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Bio-diesel, Climate Change and Sustainability

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The argument for bio-fuels has developed very rapidly in the last two years. The excellent review by Chandran (2005) of the global situation of the palm oil industry did not mention it, because it was still a rather theoretical concept at that time. The technical possibilities for palm oil to be converted to bio-diesel and replace petroleum diesel fuel were known from research by the Malaysian Palm Oil Board (MPOB) and others (Ma *et al.*, 1999). How-ever, there seemed little possibility of it being used in practice, on a large scale and very soon.

Plantations on Peat: How Sustainable are They? Environmental Aspects of Developing Peat Lands for Agriculture[1]

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The shortage of good quality land for the expansion of oil palm and other crops in Malaysia has led to the increasing use of less suitable soils for cultivation. Peat soils constitute perhaps the largest readily available area of previously uncultivated land with potential agricultural use. Most of these are located in Sarawak along the coastal plain but there are also small areas remaining in the Peninsula and in Sabah.

Oil palm has been successfully cultivated on peat soils for some time with the oldest plantations now being in their second or even third replant. Other crops such as pineapple have also been grown successfully on peat. However, peat lands are generally regarded as fragile environments that require great care in preparation and management to achieve successful crop establishment and productivity.

Peat soils are diverse and not all may prove tractable, productive or easy to manage. Considerable skill and diligence are needed as well as careful planning at inception for plantations on peat to be successful. Generally, the costs of establishing and running an oil palm plantation on peat are appreciably higher than those on mineral soils, though yields can be high, or at least sufficient, to make such enterprises profitable. However, there are additional considerations, involving long-term environmental impacts, that need to be taken into account.

Ecologists regard peat lands as unique ecosystems as they are 'true' carbon sinks, but their carbon sequestering properties may be badly disrupted and reversed after drainage; a necessary pre-requisite for growing oil palm and other crops. Such changes limit the effective lifetime of the peat and may affect the hydrology of the area beyond the plantation boundary as well as contribute to the rise in atmospheric greenhouse gas concentrations despite the carbon being sequestered by the oil palm and the natural vegetation in the plantation. Such effects can be minimised by selecting with care the peat areas to be developed on the basis of their 'drainability', together with a conservation approach to water management. The initial clearance of peat land forest results in a loss of natural resources including valuable timber species and endangered fauna and in a general decline in biodiversity. However, where peat land has already been heavily logged or cleared, the conversion to plantations will have less additional impact. Nevertheless, careful consideration needs to be given to decisions involving the fate of peat land areas.

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