workshop statement. Uniquely all parties recognized each others needs with regard to peatland management and during the meeting they worked together to develop appropriate strategies and action plans to address current issues facing the tropical peatland resource.

### ***The Yogyakarta International Symposium and Workshop:***

**WELCOMES** the attendance of the representative of the Minister of Environment, Rektor of Gadjah Mada University, President of the International Peat Society, Governor of Yogyakarta, Ambassador of Finland and the First Secretary of the Netherlands Embassy in Jakarta; their support indicates a high level of awareness of tropical peatland problems and a desire for these to be resolved as matters of urgency.

**NOTES** the international interest in and concern for tropical peatlands and acknowledges that there are serious problems facing Governments in the ASEAN Region as a result of land use change and fire that are causing transboundary haze and a large increase in greenhouse gas emissions (GHG).

**RECOGNIZES** that all development on tropical peatland has associated environmental impacts while inappropriate or poorly managed development, especially over drainage, leads to peat subsidence and fire, which affect severely local and regional biodiversity, natural resource functions of the remaining peat swamp forest, and livelihoods and health of local people.

**URGES** the Indonesian and other ASEAN Governments to promote responsible management of peatlands, based on an ecohydrological approach that should prioritize the protection of high conservation value peat swamp forests, including semi-pristine and logged-over forests, and the rehabilitation of deforested, degraded peatland areas.

**ENCOURAGES** investment by all interested parties including international governments, donor agencies and the private sector in the conservation, rehabilitation and restoration of tropical peatland, and the improvement of existing peatland management practices by promoting wise use, including participatory management of this ecosystem in partnership with local communities;

**EMPHASIZES** the need for all stakeholders involved in peatland management to operate with accountability and transparency, develop new financial mechanisms and partnerships, undertake capacity building and apply appropriate technology in order to achieve success;

**RECOMMENDS** that land use planning of peatlands be optimized to promote their wise use and reduce greenhouse gas emissions.

***Endorsed by participants of the International Symposium and Workshop on “Carbon-Climate-Human Interactions on Tropical Peatlands” at the final plenary session held in Yogyakarta, Indonesia on 29<sup>th</sup> August 2007.***

## Mitigation and Financing Initiatives to Increase/Maintain Carbon Stores in Tropical Peat

Carbon emissions from peatlands in Indonesia constitute a large problem causing haze, contributing to climate change processes, increasing loss of biodiversity and livelihood problems. This chain of events needs to be interrupted.

Carbon investments should take on board both poverty reduction and biodiversity in order to increase performance and sustainability of carbon investments. To generate capital and increase the returns on these investments, contributions of governments, industries (e.g. palm-oil and paper and pulp) and financial parties are crucial. To reduce risks and safeguard carbon investments in peatlands in Indonesia, two essential factors related to fires have to be addressed:

1. Poverty;
2. Reduction of excessive drainage (closely related to the uncertainty of precipitation changes).

### Need for innovative financial mechanisms:

- a. Globally:
  - i. REDD; special peatland focused facility
  - ii. Voluntary (private sector & public) investment schemes
- b. Nationally: multi-donor trust fund
- c. Regionally/provincially: provincial trust funds; private sector taxes (CSR)
- d. Community level: micro-credit facilities and Bio-rights mechanism ([www.bio-rights.org](http://www.bio-rights.org))

### Need for new Institutional and management arrangements:

The financial mechanisms need to be backed up by new institutional finance management structures, policy and legislative frameworks and legal mechanisms to regulate, monitor and guide this new emerging market.

These should include

- e. Consideration of the level, transparency and stakeholder involvement of governance of the funding, and facilities for pro-poor investment (e.g. integration of carbon conservation, poverty reduction and biodiversity conservation)
- f. Recognition of customary rights
- g. Monitoring and audit or certification mechanisms
- h. Avoidance of leakage and perverse incentives through imbalanced land use planning: need for Master Plans for national and regional/local peat carbon emission reduction.
- i. Standards and criteria for:
  - i. Reduced emissions from avoided peat swamp forest deforestation and degradation,
  - ii. Reduced emissions from optimization of water management in plantations (within a wise use approach)
  - iii. Carbon sequestration through reforestation
- j. Policies and legislation that can provide the necessary long-term guarantees for long-term carbon store conservation, including tenure aspects.
- k. Hedge against risks (e.g. fire, natural disasters) through insurances and bank guarantees.

### Need to show political will and stop expansion of the problem:

Evidence of political will is the key to attract investment. Indonesia's peatlands and current peatland issues provide for a potential avoided emissions of around 1.6 G ton (1.4 Gt from fires and 0.2 Gt from drainage (e.g. 30% of current annual drainage emissions)). A moratorium will be a strong signal and can be a first step in countering peatland degradation and to buy time to maximize the new opportunity of carbon finance. A moratorium needs to be part of a longer-term strategy of land use planning.

# Development of Tropical Peatland for Agriculture and Forestry

## Aims:

To promote responsible land-use development on peatlands that result in environmentally well-managed, highly productive and socio-economically beneficial agricultural/forestry development whilst at the same time protecting a representative sample of Indonesia's unique and biodiverse peatland heritage and minimising carbon loss.

## Recommendations:

### **Land use planning**

- Create a 'one stop centre' for peatland management, which simplifies institutional responsibility and accountability, integrates different land-use plans, requires better inter-agency cooperation and implements a high level of stakeholder (including local community) involvement.
- Develop an inventory and classification (definition) of existing peatlands, which can be used to identify appropriate land-use at the District level; future land use planning should:
  - be based on current peatland status including semi-pristine forest, irreversibly degraded/illegally logged peatland, agricultural peatlands and peat-based (including smallholder) plantations.
- Prioritise (using wise use criteria) and protect peatland for conservation according to hydrological status, size, habitat condition, biodiversity, ecological uniqueness, peat carbon storage capacity, substrate and different stakeholders' (including local communities') needs; these peatlands should remain under good forest cover and not be converted to plantations/ buffer zones.
- Use the eco-hydrological approach instead of the (3 m) peat thickness criterion for land-use planning, as greater biodiversity often occurs on shallower peat that may also be inappropriate for agriculture.
- Identify areas most suitable for the promotion of alternative livelihoods (such as agri-business and integrated agro-forestry systems including animal husbandry) to provide food and cash and also biogas.

### **Involvement of stakeholders/local communities**

- Establish proper coordination between government agencies and involve local communities and other stakeholders in the development of peatland for agriculture and forestry and the promotion of sustainable livelihoods. In particular:
  - stakeholder awareness of and involvement in fire prevention should be increased.
  - water and forest restoration should be community-based using wise use management principles.

### **Fire**

- Prevention of fire should be proactive and based upon peatland status, i.e. semi-pristine forest, irreversibly degraded /illegally logged peatland, agricultural peatlands and peat-based (including smallholder) plantations.

### **Irreversibly degraded/illegally logged areas.**

- Properly define degraded forest; prioritise future agricultural/plantation development on irreversibly degraded/deforested land.
- Promote more effective law enforcement targeted towards financiers and the market.

### **Semi pristine forests**

- Maintain high water levels in semi-pristine and lightly logged forests by aiming for zero drainage and the restoration of their former hydrology by blocking existing drainage canals.

### **Existing major plantations**

Advanced plantation management practices that aim to minimise carbon loss should be promoted and extended. Examples of existing wise use practice to build upon include:

- Development of advanced water and related peat resource management systems that seek to minimise drainage (e.g. the identification of species that will grow under waterlogged conditions).
- Development of integrated hydrological management plans for peatland which deal with the whole river basin and engages with different stakeholders that are active within the area.
- Active prevention of fire both within and adjacent to plantations.
- Inclusion of buffer zones and conservation areas on deepest peat/most important forest.
- Promotion of sustainable forest management as per government recommendations for plantations.
- Emphasis on stakeholder involvement in decision-making and income-earning opportunities for local people.

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# Rehabilitation and Restoration of Tropical Peatland

## Needs:

- Government should revise the classification of 'production forest' with regard to peatlands, to take into account present levels of degradation (undamaged and primary, secondary and severely degraded land). Accurate maps are required of areas set-aside for different land uses. Management options should reflect these classifications and maps.
- Improve and up-date data base on peat area, depth, profiles and volumes.
- Prepare strategies for peatland:
  - *Conservation* – Locate and actively protect remaining peat swamp forest ecosystem.
  - *Rehabilitation* - Repair of degraded ecosystem,
  - *Restoration* - Back to original ecosystem,
  - *Reforestation* - Plantation activity, recovers some ecosystem function and some benefits,
- Ensure rehabilitation and restoration promote recovery of ecological and hydrological functions, including favourable carbon balance in line with wise-use principles, and that they have historical fidelity and improve local livelihoods.

## Aims:

- Undamaged: rehabilitated forests can act as buffer zones, reducing need for activity in and access to pristine forest while providing alternative livelihoods.
- Primary degraded land should be enriched by planting native species; further degradation must be prevented, and local people should benefit.
- Secondary degraded land, owing to repeated logging/active degradation, requires positive rehabilitation through enrichment planting with native species, fire prevention, and hydrological recovery. These areas should be restored and used by local communities in a sustainable manner.
- Severely degraded land that has suffered from repeated disturbance is difficult to rehabilitate. Instead consider conversion to another land use, for example, plantations, but applying wise-use principles.

## Recommendations:

- Conserve the remaining peat swamp forest; reinstate hydrological processes, through construction of water flow retarders, especially on thick peat.
- Implement fire-fighting strategies to prevent and suppress wildfire, establish dedicated fire-fighting teams that are supported by a regular income.
- Commence scientifically based and community-informed rehabilitation programs that promote:
  - Planting of native, locally useful, marketable trees,
  - Recovery of ecosystem function, historical fidelity and
  - Improvement of livelihoods of local people.
- Government should:
  - Apply unified policies, enforce the law and apply sanctions;
  - Raise public awareness and knowledge; educate small businesses and local communities;
  - Involve all stake holders (National and regional government, local communities, large and small private businesses) at each stage of land rehabilitation, through to long-term management;
  - Support community development programs, including local, regional and provincial involvement, through grass-roots programs, with education, long-term management and investment. Need for short-term monetary incentives and long-term beneficial outcomes for local communities, leading to ownership and tenure rights, and increased responsibilities.
- Further research is vital, especially
  - by establishing research sites across the peatland areas to increase site-specific knowledge,
  - by increasing rehabilitation knowledge, e.g. to identify native, but productive trees that can tolerate different environments, under different degradation levels, and will create incentives for local communities, e.g. jelutung, meranti, ramin, gemur.
  - by implementing alternative land clearing methods instead of fire.
- Generate funding guidelines for NGOs and other bodies

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# The Tropical Peatland Carbon Budget: Sinks, Stores and Losses

## Background

Peatlands of the tropics represent archives of carbon. They have formed and vanished or buried over the last few million years – at present, few peatlands in SE Asia are older than 20,000 years; most of them are less than 10,000 years. These peatlands can therefore represent BOTH a carbon sink for, and source of, CO<sub>2</sub> and other gases from/to the atmosphere. Peatland use changes over the last few decades have necessitated drainage that has caused peat subsidence and a significant net carbon loss, which has been enhanced by accelerated decomposition and more frequent and severe fires.

## The carbon cycle in tropical peatland

The carbon cycle on tropical peatlands differs under natural and land use changed conditions and is influenced by:

- Temperature, light, nutrients, water table;
- Biological: vegetation type, e.g. natural forest, arable cropping, plantations (biomass differs);
- Physical: wild fires, storms, etc;
- Management: cropping regime (no cropping, cyclic cropping, accidental cropping), water management (water table depth), soil management (tilling, burning, fertilisation, etc.)
- Change in C stock (peat structure, peat depth, peat area, soil gas fluxes, vegetation type).

## What are Greenhouse Gas Emissions (GHG) from tropical peatland and how do they vary?

- The focus has been on CO<sub>2</sub> but CH<sub>4</sub> is important when water tables are high and N<sub>2</sub>O is released under drained conditions when the water table is around 20 cm below the surface;
- There are diurnal and seasonal variations in GHG emissions;
- Addition of lime and fertilizers may change GHG emission patterns;

## Factors affecting the tropical peatland carbon budget

- Logging (authorised and illegal); deforestation; drainage; subsequent land management and fire leading to:
- Cessation of carbon sink function, oxidation, increased decomposition, subsidence and increased GHG emissions;

## Needs

It is urgent that:

- Different researchers collaborate to share data and standardize methods and analysis procedures;
- Gaps in knowledge are identified and more studies carried out of GHG emissions in ALL types of tropical peatland focussing on spatial and temporal variations over long periods (only three comprehensive studies have been carried out so far);
- Detailed study is made of the effect of biomass changes and crop composition on hydrology and soil structure that impact upon the peat carbon store and lead to loss of carbon to the atmosphere;
- Decomposition and subsidence that occur during development of tropical peatland are quantified better in order to solve some of the problems with data on the emission status of different peatland types;
- More and better information is obtained on the relationship between fire-releasing carbon, intensity and frequency, and the amount of biomass (fuel), water table and land use.
- Fire control and management should be prioritized in order to reduce GHG emissions from tropical peatland;
- Data presentation and synthesis are provided for policy decision makers.

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