

Drainage Area Changes of Northern Mozambique and Implications for Petroleum Exploration

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Sediment quality and volumetric output of river systems into deltas and deepwater systems is closely linked to drainage basin area (as well as many other factors). Therefore, changes to the drainage basin area can have significant impact on the resulting sedimentary deposit, and so also an impact on predicting reservoir risk. Heuristic analysis of modern drainage basin stream networks can highlight areas that may have undergone modification in the past and thereby improve an understanding of where and when one would expect increased or decreased sediment output. This type of analysis is particularly important in frontier basins, where the temporal changes in sediment supply are poorly known, but due to the numerous other factors involved in predicting sediment yield, it works best when two rivers of similar size, in a similar climate, and draining similar lithologies can be directly compared. Two such rivers are the Rovuma and Mualo Rivers of northern Mozambique. Analysis of the Rovuma river drainage network provides clues that it may have undergone two distinct modifications in the past - one area-reducing event relating to the East African Rift, and one area-increasing event relating to a tectonic uplift which redirects a significant part of the Mualo drainage network into the Rovuma. This would therefore predict a varying Rovuma output, but perhaps more significantly, an increased Mualo sediment output in the past. This demonstrates how paleo-drainage analysis can be used to better predict reservoir presence and quality.