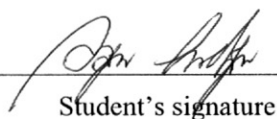Krotsuwan Phosuwan 2008: Application of Genetic Algorithms for Multiple Reservoirs Operation: Case Study of Huay Sai Royal Development Study Center, Cha-Am District, Phetchaburi Province. Master of Engineering (Irrigation Engineering), Major Field: Irrigation Engineering, Department of Irrigation Engineering. Thesis Advisor: Associate Professor Kampanad Bhaktikul, Ph.D. 324 pages.

Huay Sai Royal Development Study Center in Cha-Am Distric, Phetchaburi Province have water supply for any activities of water demand. This project has 6 reservoirs and 1 pond and the total capacity is 28.262 MCM. From study show that the total of water demand is 22.710 MCM per year, minimum inflow of all reservoirs is 9.476 MCM per year, average inflow of all reservoirs is 24.544 MCM per year and maximum inflow of all reservoirs is 39.571 MCM per year.

In this study, GAs can apply for Multiple Reservoirs Operation. In case of minimum inflow of all reservoirs's simulation show that most areas have water shortage, the ratio of water supply and water demand is 0.40-1.00. The sensitivity analysis of GAs suggests that Number of Mutation per Chromosome is 31, Probability of Crossover is 0.80 and Population Size is 80 are the most appropriate parameters. In case of average inflow of all reservoirs's simulation show that most areas have water shortage, the ratio of water supply and water demand is 0.94-1.00. The sensitivity analysis of GAs suggests that Number of Mutation per Chromosome is 11, Probability of Crossover is 0.80 and Population Size is 160 are the most appropriate parameters. And in case of maximum inflow of all reservoirs's simulation plan to allocate as equal as water demand, the ratio of water supply and water demand is 1.00 except Huay Sai Ngam Ecosystem Stability area has most extra water supply because the simulation want to protect spill and flood. The sensitivity analysis of GAs suggests that Number of Mutation per Chromosome is 26, Probability of Crossover is 1.00 and Population Size is 40 are the most appropriate parameters. Finally, all case's simulations didn't release over the capacity of area.

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Student's signature   Thesis Advisor's signature