

عنوان مقاله:

Reservoir Operation Optimization Using Imperialist Competitive Algorithm to Balance Sediment Removal and Water Supply Objectives

محل انتشار:

اولین کنفرانس بین المللی و سومین کنفرانس ملی سد و نیروگاههای برق آبی (سال: 1390)

تعداد صفحات اصل مقاله: 14

نویسندگان:

S. Ashraf Vaghefi - *Department of Civil & Environmental Engineering, Amirkabir University of Technology, Tehran, Iran*
Eawag, *Swiss Federal Institute of Aquatic Science and Technology, PO Box 611, 8600 Dübendorf, Switzerland*

S. J. Mousavi

Karim C Abbaspour

M. Ehtiat

خلاصه مقاله:

In the literature, optimization of reservoir operation has been mostly carried out to achieve certain objectives including high reliability of water and energy demand supplies, flood control, and environmental preservation. These objectives can be less important for the reservoirs with high sedimentation. Sefid-Rud Reservoir in Iran has been facing extreme sedimentation rates in the past 48 years. A major challenge in operation of this reservoir has been to create a tradeoff between sediment removal and water supply to downstream users. The lack of modeling tools for balancing sediment removal with water supply objectives has been the main driving force behind this study. In this paper, a new approach is proposed for monthly reservoir operation optimization. A model has been developed to minimize the total deficit in supplying demands and to maximize the total volume of sediments removed from the reservoirs. The objective function for sediment outflow is formulated based on Tsinghuauniversity flushing equation. A new evolutionary algorithm Imperialist Competitive Algorithm (ICA) is used to optimize the objective functions. Five scenarios which have been developed for various policy options in the case of Sefid-Rud Reservoir show higher long-term reliability of supplying demands and sediment removal simultaneously when compared with historical records of operation of this dam. The results of the case study have been summarized in the form of practical operating rules for flushing and operation management. The optimization model results indicatethe feasibility of increasing efficiency of flushing .operation and supplying downstream water demands of Sefid-Rud Reservoir

کلمات کلیدی:

Sediment removal, Imperialist Competitive Algorithm (ICA), Flushing, Sefid-Rud Dam, Multi Objective Reservoir Operation

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/137973>



