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Sustainable agricultural production and bio-diversity conservation through soil and water conservation measures

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ABSTRACT

The study was undertaken in the micro watershed located in Kakdwip Block in saline eco-system of Sundarban. Composite surface soil samples(0-15 cm depth) of double and mono-cropped paddy fields as well as grassed and barren lands were analyzed for different physical (particle size distribution, bulk density, aggregate stability, water holding capacity, moisture evaporation, plasticity) and chemical (organic carbon, SAR, ESP, CEC, pH, EC as well as total N, available phosphate P_2O_5 and K_2O) properties. Result revealed that low land soils contain 49.8% clay and it was more than 50% in both double and mono-cropped paddy fields, which resulted 99 % aggregation in these land uses. The higher (0.97) structural co-efficient under these two practices resulted maximum porosity (49.81%) under medium land situation and water holding capacity (61.73%) as well. All the physical and hydrological parameters were found to be highly correlated with both clay and organic matter content of the soil. The pH of the soils under cultivated double and mono-cropped land was acidic (pH 5.3 to 4.6); and alkaline in rest of the land uses. ECe was $> 2.0 \text{ dSm}^{-1}$ in both the land situations. Other chemical indicators viz., SAR, ESP, CEC was found to be relatively higher in lowland situations due to higher clay and organic matter content of the soil. Total nitrogen content did not show any variation w.r.t. land uses and land situations, but, considerably higher content of available P_2O_5 and K_2O in either double cropped or mono-cropped lands in lowland situation was found to be associated with high clay content. Finally it was revealed that both double and mono-cropped paddy land under medium land situations have highest productivity. In lowland situation, productivity of cropped lands was marginally lower than those under medium land situation.