

Development of river dominated delta in mio-Pliocene Manchar Formation, Wahi Pandhi and surrounding areas Kirthar Range, Distt: Dadu Sindh, Pakistan

Muhammad Ikram

*Pakistan Atomic Energy Commission, Atomic Energy Minerals Center, Lahore-Pakistan.
Visiting Faculty Member, Minerals Resource Engg. (MRE) Department PIEAS-Islamabad
awanikram@yahoo.com*

Abstract

Late Miocene-Pliocene sedimentary sequence in the Kirthar Range, lower Indus Basin of Pakistan is represented by sandstone dominated Manchar Formation and shows deposition as the result of tectonic uplifting, sea level fluctuations and environmental changes. The deposition of a number of gray colored sandstone sedimentary units (GS) of Manchar Formation took place in marginal marine and braided river dominated deltaic environment in fining upward sequences. The basin fill sedimentary sequence is comprised of sandstones, conglomerates, siltstone and gypsiferous clays deposited in varying time and space and different environmental conditions. This unusual character of incised valley-fill sequence can be accounted for by rapid and high amplitude sea level fall and progradation occurred on a narrow and steeper gradient continental shelf. The high rate of sediment supply was provided by rapidly rising hinterland areas. The distinct and remarkable facies pattern and associated depositional environments are characterized by yellow brown siltstone of flood plains, massive silica rich off-white to cream colored sandstones of beach environment, gray colored sandstones of deltas, variegated colored and thinly bedded to alternate laminated sandstone, siltstone and clays of tidal flats as well as massive brown and maroon colored gypsiferous clays of overbank deposits. Moreover, small scale and locally developed shallow lagoons and estuaries are characterized by thinly bedded and white to buff colored gypsiferous carbonaceous sandstone which is overlain by brown siltstone/claystone with Oyster bank development. The gray sandstone units (GS) of braided river dominated delta complex show large facies variations recording deposition under a wide range of depositional conditions as: delta plain, delta front and pro-deltaic environments. The debris flow deposits also contribute significant part to the deltaic gray sandstone (GS) units. The evolution of successive valley fills shows shallow to moderate water depths and high energy braided-river dominated deltas to fluvial environments. The basin architecture and facies distribution were mainly controlled by sediment supply, sea level fluctuations, environmental changes and syn-sedimentary tectonism.