

'Extreme rainfall a challenge to reservoir operation

Need to improve prediction to avoid flooding, says study

The catchments of top seven large reservoirs that produce hydropower in India are likely to experience "substantial warming" leading to increased mean annual rainfall in near future (2020-2030), mid and end (2070-2099) of the century due to global warming.

Based on modelling, a team of researchers from IIT Gandhinagar found the mean increase in rainfall in the catchments to be 6-11% while the mean annual air temperature is projected to rise more than 2.5 degree C by the end of century if the emissions are low.

In the case of high emission scenario, the mean annual air temperature is projected to increase up to 6.25 degree C by the end of century, while rainfall in the catchments is likely to rise by 13-18%, the study published in *Scientific Reports* says.

Seven reservoirs

The impact assessment of climate warming on hydropower production was carried out at seven large reservoirs in India — Nathpa Jhakri, Bhakra Nangal, Srisaillam, Nagarjuna Sagar, Hirakud, Sardar Sarovar, and Indira Sagar. Of the seven reservoirs, Nathpa Jhakri, Bhakra Nangal are located on Satluj River, and snowmelt is one major source of water, which is likely to change under the future climate. The other five are primarily located in the monsoon-dominated climate region in central-south India.

"If the projected increase in rainfall occurs predominantly in the form of extreme events it is likely to pose enormous challenge to reservoir operations," says Prof. Vimal Mishra from the institute's Department of Civil Engineering and senior author of the paper. "Almost all of the additional flow into the reservoir has to be released. This might not add to hydropower generation as the focus will be on flood or disaster mitigation than power generation."