

Tropical Fluvio-Lacustrine Complexes of Africa and SE Asia: Implications for Exploration and Development

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This paper discusses some of the deposits of the soil-fluvial-swamp-delta-lacustrine complexes that together make up the reservoir-source-seal trilogies encountered in many of our petroliferous humid tropical non-marine basins

Soils: Can help correlate between wells, can help constrain the depositional setting of associated reservoir, source and seal facies, and can provide palaeoclimatic proxies. Pedogenic sedimentation, disruption and cementation caused by activity of termites and other soil biota in different climatic and hydrologic settings are illustrated.

Humid fluvio-deltaic systems: Accumulate rapid alternations of mud and sand, along with lacustrine and coaly source facies. The resulting complex of reservoir, seal and charge pathway geometries present particular problems of reservoir quality and connectivity that need new approaches. Where seismic imaging is insufficient to define depositional geometries then, provided appropriate analogues are selected, databases of sandbody geometries and volume ranges can help constrain these uncertainties.

Sequence Geometries in Tropical Terrestrial Basins: Differentiation of stratigraphic variations due to climatic changes from those due to palaeogeographic changes influences the way we think about gross stratal geometries in these basins. Our ability to model palaeoclimate and to predict rates of variation in lake level helps us to discriminate between these options.

Rock characterisation: The irregular distribution of facies in many of these basins makes proper targeting of coring impractical, and it is difficult to undertake standard petrographic analysis of ditch cuttings or sidewall cores consistently. Sidewall coring, plus high-resolution rock sample scanning research methods that digitally integrate scanning electron and XRD analyses, offer a way forward.

Conclusion: It is evident that sedimentary process models developed in mid to high latitudes are not fully appropriate to the humid tropics, and that exploration and development in basins containing these facies would benefit from additional research and new geotechnical approaches.