Several large rift basins have been identified in central Sudan, amongst which is the Early Cretaceous Melut basin. The rift zones are generally northwest- to southeast-striking and exhibit half-graben symmetries. The basins are filled by continental clastic sediments, at some places more than 10 km thick. These extensive rift-related basins are the target for oil and gas exploration. The Sudanese rift basins are underlain by Precambrian basement rocks, which outcropping particularly in the southwest, centre and northeast of Sudan.

Oil potentiality of naturally fractured basement reservoirs in North Melut Basin is manifested by the discovery of Ruman-N-2 well. An attempt has been made by the Exploration department of Petrodar Operating Company (PDOC) to understand hydrocarbon production and trapping mechanism in basement rocks.

Ruman North field represents a structure high in the basement created by fault tectonics. This basement high was generally continuously uplifted for long periods of geologic time and was subject to a long period of weathering and erosion. About 400 barrel oil per day have been tested from fractures in Precambrian metamorphic basement rocks. The depth of the well is 922m, with hydrocarbons found between 863m and 915m in the basement fractures. The well appears to have only two major contributing open fracture zones which were not imaged in the seismic data. Open fractures characterized by decrease in velocity & density, and energy loss in Stoneley response.

The drilling results revealed that basement rocks underlying the Melut basin comprises various types of granitoids, schist, marble and mafic ultra-mafic materials that altered in different degree to serpentine, talc and carbonate materials. Such rocks regarded as non-reservoirs for long time and failed to draw the attention of the exploration activities.
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