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A preliminary study on some soil characteristics in a disturbed ecosystem (rubber plantation) located in the low country wet zone of Sri Lanka

H A S Weerasinghe and T K Weerasinghe*
Department of Botany, The Open University of Sri Lanka, Nawala, Nugegoda

From the recent past, it is observed that the rate of anthropogenic activities have increased considerably bringing about disturbances to the valued natural ecosystems. There is a shortage of information regarding soil characteristics of such disturbed ecosystems in the wet zone compared to the rest of the zones in Sri Lanka. This study is an attempt to study some soil characteristics (physical, chemical & biological) in a disturbed ecosystem (Rubber Plantation) in Waga while comparing with a natural site.

Four sub locations were selected in each of the study sites and soil samples were obtained according to the simple random sampling technique at each of the sub locations from February to June 2004. The soil samples were tested on site and off site for physical, chemical and for biological characters and the results were analysed using a one way ANOVA table.

The results for physical parameters indicated that the values obtained for %soil moisture were significantly different at 5%($p=0.003$). Further, the data for field capacity(%) also showed a remarkable difference between the two sites,. The low value obtained for Field capacity at Rubber plantation could be considered as an indication for possible changes of the structure of soil due to human influences caused during the preparation of the site for a plantation. However no considerable change was observed for mineral composition of the two sites. With respect to the chemical parameters, soil pH did not show a reasonable difference although it was one of the key parameters that give a quick idea about a disturbance. It was observed a reasonable difference between the two sites on the measurements of soil conductivity and a significant difference of the values obtained for soil organic carbon ($p=0.02$) and cation exchange capacity ($p=0.046$). These results very clearly indicate the fate of natural soils due to human influences. These results further reveal that disturbance has created an environment which lacks required soil fertility characteristics thus developing the signs of possible soil degradation. The study also observed very low soil phosphate and high nitrate contents under Rubber plantation indicating possible low retention of Phosphate under disturbed conditions. The obtained soil microbial biomass values showed that the plantation site was biologically disturbed.

The overall results revealed that some of the soil parameters were changed as a result of the changed vegetation indicating possible soil quality deterioration under rubber monoculture plantations. Further studies are required to find the consistency of these results and to determine the extent to which rubber planting disturbs a natural ecosystem.