

CHARACTERISATION, GENESIS AND CLASSIFICATION  
OF SUBTROPICAL SOILS ON VARYING PARENT MATERIALS  
IN PARTS OF BIHAR AND WEST BENGAL, INDIA

ABSTRACT

Representative soil profiles were investigated from an area of about 16,000 sq.km under humid subtropical climate lying between north latitude of  $22^{\circ}15'$  and  $23^{\circ}45'$  and east longitude of  $84^{\circ}0'$  and  $87^{\circ}30'$  forming parts of Ranchi and palamau districts of Bihar comprising of high level aluminous laterites, which extends through Purulia and further to the western fringe of West Bengal in Midnapore district as low level lateritic soils. The parent materials of the area are chiefly Archaean containing granite, granitic gneiss, phyllite, calc and mica schists, meta amphibolites, basic materials of deccan trap, and also of tertiary sediments of alternating sandstone and shale, and alluvium.

Samples were analysed for physical, physico-chemical, chemical and mineralogical parameters including XRD, IR, differential thermal and petrographic analysis to obtain a detail account on the characterization of the soils on the above varied parent materials, geomorphic land forms and

landscapes. Soils, especially of those of deep profiles have been studied far beyond the controlled section to obtain a complete picture of the pedological as well as geological weathering processes enabling classification of this complex group of subtropical soils into their appropriate taxonomic classes. It has been revealed that the subtropical and tropical soils which were variously named as laterite, lateritic and latosols, could be placed well under any of the ten orders depending upon weathering stage in relation to the parent material composition, and characteristics imparted by vegetational climatic influence, as these soils may exhibit as broad a range of properties as of soils of temperate region. A possible pathway of soil development and clay mineral genesis has also been suggested. Lastly, based on soil survey data, soil characteristics and classification, the soils have been placed into "Fertility capability classification system (FCC)". The latter has been used for grouping the soils according to kinds of problems they present for the agronomic management of their chemical and physical properties.

Key words : Subtropical soils; parent materials and land forms; available moisture; soil acidity levels; ZPC;

ECEC; base saturation; NPK - forms and distribution;  
micronutrients; amorphous Al/Fe hydroxides; sand mineralogy;  
clay characterization and genesis; soil formation and taxo-  
nomy; Fertility Capability Classification (FCC).