

DEPLETING GROUND WATER: A CHALLENGE FOR REGULATORS AND HYDROGEOLOGIST

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ABSTRACT: Groundwater is one of the most significant water sources in India accounting for 63 per cent of all irrigation water and over 80 per cent of the rural and urban domestic water supplies. United Nations Educational, Scientific and Cultural Organization (UNESCO) World Water Development Report states that India is the largest extractor of groundwater in the world. India is a groundwater economy. At 260 cubic km per year, our country is the highest user of groundwater in the world - we use 25 percent of all groundwater extracted globally, ahead of USA and China. Fifty-four percent of India's groundwater wells have deteriorated over the past seven years and 21 major cities are expected to run out of groundwater by 2020. Thus, India faces a dual challenge: to regulate the rising demand for groundwater while refilling its sources. The vast majority of groundwater pumps is unmetered, thus it creates excessive withdrawal of groundwater. Groundwater is the largest liquid freshwater resource of the Earth. It plays a crucial role in human fuel and global food security by supporting irrigated agriculture. At present, India is undergoing a "groundwater drought".

Keywords: Ground water, Hydrogeologist.

Introduction

After the Green Revolution in the 1960s got us dependent on groundwater instead of surface water, more than 1,000 blocks have become water stressed, identified the Central Ground Water Board (CGWB) in the Census. The country comprises <3 per cent of the terrestrial area and hosts about 19 per cent of the global population. It also covers more than 30 per cent of the global irrigated land and consumes the largest volume of global groundwater resource. The country is witnessing a rapid rise in population, urbanization and change in anthropogenic water use, cropping pattern and lifestyle leading to unsustainable abstraction available groundwater. These result to groundwater withdrawal to availability being higher than 0.8 (i.e. more than 80 per cent of the available ground water been withdrawn) in most parts of the country. The groundwater level in India has declined by 61 per cent between 2007 and 2017 and of the extracted water 89 percent is used for irrigation, according to the census. There are strong links between cash cropping, the failure of bore wells overwhelming debts and farmer suicides. At independence, the share of groundwater in agriculture was 35 percent; today it is amazing 70 per cent.

In our society, the perception often is, "This is my land and hence the water below it is my water." But the question we've been asking communities to think about is, "How can you own the water below your land, when the water in Your well has come from underneath someone else's land and the water from under your land is naturally going to flow underneath your other neighbor's lands?" The country has been placed in the top of the list of groundwater depletion (GWD) with 33.9 per cent of the global GWD linked with food production and trade. At least 54 per cent of India has been identified to be highly to extremely water stressed with present water demand of 712BCM, projected to be increasing to 833BCM in 2025 and 899BCM in 2050. India's over-exploitation of groundwater is contributing to—as stated by NITI Aayog—"the worst water crisis in its history". Further, the natural groundwater availability and recharge in the region is extremely heterogeneous because of diversity in hydrogeological set-up and climatic conditions.

Causes of Ground Water Depletion

Inefficient water use practices, wasteful irrigation systems with poor maintenance. Further, the natural groundwater availability and recharge in the region is extremely heterogeneous because of diversity in hydrogeological set-up and climatic conditions. India's declining groundwater resources are the product of a number of drivers. For instance, the ground water is highly abstracted for industries, infrastructural projects, mining and farming.

India's groundwater is being unsustainably exploited in these segments. This is why Unmaintainable groundwater depletion has become a very serious issue, and it is a very difficult problem to address. All users compete with each other to extract as much water as they can while the resource still exists worse.

Who Draws and How Much

India is the world's largest user of groundwater, withdrawing about 250 cubic kilometers per year, more than twice that of the US. As per the latest assessment of the Central Ground Water Board, out of 447 billion cubic meters (BCM) of total refillable groundwater available annually, 228 BCM is currently being used for irrigation, while 25 BCM is being used for domestic, drinking and industrial purposes. Nearly 7,426 licenses have been given to packaged drinking water plants in the water-stressed States of Andhra Pradesh, Gujarat, Karnataka, Tamil Nadu and Uttar Pradesh. Not only this, many multinational beverages and packaged drinking water companies in various States reportedly draw about 6.5-15 lakh against permissible limit of 2.4 lakh litres. It is estimated that as much as 50 lakh liters of groundwater is extracted illegally on a daily basis by tanker mafia in most metropolitan cities.

The rate of groundwater extraction is so severe that NASA's finding suggest that India's water table is declining alarmingly at a rate of about 0.3 meters per year. According to a latest survey by the Central Groundwater Board (CGWB), Andhra Pradesh, Tamil Nadu, Kerala and Karnataka are in a worse state as far as groundwater decline, concerned. The Standing Committee of Water Resources in its 23rd report (2017-18) underlined that by 2020, 21 major cities, including Delhi, Bengaluru and Hyderabad to reach Zero Ground Water levels affecting access for 100 million people. If the present rate of groundwater depletion persists, India will only have percent of the present daily per capita water available in 2050, possibly forcing the country to import its water. The NITI Aayog's water report has warned that if the situation persists, there will be a six per cent loss in the country's GDP by 2050. Falling groundwater tables will result in escalation of irrigation costs and, thereby, a rise in cost of cultivation. Up to a quarter of India's harvest has been estimated to be at risk due to groundwater depletion.

Major Sources of Ground Water contamination:- Once the ground water was known: clean and free from contamination. Due to rapid industrialization and increased use of chemical, numerous contaminants often find their ways in to the ground water. The major sources of ground water contamination are:- Agriculture Chemical, Septic Waste, Landfills, Hazardous waste sites, Storage tanks, Atmospheric pollutants, Underground pipes, Road salts, Contaminated water with oil produced by industries.

The Guidelines and Recent Decisions for Ground Water Abstraction Central Ground Water Authority (constituted under Environment Protection Act-1986) had issued a detailed guidelines on the "CRITERIA FOR EVALUATION OF PROPOSAL/REQUESTS FOR GROUND WATER ABSTRATION with effect from 15.11.12" in which some specific guidelines were included and any kind of violation of the conditions was made punishable under section 15 of the EPA. On 16.11.15, an amendment on the same was issued by CGWA and revised guidelines were issued as the directions of the National Green Tribunal. In the above guidelines lists of the Infrastructure projects, water intensive industries, and mining industries were enclosed with the conditions laid down in it for granting the NOC of ground

water abstractions. (List enclosed)

The regulations of CGWA for the groundwater are as under:

1. All industries/infrastructural/mining projects which are either existing, new or are under expansion and required to withdraw ground water have to obtain NOC from CGWA.
2. As per the recent NGT directions, all existing industrial/infrastructure/ mining projects which are drawing ground water and have not obtained NOC shall apply to CGWA for NOC to abstract groundwater for their uses.
3. CGWA is issuing NOC for above mentioned state areas except Andhra Pradesh, CT, Delhi, Goa, Himachal Pradesh, J and K, Karnataka, Kerala, Tamilnadu, Telangana, West Bengal, UTs of Chandigarh, Puduchery and Lakshdweep.
4. Areas notified by CGWA for the purpose of regulation of ground water development and management. In notified areas abstraction of ground water is not permissible for any purpose other than drinking and domestic uses.
5. All industrial /infrastructural and mining projects falling in safe areas are required to obtain NOC from CGWA.
6. New industries using ground water as raw material/water intensive industries like packaged drinking water, mineral water, distilleries, breweries soft drink industries, textile, paper and pulp are not granted NOC from non-notified over exploited areas.
7. The quantum of ground water for usage other than drinking/domestic uses in Housing/residential townships projects shall not exceed 25 per cent of total ground water abstraction.
8. The CGWA has framed application forms for getting permission to abstract ground water for industrial use, mining projects, New mining activities, renewal of NOC issued to existing industrial/ infrastructural projects and mining activity. The copy of referral letter from State/Central Pollution Control Board/BIS/Ministry of Environment and Forest and other state/ Central agencies and consent to operate and consent to establishment as on date is a must for seeking NOC from CGWA.

Notices; Instruction Issued by CGWB

The CGWA issued a public notice No. 8/2017 dated 23 Oct 2017 regarding the appointment of the District Magistrate/ Deputy commissioner of each revenue area in the states of:- Arunachal Pradesh, Assam, Bihar, Chhattisgarh, Gujrat, Haryana, Jharkhand, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Odisha, Punjab Rajasthan, Tripura, Uttar Pradesh, Uttarakhand, Andman and Nicobar, Dadra and Nagar Haveli, Daman and diu, Lakhshdip Island, As the "Authorized Officer" for the purpose of enforcement of the directions of CGWA in the respective revenue areas under his/her jurisdiction and the conditions laid down in the NOC for ground water withdrawal issued by the Authority. The Authorized officer is further delegated with the power to inspect whether all existing users owning tube wells in their premises have obtained/applied for NOC for ground water withdrawal. The DM/DC is also authorized to initiate action in case of violation like sealing of illegal wells, launching of prosecution against offenders etc. including grievances redressal related to ground water.

CGWA had issued a letter to all Regional Directors of all regions that makes the referral/consent letter from the concerned State Pollution Control Board and Local administration for proposals related to beverages, mineral water and packaged drinking water mandatory for processing the cases. As a further initiative, the CGWA issued another notice to

penalize those industries with a fine of RA 5000/- per day which have not obtained NOC for ground water till 31 March 2019 and directed random site inspections by CGWA officers.

CGWA also issued a notice dated 05 Aug 2019 FSSAI and BIS with the directions to ensure that the guidelines of CGWA and directions orders from Hon'ble NGT and supreme Court of India issued from time to time, are complied with while granting licenses/certificates in respect of packaged drinking water units, distilleries beverages and other water based industries/units using ground water as source water in other (safe/saline) areas. A copy of the same was also forwarded to MOEF, Department of Water Resources, Consumer Affairs, Health and Family welfare and central Pollution Control Board. The notice also stated that any violation of above direction shall attract penal provisions under section 15 of EP Act 1986.

Directions of Hon'ble NGT

On the date of hearing on 23.08.2019, Hon'ble bench of National Green Tribunal new, Delhi has issued the direction:-

"32. The CPCB may constitute a mechanism to deal with individual cases of violations of norms, as existed prior to notification of 12.12.18, to determine the environment compensation to be recovered or other coercive measures to be taken, including prosecution, for past illegal extraction of ground water, as per law. All the matters relating to illegal extraction of ground water by individuals are disposed of with these directions."

The Alarming Data of the State of MP

To study and research on the Ground water abstraction and implementation of the guidelines, the presenter took initiative and made efforts to collect data on the above subject. The data is highly alarming and amazing. They are:

1. Only 4 Automobile service provider/parts traders of MP have applied for NOC of ground water, whereas there are thousands of automobile industries and workshops existing in the state and using million KL of ground water. The inspection reports of MPPCB reveal that 95 percent of automobile service stations are using tube wells as source of water but are not having CTE/NOC from MPPCB and CGWB Bhopal.
2. Only 32 builders/colonizers of Bhopal working in Real Estate sector were given the NOC to abstract ground water whereas there are hundreds of builders registered with RERA and constructing commercial and residential projects.
3. Only 10 firms manufacturing Packaged Drinking water have applied for residential projects. NOC to abstract ground water whereas there are more than 180 registered and ISI licensed industries are working. Besides hundreds of un-registered water units are abstracting the ground water throughout the state.
4. The information provided by the, CGWB office of North Central Region Bhopal on 05.03.18 reveals that only 12 infrastructure project were given NOC during FY 2014-15 and 2016-17.
5. The responsible and concerning departments which are directly or indirectly connected with the subject of Abstraction of ground water are not aware of the guidelines and instructions issued by the concerning Authorities.
6. Most of the industrialists/Project proponents engaged in the businesses using ground water i.e. Automobiles, Real Estate, Mining and packaged drinking Water are not very much aware of the rules and regulations pertaining to the ground water.

7. After taking initiatives, the concerning board, BIS and CGWB are taking actions accordingly. The MPPCB has recently issued letters to BIS and CGWB regarding the implementation of acts under EPA before granting of NOC and ISI certifications.

Impact of representations and latest development in the areas of research (MP and Chhatisgarh):-

The presenter has made frenziedly representations on “illegal abstraction of ground water by the residential and commercial projects, Automobile service centres and workshops and packaged drinking water industries casing various areas of Madhya Pradesh and Chhatisgarh. The consequence of it and the most up-to-date developments are as under:-

1. Illegal abstraction of ground water by residential and commercial projects,

The representation dated 06.06.20 was specified before the concerning government agencies including the central and state government departments. The Ministry of Environment, Forest and CC (western region), Bhopal has issued letter to the Principal Secretary, Housing and Environment of MP State on 13.08.2020 referring the representation made on 06.06.2020 with a copy to the Regional Director, CGWB, Bhopal, Member Secretary, SEIAA, Bhopal, Member Secretary, MP Pollution Control Board, Bhopal asking them to submit a factual report on unauthorized withdrawal of ground water by the residential and commercial projects. The office of the Chief Secretary MP has also forwarded the same representation to the Principal Secretary, Housing and Environment, Madhya Pradesh on 14.12.2020.

2. Illegal abstraction of ground water by Automobile service centres and workshops.

Referring the representation dated 11.06.2020, the Ministry of Environment, Forest and CC (western region), Bhopal has issued letter to the Principal Secretary Housing and Environment, MP on 30.07.20 with a copy to the Regional Director, CGWB, Bhopal, Member Secretary, MP Pollution Control Board, Bhopal asking them to submit a factual report on unauthorized withdrawal of ground water by the automobile service centres and workshops. The ministry of Environment, Forest and CC, (CPW), New Delhi has also issued letter to the Member Secretary, Central Pollution Control Board Delhi to take the necessary action on the same representation. The Regional Director, Central Ground Water Bard (North Central Zone) Bhopal also issued letter on 23.12.20 and requested the District Collector, Bhopal to initiate the legal action against the 38 automobile service centres of Bhopal which have been abstracting ground water without obtaining proper NOC from the board.

3. Illegal abstraction of ground water by packaged drinking water industries

Referring the representation made on 07.06.20, the Ministry of Environment, Forest and CC (West Region) Bhopal has issued a letter to the Principal Secretary, Housing and Environment, Bhopal on 13.08.20 with a copy to the Regional Director, CGWB, Bhopal, Member Secretary, MP Pollution Control Board, The District Collector Bhopal, Member Secretary SEIAA, MP Bhopal asking them to submit a factual report on unauthorized withdrawal of ground water by the packaged drinking water industries. The Central Ground Water Authority, New Delhi issued

letters dated 16.07.20 to the CGWB Regional offices Bhopal and Raipur accordingly to take necessary action.

The Member Secretary, MP Pollution Control Board, Bhopal took a landmark assessment on all these matters. The MS issued letters dated 05.10.20 to the Members Secretary, Central Ground Water Authority, New Delhi and Regional Head, Central Ground water Board, MP Bhopal, by referring the letter of Bhopal collector (Dt 09.06.20) and letters of representation dated 07.06.20, 11.06.20 and 22.06.20 with copies to Regional Head, Bureau of Indian Standard, MP Bhopal and all Regional Offices of MP Pollution Control Board. Similarly, the Regional Director, Central Ground Water Board, MP Bhopal also took initiative to write letters on the above issues on dated 30.12.20 to the Members Secretary, MPPCB Bhopal with a copy to all district collectors of MP.\

Findings of the research:-

While working on these issues to put in order a research paper on the above topics, the presenter has come across staggering and astounding findings on these factors largely accountable and responsible for the continually and incessantly depletion of ground water. These may be depicted

as under:-

1. Residential and Commercial Projects:

In the states of MP and CG, there are more than 3000 plus residential and projects are either completed or under constructions. In the most of the areas, the ground water is being used in huge quantity for the drinking and construction activities. (Although use of ground water in construction is not permitted.) The condition of using the ground water in such projects is invariably mentioned in the Environment Clearance depending upon the size of the project. The PPs have to obtain Environment Clearance from SEIAA after obtaining the Consent to Establish (CTE) and Consent to Operate (CTO) from the respective Regional Office of the Pollution Control Board. The TNCP perpetually puts the condition of EIA notification dated 14.09.2006 while granting the approval of the projects. The process of overlooking the ground water concern has been a incessant practice adopted by the project proponents and the Building permission section of Municipal Corporation is the main liable section which always close the eyes to the EIA notification and environment permissions. As per the RERA's reply to the presenter dated 22.05.20, RERA has made the arrangements of uploading the Environment Clearance (EC) in the respective RERA's website which is usually not seen on the websites of PPs. Likewise, details of completion certificates has to be uploaded in website, is also imperceptible. As per the directions of RBI, the nationalized banks also do not bother to include papers of ECs while approving the projects. To wrapping up, the environmental rules and regulations are highly unnoticed by this segments for which the concerning government agencies are also legally responsible

2. Automobile Centres/workshops

There are innumerable and incalculable size of automobile dealers in both the states which are also having their workshops and service stations used for overhauling and servicing of vehicles. This segment necessarily requires the environmental permissions from Pollution Control Boards and Central Ground Water boards. The findings reveal that most of the dealers of various automobile companies do not implement the environmental laws and disastrous to obtain consent to establish and consent to operate and even NOCs for abstraction of ground water. After the representations, ceremonial lettering has been issued by the in charge government agencies but a concrete outcome has not been seen on the surface. Although, CGWB has issued show-cause notices to some of the top dealers recently but the endeavor to pull through the environmental damage is not noticeable.

3. Packaged drinking water

The finding for this segment reveals the perilous specifics as the topic is unswervingly associated with the healthiness of general public of India. As per the FSSAI notification and manual of packaged drinking water issued by the Bureau of Indian Standard, the packaged drinking water industry needs to have FSSAI license, consent to establish from the pollution control board NOC from ground water board if abstracted and ISI mark after fulfilling all requirements. According to the BIS notification No. 760 (E) rules, "No person shall manufacture, sell or exhibit for sale packaged drinking water without ISI mark". CGWA has also issued directions referring the orders from the honorable NGT and Supreme Court of India regarding compliance of direction while granting the ISI marks for the PDW.

There are approximately 180 plus ISI marked units in MP and CG respectively manufacturing packaged drinking water to sell in the market, but most of them are not having consents from the Pollution Boards and NOCs from CGWB as well. The local administration has been asked by office of Bureau of Indian Standard, MP Bhopal to provide the list of those manufactures in the state that are selling the packaged drinking water without ISI mark and claiming it as "unsealed water." The Food controller of MP and other related offices have not responded to such significant letter of BIS dated 18 Sep 2019. Condition is such horrible that "ISI marked companies are manufacturing packaged drinking water without consents from Pollution Control board and NOCs from CGWB despite serving the show-cause notices to most of the units. The GWA notification dated 24 Sep 2020 has not yet been competent to execute the guiding principle for ground water abstraction. Its deplorable act for the CGWB Raipur office which does not yet understand the function of CGWB in regards to take legal actions against the defaulters that are abstracting the ground water without following the guidelines issued for packaged drinking water. Although the impact of representation and most recent progress is to some extent progressive but till a appropriate and result oriented action is need of the hour.

Way For ward and Endorsements

There is an urgent need to change the status quo with tough regulations. Besides the strict implementation of the guidelines of CGWA and direction of Hon'ble NGT, we require policies that promote judicious use of groundwater in all segments using huge quantities of ground water.

Recommendations by the Presentation

1. Officials of the Central Ground Water, Ministry of Environment, Forest and Climate Changes, Ministry of Water Resources, State Pollution Control Board, Central Pollution Control Board, SEIAA, BIS and the Local Administration should be more concerned and sincere on the issue of Ground Water Abstraction in the state.



2. The responsible Agencies must be made liable for any lack of implementation of the guidelines and notification issued by the concerned authorities. The action should be taken accordingly as per the provisions in EPA sections 15,16 and 17.
3. Government should advertise all rules and regulations pertaining to the ground water so that the public and concerned companies become aware of the ground water rulings.
4. All defaulters who have violated the rules to abstract the ground water and other implementations should be penalized as per the provisions in the EP Act.

REFERENCES

CGWA guidelines and Gazette of India Dec 2018, Documents procured through RTI Acts, EPA 1986.