

## Impact of Reservoir Sedimentation on Community Water Use: A case study of Kalundu Dam in Kitui County, Kenya

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### Abstract

In Kenya, a number of water reservoirs in arid and semi-arid lands are experiencing problem of sedimentation. Kalundu dam in Kitui County has been experiencing periodic siltation since 1950s when it was commissioned. Lack of data and information has limited implementation of localized strategies to minimize sedimentation in the reservoir. The study sought to determine the impacts of Kalundu dam reservoir sedimentation on the local community water use in the period between (2013 – 2020). Data was collected by sampling water from three stations established in the reservoir to determine turbidity and total suspended solids concentration (TSSC), questionnaire survey, field observations, review of reports, and focused group discussions with the local community. Descriptive research design method was used to collect data. The sample size was 102 households from a total population of 1020 households. Piloting of the questionnaire was done using 10 respondents. Questionnaires were administered to 92 residents and beneficiaries of the water from the Kalundu dam. Quantitative data collected was analysed using Statistical Package for Social Sciences, (SPSS version 21). Qualitative data was analyzed using content analysis method. The study established a significant relationship between turbidity and TSSC given ( $r=0.92$ ,  $R^2=0.974$ ,  $P\text{-value}=0.025$ ). TSS was found to range between 1.2 -456mg/l with a mean of 85.4mg/L. The mean turbidity was 102 NTU. The study showed that 50% of the community abstracted more than 500 litres of water from the reservoir per day. The study concluded that TSSC was a key determinant of turbidity of water in the reservoir. Continuous sedimentation in Kalundu dam resulted to problems including increased turbidity, reduced fishing, water scarcity, reduced crops cultivation, reduced aesthetic value of the dam and reduced income for the households that depended on the dam for their livelihood. This study calls for improvement in soil, water and natural vegetation conservation in the basin to reduce sedimentation in the Kalundu dam

**Keywords:** sedimentation, siltation, conservation