

Spatial Distribution of Potential Water-bearing Zone in the Mountainous Region of Taiwan

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Abstract

With the developing of the population and social economy, the demand of groundwater resources is necessary and important. Especially, the water quantity and quality in the plain area is not enough and steady for the society. Thus, in many countries, there is an issue to investigate and explore the groundwater resources in the mountain area as to the substitute water supply.

To achieve above water issue, the main purpose of this study is to understand the spatial distribution of potential water-bearing zone in different hydrogeologic units, elevations and subbasins of Taiwanese central mountainous region. The formations of consolidated rock mainly include sedimentary and metamorphic rocks ranging from Eocene to Pleistocene; besides, the tectonic collision creates a series of fold-and-thrust belts and faults. Therefore, the hydrogeologic properties are various in the study area. Within the limited budgets and getting more data effectively, 65 boreholes (depth: 100 meters) were completed by the integration of subsurface exploration technologies, including drilling, core inspection, borehole, hydraulic and pumping testing and groundwater monitoring.

Results show the average thickness of regolith layer, i.e. the cover of loose weathering material, is about 14.2 meter, and for the underlying bedrock the water-bearing zones are commonly observed at the depths of 0 to 20 meter and 30 to 50 meter below the surface. Furthermore, hydrogeologic units with higher groundwater productivity are distributed in the well-developed fractured network of the metamorphic rock units, and some study sites of well yield could be as water supply for the regional (>600 litres per minute). Ultimately, the results incorporated with a GIS-based system have shown the mapping of water-bearing zones and hydrogeologic units in the study area.