The title (العنوان):

Application of sediment management strategies to improve reservoir operation: a case study Foum El-Gherza Dam in Algeria

The paper document Shelf mark P22-5 (**paper version not available)**

APA Citation (توثيق APA):

Boudjerd M. , Touaibia B., Mihoubi M.K., and other (2022*). Application of sediment management strategies to improve reservoir operation: a case study Foum El-Gherza Dam in Algeria.* International Journal of Environmental Science and Technology. vol 19 (n°11), p10957-10972. DOI ou URL : https://www.researchgate.net/profile/Gerrit-Basson/publication/357784766_Application_of_sediment_management_strategies_to_improve_reservoir_operation_a_case_study_Foum_El-Gherza_Dam_in_Algeria/links/61e1265a8d338833e368e8b8/Application-of-sediment-management-strategies-to-improve-reservoir-operation-a-case-study-Foum-El-Gherza-Dam-in-Algeria.pdf

Abstract : Reservoir sedimentation can represent a major threat to water supply and should be considered when establishing a reservoir's design life. This study optimized reservoir management using a Dynamic Programming Neural Network by incorporating an optimal operation rule devised to minimize the gap between water releases and water irrigation demands. The Foum El-Gherza Dam in Algeria was selected to validate the proposed optimization model. The optimized dredging model saved large quantities of water from April to October (dry summer season), economizing a total of 10.25 million m3 or 9% more water over a 4 year period. Dredging increased the satisfaction rate of water demand from 16% (historical releases) to 44% (optimized releases), while a satisfaction rate of 34.75% (optimized releases) was obtained in the case of no-dredging. The operation rule generated from the dredging operation proved to be more reliable, more resilient and less vulnerable to satisfy water demand patterns on a monthly basis. Finally, the dredging operation's optimal releases were superior to that obtained in the no-dredging operation case demonstrating that dredging is an efective solution to tackle reservoir sedimentation if it is incorporated as part of a holistic dam management strategy. However, optimized releases obtained during venting were inferior to those of the no-venting case due to the excess water releases required for venting. This study provides practical information on the extent of modelling applications for future perspectives on the need for advanced reservoir sedimentation management.

Key words : Reservoir sedimentation ; Venting turbidity currents ; Dredging ; Dynamic Programming Neural Network ; Artifcial Neural Network