

Speculative Tectonic Model and Hydrocarbon Play System in Outer Himalyan Foldbelt of Kashmir

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Abstract

Kashmir Foreland Fold belt is located on the northern margin of Indo-Pakistani Plate and placed in a possible corridor where petroleum play can be considered form a speculative history of tectonics and deposition. It is important to understand presence of key four ingredients (source, reservoir, seal and trap) from the evolutionary path of Indo-Pakistani Plate Model. The tectonic history leads to consider and favour for such considerations. The plate history in this part of basin also suggests factors for maturity which together with structural pathways for migration supports concept of hydrocarbon presence.

History of opening of Kashmir Basin can be dated back after the rifting of Lusha and Afghan Blocks in early Triassic thus providing an opportunity to deposit Mesozoic sedimentary cover in a sag type of basin setting. This together with Global eusataic controls and tectonic controls may have lead to consider for presence of clastic units which can be categorized among the source, reservoir and seal levels in the basin setting. However presence of such system is still not known from surface geology, but in subsurface their existence cannot be ruled out.

The Cenozoic levels of rocks present in the basin are known and these can be categorized into source, reservoir and seals. Therefore present scenario suggests presence of dual petroleum system (Mesozoic and Cenozoic in Kashmir Basin if preserved and may form a viable play.

The structural evolution in this plate history suggests presence of inverted structural features (folded and trusted blocks, duplexes and erosional traps) which could set geometries both for migration path ways and pooling of hydrocarbons based on preserved structural dips. The history of Kashmir Basin also support increase in Geothermal gradients which contributed for baking of source rock if have a valid TOC contents.

The presence of hydrocarbon seepages and shows in wells in eastern segment of Foreland basin requires evaluation and further study for the case of presence or absence or deterioration of oil and gas pooling in the Basin. The second key factor is a proper understanding of thermal history which may have a considerable impact for under or over maturation of source rocks and also to mitigate the risk for absence of Petroleum system in the Basin.