8-1-2 Impact of different land use systems on Biological Properties of Soils

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Soil is a vital natural resource that supports life on Earth and maintains environmental balance. Among the soil properties, biological properties play major role in ecosystem maintenance and are influenced by different land use systems. This study aimed to assess the impact of different land use systems on soil biological properties in the Vavuniya District, Sri Lanka. Soil samples were collected from six different land use systems: organic, inorganic, integrated nutrient management (INM), forest, permaculture, and bare land at two depths, surface and subsurface. The experimental design was a Completely Randomized Design with three replicates. The following parameters were measured: colony counts, respiration, microbial biomass carbon, and organic matter. The data were analyzed using ANOVA (SAS 9.4) at the 0.05 significance level, followed by Duncan's mean separation test. Results showed significant variation in the tested soil biological properties between land use systems. Forest, permaculture and organic land uses were recorded significantly higher colony counts, respiration, microbial biomass and organic matter content compared to bare and inorganic land uses , whereas INM lay in between. Between different depths, biological activity was significantly higher in surface soils than subsurface soils. Overall, this study highlights that organic and permaculture land use systems increased soil biological parameters similar to those of forest. Therefore, findings suggest that soil biological properties can be improved through sustainable soil management.