

Exploration strategy of Lower Bhuban play in Eastern Tripura, India. A Case study

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Exploration for hydrocarbons in Western Tripura-Cachar, in India is about 37 years old. However, quest for hydrocarbon in Eastern Tripura began only in 1991. Drilling of few wells mainly over the crest has helped in establishing only hydrocarbon leads within Bhuban reservoirs. Complex geological conditions, prevalent high pressure regime and subjectivity in delineating exploratory targets from seismic data were significant hindrances in initial phase of exploration in Eastern Tripura. In the later years exploration was shifted towards the synclinal part between anticlines marked by geomorphic highs. Recent discovery of sandstone gas pay within Lower Bhuban formation in Agartala Dome in Western Tripura and a thick sandstone gas pay within Lower Bhuban formation in “Khubal Structure” in East Tripura has generated a new impetus to hydrocarbon exploration from Lower Bhuban reservoirs in Eastern Tripura and has helped in establishing Tripura-Cachar region as a part of giant petroleum gas province comprising of Bangladesh-Tripura-Cachar-Mizoram.

Present paper attempts to develop a conceptual geological model for Lower Bhuban play in East Tripura, demarcate prospective areas for future exploration and delineation of potential reservoir facies. A comprehensive study was under taken, integrating surface geology, 2-D Seismic, drilled well, Petrophysical, Sedimentological, Geochemical and Palaeontological data of Tripura, Cachar & Mizoram to understand sedimentation history, distribution of reservoir facies and hydrocarbon accumulation pattern in the study area.

Different seismic attributes and AVO studies were undertaken to understand the distribution of pay sands around Khubal area. Based on this integrated study, seismo-geological cross sections, structure contour & lithofacies maps were generated. Detailed facies analysis was done to reconstruct suitable geological model. The suggested model is essentially a delta complex. This integrated study has helped in preparing a Tectono-Sedimentological model of Lower Bhuban play; identify lead areas and potential reservoir facies for exploration and delineation of Lower Bhuban reservoirs in Eastern Tripura.