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SEMINAR NOTICE

Title: "Delineating Groundwater Security of India: Where Science Meets Policy"

Speaker: Prof Abhijit Mukherjee, Associate Professor (Hydrogeology), Dept. of Geology and Geophysics, School of Environmental Science and Engineering, Indian Institute of Technology (IIT) - Kharagpur

Date: 15 October, 2020

Time: 3.30 PM

Venue: Online using MS Teams

Abstract: The significance of ensuring groundwater security is no-where more evident than in South Asia, specifically India. Huge groundwater-dependent population, uncertain climate-reliant recharge processes, transboundary upstream water sources, major geogenic-sourced, non-point contaminants, archaic irrigation methods and human practices, and indiscriminate land-use changes with urbanization, have rendered the Indian groundwater scenario to become a global paradigm for water scarcity, for both quantity and quality.

Using a combination of ground-based in-situ groundwater level data, NASA satellite-based estimates of groundwater storage, numerical analyses and simulation of global models on groundwater storage changes and artificial intelligence, long-term, decadal-scale groundwater quantity changes over the Indian subcontinent was delineated. For the first time, estimation of the volume of existing usable groundwater across Indian states shows rapid depletion of usable groundwater storage in Assam, Punjab, Haryana, Uttar Pradesh, Bihar, and West Bengal. In these areas, increases in agricultural food productions have resulted at the cost of non-renewable loss in groundwater volume at an alarming rate.

Observed and satellite-based estimates show the highest groundwater storage depletion rates in Assam, Rajasthan and Uttar Pradesh. A water-affluent state like

Assam has lost ~2% of its usable groundwater resource in last one decade and is in the brink of suffering drought and famine in impending years. In contrast, scenarios of groundwater replenishment, potentially caused by policy interventions are observed from these analyses. Rejuvenation of groundwater storage in western and southern parts of India suggest that proper, pervasive groundwater governance may optimistically lead to possibilities of transforming the country from a “groundwater-deficient” to “ground-water sufficient” nation, and providing sustainable water availability. The work has significantly contributed to support and evaluate the Government of India missions like MNREGA on groundwater rejuvenation in India, which potentially influenced country-wide artificial recharge programs.

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