IIT-Gn collects data to chart future course of Sabarmati, plan rejuvenation

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Ahmedabad: In a first of its kind, IIT-Gandhinagar is doing a study on dynamics of the Sabarmati River to define the future trajectory of the river system and strategize its rehabilitation and rejuvenation.

"We've initiated a watershed scale study of western Indian rivers, especially of the Sabarmati River basin, which will provide the initial data set on its physical characteristics. The study will also summarize the seasonal fluctuation in the sediments," said Prof Vikrant Jain, faculty of earth sciences, IIT-Gn.

Watershed scale study includes analysis of hill slopes, land use, land cover, floodplain mapping, channel processes and integration of these processes to have a holistic understanding of river processes. The initial analysis will be based on remote sensing data for mapping and landscape scale modelling of energy distribution. "Once, the model will be ready, the impact of human activity on river processes will also be analyzed," he said.

Prof Jain has also done a study on how Indian rivers have changed their course over the past 300 years.

UNDER STUDY: Sabarmati River

MY CITY MY RIVER

Turbulent Ganga

The study reveals why Ganga is more turbulent in Bihar and causes more flooding as compared to Uttar Pradesh. Prof Jain says in Bihar, Ganga is shallow as the amount of sediments is higher in plains. This is mainly due to higher uplift of Himalayas and high rainfall intensity in Nepal. Also, flow energy of the river is lower in Bihar as compared to UP. High sediment supply and channel silting is also one of the main causes of flooding in the Himalayan rivers. He says in the absence of rain gauge stations, hydrograph may be generated through geomorphic parameters, which can provide rainfall-discharge relationship and better prediction of flood hazard. The impact of flood on bank erosion can be predicted through process-based probabilistic models of bank erosion.

Why Kosi changed track

The August 2008 avulsion of the Kosi River was caused by a combination of factors such as rapid aggradations of the channel belt after the construction of an embankment, planform dynamics, and the lack of a sound monitoring mechanism. The study has provided steps to identify potential sites for future avulsions such as repetitive cross section surveys to compute slope ratios, repetitive planform mapping and monitoring of thalweg position with respect to the embankment, and monitoring of discharge in seepage channels outside the embankment to assess pore pressure condition in the embankment and its vulnerability to erosion processes.