Changing Geohydrological Scenario and its Environmental Impact in Rajasthan

In the last five decades the geohydrological scenario in the country has undergone vast changes. The water management issues and the environmental impacts of development however, vary from region to region depending on the hydrogeological setting, rainfall and water-use pattern. Rajasthan with its arid deserts, recurrent droughts, deep groundwater levels, dry rivers, salt lakes, saline and fluoride-rich groundwater, is a distinct geohydrological entity. A National Seminar on "Changing Geohydrological scenario and its environmental impact" was organized by the Geological Society of India jointly with *Tarun Bharat Sangh* at Bhikampura (Alwar) of Rajasthan on 6-8 July 2009. It was attended by delegates from all over the country including geoscientists, technologists, academicians, research workers, environmentalists, water managers and representatives of NGOs; as also university students and a platform for an evaluation and understanding of the dynamic hydrogeological situation, and of the scientific aspects of the traditional water management practices. Open deliberations was followed by field visits for live demonstration of rainwater harvesting and its benefits in the Arvari basin.

The inaugural session was presided over by R.P.Mathur of CGWB, and J.K. Jamadar of *Jal Biradari* was the chief guest. Welcoming the delegates Rajendra Singh, President of *Tarun Bharat Sangh* (TBS) expressed deep concern over the present state of rivers, – overexploited and encroached upon, turning to small polluted drains. He laid out the objective of the seminar for protection and conservation of river and land resources with community participation. Memoir 70 of the Geological Society of India (Drinking Water and Food Security in Hard Rock Areas of India), and several other publications by Rajendra Singh and others were released.

Five technical sessions were held on 6th and 7th July 2009. The first Session on the theme "Changing of Geohydrological Scenario", was chaired by S. Das of the Geological Society of India, and co-chaired by J.K. Jamadar. R.P. Mathur set the tone of the seminar narrating the historical hydrogeological changes in Rajasthan. Six papers were presented with case studies in Kantli Basin (Dinesh Gupta), Sabi Basin (P.Rakshit), Sekhawati Basin (Rakesh Kushwaha) and Alwar Urban area (Anurag Khanna). Speakers called for water conservation, groundwater augmentation and regulatory measures for abetting adverse impacts on development on groundwater regime.

In all, four presentations were made in the second and third Technical Sessions mainly centred on environmental hazards, water pollution, and their remedies. The sessions were chaired by Dinesh Gupta of GSI, and co-chaired by K.N. Joshi of the Institute of Development Studies. V.P. Laul narrated geoenvironmental hazards in Jaisalmer district due to mining, groundwater overexploitation, water logging. Raj Maheshwari discussed about cost effective strategies for mitigation of high fluoride and bio-organics in groundwater .

The fourth and fifth Technical Sessions chaired by Rajendra Singh and co-chaired by K.R. Gupta deliberated on rainwater harvesting and community management of water resources. Four papers were presented in the sessions. J.K. Jamadar described the cascading effects of water harvesting on socio-economy. L.N. Mathur narrated the mechanism of integrated participatory management of water resource.

Field Visits

Led by Rajendra Singh, the delegates visited Gopalpura, Palpura and Mandalwas villages in the catchments of Tilda, Bhagani and Jahajwali watersheds of Arvari Basin to get an idea of the traditional techniques of constructing Johads/check dams with the participation of the village community, and the benefits accruing therefrom. The area was hilly with inter-montane valleys. Fractured quartzites, schists and gneisses constitute the aquifers. Enroute the barren lands changed to lush green fields with flowing rivers aided by adaptation of rainwater harvesting methods. Local farmers explained the benefits of construction of johads, rising groundwater levels, rejuvenation of dry streams, sustainable availability of water for drinking , and for farming even during droughts, increase in pumping hours of wells, and all round socio economic upliftment. They are now raising both Kharif and Rabi crops. At Mandalwas people of Meena caste are also earning out of fisheries. Rainwater harvesting had transformed the degraded parched lands of Arvari catchment in to

A Johad in Bhagani-Jahajpura catchment, Alwar district.

'oasis' in the desert. Delegates felt the need for replication of such endeavors in other watersheds in the country.

In the Concluding Session Rajendra Singh spoke about the traditional water harvesting systems in the country. Induction of water extraction technology changed the State taking over community functions creating a dependency syndrome, disintegrating the community institutions. Sadly this led to the loss of initiative and creativity of the people, neglect and break-up of the traditional age old systems. He suggested revival of indigenous knowledge, community participation in rejuvenating old water harvesting structures, construction of new ones, and creation of village level and river basin institutions for participatory management of water resources. The need of the hour was restoration of the old system, conservation and disciplined use of a precious natural resource.

The seminar sent a strong message of the efficacy of rainwater harvesting and community management of water resources as the only option to reverse water insecurity in arid areas. Traditional water harvesting systems were still relevant with modern inputs. Water harvesting can rejuvenate the dry rivers, restore the natural water cycle and establish harmony of man and nature. Rejuvenation of rivers through rainwater harvesting should be on our national agenda. Arvari is a shining model for community management of water resources.

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