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CHARACTERIZATION AND CLASSIFICATION OF PEAT SOILS IN MALAYSIA

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SUMMARY

Peatland in Malaysia covers approximately 2.76 million hectares of which 796,782 hectares are in Peninsular Malaysia (Law and Selvadurai, 1968), 200,600 hectares in Sabah (Acres et al, 1975) and 1,765,547 hectares in Sarawak (Melling, 1999). Tropical peat differs from temperate peat due to differences in climate and the plant species that decomposed to form the peat layer. Temperate peats are mainly derived from remains of low growing plants such as *Sphagnum* spp., Gramineae and Cyperaceae while tropical peats are formed from tropical forest species (Paramanathan, 2016). The types of organic soil material (OSM) in Malaysia are mostly fibric and hemic. The thickness of OSM may reach to over 20.7 m as found in Loagan Bunut National Park (Melling *et al.*, 2006).

The three regions of Malaysia i.e. Peninsular Malaysia, Sabah and Sarawak established their own peat classification system during the reconnaissance soil survey by the teams who surveyed each region. Effort to unify the peat classification system for the three regions was initiated in the early 1980's with the formation of the Committee for the Standardization of Soil Survey and Evaluation in Malaysia (COMSSSEM) by the Department of Agriculture, Malaysia (Paramanathan et al, 1984, 1992). With more knowledge on the peat characteristics and field experienced of the soil surveyors, together with advancement in Soil Taxonomy (Soil Survey Staff, 1975, 1999) a more defined classification system was developed. Peat or organic soil definition in Malaysia adopts the criteria by Soil Taxonomy with modification, especially in the depth criterion. Few approaches in defining the taxa have been adopted by the committee and the consultants doing soil mapping in the three regions (Paramanathan *et al.*, 1998; Lah *et al.*, 2010). However, the Malaysian Soil Taxonomy (Paramanathan, 2000) is currently considered a reliable system and first approximation to unify the three classification systems in Malaysia. At the highest hierarchy, the organic soils (Histosols) must have a minimum cumulative thickness of 50 cm of organic soil material within 100 cm, or more than half of lithic/ paralithic or terric layer. This is then followed by other parameters - drainage class (either poor or well), thickness of organic layer (shallow 50-150 cm, moderately deep 150-300 cm and deep >300 cm), dominant material in the subsurface tier (at 50-100 cm either sapric, hemic or fibric), nature of stratum, presence of wood and mode of origin.

In its original state, peat soil is considered to have very low capability for agriculture development (Wong, 1986) due to its physical and chemical properties. These include high water table, drainability of the area, presence of woods in the profile and above the ground, type of organic soil material and nature of substratum. With proper soil and water management, various economic crops such as oil palm and pineapple can produce good and economical yields.

Keywords: *Malaysia, peatland, characterization, soil classification, agricultural capability*

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