

Accepted Manuscript

Hydrologic sensitivity of Indian sub-continental river basins to climate change

Vimal Mishra, Rajtantra Lilhare

PII: S0921-8181(16)30014-5
DOI: doi: [10.1016/j.gloplacha.2016.01.003](https://doi.org/10.1016/j.gloplacha.2016.01.003)
Reference: GLOBAL 2385

To appear in: *Global and Planetary Change*

Received date: 13 March 2015
Revised date: 14 January 2016
Accepted date: 18 January 2016



Please cite this article as: Mishra, Vimal, Lilhare, Rajtantra, Hydrologic sensitivity of Indian sub-continental river basins to climate change, *Global and Planetary Change* (2016), doi: [10.1016/j.gloplacha.2016.01.003](https://doi.org/10.1016/j.gloplacha.2016.01.003)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Hydrologic Sensitivity of Indian Sub-continental River Basins to Climate Change

Vimal Mishra and Rajtantra Lilhare

Indian Institute of Technology (IIT) Gandhinagar, Gujarat, India, 382424

*Corresponding author: vmishra@iitgn.ac.in, +919687944337

Abstract

Climate change may pose profound implications for hydrologic processes in Indian sub-continental river basins. Using downscaled and bias corrected future climate projections and the Soil Water Assessment Tool (SWAT), we show that a majority of the Indian sub-continental river basins are projected to shift towards warmer and wetter climate in the future. During the monsoon (June to September) season, under the representative concentration pathways (RCP) 4.5 (8.5), the ensemble mean air temperature is projected to increase by more than 0.5 (0.8), 1.0 (2.0), and 1.5 (3.5) °C in the Near (2010-2039), Mid (2040-2069), and End (2070-2099) term climate, respectively. Moreover, the sub-continental river basins may face an increase of 3-5°C in the post-monsoon season under the projected future climate. While there is a large intermodel uncertainty, robust increases in precipitation are projected in many sub-continental river basins under the projected future climate especially in the Mid and End term climate. A sensitivity analysis for the Ganges and Godavari river basins shows that surface runoff is more sensitive to change in precipitation and temperature than that of evapotranspiration (ET). An intensification of the hydrologic cycle in the Indian sub-continental basins is evident in the projected future climate. For instance, for Mid and End term climate, ET is projected to increase up to 10% for the majority of the river basins under both RCP 4.5 and 8.5 scenarios. During the monsoon season, ensemble mean surface runoff is projected to increase more than 40% in 11 (15) basins

Download English Version:

<https://daneshyari.com/en/article/6347946>

Download Persian Version:

<https://daneshyari.com/article/6347946>

[Daneshyari.com](https://daneshyari.com)