

Hydrocarbon Exploration in West Coast of South Africa: An Enigma or a Point to Cogitate

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The West coast of South Africa is under exploration for hydrocarbon since the early 70's. A plethora of data is generated and 38 wells are being drilled in the area with mixed results. Various vintages of 2D Seismic data and recently acquired 3D data in the area gave an insight for processes chronology in basin evolution and subsequent modifiers responsible for the present configuration. Opening of the South Atlantic created a conjugate system of passive margin basin all along the western coast line. The offshore sediments bear typical signature of rift drift successions, and eight mega sequences are identified by sequence Stratigraphy approach. The authors have used a combination of Gravity magnetic, seismic and well data to estimate basin fill and crustal thickness to ascertain basin thermal and subsidence history, which when amalgamated with Sequence Stratigraphy, has a predictive value for the future course of exploration in hitherto lesser explored, high potential basin. In the course of the study it has been brought out that the unique interior highland of southern Africa, the Kalahari plateau and its flanking coastal plain drained by major operative river systems were causative for very fast rates of sedimentation. AFT and Geochemical data has verified the points. Walvis ridge, aligned NE-SW was a mega lineament separating open circulating basin from a restricted and lacustrine environment in the north. The activation of different lineaments and tectonic elements in course of west coast evolution has created differential loading and unloading, switching of location of overburden sediments, and it has significant impact on source rock interval maturation especially in the deeper water area.

By holistic approach authors have confidently carved out the areas for (1) Conventional exploration (2) Deep water plays, BFF, IVF and canyon cuts (3) and for non conventional Gas hydrate exploration by assimilating the chimneys and other conclusive reliable indicators.

The study will give a new insight and shall guide the future exploration in the area with a better holistic working exploration model.