

# **Application of Sequence Stratigraphy in Reservoir Characterization of a Fluviodeltaic Succession: Aradeiba Formation, Muglad Basin, Sudan**

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The Aradeiba Formation of Muglad basin ranges in age from Coniacian to Santonian, spreading over 5.5 my. It is overlain by Zarga Formation separated by an unconformity of 0.5 my, while underlain by Bentiu Formation of Albian-Cenomanian age. Bentiu Formation representing the first sag phase after rifting is major reservoir in study area; hence Aradeiba Formation attains a major significance for providing seal to stratigraphic traps in the area. The formation is penetrated and sampled by no. of wells in the area. Authors, to understand spatio temporal facies distribution applied sequence stratigraphic concept to understand delineate and map the facies variation in this fluvio deltaic succession. The formation qualifies for definition of sequence as bounded on both side by an unconformity. The electrofacies analysis suggests the Aradeiba formation is divisible in three Parasequences. The PS-1 (Parasequence -1) is mainly shaly at base with presence of limited sand bodies. The log characters, calibrated with laboratory data suggest them to be deposited under distributory/ meandering channel environment. This is followed by PS-2, a mainly sandy coarsening upward parasequence of minor fluctuating deltaic nature. PS-3 ends with continuous shale to silt lithology and globally corresponds to a transgressive system. By modeling of this formation using Sequence stratigraphic concepts the area of argillaceous and arenaceous dominance could be speculated and mapped providing a much sought after lead for juxtaposition of critical seal to charged reservoir. It has also explained the dry wells in the area as absence or non development of PS-1 and PS-3 left the formation with arenaceous facies hence not providing adequate seal for Bentiu reservoir.