



## **SPATIAL VARIATION OF SOIL NUTRIENTS IN PADDY LANDS; A CASE STUDY IN POLONNARUWA DISTRICT**

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Soil nutrient variation and its impact on growth is important in proper fertilizer management in paddy. There is an issue of yield stagnation although farmers use recommended rates of fertilizer. In this research, spatial variation of soil nutrients is identified to overcome this problem and to recommend site specific plant nutrient management practices to avoid excessive use of fertilizers. This study was carried out in Ellewewa as a command area in Polonnaruwa district. Samples were collected from both top and sub soil layers and sampling points were recorded by using Global Positioning System (GPS). Soil samples were analyzed for pH, electrical conductivity, Na, K, P, Mg, Cu, Zn, Mn, Fe and soil organic matter. ArcGIS 10.1 was used to mapping and the Kriging tool used in interpolating the data to determine spatial variation. Results revealed that the most major nutrients (K, P, and Mg) were not in adequate and micronutrients such as Zn and Cu were deficient. Fe was in excess level for paddy cultivation, although this region belong to dry zone. Micronutrient Mn was adequately present. In almost all the area average Potassium (K) was below the threshold K level (<75 ppm). Therefore attention on K fertilization is important. The soil reaction was in fairly proper range but there was an evidence of development of acidity and alkalinity. Soil in the study area indicated very strongly acidic to slightly basic. Sub soil had a large area of developing alkalinity. Soil Phosphorus (P) was also below the adequate level. This may be the result of washed out from soil and soil may inherently low with Calcium (Ca), Magnesium (Mg) to form non soluble compounds with P. It is also below the productive level (<10 ppm). Considerable area had medium level of P fertility (10-20 ppm). Alternative seasonal P application is recommended. Best nutrient management practices are necessary to break yield stagnation. Site specific fertilizer application according to spatial variation of nutrients in soil will increase the yield and reduce the fertilizer costs while protecting the environment.

**Keywords:** *GIS, GPS, Paddy, Spatial variation, Soil fertility*