

Impact of climatic vulnerabilities on Indian mountain rivers

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Potential climate change impacts on hydrology pose a threat to water resources systems throughout the world. Changes to the present climate system may affect a variety of eco-systems, socioeconomic sector and industry in addition to water resources. Analysis, with long term historic data shows increase as well as decrease in temperature and rainfall. The course of variability is significant at some places, because of which a wide range of variation takes place from year to year. Analyses of historic weather data sets indicate rising temperature trends in most locations, with large year-to-year seasonal and annual variation around the trend line. Thus, it is obvious from the studies in this area with rainfall and temperature that the understanding of the climate variability is a difficult task. The Vulnerability Analysis is a method to analyze the response of a system to uncertain events or "hazards". The example of uncertain events includes floods, droughts, earthquake, tidal wave, dam failure, environmental hazards etc. River basins are generally plagued by uncertain events like floods and droughts. Prolonged droughts increases water stress and aridity in the watersheds again floods would result in wastage of available fresh water. The present research is an attempt to use distributed hydrological modeling to identify the impact of such vulnerability on Teesta river system situated in the northern part of West Bengal. The vulnerability was calculated based on water availability, virtual water, water footprint, green water and water sequestration. The results may identify and educate natural resource managers about the regions which are most vulnerable to climate change.

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