

Soil fertility status in five vegetations in an abandoned agriculture land in Sri Lanka

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ABSTRACT

Large areas of agricultural lands where crop plantations established during past hundred years had been abandonment are present in the wet zone of Sri Lanka. Hantana is one such area regenerated with *Paraserianthes* (PAW), *Alstonia* (ALW), mixed species (MSW), *Pinus* plantation (PIW) and natural forest (NF). Though information is available on floristic diversity of woodlands, very little is known about the soil. Soil studies will help in understanding soil fertility status, and provide necessary information to manage vegetation with soil degradation.

Using stratified random sampling 15 plots were selected in each vegetation. Top soil was collected in zig zag manner and was analyzed for total N, NO_3^- , available P, exchangeable K, Ca and Mg, C.E.C., pH, organic matter (o.m.) and saturation capacity. Vegetation - specific differences among the parameters were compared by Turkey's test after ANOVA.

The highest and the lowest values were shown by the NF and PIW respectively for most of the parameters. MSW showed higher C.E.C., K, NO_3^- and Mg than ALW and PAW. Except for NO_3^- and o.m., all the other parameters showed no significant differences between MSW and NF. However, between ALW/NF and PAW/NF some other parameters also showed significant differences. Nitrate and o.m. contents of the NF were significantly higher than all secondary woodland types. Apart from NO_3^- , all other parameters were significantly lower in PIW than in all broad-leaved woodlands.

In conclusion, soil nutrient levels of the NF were found to be higher than that of the other woodlands. Soil fertility under PIW appears to be less than that of other woodlands. MSW had higher nutrient levels than the other secondary woodlands and a better soil rehabilitation process seems to be taking place in MSW towards NF.

Therefore, this study reveals that use of mixed species seems to be more effective than mono-species pine plantations for soil rehabilitation.

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