

Assessing of soil compaction and relations to soil fertility on different land used in Bintulu, Sarawak

ABSTRACT

Assessing land uses-induced changes in soil properties from natural forests to farmland are indispensable for addressing the complications in terms of agricultural landscape sustainability. A study was conducted in Rehabilitated Forest (RF), Oil Palm (OP), Secondary Forest (SF) and Rubber Plantation (RP) at University Putra Malaysia in order to examine the results of soil densification on soil characteristics and fertility status via soil indices. Soils were sampled at two soil depths. Fall-corn-type soil penetrometer was used to examine Soil compaction. Status of the soil fertility was determined by using Soil Evaluation Factor (SEF) and Soil Fertility Index (SFI). The soil compaction was severe at RP and OP compared to SF and RF. The highest pH, total carbon and cation exchange capacity was recorded at RP site. Soil at OP was found highest organic matter content, nitrogen and available Al. The SFI was comparatively upper than SEF value in case of both depths. The highest SFI value was OP, followed by RP, RF and SF for the surface soil. Therefore, soil fertility were affected by different types of trees such as dipterocarp trees, oil palm trees and rubber trees as well as soil managements and it is required to develop appropriate land use policy, sustainable soil management and cultivation practices to face the recent soil degradation in the study area.

Keyword: Soil compaction; Physical and chemical properties; Soil fertility; SFI; SEF