

Geologic setting and heavy mineral sands occurrence at the Kenyan coast and the effects of mining on the Kwale ecosystems

OCHOLA, KEVIN

Abstract:

The Kenyan coast extends from Kiunga in the North to Vanga in the South, for about 574Km. The Coastal region is bounded in the North by latitude 2°S and in the West by the meridian of longitude 38°E. The southern and eastern limits are determined by the Kenyan, Tanzanian border, the shoreline of the Indian Ocean and the longitude 40°30' E respectively. The total area is approximately 66,500 square kilometers. The altitude varies from 0m at the shore to about 2200m in the Taita hills. The region comprises of six counties; Mombasa, Kwale, Kilifi, Tana River, Lamu and Taita Taveta. The geology of the Kenyan coast is dominated by rifting and breakup of the Paleozoic Gondwana continent and the development of the Indian Ocean. The Proterozoic gneisses of the Mozambique belt (Pohl and Horke 1980) form the basement of an intracratonic basin, filled with continental permo- Triassic clastics. The geology of the Kenyan coast is a major factor in the occurrence of the heavy mineral sands. These heavy mineral sands occur in various parts of the Kenyan coast in almost similar geologic environments.

Geochemically, mineral sand deposits contain ilmenite, rutile, zirconium as well as other minerals and trace elements that could be of radioactive nature, such as thorium. Mineral sands do contain various quantities of metallic and non metallic minerals that are of economic significance; however poor mining and processing methods could result in grave environmental issues, which would jeopardize the ecosystems of the particular area of occurrence and mining. These threats can however be minimized by taking certain precautionary steps and avoiding certain methods of extraction.