

Structural Style and Its Impact on Trap Formation: A Study from Neem Field, Muglad Basin, Sudan

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Muglad basin is the most important of six rift conjugated basins of Sudan. The GNPOC operating in concession area 1, 2, & 4 falling in the basin, presently concentrating its exploratory efforts in three clusters, of which Neem cluster is most significant as far as success rate is concerned. Authors studied the petroleum systems operative in the area upto generic level and its evolution viz a viz basin tectonics, operative from Cretaceous to Tertiary times. Broadly interrelated assemblage of geological structures constitute the fundamental structural style of petroleum provinces.

In Muglad basin an extensional stress created by West and Central African rift system during Gondwana breakup induced the development of large linear rift system. During early Cretaceous a strong dextral transtensional stress derived from central African shear zone gave rise to rifting in NW-SE direction, resulting in several en echelon depocenters, which served as locale for sediments accumulation, hence petroleum potential of Sudan and specifically Muglad basin is focused on three main rift systems which show an overall NW-SE and NS striking direction nearly perpendicular to Central African shear zone.

These three major rift cycles later modified the structural setup to some extent but original fabric of tilted half graben's is preserved providing favorable locales of hydrocarbon accumulation mostly in fault and four way dip closure against the foot wall where throw and thickness of porous and non porous horizon plays a major role in entrapment. An statistical analysis of preferred Hydrocarbon accumulation amalgamated with tectonics resulted in better understanding and identifying areas for future exploration in this sparsely explored concession area of GNPOC in Muglad basin.