Water Conservation: Initiatives and Future Strategies

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The responsibility of planning and implementing water and sanitation projects, primarily lies with the state governments. The Central Government, playing an advisory role, has formulated several policies and the Model Bills to develop and manage projects, and its uses in various sectors of economic development. These interventions have brought phenomenal changes in the overall scenario of water and sanitation in the country and also provided a way forward about the needs of the sector which have to be fulfilled in coming future to make India a water secure and hygienic country.

In last few years, numbers of reports and ground level realities have reflected that India right now is going through the hard times where water scarcity and poor sanitation facilities are bigger challenge than the economic development. With a country generating 140 BCM of waste water annually, mismanagement of waste water which also contaminates groundwater, lacking liquid waste management, poor sanitation conditions and poor hygiene habits have contributed to a major portion of population suffering from water-borne diseases. The per person disease burden due to unsafe water and sanitation was 40 times higher in India than in China and 12 times higher than in Sri Lanka in 2016. Unsafe water, sanitation, and hand-washing are responsible for 4.6 percent of the disease burden through diarrhoeal diseases and other infections. The disease burden from unsafe water and sanitation was 5 percent of the total in 2016. Total number of cases of water borne diseases (Cholera, Acute Diarrhoeal Diseases, Enteric Fever (Typhoid) and Hepatitis A & E) were 1.65 crores in 2016 and 1.53 crores in 2017 with deaths ranging from 2,520 in 2016 , 2,334 in 2017 and 1,917 in 2018 . In contrast, Global Health Observatory data repository of World Health Organisation (WHO) quotes number of diarrhea deaths from inadequate water, sanitation and hygiene as 2,43,551 (total of all age groups) and number of diarrhea DALYs from inadequate water, sanitation and hygiene as 1,17,31,606 (total of all age groups) in 2016. These stats clearly indicate the need of swift action on the part of Government and it is heartening to see that Government of India has taken several actions in this direction.

As per the Indian Constitution, Water and Sanitation are state-subjects under List II of the Seventh Schedule. The responsibility of planning, funding and implementation of water resources and sanitation projects, primarily lies with the state governments. The Central Government plays an advisory role, and therefore, with the formulation of various policies and the Model Bills, the Centre is making efforts to develop and manage the projects and its uses in various sectors of economic

development. Along with the centre, many states have also come up with innovative measures to encourage water conservation and better sanitation practices in their respective jurisdictions. The next sections of the article are going to elucidate some interventions/schemes of centre and states which have brought phenomenal changes in the overall scenario of water and sanitation in the country and provide a way forward about the needs of the sector which have to be fulfilled in coming future to make India a water secure and hygienic country.

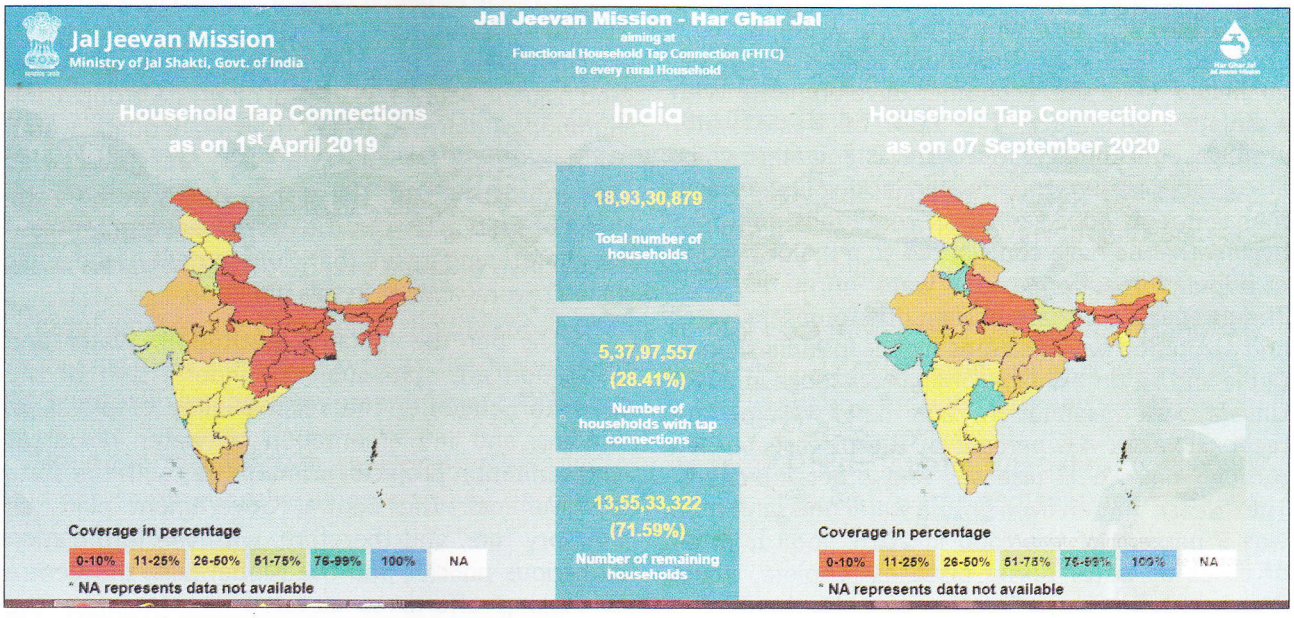
Government Initiatives

On 15th August 2019, Prime Minister Shri Narendra Modi launched the Jal Jeevan Mission (JJM) worth Rs 3.6 lakh crore to supply piped water to every rural household. The vision of the JJM is "Every rural household has drinking water supply in adequate quantity of prescribed quality on regular and long-term basis at affordable service delivery charges leading to improvement in living standards of rural communities". The programme also implements source sustainability measures as mandatory elements, such as recharge and reuse through grey water management, water conservation and rain water harvesting. The Jal Jeevan Mission is based on a community approach to water and will include extensive IEC as a key component of the mission. JJM looks to create a jan andolan for water, thereby making it everyone's priority. Since the inception of the Jal Jeevan Mission, the percentage of rural household having access to safe drinking water increased from 18 percent to 28.41 percent.

Ministry of Jal Shakti also launched the Jal Shakti Abhiyan on 1st July 2019, in 256 water stressed districts across the country. This Abhiyan is a mass movement to bring all the stakeholders under one ambit of water conservation drive, and last year it had a nationwide impact. Under this Abhiyan, more than six and a half crore people became a part, comprising of State Governments, Central Governments, Civil Society Organisations, Panchayati Raj Institutions and Communities. More than 75 lakh traditional and other water bodies and tanks were renovated and around one crore water conservation and rainwater harvesting structures were created. Encouraged by the response, Jal Shakti Abhiyan is geared up to combat current health emergency by focusing more on irrigation and water conservation works with the caution that all works are undertaken with strict implementation of social distancing, use of face covers/ masks and other necessary precautions.

Relentless and unplanned extraction of groundwater exceeding the average annual recharge has resulted in widespread decline of the water tables, reduced availability of water in the wells and degradation of the resource manifested through contamination with heavy metals (iron, arsenic, chromium etc.) and fluoride. Keeping these facts in the mind and in order to provide special emphasis on groundwater conservation, in 2020 Budget, Rs. 200 Crore has been allotted for Atal Bhujal Yojana (ABHY). ABHY envisages sustainable ground water management, mainly through convergence among various on-going schemes, with emphasis on

Figure: Progress of Jal Jeevan Mission



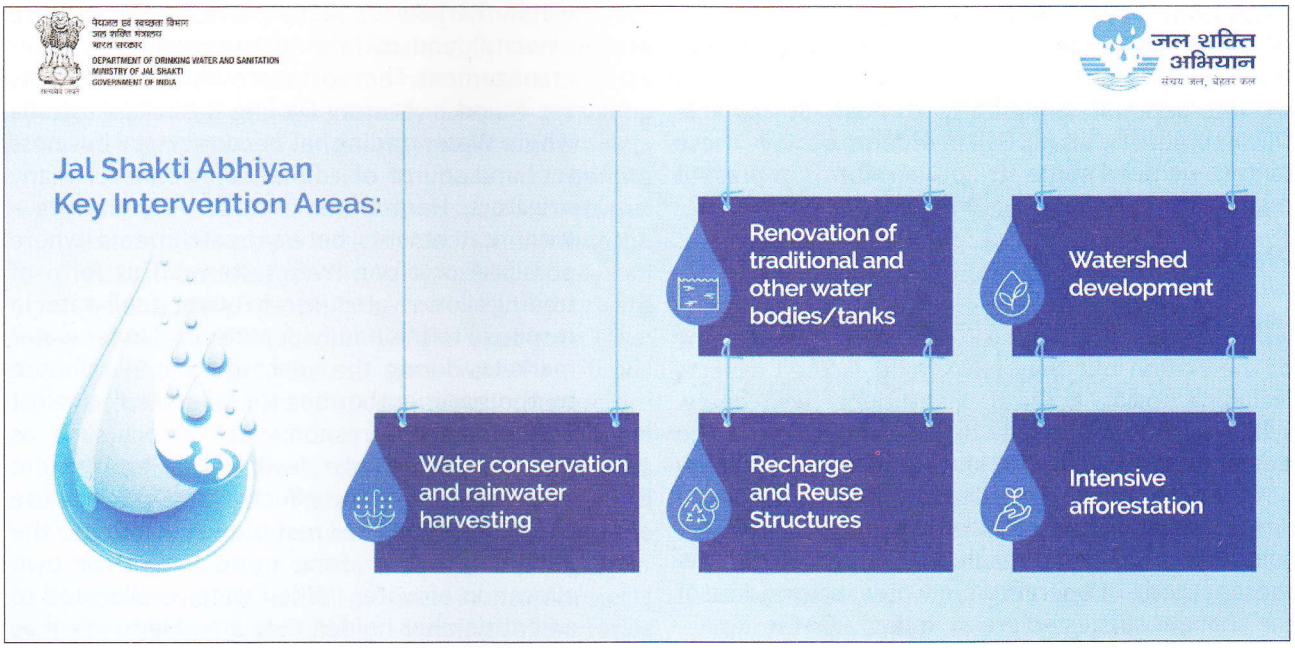
Source: https://ejalshakti.gov.in/IMISReports/MIS.html

demand side measures through active involvement of local communities and stakeholders. This aspect makes the ABHY a unique centrally sponsored scheme which will endeavor to facilitate efficient implementation and convergence of various ongoing Central and State schemes in the participating States. ABHY will also play a key role in drought proofing, thereby improving climate resilience in select water stressed areas, create better job opportunities through improved skill development, etc., all leading ultimately to sustainable management of ground water.

NITI Aayog, as the premier think tank of Government of India, has also developed a mechanism to compare the efforts of various states in water conservation. In pursuit of competitive & cooperative federalism and keeping in view the criticality of water for life, Aayog has developed a Composite Water Management Index (CWMI). The CWMI as a yearly exercise is an important tool to assess and improve the performance of States/ Union Territories in efficient management of water resources. CWMI compromises of 9 broad sectors with 28 different key performance indicators covering various aspects of ground water, restoration of water bodies, irrigation, farm practices, drinking water, policy and governance. The data for the 28 key performance indicators are uploaded by the States on the online web portal. Index has been quite successful in sensitising the states about the impending water scarcity in the Nation. Since launch of round I of the Index, 80 percent of the states have shown improvement with average change in scores being +5.2 points.

Beside these Central Government Interventions, some of the states have initiated state level programmes which have effectively solved the local water problem. Some of such schemes are Jalyukt Shivar in Maharashtra, Mukhya Mantri Jal Swavalamban Abhiyan in Rajasthan, Neeru Chettu in Andhra Pradesh, Mission Kakatiya in Telangana, Sujalam Sufalam in Gujarat, Integrated Water Resource Management and Artificial Recharge Structures Scheme in Karnataka. Other laudable initiatives by States, having a positive impact on the ground water resources include "Punjab Preservation of Subsoil Water Act, 2009" which bans early sowing of paddy nursery and transplantation of saplings and the voluntary scheme of "Pani Bachao, Paisa Kamao (PBPK)" by Government of Punjab to encourage farmers to save electricity and reduce the use of ground water. The 'Maharashtra Groundwater Development and Management Act, 2009' prohibits drilling of deep wells within the notified and non-notified areas, for agriculture or industrial usage. It also imposes total prohibition on pumping of ground water from existing deep-wells of depth 60 meters or more in notified areas.

Apart from these, there are some states which have deciphered the use of technology in the water sector. The most striking works in these domains are done by Andhra Pradesh and Maharashtra. Water Resources Department of Government of Andhra Pradesh along with the private partner Vssar Labs has developed Andhra Pradesh Water Resources Information and Management System (APWRIMS). APWRIMS is a Smart Water Solution platform targeting overarching objective of sustainable water



management in the State. The APWRIMS collects data from 1,254 piezometers on real time basis across all the 13 districts of the state and correlates the information with all 15,00,000+ bore wells used for agricultural purposes in the state. Soil moisture data is also collected from 900+ locations across the state. The platform has data related to 100+ reservoirs, 40000+ Minor Irrigation tanks, 15 lakh agriculture bore wells and more than 10 lakh water conservation structures. Since its implementation, APWRIMS has benefitted more then 60 percent of the population of the state. Groundwater levels improved by 2 meter across the State, despite receiving 14 percent deficit Rainfall and the Crop planning activities have resulted in increase of about 1.85 L ha of Horticulture crops.

Government of Maharashtra has also taken an innovative step by launching the Draft Maharashtra Water Resources Regulatory Authority Water Entitlement Transfer (WET) and Wastewater Reuse Certificates (WRC) Platform Regulations, 2019. The main aim to the regulations are to encourage wastewater recycle and reuse in large water consuming industrial and urban centers that go beyond the stipulated water reuse targets set-forth in the State Water Policy and creation of a transparent water accounting process with the use of IOT metering at the water consumption, reuse and environmental discharge points with a repository of water consumption maintained under a regulated process. The regulations also envisage the creation of immutable distributed ledger-based repository of wastewater reuse certificates which can be easily marketable.

All these efforts of three tiers of Indian Federalism have resulted in marvellous changes in water and sanitation sectors of the country but still we are quite behind the targets envisioned by International community through Sustainable Development Goals (SDGs). In order to achieve these targets we need some structural reforms in present regime.

Way Forward

Growth and development are not the words which we can afford to use in describing the economy of the Nation but they have multi faceted aspects including social, political, institutional well being. While talking about growth we cannot ignore the existence of the dreadful phrases like water scarcity and climate change. In order to achieve sustainable development in the country, we have to look for solutions which may result in overhauling of the present mode of operations in water sector. Some of the changes suggested are as under:

1. **Making Water as Part of Economic Development**

   Improved water supply and sanitation and improved water resources management boost countries' economic growth and contributes greatly to poverty eradication. The economic benefits of improved water supply and sanitation far outweigh the investment costs. Studies have revealed that the benefit-cost ratio (BCR) is significantly greater than 1, recording values in developing regions of between 4 and 32 for the water Millennium Development Goals (MDG), between 5 and 46 for the WS&S MDG and universal basic access, and between 5 and 41 for universal basic access with water disinfection at the point of use. The benefit-cost ratio for regulated piped water supply and sewer connection ranges between 2 and 12. Under base case assumptions the cost-benefit ratio is at least US$ 5 in economic benefit per US$1 invested, and even under pessimistic data assumptions, the benefits per dollar invested remained above the threshold of US$1. More importantly these are the results when non-health and non- financial benefits are not taken into account. Therefore, it makes a strongest case to increase the budget allocation to water and sanitation sector, along with agriculture, manufacturing and services sector, it should be a priority sector for investment.

2. **Introduction of Water Markets at Large Scale**

   It is high time that along with the public good, water should be treated as the high value economic good. There is need to introduce water markets to make more productive use of water and contribute to sustainable water management. The most successful water markets are found in Murray Darling Basin of Australia where Water trading has become a vital business tool and source of additional income for many irrigators. Here water is traded on markets – within catchments, between catchments (where possible) or along river systems. This form of trading allows water users to buy and sell water in response to their individual needs. Under water markets, during the year, water is distributed by the basin authorities (or 'allocated') against entitlements in response to factors such as rainfall and storage levels. The entitlement holder can make the effective and efficient use of the water and sell rest of the quantity to the entities which is using more than their own allocation of water. When water is allocated to an entitlement holder, they are able to use it as

needed - this is their business decision to make. Water markets create incentives for water to be moved to higher-value uses. The similar trading can be opted for treated waste water.

3. **Pollution Tax as the Remedy to Decrease Pollution in Water Bodies**

   The cost of water security has to be distributed to different stakeholders and the entities and communities which are harming the resources have to pay for their right to being polluter. Introduction of predetermined water pollution charges for surface and groundwater use or charges for wastewater discharge could have a significant incentive effect to prevent and control pollution, maintain proper sanitation and enhance water use efficiency. The pollution tax should be regarded as the part of Extended Prouder Responsibility (EPR). Economic instruments such as pollution tax are theoretically more cost effective than direct regulation or subsidies to curb pollution, which imposes the same controls on all polluters and does not take into account the heterogeneity of abatement costs. Pollution taxes can lead to significant investment in pollution abatement and technological innovation, thereby lowering the overall cost to society of meeting environmental targets. Apart from this, these taxes or charges not only reduce the pollution and enhances the quality but also provide revenue to the government which can be used to further abatement of pollution.

4. **New strategies to support Public Private Partnership in Water Sector**

   Governments can play a role in helping to attract new investors by enabling public and private actors to earn returns commensurate to the risks they take. Governments may consider providing risk mitigation to long-term investment projects where it would result in more appropriate allocation of risks and their associated returns. Guarantees play a critical role in mitigating the risks financiers face. Similarly, public money can be used to cover parts of the risks that private financiers (debt or equity) are unable to take. In the United States, state revolving funds provide examples of a sustainable infrastructure financing model. Set up with 'seed money' from US Congress, the state revolving funds capitalise a state-administered financial assistance programme to build and upgrade wastewater treatment plants and drinking water infrastructure, as well as invest in other projects to improve water quality. In doing so, the funds support a longer transition and ample flexibility to set up long-term financing to promote state and local self-sufficiency. Apart from it, the public private approach to Themes Tideway Tunnel (TTT) can also serve as the example for the operating PPP in high risk and long gestation period water sector projects.

   All these structural reforms, if implemented in phase and detailed manner, can immensly benefit the existing programmes and schemes of both state and central government. They will decrease the overall dependency on the government sector and make the sector self reliant, attractive and profitable for number of investors which is a crux for growth of not only any sector but the entire country.

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