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Evaluating the Global Warming Impact of Palm Oil Production (II). An Estate Model

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The increasing need for oil palm estates to undertake assessments of their environmental impacts can only be met if appropriate procedures and tools are available. One such impact involves global warming, as influenced by the sequestration and emission of greenhouse gases (GHGs), principally carbon dioxide. Previously, such assessments have involved the use of generalised or modelled data relating to a single crop, or have operated at a whole industry level, making use of country-wide data. This report describes an intermediate approach developed for use with individual oil palm estates or units. It was tested for an estate with a hypothetical history of land use and with notional inputs and outputs based on Malaysian conditions. The intention was to establish methodology appropriate for use with real estates and to assess the impact of different scenarios on the GHG balance.

The characteristics and history of land use for the virtual estate are described and carbon budgets are presented giving the net carbon balance for the whole estate and per hectare and per tonne of palm oil produced. Opportunities for reducing the total emissions are explored, with the chief contributory factors to the budget being: i) initial land use, ii) methane emission from POME ponds, and iii) the use or otherwise of improved oil palm planting materials for replanting. Some effects of varying these factors on the C budget are described.

Keywords: Oil palm, land use change, carbon sequestration, greenhouse gas emission, estate level model.