

E-4. Restoration of Tropical Forest Ecosystem (Final Report)

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1. Morphological characteristics of fruits of *Durio zibethinus* Murray were investigated at an experimental field of Universiti Pertanian Malaysia (UPM) in Kuala Lumpur. Proportionality was observed in the allometries of lateral fruit diameter to longitudinal fruit diameter and of fruit volume to the $3/2$ nd power of the product of lateral and longitudinal fruit diameters.

2. Growth of seedlings under the natural and artificial light conditions was surveyed. Seedlings were cultivated under the various sizes of gaps and heights and basal diameters were measured. Both height- and diameter-growths were influenced by the gap-sizes and were high under the big gap. Seedlings grown under low-shaded (45% of full sunlight) condition were 1.7 times larger in height, 2.1 times larger in phytomass and 1.2 times larger in leaf area ratio than seedlings grown under high-shaded condition (15%).

3. The CO₂ concentration increased with increasing depth and exceeded 100 times at 50 cm deep as compared with the concentration at the soil surface. In a grassland, the CO₂ concentration was higher than that in a secondary forest at any depth and was approximately double of the concentration observed in a secondary forest. These differences in CO₂ concentration were considered to be caused by the carbon supplied from the buried wood.

4. Observations of suspended solids(SS) concentration, and surface runoff experiments in a watershed of tropical rain forest were conducted to assess mechanism of SS production. A clockwise hysteresis was recognized in relationship between discharge and SS concentration which was correlated with rainfall. Ignition loss showed an inverse relationship with SS concentration and converged at 30-40% indicating high organic content. Surface runoff on forest road during a storm produced SS concentration higher by 3 orders than that of the overland flow without rain drops. These results conclude that rain drop energy produces SS on damp areas near the stream.

5. Approximately 130 species of wood decaying Basidiomycetes were recorded in the study site. Most species were tropical species that are restricted in tropical area, or tropical-subtropical area. Species compositions of wood decay fungi are different according to the substrata size. Species on smaller substrata were less affected by water potential and were suggested to be more tolerable against drought stress. Some species were suggested to be specific on Dipterocarpaceae species but most of very common species were probably not host specific. In many cases, single species colonized wide areas of single fallen trees. Most isolates obtained from different basidiocarps belonged to different clones that suggested populations of wood decay fungi on single trees are composed of mycelia that belong to a number of smaller genets in many cases.