The Neoproterozoic Supracrustal Kurnool Group, India: A Case History Of Sediment-Starved Basin

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The Nallamalai fold belt in the Cuddapah province, India is recognised as a Proterozoic rift basin which evolved under a regime of continued crustal stretching. Episodes of igneous activities (1.09Ga to 0.87Ga) leading to emplacement of diamond-bearing kimberlites and lamproites in the Cuddapah province took place during the deformation of low-grade Nallamalai strata. The emplacement of kimberlites probably manifests a phase of rifting and magmatism which heralded the Meso-Neoproterozoic transition in Indian craton. The event is contemporaneous with the Grenvillian orogeny. The transition from the Nallamalai to the succeeding Kurnool basin took place by a northerly shift of sub-basins during the latter stage of aforesaid igneous episodes.

The Kurnool sedimentation started with deposition of diamond-bearing and volcaniclastic-rich conglomerates, sandstones and mudstones over the pre-Kurnool sediments with an angular unconformity. Palaeocurrent analysis indicates derivation of the conglomerates from kimberlite-dominated southwestern region. The Neoproterozoic Supracrustal Kurnool Group comprises cycles of quartz arenites and carbonates with sequences of limited thickness. The facies assemblages include: (i)fluvial facies, (ii)lake facies with a tendency towards playa conditions and (iii)deep water carbonate platform facies punctuated by shallow-marine facies.

Limited supply of terrigenous clastics, rifting below sea-levels and distality from the continents, at least for sometime, might have controlled deposition in the sediment-starved Kurnool basin.