World Academy of Science, Engineering and Technology
International Journal of Environmental and Ecological Engineering
Vol:18, No:11, 2024

Hydrology and Hydraulics Analysis of Aremenie Earthen Dam, Ethiopia

Authors : Azazhu Wassie

Abstract : This study tried to analyze the impact of the hydrologic and hydraulic parameters (catchment area, rainfall intensity, and runoff coefficient) on the referenced study area. The study was conducted in June 2023. The Aremenie River Dam has 30 years of record, which is reasonably sufficient data. It is a matter of common experience that, due to the failure of an instrument or the absence of a gauged river, the rainfall record at quite a number of stations is incomplete. From the analysis, the 50-year return period design flood is 62.685 m^3/s at 1.2 hr peak time. This implies that for this watershed, the peak flood rate per km^2 area of the watershed is about this value, which ensures that high rainfall in the area can generate a higher rate of runoff per km^2 of the generating catchment. The Aremenie Rivers carry a large amount of sediment along with water. These sediments are deposited in the reservoir upstream of the dam because of the reduction in velocity. Sediment reduces the available capacity of the reservoir with continuous sedimentation; the useful life of the reservoir goes on decreasing.

Keywords : dam design, peak flood, rainfall, reservoir capacity, runoff
Conference Title : ICW 2024 : International Conference on Water
Conference Location : Toronto, Canada
Conference Dates : November 25-26, 2024