Salinity levels in costal saline paddy areas of Jaffna and Mannar districts

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Rice is the staple food in Sri Lanka. Paddy cultivation mostly occur in Dry and Intermediate zones of the country including some low laying land areas along the coastal belt. Coastal zone is more vulnerable to salinity intrusion due to sea level rise induced by climate change. Every year farmers lose their arable lands due to soil salinization. This study primarily focused on identifying and mapping salt-affected paddy cultivating areas in Jaffna and Mannar districts, since these two districts in Northern Province are highly vulnerable to contamination with saline water. Salinity- affected paddy areas were identified with the help of the regional officials of the Department of Agriculture. The soil samples were collected during the Yala season, using Zig-zag soil sampling method. Forty-nine salt-affected areas were identified in Jaffna district and thirteen areas were identified in Mannar district. Composite samples were collected in all identified areas. Composite field sampling was done by collecting sub samples at 15 cm depth by traveling in a zig-zag pattern. Each composite sample consisted of 16 subsamples spread evenly across the field.

Collected soil samples were analyzed for Electrical Conductivity (EC) by using unsaturated soil suspension technique (i.e. 1:5 soil-water extract) to study the degree of salinity. Based on the obtained EC values, the sampled areas were classified as non-saline (<0.15 dS/m), slightly saline (0.16-0.30), moderately saline (0.31-0.60), very saline (0.61-1.20), and highly saline (>1.20). The thematic maps were prepared according to the GPS location and classified data by using Arc GIS 10.3.

The measured EC ranged from 1.6 – 4 dS/m in Jaffna district and 1.5 - 1.7 dS/m in Mannar district. The results revealed that all the study areas are affected by high salinity in both districts. There may be more salt-affected areas in these districts which need to be assessed. Highly saline areas were identified along the costal low-lying lands and areas close to lagoons. The findings of the current study will support policy decision making and potential remedial measures (cultivating salt tolerant varieties, seedling transplanting, water management and land preparation techniques) in relation to the salt-affected paddy areas in the country.

Keywords: Salinity, Jaffna, Mannar