Landforms and coastal dynamics of the Penner Delta, A.P. using remote sensing and GIS techniques

K.V. Suryabhagavan

Supervisors:
Dr. D.Mitra, MSD, IIRS
Dr. E.N.Dhananjaya Rao, Geology Dept, Andhra University

Abstract

The Penner Delta in the Nellore district of Andhra Pradesh exhibits a combination of many typical landforms such as estuary, beach ridge/swale complex and alluvial plains. The deltaic coastline is about 60 km with prominent spits, tidal creeks, barrier islands and beach ridges.

The deltas are progradational in nature and they prograde due to barrier development and lagoon filling processes. During deltaic progradation, a number of micro sedimentary environments evolve and effects morphodynamic changes through time. Since, environmentally efficient coastal zone management based on accurate and comprehensive scientific data is the need of the hour for making policy decisions. As an attempt towards this direction the present work is taken up with reference to Penner Delta front on the east coast of India.

Remote sensing and GIS has pointed out that Penner deltaic coastline is cuspate in shape. At present, the river discharge is largely regulated by dams. The anthropogenic interference drastically reduced the sediment supply leaving out the deltaic evolution mainly to the reshaping processes.

The normal stream of the main channel is hampered by two cuts, namely, Sangam and Nellore. The active river channel (floodplain) made up of more sandy sediments is subjected to annual flooding. The thickness of floodplain of the Penner river is estimated to be 400 – 600m and is designated as recent active floodplain.

The recent active flood plain encompasses an active channel. The shore parallel beach ridges are being modified to the coast by wind in view of absence of vegetal cover over them. Their preservation in stratigraphic record would thwart interpretation of exact trends of coastline configuration.

Use of multi-temporal satellite data showed a continuous change, which was relevant to the other factors, such as erosion and deposition and infrastructures along the river mouth and shoreline.

The opening up of a new distributary, which is formed just to the north of the present river may be due to neotectonic activity and /or morphological changes at the river mouth. In the future adjacent villages may be endangered by the new distributary.

Information on soils, landforms, land use information as well as delta front changes can be generated using remote sensing and GIS analysis in more detail for better management of resources and identification of potential areas for intensive agriculture practices on sustained basis in the delta area.