

EFFECT OF CLIMATE CHANGE ON WATER RESOURCES OF INDIA

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ABSTRACT

Water resources will come under increasing pressure in the Indian subcontinent due to the changing climate. Climate change is one of the most far-reaching and formidable environmental challenges facing the world. The earth is undoubtedly warming, largely as a result of GHG emissions from human activities including industrial processes, fossil fuel combustion, and changes in land use, such as deforestation. In recent times, several studies around the globe show that climatic change is likely to impact significantly upon freshwater resources availability which is dependent upon monsoon system. The monsoon system operates via connections between atmosphere, land and ocean systems, through fluxes of heat, moisture, and momentum between them and the loss of heat to outer space. The monsoon system is potentially sensitive to changes in radiative forcing resulting from changing concentrations of long-lived greenhouse gases and aerosols, as well as through changes in boundary conditions such as sea surface temperature and land surface conditions such as snow and vegetation cover. While the terrestrial ecosystems are known to be sensitive to monsoon variability. Besides possessing the largest annual amplitude of any tropical or subtropical climate feature, the monsoons also exhibit considerable variability on a wide range of time scales due to change in climate. Changes in cropping pattern and land-use pattern, over-exploitation of water storage and changes in irrigation and drainage are modifying the hydrological cycle in many regions. Change in Indian population, India's water needs, climate of India, river basins of the country, present water resources and future demand and supply, impacts of projected climate change and variability,

and associated hydrological events and vulnerability of regional water resources to climate change, and identifying research are needs of the day. In India, demand for water has already increased manifold over the years due to urbanization, agriculture expansion, increasing population, rapid industrialization and economic development. In view of the above, an attempt has been made here to give a brief resume of the possible impacts of climate change on India's surface water and groundwater resources and the remedial measures to be sought. An assessment of the availability of water resources in the context of future national requirements and expected impacts of climate change and its variability is critical for relevant national and regional long-term development strategies and sustainable development.