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Depositional Processes, a Key towards understanding Depositional Environments in Siliciclastic setting

Going by the recent shift of Oil Exploration and Production activities to more remote areas, there has been a growing need to understand well the depositional systems in these Frontiers and their sequence architecture. A detailed sedimentological analysis has been carried out on 103 outcrops visited (~180km2) with subsurface corehole samples across the Anambra and Benin Flank Basins. From 1880ft of core analysed sedimentologically, various facies and facie associations were recognised ranging from fluvial - deep marine facies based on grain sizes,sand/shale ratio, structures, mineral composition, color and fossil content. This was correlated and integrated with the surface outcrop data which involved documentation of lithologies, bed and biogenic structures,textures,composition,stratal thickness,major discontinuities and paleocurrent directions of the studied outcrops and were used in building depositional models to typify various environments encountered ranging from Fluvial/Alluvial, Shoreface,Estuarine/Tidal ,Foreshore and Shelf. The sediments span from Cretaceous - Quaternary. Mapping/study of Transverse and Longitudinal side attached bars along the channels and plains of major Rivers in these basins (Osse, Onwa and Niger rivers) revealed the types and effect of recent depositional processes in fluvial setting. The presence of herringbone structures, tidal bundles, pause planes,reactivation surfaces, quartz arenites and ophiomorpha structures depicts Ajali Formation in the basin a Tidal environment candidate. Additional work will concentrate on sequence stratigraphy studies across the study area. This combined with results from earlier surface and subsurface investigation, this project will provide insight in understanding processes at play in various siliciclastic depositional environments, help in producing volumetric models for the spatial distribution of reservoir / non-reservoir elements utilising both deterministic and probabilistic techniques which on the other hand will refine strategies for hydrocarbon Exploration/Production in these frontier Basins.