ABSTRACT

Accumulation of excess salts in the root zone resulting in a partial or complete loss of soil productivity, which hampers crop production and reduces the utility of lands. The extent of salt-affected lands in Sri Lanka are about 223,000 hectares or about 3 percent of the land cover of the island. Identification of salt-affected lands and estimation of their salinity levels are very important for land use planning and restoration.

In this study, salt-affected lands in Hambantota district of Southern Sri Lanka are identified and demarcated into different categories according to the salinity levels using GIS and Remote Sensing technologies. An extensive soil survey was conducted to collect soil samples throughout the district. The sampling was done with a manual soil auger. Electrical Conductivity and pH of the samples were determined.

Field salinity data are mapped in a GIS environment of ArcView 3.2a and Ilwis 3.2 for Windows. To create salinity distribution maps, surface interpolation Inverse Distance Weighting (IDW) method developed by Environmental Systems Research Institute, Inc. , was used.

In the Hambantota district, salinity levels are high along the coastal belt. Highly salinized areas were identified in Tangalle, Ambalantota, Hambantota, Lunugamwehera and Thissamaharama where salinity is greater than 4 dSm^{-1}. In Katuwana, Weeraketiya and Okewela areas, saline levels were lower than 2 dSm^{-1} while in Beliatta, Angunakolapalassa and Sooriyawewa, moderately saline areas were located with salinity levels of 2 - 4 dSm^{-1}.

The study helps to produce a salinity map of the Hambantota District. From the total land area (including inland water resources) of the Hambantota district (2120 square kilometers), 40% of in-lands have no threats from salinity (855 sq.km.). Thirty eight percent of the land in the district (806 square kilometers) is of slightly or prone to salinity. There is 433 square kilometers (20%) of land, which are moderately saline and needs improvement. It was revealed that from the total area of 2120 sq km, there is an extent of 25 square kilometers (1%) where salinity is severe.

The Remote Sensing analysis conducted using the digital satellite data (30x30 meter resolutions) helped to locate saline areas. It was revealed that optical parameters of the *Acacia leucopholea* as a reliable indicator to identify the salinity spots when Remote Sensing techniques are used to locate saline patches in Hambantota District.