SEDIMENTATION PROBLEM IN THE RANTAMBE RESERVOIR

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Reservoir siltation due to land erosion and subsequent sedimentation are critical environmental and economic issues that have been discussed extensively in the literature for decades in Sri Lanka. Excessive sedimentation has also obliterated highly productive and important natural aquatic environments. Mainly poor catchment management and lack of soil conservation measures are the reasons for the sedimentation.

After the Accelerated Mahaweli project initiated in 1985, Mahaweli River was dammed across several places to store the water mainly for the purpose of generating hydropower. Constructed reservoirs were affected by sedimentation problem within very short period of time. Rantambe reservoir is the most vulnerable reservoir according to previously done hydrographic surveys. The present study is focused on the transported material by the Uma oya and their depositional pattern in and in the vicinity of the Rantambe reservoir.

The noteworthy feature of the Uma oya river morphology is that it changes to gradient from moderate angles to gentle angle at a point about 2km upstream to the reservoir. River morphology affects the associated depositional patterns and there is a decrease in grain size of the deposited sediments in the flood plain towards the down stream direction up to the reservoir from this breaking slope. Gravelly and sandy deposits are found about 2km upstream of the reservoir and more silty and clayey sediments are common when coming close to the reservoir. The reservoir is mainly filled with clay deposits.

Sedimentary deposits generally show a gradual increase in grain size towards deposits. Deposition of coarser particles at depositions reveal high flow velocities of the Uma oya

during early stages of deposition and gradual decrease in flow velocity with the development of sedimentary deposits. Data also reveal that the reservoir has lost about 36% of its original capacity 9 years after its impoundment. The highest sedimentation occurs in the reservoir at the Uma oya limb.

The improper land use management and steep slope conditions in the Uma oya catchment is mainly responsible for the sedimentation. The breaking slope of the Uma oya cause about 2km upstream of the Rantambe reservoir provide good depositional environment for the sedimentation before entering the reservoir. Creating multiple base levels with few small dams across the segment of Uma oya will be a good remedy for minimizing the siltation in the reservoir.

During low flow periods these sediments can be used as row materials for the building construction and this can provide a cost effective solution to the siltation problem.