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# HOW DAMS CAN CONTROL FLOODS

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In the aftermath of any tragedy, people struggle to comprehend what happened and how to cope. Kerala is no different. With the floodwaters finally receding, a number of experts and politicians have stated various possible reasons for the tragedy. Some have cited ill-thought-out development plans that have affected the sustainability of the Western Ghats, arguing that without thoughtful conservation, this was a tragedy waiting to happen. Some have said that the rainfall was unprecedented. Some others have said that Kochi airport was bound to flood given that it has been built on fields and wetlands adjacent to the Periyar river which swelled to dangerous levels during the floods. And some have blamed dams, which were all opened when they were nearly full, causing heavy floods downstream and greatly affecting the lives of the people there. While criticism and suggestions are natural after a tragedy of this magnitude, we should learn lessons from the experience. The question is, how do we avoid or minimise destruction after such an event?

The world over, dams are constructed mainly for the purposes of irrigation, power generation, and flood control. While the first two roles are acknowledged, the role of dams in flood control has always been underestimated. It is unfortunate that in both irrigation and hydel projects, flood control is completely ignored. Authorities always look to store the maximum amount of water in reservoirs during the monsoon season, which is then used for irrigation and generation of electricity during the summer months. It is an internationally accepted practice that the water level of a reservoir should be kept below a certain level before the onset of the monsoon season. This is so that when the monsoon rains come, there is space to store the excess rainwater and also so that water can be released in a regulated manner, thus preventing floods downstream when there is heavy inflow to the dams. In May, Thailand, for instance, wisely brought down the water level in the dams in the country to below 60% of the storing capacity before the rainy season.

Until dams do us part

However, it is unfortunate that the maximum amount of water is stored in reservoirs even before the close of the monsoon, only to ensure greater electricity generation and irrigation. How the reservoir water was managed in the dams prior to the Kerala floods requires no explanation. While earlier too there was no practice of keeping space for greater storage of water, rainfall has never been as torrential as it was this year. Hence, there were no floods either. It is difficult to predict what will happen during the ensuing northeast monsoon in Kerala in case of heavy inflow. Whatever be the extra quantity of electricity produced and area of land irrigated because of the risky storage of water in our dams, that cannot compensate for the loss of human lives, infrastructure and agricultural land. Nor can the agony caused by such destruction be compensated for. The estimated loss to the State runs into thousands of crores. It will take years to rebuild Kerala.

In view of all these problems and to ensure that the flood control purpose of dams is met, it is important that at least 30% of the storage capacity of dams be kept free before the monsoon. While simultaneously allowing discharge of water, it is possible to increase storage slowly as the monsoon progresses. Kerala receives rainfall mainly during the southwest monsoon (June-September) and northeast monsoon (October-November). These rains are controlled by winds that carry clouds from the Arabian Sea and the Bay of Bengal. Atmospheric depression that controls wind movement cannot be predicted months in advance. The meteorological

department can predict rains or cyclones only a few days in advance. Therefore, keeping space in reservoirs before the monsoon begins must be done whether or not there are heavy rains, as no State can afford to take risks in the manner that Kerala did.

Reservoirs not managed using a scientific, decision-support system: M. Rajeevan

Some argue against the existence of dams, but it is an irrefutable fact that dams are useful. We need them for irrigation and electricity generation. However, even if the monsoons fail and dams fall short of water and there is a shortfall in electricity generation, this is not a loss compared to the possible loss of lives in the event of a flood of this magnitude.

It is time for the government and the public to formulate water management policies for reservoirs in such a manner that dams are used to control floods, not cause them. In 2015, hydropower generation was only 16.6% of the world's total electricity production. The tendency to hold the maximum amount of water in our reservoirs while ignoring the high risk involved in doing so can be attributed to our over-dependence on hydel projects to produce electricity. Therefore, it is time to think of non-conventional sources for electricity generation such as solar, wind and tidal power. The practice of solar power generation in Kochi airport can be copied in similar large-scale projects by other government agencies. The public too should be encouraged to adopt the practice of solar power generation. This will greatly reduce our dependence on dams for power generation.

Catastrophic rain is the new normal

It is also crucial to follow good reservoir water management policies. At present, the task of dam and water management is vested with the Public Works Department, the Electricity Board, and the Irrigation Department. Even in normal conditions, given contradictory opinions from various departments, it is difficult to implement decisions. Hence, the State Dam Security Authority, if competent, should be entrusted with the task of water management in reservoirs and with taking decisions in emergency situations.

The State government, the State Dam Security Authority and the National Water Commission should all be prepared to take bold decisions together on water management so that there are no such devastating floods in the future. If this happens, we hopefully won't see another day where we rue decisions of the past that are causing untold suffering to millions in the present.

*Mathew Abraham is a Principal Scientist (retired) from the Indian Council of Agricultural Research*



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