



Delhi Sustainable Development Summit 2015

Thematic Track _Concept Note

Groundwater Management: Technology, Processes and Methodologies to Facilitate Improved, Community Led Management of Groundwater

Groundwater is considered to be universally available at a comparatively lower capital cost as compared to other sources of water. This makes it most preferred and reliable source, leading to its indiscriminate extraction in various parts of the country. As per the latest assessment, the annual replenish able ground water resource of country has been estimated as 431 billion cubic meter (bcm), 68% of which is contributed by annual rainfall. Net annual groundwater available for development for various uses is considered to be 396 bcm. The total annual groundwater draft is 243 bcm with irrigation sector being the major consumer of ground water, accounting for 91% of its annual withdrawal. However, the distribution of groundwater is spatially variable, with Himalayan states and parts of western and southern India having comparatively scarce resource as compared to states in alluvial belt of Indus-Ganga-Brahmaputra.

Central Ground Water Board (CGWB) estimates that on a decadal basis, there is a general decline in groundwater level in northern, western and eastern parts of the country, while there is rise in water level in central and southern parts of the country. While the Stage of groundwater development in the country is 61%, approximately 29% of total groundwater assessment units in the country have been considered to be in overexploited to critical and semi-critical state indicating a significant long term trend of decline in water level. Thus, while dependence on groundwater is extremely high in the country, their status is declining. Moreover, different studies have suggested that total groundwater structures in India range from 20-30 million, while CGWB assessment about the status of groundwater is limited to observations through about 15000 monitoring wells. This makes the chances of underestimation of actual status very high. Furthermore, a more volatile and uncertain climate, uncertainty around surface water deliveries, and changes in land use practices makes it necessary to adopt sustainable groundwater management practices.

While groundwater management is a complex subject involving experts in geology, engineering, economics, and ecology, the basic necessity is to deal with balancing the exploitation of a complex resource (in terms of quantity, quality and surface water

interactions) with the increasing demands of water at the individual aquifer level. As commonly groundwater basins are referred as shared bank accounts, involvement of local communities could provide sustenance to the success achieved in groundwater management through artificial recharge initiatives.

Planning Commission of India also emphasizes that implementation of an *integrated aquifer mapping and groundwater management programme* is possible only through strong partnerships between government departments, research institutes, gram panchayats/urban local bodies, industrial units, civil society organizations and the local community. Groundwater management will also require improved participation by all, especially women and particularly the land-less.

Currently, participation of local communities in groundwater management is limited to reactive participation and development of user organisations, while it is required to involve stakeholder organisations into the groundwater management structure itself with sufficient authority delegated and responsibility shared. This also requires a change in approach in specific programmes for drinking water and sanitation, from groundwater as water *source* to groundwater as *resource*. This approach is restrictive and concludes at understanding groundwater prospects with a special reference to locating drinking water sources. In many ways, the objective of locating sources restricts the potential use of advanced techniques like remote sensing, geophysics and GIS-type platforms for data-management, also. However, groundwater resource approach allows for comprehensive assessment and management from the stage of its generation, transmission, and distribution to replenishment of groundwater with the perspective of its demand at the individual aquifer level.

The World Bank highlights that there are many ways in which stakeholders can participate in the management of groundwater resources and aquifer systems. These could include groundwater monitoring and data collection by local communities, administer local allocation and access to groundwater, prepare and implement management plans, undertake demand reduction measures, engage in recharge and retention measures as well as mobilizing additional resources for water.

Community led management of groundwater has been practiced in the country with remarkable success, in different states. Some significant examples are APFAMGS programme in Andhra Pradesh aimed at involving farmers in hydrologic data generation, analysis and decision making, particularly around crop-water budgeting; UNDP supported Hiware Bazar model of watershed development and social regulation to manage water resources in Ahmednagar, Maharashtra; Foundation for Ecological Security (FES) led initiatives of taking a micro-watershed unit for water balance and planning groundwater use along with communities at their sites in Rajasthan, MP and AP, etc. These projects emphasized

specifically that sustainable management of groundwater is feasible only if users understand the processes behind its occurrence, cycle, and limited availability. Besides creating awareness and capacity building, projects like APFAMGS provided farmers with the equipment and skills to collect and analyze rainfall and groundwater data, and estimate their annual water use based on planned cropping patterns and develop village level groundwater budget. The project is essentially transforming farmers into “barefoot hydrogeologists”.

While these individual projects demonstrate successful approach for groundwater management through community participation, their scope remain confined to areas under implementation. These projects require intensive interventions and supervision from the implementation agencies, and are highly cost and time consumptive at least at their initial stages. Hence, sustainability of these projects after a time gap of few years from the exit of implementation agencies, as well as upscaling of demonstrated processes and methodologies for their implementation at the regional or national level require comprehensive analysis and brainstorming. It is necessary to devise innovative techniques and processes to ensure active community participation establishing sustainable groundwater management practices at the country wide scale.

The thematic track on **Groundwater Management: Technology, Processes and Methodologies to Facilitate Improved, Community Led Management of Groundwater**, during Delhi Sustainable Development Summit 2015 aims to generate dialogue on the related issues and expects brainstorming among the experts to deliberate the issue and highlight the opportunities and challenges for sustainable groundwater management.

Question 1: What is the role of local government to help dovetail the scientific observations and local knowledge in going towards a more people-friendly groundwater resource management? What institutional changes are needed to exchange the knowledge between local communities and scientific institutes?

Question 2: What methodologies and processes could be opted for replication of local level case study success on community participation for groundwater management at the national or regional level?