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SUSTAINABLE OIL PALM PLANTING ON PEAT SOILS IN SARAWAK

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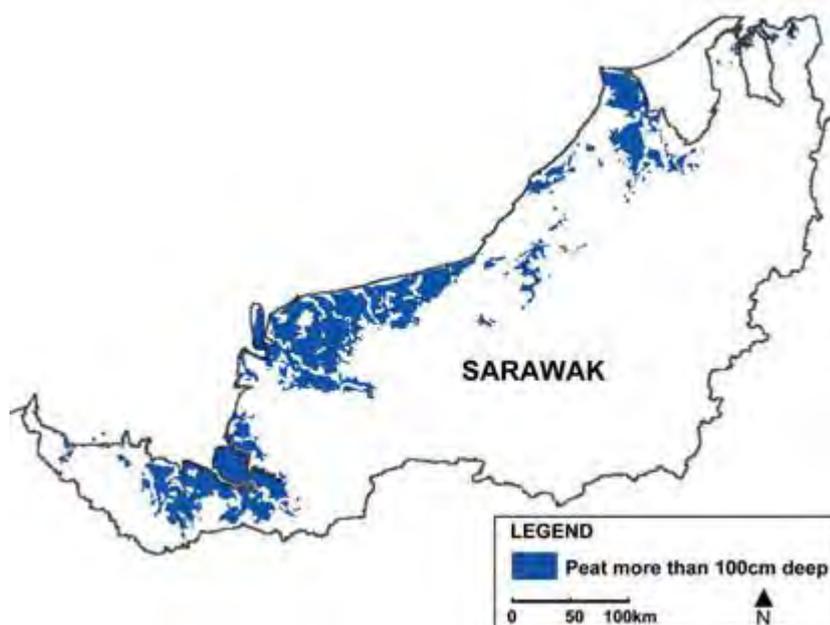
SUMMARY

To produce high oil palm yields growers have to observe the practices that can ensure the crop is sustainable, namely careful water management, the optimum fertiliser programme and good weed control and logistics.

INTRODUCTION

Peatland is extensive in Sarawak's coastal lowlands, covering approximately 1.6 million hectares (MHA) or 13% of the state's total land area. The single largest usage of peatland in Sarawak is for agriculture (plantations) with a much less significant area converted for housing/township development (particularly in and around Kuching and Sibu) or left under forest. In Sarawak extensive peatland conversion, especially for oil palm plantations, has occurred only since the early 2000s. Probably about one MHA of peatlands still remain to be planted in the state. The main objective of this paper is to highlight the main agro-management practices for sustainable cultivation of oil palm on peat soils.

Map 1: Distribution of peat swamps in Sarawak



Source: Tie and Kueh 1979

The Sarawak Agriculture Perspective Plan Study 1992 (xxxx 1992) identified the state's coastal peatlands as an important resource for agriculture and other land uses in the state. Realising the enormous potential of the coastal land and looking at peatland as the "most strategic alternative fast track resource (gold mine)" (ref) the Sarawak State Government's approach was to open up such areas for plantation development. The State Government targets the end of 2005 for the completion of a new coastal highway in order to facilitate access into these areas (Abdullah, 1999). Drahman (1999) reported that Sarawak's target for agricultural plantation development (mainly oil palm) in terms of actual planted area by 2020 is one million ha on state land and land under Native Customary Rights (NCR).

UTILIZATION OF PEATLAND

Around 20% of all oil palm plantations in Southeast Asia are on peat. Sumatra has the largest absolute extent of oil palm plantations on peat (1.4 MHA or 29%), followed by Sarawak (476,000 ha or 46%), Kalimantan (307,515 ha or 11%), and Peninsular Malaysia (215,984 ha or 8%) (ref.). The highest rates of oil palm development on peat are in Sarawak: the rate of change of swamp forest in Sarawak in the last temporal period was approximately 7% annually (59,620 ha) and nearly all the conversion of peat swamp forest can be directly attributed to the establishment of new oil palm plantations.

The area of peat under cultivation in the state of Sarawak is 554,775 ha (Ambak and Melling 1999). The most important crop at present is oil palm. Sarawak's climate is ideal for this crop, which establishes well as a plantation crop on peat and has been profitable. Sago (*Metroxylon sagu*) traditionally a staple food crop for some of Sarawak's coastal population, is another crop being planted on a large scale. Coconut, padi, pineapple and mixed horticultural crops also planted on peat in Sarawak.

OIL PALM DEVELOPMENT IN SARAWAK, MALAYSIA

Up until 2008 Sarawak's oil palm plantation area was smaller area than that of either Johor or Pahang, the two top performing states in terms of oil palm hectareage in Peninsular Malaysia, even though these states' total land area is only 16% and 29% respectively, of that of Sarawak. In 2008 Sarawak experienced its largest increase in oil palm plantation areas so far, which grew by 12.8% against the national figure of only 4.5% (MPOB 2010). This brought Sarawak's total hectareage of oil palm to 744,372 hectares (ha) (MPOB 2008), surpassing that of both Johor and Pahang and putting Sarawak well on the way to achieving its target of one million hectares of oil palm plantations by 2010.

A state-wide independent peat basin (IPB) study conducted in 1992 identified 109 IPBs covering 825,156 ha and classified 91 of these IBPs (or one-third of the total hectareage) as having potential for agricultural development (Sime Darby Services 1999, Kamaruddin *et al.*, 1999). Sarawak tapped this potential almost immediately: between 1997 and 2001 oil palm plantations doubled in area, reaching 374,827 ha by 2005 (more than 46% of the agricultural land in use and constituting the largest area of commercial crops) (Department of Statistics Sarawak 2005). Sarawak's success in developing oil palm plantations has been helped by the Malaysian government's infrastructure development and economic stimulus initiatives. Road development in Sarawak's coastal plains was enhanced in the late 1990s. This enabled exploitation of the peat swamp forests that dominated these plains as a fast-track approach for large-scale oil palm expansion (Sahamat 1999). SCORE (Sarawak Corridor of Renewable Energy) Sarawak's long-term development strategy for the central region, launched in 2006 to propel the state into the ranks of Malaysia's most developed states by 2020, reaffirmed the state's commitment to further expansion of oil palm plantation, which it identified as a key growth industry in three peat swamp forest dominated centres: Tanjung Manis, Mukah and Similajau.

THE BENEFITS OF OIL PALM TO SARAWAK AND THE WORLD

Sarawak's palm oil had an export value of RM1.38 billion in 2003, making oil palm the commodity with the highest export value among the state's principal agricultural products (Department of Statistics Sarawak 2005). With more than 500,000 ha of peat in Sarawak already planted, palm oil can reach and meet the needs for edible oil of about 80 million people annually. Sarawak will continue to increase its palm products supply to the world edible oil market as the palms planted on peat over the last few years mature and production increases. Previously unproductive and uninhabitable areas with wet soils have been transformed into oil palm plantations with residences, roads and economic activities. Oil palm planted on peat can provide work for 50,000 people (at a rate of one person per ten ha). Other jobs are also created, in oil palm mills, refineries, transportation, shipping, marketing and research, as well as support and management.

ENSURING OIL PALM CULTIVATION ON PEATLAND IS SUSTAINABLE

Sustainability depends on four interconnected factors: legal compliance and social, environmental and economic factors. Each of these carries a risk of undermining the sustainability of oil palm plantations on peat.

Legal compliance

Social factors

Environmental factors

Not all peat soils are the same. Soils have differing maturity levels and some contain big tree roots that would stunt the growth of palms. Thus, there are challenges.

Water management

Fertiliser application on peat areas is different from that on mineral soils. 'Little and often' is the rule so that the palms have a constant supply of food. Some trace elements, possibly zinc, copper and boron, may have to be given following field observations and leaf analysis.

Palms on peat soils have special pest problems such as infestations of termites and *Tirathaba* (coconut spike moth). United Plantations Berhad was among the earliest companies to plant oil palm on peat soil and the company's then head of research, Dr Gurmit Singh, noted, "Considerable progress has been made in United Plantations Berhad since the 1980s in overcoming most of these problems and today yields comparable to [those on] good mineral soils are obtainable on deep peat" (Gurmit 1999). Much has been said, researched and reported on the properties of peat soils all over the world. The

Economic factors

Oil palm cultivation on peatland requires extra effort and costs when compared to cultivation on mineral soils. Additional land preparation work, road maintenance and water management will result in increased operational costs.

Sustainable practices in oil palm operations can only be achieved if oil palm development on peatland is understood and correctly managed. In order to reduce the impact, oil palm cultivation in peatland requires expertise, planning and best management practices. To be effective, supervision and documentation in peatland management are important, in addition to regular monitoring and quantification of the outcomes of best management practices implementation.

CONCLUSION

With better understanding of the peat characteristics, improved peat planting technologies and best agro-management practices, oil palm planting on peat can be carried out sustainably on properly selected peat areas. Continuous training at the estate level on management is important to avoid making costly mistakes. More research is still needed to optimize yield and maximize sustainability of oil palm plantings on deep tropical peat.

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REFERENCES

1. Abdullah 1999
2. <http://www.rspo.org/news-and-events/news>
3. Amback and Melling 1999
4. Basiron, Y. (2007) Palm oil production through sustainable plantations. *Eur. J. Lipid, Sci. Technol.* 109: 289-295.
5. Gurmit, S. (1999) Agronomic management of peat soil for sustainable oil palm production. Paper presented at the Seminar on Various Aspects of Large Scale Oil Palm Cultivation on Peat Soil. 23 October 1999, ISP-Central Sarawak Branch, Sarawak, Malaysia: Preprint.

6. Department of Statistics Sarawak. 2005.
7. Drahman 1999
8. Kamaruddin et al. 1999.
9. Lim, K.H. (2007) Effects of peat subsidence on oil palm cultivation and some ameliorating measure. In: Jol, H. *et. al.*(ed) Proc. Soil Science Conference 2007-
10. Peat and other soil factors in crop production. MSSS, DOA Sarawak and ISP, 17-19 April 2007, Mukah, Sarawak: 194-201
11. Lim, K.H. (2005a). Soil, water and fertilizer management for oil palm cultivation on peat soils. In: Proc. PIPOC 2005 International Palm Oil Congress, Biotechnology and Sustainability Conf. 26-28 Sept. 2005. Malaysian Palm Oil Board, Kuala Lumpur: 433-455.
12. Melling, L., Ambak K., Osman, L. and Ahmad H. (1999) Water management for the sustainable utilization of peat soils for agriculture. Paper presented at the International Conference & Workshop on Tropical Peat Swamps, 27 – 29 July 1999. Penang, Malaysia: Preprint.
13. Melling, L. and Hatano, R. (2003) Characteristics of tropical peatland and its implication to agricultural development. Paper presented at 2nd International Conference on Advances in Soft Soil Engineering and Technology. Putra Jaya, Malaysia. 2-4 July 2003: Preprint
14. Malaysian Palm Oil Board (MPOB). 2008. Malaysian oil palm statistics 2007. 27th Edition. Malaysian Palm Oil Board, Kuala Lumpur: 189 pp.
15. Malaysian Palm Oil Board (MPOB). 2010.
16. Sahamat 1999
17. Sime Derby Services. 1999.
18. Tie and Kueh 1979
19. Jason Hon 2011-04-12