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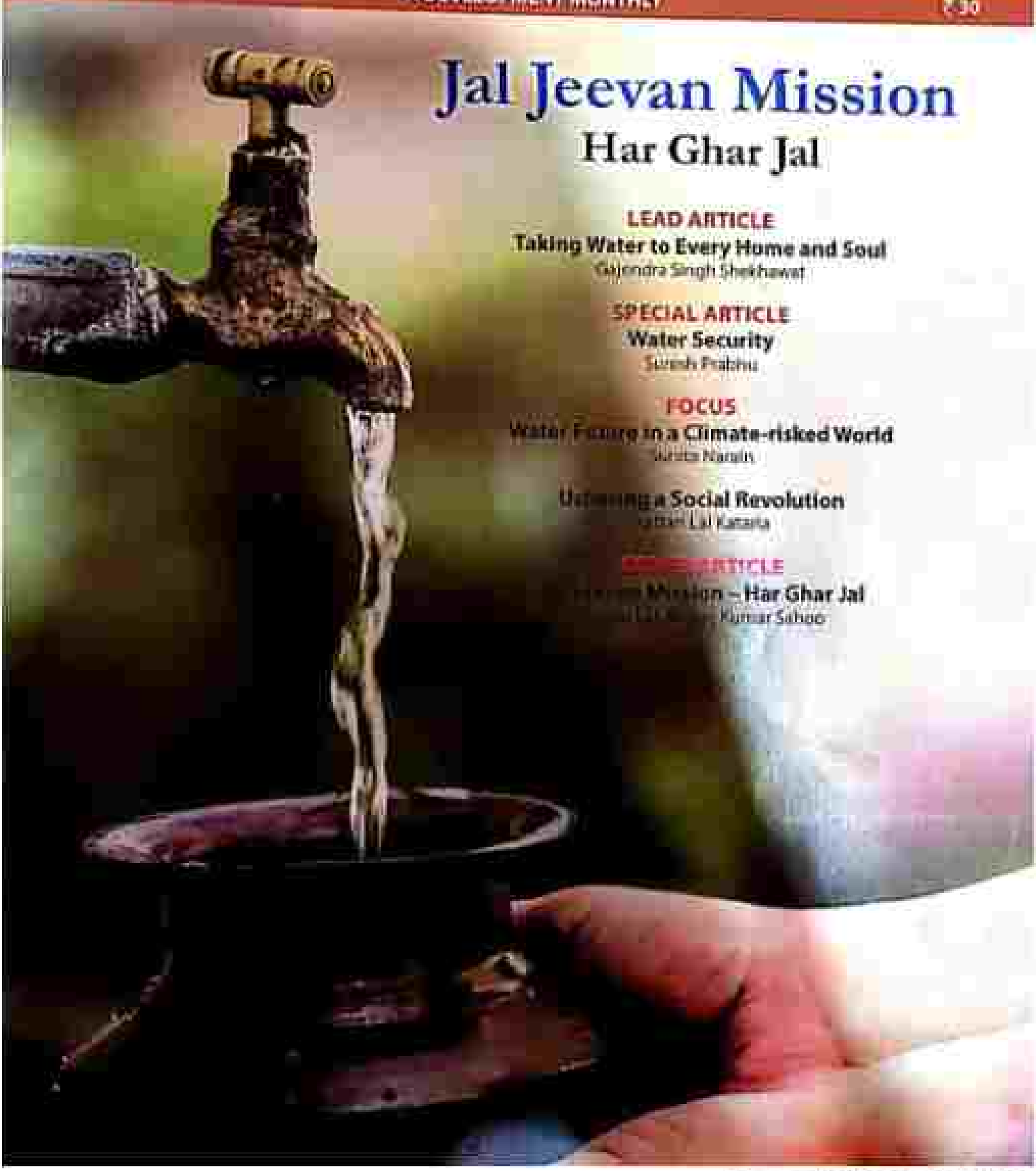
YOJANA

SPECIAL ISSUE

MISSION INDIA

APRIL 2021 | A DEVELOPMENT MONTHLY | ₹ 30



Jal Jeevan Mission

Har Ghar Jal

LEAD ARTICLE

Taking Water to Every Home and Soul

Gajendra Singh Shekhawat

SPECIAL ARTICLE

Water Security

Suresh Prabhu

FOCUS

Water Equity in a Climate-risked World

Sunita Narain

Ushering a Social Revolution

Vivek Lal Kataria

SPECIAL ARTICLE

Jal Jeevan Mission – Har Ghar Jal

Pankaj Kumar Sahoo

Jal Jeevan Mission

"Last time, I had made an announcement for the Jal Jeevan Mission. It is completing one year. I am very proud to tell you that our dream of making available safe drinking water to all the people is getting realized. The solution to several health problems is directly linked to the safe drinking water. It also contributes to the nation's economy. That's why we have started the Jal Jeevan Mission.

Today, I am happy to share that every day we are able to provide piped water connection to over one lakh households. And in the last one year, we have been able to provide tap water to 2 Crore families, especially to the tribals living in the forests and far-flung areas. A huge campaign has been launched. And I am glad that today 'Jal Jeevan Mission' has created an environment of healthy competition in the country. There is a healthy competition among the districts, among the cities and also among the States. Everyone is hoping that the Prime Minister's dream of 'Jal Jeevan Mission' is accomplished at the earliest in their respective areas. The new strength of cooperative and competitive federalism has been associated with the 'Jal Jeevan Mission' and we are moving forward with this."

August 15, 2020

"I declare from the Red Fort today that in the days to come, we will take forward the Jal Jeevan Mission. The central and the state governments will jointly work on this Jal Jeevan Mission. We have promised to spend more than Rs. 3.50 lakh Crore on this mission in the coming years..."

August 15, 2019

Shri Narendra Modi
Prime Minister of India

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YOJANA
Since 1957 A DEVELOPMENT MONTHLY

Let noble thoughts come to us from all sides
Rig Veda

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REGULARS

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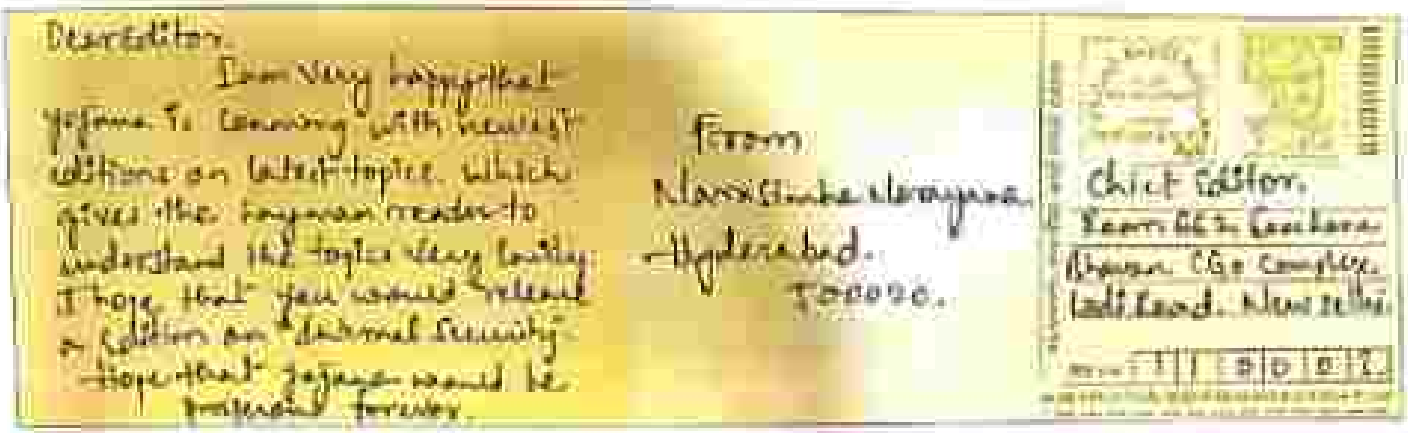
YOJANA is published in Assamese, Bengali, English, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu and Urdu.


Dear Editor,
I am very happy that Yojana is coming with monthly editions on latest topics which gives the layman reader to understand the topics very easily. I hope that you would release a edition on "National Security" - Hope that Yojana would be released forever.

From
Nagalinga Narayana
Hyderabad.
500090.

Chief Editor,
Room No. 336,
Yojana, CGO Complex,
Lodi Road, New Delhi.

Relevant Topics

I have been reading the Yojana magazine since December 2018. The magazine not only provides issues but also explores the issue, like its past, present, and future, which help in and create a better understanding of the issue. Topics are also relevant and follow contemporary issues. It is the only monthly magazine that brings relevant different aspects on one platform in a concise way. I congratulate and am thankful to all the members of team Yojana.

– Prem Kumar Gedam
Mumbai, Maharashtra
premgedam7733@gmail.com

Helps in Competitive Exams

I am a follower of Yojana magazine for the last year; I use to practice my daily answer writing on various issues of Yojana monthly magazine. Yojana team is helping all UPSC CSE aspirants for better awareness on governance issues, my sincere request to the Yojana team to publish some more topics on Indian geography, policy, and governance, public administration, social justice, security issues.

– Venkata Sai Kiran Mukkamala
Prakasam, Andhra Pradesh
csindiakiran@gmail.com

Detailed Coverage

I am preparing for the UPSC IAS examination, and regularly following this informational magazine without any gap. All the columns are highly appreciated. Detailed coverage on current affairs topics helps me to build the right vision & understanding of that particular topic. The topics written by experts and professionals will shape the right knowledge for us. I am thankful to Team Yojana for providing relevant information to all of us. I congratulate Team Yojana on their appreciable job every time. Keep writing and inspiring knowledge seekers.

– Dimple Wadhawan
dimpledevries774@gmail.com

Brings Quality Information

I have been reading Yojana for a long time, regularly. And I am very much thankful to Team Yojana for bringing quality information every month with comprehensive details and Seniors us with fruitful knowledge at an affordable cost for students and learners. I am also a civil services aspirant, for which I have to stay updated over current development in the nation and world. Yojana is the best magazine among all, which is a pure knowledge booster for every reader. Every magazine brings new themes and columns which will help UPSC CSE aspirants to prepare a diversity of topics over a period of time. I would highly appreciate it if you publish a separate edition over North East India (the Seven sister states - their life, challenges, and opportunities).

– Kirti Wadhawan
Kanpur
kirtidimple2007@gmail.com

Literature- A Unique Topic

Yojana rightly brings out issues that concentrate on one topic every month. The February 2021 issue is all the more unique to carry information on literature, especially in its print form, albeit it is getting alarmingly sidelined due to digital media. Such a unique feature is the reason why Yojana is popular even in rural India.

– Rajiv N Magal
Halekere Village, Karnataka
rajivnagal2016@gmail.com

Distinguished Authors

I am referring to Yojana in my UPSC preparation since 2014. I always eagerly wait for the new issue of Yojana. Yojana covers a very wide range of issues like the environment, development, infrastructure, society, etc. It also highlights India's achievement in various fields. It helps to develop analytical power. It explains every issue from distinguished authors related to that particular issue. Every issue is an enriching source for students in UPSC preparation. It not only helps in prelims and mains but also in interview.

– Krishna Gaikwad
gaikwadkrishna822@gmail.com

Valuable Content

The February issue on "Indian Literature" is highly appreciated work done by the Yojana Team. The valuable content given by the authors makes every reader know about the genesis of the Indian languages and their literature, which is the need of the hour for every citizen. I request the Yojana team to publish similar types of issues regularly based on our Indian culture.

– Chaitanya Thatiampudi
Samalkot, Andhra Pradesh
tckjbr@gmail.com

India@75

India is going to celebrate its 75th year of independence. The January special issue as title 'India@75' has touched on very crucial changes, achievement and issues we have had from independent to now. I would request you to publish on the environmental issues in India, and the government's steps to tackle environmental problems and issues.

–Arun Srivastava
Varanasi
arun24srivastava@gmail.com

Tholkappiam, An Insightful Article

The February issue on "Indian Literature" is another beautiful edition of Yojana. As a UPSC civil services aspirant, whenever I used to come across any mention about Indian Literature I was tempted to read more on that. But a source like this edition has helped me fulfill my thirst to some extent. The articles are from diverse languages and regions of our country. The article on Tholkappiam was highly insightful. I am thankful to the Yojana Team for bringing such editions. I hope to read more such amazing editions.

– Udayan Singh
udayanrocks6@gmail.com

Enriching Magazine

I have been an ardent and inflamable traveler of such an enriching magazine called Yojana since six years of my UPSC preparation and it has always been a knowledgeful and soaring experience to learn through such a magazine. May this journey continue forever.

– Nagen Deo
rsgrader007@gmail.com

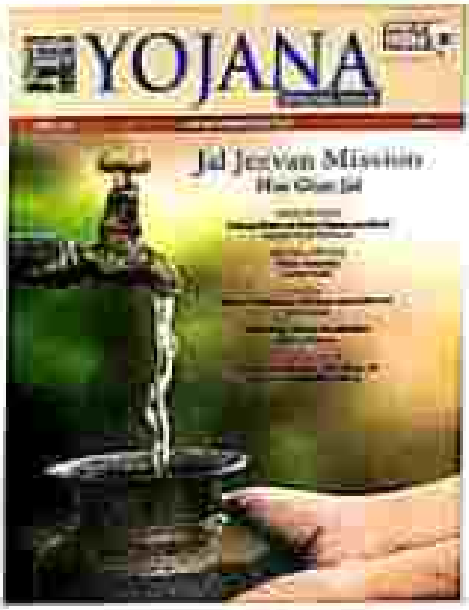
Farm Bills

I am a regular reader of Yojana. It provides authentic facts and figures. I would like to request team Yojana to publish an edition that totally focuses on "farm bills". My sincere thanks to the entire Yojana Team.

– Joginder kumar
Narela, Delhi
pawarjogi1967@gmail.com

Har Ghar Jal

"Gracious be divine waters for our protection, be there for our drink, and stream on us bliss and happiness."
- Rig Veda 10-9



Water stress is being experienced across the world with increased spells of drought, desertification, and inequitable access to water. Assured availability of potable water is vital for human development. Sustainable Development Goal-6, of ensuring access to water and sanitation for all, involves reaching to people who lack basic services and improving accessibility. For water management to be sustainable, it has to be planned with a people-centric strategy that encourages and ensures their participation.

The Covid-19 pandemic, when people realised that 'washing hands' was the least and the best defence available to them for almost a year, re-emphasised the value of clean and accessible water in our lives. Also, running tap water is critically important for sanitation and hygiene. The Prime Minister had envisaged it way before this pandemic when he announced in August 2019 to take tap water to every household through Jal Jeevan Mission. The initiative aims to provide tap-water connection to every rural household in the country by 2024. It also implements source sustainability measures as mandatory elements, such as recharge and reuse, through greywater management, water conservation, and rainwater harvesting.

The Jal Jeevan Mission (JJM) is based on a community approach creating a jan andolan for water, thereby making it everyone's priority. The key challenge is to ensure the sustainability of the water supply systems. It has recognised this fundamental flaw in water infrastructure projects and has stressed that its objective is sustainability so that water continues to flow in pipes and taps. Jal Jeevan Mission aims to reach all rural households by 2024, which is six years well ahead of the Sustainable Development Goal-6 target and could become a model for other developing countries to adopt such practices and achieve their SDG-6 goal. Its predecessor Swachh Bharat Abhiyan had already done the groundwork with bringing sanitation to the forefront and made the country open-defecation free. Now, the Swachh Bharat Abhiyan 2.0 is taking it to the next level by making necessary interventions in biodegradable solid waste management, greywater management, and faecal sludge management.

India is the largest user of groundwater in the world, using more than a quarter of the available global resources. Groundwater has played an important role in ensuring the food security of the country. It is critical to involve women in decision-making processes, at all the stages of planning, implementation, management, operation, and maintenance of rural drinking water supply schemes. Women across the country need to be engaged in rural drinking water-supply schemes consciously for long-term water security in villages.

Atal Bhujal Yojana is one such initiative that demonstrates community-led sustainable groundwater management, taken to scale. The major objective of the scheme is to improve the management of groundwater resources through a convergence of various ongoing schemes. It is a pioneering and unique experiment involving stakeholders to bring about innovative reform in the management of groundwater by engaging the local communities.

Pradhan Mantri Krishi Sinchayee Yojana, on micro-irrigation, has an objective to enhance water use efficiency in the agriculture sector by promoting appropriate technological interventions like drip & sprinkler irrigation and encouraging the farmers to use water-saving and conservation technologies. Armed with a four-pronged vision of Accelerated Irrigation Benefits Programme, Har Khet Ko Pani, Per Drop More Crop and Watershed Development, this scheme aims to bridge the gap between the potential of Micro Irrigation potential of the country.

It is interesting to note how the Indian experience has been invaluable in teaching the world how water management can be reinvented to make it affordable and sustainable. These initiatives put water in the hands of communities and are focused on decentralised recharge and reuse, thus making water everybody's business. ❑

Taking Water to Every Home and Soul

Gajendra Singh Shekhawat

Jal Jeevan Mission is the flagship programme of the Union Government which aims to provide tap water connection to every rural household of the country by 2024. It also implements source sustainability measures as mandatory elements, such as recharge and reuse, through greywater management, water conservation, rainwater harvesting. The Jal Jeevan Mission is based on a community approach to water creating a jan andolan for water, thereby making it everyone's priority.

Tashigang, an innocuous-looking village in Lahaul and Spiti situated at 15,256 feet above sea level has the rare distinction of being the highest polling booth in the world. This picturesque village looks otherworldly, harsh winters freeze everything in its wake, snowstorms below through the valleys and a day with a temperature of minus10 degrees is considered rather sunny and balmy. Yet, despite its hostile weather, Tashigang stands tall as a testimony to Indian democracy. Recently it achieved another impossible feat, the first household tap water connection was provided in the village in September 2020. If a polling station in Tashigang bears witness to the fact that no one is left behind from expressing their choice, the household tap connection bears testimony to the philosophy of the Hon'ble Prime Minister's vision of "Sabka Sath, Sabka Vikas, Sabka Vishwas". Come rain or snow, come day or night, no matter the road, no matter the height, Jal Jeevan Mission is ensuring potable tap water to all households.

Stories like that of Tashigang are one part of a series of success stories of Jal Jeevan Mission, the flagship programme of the Union Government, which aims to provide tap water connection to every rural household of the country by 2024. This resolve can be traced back to the words of the Hon'ble Prime Minister, who equated Pani (Water) with Parmeshwar (God) and Dana (elixir) during one of his "Mann Ki Baat" talks. For the team of Jal Jeevan, providing water transgresses the lines of being only a policy to be implemented, for us it is an act of bringing God (Parmeshwar) into people's homes, an act in the service of humanity as well as God. That would explain the sheer speed of the ministry's work, while 3.23 Crore household tap connections were provided during the last 70 years, in one year of Jal Jeevan Mission, more than 3.73 Crore household tap connections were provided. In the last year, 81,154 villages, 41,835 Panchayats, 669 blocks, and 52 districts and two states have achieved the distinction of 100% households with tap water connections, many other villages, districts, and states are slotted to follow suit this year. While numbers do speak volumes, nothing can be more evidential than being probed by a neutral party. When major media outlets visited the villages with 100%

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household tap connections, they found that the numbers are not just on papers, the implementation is winner side, although some minor details remain to be sorted which in time shall be, their overarching assessment of the Jal Jeevan Mission was positive, encouraging and applaudable. Enthused by the progress of the mission, the allocation of the Department of Drinking Water & Sanitation has been increased from Rs. 21, 518 Crore in 2020-21 to Rs. 60,030 Crore in 2021-22.

While the Department of Drinking Water & Sanitation is presently in news because of the Jal Jeevan Mission, the stellar work being done by Swachh Bharat Abhiyan's successor, the Swachh Bharat Abhiyan 2.0 is an equally important programme being implemented by the Ministry. As per one study conducted by WHO, the Mission resulted in averting more than 300,000 deaths (diarrhoea and protein-energy malnutrition) between 2014 and October 2019. The "Environmental impact of the Swachh Bharat Mission on Water, Soil, and Food" study by UNICEF, found that, in terms of faecal contamination, non-ODF villages were, on average, 11.25 times more likely to have their groundwater sources contaminated (13.7 times more from contaminants traceable to humans alone). While, the sanitation coverage rose from 38.7% at the time of the Swachh Bharat Abhiyan's inception to 100% by October 02, 2019, the larger challenge of a holistic sanitation coverage remained. Recently allocated, more than 1.40 lakh Crore for SBM Phase II, is an attempt to address the challenge of holistic waste management by focusing on various aspects of waste management in rural India, including faecal sludge management and wastewater

treatment, source segregation of garbage, reduction in single-use plastic, etc.

The Swachh Bharat Mission 2.0 comes at an appropriate time, India makes a large contribution to plastic waste pollution worldwide, and appropriate community action to reduce the waste production and its suitable disposal is the need of the hour. The other three impact areas of Swachh Bharat Abhiyan 2.0 are Bio-degradable Solid waste Management, Greywater management, and Faecal Sludge Management. It was because of this Government's foresight that more than 10 Crore household toilets built turned out to be a blessing because of the use of twin-pit toilets that have in-situ treatment of faecal sludge. However, for toilets built in peri-urban/ urban areas before the Swachh Bharat Abhiyan, nearly 1,20,000 tonnes of faecal sludge are left untreated as two-thirds of all toilets were not connected to the main sewer lines.

Swachh Bharat Abhiyan 2.0 is needed to halt the advent of a staggering health menace caused by the mismanagement of faecal sludge also.

The Department of Water Resources, River Development and Ganga Rejuvenation under the Ministry of Jal Shakti is also heralding vital policies needed for the assurance of water security in the country. Atal Bhujal Yojana, with an outlay of Rs. 6,000 Crores aims to facilitate sustainable groundwater management with an emphasis on community participation and demand-side interventions for sustainable groundwater management in identified water-stressed areas in 8,353 Gram Panchayats in 78 districts of seven states in the country. Atal Bhujal Yojana came at a precarious time for the country, about 22% of our groundwater resources are in critical or over-exploited category, 1,499 out of 6,881 assessed units were found to be either critical or overexploited. With annual withdrawal exceeding annual replenishment of groundwater, demand-side management was the call of the hour. Atal Bhujal Yojana was constituted for this explicit purpose. It was also found that if only agriculture sector, the prime user of water resources in India, saves 10% water by water-efficient practices, water would be available to all for the next 50 years. For this purpose, the grand vision of Pradhan Mantri Krishi Sinchayee Yojana was implemented. The centrally-sponsored Scheme on micro-irrigation has an objective to enhance water use efficiency in the agriculture sector by promoting appropriate technological interventions like drip & sprinkler irrigation and encouraging the farmers to use water-saving and conservation technologies.

Armed with a four-pronged vision of "Accelerated Irrigation Benefits Programme (AIBP), Har Khet Ko Pani (HKKP), Per Drop More Crop and Watershed Development, this scheme, set up with an allocation of Rs. 50,000 Crores, aims to bridge the gap between the potential of Micro Irrigation potential of the country which stands at 6.95 Crore Hectares of which only 10% was achieved till 2014. To cover 100 Lakh Hectares under micro-irrigation by 2022, the expected increase in farmer's income due to the scheme is expected to rise by Rs 10,000 – Rs 25,000 per acre.

The Ministry is at the forefront of many such initiatives which on one hand shall augment the water resilience of the country and on the other hand provide access to safe drinking water to millions. It is an exciting time for us, a time which shall change the fortunes of the country. It was the legendary Ben Gurion, the first Prime Minister of Israel who guided by the wise words of the old testament exulted his countrymen to convert desert into the promised land, and Israel turned from a water-scarce nation to a water secure nation. The Hon'ble Prime Minister Shri Narendra Modi has the same impact over the nation- he has elevated water to that of God (Parmeswar) giving us the encouragement to take the blessings of water to each house and each person. In its efforts, the Ministry is indeed doing God's own work. □

India | Status of tap water supply in rural homes

Total number of households (HHs)	Households with tap water connections as on 15 Aug 2019	Households with tap water connections as on date +1,13,717
19,19,10,552	3,23,62,838 (16.86%)	7,01,17,638 (36.54%)

Households provided with tap water connection since launch of the Mission

3,77,54,800 (19.67%)

Water Security

Suresh Prabhu

India, a centuries-old civilisation has originated and flourished on the banks of the sacred rivers of Indus and Saraswati. The importance of water conservation and management was often highlighted in the ancient texts. The Indus River is the longest one stretching to 2900 km followed by Brahmaputra, Ganga, Godavari, Narmada, Krishna, Mahanadi, and Kaveri. India has also a vast number of natural resources and is blessed with rich flora and fauna with 47,000 species of plants and 89,451 species of animals. According to the India State of Forest Report (ISFR) 2019, the total forest and tree cover has also risen to 24.56 per cent of the total geographical area of the country.

With population growth over the years and increasing demand for water, today India is facing many challenges in the water sector. Water scarcity is already visible with the current population size of 1.3 billion which is projected to be increased to 1.6 billion by 2050. Along with this, with rising pollution levels and climate change, the water cycle is expected to undergo significant change all across the world. India consists of 16 percent of the world's population but with only 4 percent of the world's water resources. The total annual water available from precipitation in India is about 4,000 cubic km. Surface water and replenishable groundwater contribute to 1,869 cubic km but only 60 per cent of this can be put to beneficial uses which means only 1,122 cubic km is a utilisable water resource in India.

The 2018 Composite Water Management Index (CWMI) 2.0, a pan-India set of metrics that measures different dimensions of water management and use across the lifecycle of water report released by the NITI Aayog in association with the Ministry of Jal Shakti and the Ministry of Rural Development, indicated that 21 major cities including Delhi, Bengaluru, Chennai, Hyderabad, and others are racing to reach zero groundwater levels by 2020, affecting access for over 100 million people. The report also informed that, by 2030, the country's water demand is projected to be twice the available supply, implying severe water scarcity for hundreds of millions of people which will lead to a 6% loss in India's GDP. It is believed that water will also be a major source of geopolitical conflicts this century. It is therefore critical to manage this natural resource well.

The author is Member of Parliament (Rajya Sabha), India's Sherpa to the G20, Former Union Minister, Government of India.
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We need to have a sharp focus on tackling the water crisis in the interest of all citizens of our country. The government is already working on the Scientific management of water through its various initiatives to solve the water crisis. Water security is of paramount importance to ensure reliable access and sustainable availability of clean water in adequate quantity to the entire population.

Under the leadership of Prime Minister Shri Narendra Modi, from 2014, the government has been proactive about water management. India has made considerable progress especially in SDG 6: Clean water and sanitation by constructing over 11 crore toilets to become open defecation-free (ODF) in five years through Swachh Bharat Abhiyan launched in 2014. The Prime Minister was conferred the "Global Goalkeeper" award by the Bill and Melinda Gates Foundation in 2019 for this campaign which also marked Mahatma Gandhi's 150th birth anniversary. Recently, Hon'ble PM was also conferred with the Global Energy and Environment Leadership Award by Cambridge Energy Research Associates (CERA) for his commitment to expanding India's leadership in sustainable development to meet the country's, and the world's, future energy needs.

Namami Gange Flagship Programme was launched in June 2014 with a budget outlay of Rs.20,000 Crore to accomplish the twin objectives of effective abatement of pollution, conservation, and rejuvenation of the National River Ganga. The National Ganga Council is chaired by Hon'ble PM and is working towards this goal by i) adopting a river basin approach to promote inter sectoral co-ordination for comprehensive planning and management, and ii) maintaining minimum ecological flows in the river Ganga to ensure water quality.

A draft National Water Framework Bill, 2016 containing provisions for an overarching national legal framework with principles for protection, conservation, regulation, and management of water as a vital and stressed natural resource was suggested under the Chairmanship of Dr. Mihir Shah through a committee constituted by the Ministry of Water Resources, River Development, and Ganga Rejuvenation in 2016. The Government is planning to update the 2012 version of the National Water Policy (NWP) and set up a National Bureau of Water Use Efficiency to bring a paradigm shift in water management.

The efforts to ensure water security and effective governance have been doubled through the creation of the Ministry of Jal Shakti in 2019 by merging the Ministry of Water Resources, River Development & Ganga Rejuvenation, and Ministry of Drinking Water and Sanitation. Jal Shakti Abhiyan – a campaign for water conservation and water security was launched in 2019 to make water conservation a Jan Andolan (People's movement) through asset creation and extensive communication. The focus is on 1592 water stressed blocks in 256 districts of India, to ensure five important intervention areas - Water conservation and rainwater harvesting, Renovation of traditional and other water bodies/tanks, Reuse of water, and recharging of structures, Watershed development, and Intensive afforestation. The special intervention areas include Block and District Water

The government is already working on many initiatives to solve the water crisis but several issues need consideration by various stakeholders to ease the implementation of various schemes of the Central and State government. We have launched a nationwide movement (campaign) named 'Nisarg Raksha' on Environmental conservation and Water Rejuvenation.

Conservation Plan, Krishi Vigyan Kendra Mela, Urban Waste Water Reuse, Scientists and IITs, and 3D Village Contour Mapping.

The Government launched Jal Jeevan Mission (JJM) on India's 73rd Independence Day on August 15, 2019 to provide Functional Household Tap Connection (FHTC) at the rate of 55 litres per capita per day (lpcd) to every rural household (Har Ghar Nal Se Jal-HGNSJ) by 2024. During 2019-20, in 7 months (from August to March), more than 84 lakh households were provided with tap connections. As on 27 Feb 2021 - 7,00,03,921 (36.48%) Rural Households were provided tap connections out of a target of 19,19,10,552 households.

> This movement will be driven by people and it will be a people's movement. We aim to train around 1 million Nisarga Rakshaks – One volunteer for every village in the country. These volunteers will be trained by 50,000 Nisarga Shikshaks (teachers) across the country and they will carry out various activities towards Environmental conservation and Water Rejuvenation at the local level.

Atal Bhujal Yojana (Atal Jal), a groundwater management scheme was launched on the 93rd birth anniversary of former Prime Minister Atal Bihari Vajpayee, on December 25, 2019. The purpose of the scheme is to improve groundwater management in seven states of India - Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh with a total outlay of Rs.6,000 crore to be implemented over 5 years from 2020-21 to 2024-25. This scheme will benefit nearly 8350 Gram Panchayats in 78 districts of these seven states.

In the Union Budget of 2021-22, Universal Coverage of Water Supply and Swachh Bharat Mission had a special focus. The launch of Jal Jeevan Mission (Urban) was announced for universal water supply in all 4,378 Urban Local Bodies with 2.86 crore household tap connections, as well as liquid waste management in 500 AMRUT cities to be implemented over 5 years with an outlay of Rs. 2,87,000 crores. Urban Swachh Bharat Mission was proposed to be implemented with a total financial allocation of Rs 1,41,678 crore over 5 years from 2021-2026.

Inter-Linking of Rivers is the long-cherished dream of former Prime Minister Atal Bihari Vajpayee and the project comprises 14 rivers in the peninsular region and 16 rivers of Himalayan origin. In my tenure as the Chairperson, Task Force for Interlinking of Rivers (Cabinet Minister Equivalent), Govt of India from 2002 to 2004, I have

- Chaired the comprehensive program of the Government of India aimed at ensuring the country against water stress through linkage of major rivers in the Himalayan and Peninsular region of the country.
- Steered the Task Force towards making an action plan for completion of the feasibility studies and providing guidance on norms of appraisal of individual project in respect of socio-economic impacts, environmental impacts, and economic viability.
- Prepared ground for reaching consensus with the concerned State Governments on the program of interlinking of rivers.

I have also engaged with various international bodies and have chaired the South Asia -Global Water Partnership and Council on Energy, Environment, and Water among others. I have been a Member of the Reference Group to study policies of water in 11 African countries.

As a Union Minister for Railways between 2014 to 2017 –

- Introduced Water vending machines at Railway stations.
- Jaldoot water trains were sent to drought-hit areas of Maharashtra.
- New Water policy launched for the restoration of water bodies, establishing water recycling plants, rainwater harvesting, efficient water usage, automatic coach washing plants, etc.

As a Parliamentarian from the Konkan region - Executed several works on important projects like drinking water, bridges, and electricity under the MPLAD scheme and associated with Parliamentary Forum on Water Conservation and Management, and served as a thought leader at World Water Forum.

As a current Prime Minister's Sherpa to G7 and G20, I am shaping the official agenda of the Government of India on key issues for the G7 & G20 Summit and have a special focus on SDG 6: Clean water and sanitation.

The government is already working on many initiatives to solve the water crisis but several issues need consideration by various stakeholders to ease the implementation of various schemes of the Central and State government.

To tackle these issues, on the occasion of the 72nd Republic Day of India we have launched a nationwide movement (campaign) named 'Nisarg Rakshak' on Environmental conservation and Water Rejuvenation. This whole movement was conceptualised considering my experiences in the water sector along with inputs from various stakeholders. This movement will be driven by people and it will be a people's movement.

We aim to train around 1 million *Nisarga Rakshaks*- One volunteer for every village in the country. These volunteers will be trained by 50,000 *Nisarga Shikshaks* (teachers) across the country and they will carry out various activities towards Environmental conservation and Water Rejuvenation at the local level. The training component for teachers would include online learning modules in local languages of respective regions designed by Rishihood University through its panel of experts and e-Certification will also be provided by facilitating organisations.

Further, we are creating a forum named 'Nature Protector Forum' at the National and state level to monitor this project implementation. For the National level forum, one member from each state from a prominent organisation will be invited to be on board. For the state-level forum, one member from each district from a prominent organisation will be invited to be on board. The project will be implemented through four divisions: State → District → Taluka → Village.

The main component of the project would be to use Data Analytics to increase the effectiveness of the project and low-cost methods using local means to work on initiatives on Environmental conservation and Water Rejuvenation. Local stories of change like Chipko Andolan to save trees and themes on local culture will be used to strategise new initiatives for conserving water resources and protecting the environment.

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'Nature Protector App' has been designed to help any conscious citizen to participate in the nature conservation campaign. Participating environmentalists will be able to combine time-tested experience and consistent entrepreneurship. The app will continue to be an open platform for any citizen interested to participate in the campaign. Appropriate and useful information will be conveyed to the participants through this app. Besides, experiences in this field can be shared. Channel of communication would be divided into three verticals which would help in creating and sustaining this network: Organisational → Outreach → Content (Social media and Data Analytics). This would be the first of its kind of project on Environmental conservation and Water Rejuvenation in India on a national scale.

Also, through Rishihood University we are planning to launch a one-year fellowship program for young professionals in the water sector in collaboration with the NITI Aayog and Ministry of Jal Shakti. The role of fellows is to work with respective governments of state and union territories to understand the local issues, administrative structure and gain insights into water governance. Using this insight, they shall develop entrepreneurial/ intrapreneurial solutions on water issues and also help the government in implementing/scaling-up best practices.

It is high time for us to realise water's true, multidimensional value if we are to survive the future and build a sustainable world. Under Hon'ble PM's leadership, India has overcome many challenges in all the sectors over the past 7 years and I am confident that much is being done towards ensuring water security and strengthening water sector governance. ❑

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Water Future in a Climate-risked World: The Indian Experience

Sunita Narain

The Indian experience has been invaluable in teaching, not just us, but the world how water management can be reinvented so that it is affordable and so sustainable; it puts water in the hands of communities and focused on decentralised recharge and reuse. Making water everybody's business is the only way ahead.

There are two incontrovertible facts: one that water is a key determinant for health security and economic growth. And two, water wars are not inevitable but will happen only if we do not manage our resources prudently. In this age of Covid-19, we have understood just how critical the issue of clean water is. Our defense against the pandemic is that we wash hands frequently. This is why in the Union Budget 2021, the Government has included water in the health component of the country's accounts. This is a game-changer, in my view, as it recognises the role of clean water as a critical preventive health measure.

I would also argue that while water scarcity is indeed growing, it is not inevitable that cities will run out of water or that we will not have any water to drink. I say this because water is a replenishable resource—it snows and rains each year. More importantly, other than in the case of agriculture, we do not consume water. We use and discharge. Therefore, it can be treated and then re-used and recycled. So, this is one future we can change.

This means getting the policy and practice of water management right. The good news is water literacy has grown. Over the past few decades, the country has learned critical lessons on water management and evolved a new paradigm. Till the late 1980s, water management was largely confined to the issue of irrigation projects – the building of dams and canals to store and supply water

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long distances. But then came the big droughts of the late 1980s and it became clear that it was not enough to plan for augmenting water only through large projects. This was also when the Centre for Science and Environment (CSE) published its report, *Dying Wisdom*, which documented traditional technologies for rainwater harvesting in ecological diverse regions of India. The slogan was "Rain is decentralised, so is the demand for water". So, capture rain where and when it falls.

There was a paradigm shift in policy. In the droughts of the late 1980s, state governments launched massive programmes to capture rainwater by building ponds, digging tanks, and building check-dams on streams. By the mid-2000, these efforts coalesced into the Mahatma Gandhi Rural Employment Guarantee Act (MGREGA) – investing labour into building rural water assets. By this time, it was also understood that groundwater – considered a "minor" resource was the "major" supplier of water for both drinking water and irrigation in the country. It was also understood that over 50 per cent of agriculture was still rainfed and so water conservation and decentralised rainwater harvesting – ensuring that every well and every waterbody was recharged — was critical for productivity and wellbeing.

In the decade of 2010, the crisis of urban drought hit homes. But again, policy evolved as it learned that augmenting water supply was only one part of the challenge – cities were increasingly dependent on long-distance sources; pumping and piping this water meant both losses in distribution, as well as costs of electricity, and this, in turn, made the available water expensive and more inequitable. As water supply dried up, people turned to groundwater and without recharge – ponds and tanks had been decimated up by real estate or supply through neglect – meant declining water levels.

More importantly, water supply was linked to pollution – the more the water supplied the more is wastewater generation. This, without adequate treatment, leads to pollution of rivers and water bodies, which in turn destroys available water and increases the cost of cleaning up drinking water.

A few years later, research revealed that the bulk of urban residents are not

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even connected to the underground sewerage network, which is capital and resource-intensive. Instead, they depend on on-site sewage 'disposal' systems, where household toilets are connected to septic tanks or just holding tanks or even to open drains in the vicinity. But the sewage treatment infrastructure was not designed to fit the city sanitation system and so remained underutilised. Rivers remained polluted.

In all this, new solutions emerged – if the affordable water supply was critical, then cities needed to cut the length of their distribution pipelines, which meant an increased focus on local water systems like ponds, tanks, and rainwater harvesting. Then, if cities needed to ensure affordable sanitation for all and affordable treatment of wastewater, on-site systems could be re-engineered so that waste was collected from each household, transported, and treated. There was no need to build long-distance pipelines for the supply of water or even longer dilution pipelines for taking back the wastewater for treatment. But most importantly, we have learned that if this urban-industrial wastewater is treated for reuse then water is not lost. More importantly, our rivers will not be lost. This is where implementation is now focused.

The Indian experience has been invaluable in teaching not just us, but the world how water management can be reinvented so that it is affordable and so sustainable; it puts water in the hands of communities and focused on decentralised recharge and reuse. Making water everybody's business is the only way ahead.

This is because the key challenge is to ensure sustainability of the water supply systems. The Government of India's ambitious and much-needed *Har Ghar Jal* mission has recognised this fundamental flaw in water infrastructure projects and has stressed that its objective is sustainability so that water continues to flow in pipes and taps. This requires focusing on improving the durability of the water asset that is created – it means ensuring that the pond or lake or tank is not encroached and that the watershed – so critical for the drainage to be secured – is not destroyed.

The problem lies in the fact that land and water bureaucracies are fractured – somebody owns the pond, another agency the drain, and yet another, the catchment. Water security requires this to change. This means giving much greater control over the water structures to the local community – deepening democracy and devolution of powers – is then the answer to water management.

In all this we must maximise our use of water – become much more efficient with every drop. This means doing everything from investing in water-efficient irrigation, household appliances, and changing diets so that the crops we eat are water prudent.

This is the opportunity – this decade we can put all we have learned into practice and turn around the water-story of India. It is possible. We just have to make it our single-biggest obsession. Water, remember, is about livelihood. It is about food and nutrition. It is about our future.

This is even more important in today's climate-risked world. In this decade that we will see the revenge of nature as climate change impacts grow. We need them to scale up our work to invest in water systems and to make them durable, not just to withstand another rain, but another deluge. We need to speed up our work because climate change will make sure that we have more rain but on fewer rainy days. This means doing much more to capture the rain, when and where it falls so that groundwater is recharged.

Our water future is about our water wisdom and in this we must recognise that water and culture go together. Water shortage is not about the mere failure of rain. It is about the failure of society to live and share its water endowment. So, we can be water-secure, because we are water-wise. ❑

Ushering a Social Revolution

Ratan Lal Kataria

Providing water to every household is an inescapable duty of any Government. Water is the elixir of life and "is deemed to be a merit good that is something to which people have a right, regardless of ability to pay because it is essential for life." It is enshrined as a human right in resolution number 64/292 of the United Nations General Assembly, which calls upon Governments to ensure adequate and affordable quantities of safe water for domestic use.

I grew up in a small village in Haryana. Coming from a poor Dalit family, poverty and exclusion was the only flavour of life. My parent's daily schedule hinged around securing two-course meals for their family. My father worked as a shoemaker while my mother toiled hard as a wage labourer. I remember her ordeal, walking tirelessly up to the designated well, each day, just to fetch drinking water. Her resolve to secure drinking water for her children gave her the grit to brave all physical and social hardships she faced in this process.

This has been a common story for the majority of rural women numbering over 40.5 Crore (Census, 2011), considering the fact that until August 15, 2019, only 3.23 Crore rural households out of a total 19.18 Crore households had piped water connections. Mere data is not enough to assess the far-reaching implications that the non-availability of potable piped water has on people belonging to the weaker rural sections of society and especially women.

Women and girls in India spend a considerable time (up to 352 minutes/day) performing domestic chores. This is 577% more than their male counterparts (52 minutes) and 40% more than women in South Africa and China (OECD data). Collecting drinking water for their families

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constitutes a major part of it. This poses a major barrier to the enrollment of girls in schools, especially those belonging to poor households. The magnitude of the problem can be imagined as over 11 Crore rural women are pegged to be below the poverty line in India (Planning Commission estimates, 2004-05).

Variability in water supply due to heavy dependence on monsoon rains and groundwater adds up to their vagaries. It exacerbates gender inequality. In India, about 70% of the rainfall is received during the monsoon season and its intensity varies each year, from one region to another. As a result, 42% of the Indian landmass is rendered drought-prone (Drought Early Warning systems report: March 2019). It is well known that extreme weather events like droughts have a devastating impact on weaker sections of society as they lose out on livestock and crop yield. Food prices shoot up and it has a crippling effect on their health and nutrition, ultimately affecting human capital. Women and girl child, in particular, bear the brunt and are most adversely affected. It leads to their stunted growth, which further translates through generations. As per a study, it was observed that women who have experienced a large number of dry shocks (below-average rainfall) during infancy are 29% more likely to have their child suffer through some anthropometric failure - that is, being significantly below average size in terms of height for age, or weight for age, or weight for height (World Bank report: Uncharted Waters). This reflects the urgency to provide potable water to every household to secure our human capital and to prevent stunting of our future generations.

The entire Mission follows a bottom-up approach. It requires the formation of Village Water & SanitationCommittees/ Pani Samiti's that will prepare a 5-year Village Action Plan consisting of drinking water source strengthening, water supply, greywater management, and operation & maintenance so that people in the villages get assured tap water supply on regular basis uninterruptedly.

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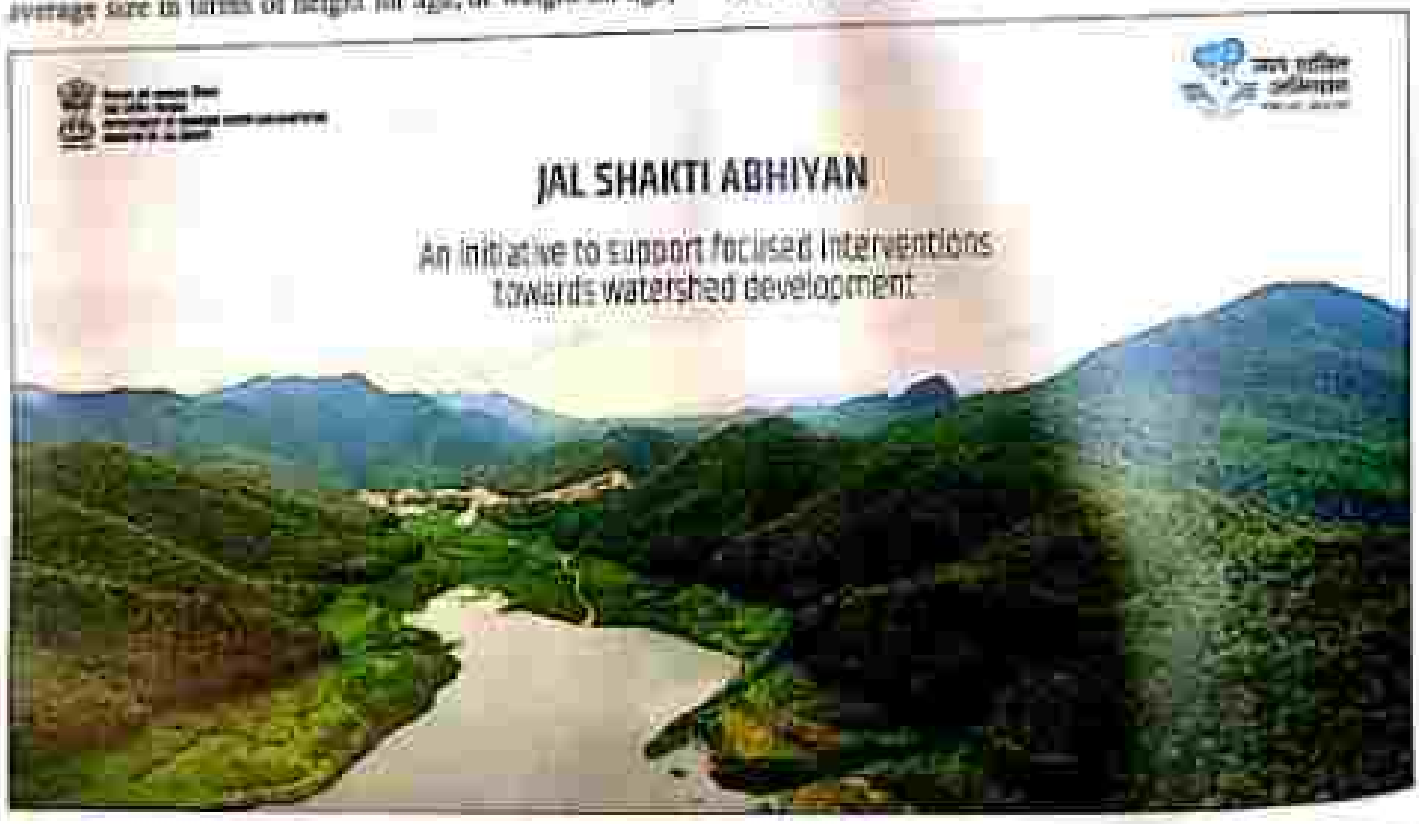
Accordingly, in the year 2019, Prime Minister Shri Narendra Modi announced the Government's resolve to provide tap water connections to every rural household under the flagship program "Jal Jeevan Mission". The newly created Jal Shakti Mantralaya is implementing the centrally sponsored scheme in partnership with States to provide "Nal Se Jal" and to secure the "Har Ghar Jal" target by 2024.

In fact, in a short span of one year, 3.77 Crore households have been provided piped-water connections. Goa and Telangana have emerged as the first and second States respectively, to achieve 100% coverage under Jal Jeevan Mission and as of date, 52 Districts, 669 Blocks, 42,000 Gram Panchayats, and 62,000 villages have achieved the target of "Har Ghar Jal".



However, there is something more significant that is happening as an implication of this Mission.

A tap water connection is being provided to one and all irrespective of caste, community, religion, race, etc. with an approach i.e. "No one is left behind". Priority has been given to villages with a majority SC/ST population to secure 35 lpcd. This secular and inclusive approach is primarily benefiting the people from weaker and marginalised sections of society and is proving to be a Social Revolution.

The Mission mandates the provisioning of water supply infrastructure at an unprecedented scale. It requires skilled manpower like plumbers, masons, electricians, fitters, pump operators, etc. which will be met by skilling people from respective villages, therefore, opening vistas for skilled employment in-situ and create entrepreneurial opportunities in villages.

The entire Mission follows a bottom-up approach. It requires the formation of Village Water & Sanitation Committees/Pani Samitis that will prepare a 5-year Village Action Plan consisting of drinking water source strengthening, water supply, greywater management, and operation & maintenance so that people in the villages get assured tap water supply on regular basis uninterruptedly. Interestingly, these committees are mandated to have 50% women members, since women are the most affected stakeholders and their participation is seen as a crucial input for its effective implementation. Moreover, it is a fact that Panchayats with greater women membership have performed better in projects like drinking water supply, sanitation, etc. [UN Report]. Further, a suitable representation of the weaker section of the society is there in the Pani Samiti. Thus, this mission seeks to provide a platform for their participation as well as empowerment.

Lastly, Information Technology has been leveraged to collate and display real-time nationwide water data on a portal www.ejalshakti.gov.in. A Rashtriya Jal Jeevan Kosh (RJJK) is set up for accepting contributions from corporates, organizations, and individuals, who have moved from villages but still nurture love for their native place. Soon, they will be able to donate, at the click of the mouse, for specific water supply-related works by interacting with the members of Pani Samiti through this portal.

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Hence, Jal Jeevan Mission is not merely a scheme whose outcome is limited to the aggregate of tap water connections provided. It aims to mitigate the economic, social, and physical hardships that the weaker most sections of our society have to endure in absence of a supply of regular, reliable, and safe drinking water at their doorsteps. It is ushering a social revolution marked by people's participation, empowerment, convergence, inclusion, and equity. ❑

Water Governance

Pankaj Kumar

Multiple issues in water governance require action on several fronts. Given their complexity, a multi-disciplinary approach is needed to address them effectively. Above all, it is important to keep awareness of water issues and mobilisation of the community at the centre of our strategies for sustainable use of this precious resource.

Water is fundamental to life. It is a limited natural resource. While India has more than 18% of the world's population, it has only 4% of the world's renewable water resources. The average annual precipitation of 3,880 billion cubic meters (BCM) in India is highly variable, both in time and space. More than 90% of precipitation takes place in about 15 days and less than 100 hours altogether in a year. After evaporation, we are left with about 2,000 BCM of water. We cannot utilise this quantity in full, owing to geological and other factors. The utilisable water resources are about 1,122 BCM (690 BCM, or 61%, surface water and 432 BCM, or 39%, groundwater). The water resources utilised are about 700 BCM (450 BCM of surface water and 250 BCM of groundwater). It is estimated that the annual requirement would be about 843 BCM in 2025 and 1,180 BCM in 2050.

About 78% of water utilised goes for agriculture; 8% goes towards domestic use; 6% is used for industry, and the remaining 8% goes towards other uses.

With increasing population, India's per capita water availability is declining – it reduced from 1,816 cubic meters in 2001 to 1,545 cubic meters in 2011. We are already in a water-stressed situation defined by per capita availability of less than 1,700 cubic meters. The per capita availability is projected to further reduce to 1,340 cubic meters by 2025 and 1,140 cubic meters by 2050.

The finite water resources of the country are under pressure due to increasing population, urbanisation, industrialisation, water pollution, and inefficient use. Climate change poses an additional challenge.

Water Governance Issues

Given the above context, many issues for water governance arise. The first issue is making an adequate quantity of drinking water available to the people. The second issue is improving the low water-use efficiency in irrigation and industry – a drop of water saved is a drop added to the ecosystem. The third issue is tackling pollution of water bodies,

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especially our rivers. The fourth issue is reusing and recycling water.

The Approach

The management of water resources has seen a paradigm shift in India in recent years even as water governance has been placed at the forefront of the country's development agenda. In May 2019, a much-needed policy reform was undertaken at the highest level with the creation of the Jal Shakti Ministry to give impetus to integrated management of water resources in India with a special focus on the demand side and supply-side management. The main aim was to bring all aspects of water under a single umbrella in line with India's National Water Policy and shift from a compartmentalised approach to a comprehensive approach.

The Jal Shakti Abhiyan (JSA), first launched in 2019, is a water conservation campaign, under which officers, groundwater experts, and scientists from the Government of India work together with State and district officials in India's most water-stressed districts for the targeted interventions - water conservation and rainwater harvesting, renovation of traditional and other water bodies/ tanks, reuse and recharge structures, watershed development, and intensive afforestation. Community awareness and mobilisation are at the core of the campaign.

Piped Water Delivery to Households

The Jal Jeevan Mission launched in 2019 aims to provide 55 litres of water per person per day to every rural household in the country by 2024, with a massive outlay of Rs. 3.60 lakh Crore. The maximum impact of water scarcity is faced by women who have to spend considerable energy and time to carry water from the source to their homes. With piped water supply delivering water to the households, Jal Jeevan Mission aims to end their drudgery. Similarly, the announcement of Jal Jeevan Mission (Urban) in the Union Budget in 2021, with an outlay of Rs. 2.87 lakh Crore would provide piped water to these 2.68 Crore urban households which do not have it.

The activities under the National Water Mission, which aims to optimise water use efficiency by 20%, look to conserve water, minimise wastage and ensure more equitable distribution both across and within states with a special focus on recycling of wastewater. The mission has been able to nudge various stakeholders to see water as a limited resource through campaigns like 'Catch the Rain', 'Sahi Fasal' etc.

Improving Water Use Efficiency

The 'Per Drop More Crop' component of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) promotes water use efficiency through drip and sprinkler irrigation. To provide impetus to micro-irrigation in the country, a Micro Irrigation Fund with a corpus of Rs. 5,000 Crore was created with NABARD during 2018-19, for the 'Per Crop More Drop' component. In the Union Budget for the financial year 2021-22, an announcement has been made to double the initial corpus of the Micro Irrigation Fund of Rs. 5,000 Crore, created under NABARD, by augmenting it by another Rs. 5,000 Crore.

The activities under National Water Mission (NWM) aim to optimise water use efficiency by 20% looks to conserve water and minimize wastage. 'Sahi Fasal' campaign of NWM is an initiative to nudge stakeholders in agriculture towards crops that use less water but more efficiently. There is considerable potential for saving water through improving water use efficiency in irrigation and industry.

Water Pollution

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, an area of over 13 lakh sq km has been mapped out of a total of 24.6 lakh sq km.

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Jal Jeevan Mission – Har Ghar Jal

Improving Ease-of-living with Clean Tap Water to Every Home

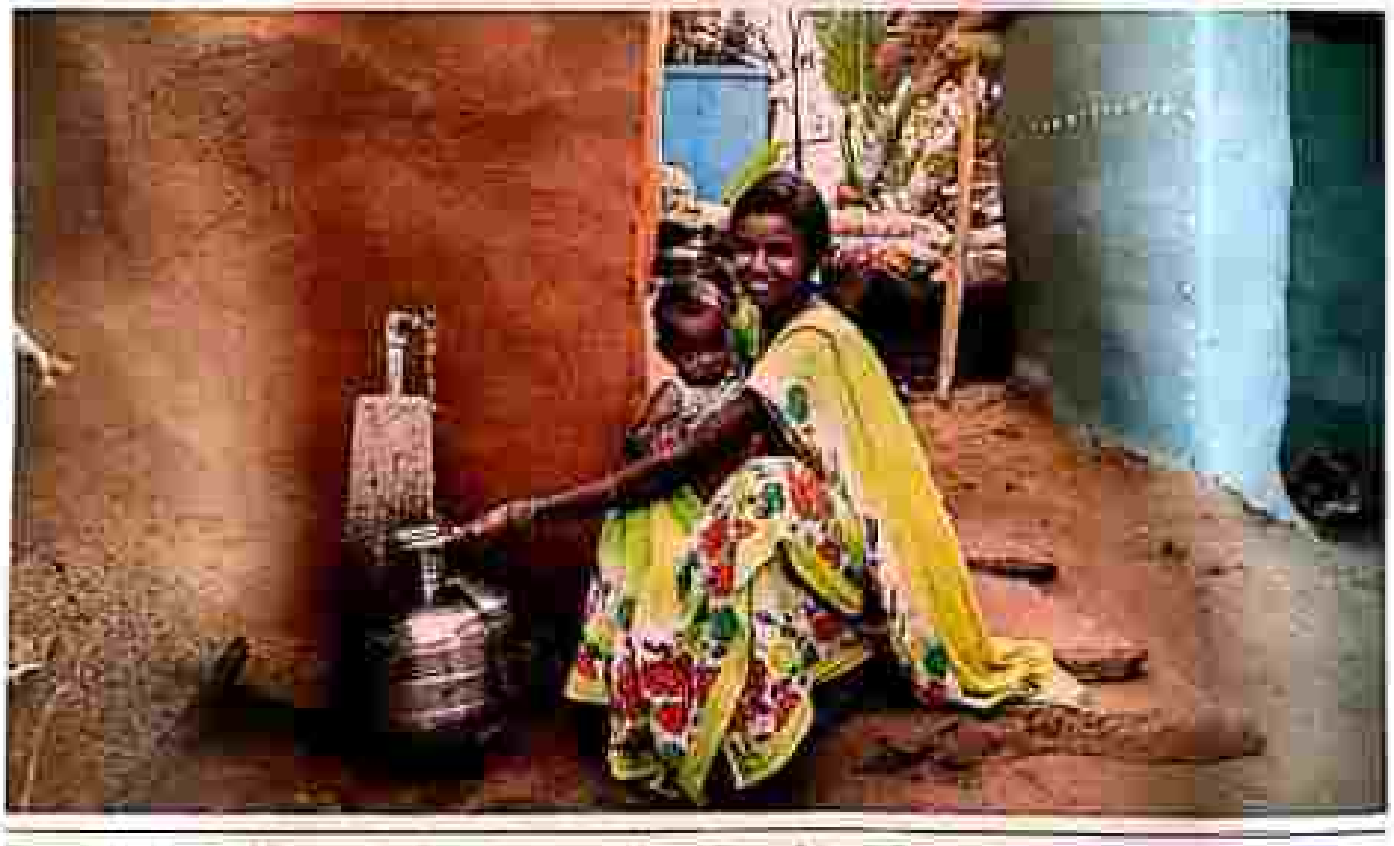
Bharat Lal
Manoj Kumar Sahoo

JJM focuses on 'equity and inclusion' with the vision that 'every rural household has tap water supply in an adequate quantity of prescribed quality on regular and long-term basis leading to improvement in living standards of rural communities.'

To improve the quality of life and enhance the "ease of living" of people of the country, Jal Jeevan Mission (JJM) was announced by the Prime Minister on August 15, 2019 to provide Functional Household Tap Connection (FHTC) to every rural home by 2024. The outlay of JJM is Rs. 3.60 lakh Crore, out of which Union Government's share is Rs. 2.08 lakh Crore and State's share is Rs. 1.52 lakh Crore.

At the time of the announcement, out of about 18.93 Crore families living in rural areas, about 3.23 Crore (17%) rural families had tap water connections in their homes. Thus, 15.70 Crore families were fetching water from a drinking water source outside their homes.

Swachh Bharat Mission was launched in 2014 to make India an open defecation-free country. As a result, 11 Crore toilets were constructed in rural areas, and on



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October 2, 2019 as a tribute to Mahatma Gandhi on his 150th birth anniversary, the country declared itself open defecation free. Jal Jeevan Mission aims to reach all rural households by 2024, which is six years well ahead of the Sustainable Development Goal-6 target and could become a model for other developing countries to adopt such practices and achieve their SDG-6 goal.

The mission is to give a boost to the manufacturing industry, creating job opportunities, and helping the rural economy. Assured tap water supply in rural homes reduces the drudgery of women and provides them with quality time to educate themselves, teach their children, learn a new skill, and explore better livelihood options.

Focus on 'Service Delivery'

Under the mission, the focus has shifted to the assured supply of potable water to every home rather than merely infrastructure creation. Massive training and skilling programmes are being taken up to build the capacity of public health engineers and the local community including mason, plumbers, fitters, pump operators, etc. to ensure regular service delivery to every home. Public Health Engineering Department and Gram Panchayats and / or its sub-committees to play the role of a public utility.

Jal Jeevan Mission has identified key priority areas such as water quality-affected habitations, villages in desert and drought-prone areas, SC/ST majority, and Sansad Adarsh Gram Yojana villages. Under the mission, 112 Aspirational districts with low human development indices and 61 JE-AES affected districts have been given top priority for providing piped water supply to every home.

Consumption of contaminated water leads to water-borne diseases. Groundwater is a major source of drinking water and in some parts of the country, there are geogenic contaminants like Arsenic, Fluoride, Iron, salinity, nitrate, heavy metals, etc.

Under JJM, all villages with water quality issues, have been prioritised for potable tap water supply. In case, the building of surface water-based systems takes time, purely as an interim measure, provisions have been made to install community water purification plants to provide safe water at the rate of 8 – 10 litres per capita per day, to every household.

Drinking water quality testing laboratories in various States/ UTs have been opened to the general public so that they can get their water samples tested at nominal charges and ascertain the quality of drinking water.

It will help improve public health and reduce water-borne diseases benefiting the entire rural population, especially vulnerable groups like pregnant women and children. Also, at least five persons in every village, preferably women, are trained as our Field Testing Kits (FTKs) for testing water quality at the village level.

Special Focus on Children

Children are most susceptible to water-borne diseases and they spend a considerable amount of time in their educational spaces such as schools, Anganwadi centres, and Ashramshalas (tribal residential schools). Therefore, making provision of potable tap water in these institutions has been taken up in a campaign mode. Thus, on October 2, 2020, a 100-day-campaign was launched to ensure potable tap water supply in adequate quantity for drinking and cooking mid-day meals, handwashing, and use in toilets to all schools, Anganwadi centres, and Ashramshalas. So far, States like Andhra Pradesh, Goa, Haryana, Himachal Pradesh, Tamil Nadu, and Telangana have provided tap water supply to 100% of schools and Anganwadi centres. In the country, more than 5.4 lakh schools and 4.86 lakh Anganwadi centres have started getting potable piped water supply.

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Making Water Everyone's Business

JJM adopts an end-to-end approach, where the focus is on source sustainability, water supply, greywater treatment & its re-use, and operation & maintenance. Every village to prepare a Village Action Plan (VAP) co-terminus with 15th Finance Commission period, capturing these details and to be achieved by dovetailing all available sources at village level such as MGNREGS, JJM, SBM(G), 15th Finance Commission grants to PRIs, District Mineral Development Fund, CSR funds, community contribution,

BEFORE

AFTER

etc. to achieve long-term water security. This holistic approach will help in achieving water security by judicious utilisation of resources.

The motto of Jal Jeevan Mission is 'Building Partnerships, Changing Lives'. To handhold and train VWSCs in planning, mobilising, and engaging communities, disseminating information and encouraging women participation, NGOs/ CBOs/ SHGs/ VOs, etc. are being engaged as Implementation Support Agencies (ISAs). Jal Shakti Abhiyan (JSA) to make water everyone's business, was launched in 2019 in water-stressed areas by dovetailing efforts and resources to achieve water security.

Further, Atal Bhujal Yojana has been started in 78 water-stressed districts of 7 States, to conserve water by involving the village community and Gram Panchayats.

Trusts, foundations, NGOs, etc. are empanelled as 'Sector Partners' as JJM aims to harness the huge potential of people by reaching out to organisations working in the drinking water sector, who are willing to work to mobilising and enhancing the capacity of communities to achieve the goal of the mission in a time-bound manner.

Jal Jeevan Mission focuses on the involvement of women at every step since they are the primary stakeholder in the drinking water sector. The Gram Sabha forms a VWSC/ Pani Samiti with 50% women and 25% from weaker sections of society, proportionate to their population.

Strategy for Implementation

To ensure tap water supply in every home, the following strategy is adopted:

i. In villages where piped water supply systems exist, they are being assessed and if required, augmentation and retrofitting work including water source strengthening are taken up, to make them functional for the next 30 years and all households are given tap water connection.

ii. In villages with sufficient groundwater of prescribed quality, a single-village piped-water scheme based on the local water source is

be built, and every household is given tap-water connection.

iii. Villages having sufficient groundwater, but with some geo-genic contaminants, single-village water-supply schemes, with treatment plant, are to be built.

iv. In water-deficient, drought-prone and desert areas without a dependable source of water and in severe quality-affected areas, bulk water transfer and distribution network along with treatment plants, known as regional water supply schemes or group schemes are planned for assured piped water supply to every house.

v. In tribal/ hilly/ forested areas, gravity or solar power-based water supply schemes are planned, which are easy to operate and maintain as recurring operation and maintenance expenses are comparatively low.

vi. In hills and mountains, springs are explored as a reliable drinking water source. In hot and cold deserts, innovative technological solutions are encouraged.

Technological interventions

Jal Jeevan Mission leverages the use of technology to ensure transparency, accountability, proper utilisation of funds, and service delivery. A robust JJM-IMIS captures physical and financial progress under JJM with a dedicated "**Dashboard**" is in the public domain. A "**MobileApp**" is for the use of all stakeholders to bring in ease of working". A sensor-based IoT solution is piloted for **measurement** and **monitoring** water supply with respect to quantity, quality, and regularity in villages on a real-time basis. Every water supply asset created is **geo-tagged**. Hydro-geomorphological (HGM) maps are used in the planning of single-village schemes in identifying drinking water sources as well as building aquifer recharge structures. Household tap connections provided are linked with **Aadhaar number** of the 'head of household' and more importantly, all financial transactions are undertaken through **Public Finance Management System (PFMS)**.

Progress

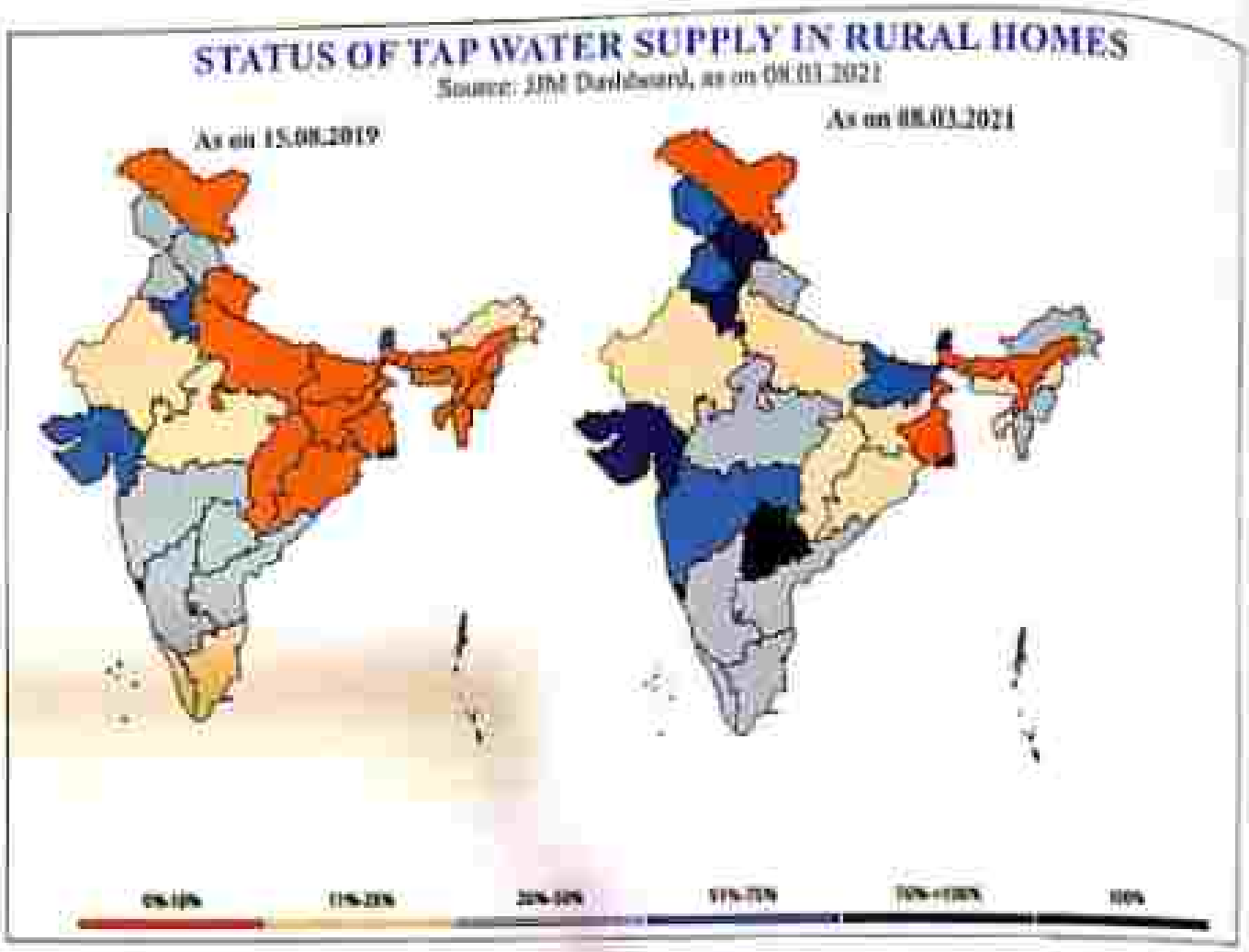
Since the announcement of Jal Jeevan Mission so far, 3.23 Crore households have been provided with tap water connections, thus increasing the tap water supply from 3.23 Crore (17%) to 7 Crore (37%) rural households in the country. Presently, Goa and Telangana States have become

Role of Village Water & Sanitation Committee (VWSC)

- Function as local water utilities
- Play lead role in planning, implementation, management and operation & maintenance of in-village water supply system
- Mobilise and motivate community to contribute 5% or 10% of in-village capital expenditure in cash and/ or kind and/ or labour
- Ensure periodic water quality testing using the FTKs
- Decide and collect water user charges

What is Village Water & Sanitation Committee (VWSC)

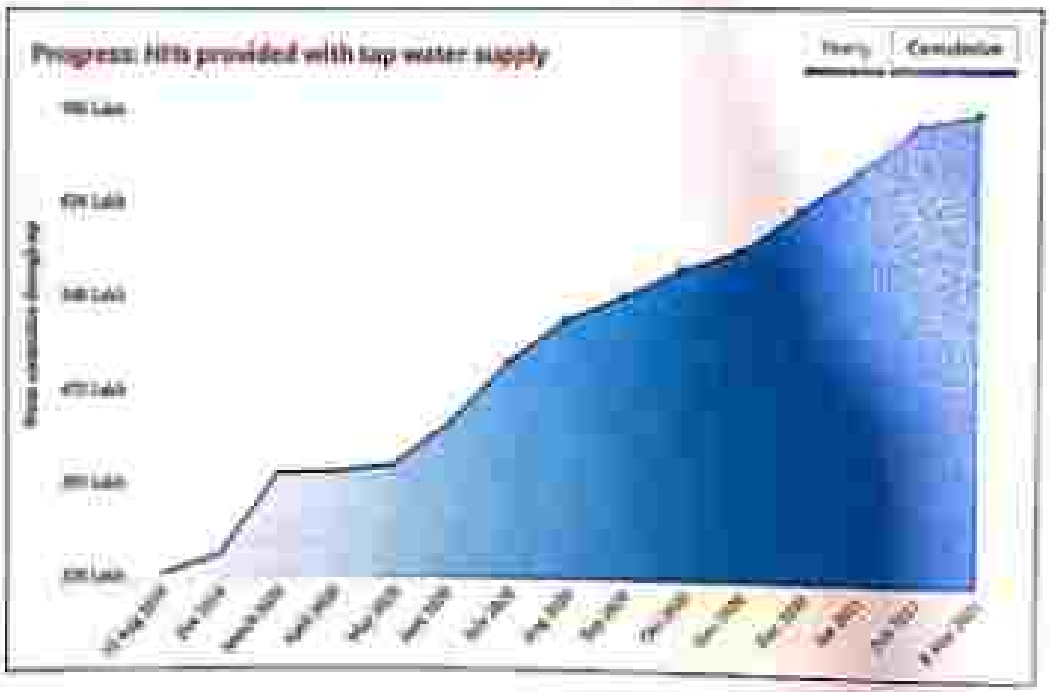
- Sub-committee of Gram Panchayat
- May also be called as Pani Samiti
- Consist of 10-15 members comprising
  - up to 25% elected members of GP
  - 25% representation from weaker sections (SC/ ST) of the village
  - at least 50% women
- Headed by Sarpanch/ up-sarpanch/ traditional village head, etc. as the Gram Sabha may decide
- Panchayat secretary/ Revenue/ Field Asst etc as Secretary of the Committee



'Har Ghar Jal' States and every household in 52 districts and 82 thousand villages of the country have tap water supply. This is the 'speed and scale' of the mission works, which is generating healthy competition among States to ensure 'Har Ghar Jal' and many States have advanced their targets of 100% tap water supply to every home much before 2024.

Conclusion

To achieve the goals of Jal Jeevan Mission, community to be trained and empowered to plan, implement, manage, operate & maintain their in-village water supply system. There is a paradigm shift from the 'department-based and construction-based' approach to 'service delivery' approach with the focus being empowered communities managing water supply in their villages. Gram Panchayats and/ or VWSCs/ Pani Samitis are to function as local water utilities with skills to ensure assured tap water supply in adequate quantity of prescribed quality on a regular and long-term basis to every home. Thus, Jal Prabuddh Gaon (water enlightened villages) will lead the path to make the Azad Nal-Jal Bharat (Safe, Reliant India).



Framework for River Rejuvenation

Rajiv Ranjan Mishra

National River Ganga is revered, cultural and spiritual mainstay, and its basin sustains about 45% of our population. The largest and most important basin is rich in agriculture, biodiversity, and a lifeline for millions. Urbanisation, industrialisation, and large abstraction of water for agriculture and other uses have led to challenges to its quality of water and level of flow. We need to rejuvenate Ganga, its ecosystem for our good, and several attempts were made for it. Namami Gange is the most comprehensive one which is showing results and laying down the foundation for river rejuvenation in the country.

Namami Gange was launched in 2014-15 for the rejuvenation of Ganga and its tributaries with assured funding of Rs 20,000 crores. National Mission for Clean Ganga (NMCG) is the implementing agency. Backed by Ganga River Basin Management Plan by a consortium of 7 IITs, it has a holistic multi-sectoral, multi-agency and multi-level approach in four broad categories- Pollution Abatement (Nirmal Ganga); Improving flow and ecology (Aviral Ganga); Strengthening People-River connect (Jan Ganga) and Research, knowledge management (Gyan Ganga). Unlike previous efforts, it is not limited to cleaning or piecemeal selected city interventions but follows river centric, basin-based approach for comprehensive rejuvenation.

Improving Governance and Empowering Institutions

In a major policy decision, the government notified NMCG as an authority under EP Act, 1986 and created empowered institutions, and laid down fundamental principles with a comprehensive framework for rejuvenation of rivers in the Ganga Basin. This approach is now considered a model for application for rejuvenation of other rivers in the country. It integrates rivers, tributaries, wetlands, flood plains, springs, and small rivers as a single system. An integrated administrative structure from the National to district level facilitates shared vision, convergence, effective implementation, and involvement of people.

A total of 335 projects have been sanctioned under Namami Gange at Rs. 29,578 crores. Out of these, 142 projects have been completed and the remaining are under

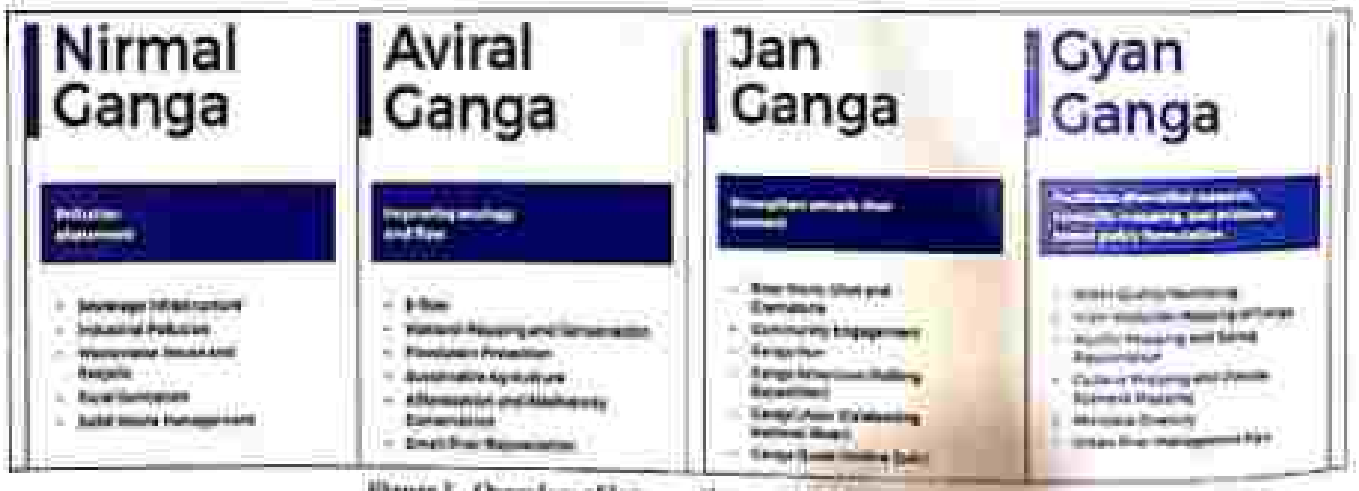


Figure 1 - Overview of Interventions under Namami Gange

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Figure II Integrated Institutional Framework

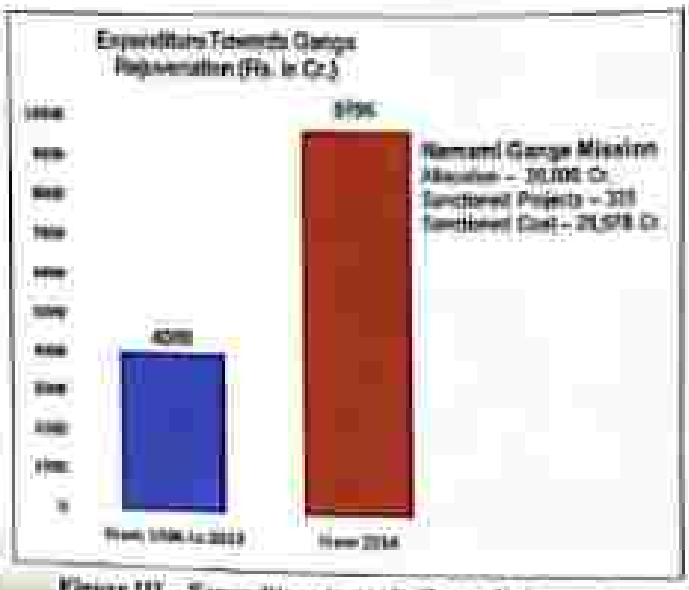


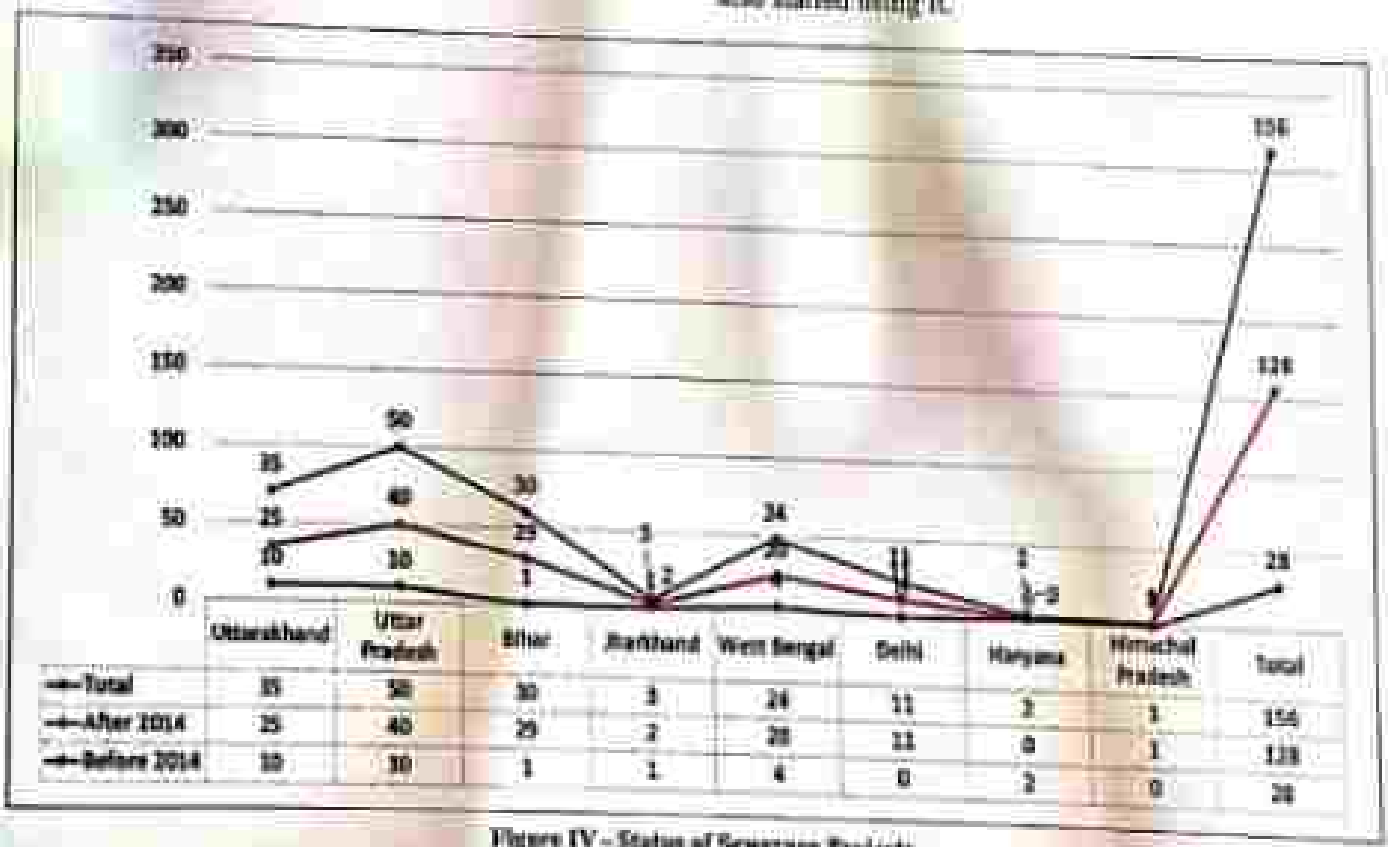
Figure III – Expenditure towards Ganga Rejuvenation

execution. The pace of execution has increased manifold reflected in the total expenditure of Rs 9,709.92 crores from 2014 till Feb 2021. This is more than double as compared to that from 1985-86 to 2014 (Figure III).

Pollution Abatement (Nirmal Ganga)

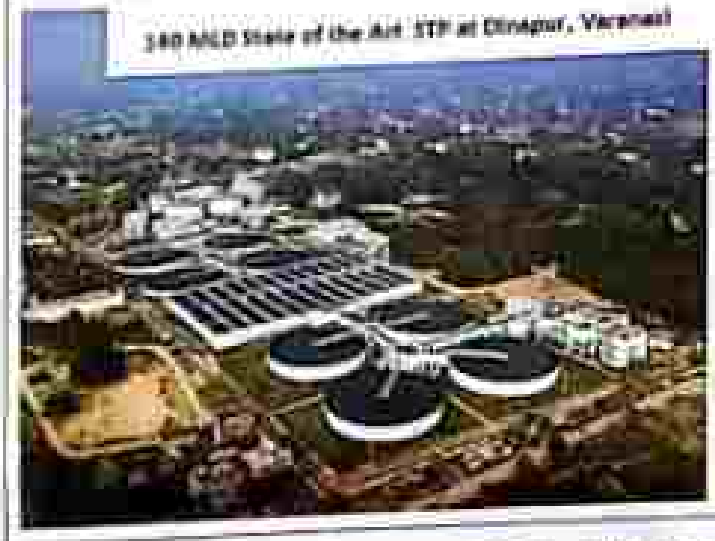
A total of 156 sewerage infrastructure projects has been sanctioned to create 4856 MLD treatment capacity in the Ganga basin. In 2014, only 28 projects existed for only 862.83 MLD, the Figure IV indicates the scaling up of efforts to bridge the past gap between sewage generation and treatment capacity and create adequate capacity for 15 years.

Namami Ganga introduced PPP for sewerage infrastructure for the first time in India, through **Hybrid Annuity Mode (HAM)** with 40% of capex being paid during construction and 60% with interest by 15-year annuity with separate payment for operation & maintenance (O&M) bringing a paradigm shift from payment for construction to Performance Linked Payments. The **'One City One Operator'** approach merging rehabilitation of old and creation of new assets and O&M for all of them on HAM to improve governance was introduced. HAM is now accepted by NITI Aayog and states outside the Ganga basin have also started using it.

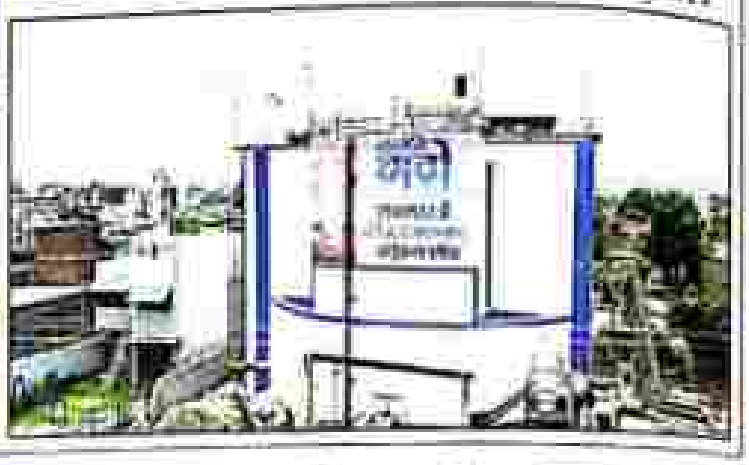


	Uttarakhand	Uttar Pradesh	Bihar	Jharkhand	West Bengal	Delhi	Haryana	Himachal Pradesh	Total
Total	35	50	30	3	34	11	3	1	156
After 2014	25	40	29	2	28	11	0	1	128
Before 2014	10	10	1	1	6	0	3	0	28

Figure IV – Status of Sewerage Projects



340 MLD State of the Art STP at Dinapur, Varanasi



7.5 MLD STP, Chandreshwar Nagar, First four storey STP

Projects have been taken up as per a comprehensive plan for all the 97 cities/towns along Ganga including rehabilitation, upgradation of old plants after condition assessment. Subsequently, projects for tributaries have also been started. Major drains falling into Ganga have been intercepted and diverted to STPs. All projects along Ganga have been completed in Uttarakhand and Jharkhand. Most of the projects in Kanpur, Prayagraj, and Varanasi, and other Ganga towns in UP have also been completed. The improvement in the quality of water is established through monitoring and visible to people. Kumbh is an example.

Annual inspection of grossly polluting industries by expert institutions, online monitoring, process improvement, Common Effluent Treatment Plant (CETP) helped in checking industrial pollution. Improving sanitation at ghats, stopping solid waste from entering the river, surface water cleaning, and improving process capacity in ULBs have helped 4500 Ganga Gram are ODF.

Improvement in Flow and Ecology (Aviral Ganga)

The historic Notification of Ecological flow for river Ganga in October 2018 is a big step for Aviral Ganga. Demarcation and protection of floodplains, protection &conservation of wetlands especially floodplain and urban wetlands, spring and small river rejuvenation projects are under implementation. **Sustainable Agriculture** is being promoted through organic farming, eco-agriculture, and medicinal plantation, and improving water use efficiency.

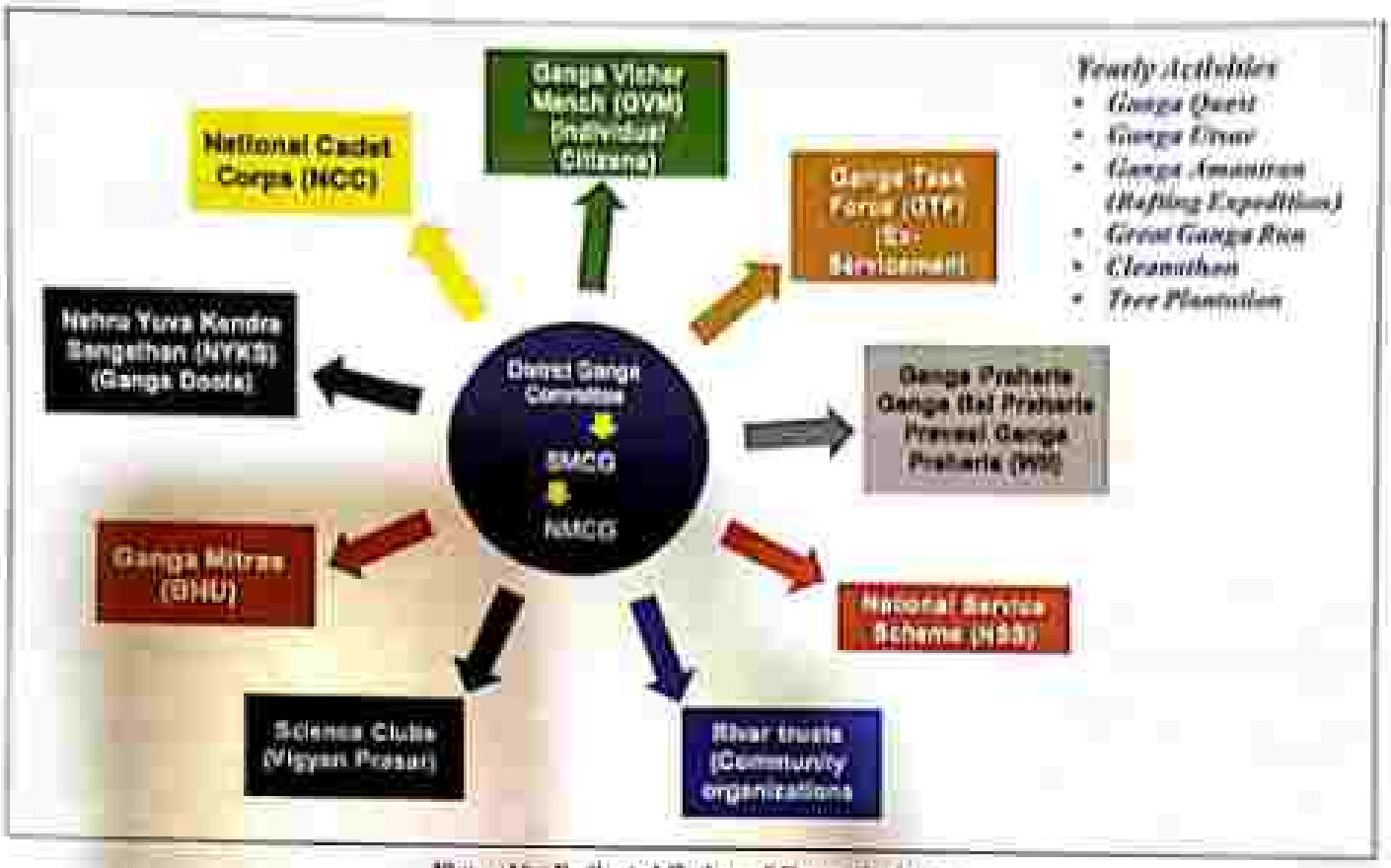


Figure V— Dedicated Cadres of Ganga Saviours

Demand-side management, Rainwater harvesting, aquifer mapping, and recharge are in progress.

Afforestation along Ganga as per the scientific plan by FRI is a model for similar work for 12 more rivers. A comprehensive programme for fisheries and *Biodiversity Conservation* include baseline survey, habitat and species improvement, and community involvement in the biodiversity hotspot of Ganga. Conservation of *Gangetic Dolphin*, the National Aquatic Animal is a top priority.

People River Connect (Jan Ganga)

Unlike previous efforts, Jan Bhagidari is central to this mission. Riverfronts have been improved and kept clean. More than 150 ghats and crematoria have been constructed, improved. Transformation of ghats from dirty to beautiful river banks is taking place with people's participation.

Dedicated Cadres of Ganga saviors are working to reach out to the community and create awareness. They are imparted skills, supported for improving their livelihood, by linking with the conservation of biodiversity and river.

Several innovative public outreach activities such as Ganga Quest quiz (www.gangaquest.com), rafting expedition, Ganga run, Ganga Utsav, etc are conducted throughout the year to catalyse and motivate community volunteers and people and helping in behavioral changes transforming the programme as a *Jan Andolan*.

Research, Policy& Knowledge Management (Gyan Ganga)

Centre for Ganga Management & study was set up at IIT Kanpur for long-term basin studies, technology development. Scientific mapping of different aspects -LIDAR mapping for high-resolution DEM & GIS-ready database, mapping of springs, microbial diversity, fisheries, biodiversity, hull survey for aquifers help in evidence-based decisions. The unique cultural mapping for natural, built and intangible heritage has potential for the development of tourism, heritage, and traditional livelihood opportunities. A new paradigm for planning for River Cities to mainstream river health in urban planning and a national framework for reuse of treated wastewater are being formulated. Namami Gange is now leading to the development of Arth Ganga model linking the economic development of the Ganga Basin with ecological improvement and Ganga Rejuvenation. ❑

Jan Bhagidari is central to this mission. Riverfronts have been improved and kept clean. More than 150 ghats and crematoria have been constructed, improved. Transformation of ghats from dirty to beautiful river banks is taking place with people's participation.

Groundwater Management: A Paradigm Shift

Debashree Mukherjee

तीव्रता से गहरे हो रहे जल-संकट से लड़ने के लिए, हमारे पास एकजुट होने के अलावा कोई विकल्प नहीं है।
- अटल बिहारी वाजपेयी

Groundwater—An Invisible Resource

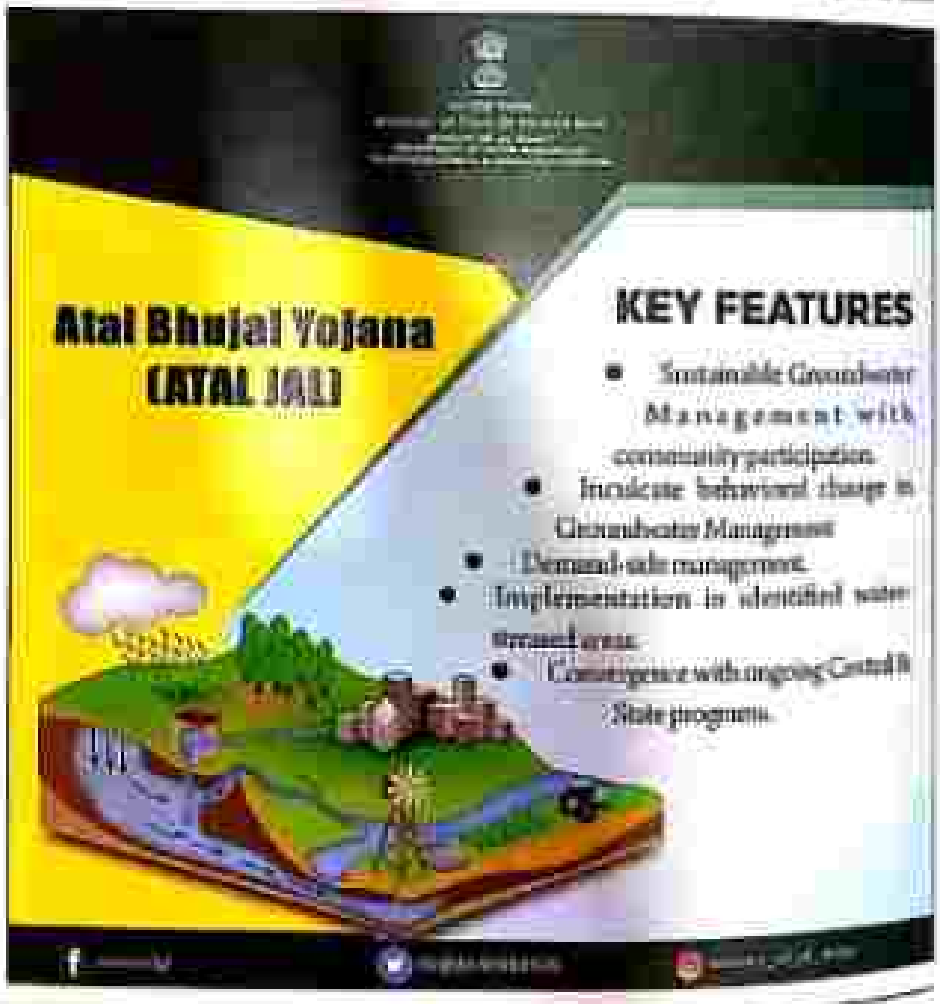
Groundwater is sometimes called an invisible resource. Everybody uses it. It is mostly free, available to those with access and the means to extract it. It sustains critical ecosystems, such as lakes, wetlands, and woods. It is, however, largely invisible and users have no knowledge about aquifers that yield the groundwater they use, and what constitutes sustainable and equitable usage of this common-pool resource.

The Indian context

India is the largest user of groundwater in the world, using more than a quarter of the available global resources. Groundwater has played an important role in ensuring the food security of the country. It was a major driver in ensuring the success of the 'Green Revolution' through millions of energised tube wells. This finite resource currently caters to more than 60 per cent of irrigated agriculture, 85% of rural drinking water supply, and more than 50% of urban water supply.

Increasing and unsustainable extraction of groundwater has resulted in significant depletion, with consequent adverse environmental impact. From the large-scale loss of livelihoods to health issues related to lack of availability of safe drinking water to people migrating, the impact of water scarcity is severe. This is compounded by climate change, which makes precipitation patterns erratic and therefore affects the predictability of groundwater recharge. Currently, groundwater resources in nearly one-third of the country are under different levels of stress. Small and marginal farmers, women, and weaker sections of the society, disproportionately bear the brunt of groundwater depletion and contamination.

According to a report published by the Central Water Commission in 2019, the utilisable water available in India is 1,122 billion cubic meters (BCM) per annum, and the



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availability varies over time and space. The total requirement of the country for different uses for a high demand scenario for the years 2025 and 2050 has been assessed as 843 BCM and 1,180 BCM respectively. This implies that, even if we store every drop of available water, we will still fall short in 2050, unless we manage demand.

Supply-side Interventions

Schemes implemented in the water sector in the past did help to improve groundwater conditions to some extent through improvement in availability but did not focus on reducing demand through more efficient use. These schemes also suffered from a top-down approach with little or no community participation. Also, most of these schemes were implemented in isolation, with little effort to leverage other ongoing schemes for optimal benefits. Lessons learned from success stories of community-led groundwater management, mostly in the non-government space, were not incorporated in the design of these schemes.

The Community Leads the Way

As groundwater resources in the country continued to be under increasing stress, the need for a shift in approach in the management of groundwater was felt. Success stories of initiatives taken up at Hivre Bazar, Ralegaon Siddhi, and elsewhere in the country provided inspiring examples of community-based groundwater management. In the Hivre Bazar village in Maharashtra, combined efforts of the Gram Sabha, local government, and Non-Government Organisations turned a drought-ridden village into a thriving community. The water table in the village rose from 70-80 feet to 20 to 25 feet, change in cropping pattern was brought about (from jowar, bajra to onion, potato, horticultural crops, etc.) and the standard of living improved considerably due to economic stability. It was observed, however, that such initiatives have been few and isolated and needed to be replicated at scale with an area based approach.

Atal Jal – Scaling-up Informed Demand Management

The need for Government intervention was felt to institutionalise this approach. Government intervention through a combination of strengthening of institutions at State and district levels, community mobilisation, a convergence of ongoing schemes with a focus on more efficient use of water, and efforts to change the behavior of the community toward judicious use of available water was perceived to be the need of the hour.

The Atal Bhujal Yojana (Atal Jal) is an important step in this direction.

The goal of Atal Bhujal Yojana is to demonstrate community-led sustainable groundwater management, taken to scale. The major objective of the scheme is to improve the management of groundwater resources through a convergence of various ongoing schemes.

A Step Towards Groundwater Conservation

- The Cabinet announced Atal Bhujal Yojana, an ambitious Rs 6000 crore scheme to accelerate the conservation of groundwater
- It includes water security plans by the Gram Panchayat, monitoring committees and setting up of Water Panchayat to deliberate on the distribution of water
- Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh would benefit from this program for the next five years.
- This comes as a logical successor to the Rs 3.5 lakh crore Jal Jeevan Mission to ensure every drop of water is conserved and used judiciously

The goal of Atal Bhujal Yojana is to demonstrate community-led sustainable groundwater management, taken to scale. The major objective of the scheme is to improve the management of groundwater resources through a convergence of various ongoing schemes. It is a pioneering and unique experiment involving government institutions, and civil society organisations to bring about innovative reform in the management of groundwater by energising the local communities.

Atal Bhujal Yojana is a Central Sector Scheme with an outlay of Rs 6,000 Crore. For now, the scheme is being implemented in seven States– in water-stressed areas of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh. It is expected to benefit about 9,000 Gram Panchayats in 222 blocks/ talukas spread over 80 districts. The scheme, partly funded by the World Bank, was launched on Good Governance Day i.e. December 25, 2019.

Disbursement of Resources against measurable indicators

A key feature of this outcome-focused scheme is the disbursement of incentive funds (disbursement

linked indicators – DLIs) to states based on performance against selected indicators. The selection of DLIs has been guided by activities that need to be done for sustainable management of groundwater, measurability, and ease of verification, and the capacity of stakeholders to achieve the results. Taken together, these DLIs, while focusing on the objective of the Scheme, provide incentives for achieving key milestones towards the ultimate goal of the scheme i.e. improving groundwater management with community participation.

DLI#1 - Public disclosure of groundwater data/information and reports: This DLI incentivises the strengthening of groundwater management institutions to ensure collection and public disclosure of groundwater-related information.

DLI#2 - Preparation of Community-led Water Security Plans: This incentivises the roll-out of a bottom-up participatory groundwater planning process.

DLI#3 – Public financing of approved Water Security Plans through a convergence of ongoing/ new schemes: The DLI incentivises the use of a bottom-up groundwater planning process to improve the effectiveness of public financing and align implementation of various government programs on groundwater.

DLI#4 - Adoption of practices for efficient water use: incentivises the implementation of demand-side measures within the WSPs.

DLI#5 - Improvement in the rate of decline of groundwater levels: incentivises the arrest in the decline of groundwater levels.

This scheme is a harbinger of change in groundwater management. It encourages the creation of "water aware" communities, that have the knowledge and the ability to plan their water use based on available water. The incentives under the scheme can be used flexibly, to further improve water management, through both supply-side and demand-side measures.

Way Forward

The participating States have begun to implement the programme in the right earnest. States are being encouraged to innovate in the process of implementation, in recognition of the fact that solutions for Karnataka will not be the same for Uttar Pradesh. Already, innovations are emerging. Karnataka has reached out to its village communities digitally, so as not to lose time during the current pandemic. Uttar Pradesh has decided to implement a scheme for improving the groundwater management covering all the Gram Panchayats in the State along the lines of Atal Bhujal Yojana. Innovations are also happening as communities are involved in the preparation of water security plans with the use of a custom-built mobile app for capturing geo-tagged field data.

Learning from the experience in the selected states, it is proposed to create a pan-India programme for the water-stressed areas of the country. Strengthened water-aware communities, reliable water data that informs decision making, and a participatory regulatory framework are the three pillars that will support sustainable groundwater use in the country, making water available for life, for livelihoods and culture and enable us to combat the effects of climate change. ❑

Swachhata Movement Continues

Arun Baroka

Swachh Bharat Mission (SBM) became the world's largest behavior-change programme in India and as a result, it achieved the seemingly impossible huge task of becoming open-defecation free in five years. It could happen due to the leadership of the Prime Minister and the Mission turned into a Jan Andolan (people's movement), with 130 Crore people from all walks of life contributing to making this programme, a grand success.

As a result of the Mission, rural sanitation coverage has increased from 38.7 per cent in 2014 to 100 per cent in 2019, with over 10.25 Crore toilets built across India and all states & districts had declared themselves ODF. This all was well supported by a huge investment of Rs. 130 thousand Crore by the government. For eligible households Rs. 12,000 were provided as an incentive to construct a toilet.

Various Global agencies such as UNICEF, WHO, BMGF, Dalberg, and others have estimated significant economic, educational, environmental, health, and social impacts of Swachh Bharat Mission's ODF achievements. India achieved SDG Goal 6.2 declared by the United Nations for providing safe sanitation for all 11 years before the targeted year, 2030.

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2ND OCTOBER 2019: THE SWACHH BHARAT MOMENT

The success of the programme is attributed to the 4 Ps – political leadership, public financing, partnerships, and public participation. With the Prime Minister leading from the front, SBM in a true sense became a people's movement, of such a magnitude that few could have imagined.

As the Prime Minister said on October 2, 2019, at Ahmedabad on the occasion of the 150th birth anniversary of Mahatma Gandhi, "But now the question is – whatever we have achieved is that enough? The answer is simple and clear. What we have achieved today is just one stage, only one level. Our journey towards clean India continues unabated."

In February 2020, Union Cabinet approved Phase II of the Swachh Bharat Mission- Grameen (SBM-G). It has a total outlay of Rs. 1,40, 881 Crore to focus on solid and liquid waste management (SLWM), and the sustainability of ODF status. At about the same time, the 15th Finance Commission report for the year 2020-21 was released. It also provided much-needed tied grants for sanitation to rural local bodies. Thus, the Phase II of the SBM-G is planned to be a novel model of convergence between different verticals of financing and various schemes of the Central and State governments.

The Department of Drinking Water and Sanitation (DDWS) is implementing this as a Mission Mode from 2020-21 to 2024-25. Phase II will provide impetus to the rural economy through the construction of household toilets and need-based community sanitary complexes, as well as the infrastructure for solid and liquid waste management such as compost pits, soak pits, waste stabilization ponds, bio-gas plants, material recovery facilities, etc.

SBM Phase II: From ODF to ODF Plus

The key objective of the SBM Phase II is to make villages across India ODF Plus villages. An ODF Plus village is a village that sustains its open defecation-free (ODF) status and also ensures solid and liquid waste management and is visually clean.

In Phase II of SBM, visual cleanliness has also been defined. A village is called visually clean if at least 80 per cent of its households and all its public places have a minimal litter and minimal stagnant water, and the village does not have any plastic waste dump.

Various components which can help to convert a village ODF Plus status are: construction of individual household latrines, retrofitting of toilets, need-based construction of community sanitary complexes, biodegradable waste management, GOBAR-Dhan (Galvanizing Organic Bio-Agro Resources-dhan), plastic waste management, greywater management, and faecal sludge management.

The success of the programme is attributed to the 4 Ps – political leadership, public financing, partnerships, and public participation. With the Prime Minister leading from the front, SBM in a true sense became a people's movement, of such a magnitude that few could have imagined.

Thus, to become an ODF Plus village, a village has to ensure that:

i. All households have access to a functional toilet facility.

ii. All schools, Anganwadi centres, and Panchayat Ghars have access to a functional toilet, with separate toilets for females and males.

iii. Public places are visually clean.

iv. At least 80 per cent of households and all public institutions have arrangements for managing solid and liquid waste.

v. The village has a plastic segregation and collection system.

vi. At least five ODF Plus IEC wall paintings per village on five key themes of ODF sustainability, handwashing with soap, biodegradable waste management through compost pits, greywater management through soak pits, and plastic waste management.

The key objective of the SBM Phase II is to make villages across India ODF Plus villages. An ODF Plus village is a village that sustains its open defecation-free (ODF) status and also ensures solid and liquid waste management and is visually clean.

Planning for SBM (G) Phase II

Swachh Bharat Mission promotes decentralised sanitation interventions. Therefore, it is required that each Gram Panchayat prepares Village Action Plans for all of its villages in a convergent manner for the SBM (G) and the Jal Jeevan Mission, in a participatory manner, especially involving women and marginalised people, so that everyone could get equally benefitted from the implementation of the village action plan.

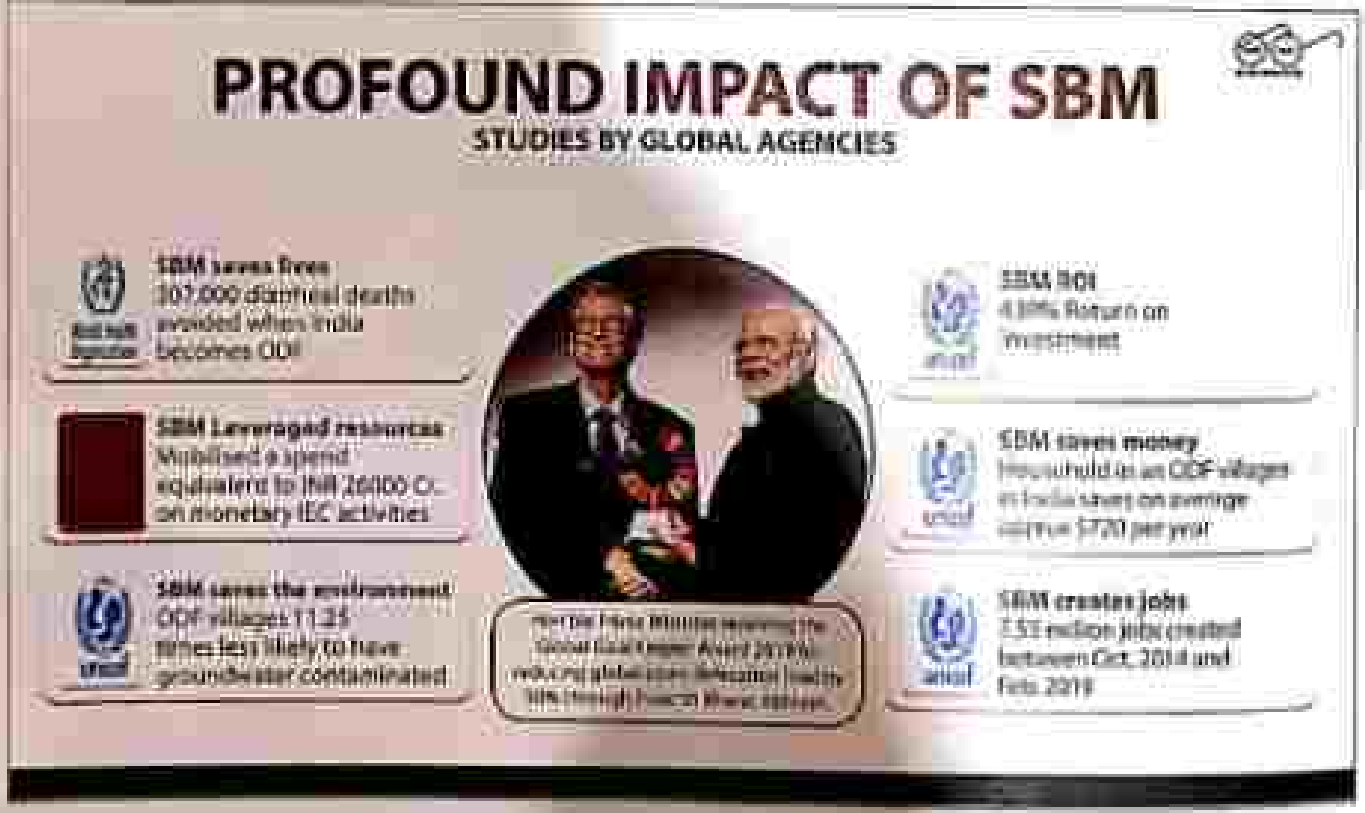
The plan should be presented in the Gram Sabha and endorsement of the Gram Sabha should be obtained and recorded.

At the district level, each district is required to prepare a District Swachhata Plan after consolidating its Village Action Plans. Districts are expected to develop the plan as per a date decided by the State Water and sanitation Committee every year and upload it on MIS after obtaining approval from the State Government.

States and UTs are required to develop a Project Implementation Plan (PIP) and Annual Implementation Plan (AIP) every year consolidating the District Swachhata Plans to achieve the objectives of SBM (G) Phase II. The National Scheme Sanctioning Committee (NSSC) then considers and approves the PIPs and AIPs. The States and UTs are required to develop and upload these plans on the Integrated Management Information System (IMIS) by the 1st March of every year.

Capacity Building

Swachhagrahis are the foot soldiers of the SBM (G) and have proved excellent motivators in bringing behaviour change for construction and usage of toilets. The role of



these volunteers remain important even in Phase II. They may be able to play the same active role with sustained engagement, capacity strengthening and sharpening, and providing them appropriate incentives for their sustained engagement.

Role of Panchayati Raj Institutions (PRIs)

As per the Constitution 73rd Amendment Act, 1992, sanitation is included in the 11th Schedule. Therefore, the role of Gram Panchayat (GP) is pivotal in implementing SBM (G). At the cutting edge, PRIs play even a greater and very important role in Phase II, especially after the earmarked provision for sanitation activities by the 15th Finance Commission. All institutions and committees working within the GP framework have to prioritise sanitation within their programs.

Each Gram Panchayat is expected to develop a village Swachhata plan for each financial year and feed it as per GPDP planning principles in the designated Plan Software, as well as into the SBM (G) MIS. Receiving funds, subject to conformity with State arrangements, and contributing from their resources for the finalising of community toilets and SLWM infrastructure are some of the important roles of the PRIs.

Monitoring and Evaluation

DDWS leads the monitoring and evaluation of the SBM Phase II work in coordination with the States/UTs and Districts. The monitoring and evaluation have two aspects: first is ensuring the status of ODF Plus villages and second is that of created assets and expenditure incurred.

The monitoring framework should be able to identify whether: adequate IEC activities have been carried out for behaviour change, ODF status of the village is sustained, adequate SLWM has been ensured and the village is visibly clean.

Monitoring activities are aimed towards the attainment of programme results, both effectively and efficiently. These include: independent assessments, periodic reviews, field visits, and thematic consultations to ascertain the progress of the programme. Monitoring of both qualitative (outcomes) and quantitative (output) progress is provided in the operational guidelines.

The Way Forward

DDWS has begun to work towards the management of biodegradable waste, animal waste (Gobardhan), and plastic waste management in the spirit of waste to wealth along with liquid waste management that includes both grey water as well as faecal sludge management. States and districts have started earnestly planning and working towards these goals. There is a new kind of enthusiasm and dynamism in villages ably led by sarpanches. India is hopeful that like ODF, its people will achieve the goals of ODF Plus by 2025 as the Swachhata momentum accelerates. ❑

Jal Shakti Abhiyan

Renjitha M H
A Muralidharan

Water is one of the most essential requirements of life. Assured availability of potable water is vital for human development. India is home to 18% of the global human population and 15% of the global livestock population. However, it has only 2% landmass and 4% of global freshwater resources. As per estimates in 1951, per capita annual freshwater availability was 5,177 cubic meters which came down to 1,545 cubic meters in 2011. It is estimated that in 2019, it is about 1,368 cubic meters which is likely to further go down to 1,293 cubic meters in 2025. If the present trend continues, in 2050, freshwater availability is likely to decline to 1,140 cubic meters.

The source of water is finite. Thus, finite availability and competing demands make water management a complex issue with increasing conflicts between water users and its uses. In pre-independent India, local communities have been known for designing their systems using traditional knowledge and wisdom to fulfill the needs of the community in different climatic conditions. Taking over water management by colonial rule led to the decline in community participation and made them dependent on the Government for meeting both drinking water and agriculture requirements. Any solution to the water management issue has to be planned with a people-centric strategy that encourages and ensures their participation.

On June 30, 2019, the Hon'ble Prime Minister in his 'Mann ki Baat' address gave a clarion call for a mass movement with citizen participation for water conservation. He said *"Let's also start a mass movement for water conservation. We together should all resolve to save every drop of water and I believe that water is God's prasad to us, water is like a philosopher's stone! Earlier it was said that by the touch of philosopher's stone, iron could be transformed into gold. I tell you, water is a philosopher's stone and its mere touch creates and regenerates life! Let us start an environment campaign to save even a single drop of water."*

The Department of Drinking Water & Sanitation, Ministry of Jal Shakti on July 1, 2019 launched Jal Shakti Abhiyan (JSA), in coordination with States/ UTs, as a time bound campaign in 256 districts covering 1,592 blocks, that were classified as water-stressed. These blocks, as per the Central Ground Water Board were either critical or overexploited blocks. Out of these districts, 21 are aspirational districts identified by NITI Aayog. In parallel, the Ministry of Housing and Urban Development identified 736 local bodies in urban areas for carrying out the activities under the Abhiyan.

The Roll-out

The campaign was carried out in two phases. Phase I was carried out between July 1 and September 30, 2019, for all States, coinciding with the South-West Monsoon period. For States and Union Territories receiving the retreating

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monsoon (North-East Monsoon), the campaign continued as Phase II between October 1 and November 30, 2019. Multiple teams of officers from the central government, led by Additional Secretaries / Joint Secretaries, were mobilized and were mapped to each of the JSA districts / blocks. From different Ministries of Government of India, 256 Additional Secretary / Joint Secretary level officers, 446 Director / Deputy Secretary level officers, and 440 Technical Officers from Central Water Commission and Central Ground Water Board were deputed to these districts / blocks. Besides, 169 newly trained IAS Officers who were posted as Assistant Secretaries in the Government of India also participated. Each team had to visit their allotted districts/ blocks thrice for three-day duration for implementation of interventions identified under the Abhiyan. The State Governments appointed a State nodal officer and at the district level, the District Collector / Deputy Commissioner / District Magistrate spearheaded the Abhiyan.

Intervention Areas

Under this campaign, targeted activities were undertaken under five key areas of interventions namely:

i. Water conservation and rainwater harvesting;
ii. Renovation of traditional and other water bodies/ tanks;
iii. Reuse and recharge structures;
iv. Watershed development; and
v. Intensive afforestation.

Apart from these interventions, special interventions like preparation of district and block-level water-conservation plans, Krishi Vigyan Kendra Melas, urban wastewater re-use, preparation of 3D village contour maps were also envisaged. These areas of intervention broadly fell under the mandate of the Ministry of Jal Shakti, Ministry of Rural Development, Department of Land Resources, Ministry of Agriculture, Cooperation & Farmers Welfare, Ministry of Environment, Forests & Climate Change, and Ministry of Housing & Urban Affairs. The Office of the Principal Scientific Adviser, Government of India, along with ISRO and others, assisted the Department of Drinking Water & Sanitation in providing scientific inputs (like digital maps of districts showing various layers like drainage, water bodies, MGNREGA works, etc.) as well as in outcome monitoring.

The funds allocated under various regular schemes (both Centrally Sponsored Schemes of Government of India and State Government Schemes having similar interventions as objectives) were downsailed at the district level. There was no separate fund allocation for the campaign.

Monitoring

A national-level JSA monitoring dashboard was developed to capture the progress of the States/ districts against JSA interventions. A mobile app was created for assisting the visiting teams to share the progress of the campaign during their visit to States. Using the app, the visiting teams uploaded their reports on the real-time dashboard. The dashboard was continuously monitored by a dedicated team of officials from DDWS. Based on the performance reported, the districts were ranked generating a healthy competition among them. Also, the campaign was reviewed regularly.

Jan Shakti for Jal Shakti

True to the spirit of JSA, village leaders, community members, school students took up the task of water conservation. The Abhiyan was especially led by youth - enthusiastic and actively participating in water conservation activities. An estimated 2.64 Crore people participated in the campaign.

Outputs and outcomes

The following outputs were reported by the States.

The people of Haripur have converted a filthy water body into a beautiful park with a pond. The village community constituted a committee called "Hariput Vikas Committee" for the development of the village including the pond site.

Based on these activities, the outcomes were assessed under four activities:

i. Increase in the groundwater level
ii. Increase in the surface water storage capacity
iii. Increase in the soil moisture in farmlands
iv. Increase in the area covered with plantation and number of saplings planted

An increase of more than 20% in groundwater levels was observed in 12 States/ UTs. About 72 million cubic metres of surface water storage capacity created. Nine states showed an increase in soil moisture of more than 20%, 3 States up to 20%. 1.2 billion saplings planted in an area of 1.08 million hectares.

Interventions/ Special Intervention Areas	Outputs
Water conservation and rainwater harvesting	1,30,344 structures constructed (check dams, trenches, ponds, rainwater harvesting structures)
Renovation of traditional and other water bodies/tanks	15,917 water bodies restored
Reuse and recharge structures	49,345 structures constructed (soak pits, stabilisation ponds, and other structures)
Watershed development	1,41,923 watershed structures constructed (gully plugs, percolation tanks, staggered trenches, and other structures).
Intensive afforestation	77,320 sampling planting activities completed.
Block and district water conservation plans	1,372 blocks and 228 districts prepared their plans
KVK *Melas*	22,157 melas organised in 214 districts
Mobilisation of farmers	21,360 lakhs

Post Jal Shakti Abhiyan – Way Forward

Though JSA could not be carried out in 2020-21 due to pandemic, it is essential to consolidate the gains of the campaign by undertaking the following activities:

i. The digital inventory of all the water bodies/ resources should be completed and shared with all stake-holding Departments and their headquarters.

ii. The list of water bodies that were rejuvenated, rejuvenated or the ones in which encroachments were removed should be documented and recorded in the revenue records.

iii. Such water bodies should be linked to people's livelihood so that the people's community interest can protect them. For example, fisheries can be encouraged and water bodies leased so that they can be maintained by communities that benefit out of them.

iv. Encourage social water bodies policing (*volunteer Jal Rakshaks*) for the maintenance of restored water bodies using the services of college and senior secondary students, volunteers, NGOs, etc.

v. Survival of plantation has to be monitored periodically so that the original number is maintained. A protection mechanism needs to be adopted from grazing, while replacement of decayed plants should be covered by the department administrations.

vi. Incorporate voluntary Shramdan as a means to build awareness as well as completing various works. The whole community can be involved.

vii. Capacity building of farmers on water conservation should go on simultaneously. The main focus should involve the usage of micro-irrigation for water-guzzling plants.

viii. The Government building should mandatorily include rainwater harvesting structures.

ix. Create a dedicated JSA cell at the district-level post Abhiyan period to complete the follow-up activities under Jal Shakti Abhiyan.

Jalore, Rajasthan: The local community cleaned and deepened the main village pond in Samtipura village in Sumti Panchayat of Jalore, Rajasthan. The activity will help increase the storage capacity of rainwater and at the same time recharge groundwater and water for drinking purpose.

This year the Ministry of Jal Shakti plans to hold this campaign in a big way following the same principle of participation of all stakeholders to make water 'everyone's business'. □

Integrated Water Management for Faster Socio-economic Development and Water Security

Bharat Lal

"...Work should be done on water conservation, irrigation, rain-water harvesting, recycle of waste water treatment, and 'Per Drop, More Crop' Micro Irrigation for the farmers. Water conservation campaigns should be launched, creating awareness in the common citizens about water, arousing their sensitivity so that they understand the importance of water; even the children should be taught about water conservation as part of their curriculum in their childhood. We must move forward with the belief that in the next five years we have to do more than four times the work that has been done in the last 70 years for water conservation and to revive the sources of water. We cannot wait any longer..."

[Extract from the Independence day address of Prime Minister from ramparts of Red Fort on 15th August, 2019]

India is home to 18% human population and 15% global livestock with only 4% global freshwater resources. The situation in Gujarat is worse with 6.4% of India's geographical area and 5% population, along with more than 2 Crore livestock, having a meager 2% of country's freshwater availability. Even the available water has a skewed distribution with 70% water availability in about 25% area of the State (Table-1).

Table 1: Unequal distribution: Rainfall and water availability in different parts of Gujarat

Area	Share in area	Average annual rainfall (in mm)	Share in water availability
South & Central Gujarat	24.26 %	1,114	69%
North Gujarat	19.63 %	694	11 %
Saurashtra	32.82 %	659	17 %
Kachchh	23.29 %	402	3 %

Gujarat is considered capital of India's dairy industry. Farmers of Gujarat and their families are entrepreneurial and very industrious. Animal husbandry is one of the major sources of income to rural families. Ensuring adequate and assured availability of clean water for cattle is pre-requisite for productivity.

The annual rainfall in Gujarat is skewed with Central and South Gujarat receiving 80–200 cm. North Gujarat

Figure 1: Rainfall distribution in Gujarat

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Figure 2: People gather to fetch water in Gujarat in 2002

Figure 3: People fill water from tanker in 2002

& Saurashtra receiving 40–80 cm and Kachchh receiving less than 40 cm rainfall annually. The uneven distribution of water in Gujarat creates a peculiar situation wherein 1/4th area has adequate water and remaining 3/4th of the State is water-scarce, especially Kachchh with 23.29 % area but only 3% share in total water availability in the State.

As per estimates[1], in 2011, per capita water availability in the State has been only 920 cubic meters per annum against country's 1,720 cubic meters. The minimum requirement of water per person is at least 1,000 cubic meters/ year.

While Gujarat has 6% of the total geographical area of India, it has 12.36% of total water-stressed area of the country. About 58.6% of the total area of Gujarat is water-stressed due to arid, semi-arid and salinity conditions. It is severely water-stressed State, next only to Rajasthan.

Western India, especially Rajasthan, Gujarat and parts of Maharashtra regularly experience scarcity of water due to peculiar agro-climatic conditions. This also necessitates drinking water supply by road tankers and water trains. In mid-1980s, consecutive three drought-years led to severe water scarcity resulting into crop failure, shortage of fodder and paucity of water even for drinking and domestic use.

Once again, during 1999 – 2002, Gujarat faced severe drought like conditions and water scarcity. The mitigation measures included drinking water transportation on a very large scale through road tankers and railway rakes. Every year, few thousand tankers used to be deployed to meet the drinking water need in Saurashtra, Kachchh, eastern tribal belt and parts of North Gujarat. Every year, for 6–8 months, entire administration used to be involved in scarcity management, particularly water supply. The earthquake of January 26, 2001, with its epicenter in Kachchh caused massive loss of life and property, including water supply infrastructure, which further accentuated the water crisis.

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The Prime Minister Shri Narendra Modi, after becoming the Chief Minister of Gujarat in October, 2001, made a firm resolve to make water scarcity in Gujarat a thing of past. This determination led to a series of policy decisions which helped in achieving drinking water security in the State. Overall, the water sector was integrated to manage demand and supply as well as to

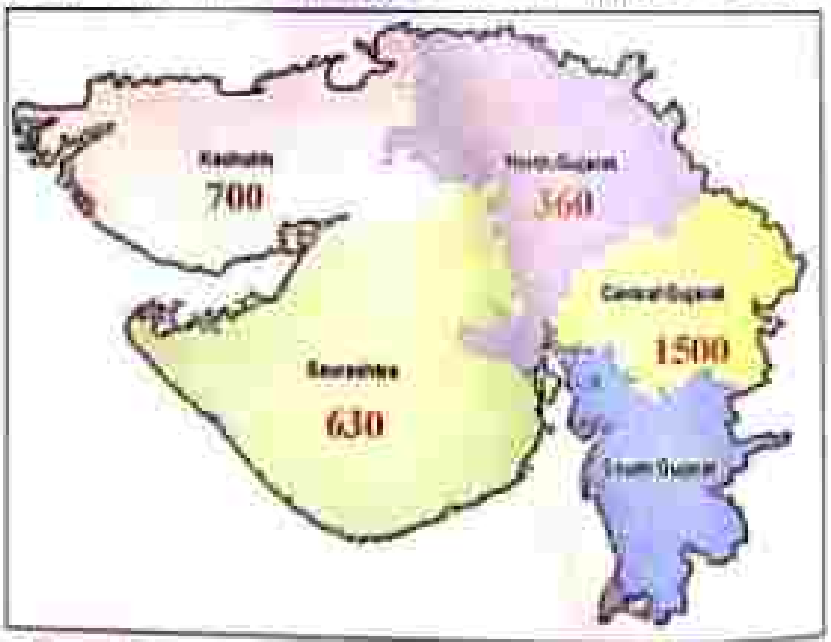

Figure 4: Per capita water availability in Gujarat in cubic meters/ year (in 2011)

Figure 5: Community meeting facilitated by WASMO

Figure 6: Finalising Village Action Plan (VAP)

ensure accountability at different levels.

In order to meet the rising demand of water due to expanding economic activities and aspirations of people for better life, the following broad strategy was adopted to achieve the water security:

i. In all decision-making related to water, people's participation became the non-negotiable principle. People are to be involved in all water conservation and management efforts;

ii. Rainwater harvesting and/ or artificial recharge with scientific planning and monitoring based on watershed principles, using satellite data was adopted;

iii. Completion of Sardar Sarovar Dam on Narmada river and distribution canal network was taken up on top priority;

iv. Inter-basin transfer of water from reasonably water rich South and Central Gujarat to North Gujarat, Saurashtra and Kachchh was planned;

v. Strengthening of existing canal system, participatory irrigation management and micro-irrigation promoted in a big way;

vi. Agriculture extension activities to educate farmers to promote the concept of "Per Drop More Crop" and conserve water was initiated as a campaign;

vii. It was decided that people should get drinking water in their homes and drinking water supply sector was reorganised in the form of three organisations carrying out specific tasks:

a. Gujarat Water Infrastructure Limited (GWIL) for building bulk-water transfer infrastructure;

b. Gujarat Water Supply & Sewerage Board (GWSSB) to be responsible for water supply in rural and urban areas and managing distribution network; and

> **While Gujarat has 6% of the total geographical area of India, but it has 12.36% of total water-stressed area of the country. About 58.6% of the total area of Gujarat is water-stressed due to arid, semi-aridand salinity. It is severely water-stressed State, next only to Rajasthan.**

Figure 7: Administrative process by Pani Samiti

Figure 8: Community awareness programmes

Figure 9: Before after images of water conservation work in Rasej village, Banaskantha. Increase in storage capacity by 5 lakh cubic feet.

c. Water and Sanitation Management Organization (WASMO) – A unique organization created in February, 2002 to plan and implement decentralized, demand-driven, community-managed water supply systems in villages by facilitating and empowering local village community to plan, implement, manage, operate and maintain their own water supply systems.

Shri Narendra Modi, the then Chief Minister personally led the water conservation campaign in the State and gave the concept of *'Khet ka pani khet 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 checkdams, ponds, etc. in and around their farm lands.

Under WASMO, partnership with NGOs was forged for community mobilisation and their handholding. As a result, massive water source strengthening, water supply work along with grey water management was taken up in a campaign-mode. With the help of NGOs, village after village started preparing their Village Action Plans (VAPs) to achieve drinking water security.

In every village, five persons, especially women, were trained to test the quality of water. Government issued a special resolution under the Panchayati Raj Act making provision to form Village Water & Sanitation Committee (VWSC) popularly known as *'Pani Samiti'* as a sub-committee of gram panchayat, comprising of 10-15 members with 50% women and 25% representation from weaker sections of the society, proportionate to their population.

The VWSC/Pani Samiti became the fulcrum of

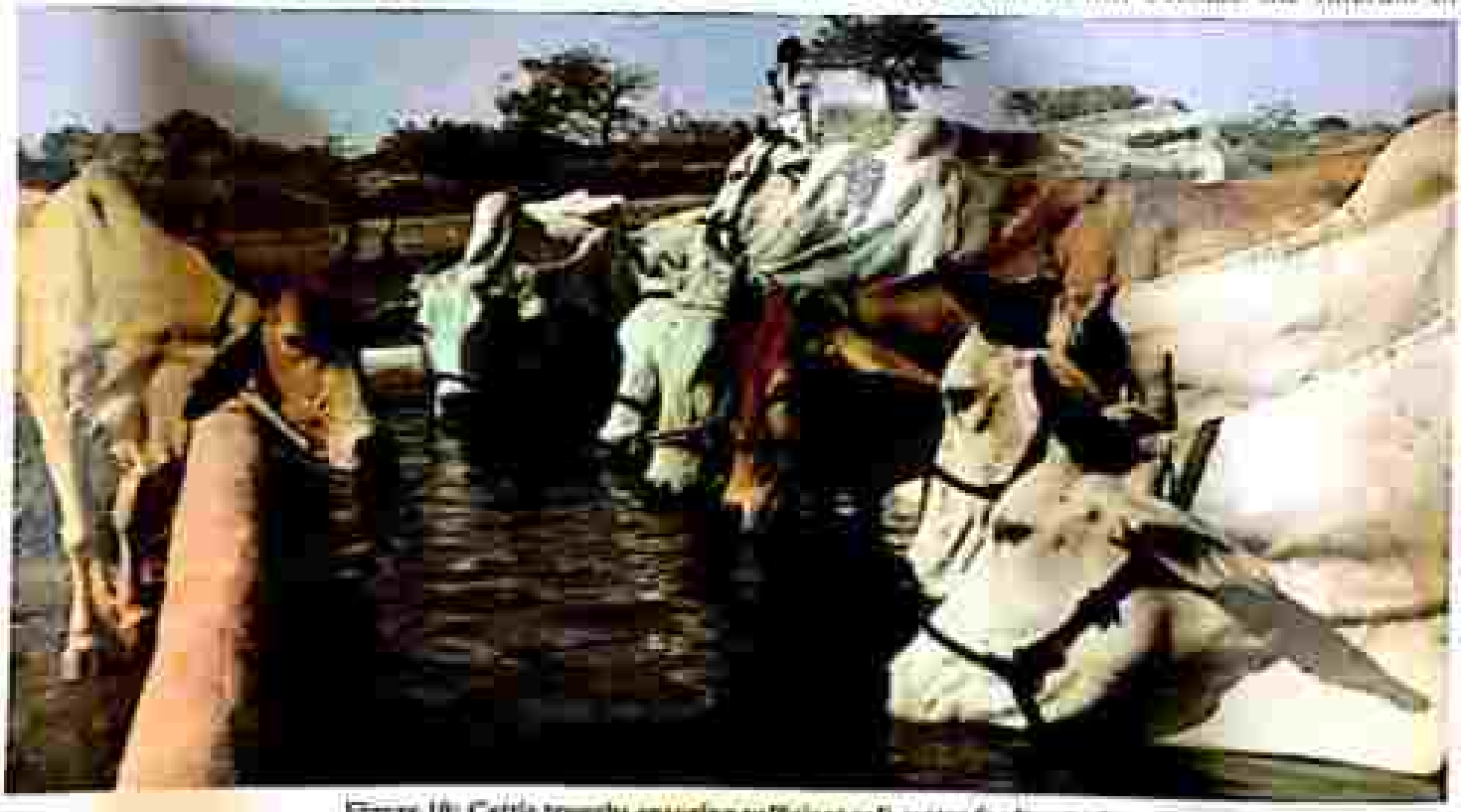

Figure 10: Cattle troughs ensuring sufficient safe water for livestock

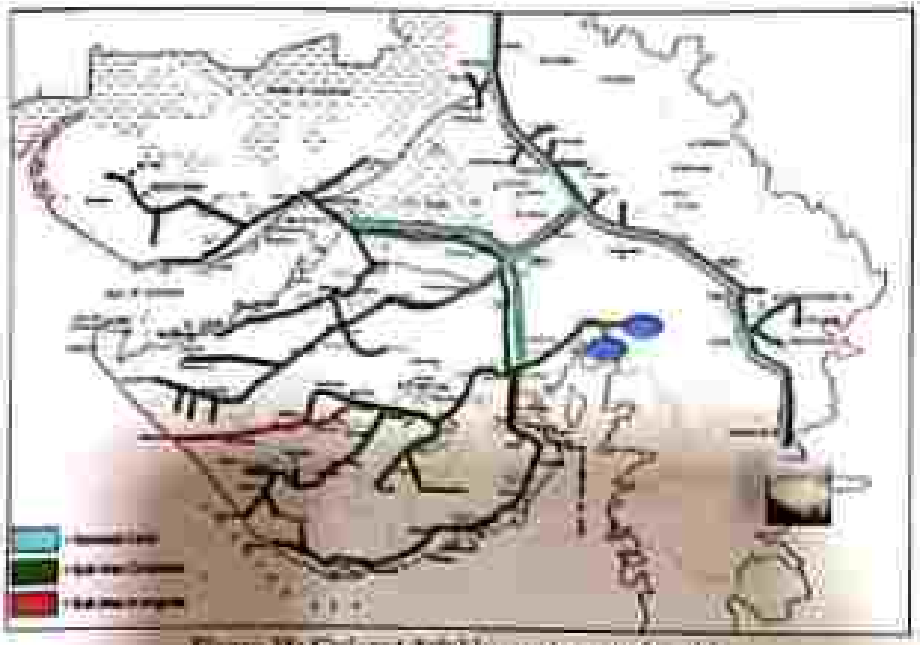

Figure 11: Gujarat drinking water supply grid

drinking water source management, drinking water supply, grey water management and operation & maintenance in villages. This led to development of "responsible and responsive leadership" at village-level with local community having the experience, confidence and means to take up and shoulder the full responsibility of water supply. Massive work for rainwater harvesting and artificial recharge of aquifers was taken up so that local water sources sustain throughout the year.

VWSC/ Pani Samiti decided to collect water delivery charges from every household so that water supply systems are operated and maintained properly. To ensure water security to meet the increasing demand especially in drought-prone North Gujarat, Saurashtra and Kachchh, Narmada water was taken to these regions through a series of canal network. A unique approach of transfering flood water from Narmada to water scarce regions of North Gujarat and Saurashtra was taken up by constructing 532 km long *"Sujalam Suflam"* (unlined recharge) canal, on Northern side, parallel to Narmada main canal. This helped in groundwater recharge leading to reversal of the depletion in the groundwater.

As part of water conservation campaign, about 1.85 lakh checkdams, 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 nagarkhi in the State were cleaned, revived and put to use.

Despite all these efforts, ensuring adequate quantity of water, especially in drought years was a challenge. To ensure drinking water security, a State-wide drinking water supply grid was planned. Under this project, 2,900 km long bulk water transfer pipeline, 270 water treatment plants, 350 major pumping stations, 1,833 elevated storage reservoirs and 1,883 groundwater storage structures have been constructed. This grid is providing potable drinking water to 207 ULBs including 5 municipal corporations and 106 municipalities, and to about 14,000 villages.

To meet water requirement, especially in areas with salinity in ground water, desalination plants are being set and so far, 4 such plants producing 270 MLD water have been taken up in coastal areas of the State.

To bring behaviour change, promote water conservation and judicious use, micro-irrigation was promoted in a big way. In 2005, Gujarat Green Revolution Company (GGRC) Ltd. was set upto bring in water-use efficiency in agriculture sector by promoting drip and sprinkler irrigation systems. Since then, 12.28 lakh farmers have taken the benefits in the form of subsidy varying from 70-90% of the total cost and 19.67 lakh ha farmland has been covered under these micro-irrigation systems.

To make Gujarat a "water secure State", *Sujalam Sufalam Jal Abhiyan"* was launched in 2018 under which a number of water conservation activities including cleaning

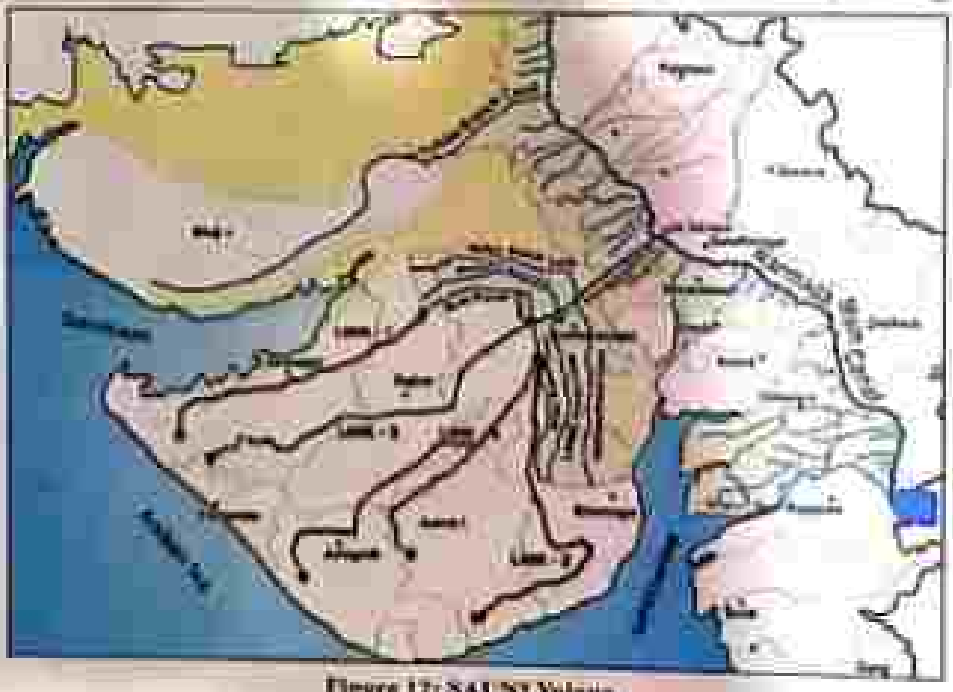

Figure 12: SAUNI Yojana

and deepening of ponds, nalla, tanks, checkdams and reservoirs, repair of water storage structures, construction of rainwater harvesting structures, etc., were taken up. In addition to construction of more than 41,000 water storage structures, 16,588 ponds were deepened and 8,100 checkdams were de-silted. This created 420 Crore cubic feet additional water storage capacity.

To ensure water security in drought-prone Saurashtra region, 'Saurashtra Narmada Avtaran Irrigation' (SAUNI) Yojana was taken up under which on completion, during monsoon, surplus water from Narmada will be transferred and stored into about 115 reservoirs of Saurashtra. This work will benefit 8.25 lakh acre of area in Saurashtra. This is at advance stage of completion.

In southern and eastern Gujarat inhabited by tribals, small lift irrigation schemes have been taken up in a big way providing assured irrigation in about 3.50 lakh acre farmland belonging to tribal communities, thus improving their income.

This integrated water management approach helped Gujarat in ensuring irrigation in 68.88 lakh hectare farmland out of total ultimate irrigation potential of 70.80 lakh hectare. Total irrigable area in the State increased from 18.77 lakh Ha in 2001 to 68.68 lakh Ha i.e. increase by 77%. As compared to 2002, by 2017, there was 50% increase in the utilizable ground water recharge by about 700 MCM/ year. Ground water table in whole State is continuously improving. Over 19.48 lakh Ha, i.e. 20% net sown area in State is covered under micro-irrigation benefitting 12.28 lakh farmers. A total of 647 MLD treated waste water produced by UIBs which is about 17% of the total freshwater use in the State is being used. Since 2001, the agriculture production in the State increased by 253%.

Table 2: Level of groundwater development in different parts of the State in 2002 & 2017

(nos. indicate assessment units)

Category	2002	2017
Over-exploited	30	25
Critical	12	05
Semi-critical	63	11
Safe	104	194
Saline	14	13

With the creation of State-wide drinking water grid, promotion of decentralised, demand-driven, community-managed drinking water supply programme through WASMO and massive water conservation campaigns, the State has made transportation of drinking water through road tankers and railways rakes a thing of past. Today in Gujarat, more than 82% rural households have assured

Figure 13: Woman with tap water at home

tap water supply in their homes. Out of the total 18,191 villages, in 8,214 villages, every household is having tap water supply by following the Prime Minister's governance philosophy of 'Sabka Saath, Sabka Vikas and Sabka Vishwas'; thus ensuring 'no one is left out'. VWSC/ Pani Samitis are managing in-village water supply and more than 76% families are paying monthly water service charges.

The pioneering work by WASMO has gained multiple recognitions including Prime Minister's Civil Services Award in 2018, United Nations Public Service Award in 2009; and CAPAM International Innovation Award in 2010.

The vision of the then Chief Minister of Gujarat, Shri Narendra Modi has borne fruits and today water scarcity in Gujarat is only in memory of older generation. By ensuring adequate water in terms of quality and quantity, Gujarat marched ahead on the path of double-digit growth. Also, women and children need not walk a long distance to fetch water. The success of this integrated approach in Gujarat inspired the formation of Ministry of Jal Shakti in 2019. This also led the Government to launch '*Jal Shakti Abhiyan*' (JSA) to conserve water by 'making water everyone's business' and achieve water security to all. On August 15, 2019, the Prime Minister Shri Narendra Modi announced Jal Jeevan Mission (JJM) to be implemented in partnership with States, to provide tap water supply to every rural home in the country by 2024. If water security can be achieved in drought-prone Gujarat, it is possible that this integrated and focused approach followed by the Union Government will bring water security in the country, ensuring faster socio-economic development and high economic growth for the benefit of all. ❑

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Access to Water is Access to Education and Opportunity for All

Dr Yasmin Ali Haque

With the concerted efforts of the Government of India and State Governments, so far, more than 3.71 Crore rural households have been provided with new tap water connections. As a result, more than 6.95 Crore (36.3%) rural households in the country are getting assured and potable tap water in their homes. This shows the commitment of the government and the speed and scale of works being done under Jal Jeevan Mission.

Across the country, government officials, teachers, and parents are deliberating on how to ensure that schools are re-opening with a close eye on keeping Covid-19 out of the classroom.

Children will have to adapt to this new environment in which they have to wear masks in school, and it is also important that they continue to practice cleaning their hands with water and soap, something that has been so critical in the past year.

Assurance of running water in toilets not only helps children's hygiene and also helps motivate adolescent girls and teachers not to miss schools, especially during menstruation days.

Schools and Anganwadi Centres play a crucial role in the lives of children and are considered important places for learning and socialisation. After all, these are places where children get to learn positive and healthy behaviours while mothers are given support on parenting and caregiving skills. Early habits of sanitation and hygiene cannot be taught in the absence of regular access to the said facilities. Not to mention, it is critical for cleaning staff to implement infection prevention and control protocols.

Even before the Covid-19 pandemic hit India, schools and Anganwadi centers (AWCs) – especially those in vulnerable communities and regions of the country - were struggling with access to a regular water supply. According to the data submitted to the Lok Sabha back in 2019, almost 160,000 AWCs did not have access to water

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and there were significant gaps in hard-to-reach communities. With regards to the value of water and sanitation, every dollar invested in water access and sanitation yields an average of $6.80 in return[1], through averted health and productivity costs. Some studies have found that access to water has an identifiable influence on reducing the odds of absenteeism amongst students, especially girl students.

Jal Jeevan Mission (JJM) was launched back in 2019 to bring piped water supply to every rural household in India by 2024 and with the ambition to invest in sustainable water usage and opportunities for women and girls who will have averted time lost to travel to collect water for their homes.

With the concerted efforts of the Government of India and State Governments, as per the JJM IMIS, so far, more than 3.71 Crore rural households have been provided with new tap water connections. As a result, more than 6.95 Crore (36.3%) rural households in the country are getting assured and potable tap water in their homes. This shows the commitment of the government and the speed and scale of works being done under Jal Jeevan Mission.

Given the health implications of no water in school and Anganwadi centre grounds, especially due to the closures and the impact of the pandemic, the Government launched a 100-Day Campaign, which mandated States/ UTs to actively prioritise the provision of piped water supply in schools and AWCs in previously unserved or serving vulnerable communities.

> Women were not only treated as beneficiaries but also as problem solvers, as cadres of self-help groups, teachers, and AWC workers who took up the responsibility of disseminating key information that sensitised communities on the importance of piped water supply. School management committees and children themselves became champions for the cause of equitable access to water for all.

To a large part, thanks to the leadership and commitment from the highest levels of government, including the Prime Minister, the campaign has achieved great heights. Against the campaign's baseline, six States reported achieving 100 percent coverage for schools, another five States reported achieving coverage above 90 percent. Much of the credit goes to the convergent and inclusive approach that propelled it forward. Various government ministries and departments have joined hands to train implementers who in turn worked alongside communities to identify institutions with the greatest need.

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UNICEF has been a proud partner of the Campaign and has been working with both central and state governments to drive forward the vision of achieving universal access to safely managed drinking water and sanitation. This work puts India on an optimistic trend towards achieving the Sustainable Development Goal- 6, while also contributing to other SDGs ensuring better resource management and socio-economic progress. During the rollout of the campaign, there were initial challenges in getting data on water supply in schools and Anganwadi centers in the period of limited mobility. UNICEF advocated with the Chief Secretaries and Principal Secretaries of departments of rural water supply, Education, Women and Child development to prioritise the implementation

India | Tap water supply in schools/ AWCs/ GPs/ CHCs etc.

Tap water supply in schools	Tap water supply in anganwadis (AWCs)	Tap water supply in GPs/ CHCs etc.
5,45,442	4,88,881	1,15,357

UNICEF supported States in sharing data among the different line departments, developing plans for coverage of the schools and Anganwadi centers based on the availability of water supply sources, assisting States and districts in developing standard designs of location-specific upgradations using sustainable technologies such as the solar-powered lifting of water to overhead tanks in the institutions and monitoring progress of implementation.

With political drive, public financing, partnerships with different stakeholders, and people's participation, the Government has identified a successful formula for bringing change on a large scale. With approximately 20 lakh AWC workers and 52 lakh teachers across India ready to join hands, there is no limit to what our children can achieve.

The Jal Jeevan Mission, therefore, is not just about the provision of drinking water, it is about increasing women's participation in the workplace and economy, by giving them more time to pursue their aspirations. It is about helping adolescent girls practice menstrual hygiene management while still having access to education. It is about keeping safe hygiene and sanitation practices at the center of all the work we do to keep children safe at home and outside of them.

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Adding water to the lives of millions of people, especially those of women and girls, can be transformational ensuring regular schooling, less absenteeism among teachers, learning new hygiene habits, and preventing disease. We must therefore continue to prioritize water supply if we want to continue transforming India into a more resilient nation. ❑

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Safe, Adequate, and Sustainable Drinking Water

Dr Roderico H Ofrin

We need to develop effective strategies to engage various stakeholders including communities in providing safe and adequate water to rural populations but importantly to ensure sustainability. There is an urgent need to rethink and re-strategise to make water a health issue rather than solely an engineering issue, to come up with proactive ways to manage water systems and do away with reactive actions.

The Alma-Ata Declaration on primary health care in 1978 identified the availability of safe water and basic sanitation as essential to achieve the 'Health for All' goals by 2000. Though countries have not yet achieved this ambitious goal, water, sanitation, and hygiene remain high on the international agenda, having been secured as targets under the SDG6. Target 6.1 aims to achieve universal and equitable access to safe and affordable water for all. Due to the direct impact, water has on health, countries have pledged two targets on water under the health SDG i.e. to combat water-borne diseases by 2030 (3.3); and, to substantially reduce the number of deaths and illnesses from water pollution and contamination (3.9).

Water is lifesaving, yet it is also a carrier of pathogens and toxic chemicals which when consumed cause diseases and deaths. Diarrheal diseases, cholera, typhoid, polio, hepatitis A & E are water-borne diseases. Water is necessary for personal hygiene and allows for hand hygiene which are key factors in preventing the spread of respiratory diseases and trachoma which is yet to be eliminated in India. The Covid-19 pandemic has highlighted the need to accelerate water goals as handwashing is the key to preventing Covid-19 both in communities and in health care facilities. Many vectors which transmit diseases like lymphatic filariasis, dengue, malaria, Japanese Encephalitis, etc. breed in water bodies. Water is essential for morbidity management and disability prevention for lymphedema patients (lymphatic filariasis). There are around 396,000 lymphedema patients in the eight highly endemic states in India[1] requiring water in the home to keep their affected legs clean and prevent further deterioration. In Arsenic and Fluoride-affected areas, drinking water can expose people to these chemicals, and prolonged exposure could lead to Arsenicosis and Fluorosis. Also, safe drinking water has a positive impact on the nutritional status of children and prevents financial loss in the household and contributes to the overall economy of the country.

India's achievement in drinking water

The Government of India has made tremendous progress in providing drinking water to its people. As of 2019, more than 93%[2] of the population has access to basic drinking water. After the successful implementation

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WATER QUALITY PARAMETERS

S. No.	Characteristic	Unit	Requirement (Acceptable Limit)	Permissible Limit in the absence of alternate source
1.	pH value	–	6.5 - 8.5	No relaxation
2.	Total dissolved solids	Milligram/ litre	500	2,000
3.	Turbidity	NTU	1	5
4.	Chloride	Milligram/ litre	250	1,000
5.	Total alkalinity	Milligram/ litre	200	600
6.	Total hardness	Milligram/ litre	200	600
7.	Sulphate	Milligram/ litre	200	400
8.	Iron	Milligram/ litre	1.0	No relaxation
9.	Total arsenic	Milligram/ litre	0.01	No relaxation
10.	Fluoride	Milligram/ litre	1.0	1.5
11.	Nitrate	Milligram/ litre	45	No relaxation
12.	Total coliform bacteria	Shall not be detectable in any 100 ml sample		
13.	E.coli or thermotolerant coliform bacteria	Shall not be detectable in any 100 ml sample		

of Swachh Bharat Abhiyan, the Government has launched a new Mission to provide safe and adequate water to every household in rural areas by 2024 through its Jal Jeevan Mission, six years ahead of SDGs, which is commendable. The National Health Policy-2017 recognises access to safe drinking water and sanitation as a cross-sectoral goal and emphasises on the need to eliminate water and sanitation-related diseases[5].

Since its launch on August 15, 2019, the Jal Jeevan Mission estimates that it has provided household tap water connections to more than 37 million rural households, which is around 20% of rural households. The Mission has started a campaign to provide safe water to 0.5 million rural schools and 0.45 million early childcare development centers. A near-real time dashboard to monitor the progress of water supply at the village level has been developed and is functional[6]. These enabling environments and new commitment allow to think and to innovate, to reach safe and adequate water to the last house in a remote village. Most importantly, such commitments will help alleviate those vulnerable populations from water-related diseases and free up the drudgery of collecting water which mainly roam with women and girls so that girls have more time to study and women have more time for other activities, including caring for their babies.

We need to develop effective strategies to engage various stakeholders including communities in providing safe and adequate water to rural populations but importantly to ensure sustainability. There is an urgent need to rethink and re-strategise to make water a health issue rather than solely an engineering issue, to come up with proactive ways to manage water systems and do away with reactive actions. We propose the following.

Convergence: Health and Water

1. Prioritise water schemes in villages/blocks, where water-related disease burden (diarrheal, soil-transmitted helminths, Lymphatic filariasis, kala azar, etc) is high. This would require working with the health sector to identify common health-based targets and develop an implementation plan for jointly agreed target areas. This could be capitalised for developing annual programme implementation plans by states/UTs. Prioritisation should progressively also incorporate data from sector monitoring gaps in access or service levels that include the elements of "safely managed" water services that is the metric that WHO and UNICEF Joint Monitoring Programme for Water Supply, Sanitation and Hygiene monitor the SDG target 6.1, which are quality, accessibility, and availability. To do this, monitoring capacity should be strengthened and expanded as outlined below in point.
2. Strengthen current operation and management of water schemes by introducing a systematic risk

assessment and risk management approach aligning with the principle of Water Safety Planning, which is the central recommendation of WHO's Guidelines for drinking water quality. This approach would proactively identify risks to water quantity and quality, to enable corrective action as opposed to the traditional system of fixing problems when they are encountered. Community and local government engagement are key in this. Developing national and State/UT master trainers on this approach would be the first step in this direction.

3. Develop surveillance of drinking water quality by an entity independent of those charged with water service provision. This would serve as verification that the water systems are supplying safe water. Operational monitoring of water quality can be done by the water supplier or PHED in each State/UT. Expanding the current dashboard to include key parameters on water quality and availability would help in understanding the holistic achievement of the Jal Jeevan Mission. The water quality surveillance system would serve for data analysis on water quality trends in a particular area; it can be also linked with the disease surveillance system for analysis of water-related diseases and using the evidence for policy action.

Safe water is critical for preventing diseases and sustaining the elimination status of diseases such as polio. The nexus between water and health is clear, however, we normally tend to work in isolation. Hence, there is an urgent need to change the way we work by converging with health to produce maximum health benefits from Jal Jeevan Mission. The goal of the water sector would be to build water systems and taps however if the taps do not produce safe water and not available when needed, the purpose is defeated. Hence the need to have health-based targets for water and institute a proactive and preventive approach with the participation of the community and local government to ensure safety, availability, and sustainability of drinking water.

The Government's Ayushman Bharat programme with two pillars of health protection scheme reaches 500 million poor and vulnerable populations and establishing 150,000 health and wellness centers, Swachh Bharat 2.0, the new campaign on self-reliant India, and Jal Jeevan Mission are initiatives that put India in an advantageous position to achieve SDGs for health and water.

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Centrality of Women in Water Management

Apoorva Oza

It is critical to involve women in decision-making processes at all the stages of planning, implementation, management, operation, and maintenance of rural drinking water supply schemes. Women across the country need to be engaged consciously for long-term water security in villages.

Women have played an integral role in water management and policies need to be designed in a manner to enhance this role even further. This article draws on the experience of the Aga Khan Rural Support Programme (India), and many other NGOs and government departments in their work on rural water systems, both traditional and modern.

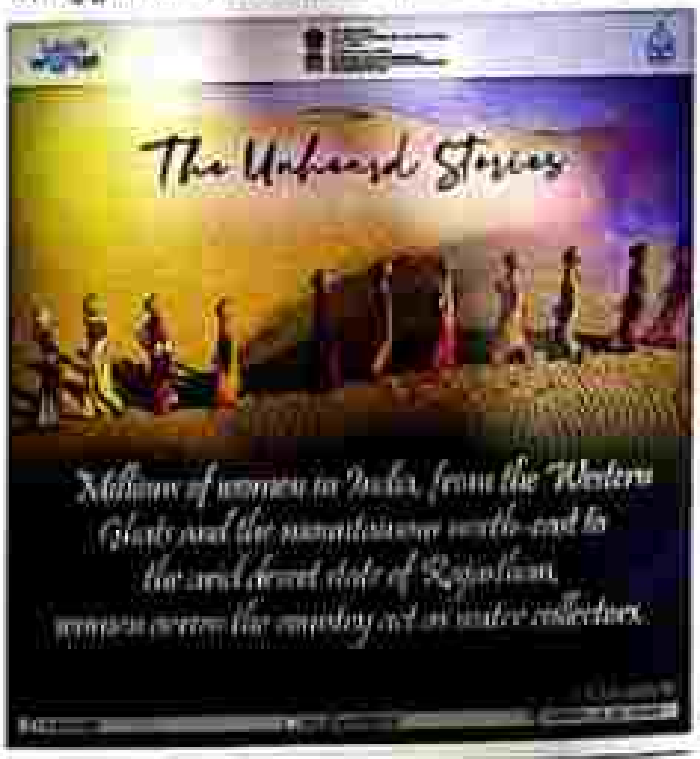
Water has four primary uses in rural areas:

1. Drinking water for humans
2. Drinking water for livestock
3. Water for irrigation
4. Water for ecosystem balance and restoration (common lands, forests, etc)

While women do play a key role in water for irrigation and livestock, we will first discuss their role in the provision of potable drinking water at the household level, which is the core aim of the Jal Jeevan Mission.

Gender roles: Ownership and Management

In most rural communities, the collection of drinking water has been traditionally allotted to women. They travel to different sources (wells, ponds, tanks, streams, rivers) to collect water, which they fetch mostly through pots. Young girls miss school to fetch water, and the drudgery of



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water collection is known to cause many health problems. Thus, the provision of water service at the household level would benefit women the most, and save them substantial time and drudgery. They have the most to lose when the system does not function due to this reason. Gender roles also make women the "health care-takers of the family". Hence, when children or the elderly fall ill, they have to take up the burden of health care at home. Thus, the poor quality of water which causes water-borne diseases also affects women the most. In some locations, when water collection has to be done in the early/late hours because of the erratic supply or nature of the source (sandy river bed), there are issues of women's safety also. In most communities, women not only collect water, but they are also primarily responsible for managing the drinking water at home: so any change in water timings, change in pressure/flow of water – affects women in the household the most. Being water carriers and water managers, women are traditional knowledge bearers of the season-wise water availability in different water sources, source-wise water quality as compared to men, as they use the sources and water every day. This knowledge is very useful for planning the water supply scheme.

Hence, within the larger rural community, because of the gender role division, women become the core stakeholder in the provision of Functional Household Tap Connections and therefore, are likely to contribute more effort and time, in both the development of the system and its management, if community mobilisation is done well. In many villages, we have found that it is the women who unite the men to develop a common plan for the drinking water system. Women often ensure that egos and political/caste differences do not affect community contribution or water rate collection which may otherwise lead to a system breakdown. They are also the first to know of health problems in the family, hence are keen to learn the link between water quality and health, the ways to test water quality and address its impurities through traditional (boiling) or new technologies (filtration). Of course, gender roles in fetching and managing water may differ or change based on i) location and distance of the source, ii) caste/ social norms, and iii) severity of scarcity or immediate needs at the household level.

For an equal society, we do want men also to take up an equal role in providing drinking water, but till this gender transformation takes place, we need to ensure that women are empowered in all decisions related to drinking water management in a village as they have the most to gain when a system works well.

By involving women, not only does the drinking water intervention become more effective and inclusive, but by giving voice to women in its implementation and management, the programme also empowers the women and enhances their respect in the village as community leaders /members who solve the problems common to the village, thus creating a gender transformative impact.

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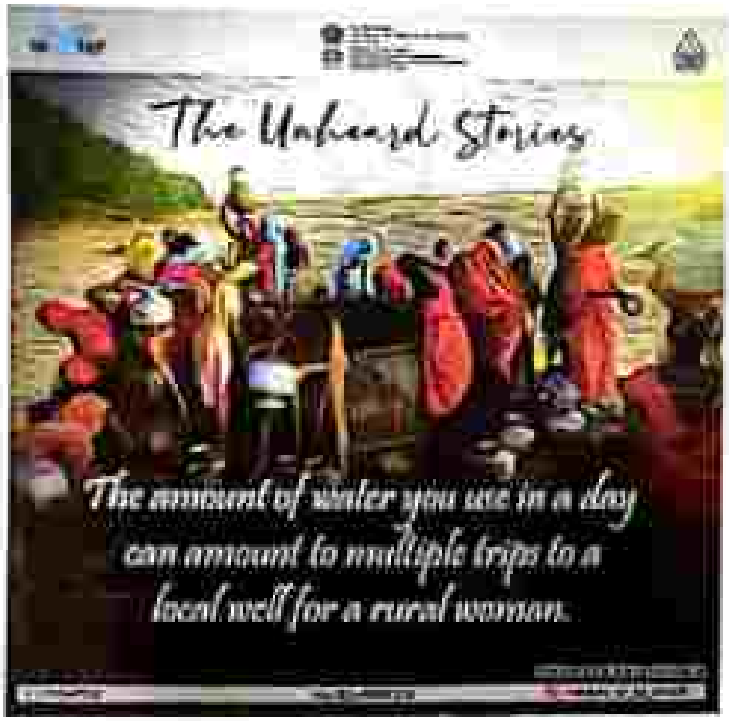

Hence, it is critical to involve women in decision-making processes at all the stages of planning, implementation, management, operation, and maintenance of rural drinking water supply schemes. There are many ways in which women's contribution can be sought and their voice be given weight:

1. Mandatory 50% participation of women, especially those belonging to SCs/ STs and OBCs, in the Village Water & Sanitation Committee (VWSC).
2. Separate meetings with women during the mobilisation process: The 73rd/74th Amendments of the Constitution and PRI Act make women's representation mandatory and many Gram Panchayats have woman Sarpanches. Each Panchayat has at least 1/3rd women and many states have 50% women representation in the Panchayat. These elected women representatives (EWRs) should be given greater powers in all water-related schemes and separate training empowering them in decision-making also.
3. Interaction with existing women's groups during the initial village visits: Thanks to National Rural Livelihood Mission, 12 Crore women are part of almost 1 Crore women Self-Help Groups (SHGs) all across the country. Many states have thousands of women's SHGs promoted by government departments or NGOs. These are platforms where women meet regularly. Many of these SHGs have women, mainly from economically weaker sections, and hence, involving them ensures the inclusion of the poor and vulnerable communities in the village.
4. Special recognition of VWSCs with women leaders or larger women's membership: For example, in Gujarat, additional funds were granted to villages with all-women VWSCs.
5. Gender sensitisation of the implementation team/ staff is essential and women should be part of the capacity building. Having women staff as part of the

community mobilisation team, but not restricted to, is an added advantage.

6. Have gender-specific IEC material, including gender-transformative rules for drinking water.
7. Involving trained women in critical decision-making, including planning, procurement, accounting, technical sanctions, financial sanctions, monitoring, and O&M.
8. Have at least 20% of women members in local technician teams.
9. Train at least five village women for the supervision of implementation, and later for a regular supply of water. Nominate and train women as *Jal Doots/ Bhu Jaankar*, if there is a cadre of water para-legal workers.
10. Make it mandatory to obtain a certificate about satisfactory completion of the schemes from women groups in the habitations in addition to the certification of panchayats which may be male-dominated.
11. Develop women entrepreneurs and SHGs/ local enterprises for water supply services like de-fluoridation treatment plants, water-testing kits, etc.

In Sehar Panchayats of Muzaffarpur and Samastipur, we have many examples of women SHGs not only contributing towards the planning and implementation of water schemes but also ensuring that water is tested regularly (paying Rs. 10/test) and closing hand-pumps where water quality is poor. Water charges are collected monthly (Rs. 30-100/month) and water operators are paid to run the system and manage the repairs and maintenance. Surplus income is used to extend the supply to newer households.

Rural women also play a key role in livestock management, hence they need to be involved in all provisions for drinking water for cattle. Women will ensure that the village plan has provision for cattle, especially in summer when water is scarce in many locations.

Irrigation uses up to 80% of the water in the country, hence its efficient and equitable use is critical. Women do 60% of the work in agriculture, and in many hilly and poor regions, they do the bulk of farming when men have migrated out. Yet, most irrigation committees have no women representation and miss out on the conservation and efficiency-based approaches that women bring to decision-making.

In Gujarat, there are many examples of tribal women taking a lead role in canal irrigation cooperative societies. Because of their holistic understanding of water, they ensure that there is enough water for irrigation and drinking water needs for livestock and drinking.

Thus, women across the country need to be engaged in rural drinking water supply schemes emotionally for long-term water security in villages. ❑

A Case Study of Goa

Parimal Rai

The State of Goa is cradled between the Arabian Sea and Sahyadri ranges, or the Western Ghats, spread across 3702 sq. kms. The resident population is 15 Lakh, but being a tourist destination of international repute, a floating population of more than 70 Lakh tourists visit the State annually. The annual rainfall in the State ranges from 2695 mm to 3008 mm.

Goa is gifted with many rivers viz., Terekhol, Chapora, Mandovi, Zuari, Baga, Sal, Saleri, Talpona, and Galgibag with several tributaries. Most of these rivers are perennial and some have seasonal variance inflow. Ground Water resources are estimated at 132.74 Mcum and total water resources are assessed at around 8,570 Mcum.

Surface Water and reservoirs are the main sources of raw water besides localised spot sources across the State. Most of the water treatment facilities available in Goa are of more than half a century old. The major drinking water supply is through water treatment plants, wherein the process involved is pumping from source, aeration, coagulation, flocculation, sedimentation, filtration, pre and post disinfection, collection into clear water tanks, and pumping to Master Balancing Reservoir or Overhead tanks. Supply through the transmission and distribution network is fed by gravity, except in the case of hilly terrain, or tail end consumers, where pumping is required.

The water supply demand is catered by 10 Regional Water

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Supply Schemes ranging from 5 MLD to 160 MLD covering Multi Village Schemes and Single Village Schemes with spot sources covering the remainder of the State. A few locations use pressure filters and nanofilters are used for spot sources in the hinterland. It contributes to around 1.42 MLD. There are other areas, where water treatment facilities with flow stream raw water, tube wells, and open wells, totaling 6.33 MLD.

All the consumers in the State, which is approximately three Lakh, have metered connections, and regular testing is performed to ensure that water conforming to the BIS 10500:2012 standard is guaranteed to every household. The State has already adopted computerised billing to ensure accuracy; one district even provides "On The Spot Billing" using the water supply billing application. The water billing has been successfully rolled out to all consumers, with affordable water tariffs to all.

Jal Jeevan Mission had a mandate to provide functional household tap connections to all rural homes in the State, which was amended to include urban households by the Union Finance Minister during the presentation of the Budget of 2021-22. The mission objectives dovetailed perfectly with the work that the government of Goa had already started, so the State immediately acted upon the opportunity. The Government of Goa had recognised

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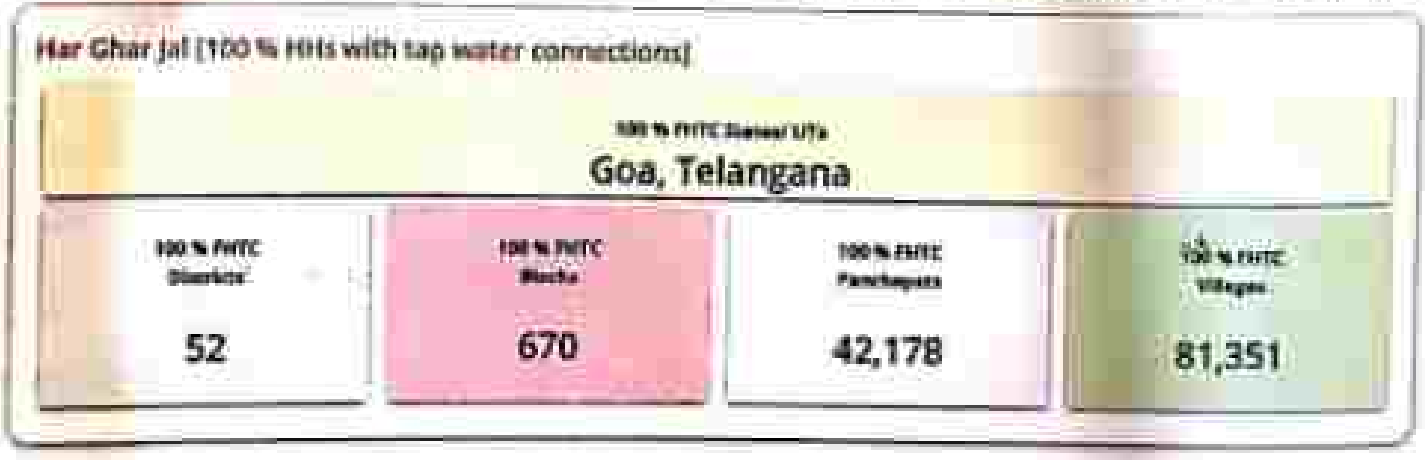
the need to assure piped drinking water to every citizen. The aim was to improve their quality of life and make the State more efficient and business-friendly. The Public Works Department (PWD) was tasked with the challenge to modernise and improve the water supply system that still utilized assets and pipelines that had outlived their utility and required immediate replacement.

With assistance from the National Jal Jeevan Mission, the State is hoping to adopt the concept of "Drink From Tap" with an assured supply of clean drinkable water, 24 hours a day. A host of technology initiatives will help ensure the quality and quantity of the supplied water to develop a "Smart Water Utility" for the State of Goa.

While Goa receives abundant rainfall, and adequate sources of freshwater, its water pipeline assets were ageing and in need of an upgrade. Replacing large swaths of pipelines would incur a huge financial burden, and disrupt supply, so a plan was required. PWD decided to review various technology solutions that could help strategically approach the problem. The mandate was to move ahead at a rapid pace while adopting a low-cost solution.

The goal was to use a smart GIS system to document the existing infrastructure, before attempting to upgrade it. The PWD partnered with a local "Startup" working on Water Utility Management Systems and adopted their smart platform to provide the requisite tools.

Goa adopted an Integrated Utility Management platform that acted as a Single System of Reference for all Asset data. The most successful feature of the platform was the fact that it was accessible on mobile phones and devices in the field. This allowed simultaneous data collection across the State, while the same was monitored by many people. The "Made in India" solution was able to serve the needs of the PWD, at a fraction of the cost of imported products. Major Water Supply assets were catalogued on a GIS platform



along with additional information that would assist in decision making.

In 2019, the Hon'ble Prime Minister announced the bold initiative, Jal Jeevan Mission, to provide functional household tap connections - Har Ghar Jal - by 2024. The comprehensive program takes an integrated approach covering the journey of water, from its source to our homes, and then back again to recharge the source.

Goa had already achieved the primary mission objective of providing 100% tap water connections to all homes on October 2, 2020, well ahead of schedule, so it was decided to go a step ahead and build a system that would rival international standards. It is important to note that the target of 100% connections was only possible because the State invoked a special provision in the Health Act, whereby the concerned Health Officer can direct the PWD authorities to provide a water connection to households, that don't have water connections. This provision has enabled the State to cover households that do not have valid legal documents of their houses/properties or in cases where the landlord refuses to provide a NOC for the release of water connections.

Jal Jeevan Mission recommends the use of sensors that monitor important safety parameters at various points to guarantee the quantity and quality of our water supply while minimizing distribution losses. Under the aegis of the Jal Jeevan Mission a pilot project to be executed in the Village of Taleigao, North Goa. The project will connect with the Integrated Utility Management Platform and provide live IoT data from multiple sensors.

With assistance from the National Jal Jeevan Mission, the State is hoping to adopt the concept of "Drink From Tap" with an assured supply of clean drinkable water, 24 hours a day. A host of technology initiatives will help ensure the quality and quantity of the supplied water to develop a "Smart Water Utility" for the State of Goa.

Additional modules were added to the Integrated Platform to provide the following functions in one system:

1. GIS-based catalog of Assets
2. Single System of Reference to allow collaboration of all employees.
3. Asset Maintenance Tracking System
4. Public Grievance App
5. Real-Time IoT sensor data integrated with the GIS platform.
6. Targeted Messaging System to disseminate information.
7. Command and Control System
8. Effective Dashboards keep all stakeholders informed
9. Analytics and Decision Support System

Unlike standalone systems, the integrated platform can magnify the benefits of individual systems. The collaborative nature of the system allows all stakeholders to share a common view of the problem. A Geo-tagged Citizen Grievance App allows consumers to provide important input and feedback that can help diagnose problems.

Brief of the Pilot Scheme

Seven bulk flow meters will monitor the water coming into the village of Taleigao on a real-time basis. The flow data is correlated with the number of consumers served to ensure that each household is provided a sufficient amount of water. Quality Tests conducted periodically will be published on a public dashboard, to build consumer confidence that their tap water is fit for drinking, without the use of any kind of RO or filter equipment.

In the absence of appropriate data, a Water Utility is forced to only react in the event of a break. The goal of the Integrated Platform was to provide analytics data related to the age, and other risk parameters of the equipment. The data allows us to undertake Preventive and Predictive Maintenance to attend to assets that are at risk of failure. This ensures minimum wastage of water and more stable delivery of service. The problem of ageing infrastructure can now be solved in a strategic and planned manner while minimising the disruption of the water supply.

A public dashboard and mobile app will be used to keep consumers informed about water quality parameters, and service alerts in their area. The GIS system can identify the Area of Influence of a pipeline to disseminate information to specific consumers, in the event of a failure, or scheduled maintenance.

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The Integrated Utility Management Platform, which was built by a Goa-based startup was praised for its design, and recognised as a first in the country. The experts further stated that this platform could be successful in international markets, and the same may be considered.

Plans for the future

Goa has a vision to build a predictable and assured Water Utility so that consumers can have confidence in the availability and quality of their tap water. Consumers would be informed in advance about any service outages, in a targeted manner to minimise the impact and allow them to plan their lives better. If service quality and public trust are achieved, then consumers can drink water directly from the tap with a high degree of confidence and peace of mind.

Water Utilities across the world are attempting to go beyond the simple delivery of water. Regulatory compliance, Customer Service parameters, and Assured Service Levels are the new benchmarks. These changes are not necessarily more expensive, since the added cost is offset by fewer breakdowns and reduced economic hardships to citizens at large. Internet of Things (IoT) devices are low-cost gadgets that can help us monitor various parameters linked to the health of a system. The strategic use of IoT devices, combined with an analytics platform will allow the State to monitor the real-time status of its infrastructure. The Government of Goa has an ambitious plan to be more proactive in these maintenance parameters and act as a model for other Utilities in India and abroad. ❑

Technological Innovation for Assured Water Supply

Pradeep Singh
Siddhant Masson

The requirement of transparency, accountability, and prudent expenditure of public funds during implementation while ensuring speed and scale is being done by monitoring village level implementation through Dashboard. The information of every scheme is being stored in a central JJM-Integrated Management Information System with details of cost, infrastructure, water-source for each habitation in villages.

Clean drinking water is a basic need. It is a key requirement for any society to exist. Based on the report of NSS 78th Round, about 87.6 percent of the households in the rural areas, about 90.9 percent of the households in the urban areas, and about 88.7 percent of the households in total had sufficient drinking water throughout the year from the principal source. Further, about 94.5 per cent of the households in the rural areas, about 97.4 percent of the households in the urban areas, and about 95.5 per cent of the households in total used 'improved source of drinking water'.

At the same time, the average annual per capita water availability in the years 2001 and 2011 was assessed as 1,816 cubic meters and 1,545 cubic meters respectively which may further reduce to 1,486 cubic meters and 1,367 cubic meters in the years 2021 and 2031 respectively. Thus, it is high time that we secure the water for drinking purposes else we will have to do it by compulsion. We should design the system in such a way that drinking water should never become a limiting factor for the growth, wellbeing, and development of our society. Recognising the need, the Government of India in 2019 announced the Jal Jeevan Mission to provide all the households in villages with functional household tap water connection (FHTC) by 2024.

To develop a long term, resilient water supply infrastructure in villages an investment of 3.60 Lakh crore is being made for more than 6 lakh villages across the country through Jal Jeevan Mission in a time-bound manner with a very specific quantifiable objective of providing a minimum of 55 lpcd of water, of IS10500-2012 BIS standard quality on a

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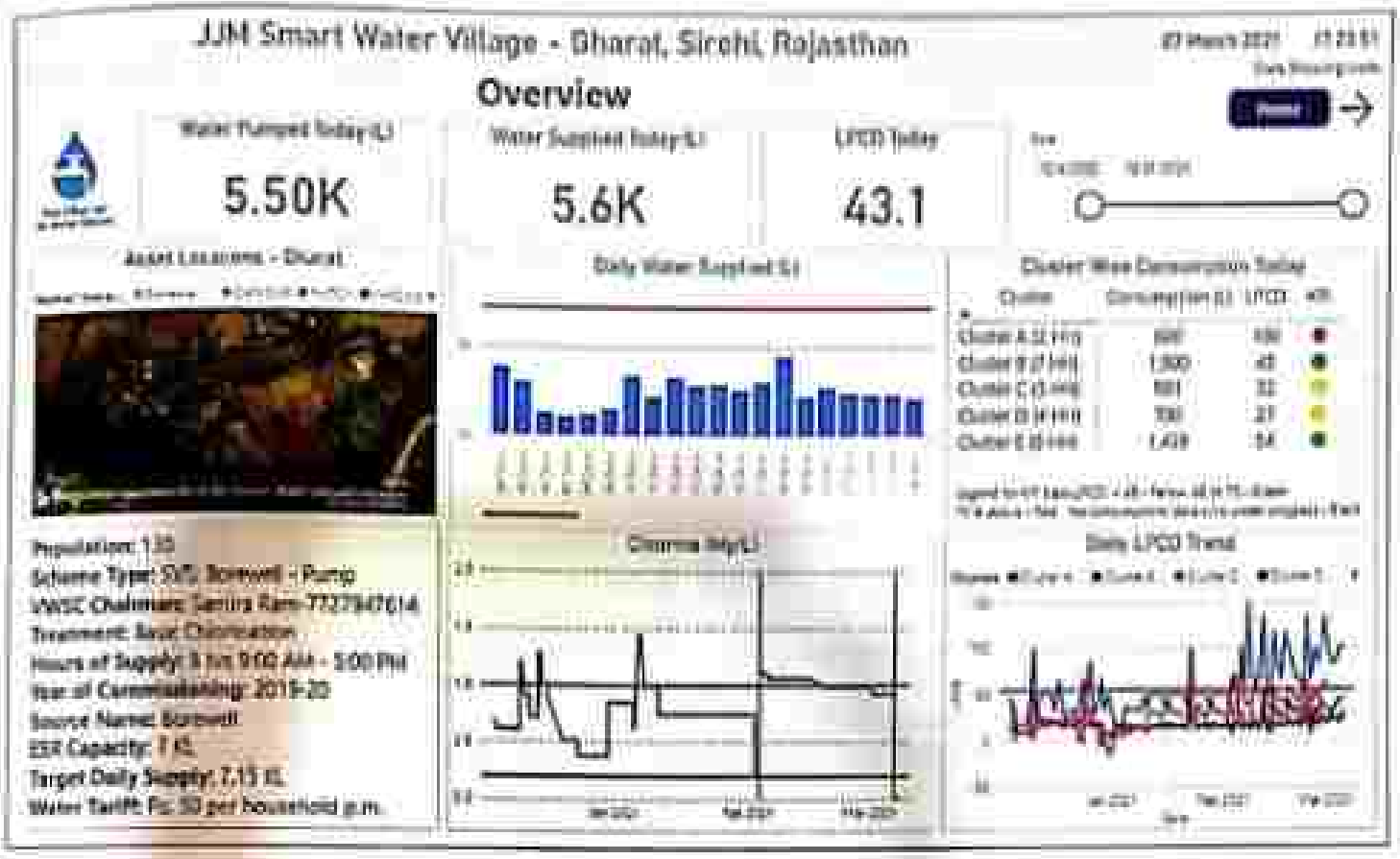

regular and long-term basis. There is a systematic shift in the approach of rural water supply from infrastructure creation to meeting water-service delivery benchmarks. This means that a holistic approach has to be made taking into account source and system sustainability, greywater management, operation and maintenance, community participation, a convergence of funds at the village-level to ensure long-term and regular supply. The Jal Jeevan Mission is focusing on the use of technology in a significant manner to take into account these aspects both at the implementation as well as a post-implementation stage to achieve this objective.

The requirement of transparency, accountability, and prudent expenditure of public funds during implementation while ensuring speed and scale is being done by monitoring village level implementation through Dashboard'. The information of every scheme is being stored in a central JJM-Integrated Management Information System with details of cost, infrastructure, water-source for each habitation in villages. The use of a public fund management system (PFMS) by States/UTs is being ensured for payment in an online manner. The tap water connection provided to every household is being tagged with the Aadhaar number of the head of household.

The Jal Jeevan mission is taking advantage of the digital revolution in India to ensure the existing problems in the rural water supply are addressed. The village water supply in India encounters several issues like premature drying up of source, poor raw water quality, pump assembly failure or insufficient intake by pump, insufficient water or poor-quality water produced at treatment plant, overflowing of water storage unit, frequent leakages, and difficulty in detecting minor leakages, inadequate pressure in pipes, etc. Due to these issues, in most cases, the women of the house has to toil, often on foot over hours. It often also leads to several water-borne diseases which could have easily been avoided had the water supply scheme been functional. The disruption caused is not just physical and mental, but also economic if we consider wage loss and expenditure on health care into account.

A holistic approach has to be made taking into account source and system sustainability, greywater management, operation and maintenance, community participation, a convergence of funds at the village-level to ensure long-term and regular supply.

These issues can be addressed if we have a system to accurately monitor the water supply performance and ensure the accountability of a responsible person. The challenges of effectively monitoring and managing rural water supply systems across the length and breadth of a vast and diverse country like India are daunting. Some villages are so remote that they are difficult to reach physically rendering the traditional methods of monitoring

ineffective. Even in other villages, the visibility of issues is rather poor – it takes days before senior officials are notified about the problems being faced by the community.

To address the above challenges, the Jal Jeevan Mission has advocated taking the digital route to effectively monitor water supply in each village. It was decided to explore the Internet of Things (IoT) based remote monitoring which provides real-time information by using sensors and communication infrastructure without any manual intervention. This would not only allow effective monitoring and management on the ground, but also enable real-time 'visibility' to senior officials, people representatives, and citizens. The JJM envisions creating a Digital Wall and Remote Command and Control Center for monitoring and managing supply of good quality water every day to all of more than 19 Crore rural households of India.

Jal Jeevan Mission has advocated taking the digital route to effectively monitor water supply in each village. It was decided to explore the Internet of Things (IoT) based remote monitoring which provides real-time information by using sensors and communication infrastructure without any manual intervention.

The pilot studies undertaken for such project has demonstrated that technology-enabled real-time monitoring leads to positive behavioural change thereby ensuring significant gains in socio-economic and health parameters for the village communities:

- **Equitable distribution of water** – all clusters now get water supply (adequate quantity and pressure); recognition of low-pressure issue in two clusters led to the community installing two gate valves to regulate pressure;
- **Long term sustainability of water source**: Observing the fast-depleting groundwater level on a TV screen dashboard on a real-time basis led to the awareness in the community to create rainwater harvesting structures and management of watershed;
- **Regular chlorination process at the service reservoir**: 'Visibility' of chlorine levels on the TV screen dashboard created awareness and led to another behavior change of getting regular disinfection done by local community operator;
- Other benefits observed at the pilot sites include **efficient and responsible use of water by consumers** due to household level metering and **reduced cost of operations** through data-enabled leak detection, predictive maintenance, and automation.

On a systematic level, the benefits of such a system will include minimisation of Non-Revenue Water (leakage and unauthorized connections), reduction in repair and maintenance costs with predictive maintenance and automation for pump, reduction in excess manpower, efficient use of resources (water and electricity), and reduction in wage loss and healthcare costs for villagers.

The Jal Jeevan mission has undertaken two initiatives to create an ecosystem to roll out such a system on a pan-India scale. The partnership with start-ups, entrepreneurs, industry partners was sought to take up this challenge and provide the solution. In collaboration with the Ministry of Electronics and Information Technology (MeITY), a grand challenge has been launched. The challenge has been successful in providing correct signal to IoT industry and gives a boost to the idea of *Aatma Nirbhar Bharat*. At present four indigenously developed solutions have emerged that are being taken for testing in village conditions at several locations in the country.

For assurance of water quality at the household level all the water testing laboratories under the control of rural water supply/ public health and engineering department have been opened to public for testing of water samples. The network of labs is also being strengthened with 2% funds exclusively earmark for this purpose. The accreditation and recognition of all labs by NABL is being made compulsory so that improvement in the quality of testing at the laboratory level takes place. It is being encouraged that all the water quality testing data i.e. from testing data from labs, testing data from villages through field test kits (FTKs), and data from sensor devices will be put up on a web portal called JJM-WQMIS so that data can be cross-checked and corrective actions can be taken immediately.

To democratise the testing of water further, in both urban and rural areas, another technology challenge has been launched with DPIIT to develop portable devices to test the quality of water. This device, when developed can be used to test the quality of water from the comfort of the house. This will increase the trust of people in supplied water and enable them to drink water from tap and avoid wasteful expenditure on water purification plants.

With a partnership with States/ UTs, the Jal Jeevan Mission is rolling out this vision to secure the availability of potable water at the household level and ensure the 'ease of living' of people living in rural areas. ❑

Reference

1 The JJM-dashboard can be accessed through weblink https://ejalshakti.gov.in/jjmreport/

Inside India's Inland Waterways Plan

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The use of inland waterways has opened up a whole new innovative vision of transportation in India combining speed and safety. By revitalising its extensive waterways resources, India is creating a new and safe future, and looking to generate significant revenues.

Indian history is full of tales of goods travelling up and down its many rivers. Before the coming of the railways, and even after it, for a long time, it was the country's waterways that were the arteries of moving India, its people, and goods. Independent India created the Inland Waterways Authority of India (IWAI) in 1986 to help maintain and energise infrastructure around key inland waterways.

Five such waterways were identified at that time: the Ganga-Bhagirathi-Hoogly river system between Haldia (Sagar) and Allahabad (1,620 kilometres), the river Brahmaputra between Sadiya and the Bangladesh border (891 kilometres), a third set made up of the west coast canal (Kottapuram to Kollam), the Udyogamandal canal, and the Champakara canal, a total of 205 kilometres, the Kakinada-Puducherry stretch of canals between Bhadrachalam – Rajahmundry stretch of River Godavari and Wazira – Vijayawada stretch of River Krishna (1,078 kilometres), the Talcher- Dhamra stretch of River Brahmani, Geonkhali-Charbatia stretch of the east coast canal, the Charbatia-Dhamra stretch of River Mahanadi and the Mangalgadi-Paradip stretch of Mahanadi delta rivers (623 kilometres).

These waterways have served India well for seven decades, and in recent years, there has been renewed momentum to explore the full potential of the country's inland waterways. This is especially because India has an elaborate network of inland waterways in the shape of rivers, canals, backwaters, and creeks. Of the total length that can be navigated 20,236 kilometres, 17,980 kilometres of the river and 2,256 kilometers of canals can be used by mechanized crafts.

For many years, freight transportation by waterways has been utilised well below its potential, especially when mapped to the use of inland waterways in other countries like the United States, China, and the European Union.

To transform this situation and make the best use of the inland waterways' potential of India, 106 additional inland waterways were declared as national waterways through The National Waterways Act, 2016[1].

Before it became law, the National Waterways Bill 2015, noted that "due to large network of feeder State highways, district roads and village roads, the potential of National Highways have been exploited fully. However, the absence of such a network for waterways has resulted in gross underutilisation of the potential of National Waterways. State Governments have not been able to take adequate measures for the development and maintenance of inland waterways due to insufficient financial outlays, lack of expertise and other pressing priorities. Thus, only Central Government has to take the initiatives to develop this sector [and that] as per the Constitutional provision, Central Government can undertake development and regulation of an inland waterway for navigation only when it is declared as a National Waterway (NW) by an Act of Parliament[2]".

Therefore, a new law had to be introduced to subsume the older national waterways and introduce a new range of national waterways for rejuvenation and the introduction of new ideas on India's rivers – from goods and services transport to recreation.

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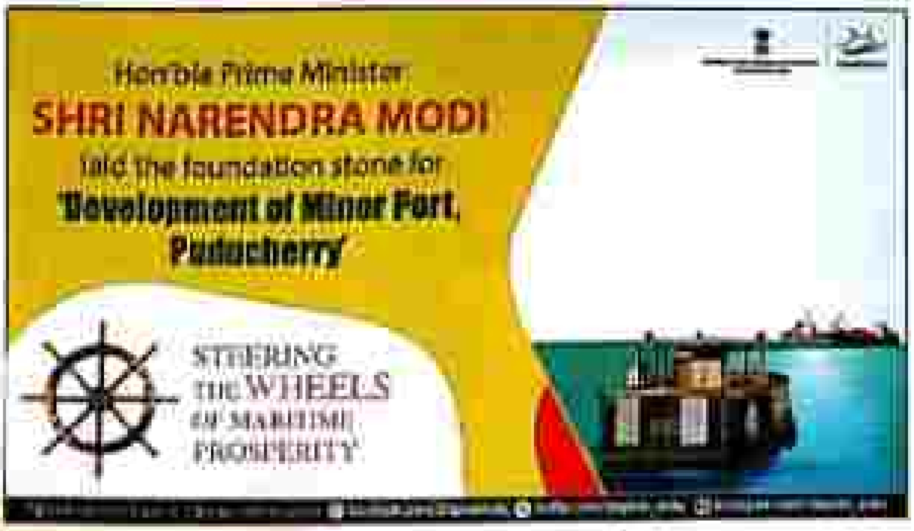
The Parliamentary Committee studying the matter before the Bill was passed also noted the vital contribution of water-based transport to safety and revenues by pointing out that "the national highways are contributing to about 40% of the road accidents and trucks being the major contributor in this. Water transportation being the safest mode, can reduce road accidents and result in casualties significantly. It also reduces treatment and rehabilitation costs to a great extent. Moreover, the land acquisition for the highways/roads have been a major problem which is not only a sensitive issue, it is high time taking and costly exercise. There is a shortage of free land for road construction. Switching to water mode, therefore, would become the most viable option to reduce the dependency on roads, particularly for the transportation of bulk and containerized cargo. Waterways have lots of tourist potential especially for pilgrimage as many famous pilgrim centres are mainly located on river side[3]".

In 2020, the Ministry of Shipping declared that all usage charges from waterways would be removed, for an initial period of three years, to promote the greater commercial and tourist exploration of the inland waterways network. This was done to promote the idea that inland waterways could serve as a supplementary mode of transport that is not only more economical but also environment friendly.



The existing rate of usage of the inland waterways system stood at a mere 2 per cent of total cargo traffic. All vessels using the national waterways were charged a waterway usage cost. These charges stood at INR 0.02 per gross registered tonnage (GRT) per kilometre for inland cargo vessels and INR 0.05 per gross registered tonnage per kilometre for cruise vessels. This became an impediment to efficient monitoring of traffic movement in the waterways, and also hindered the collection of traffic data.

These factors led to the decision to waive the charges, and the move is expected to reduce the costs to industries, simplify administration, and ultimately promote ease of doing business in the country. It is also estimated that more vessels will make use of inland waterways, with traffic expected to rise to 110 MMT in 2022-23 from 72 MMT in 2019-20[1].

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While India's national highway network is unparalleled in terms of connectivity, there are many reasons due to which the promotion of a supplementary mode of transport has become imperative. This is evidenced in the signing of a Memorandum of Understanding (MoU) between the Inland Waterways Authority of India and the MOL Group, which is a global leader in gas carriers. MOL (Asia Oceania) Limited is investing in the construction and operation of LPG (Liquified Petroleum Gas) barges, as part of the Government's Make in India initiative.

The MoU comes at a time when approximately sixty per cent of Liquefied Petroleum Gas in the country is being transported via road, at a high cost of five to six rupees per metric tonne per kilometre. Additionally, costs have risen in the wake of transporters' strikes and road blockades, which made looking towards inland waterways the most feasible solution.

The LPG, according to the agreement signed would be carried via the barges on National Waterways 1 and 2. The usage of waterways will reduce the logistical costs that were being faced earlier, which in India stand at a high 13 to 14 per cent of GDP as opposed to a global average rate of 8 per cent. The eco-friendly nature of inland waterways provides another important result of this MoU, namely a reduction in our carbon footprints[4].

Therefore, the use of inland waterways has opened up a whole new innovative vision of transportation in India combining speed and safety. For the 2016 Act, the country now has a total of 111 inland waterways which are marked as national waterways and the total length of the national waterways is 20,275 kilometres spread across 24 states[6].

A novel era of transport of water has dawned in India. ◻

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'Azadi Ka Amrit Mahotsav', India@75 launched

Azadi Ka Amrit Mahotsav is a series of events to be organised by the Government of India to commemorate the 75th Anniversary of India's Independence. The Mahotsav will be celebrated as a Jan-Utsav in the spirit of Jan-Bhagidari.

The Prime Minister flagged-off the 'Padyatra' (Freedom March) from Sabarmati Ashram, Ahmedabad, and inaugurated the curtain-raiser activities of the 'Azadi Ka Amrit Mahotsav' (India@75). Other cultural and digital initiatives for the India@75 celebrations have also been launched.

Addressing the gathering at Sabarmati Ashram, the Prime Minister stated that the launch of the "Azadi Ka Amrit Mahotsav" 75 weeks before August 15, 2022 which will continue till August 15, 2023. He paid homage to Mahatma Gandhi and great personalities who laid down their lives in the freedom struggle. The Prime Minister reiterated five pillars i.e. Freedom Struggle, Ideas at 75, Achievements at 75, Actions at 75, and Resolves at 75 as guiding forces for moving forward keeping dreams and duties as inspiration. He asserted that Azadi Ka Amrit Mahotsav means elixir of the energy of independence. It means elixir of inspirations of the warriors of the freedom struggle; elixir of new ideas and pledges and nectar of Aatmanirbharta.

Azadi Ka Amrit Mahotsav is an initiative of the Government of India to celebrate and commemorate 75 years of progressive India and the glorious history of its people, culture, and achievements.

This Mahotsav is dedicated to the people of India who have not only been instrumental in bringing India thus far in its evolutionary journey but also hold within them the power and potential to enable PM's vision of activating India 2.0, fuelled by the spirit of Aatmanirbhar Bharat.

Azadi Ka Amrit Mahotsav is an embodiment of all that is progressive about India's socio-cultural, political, and economic identity. The official journey of "Azadi Ka Amrit Mahotsav" commenced on March 12, 2021 which started a 75-week countdown to the 75th anniversary of Independence. ❑

Website: www.india75.nic.in

DO YOU KNOW?

History of Sanitation Programme in India

The first sanitation programme for rural India was introduced in 1954 as a part of the First Five Year Plan of the Government of India (GoI). Given that the 1981 Census revealed that rural sanitation coverage was only 1%, a greater emphasis was then given to rural sanitation during the International Decade for Drinking Water and Sanitation (1981-90). The GoI introduced the Central Rural Sanitation Programme (CRSP) in 1986 with the primary objective of improving the quality of life of rural people and providing privacy and dignity to women. From 1999, a "demand-driven" approach under the "Total Sanitation Campaign" (TSC) was adopted. It emphasised Information, Education and Communication (IEC), Human Resource Development (HRD), and Capacity Development to increase awareness regarding safe sanitation leading to demand generation for sanitary facilities. This enhanced people's capacity to choose appropriate options through alternate delivery mechanisms as per their economic condition. Financial incentives were provided to Below Poverty Line (BPL) households for construction and usage of individual household latrines (IHHLs), in recognition of their achievements. The 'Nirmal Bharat Abhiyan' (NBA), the successor programme of the TSC, was launched on April 1, 2012. The objective was to accelerate the sanitation coverage in the rural community through renewed strategies and a saturation approach. NBA worked towards achieving the necessary outcomes to create Nirmal Gram Panchayats. Under the NBA, the incentives for IHHLs were enhanced and further support was obtained in convergence with MGNREGS.

While the above-mentioned programmes made some progress for the rural sanitation landscape of the country, in the census of 2011, rural sanitation coverage (households with individual latrines) was found to be only 33%.