

عنوان مقاله:

Ethiopian Dam Optimum Hydraulic Operating Conditions to Reduce Unfavorable Impacts on Downstream Countries

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خلاصه مقاله:

As noted by several researchers, the Grand Ethiopian Renaissance Dam (GERD) on the Blue Nile River is expected to have unfavorable consequences for downstream countries like Egypt and Sudan. To limit GERD's negative effects on downstream countries, its operation should be secure, and its upstream water level should be ideal. However, none of the studies carried out the ideal operating scenarios from the perspective of controlling the number of gate openings. Accordingly, this study evaluates the optimal operating scenarios of the GERD and its impact on downstream countries by adopting a mathematical model to analyze the number of gates that can be opened and the depth of opening during different filling years. The paper also presents an environmental impact assessment of some GERD significant factors during construction, filling, and operation, with the goal of developing a mitigation strategy. The results showed that opening 5 gates at 4.56 m over a 10-year filling period would be the safest, most accepted, and most advantageous for Ethiopia and downstream countries. Moreover, creating a water-saving management plan in Egypt to overcome GERD's negative impacts would cost 877 billion Egyptian pounds. Doi: 10.28991/CEJ-2022-08-09-011 Full Text: PDF

کلمات کلیدی:

.GERD; Filling Scenarios; Gates; Hydraulic Jump; Dam; Egypt

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