

Current Situation of Peatswamp Ecology and Development in Riau Province, Sumatra-Indonesia

Haris Gunawan¹ |
Riau University
Indonesia

Abstract

Lowland peatswamp ecosystems are the largest among the major forest formations of Riau Province. This Province, located in Sumatra island, still remained the large blocks five of natural peatswamp ecosystem. One of them, officially declared to become the world heritage in May 2009, is Giam Siak Kccil-Bukit Batu Biosphere Reserve. For the future those of peatswamp ecosystem remnants will be considered to get more advantages through trade carbon mechanism. Moreover this fragile ecosystem is vitally linked to environmental and conservation issues, as well as its economic value for human survival. Their unique ecological features, as well as logistical difficulties in accessing and utilizing peatswamps, have not, however, deterred exploitation. Overlapping land use between protected areas and developed areas has appeared. Most of the natural peatswamp ecosystem has been converted to oil palm and acacia plantation. Even though the development on peatswamp ecosystem has brought in a lot of profit, but the effect of development has also brought the degraded environment as the results of poor management and ignore the ecological characteristic of these ecosystem. Conversion of large amount of land has had a dramatic impact on environment not only of the local area, but also of the regions surrounding the land globally. The changes have resulted in the detrimental development of peatswamp and huge degradation of the natural resources particularly the forest. Ecological information is needed urgently by decision-makers and land-owners, who may be contemplating conversion of natural peatswamp ecosystems to other land uses, to improve the conservation policy and best management practices for the wise use of this ecosystem. The paper provides an overview of peatswamp ecology with recommendations for avoiding or reducing potential ecological impacts associated with peatswamp development in this area, including to give more pay attention on a policy of being proposed moratorium or conducting careful principle on managing peatswamp towards a balance of economic endeavor and natural dynamics of Riau's peat swamp. The development should be equal to its restoration and conservation issues as well.

Keywords: conservation, development, moratorium, restoration, Riau's peatswamp.

¹Prepared for delivery at the International Conference of Asian Democratization and Politico-economic Sustainable Development and Governance in the 21st Century, held at Department of Political Science, National Cheng Kung University, Tainan, Taiwan, October 16, 2009.

Introduction

The Sumatra's largest peat land is located in Riau (+ 4.04 million hectare). Most of the peat thickness in this province is more than four meter deep > 4 M. As a result, this area is one of the most important carbon pool in the world (Wahyunto et al, 2005). Furthermore, these peatland essential from both a global and local perspective, in terms of the environmental services they provide. They are key to carbon sequestration, reducing erosion, control of flooding and nutrient cycling (Yumiko et al, 2006).

Riau Province still maintains 20% forested areas, which in absolute figures is about 3.8 million ha (Tables of 1). The largest forest area is on peat lands. Meanwhile the area of peat swamp forests is estimated at about 1,805,700 ha; this ecosystem therefore covers about 40% of the total remaining forests of the province. These forests are of varying condition and quality. Parts of the forest are still pristine condition, while other areas have been degraded in such a way, that there is little or no expectation to allow sufficient recovery (Jarvie, *et al.*, 2003).

Table 1- Forest types in Riau Province

No.	Forest Type	Wide (Ha)
1.	Lowland Dry forest	990,384
2.	Mangrove	205,305
3.	Peat Forest (< 2 m)	669,450
4.	Peat Forest (> 2 m)	1,939,019
5.	Forest Sub-Mountain	13,815
	Total	3,825,945

Source: Jarvie et al, 2003.

Distribution of Riau's peatland is located on five remaining large forest blocks. The Kampar Peninsular, as well as the areal of Kerumutan, Giam Siak Kccil, Libo and Scncpis, those arc dominated by nature peatland compare to others in Riau. Remaining protected areas in these forest blocks likely to suffer from drainage of surrounding landscape (Miettinen, 2007).

In 1982, forests including peat forests covered more than three-quarters of mainland Riau, some 6.5 million hectares. From 1982-2007 natural forest is 4.166.381 ha or loss of 65% the mainland in this Province 1.831.193 ha or 57% is peat swamp forest (Yumiko *et.al* 2006).

Forest exploitation lead to extensive exploitation of peatwamp ecosystem. 13% of peatswamp ecosystem is area for IIPH (forest concession area) and 20% of the peatswamp area is for HTI (industrial pulpwood estate), and 23% of the land for the agricultural plantation, especially oil palm plantation in 2000. 1.969 ha of peatland was used for the converted land for agricultural plantation, or industrial forest estate (HTI) and 864,000 ha among them was peatland deeper than 3 m depth (Hooijer et al. 2006).

The Current Situation of Peatswamp Ecosystem in Riau

Currently, Riau is the largest producer of two of Indonesia's most important export commodities based on forest destruction: paper and palm oil. Accordingly, wherever deforestation occurs, including the expansion of oil palm into natural forest, the majority of the timber harvested is sold for pulp. Despite grave levels of degradation.

Riau has the largest remaining area of natural forest on peat in Sumatra, making it vulnerable to predatory conversion. Local governments in Riau collectively have plans to expand oil palm plantation by 3 million hectare.

The 2007 draft of the new provincial land-use plan shows that many hundreds of thousands of hectares of peatland have been designated for conversion. Most of the forests are on peat soils with depths of over 2 m. This expansion into forest and peatland, and the related deforestation and Green House Gas emissions, takes place with little oversight from central or local government (Yumiko et al, 2005).

Riau has significant peatlands more than 2 m deep, yet many plantation concessions are located on such soils despite laws and regulations meant to protect these areas from conversion. Legally, forest conversion for oil palm plantations should not take place on land with peat depth greater than 2 m, nor may it directly or indirectly impact forest on land with peat depth greater than 3 m- such peatlands are formally protected by Ministry of Forestry and Presidential decrees no 32 in 1992 (Yumiko et al, 2005).

Jarvie et. al (2002) concluded that there are three major types of threat to Riau's peatland (Giam Siak Kecil Landscape) as following as:

1. Industrial Plantation Expansion

Clearance and conversion of Riau's peatland have been rapid and larger over the last over years. The speed and scale of conversion will have caused considerable change to the landscape hydrology.

2. Illegal Logging Operation

These appear to be widespread, particularly where there is easy access by road, river and canal. Whereas these may provide short term economic benefit to local communities. Profits are reportedly taken by middlemen. These appear to be no long term benefits to community.

3. Conflicting Spatial Plans

Current management of protected areas in Riau is already failing to protect the conservation values they contain, clearance of adjacent forest is likely to increase the scale of this failure. Furthermore, spatial planning maps used by different land users are causing confusion.

4. Forest and Land Fire

Hooijer et al. (2006) estimated that between 1997 and 2006, regional peatland fires caused average yearly CO₂ emissions of 1,400 Mt (with 90% of this originating in Indonesia, mostly from Riau in Sumatra). This is equivalent to almost 8% of global emissions from fossil fuel burning. Following conversion to oil palm plantations, the water is typically drained to a depth of 1 m which causes degradation of peat of about 10 cm year⁻¹ which causes emissions of 130-180 tonnes CO₂ year. Thus including the loss due to deforestation, about 3,750-5,400 tonnes of CO₂ will be emitted for each hectare of peatland converted to oil palm over the next 25 years (Pearce 2007).

For those issues above remind us of governing the commons. Riau's peatland can be thought as the commons. Governing the peatland is governing the commons. Even though Riau's peatland has many characteristics that are different from the ordinary forest, or pasture land.

Riau Declaration on Peatlands and Climate Change, Pekanbaru, 26th January 2006, should be a guidance to wise use of this peatlands. Declaration mentioned as following are:

1. Establish a Riau Peatland Management Partnership to bring together key stakeholders to work together to maintain and rehabilitate peatlands and promote sustainable use.
2. Develop through a multistakeholder process, a masterplan for the future conservation and sustainable development of the Kampar Peninsular given its importance as one of the largest and currently relatively intact tropical peatlands in the world.
3. Develop integrated management plans for each peatland to maintain the provision of ecosystem functions and services including carbon storage and water supply as most major peatland ecosystems function as one hydrological unit but are administered by two or more District (Kabupaten) administrations and are managed by a range of agencies.
4. Incorporate peatlands as a key part of integrated river basin management since peatlands in Riau form the largest stores of freshwater in the province and play a key role in regulating river flow and preventing saline intrusion and that peatland degradation will jeopardise future water supply.
5. Support community-based initiatives for protection and sustainable use of peatlands in Riau as an incentive to maintain peatlands and associated ecosystem services.

Moratorium was officially campaigned by Riau's NGO since 2005. The goals of this idea as following (Zulfahmi, 2008):

1. Redesigning the forest management in Riau Province.
2. Protecting the carbon storage in peatland area.
3. Protecting the hydrology regime.
4. Conserving biodiversity.
5. Minimizing CO₂ emission from utilized peatland.
6. Preparing support factors to get the economic values that guarantee forest ecosystem.

Conclusion

The need to improve management of peatswamps ecosystem in the Riau Province is clearly urgent. Degradation was caused by poor management or unsuitable agricultural crop in Riau's peat swamp ecosystem is alarming rate. For the future the utilization of peat swamp ecosystem should be based on serious consideration of the site specific and functional region of peat swamp ecosystem. In addition the moratorium policy should be considered to minimize the further degradation and efforts must be given to peat swamp forest conservation and restoration

References

- Jarvic, J., Jeyaraj, K. & dan Hurdiono (2003). A High Conservation Value Forest Analysis of the Giam Siak Kecil Landscape - Riau, Sumatera, A Report to WWF-International.
- Hooijer A, Silvius M, Weston, H. & Page (2006). Assessment of CO₂ emission from drained peatlands in SIF Asia, Delft Hydraulics report.
- Pearce, F., (2007). Bog barons: Indonesia's carbon catastrophe. *New Sci* 2632:50-53
- Wahyunto, Ritung S, Suparto & Subagjo (2005). Sebaran gambut dan kandungan karbon di Sumatera dan Kalimantan. Wetland International, Indonesia Programme. Bogor.
- Zulfahmi, (2008). Melindungi Ekosistem Rawa Gambut Semenanjung Kampar. Slide Presentation in Lokakarya Pengelolaan Semenanjung Kampar. Pekanbaru, Riau, August 5, 2008.
- Yumiko U., Budiman A. & Zulfahmi, (2006). What's The Future For Peat Swamp Forest Landscape in Riau, Sumatra? What should be done now? Sheet Presentation, Pekanbaru. Unpub.