

Central Groundwater Authority-Past Experience and Future Strategies for Regulating the Development and Utilization of Groundwater in India

Saleem Romani

Central Ground Water Board, New Delhi, India

Abstract

Role of groundwater in country's food security and for meeting requirements of domestic and industrial sectors is recognized by all, yet the full implications of its injudicious utilization is understood by only a few. The price to be paid for this rapid development is emerging in the form of increasing areas of water scarcity and fast decline in groundwater levels. Groundwater management is the need of the day to meet various sectoral demands without causing damage to fragile aquifers under stress. Central Groundwater Authority (CGWA) constituted under Environment Protection Act, 1986, under the direction of the Hon'ble Supreme Court of India, is playing its role in regulation and control of groundwater in the country. The paper deals with various activities of CGWA and experiences during their implementation. The positive impact of control is reflected in greater awareness on the need for a judicious management of available resources. Mere regulatory interventions cannot be successful unless the different user groups are fully involved and provide their cooperation and participation. CGWA has played a proactive role in creating awareness about demand side management including artificial recharge of groundwater and rainwater harvesting which has started showing its results as a public movement. The future strategy to effectively manage the fast depleting groundwater resources in the country, envisages constitution of State Groundwater Authorities with technical support from Central Government. At present some movement has started and it is hoped that with adequate level of public awareness and political willingness the need for groundwater governance in the country is realized by not only a few but all to ensure the sustainability of groundwater resources.

Groundwater Scenario

Post independence era in India has witnessed phenomenal growth in utilization and development of groundwater in resources, which are attributed to growing demands of fresh water by various sectoral users and technological advancement in water well drilling. Presently, more than 80% of water supplies for domestic use in rural areas, 50% of water for urban and industrial areas, and more than 50% of irrigation water requirement are being met from groundwater. Groundwater also

provides water security during prolonged drought periods. National Commission for Integrated Water Resources Development, 1999 has worked out the gross water requirement for the future use. It has been estimated that 843 billion cubic meter (BCM) of water will be required by 2025 from all sources (High demand scenario). Out of this, about 298 BCM (35.3%) of annual water requirement is to be met from groundwater sources. The groundwater availability in the Indian sub-continent is highly complex due to diversified geological formations, complexity in tectonic framework, climatic dissimilarities and ever changing hydro-chemical environments.

Although the present status of groundwater development in majority of the states is low to moderate, it is significantly high in number of states/ Union Territories (UT) namely, Haryana, Punjab, NCT Delhi, Rajasthan and UT of Chandigarh. Micro-level groundwater assessment at administrative block level carried out by CGWB along with the state governments have identified more groundwater stressed areas, which are presented in Table 1 (see Table 1 of M. Mehta in this volume). Presently, 673 blocks/watersheds of the country are 'Over-exploited' where the groundwater development exceeds its annual replenishable recharge and 425 blocks/ watersheds are 'Dark' or 'Critical' where the groundwater development has reached an alarmingly high level (> 85%). The growing dependency on groundwater resources for sustained irrigation has been acknowledged even in drought years for country's food security since last five decades. The importance of groundwater as dependable sources of water supply by other sectoral users has also been recognized as well. It is implied that with intensification of competing users of groundwater and sustainable limits of groundwater extraction already being reached, allocation problems are bound to advent, particularly in areas where over-exploitation, quality and pollution problems exist. In these areas, regulation in groundwater withdrawals is essential for sustainable development of groundwater resources.

Steps Towards Groundwater Governance

As per the constitutional provisions, 'Water' is a state subject and water resource management is the overall responsibility of the state governments. The complexity of natural occurrence of groundwater in diversified hydrogeological environments, its multifarious importance as socioeconomic commodity, and environmental entity and problems of ownership issue has made the scientific management of groundwater resource a mammoth-challenging task.

A limited control on groundwater over-exploitation are exercised by states through indirect measures, such as, stipulation of spacing criteria between groundwater structures by financial institutions (like NABARD), technical clearances of groundwater development schemes by Ground Water Departments of the concerned states, and, denial of power connections for pump sets among others. However, in absence of adequate administrative measures, affluent users could not be restrained from construction of high capacity deeper wells especially in critical areas, which, adversely effect shallow wells in the neighborhood. Such concerns have also been echoed in National Water Policy, 2002, which lays emphasis on control of over exploitation through effective regulation.

Model Bill for Groundwater Regulation

In order to enable the states to frame and enact legislation for groundwater governance on scientific consideration, Government of India circulated a model bill in 1970 to all states. The provisions of Model Bill included constitution of State Groundwater Authority and the modalities for regulation of groundwater resources. The Model bill was enacted by some of the coastal States: Andhra Pradesh, Goa, Tamil Nadu, Lakshadweep, Kerala and Pondicherry. In majority of the remaining states, the enactment of Model bill is under active consideration. However, for certain states namely, Nagaland, Sikkim, Tripura and UT of Chandigarh, the state Government did not feel the enactment of legislation necessary.

The revision of Model bill is under active consideration by the Ministry of Water Resources (MOWR). A working group has been constituted for reviewing and finalizing the model bill, keeping the provision of National Water Policy, 2002 and rainwater harvesting.

Constitution of Central Groundwater Authority (CGWA)

The alarming decline of groundwater levels in the country due to over-exploitation of groundwater resources led to a Public Interest Litigation (PIL) before the Hon'ble Supreme Court of India in 1996. Subsequently, under the directive of the Court, Central Groundwater Board (CGWB) was constituted as an Authority under Section 3 of the Environment (Protection) Act, 1986 vide notification no. S.O. 38 (E) dated 14.1.97, and subsequent amendments for the purposes of regulation and control of groundwater development and management. The Honorable Court observed that:

" The main object of Constitution of Board as an Authority is the urgent need for regulating the indiscriminate boring and withdrawal of groundwater in the country. ...)"

Commensurate with the mandate Central Groundwater Authority is undertaking groundwater governance through regulation and control of groundwater development and management in the country.

Present Activities of Central Groundwater Authority (CGWA)

Regulation of Groundwater Development

Central Groundwater Authority is regulating development of groundwater in some of the critical and over-exploited areas, through concerned district administration heads. It has so far notified eleven critical areas on consideration of over-development of groundwater resources, to protect the fresh water aquifers to meet drinking and domestic requirements. The list of notified areas are given in Table 2.

State administration of the concerned areas have been issued directives under Section 5 of Environment (Protection) Act, 1986, to ensure that no groundwater development is done without prior approval of CGWA. In case of violations, they have been advised to seal the tube well or even seize the drilling equipments. Abstraction of groundwater in these notified areas for sale and supply has also

Table 2. List of notified areas for regulation of groundwater development

Sl. No.	Place	State/ U.T.	Need for regulation	Date of public notice
1.	Municipal Corporation of Faridabad & Ballabgarh	Haryana	Depletion of groundwater resources due to over-exploitation	14.10.98
2.	Union territory of Diu	Diu	Depletion of groundwater resources and seawater ingress due to over exploitation.	17.10.98
3.	Ludhiana City, Ludhiana district.	Punjab	Depletion in groundwater resources due to overexploitation.	8.12.98
4.	Municipal Corpo-ration of Ghaziabad, Ghaziabad District	Uttar Pradesh	Depletion in groundwater resources due to overexploitation	4.4.99
5.	Jhotwara Block, Jaipur district.	Rajasthan	Depletion of groundwater resources due to over exploitation.	24.12.99
6.	South District	NCT, Delhi	Depletion of groundwater resources due to overexploitation	15.08.2000
7.	South West District	NCT, Delhi	Depletion of groundwater resources and upconing of saline groundwater due to overexploitation	15.08.2000
8.	Gandhinagar taluka, District Gandhinagar	Gujarat	Due to limited availability of fresh water, aquifers below 200meters depth notified exclusively for drinking and domestic use.	2.9.2000
9.	Haldia Municipal Area, District East Medinipur	West Bengal	Depletion of groundwater resources and salinity ingress due over-exploitation.	8.9.2000 12.2.2003
10.	Yamuna Flood Plain Area	NCT, Delhi	Due to limited availability of fresh water, Flood plain aquifers notified exclusively for drinking and domestic use.	2.9.2000
11.	Gurgaon town and adjoining industrial areas of Gurgaon district	Haryana	Depletion of groundwater resource due to over-exploitation.	26.12.2000

been banned. In notified areas of Delhi and Haryana, CGWA is directly regulating the groundwater development. CGWA is according limited permission for construction of new tube wells or replacement of existing tube well to government water supplying agencies, institutes, hospitals, embassies etc, to meet their drinking and domestic requirements. District administration is taking action in case of violations, and CGWA if any complaint is received, forwards it to them for action. Directives have also been issued to group housing societies, institutes, hotels, industries, and farmhouses to adopt rainwater-harvesting system in notified area of Delhi, Faridabad, Gurgaon and Ghaziabad.

In addition to above, CGWA has also notified 32 over-exploited areas (Blocks/ taluks) in the country for registration of groundwater structures through the state administration with a view to assess the realistic scenario of groundwater development in these areas for future regulation. Based on the data of registration

the reassessment of dynamic and static groundwater resource of the areas will be carried out for these areas for confirmation of status of over exploitation. The list of areas is presented in Table 3.

Table 3. Over-exploited areas in the country for registration of groundwater structures through the state administration

State	Notified Areas
Rajasthan	Pushkar valley, Ajmer district; Behror block, Alwar district; Bhinmal block, Jalore block & Raniwara block, Jalore district; Budhana block, Chirawa block & Surajgarh block Jhunjunu district; Mundwa block, Nagaur district; Dhod block & Shri Madhopur block, Sikar district
Madhya Pradesh	Dhar block & Manawar blocks of Dhar district; Mandsaur block & Sitamau blocks of Mandsaur district; Neemuch block of Neemuch district; Jaora block of Ratlam district, Indore Municipal Corporation
Punjab	Moga-I block & Moga-II block of Moga district; Sangrur block, Mahal Kalan block & Ahmedgarh blocks of Sangrur district.
Haryana	Shahbad block of Kurukshetra district, Nangal Chowdhary block & Namaul block of Mahendergarh district; Samalkha block of Panipat district; Karnal block of Karnal district, Khol block of Rewari district
Andhra Pradesh	Midjil Mandal of Mahabubnagar district, Tirupathi (Rural) Mandal of Chittoor district, Vempalli Mandal of Cuddapah district

Central Groundwater Board (CGWB) is identifying additional over-exploited areas through micro-level studies for registration of groundwater structures.

Clearance to Industries and Projects

CGWA is regulating groundwater withdrawal by industries in over-exploited and dark blocks. A list of such critical areas have been circulated to various statutory organizations like State Pollution Control Boards, Ministry of Environment and Forests, which refer the new industries to CGWA for obtaining approval. The projects referred are examined and technical clearances are accorded by CGWA on case-to-case basis based on recommendations of regional offices of Central Groundwater Board.

Representation of CGWA in the Expert Committees of Ministry of Environment and Forests

Ministry of Environment and Forests (MoEF) has constituted various technical expert committees for environmental appraisal of various categories of developmental projects, under the provisions of Environment Impact Assessment Notification. Based on the recommendation of such committees, environmental clearances are accorded by the Ministry. CGWA is representing two of such committees, (a) Mining projects, and (b) Infrastructure development and miscellaneous projects.

Groundwater Pollution from Geogenic Sources

Based on field-studies by regional offices of CGWB, as well as from other

sources such as news items, the incidence of groundwater pollution are being examined by CGWA on case-to-case basis. Depending upon the merit of the individual cases, specific directives are being issued to the state government for taking up suitable action. Arsenic contamination in Bhojpur area,(Bihar) and Balia district (UP) are some of the case examples.

Registration of Persons and Agencies Engaged in Construction of Water Wells

In order to develop database on drilling activities being carried out for regulatory measures, countrywide registration of drilling agencies are being undertaken by CGWA. Such data base not only provide information on current pace of groundwater development scenario, but also decipher micro level site specific information on groundwater availability and technology advancement for development of the same. As a regulatory measure, the drilling agencies have been prohibited to take up the work of construction of water well in the notified areas. They are also required to submit the details of drilling undertaken by them within one month of construction of water wells.

Role of CGWA in Legal Issues

Since inception, the role of CGWA on legal issues have been significant, especially to mention about the Hon'ble Supreme Court matter on depletion of groundwater due to mining activities in Aravalli Hills (the matter is under subjudice). CGWA provided necessary technical reports based on spot surveys. CGWA is also rendering active assistance to the Hon'ble Supreme Court, the High Courts and other designated courts on various legal matters concerning water conservation, which includes among others, highway and flyover projects, and protection of water bodies.

Proactive Approaches

Rainwater harvesting is an activity to facilitate groundwater recharge especially in groundwater stressed areas. Public participation is essential for promotion of this activity. Identifying inevitable need for rainwater harvesting, country wide mass awareness programs and training programs on the same are organized by CGWA on regular basis. The objective is to create public awareness about importance of rainwater harvesting in recharging groundwater. Trainings on rainwater harvesting are undertaken for dissemination of cost effective technologies to diverse spectrum of users such as private sector organizations, government agencies, NGO's, educational institutes, and individuals. So far 189 mass awareness programmes, and 120 training programs have been organized. Effective utilization of electronic and print media has also been made to promote this activity. Responses to these programs have been overwhelming, and calls for further stepping up of such activities on large scale with active involvement of various stakeholders. Beside this, CGWB has so far provided technical guidance for 1350 designs for rainwater harvesting to among others: private agencies, government organizations, road and flyover projects, and individuals.

Future Strategies

As stated earlier, task of managing country's vast groundwater resources is a mammoth task and calls for strengthening of the present institutional and legislative framework. It also requires active political support, including people and stakeholders participation to transcribe the techno- legal policies into action. Water being a state subject, its management ultimately has to be accomplished by the states. The groundwater management strategies on long-term perspectives are discussed below:

Groundwater Management in 'Notified Areas' for Regulation of Groundwater Development

In view of past experience and constraints observed, and, in order to ensure more effective implementation of regulatory measures and its monitoring and surveillance in 'notified areas', constitution of an advisory committee at district level is under active consideration. The committee shall be headed by concerned District Collectors /Deputy Commissioner of the notified areas and members drawn from various organizations has been proposed. The Advisory Committees would perform powers and functions of CGWA delegated to them for regulation of groundwater development and management in notified areas under broad framework of techno-legal policies of CGWA. In case State Groundwater Authorities are constituted in the concerned states, they may undertake the regulatory functions including monitoring and surveillance of the same under the policy framework of CGWA.

Declaration of New Areas for Regulation

As stated earlier, to bring in more critical areas under ambit of active regulation and management, CGWA has notified 32 over-exploited areas falling in the state of Andhra Pradesh, Haryana, Madhya Pradesh, Punjab and Rajasthan for registration of groundwater abstraction structures. The registration activity would provide necessary database on realistic estimate of groundwater withdrawals prevailing in these areas. On confirmation of actual number of groundwater structures by the state governments, reassessment of static and dynamic groundwater resources of the critical area would be undertaken by CGWB with state government to ascertain the realistic status of over exploitation vis-a-vis availability of groundwater in the area. Based on this assessment, the areas will be notified for active regulation. On similar lines, more overexploited areas would be identified based on micro-level studies for registration of groundwater structures and regulation.

Conclusions

Groundwater resource development and management need to be planned in an integrated manner taking into consideration long-term as well as short-term planning needs. Integrated groundwater development and management plan, incorporating environmental, economic and social considerations, based on principles of sustainability is necessary at this juncture. Central Groundwater

Authority envisages providing all technical inputs for efficient utilization of groundwater resources in the country in addition to regulating the development of groundwater resources.

Based on the past experience, 'awareness' and 'capacity building' activities have emerged as proactive approaches for management of groundwater resources. Though CGWA has organized a good number of mass awareness and capacity building programme in the country, which has inculcated positive impact on mindsets of different stakeholders including common people, it is felt that the adequate level of awareness is yet to be achieved. This can only be achieved by stepping-up of awareness and capacity building activities, with active involvement of various stakeholders, NGO's, institutes, and industrial and farmer associations in various groundwater management programs.