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Optimization of Pumping Rates to Minimise Salt Water Intrusion in Gurpur- Pavanje Aquifer System using coupled ANN- GA Model

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The intrusion of saltwater into coastal aquifers is a widespread phenomenon that gradually causes the problem of groundwater salinization. The present study aims at simulating the variation in hydraulic heads and extend of salt water intrusion in the coastal aquifer between Gurpur River and Pavanje River in the Dakshin Kannada District of Karnataka for a time period of 10 years in different scenarios using FEFLOW 6.1 (Flow- Mass Transport- Heat Transport model). A suitable management policy is to be planned for pumping from the aquifer so that the extend of Salt Water Intrusion is minimized in the future. The results of the simulation model are applied into optimization model to maximize discharge such that the drawdown does not exceed the permissible values in any of the wells. Genetic Algorithm is employed as the optimization tool. To make the working of the optimization model more time efficient an externally linked simulation- optimization model is not used, instead ANN model which predicts the head in each well (with parameters and boundary conditions similar to the calibrated optimization model) at the end of ten years is included in the constraint function. The results of optimization model was applied to simulation model and distribution of head and concentration are analysed

Biography

Annie Maria Issac has completed her B. tech in Civil Engineering from M.A. College of Engineering, affiliated to M. G. University Kerala, in 2008 and M.E., in Water Resources and Environmental Engineering from Indian Institute of Science, Bangalore in 2013. Currently she is working as Assistant Professor in Amal Jyothi College of Engineering, Kanjirapally, Kerala. Ground water Modelling, River Water Quality Assessment and Climate Change studies are her general areas of interest.

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