

Seasonal variation in physicochemical characteristics of soil in some coastal parts of Thatta District, Sindh, Pakistan

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Abstract

There is severe shortage of freshwater in deltaic parts of Thatta district. It has resulted in seawater intrusion because aquifers are recharging with saline water and have become shallow causing waterlogging and high soil salinity in these areas. As a result the area under cultivation is being reduced fast and enhanced soil salinity is also causing desertification and migration of the local people. The study area covering two Tehsils of Ghora Bari and Keti Bandar of Thatta district lies between latitudes 24°, 10' to 24°, 32' N and longitudes 67° 46' to 67° 42' E. The climate of the coastal area is arid and tropical marine with low annual precipitation. Twenty two each soil samples were collected at the depths of 0-12" and 12-24" during Post and Pre-monsoon seasons of 2011-2013. Total eighty eight soil samples were collected and analyzed to determine the soil types and temporal changes in their physicochemical characteristics. Effects of floods of 2010 and 2011 on soil salinity and agriculture in the study area were also noted. Data reveal that based on Electrical Conductivity (ECe) and Sodium Adsorption Ratio (SAR) soil quality during Post monsoon seasons (2011-2013) in both Tehsils remained Non Saline Non Sodic (Ave. 3.337 dS/m, SAR 11.6). While, in the Pre monsoon seasons (2012-2013) the ECe and SAR far exceeded the permissible limits of 4 dS/m and 14 respectively making the soil Saline Sodic. As a result in all sites of the study area mainly crops of wheat, sugarcane, tomato, brinjal pumpkin and burseem were noted in good condition during Post-monsoon seasons of 2011 and 2013 because of floods of 2010-2011. Whereas, in Pre-monsoon seasons of 2012 and 2013 most of the sites in study area remained uncultivated due to capillary action of shallow saline groundwater, high evapotranspiration, shortage of canal water, tidal flooding and seawater intrusion.