

Groundwater Exploration in Parts of Oyo and Ondo States Using Remote Sensing Techniques.

Adeyemi, Gabriel Oladapo

M.Sc. Applied Geology

Department of Geology
Obafemi Awolowo University, Ile Ife, Nigeria

1985.

Abstract:

Subsurface water in the basement complex areas is confined to the weathered overburden and the underlying fracture zones. The weathered overburden is only promising where it is thick and fairly sandy. These conditions are not obtained everywhere in the basement complex area. A large amount of groundwater is known to occur within fracture zones in the absence of thick overburden.

An attempt was made at the possibility of locating fracture controlled groundwater by means of remote sensing techniques. Side looking airborne radar (SLAR) imagery of scale 1:250,000 sheet No. NB31-4 was studied. Aerial photographs of scale 1:40,000 covering areas around Oke-Mesi and Landsat imagery (Scale 1:1,000,000) of the entire area were also studied. The study area covers the bulk of the basement complex rocks of Ondo State, parts of Oyo State and very minor portions of them in Kwara and Bendel States. Lineaments were visually interpreted using a magnifier and a mirror stereoscope.

Those interpreted on radar imagery were graphically analysed and statistically treated. Comparison of borehole yields with the interpreted lineaments showed that the boreholes with high yields in the study area are located on the intersection of, or close to, long lineaments. Four of the six boreholes whose yields exceed 6,000 litres per hour were sited on lineaments longer than 5 kilometres. Two of the nine boreholes whose yields fall below 3,000 litres per hour were sited on lineaments whose lengths exceed 5 kilometres. The calculated Spearman Rank Correlation Coefficient of 0.20 also indicates that well yields increase with lineament lengths.

This research emphasises the importance of remote sensing techniques in groundwater exploration.

Keywords: Remote sensing techniques/ groundwater exploration

Supervisor: Siyan Malomo