Summary of Research Work

“Geological and Geohydrological Study’s of Girja River Basin in Marathwada Region”

In the progress of any civilization water has important place. Human civilization is based on water perseverance and management. All civilization prospered along the river. The problems concerning along the Girja River Basin. This basin faces water scarcity problem due to erratic rainfall and change in Geohydrological characters of strata which is mainly different types of basaltic flows. The water bearing characters of Alluvium as well as Basaltic flows are different place to place. In the alluvium the different layers of clay, sandy beds play important role in ground water occurrence. The thickness and the extent of basaltic flow throw the focus on availability of ground water. In Deccan Trap area the ground water occurrence mainly depends on the factors like jointing pattern; topographic variation, thickness and lateral extent of different flows. There is need for management.

Therefore, it is necessary to implement watershed program. The idea was originally put forth by Malik Ambar the most eminent, powerful minister, master mind of the Nizam Shahi Dynasty of Ahmednagar of Deccan India founded a glorious capital town known as Aurangabad Nahar-e-Ambari, a miracle in the field of aqua technology, was perfectly designed in 1618 AD by him to supply drinking water to his newly built capital town having population over 2 lakes.

The watershed wise Geological and Geohydrological study are carried out of the study are in order to determine which sets of favorable geological conditions are necessary for constructing water conservation structures, detailed geological investigations of some completed watershed projects were carried out. In the area of watershed projects thus studied, it is observed that mainly two types of basalt flows viz. Compact Basalt flows and Amygdaloidal Basalt flows are occurring. A large number of dykes and fractures are occurring as associated features in these flows.

It is also observed that immediately below the top surface of every compact basalt flow, upto some depth, rock becomes hydrothermally altered, vesicular and amygdaloidal. But the middle and lower portions of the same flow are free from vesicles and amygdales and occur as compact mass. These middle and lower portions of flows are always dissected by joints.

The studies have also shown that, if the top amygdaloidal portion of a compact basalt flow is exposed to the atmospheric conditions, sheet jointing and secondary porosity is developed in it and it becomes highly permeable. Therefore, wells taken in sheet jointed top portion of compact basalt flows yield
good quantity of water e.g. Pal, Wadod bazaar watershed areas. But as joints become tight at the deeper level, the strata become poorly permeable.

Fresh amygdaloidal basalt flows are unjointed. As vesicles are not interconnected, fresh amygdaloidal basalt occurs as watertight mass. Therefore water conservation structures constructed on such rock do not give any benefit of stored water to the downstream region by way of percolation e.g. miasmal watershed area.

Well inventory survey will be carried out for Geohydrological character of surface and subsurface of the basaltic lava flows expose in well section along the Girja River. By studying the water table of the observation wells; help full to prepare water table map of study area. The Geohydrological maps and lithological section of Girja river basin will be prepared by undertaking well inventory and Geohydrological surveys of selected observation dug well of vertical cap along roads.

Geohydrological survey will be carried out for the study of surface geology and Geohydrological characters of the rocks along well section. Study of surface and subsurface Geology includes demarcation of different basaltic flows and study of their field characters. In Geohydrological study, the characters like thickness of the flow jointing pattern, extent and intensity of weathering, thickness of hydrothermally altered top portion of the flow etc, are to be investigated.

From the geological, Geohydrological and well invitatatory survey Geohydrological graph of the study area is prepared where Geohydrological characters of the rocks will be ascertained, which will play an important role to solving water scarcity problem of this region.

The above studies will helpful in locating high medium and low ground water potential Zone in study area. It will also throw light on the causes responsible for water scarcity problem in study area which will help to minimize water scarcity problem of study area.

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