

3rd International Conference on Hydrology & Meteorology

September 15-16, 2014 Hyderabad International Convention Centre, India

Effect of climate change on Indian irrigation system

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Scientists have so far assembled substantial amount of evidences that can show the extent of change of the earth's climate and the role of human activities behind it. Climate change is expected to have considerable impacts on natural resource systems, of which the water resources are in the prime list. It has been proved that global warming and decline in rainfall may reduce net recharge and can affect groundwater levels. Intense rain for few days will result increased frequency of floods and the monsoon rain would also be lost as direct run-off, thus can decrease the groundwater recharging potential. The countries like India, where the irrigation system is mostly dependent on groundwater (in India, 52% irrigation is groundwater dependent) can suffer severely because of these changes. Production of rice, maize and wheat in the past few decades has declined in many parts of Asia due to water shortage. The most irrigated areas in India would require more water around 2025 and global net irrigation requirement would increase relative to the situation without climate change about 3.5-5% by 2025. Climate change will affect the Indian River basins significantly. River basins of Mahi, Pennar, Sabarmati and Tapi shall face water shortage conditions, while Godavari, Brahmani and Mahanadi shall not face water shortages, but severity of flood shall increase in these areas. Additionally, rise in atmospheric temperature due to climate change will also lead to loss of glaciers in the Himalayas, which, in turn, may reduce water availability in the rivers of Indus – Ganga plains. As the Indian and South Asian irrigation systems are also dependent on canals, reservoirs and rivers, glacial retreat and changed pattern of water flow in the rivers can also threatened the water availability and irrigation potential. The melting of ice is changing the hydrological cycle, and the sea level is rising gradually. Many of India's coastal aquifers are already experiencing salinity ingress because of sea level rise. Salt water intrusion can deteriorate surface and groundwater quality, agricultural productivity and salinization of irrigation water. Linking the concept of sustainable development to climate change can provide a deep insight into the proper methods of long term societal responses to global environmental change and can help to implement the methods like rainwater harvesting, watershed development and groundwater management systems.

Biography

Arkajyoti Shome has currently completed his graduation in Environmental Science from Asutosh College, University of Calcutta. He has attended several international and national level conferences. He also has publications in international journal and also in international conference proceedings.

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