# Selection Site for Artificial Recharge of Groundwater in Hard Rocks Using ANN with Special Reference to India

Pallavi Banerjee

National Geophysical Research Institute (CSIR), Hyderabad, India

In the recent years there has been overall development in the field of agriculture and industry in the Asian countries, particularly in India. The growth in urbanization has also been increasing. All these have lead to ever increasing demand for water. It has resulted into indiscriminate exploitation of groundwater resources, which is major source of fresh water in hard rock terrain. The hard rocks pose special problems for artificial recharge due to the limited extent of aquifer horizons, heterogeneity and low hydraulic conductivity. The fracture system may have good storativity. One such area is Kurmapalli watershed covering an area of about 108 sq km in Nalgonda district (Andhra Pradesh), India. It is drought prone area. This basin is characterized by poor land soil, scarce vegetation, erratic rainfall, heavy runoff and lack of soil moisture for most part of the year. Recurring drought coupled with increase in groundwater exploitation results in decline in the groundwater levels.

Artificial Neural Network (ANN) method is a paradigm shift towards research methodology in the field of hydrology. An approach based on Back Propagation Neural Network (BPNN) algorithm is developed to estimate the best location for artificial recharge. The proposed technique is applied to climatic and hydrological data of wells gathered from the different locations of the study area. Feed Forward BPNN is used to train the predefined inputs and outputs. After successful completion of training with appropriate data, different ANN models are developed to estimate the proper site for artificial recharge. High degree of predictive accuracy of the Feed-Forward Network based predictive model proves ANN techniques is a potential tool for hydrological studies.