

Investigation Sedimentation in Karkheh Reservoir by Experimental Methods and GSTARS-3 Software

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Abstract: The construction of a dam on a river causes sediments to settle behind the dam. Reservoir sedimentation is a process which can reduce the reservoir storage and its useful life. Therefore it is necessary to conduct a comprehensive sediment study for each reservoir. Of course, any lack of information on reservoir sedimentation causes reduction of reservoir life and loses a great amount of money. It is important for dam designer to estimate the rate and distribution of sediments in the reservoir in order to decide the dam stability and fix the sill elevations of the outlets and penstock gates.

In this project we compared experimental methods; include area increment and area reduction methods; and GSTARS-3 software for assessment sedimentation in Karkheh reservoir. Karkheh reservoir is located 22 km far from Andimeshk in Khuzestan State. We used 6 parameters for this aim: volume of reservoir, useful life, fill duration, height of sediment near the dam wall and longitudinal profile of reservoir. In experimental methods, area reduction method is better than area increment method only for longitudinal profile. With calibration results of GSTARS-3 software, the best for calculation of total sediment load is Yang (1996) and Manning coefficient is 0.02. Area increment method is better than GSTARS-3 software for estimation height of sediment near the dam wall and accumulated deposition. Therefore GSTARS-3 software is the best model for assessment sedimentation in Karkheh Reservoir.