

# Team studying Cauvery basin hydrology to predict demand

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*Three-year project will tap expertise of four organisations with personnel from Bengaluru, Hyderabad and the UK to solve water management challenges*

Stating that there has been a severe water shortage in several pockets of the Cauvery river basin over a period of time, researchers from Bengaluru, Hyderabad and the UK, have started a first-of-its-kind comprehensive project to study the hydrology (rainfall, water flow) of the entire basin and look at predicting water demands for the next few years based on the effects of climate change, type of crops, amount of water used for agricultural purposes and the extent of urbanisation.

The three-year project – Upscaling Catchment Processes for Sustainable Water Management in Peninsular India – is being funded by the ministry of Earth Sciences, India and the Natural Environment Research Council, UK. Indian Institute of Science is the lead institute from India, which also includes Ashoka Trust for Research in Ecology and the Environment, Bengaluru, Inter-national Crops Research Institute for the Semi-Arid Tropics, Hyderabad, as well as Centre for Ecology and Hydrology, the British Geological Survey, and University of Dundee from UK.

Each institute will use its expertise to solve water management challenges being faced currently. For instance, IISc has developed a fully instrumented watershed in the Kabini river basin and through observations for the last 15 years, the institute has an understanding of

the impact of small-scale interventions and urbanisation. So the team will probe how small-scale developments have impacted large-scale changes in the basin. While the UK side is granting around £3 million, the Indian side is providing funds to the tune of Rs 4 crore. The team will develop scientific knowledge on the basin and make it available for societal use.

“We are looking at the basin as a whole and we find there is a severe water deficit that has been occurring over a period of time. This is the first comprehensive study on basin scale and the scientific objective is to see whether we can upscale catchment processes, that is, what is happening on a smaller scale because of human interventions in urban areas as well as check dams in rural areas, and the types of crops grown in various pockets, Prof PP Mujumdar, chairman, Interdisciplinary Centre for Water Research at IISc, told Bangalore Mirror.

“If we can understand what is happening at the smaller scale precisely and correctly, then we can use that knowledge to see whether we can relate it with what’s happening on a larger scale. This implies, how catchment processes on a larger scale are getting affected because of what we are doing on a smaller scale. We will also generate a large number of scenarios that will be actually useful for policymakers. For example, how land is used currently, how it has changed over a period of time and how it is likely to change in future, how the climate is likely to change and how farm practices are likely to change. So we will generate scenarios and predict the water situation for each,” he said.

According to preliminary observations from a field trip, the IISc team has found that the rainfall pattern is changing. In many places, they have observed that evapotranspiration – that refers to a significant water loss from drainage basins – is very high as compared to precipitation, and almost 60-75 per cent of the water goes up in evapotranspiration. So, while some pockets of the basin are contributing to flows, there are some that are extracting from the flows. The tank system in urban areas for agricultural practices is also getting disconnected due to rapid urbanisation, the team found. The team will look at the groundwater situation with the help of the model that currently exists in the Kabini river basin and how it is responding to various interventions, and how they can arrive at best management practices for use of both surface and groundwater. The team will also ascertain if more water can be saved by changing cropping patterns or farming practices.

“Cauvery basin has one of the largest growing urban areas and rapidly expanding agricultural fields. The aim is to understand the surface and groundwater fluxes in the basin and investigate the science behind them. Currently, soil moisture is being estimated through satellites. So by using this data and understanding soil moisture, we can see if irrigation efficiency can be improved. So the idea is to see how best we can use all this information and look at the Cauvery water situation as a whole,” added Prof Mujumdar.