

**Assessing soil physical quality in
Rubber and Oil Palm plantations in
the Galle region**

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**H.A.N. Upekshani
Faculty of Science
University of Colombo
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ABSTRACT

With fluctuating rubber prices, some of the rubber [*Hevea brasiliensis* (A. Juss) Mull Arg] plantations have been transformed into oil palm [*Elaeis guineensis*] plantations, particularly in the low country Wet Zone of Sri Lanka. However, only little information is available on the impact of this conversion on soil physical quality, a quality that is very hard to reestablish once degraded. Therefore, this study determines the soil physical quality under rubber and oil palm plantations and compares it with a natural forest. Undisturbed soil samples from the top 0-30 cm depth were collected from a rubber field, a converted oil palm field and a natural forest in close proximity. Bulk density, saturated hydraulic conductivity, organic carbon content, field capacity, permanent wilting point, plant available water, aggregate size distribution, texture and pH were measured in collected soil samples. Plant available water contents were 0.23, 0.16, and 0.13 m³m⁻³ in forest, rubber and oil palm fields, respectively. Compared to the natural forest, organic carbon content has been decreased by about 13 % in the rubber field and by 32 % in the oil palm field. A physical quality index was developed using the relative contribution of measured soil physical properties to soil degradation. Soil physical quality was the best in soils under natural forest and the poorest in oil palm. When the rubber field is converted to oil palm, soil physical quality has been degraded by about 53 % during the 20 years period after the transformation. The necessity of the adoption of stringent soil management practices when a rubber plantation is converted into an oil palm field is therefore highlighted.