

Extent and Limit of Gondwana in East Coast Pericratonic Basins of India and Their Hydrocarbon Potential

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Thick successions of Gondwana sediments occur in the subsurface below the marine Cretaceous successions in the East Coast basins of India. Recent geological studies have added additional biostratigraphic and source-rock data to understand the extent and limits of Gondwana in these basins and their hydrocarbon potentials. In Krishna-Godavari Basin, the Gondwana succession comprises fluvial Permian and Triassic sediments. They are separated from the overlying marine Lower Cretaceous sequence by a major Jurassic hiatus. In Mandapeta Subbasin (K.G. Basin), gaseous pay-sands, occurring below the “Red-Beds”, belong to the Lower Cretaceous Gollapalli Formation.

However, the older pay-sand zone in the Mandapeta Sandstone belongs to the Triassic Gondwana, and has shown commercial occurrence of hydrocarbon. The shales within Kommugudem and Mandapeta formations, with moderate to rich organic matter are the main source for the Mandapeta and Gollapalli pay-sands, and were within the oil-window since Middle Triassic to Early Neogene. In Cauvery Basin, Gondwana includes only the Lower Permian shale. The overlying Andimadam/Sivaganga Formation, known as Upper Gondwana, belongs to marine Lower Cretaceous sequence. The pay-sand zone within Andimadam Formation is sourced from the shale within this formation having good TOM.

The Mahanadi and Bengal basins are with well-developed Lower Gondwana successions. The carbonaceous shale within Barakar and Raniganj formations show potential source. However, occurrence of hydrocarbon within Gondwana is yet to be established. Integrated geoscientific studies may augment in discovering commercial hydrocarbons in buried Indian Gondwana basins as Lower Gondwana are well-known for their commercial hydrocarbon accumulations in Oman, Saudi-Arabia and Australia.