Nattavudh Soiprasert 2007: Application of a Genetic Algorithm for Real Time Water Allocation : A Case Study of Song Phi Nong Irrigation Project. Master of Engineering (Irrigation Engineering), Major Field: Irrigation Engineering, Department of Irrigation Engineering. Thesis Advisor: Associate Professor Kampanad Bhaktikul, Ph.D. 236 pages.

The real time allocation of water supplies in irrigation system is important. Because the over water supplies to water demand take the loss of opportunity for saving water supply to the next crop periods or to the next irrigation system in downstream and the unfair in sharing the water supplies in drought period take the conflict in water use of farmers. In Thailand, most of models used in allocation of water supplies problems have limitations especially in application for critical situations in the drought period when water supplies are less than overall water demand in each irrigation system. To find the appropriate solution, the optimization techniques are interesting.

The main purpose of this study is to apply a Genetic Algorithm (GA) to the management of real time water allocation in Song Phi Nong Irrigation Project which covers area of 307,000 rai and 32 irrigation schemes. An optimization approach based on GA is described. The objective function is to minimize water shortage for the whole irrigation schemes and maintain the equitable manners on water allocation. The results of the GA were compared with WASAM model for water allocation in 3 cases; drought, normal and flood periods.

It is found that an optimization technique such as GA was an attractive alternative for solving water allocation problem with complex network system. The solution of the water allocation problem can be achieved that are provided by WASAM in case with water supply was not less than water demand. The major advantage of using GA that it was achieved the equity supply in each canal in any weekly in drought period.

S. Nattavudh

K. Bhaktikul 12, Oct, 07

Student's signature

Thesis Advisor's signature