Estimation of Groundwater Recharge and Draft of Arwal District Watershed based on Changing Trend of Rainfall and Population Forecasting

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ABSTRACT
Increasing demand of fresh water is not only an issue in India but across the world. Rapid growth of population is a major cause of harassing the natural resources and groundwater is one of them. The methodology for groundwater resources assessment in India is mainly based on Ground Water Resources Estimation Committee, 1997 and it involves assessment of annual groundwater resources recharge, annual groundwater draft (utilization) and the percentage of utilization with respect to recharge (stage of development). The assessment units (blocks/watersheds) are categorized based on stage of groundwater development (utilization) and the long term water level trend. This study estimates the recharge and draft of Groundwater in Arwal District due to uses for irrigation, domestic and industrial uses, etc. The characteristic of annual rainfall, monsoon rainfall and non-monsoon rainfall were analyzed. The average annual rainfall of Arwal district is 743.05 mm, monsoon rainfall as 654.18 mm and non-monsoon rainfall was recorded as 66.87 mm. Groundwater recharge was estimated at 49766.15 ha-m and draft was determined as 52973.15 ha-m. Population study of district was forecasted using Geographical Increased method. Based on this study results, the total annual demand of water for Domestic purposes was estimated at 41.09 MCM. Draft of groundwater was observed more than recharge of groundwater. This needs proper planning and management of existing groundwater resources.

Keywords: Rainfall infiltration factor method; GEC-1997; Recharge; Draft of groundwater; Rainfall; Population forecasting.