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Role of neotectonics and climate in development of the Holocene geomorphology and soils of the Gangetic plains between the Ramganga and Rapti rivers

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ABSTRACT

Fifteen soil-geomorphic units have been delineated from the Gangetic Plains between the Ramganga and Rapti rivers. They were identified by remote sensing and field checks. On the basis of degree of profile development, their soils are grouped into five members (QGH1 to QGH5, QGH5 being the oldest) of a soil chrono-association. Tentative ages assigned to QGH1 to QGH5 are <500, > 500, > 2500, 8000 and 13,5000 yr B.P., respectively. From the early Holocene to about 6500 yr. B.P. a cold, arid to semi-arid climate prevailed and pedogenic calcrete developed over large areas in the Gangetic Plains. Later, a warm and humid climate and improved drainage resulted in complete removal of calcrete from soil profiles in some areas or its dissolution and re-precipitation in lower horizons in other areas. Neotectonics seems to have played a significant role in the evolution of the geomorphology and soils of the area. It determined areas of active sedimentation, pedogenesis and erosion (in upland regions). It led to tilting and sagging of large blocks resulting in shifting and increase in sinuosity of the rivers. Tectonic slopes/faults determined the courses of large rivers.