

A Comparative Assessment of Soil properties in *Pinus caribaea* Plantation and Semi-natural Montane Eco-system of Tropical Sri Lanka

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Inappropriate forestry practices have been identified as a foremost reason that prevents the soil from performing its services to society and ecosystems at a maximum. Certain species established under forestry practices cause severe soil degradation in natural ecosystems, particularly in tropical countries. Hence, this study was aimed at investigating the changes in soil properties caused by forest plantations with exotic species; *Pinus caribaea* in the tropical highlands of Sri Lanka, referring to the semi-natural forest ecosystems. Representative soil samples were collected randomly from established transects; 12 from *Pinus caribaea* plantations and 12 from semi-natural forests along the northwest altitudinal gradient in the Hantana Mountain range, at 15cm - 30 cm depth. Two vegetation types have been grown on the same soil type, Red Yellow Podzolic, and the transects were selected at the same altitude. Soil properties were analyzed by laboratory testing of collected samples. Compared to *Pinus caribaea* plantation, the mean soil organic matter content was comparatively greater in semi-natural forests, which was 8.11 % and 11.78 % respectively. Mean soil gravimetric moisture content was slightly higher in semi-natural forests (15.65%) compared to *Pinus caribaea* plantation (12.49%). There was no significant difference in mean soil porosity in each land-use type. It was 30.51% in *Pinus caribaea* plantation and 33.85% in semi-natural forests. Higher soil acidity was observed in *Pinus caribaea* plantation (mean pH-5.67) than in semi-natural forest (mean pH-6.29). Mean electrical conductivity of soil under two vegetation types did not show a significant difference. It was 13.68 ($\mu\text{S}/\text{cm}$) in *Pinus caribaea* plantation, and 15.36 ($\mu\text{S}/\text{cm}$) in semi-natural forests. This study reveals that organic matter content, pH and moisture retention in soil are comparatively different between *Pinus caribaea* plantations and semi-natural forests, which highlights the impact that species selection for reforestation programs could have on ecosystem services of a forest.

Keywords: *Pinus caribaea*, Semi-natural forests, Vegetation, Soil properties

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