

Assessment of Sedimentation in Ramganga, Rihand, Tungabhadra, Barna and Somasila Reservoirs Using Digital Image Processing

S. K. Jain, M. K. Goel, Dilip Durbude, B. Purendara, T. R. Nayak, V. S. Jeyakanthan

ABSTRACT

Sedimentation in the reservoirs is one of the principal factors, which threaten their longevity. Sedimentation reduces the storage capacity of reservoirs and hence their ability to conserve water for various intended purposes. It is essential to periodically conduct sedimentation surveys to determine the useful life of a reservoir and to assess the sedimentation rate in a reservoir. With the correct knowledge of the sedimentation process going on in a reservoir, remedial measures can be undertaken well in advance and reservoir operation schedules can be planned for optimum utilization of water.

The conventional techniques of sediment quantification in a reservoir, like the hydrographic surveys and inflow-outflow methods, are cumbersome, costly and time consuming. With the advent of remote sensing techniques, it is possible to obtain synoptic, repetitive and timely information regarding the water spread conditions in a reservoir. Due to the deposition of sediments in the reservoir, the water-spread area at an elevation keeps on decreasing. By comparing the decrease in the water-spread area with time, the sediment distribution and deposition pattern in a reservoir can be determined indirectly. This information can be used to quantify the rate of reservoir sedimentation,

Five reservoirs, namely, Ramganga, Rihand, Tungabhadra, Barna and Somasila were selected in the present study for evaluation of sedimentation rate. The results for these reservoirs are summarized in the following table:

Reservoir	Zone of assessment	Period of assessment	Sedimentation rate	
			M m ³ /year	ha-m/100 km ² /year
Ramganga reservoir	364.40 to 339.05 m	1974-2001	4.23	13.49
Rihand reservoir	267.31 to 258.78 m	1964-01	-	-
Tungabhadra reservoir	477.45 to 494.79 m	1981-2002	16.37	5.81
Barna reservoir	325.00 to 348.55 m	1975-2002	3.89	33.09
Somasila reservoir	94.39 to 83.17 m	1987-2002	1.60	0.764