

Decision Supporting System for Sathanur Command Area

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ABSTRACT

Often, the planners and decision makers have difficulties in ascertaining the amount of release and the command area to be irrigated during a given season due to the stochastic nature of inputs such as the inflow into the reservoir system etc. In this study, it is decided to guide the decision making scientifically by (a) estimating (forecasting) the initial storage in the reservoir in the beginning of the season, and (b) evolving optimum operation policies to maximize the irrigable area for a given starting initial storage and forecasted inflows to the reservoir. The inflow into Sathanur reservoir is influenced by not only its own catchment contribution but also by the releases from reservoirs upstream of that. The non-availability of release details of upstream reservoirs made the process of inflow forecasting very challenging. A novel method/model is designed by selecting appropriate model parameters to forecast inflow to the reservoir using Artificial Neural Network (ANN). Further, Genetic Algorithm (GA) is used to arrive at the release policies for maximizing the total irrigable area with constraints on releases, land requirement and restrictions on storage. The proposed coupled ANN-GA model seems to be very promising for decision making/planning purposes. This tool is effective especially when alternative methods are not available for decision making and periods of no inflow condition in the reservoir.