

Targeting Ground Water in Tribal Dominated Bonai Area of Drought - Prone Sundargarh District, Orissa, India – A Combined Geophysical and Remote Sensing Approach

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ABSTRACT Remote Sensing technique is being utilized presently as an indispensable tool for ground water exploration, which is both time and cost effective in contrast to conventional costly and tedious methods. The present study has been for targeting ground water in hard rock terrain by adopting Geophysical and Remote Sensing techniques. Information on geomorphology and lineaments were generated and integrated to prepare the hydro-geomorphological and lineament map of the study area. The hydro-geomorphic units like alluvial plains, intermontane valleys and deeply weathered buried pediplains have good ground water potential; and shallow weathered buried pediplains and pediments have moderate to poor groundwater potential. The structural hills, denudational hills, residual hills and inselbergs are indicated as runoff zone. Fracture trace analysis of the area further strengthens the fact that the better yields are expected in the areas traversed by NE – SW trending lineaments. Further, the areas of intersection points of lineaments in pediplain, alluvial plain and intermontane valleys are important loci for ground water occurrence. Vertical Electrical Sounding (VES) studies reveal that the thickness of the aquifer (*i.e.* water bearing and yielding formation) ranges from 30 to 60m in hydro-geomorphic units like alluvial plain, Intermontane valleys and deeply weathered buried pediplain. The weathered, semi-weathered and fractured zone constitute the aquifer system in the area. The prominent fractures zone are restricted within a depth range of 60 to 70 m below the ground level. Depending upon the depth to massive bedrock, suitable ground water structures have been suggested to harness ground water for sustainable growth of agriculture and mitigating drinking water problem in tribal dominated drought - prone Bonai area of Sundargarh District, Orissa, India.