S. N. Bose National Centre for Basic Sciences

Bose Colloquium

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04:00 pm

Fermion Hall

"Groundwater - the life line of India is in peril"

Speaker

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Abstract

Drinking water and food security in India is critically dependent on its groundwater resource. India's long and arduous journey from the state of external dependency in meeting the food grains requirements at the time of independence, to self-sufficiency today, has been intricately tied to the wells those relentlessly draws water from underneath aquifers. There is a significant improvement of rural health once the drinking water supply has been accomplished through tube wells tapping the groundwater resource, which are of superior quality than the traditional surface water sources like tanks, dug wells etc. Water availability has been improved round the year, even the supply remain adequate even in the draught years as we depend on aquifers. Presently 85% of rural drinking need, 64% of irrigation demand and more than 50% of urban water need is met from groundwater sources. About 9% of India's GDP is directly linked to groundwater. Presently more than 24 million privately owned wells are in operation for agriculture sector.

India's groundwater extraction is about 250 km3, more than a quarter of the global total. Being part of the hydrological cycle, groundwater resource is finite and its supply to the system follows a yearly cycle of monsoon. However, relentless and unplanned extraction of groundwater, often exceeding the recharge, has resulted in irrecoverable damage to this precious natural resource. The adverse effects are, desaturation of aquifers- manifested by declining water levels, drying up of wells or diminishing well yield, deteriorating water quality, both in terms of increasing salinity and elevated concentrations of harmful contaminants. The recent Govt of India Assessment reveals that about 16% of the total 6,600 assessment units of the country are affected by overexploitation of groundwater resources.

The major challenge in water sector of India is sustainable use of groundwater resource without adversely affecting the dependent livelihood of million of farmers and ecosystem. A paradigm shift is urgently needed from reckless groundwater extraction to sustainable management of this critical resource. However, it is easier said than done in a country like India with wide variation in aquifer type, variation in rainfall distribution and terrain. The other major issue is wide swath contamination from geogenic and human sources. Besides, the three major socio-economic issues need attention are, regulating groundwater extraction particularly for irrigation, unhealthy subsidy on energy spent on groundwater extraction, and dovetailing the community in its management.

The need of the hour is holistic understanding of the aquifers, which holds groundwater resource and assessing and scaling different supply and demand side interventions, so that the resource utilization is in a sustainable manner. The most important supply side intervention is artificial recharge and rain water harvesting, while the demand side interventions include adopting proper cropping pattern and calendar, increasing irrigation efficiency etc. Govt of India, in 2014 has initiated a massive programme called National Aquifer Mapping Programme under Jalshakti Mantralaya for sustainable management of groundwater resources. Water being a State subject active participation of the State Govts involving the communities are essential in this endeavor.