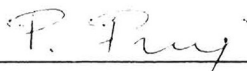


Passakorn Poopunsri 2007: Evaluation of Reservoir System Management in the Mae Klong River Basin by Data Envelopment Analysis Method (DEA). Master of Engineering (Irrigation Engineering), Major Field: Irrigation Engineering, Department of Irrigation Engineering. Thesis Advisor: Assistant Professor Ekasit Kositsakulchai, Dipl. Docteur. 135 pages.

This research applied the Data Envelopment Analysis Method (DEA) in evaluating management options of the Mae Klong reservoir system. Firstly, the analysis of Mae Klong water resource system was conducted, including estimation of water resources and demands. Then, HEC-ResSim was selected as a tool for modeling the operation of Srinagarind and Vajiralongkorn reservoirs. The model was validated by comparing simulated results with recorded data. Next, reservoir operation scenarios were arranged in accordance with present and future water demands, and hydropower generation targets. The power targets were defined in term of percentage of installed capacity, which divided into 5 levels: 0%, 10%, 20%, 30% and 40%. Finally, simulation results of each scenario, which corresponding to each decision making unit (DMU), were compared by the DEA method. Inputs of DMU consisted of mean and standard deviation of monthly inflows into reservoirs; outputs included generated power, shortage and excess of water in terms of volume and time. The DEA analysis revealed that DMUs were found in efficient frontier when hydropower target of Vajiralongkorn Power Plant was lower than 20% of installed capacity and that of Srinagarind Power Plant was lower than 10%. However, when water demand increased in the future, it was desirable to decrease hydropower generation target. The Srinagarind dam should release water for the downstream demand only. In addition, inefficient DMUs were observed, while they produced lower outputs with similar amount of inputs. The analysis results demonstrated the potential of DEA method in supporting reservoir system analysis with several performance indicators. Furthermore, this method does not require any pre-defined objective function.



Student's signature



Thesis Advisor's signature

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