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**SPATIAL DISTRIBUTION OF SOIL NUTRIENTS IN THE FOREST  
DYNAMIC PLOT AT SINHARAJA**

**A PROJECT REPORT PRESENTED BY**

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to the Board of Study in Statistics and Computer Science of the  
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*in partial fulfillment of the requirement  
for the award of the degree of*

**MASTER OF SCIENCE IN APPLIED STATISTICS**

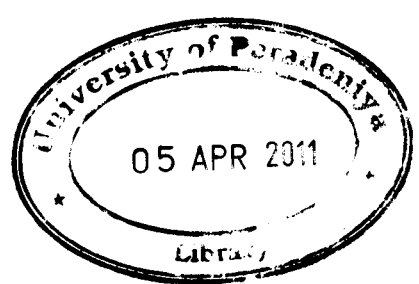
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# **SPATIAL DISTRIBUTION OF SOIL NUTRIENTS IN THE FOREST DYNAMIC PLOT AT SINHARAJA**

## **ABSTRACT**

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Rain forests supply much information about high plant diversity compared to other tropical forests. The main resource available in Sri Lanka for an illustration for a rain forest is Sinharaja lowland rainforest. A Forest Dynamic Plot (FDP) is established at Sinharaja which is the most topographically heterogeneous FDP with the highest elevation range (151 m) compared to other FDPs found elsewhere in the world. This Plot covers an area of 25 ha (500 x 500 m) and is located in the Sinharaja, UNESCO World Heritage Site. Elevation increases from 424 m to 575 m above sea level. There is a little information available on the spatial scale and pattern of below ground resources in lowland rain forests.

The present study was designed to address the spatial soil resource heterogeneity in Sinharaja lowland rainforest. Soils were sampled by using a regular grid pattern which yielded 253 soil samples in total. Soil samples were analyzed for Al, Ca, Fe, K, Mg (mg/kg), pH and soil moisture (%) using standard analytical procedures. The Sinharaja FDP was divided into 8 topographic habitats depending on three physical parameters, elevation, slope and convexity. One way ANOVA procedures and Kruskal-Wallis one-way analysis of variance were carried out to identify the differences in distribution of soil properties. Geostatistical techniques were useful in obtaining spatial predictions for 20 x 20 m quadrants. In addition to the preliminary statistics, coefficients of variations (CV) of estimated predictions were used to describe the variability of soil properties. Then exploratory unconstrained ordination analysis was performed using nonmetric multidimensional scaling (NMDS) to test whether the species composition of Sinharaja FDP was related to the variations of belowground soil nutrients.