

Soil quality parameters of tsunami affected soils in Madiha area, Matara district, southern Sri Lanka

S.H.R. Priyadarshani, B.C. Walpola and S.D. Wanniarachchi

Department of Soil Science, Faculty of Agriculture, University of Ruhuna, Kamburupitiya, Sri Lanka

Abstract

Large coastal areas of eastern and southern Sri Lanka were devastated by the Asian Tsunami occurred in December 2004. An assessment on some selected quality parameters was made on the soil in Madiha area in Matara district, to study the effect of Asian Tsunami after the 3 years. Soil samples from 36 locations in two depth segments (0-15 and 15 – 30 cm) were taken from the affected area. Representative soil sample were also taken from an unaffected site with the same soil type for comparison. Soils were analyzed for soil texture, bulk density, pH, EC, N, P, K and organic matter (OM) contents using standard methods.

According to the soil textural classification the soils were loamy sand with an average bulk density of 1.3 g/cm^3 . Average N and Organic Matter contents were 0.3 and 0.9%, respectively. The corresponding values for N and OM were 0.13 and 1.06% unaffected soils. P and K contents were 230 and 110 mg/kg of soil and corresponding figures for the unaffected soils were 96.3 and 175 mg/kg of soil, respectively. A considerable improvement of major nutrient levels were observed when compared to previous findings (0.098 and 0.63% for N and OM and 98.73 and 144.4 mg/kg of soil for P and K) and unaffected soils of the investigation carried out right after tsunami. The average pH and EC values were 8.4 and 0.2 mS/cm for the affected soil while 6.78 and 0.12 mS/cm for the reference soils. Results further revealed that more than 90 % samples collected from affected soils had pH higher than 8.4. Previously it was recorded as 8.29. A decreasing trend of soil salinity (EC values) could also be observed. This may be due to gradual washing off the salt by rain as affected site received a considerable rainfall, being in the wet zone. On the other hand, the increasing trend for pH values of affected soils could be due to gradual replacement of cations in soil. As most soil quality parameters were found to be good except pH, no major remediation measures are needed to be undertaken to improve the productivity of the soil.

Keywords: Tsunami, Soil Salinity, Remediation