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Impacts of Salt Water Intrusion in Coastal Paddy Areas of Wet Zone of Sri Lanka

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Abstract

Rice (*Oryza sativa* L.) is the staple food in Sri Lanka. It is cultivated in almost all the Agro ecological regions except for elevations above 1200 m Mean Sea Level (MSL). The major rice growing areas are in the Dry zone and Intermediate zones of Sri Lanka, but they are found in the Wet zone, too. Salinity is a major constraint in enhancing the production of rice in the world. A large extent of paddy lands in the coastal zone of Sri Lanka has become unproductive due to high salinity from salt water intrusion due to sea level rise associated with climate change. The focus of this study was on salinity problem and its socio-economic impacts on the coastal paddy fields in the wet zone of Sri Lanka due to salt water intrusion. From each site in 5 districts (Galle, Matara, Colombo, Kalutara, Gampaha) of the wet zone that are known to be affected by salinity, six soil samples were collected at regular intervals for 4 times of the year and were checked for electrical conductivity and pH. The salinity levels of those sites affected by salt water intrusion and reference site/s with no salt water intrusion within the same district were statistically analyzed using two-sample t-tests (95% CI). The results showed a statistically significant difference ($p=0.00$) between the salt-affected site/s and the reference site/s. Salinity of the saturated paste extract of most of the sites were closer to 2 dSm^{-1} which showed a high potential of hindering the productivity. The socio-economic aspects of the salinity problem in the affected areas were assessed by conducting a survey among farmers. Majority of the farmers who were surveyed, are engaged in farming for about 5-10 years and their age mostly lies in the range 40-70 years. Most of the farmers bear the idea that this problem becomes worse during the dry months of the year such as August, January and February. Application of organic matter including cow dung and leaf litter is carried out by majority of the farmers (70%) and improving field drainage is done by only 25% of the farmers to alleviate the adverse effects of the salinity. The use of inorganic fertilizers to improve the soil condition is at a minimum level in these areas. Therefore, it is recommended that necessary action should be taken for optimal control of salinity in coastal paddy areas to improve crop yields and livelihoods of the farmer communities.

Keywords: Coastal paddy, Salinity, Salt water intrusion, Soil