

# EMERGING WATER GOVERNANCE IN INDIA— LEARNINGS FROM GUJARAT TO ACHIEVE WATER SECURITY

*Gujarat, today considered the growth engine of India, witnessed a turnaround from being a water scarce state to water secure state in the first decade of the 21st century under Narendra Modi's leadership, resulting in sustained double digit agricultural and economic growth. Its transformation by adopting environment-friendly policies, climate-resilient engineering, and strengthening grassroots leadership, which stand out as an example of sustainable development and offers a path to follow. This article throws light on the steps taken in the State since 2001 that have become the basis for new policies and practices at the national level and have the potential to make an impact, especially in the Global South to achieve sustainable development goals and prosperity.*



Gujarat of 2001 is known as suffering with repeated droughts and water scarcity, damage to life and livelihood due to devastating earthquake with epicentre in Kutch on January 26, 2001 and resultant economic crisis with shrinking economy. In this backdrop, Narendra Modi took over the responsibility to lead the state as chief minister of Gujarat for the first time in October, 2001. By his foresight and progressive policies and effective implementation, he transformed the water sector and the way it was earlier perceived, managed, and governed. The realization that the paucity of water contributes negatively to socio-economic development and economic growth led the then Chief Minister to revolve its policies and practices to achieve long-term water security. Also, the critical relationship between water, environment and ecosystems was acknowledged, built upon, shaped and transformed in a sustainable way to meet the challenges without compromising on the health of the natural world.

## **The transformation: Water Governance in Gujarat**

In the late 1990s, no one had imagined what Gujarat could look like. The western and northern parts were dried up due to severe droughts and the inflating desert of Kutch had left terrible impact on the livelihood. There were cases of mass migration of pastoral communities like Maldharis, who had to move eastwards from Kutch and Suarashtra in search of fodder and water for their livestock. During this period, Gujarat was facing a skewed annual rainfall with Central and South Gujarat receiving 80 - 200 cm while areas like Kutch were receiving less than 40 cm. On an average, every third year was marked as a drought year, leading to uneven distribution of water. Annually, thousands of tankers were deployed to mitigate drinking water scarcity and make water available to people. There were also times when special water trains had become the new norm for delivery of water. The state and district administration had devoted considerable resources and time to manage scarcity of water through such temporary fixes, but the emptying aquifers and damage to environment remained unattended.

To address these challenges for once and all, Narendra Modi placed water at the centre stage of the state's developmental policy. He aimed at finding viable solutions. Conserving water and achieving an ecological balance whilst resolving to ensure adequate and assured availability of clean water in every home became the top priority. His determination led to a series of policy decisions including the integration of the overall water sector to manage demand and supply coherently thereby ensuring accountability at all levels. The long-term goal, however, was the sustainability of water sources, as it was rightly seen to be intricately linked with public health and people's livelihood.

A great value was placed on water as a 'finite resource' that needed to be replenished every year. As all water is received from precipitation during limited rainy days in the state, the focus was on making state open-defecation free, rainwater harvesting and efficient use of water. It led to an early realization that water must be consumed wisely, without polluting the sources.

## **Making tap water a permanent feature**

Securing tap water connection in every household, an important feature of modern water governance was undertaken to improve equitable access to water and improved ease of living for all citizens. This approach

required preparing public institutions that can plan, implement, manage, operate and maintain their water supply systems at local level. A state-wide Water Supply Grid was planned and executed with the help of three organisations involved in water management - Gujarat Water Infrastructure Limited (GWIL) for building bulk water transfer infrastructure; Gujarat Water Supply & Sewerage Board (GWSSB) for water supply to rural and urban areas and managing distribution network; and Water and Sanitation Management Organisation (WASMO) to empower and handhold village panchayats or Pani Samitis i.e. Village Water & Sanitisation Committees (VWSCs). All these organisations had the clear mandate to ensure tap water supply to every household and public institutions in villages like schools, anganwadi centres, ashramshalas, community centres, public and community health centres, etc., which was missing for a long time.



A component of drought-proofing was adopted in building climate-resilient water infrastructure. The 'state-wide drinking water supply grid' was planned to provide clean tap water free from chemical and bacteriological contamination. The groundwater sources were protected by transferring surface water from a distance through bulk water pipelines of about 2,000 km and distribution pipelines of over 1.15 lakh km along with numerous hydraulic structures, storage sumps, water filtration, treatment plants, etc. Simultaneously, undivided attention was given to complete the Sardar Sarovar dam on the Narmada River and the distribution canal network. The existing canal systems were further strengthened. Inter-basin transfer of water from reasonably water-rich South and Central Gujarat to North Gujarat, Saurashtra and Kutch was planned and executed in the form of a 332 km long Sujalam Sufalam Canal with speed and scale. This unlined recharge canal was constructed on Northern side, parallel to Narmada main canal. Not only were the people provided with water of prescribed quality in adequate quantity, but the State also observed a drastic reduction in the pumping out of groundwater from tube wells. This grid is providing potable drinking water to over 200 Urban Local Bodies and about 14,000 villages.

To promote sustainable agriculture in drought-prone North Gujarat, Saurashtra, and Kutch, a unique approach to transfer Narmada floodwater to these regions through a series of the canal/ pipeline networks was taken up. Further, to meet water requirements, especially in areas with groundwater salinity, desalination plants were set up. So far, 4 such plants producing 270 MLD water have been taken up in the coastal areas of the State.

At the village level, local committees were formed called 'Pani Samitis', as a sub-committee of Gram Panchayat under the Panchayati Raj Act, thus giving them statutory backing. Addressing the concern that women are disproportionately and acutely affected by the shortage of water, it was decided that at least half of the committee members would be women along with proportionate representation to the marginalized sections of society. This further empowered industrious women of Gujarat, who had already been part of the Self-Help Groups (SHGs) and brought the milk revolution, to form and lead the all-women Pani Samitis in many villages. Members of these Samitis were trained to undertake the responsibility of local water resource management, service delivery including repair and maintenance of water supply systems and collection of water user charges from every home. Since 2002, innovative mechanisms have been introduced that include direct transfer of funds to the accounts of Pani Samitis, which ensure financial decentralization in planning and implementation of various water works.

The empowered Pani Samitis also play a central role in local water resource management, drinking water supply, greywater management and operation & maintenance in villages throughout the State. This led to the development of a 'responsible and responsive leadership' at the village level. As the local communities got empowered with the right experience, confidence, and means to handle water issues, they came together to shoulder full responsibility of water supply and sanitation and local water resource management. Thus, local water utilities started taking shape to ensure assured service delivery.

WASMO involved voluntary organizations and NGOs in a big way. Their involvement created an enabling environment for the communities to take full ownership of their in-village water supply systems. With the support of NGOs, villages started preparing their Village Action Plans (VAPs) to achieve water security. Their pioneering work received global recognition in the form of the CAPAM Award and the United Nation's Public Service Award.



Under Narendra Modi's vision, it was made clear that the water governance would be participatory. By breaking the silos and involving both NGOs and the water users, a new partnership approach to achieve water security was adopted.

#### **Enabling water-use efficiency in agriculture**

With about 85% of all freshwater being consumed for agricultural purposes, micro-irrigation and participatory irrigation management (PIM) were promoted in a big way to optimise water use in farms. Agriculture extension activities to educate farmers on the concept of 'Per Drop, More Crop' were initiated as a campaign. Narendra Modi, as Chief Minister, personally led the campaign with an easy and simple idea of 'Ghar ka pani ghar

mein, Gaon ka pani Gaon mein, Khet ka pani khet mein' (capture rainwater in our homes, villages, and farmlands, respectively). Farmers were provided financial and technical support to build check dams, farm ponds, bori-bundhs, etc. in and around their farmlands to 'catch the rain where it falls'. As part of the water conservation campaign, about 1.85 lakh check-dams, 3.22 lakh farm ponds, and a large number of bori-bandhs were constructed to impound water in fields. About 31,500 ponds were desilted and deepened. Over 1,000 step wells in the State were cleaned, revived, and put to use. For a long time, many of these stepwells were unattended and empty but with the help of rainwater harvesting and aquifer recharging, the traditional systems were restored and rejuvenated.

Realizing the potential of mission-mode campaigns in making the State water-secure, 'Sujalam Sufalam Jal Abhiyan' was initiated around the twin objectives of deepening water bodies before monsoons and enhancing water storage for rainwater collection. It entails numerous water conservation activities including the cleaning and deepening of ponds, canals, and tanks, check-dams and reservoirs, repair of water storage structures, construction of rainwater harvesting structures, etc. through a participative approach.

In addition, the State established a special purpose vehicle - Gujarat Green Revolution Company to educate farmers about scientific water management techniques such as drip and sprinkler irrigation systems. To encourage farmers to adopt such micro-irrigation systems, the company provided subsidy and also electricity connections on a priority basis. As a result, about 20 lakh hectares of farmland has been covered under micro-irrigation systems. In Gujarat, on an average, only 24% of the storage capacity of reservoirs and dams in North Gujarat, Saurashtra, and Kutch used to be filled annually during the rainy season. The criticality of water storage can be gauged from the fact the day the local reservoir in Bhuj city, known to be as Hamir Sagar lake overflowed, district administration used to declare it as a holiday. This day used to be celebrated as a festival. The 'Saurashtra Narmada Avtaran Irrigation' (SAUNI) Yojana was also taken up under which, during monsoon, surplus water from Narmada is transferred and stored in about 115 reservoirs of Saurashtra. This yojana is expected to benefit 8.25 lakh acres of farm land in Saurashtra. Similarly, small lift irrigation schemes have been taken up in southern and eastern Gujarat where tribal communities reside, providing assured irrigation to about 3.50 lakh acres of farmland, thus improving their income. To further reduce the freshwater demand, greywater treatment and reuse have been promoted, especially to divert the treated water for agricultural purposes. So far, this treated wastewater has contributed in meeting about 17% of the total freshwater demand of the State.

Taking full advantage of the expanding solar power availability in the State to address the electricity issues, solar pumps were commissioned in a big way. Subsequent comprehensive energy audits for various group water supply schemes have also resulted in energy savings leading to an overall reduction of the carbon footprint in the water supply sector.

Since 2001, with the integrated water management approach and groundwater table continuously improving, the total irrigable area in the State increased by 77%, and the agriculture production in the State also increased by 255%, leading to a green economy. This has paved the way for a sustainable and environment-friendly model, popularly known as 'Gujarat model of development' that has been successful in reaching water security coupled with double-digit economic growth further contributing in the all-round prosperity of the state.



### **The 3 M's of groundwater governance: Measure, monitor and manage**

'What gets measured, gets monitored and what gets monitored, gets managed' has been Narendra Modi's way of addressing groundwater depletion. By using watershed principles and scientific methods, greater emphasis was laid on water conservation practices like rainwater harvesting, enhanced storage and efficient utilisation and artificial recharge of aquifers. Optimum use of satellite data and remote sensing technology was conducted for identifying appropriate locations and studying the aquifer patterns. A conscientious approach was adopted for groundwater usage wherein needs were met keeping in view future implications as well as environment.

Following Gujarat's footsteps, a groundwater conservation plan was designed at the national level to carry out community driven efforts to achieve water security. Under Atal Bhujal Yojana, a unique policy initiative was undertaken to empower local communities by ensuring their participation and improving their sense of ownership among all other stakeholders. Water User Associations were created and strengthened to monitor and disseminate groundwater data. Under these, water budgeting, preparation of respective Gram Panchayat water security plans was sought and implemented. These committees have witnessed active participation of women having an essential role in improving water governance and bringing sustainability. Many women led committees have also begun tackling the issue of hygiene and sanitation at the local level. Currently, this scheme is successfully implemented in seven states which include all major water-stressed districts of Gujarat, Rajasthan, Maharashtra, Haryana, Karnataka, Uttar Pradesh and Madhya Pradesh.

The agricultural demand for water being the highest in India requires water- efficient practices like micro-irrigation. Under Pradhan Mantri Krishi Sichayee Yojana (PMKSY), farmers are encouraged to adopt water smart irrigation technologies to improve productivity with reduced water wastage. One of the crucial measures undertaken is on improving rainwater harvesting under 'Catch the rain' campaign.

### **Synergising vision and acumen: Water governance in India**

As the Chief Minister, Narendra Modi truly believed in the marriage of technological advancements of the modern world and traditional wisdom from the past to bring out the best outcomes for the state in all spheres. After becoming the Prime Minister of India in 2014, he sought and believed that if through an integrated and focused approach, drought-prone Gujarat was able to achieve water security, then, the same could be scaled up with local adaptations across the India.

Preserving resources for future generations was integral to Modi's futuristic vision. As part of water conservation at local level, he promoted check-dams and village ponds to reduce reliability on water supply in adverse climate zones. Similarly, to give better resources to our coming generations, he recently launched construction of 'Amrit Sarovars'. As part of this campaign, he announced to help develop and rejuvenate 75 water bodies in each district of the country by 2023 in the honor of Amrit Mahotsav, to prevent future water crisis.

### **Clean India Mission**

During his first term, Prime Minister Modi focused on eliminating the faecal contamination of water bodies by launching 'Swachh Bharat Mission' (Clean India Mission). This national mission has been acclaimed as the world's largest behavioural change programme towards making India 'Open-Defecation Free'. The link between clean water and better sanitation practices was established through this mission. It was understood that without improved sanitation and making India ODF country, access to safe water cannot be ensured. Following the success of the transformative Clean India Mission and inspired by the success of an integrated approach to water management in Gujarat, he integrated the two water sectors - drinking water supply and water resources - forming a single Ministry of Jal Shakti in 2019. Soon after, 'Jal Shakti Abhiyan' was launched as a campaign and mission-mode initiative to make the best of the monsoons and enable water conservation, especially in the 256 identified water-stressed districts. The effort was to make it a 'Jan Andolan', a movement of the people by facilitating the role of different stakeholders, viz. bureaucracy, civil society, water users, students, researchers, academia, etc. These steps were in the right direction towards truly making water 'everyone's business' and achieving water security for all. The Abhiyan not only accelerated asset creation but also raised extensive awareness on building source sustainability.

Treating river as living entities and taking all the measures to make sure that they continue to breathe and live healthy, was another transformative step in the same direction. 'Namami Gange' was launched for rejuvenation of the river Ganga and its tributaries by adopting a multi-level and multi-agency approach in four broad categories of pollution abatement, improving flow and ecology, strengthening people-river connect, and research, knowledge, and management. With the success of Namami Gange, 13 more rivers have been taken up for rejuvenation and pollution abatement.



### **Jal Jeevan Mission - Har Ghar Jal**

On 15th August, 2019, in his address to the nation from the rampart of Red Fort, PM Narendra Modi announced Jal Jeevan Mission (JJM) with the promise of tap water supply to every rural home in the country by 2024. This mission designed in partnership with states and aimed to ensure long-term assured water service delivery rather than mere infrastructure creation. JJM was launched in the spirit of cooperative federalism and keeping sustainability in the centre, therefore focused on utilisation of existing water supply assets either by source augmentation or retrofitting to provide tap water supply along with promoting the use of solar power. The holistic approach of JJM correlates water management with women empowerment, community participation, employment generation, self-reliance, water conservation, improving sanitation standards and technological interventions. These reflect sustainable models and practices of today's India that work in harmony with our ancient Indian ethos.

Under JJM, Pani Samitis/ Village Water & Sanitation Committees (VWSCs) are being set up across the 6 lakh rural villages of the country, where they are being empowered to plan, implement, manage their in-village water supply systems by adopting an end-to-end approach involving the four key components, viz. source sustainability, water supply, greywater treatment and reuse and operation & maintenance.

Local youth are being upskilled as masons, plumbers, electricians, motor mechanics, fitters, pump operators, and other trades to secure the availability of trained human resources in villages and to carry out routine O&M. Furthermore, five women in each village are being trained to use Field Test Kits (FTKs) to test the quality of the water, conduct sanitary surveys and submit data to the JJM website. Such skilled resource at the local level is expected to aid in any disaster risk reduction and mitigation measures, as well as build local resilience.

Furthering the cause of making water 'everyone's business', 185 organizations including UN agencies, trusts, foundations, and others, have been roped in as sector partners to dovetail their resources and efforts in accomplishing the collective aim of 'Har Ghar Jal'. Massive capacity building, training and community mobilization initiatives are being undertaken to build the capacity, refocus and train public health engineers, village representatives, Pani Samiti members, etc. for which 104 reputed institutions have been engaged as Key Resource Centres (KRCs). States are also enlisting the help of more than 14 thousand local NGOs, VOs, CBOs, women's SHGs and other organizations as Implementation Support Agencies (ISAs) to assist and handhold GPs/ VWSCs in helping them to become local water utilities.

To enhance the capacity of public health engineers through learning opportunities, the 'National Centre for Drinking Water, Sanitation and Quality (NCDWSQ)' has been set up in Kolkata as an apex institution in public health engineering (PHE). The institute, adopting a 'hub and spoke model', will partner with the Key Resource Centres (KRCs), two proposed Centres of Excellence (CoE), and five Professor Chairs across the country and work in the areas of training and capacity building, education and academic programmes, research and innovation, and outreach and consulting, with a special focus on ensuring source, financial and environmental sustainability. This institution is proposed to be a national institute of water and sanitation.

Marking India's stronghold in the global digital era and leveraging the technological potential within the country, innovative and locally developed technologies are being promoted. A 'Technical Committee' chaired by the Principal Scientific Advisor (PSA) to the Government of India, comprising of state representatives, scientists, innovators, and others, has been formed to utilize emerging technology and deliver novel solutions. Sensor-based IoT pilots for smart measurement and monitoring of the daily water supply are underway in over 100 villages. Similarly, portable water quality testing devices for household or village levels are being developed within the country by creating an ecosystem for all related stakeholders.

### **Innovation and technology**

Digital governance is being promoted to ensure transparency, accountability, effective fund utilization, and assured service delivery through several measures such as the publicly available Jal Jeevan Mission dashboard that provides progress updates in a user-friendly and captivating manner. A dedicated Water Quality Management Information System (WQMIS) is also developed by combining the results of water quality tests and enabling the public with information at their fingertips.

Technology has been at the centre of improving water conservation. In pursuit of this, SCADA systems have been put in place for accurate and smart measurement and monitoring of water. Similar models using satellite data were also operationalised in monitoring the water resources and infrastructure development across Gujarat and other states.

### **Initiatives taken for a water-secure India**

The Swachh Bharat Mission 2.0 focuses on reducing waste production and its suitable treatment, reuse, or disposal. The key impact areas of this mission are bio-degradable solid waste, greywater, plastic waste, and

faecal sludge management. India, being the biggest user of groundwater on the planet, plays a significant role in influencing decentralized, demand-driven, and community-managed programmes where local communities especially those involving women, are engaged in scientific water management for long-term water security in villages. In today's climate-risked world, especially this decade where more rain is predicted in fewer days, it is crucial more than ever to speed up the work to catch and store the rainwater, use judiciously and make the most through treatment and reuse. The Government of India, over the last eight years, has taken multiple initiatives toward the circular economy of water in the spirit of people-driven programme. The National Project on Aquifer Management (NAQUIM), one of the world's biggest programmes of its kind, envisages the formulation of aquifer management plans to facilitate the sustainable management of groundwater. So far, more than half the total area of the country has been mapped.



15th Finance Commission, has allocated Rs. 1.42 Lakh Crore tied grant to Panchayats for water & sanitation during 2021-22 to 2025-26. This gives a huge push for assured tap water supply to every home and improved sanitation in villages. It has huge impact on ensuring these services in villages and thus, on public health and quality of life in rural areas. This humongous step towards water security also ensures more funds to Gram Panchayats or local communities so that they can implement, operate and maintain their water supply and sanitation related proposals and schemes. Concomitantly, Gram Panchayats or Pani Samitis can function as local 'public utilities' with a prime focus on service delivery vis-à-vis conserving the community resource through shared beliefs, values and reverence for water. This is a big move towards strengthening the local self-government in line with the 73rd Amendment to the Constitution of India.

### Way Forward

The socio-economic development and economic growth, especially in drought prone and desert areas depends upon how wisely water resources are utilized. Under Narendra Modi's governance model, water security, water conservation and water-use efficiency have become the priority areas ensuring long-term sustainability. Convergence with the aforementioned schemes offers opportunities to dovetail resources at the village level offering optimal utilization of fund and ensuring sustainability. The recent initiative to develop 75 ponds in each district in the 75th year of our independence will prove to be a milestone in water conservation and conserving the environment.

Water, being a finite resource, plays a key role especially in arid and semi-arid regions in restoring and sustaining the environment including flora and fauna. Its vitality for reducing the burden of disease and improving the health, welfare and productivity of human populations and keeping other life forms on earth possible cannot be underestimated or ignored. Narendra Modi, a great lover of nature shaped the policies both in Gujarat and thereafter at the national level, to restore the environment and preserve nature while working to improve the quality of life of 'Billion Plus Indians' and eliminate the poverty. To achieve this twin goal, ensuring water security has been the key. It is fascinating to observe how Gujarat and the Indian water journey has been invaluable in showing the world how water management can be reinvented to make it sustainable and restore our environment. These initiatives, centred around people partnering technology aiming at sustainability, pave the way for affordable, scalable and reliable models for the entire world, especially the global south. ■

## Author



**Bharat Lal**

(The author is Director General, National Centre for Good Governance (NCGG))