LONG TERM VARIABILITY IN GROUNDWATER DEPTH USING GEOGRAPHICAL INFORMATION SYSTEM

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ABSTRACT

Groundwater is an important source of fresh water which caters to more than 50% of the total domestic, irrigation and industrial needs in India. Due to overexploitation and climate change, concern has been growing about the sustainability of the resource. Precise estimation of ground water levels, their variability, climatic conditions and groundwater development are vital for scientific planning and sustainable management. Therefore, in the present study a GIS based analysis has been undertaken for variations in depth of water level from1987 to 2007. Moving average method in ILWIS software was performed to generate spatial distribution maps for groundwater depth. Further, percent areas in different depth classes were determined by generating histograms of spatial distribution maps classified into different depth ranges. It was observed from the analysis that due to excessive withdrawal of groundwater in the fresh belt areas of the district (Gulha, Pundri and Kaithal blocks), the water table has depleted by 10-23 m in the last three decades. Due to improper groundwater development and drainage in low lying and salinity affected Kalayat and Rajaund blocks, the average depth of water level has been found to be almost stable in 3.7-8.5 m and 1.2-6.7 m range respectively in pre and post monsoon seasons through 1987-2007. This has created conditions of water logging and severe

salinity at many places in these blocks. Further, a comparison of changes in depth during 1987-1997 and 1997-2007 demonstrated that the decline in groundwater depth during the latter decade has been alarming. The study also revealed that alarming groundwater depletion in the district has been triggered by intensive agriculture and thus calls for immediate attention on behalf of policy makers for mitigation of the problem.