

Jal Jeevan Samvad

November | 38th Edition | Year 2023



Har Ghar Jal
Jal Jeevan Mission

Building Partnership
Changing Lives



Special Feature
Source Sustainability

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Prime Minister on Water



Narendra Modi
Prime Minister

अमरेली में हुए 'जल उत्सव' के दौरान 'जल संरक्षण'
और झीलों के संरक्षण को लेकर लोगों में जागरूकता
बढ़ाई गयी। इसमें *Water Sports* को भी बढ़ावा दिया
गया, *Water Security* के जानकारों के साथ मंथन भी
किया गया। कार्यक्रम में शामिल लोगों को तिरंगे वाला
Water fountain बहुत पसंद आया।

PM Narendra Modi's Mann Ki Baat:
107th Episode with the Nation, 26th November, 2023

Note from the desk of Additional Secretary & Mission Director...



New Delhi
30th November, 2023

November arrives with a resounding sense of achievement as the Jal Jeevan Mission attains a commendable 70% coverage, a milestone that resonates with the heartbeat of rural India. Access to clean piped water now touches more households, promising improved health, increased opportunities, and a profound sense of happiness. As we celebrate this significant stride, it is imperative to acknowledge that our mission goes beyond mere provision; it extends to the sustainable usage of water and operation and maintenance of water sources, ensuring their vitality in the long run.

Jal Jeevan Mission has not merely laid pipelines; it has sown the seeds of a transformative culture — one that embraces innovation and champions sustainable water usage. This month, our focus revolves around the cornerstone of this cultural shift: Source Sustainability. Our Rural WASH Partners have been working relentlessly in collaboration with the state and local governments, employing a diverse range of skills and resources to strengthen the very sources of our water supply. Jal Jeevan Mission has nurtured a strong ethos of collaborations. Today, our success and accomplishments are the subsequent result of the same.

In the heartland of India, Uttar Pradesh stands as a testament to the commitment towards water resource protection and conservation. With a keen eye on Source Sustainability of Drinking Water, the state is following a number of resource protection and conservation interventions, such as Jal Shakti Abhiyan- Catch The Rain (JSA-CTR), Greywater Management under Swachh Bharat Mission (Grameen) 2.0 (SBM -II) and Atal Bhujal Yojana (ABHY).

The Jal Shakti Department in the Union Territory of Jammu and Kashmir has been actively engaged in spring rejuvenation workshops and other initiatives, which, when paired with community empowerment, exemplify the essence of the Jal Shakti Abhiyan – Catch the Rain Campaign 2023.

Many actions are being taken on the ground. In the ensuing pages you will read about Chirana, a village located in Jhunjhunu district of Rajasthan where several households are connected under an effective system to restore water levels and for greywater management.

Patan block of Durg District, Chhattisgarh has demonstrated a viable model for groundwater recharge adopting the watershed approach.

Enhulumi village in Phek District of Nagaland has also taken an initiative that involves adopting springshed management principles integrated with a community-centric approach and scientific assessment.

In this month's newsletter, many such stories and experiences have been covered that will give the readers a detailed insight into the various mechanisms, techniques and efforts that are being used to strengthen the objective of Source Sustainability.

Technology has become an indomitable ally in this endeavour for sustainable water sources. Measures like aquifer recharge, rainwater harvesting, increased storage capacities, reservoir management, and de-silting are not just technical terms; they are the lifelines that enhance the lifespan of our water supply systems.

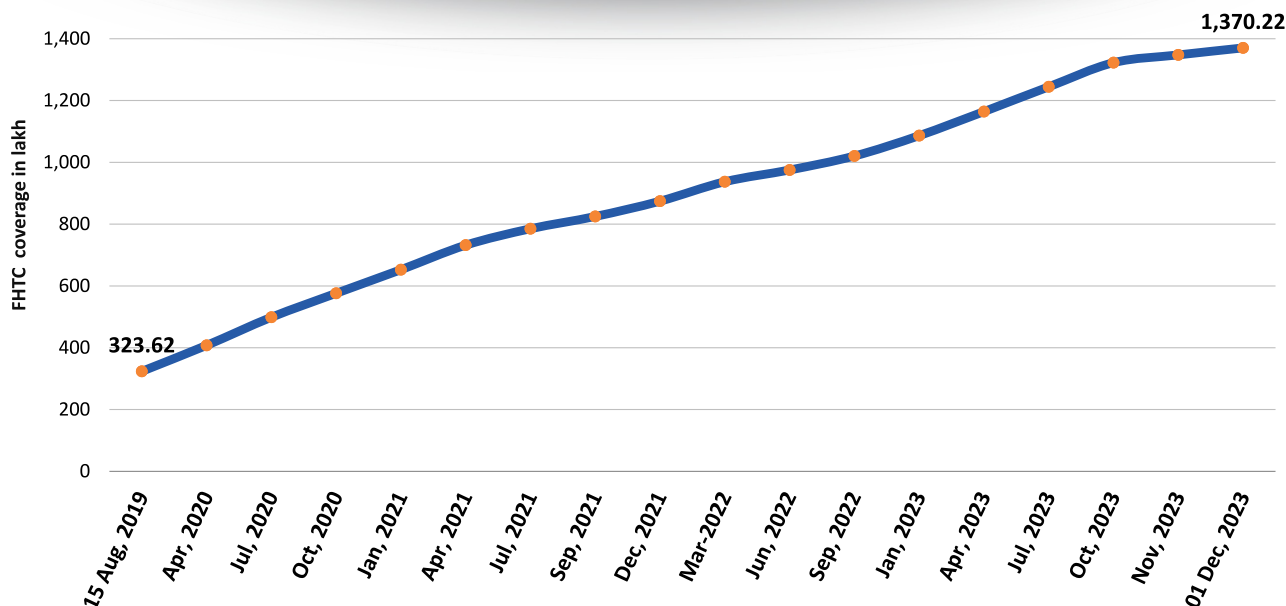
Community ownership emerges as a key player for in-village water supply system sustainability. Engaging communities in planning, implementation, and management is not just a strategy; it is a principle that ensures the longevity of our water supply systems. Our mission revolves around the development of reliable drinking water sources, with a keen eye on augmenting existing ones, thereby promising a sustained water supply system for the long term.

Regular training and capacity-building programmes on water sustainability form the backbone of our commitment to this cause. Our Nal Jal Mitra Programme has been initiated in this direction in order to equip and empower the rural people with necessary skills for Operation & Maintenance (O&M). This platform will bring people from various States/ UTs together to share knowledge, skills, and experiences, fostering a collective wisdom that propels us forward.

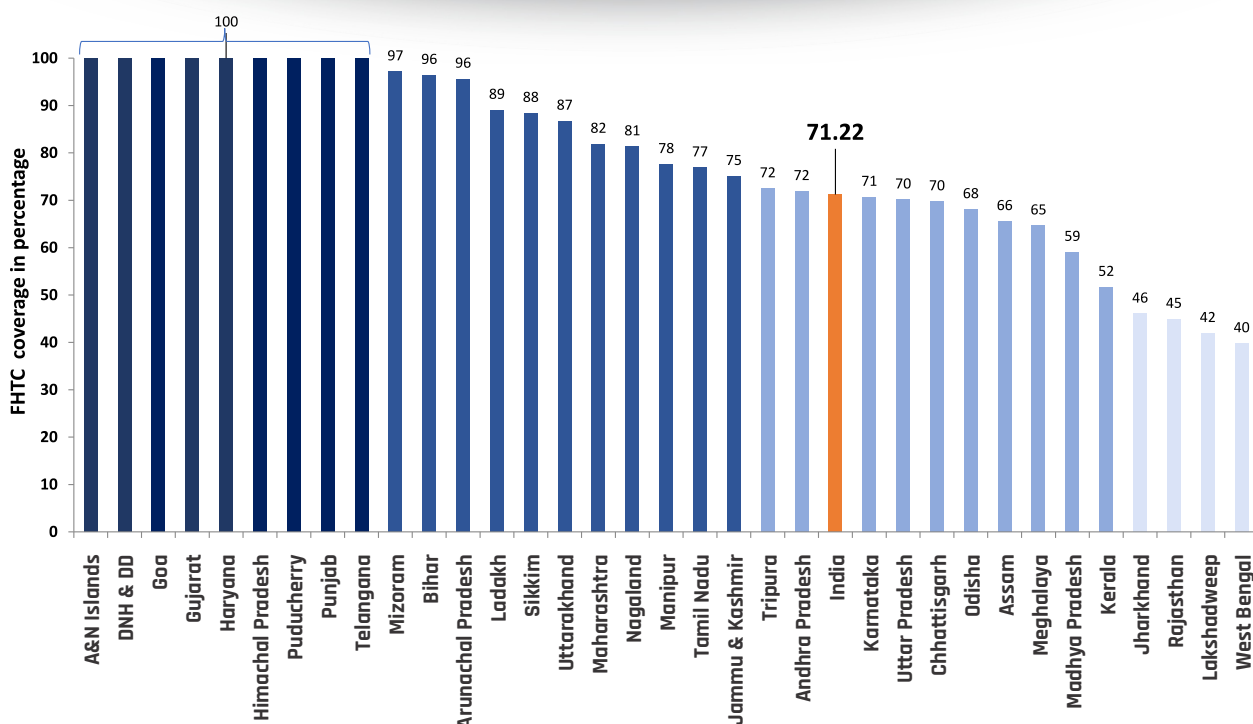
Our thrust for the future is to make our water sources sustainable for rural population. As we navigate in this direction, let us cherish the strides we have made, learn from the ground-level innovations, and continue our journey towards a future where every drop of water is not just a source but a promise of sustenance and vitality.

[Vikas Sheel]

Progressive coverage - Functional Household Tap Connection (FHTC) (as on 30.11.2023)



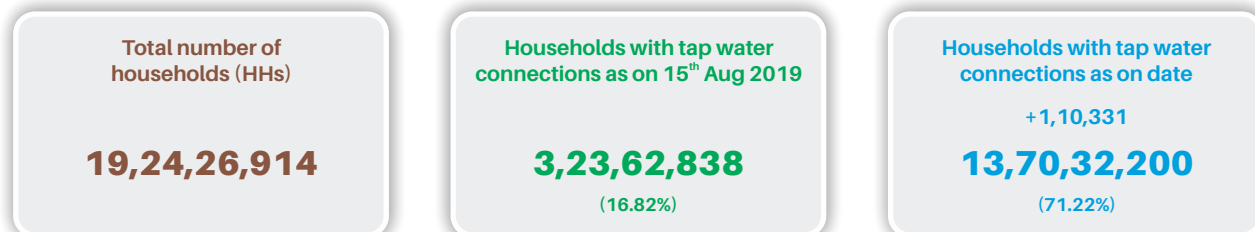
Comparative FHTC coverage status of States/ UTs (as on 30.11.2023)



As on 30th November, 2023

Source: JJM-IMIS

India | Status of tap water supply in rural homes



Households provided with tap water connection since launch of the Mission

10,45,59,031 (54.40%)

Har Ghar Jal [100% HHs with tap water connections]

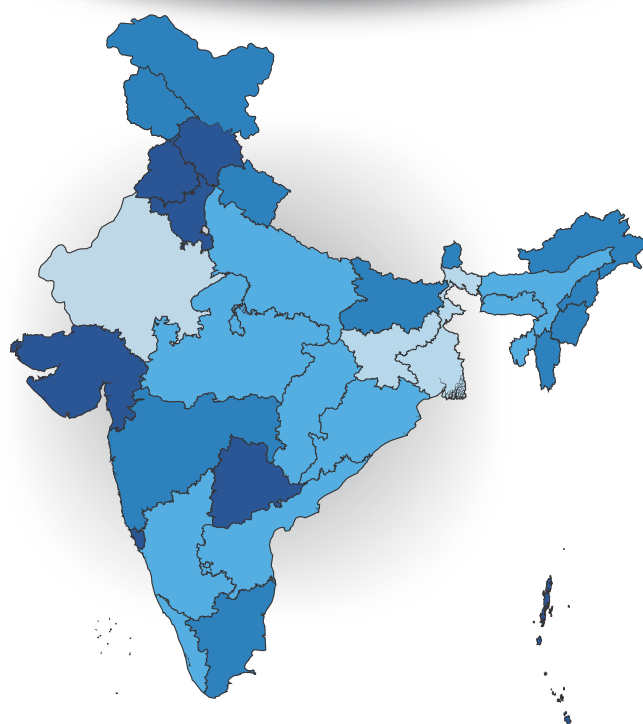
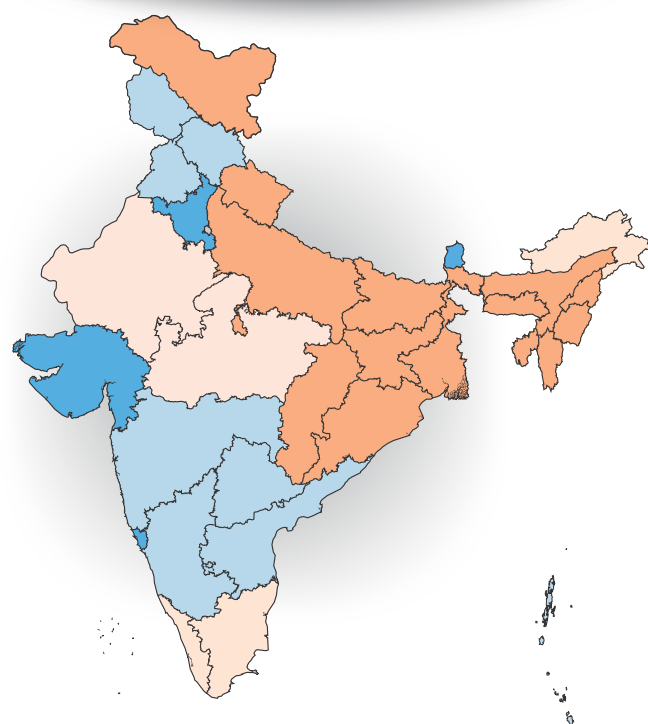
100% FHTC States/ UTs

Goa, A & N Islands, Puducheerry, D&NH and D&D, Haryana, Punjab, Telangana, Gujarat



As on 15th August, 2019

As on 30th November, 2023



0 to <10%

10% to <25%

25% to <50%

50% to <75%

75% to <100%

100%

'Water Guardian' A Cadre of School Children to Sustain the Efforts of Jal Jeevan Mission

- PHED Meghalaya
and
Amit Ranjan
NJJM

The state of Meghalaya launched a campaign in the month of August 2023 to create awareness, sensitise and engage school children. In line with Empowering Communities for Water Conservation, the Public Health Engineering Department, Meghalaya launched 'Water Guardians: Strengthening Sustainable Communities' campaign under Jal Jeevan Mission.

The campaign embodies the very essence of water conservation and sustainable practices, and aims to honour the spirit of innovation, community engagement, and

enduring commitment that village communities have displayed in safeguarding their water resources.

Jal Jeevan Mission, Meghalaya extends an invitation to both individuals and communities to become part of this movement aimed at forging a sustainable future. Together, the mission aspires to commemorate the often-overlooked 'water guardians' who are effecting transformative changes within communities through their unwavering commitment to water conservation endeavours. United in purpose, JJM Meghalaya endeavours to shape a tomorrow where water is held in

reverence, safeguarded with diligence, and shared judiciously. The 'Water Guardians: Strengthening Sustainable Communities' campaign was launched to identify and recognise village communities in the state who have made exemplary contributions towards water conservation and sustainability.

To extend the efforts, another campaign '**Water Smart Kids Meghalaya**', was launched by the PHE Department under Jal Jeevan Mission in the month of November 2023 by the hon'ble Chief Minister of Meghalaya, Shri Conrad K. Sangma.

During the launch, an award ceremony for the 'Water Guardians: Strengthening Sustainable Communities' campaign was also held, whereby the hon'ble Chief minister presented the awards to the winning villages of the campaign. The awards were presented to Lumshyiap village VWSC of Ri-Bhoi District (1st Prize), Darechikgre village VWSC of West Garo Hills District (2nd prize) and Dura Kantragre village VWSC also of West Garo Hills District (3rd Prize).

About the Campaign

The 'Water Smart Kids Meghalaya' campaign under Jal Jeevan Mission aims to target school children in 4,020 schools in rural Meghalaya through engaging, educational and interactive sessions, and fostering their role as water ambassadors through the establishment of children's clubs.



Objectives

- ♦ Educate school children in rural areas about the importance of water conservation and protection of water sources.
- ♦ Raise awareness about the judicious use of water and ways to prevent its misuse.
- ♦ Empower children to take action and become water conservation ambassadors in their communities

Vision

The campaign is expected to be highly positive and impactful. By

engaging school children in rural areas with interactive and educational activities, the session aims to achieve several objectives:

- ♦ Education and Awareness
- ♦ Practical Skills
- ♦ Empowerment and Leadership
- ♦ Environmental Stewardship
- ♦ Fun and Interactive Learning
- ♦ Community Impact

Overall, the campaign is designed to create a positive and lasting impact on the participants and their communities. By empowering young minds with knowledge and practical

skills, the sessions strive to nurture a generation of environmentally conscious individuals who actively contribute to water conservation and protection efforts.

So far, out of total 6.51 lakh rural households in the State, over 4.17 lakh (64%) rural households have provision of assured clean water supply in their homes under Jal Jeevan Mission. ■



Transforming Lives, Empowering Communities

Jitendra Mishra
Executive Engineer, PHED,
Madhya Pradesh

Soumya Sheel Singh
DPRO, District - Lakhimpur
Kheri, Uttar Pradesh

Punam Singh
NJJM

The 'Har Ghar Jal' programme, implemented by Jal Jeevan Mission under the Ministry of Jal Shakti, was announced by Hon'ble Prime Minister Shri Narendra Modi on 15th August 2019. The programme aims to provide every rural household with affordable and regular access to an adequate supply of safe drinking water through taps. The Mission intends to create a *Jan Andolan* for water to make it everyone's priority. The mission follows a community centric approach that includes extensive Information, Education and Communication as its

key components. Several cost-effective techniques and innovations have been brought under JJM to provide safe drinking water to the masses. Awareness among the public and the mission mode of operation to improve water, sanitation, and hygiene by the local, state, and central governments in India have helped improve the access to safe drinking water to a large extent.

Till date, there have been numerous success stories of the JJM from the remotest parts of India. Here are two such stories that depict how JJM has

been a life changing journey for the village folks.

Water Transforms Lives and Marriages in Tikamgarh, Madhya Pradesh

In a village named Samarra in Tikamgarh, Madhya Pradesh, JJM has brought about impactful social changes. Today, the village has safe drinking water for all 925 households, benefiting a population of 4,500, thanks to Jal Jeevan Mission.



Earlier, due to water scarcity, families were forced to migrate to other cities, leading to delays in marriages for young men in Samarra. People were reluctant to marry their daughters into the village due to the arduous task of fetching water from distant places, consuming valuable time. This resulted in late marriages or even denials emerged for grooms from Samarra.

The initiation of the 'Har Ghar Jal' brought about significant changes. Today, the women of Samarra wear smiles on their faces. 22 years old Priyanka Rajput, reflects on the past, saying, "Previously, especially women, had to fetch water from remote areas. Now, with water access, marriages are happening on time."

Chanda Lodhi, the bride of Ajay Lodhi, shares her story, "My father traveled to numerous places with my marriage proposal. However, upon learning about the water-fetching

challenges, he cancelled all proposals. Later, he discovered that in Samarra, people have access to safe drinking water, and I happily got married. I am content with my family here."

Radha Lodhi, married to Bhagchandra Lodhi, expresses gratitude to JJM, "Thanks to this government scheme, we save time and engage in constructive work. Our health has also improved significantly." She concludes with a smile on her face, highlighting the positive impact of the initiative on their lives.

A Ray of Hope for the People of Lakhimpur Kheri District, Uttar Pradesh

In the village of Dimhaura, located along the highway of Lakhimpur Kheri and Sitapur district, there are around 697 households. Thanks to the Jal Jeevan Mission (JJM), each household now enjoys the convenience

of tap drinking water. The water tank constructed under JJM provides four hours of water supply in the morning and three hours in the evening.

Before JJM, the village faced a water crisis for decades, especially during the hot summer months. Vinay Sharma, a resident of the Panchayat, notes that the launch of the Jal Jeevan Mission brought much-needed relief to the community.

Sangam Devi, another resident, expresses how the availability of water in every home has been a blessing. Clean water is used for various purposes. She emphasises how life has changed significantly, and the convenience of having water at home means she doesn't have to disturb others in the morning. The improved water quality has also led to fewer instances of illness in her family, saving both time and improving overall well-being.

Sarla Devi says "Jal hi jeevan hai" (water is life). She highlights the crucial role of clean drinking water, emphasising that life is not possible without it. With the implementation of 'Har Ghar Jal', she can now easily access water in her household. This has been a transformative experience for her and her entire family. Sarla expresses gratitude to everyone involved in making this seemingly impossible dream of having water at home a reality.

The success in scaling rural piped drinking water supply in both states is attributed to several factors. Direct communication with village women, effective engagement with district administration and local media, recognition of Pani Samitis (Water Committees), and additional training in villages with full functional household tap connections (FHTCs) have all played crucial roles in achieving these positive outcomes. ■



Jal Jeevan Mission Commitment to Sustainable Water

- Shailika Sinha
NJJM

In its four years journey since 2019, Jal Jeevan Mission has accomplished innumerable milestones in terms of number of tap connections, health benefits, empowerment and employment opportunities. In this effort to ensure access to clean piped drinking water in adequate quantity of prescribed quality on a regular and long-term basis, Source Sustainability becomes a critical aspect. In this month's edition, we shed light on this important theme of sustainable development. As communities

grapple with the challenges of water scarcity and environmental degradation, it becomes imperative to address the sustainability of water sources. Our featured articles delve into on-the-ground initiatives aimed at ensuring the longevity and health of water sources in diverse regions across the country. While at the forefront is the ambitious undertaking dedicated to providing access to clean water to every household, JJM realises the intrinsic link between access to potable water and the sustainability of its sources.

In this collaborative effort, the Rural Wash Partner's Forum (RWPF) partners have played a pivotal role in supporting and promoting source sustainability. This month, we are pleased to share with you a collection of articles highlighting on-the-ground efforts in various regions covering the length and breadth of the country. The Aga Khan Foundation has been instrumental in facilitating the sourcing and compilation of insightful articles, offering a detailed perspective on the multifaceted nature of this crucial theme.

As we explore the complexities of water management, the articles presented in this issue showcase the resilience and innovation exhibited by communities striving to secure their water sources for future generations. From community-led conservation initiatives to technological interventions, the spectrum of approaches highlighted reflects the need for adopting sustainable practices in water resource management. The commitment of local communities, NGOs, and governmental bodies is evident in their collective pursuit of balancing water accessibility with its preservation.

With this, we look forward to inspire talks and action towards a future where water sources are not just tapped into for immediate needs but are nurtured and conserved for the benefit of generations to come. ■



Source Sustainability a Key Priority under Jal Jeevan Mission to Achieve Universal and Regular Access of Drinking Water for All

- Asad Umar

Director - Health,
Nutrition and WASH,
Aga Khan Foundation

- Trisha Agarwala

Program Officer -
Knowledge Management &
Communication;
Aga Khan Foundation

India is on a phenomenal trajectory to ensure access to Safe Drinking Water for all its citizens. Today is a historic moment for the country as more than 13 Crore (72%) rural households are now connected with tap water. Since the launch of the flagship Jal Jeevan Mission on 15th August 2019, nearly 13.82 crore households have been provided with access to tap water connections. This jump of 66.12 per cent points shows the commitment of the Government of India and that of the state governments in ensuring that no citizen of this country is left behind from access to safe drinking water. The government needs to be lauded for taking up such an ambitious goal to ensure universal access of safe and reliable

drinking water through piped connections.

However, the key concern towards ensuring access to safe drinking water is the source sustainability which is further challenged by quality issues arising due to anthropogenic, geogenic contaminants and uncertainties posed by climate change. Hence there is need to take cognisance of the local diversity, go beyond the minimalist visualisation of pipelines and tap connections and encourage local innovations, community involvement and source sustainability.

The source sustainability a key priority under Jal Jeevan Mission is also aligned with the recently

concluded UN Water Conference 2023, which clearly solidified a growing global understanding that water security, and especially safe access to WASH, underpins almost every other development goal. Further it is a “linchpin for global resilience,” particularly for climate adaptation, food security, economic growth, global health, and gender equality. Simply put, no one can thrive without access to safely managed WASH.

Challenges to the Sustainability of Water Resource

Groundwater continues to be the major source of drinking water. Groundwater is primarily replenished





through rainfall, though, other source of replenishment include seepage from canals, tanks, ponds, other water structures and irrigation. Owing to climate change, the spatial-temporal variation and pattern of rainfall in many parts of the country is becoming increasingly unpredictable, hence posing a greater threat to groundwater availability. Over consumption and increased usage of groundwater by industries and for agriculture has resulted in the overexploitation of the groundwater resource, well beyond its replenishment potential. This is further aggravated due to the hard rock terrain which reduces the productivity and replenishment potential of the aquifers. Adding to this, the quality of groundwater is compromised by geogenic contaminants like fluoride, arsenic, iron, nitrate, and increased salinity ingress.

Ensuring Sustainability of Groundwater Resources

Regulatory measures and policy priorities for water conservation:

Prioritising source sustainability for drinking water is one of the essential identified priorities. Convergence of JJM with water conservation, ground water recharge activities will ensure improved water quality, quantity and longevity. The National Water Mission, Ministry of Jal Shakti seeks to achieve a water-secure future through active community engagement. The nation-wide campaign “Jal Shakti Abhiyan: Catch the Rain” (JSA: CTR) focuses on saving and conserving rainwater at the community level. So far 47 lakh structures were made all over the country to harvest rainwater. The Honourable President of India launched this year's campaign “Jal Shakti Abhiyan: Catch the Rain-2023” on 4th March with the theme “Source Sustainability for Drinking Water”. In terms of regulatory measures, the Union Ministry of Water Resources published the Revised Guidelines to regulate and control Ground Water Extraction in India on 12th December 2018. The guideline emphasised on the necessity of Water Conservation Fee (WCF) according to the area of

abstraction and amount of abstracted water. The guideline also highlights the priority need for promoting rainwater harvesting structures, conducting water audits, recycling of sewage water and having groundwater monitoring systems in place. The other policy priorities are also helping to preserve and conserve water. Initiatives such as Atal Bhujal Yojana were launched to ensure improved planning and implementation of groundwater management interventions in the water stressed areas of selected states. Similarly, the Amrit Sarovar Mission is aimed at developing and rejuvenating 75 water bodies in each district of the country.

Harnessing Technology as an Agent to Accelerate Change

As ground water development is highly dynamic and widely varying amongst different agro-climatic zones in the country, to achieve sustainability of drinking water sources through artificial water recharge, surface impound-

ment/percolation, rain-water harvesting, delineation of the catchment area etc. it is essential to use Geographical Information Systems, Hydro Geo-Morphological (HGM) Maps etc. to decode correct locations for identifying sustainable high yielding ground water sources. Similarly, smart water systems based on a combination of Internet of Things (IoT), big data and AI technologies can help minimise water scarcity challenges, and undo the damage that the imprudent usage of water resources has already caused. Under Jal Jeevan Mission, IoT is already helping in real time monitoring of rural water supply services

Engagement and Empowerment of Communities

The Honourable President of India conferred the Swachh Sujal Shakti Samman 2023 on 4th March 2023 to celebrate the extraordinary contribution of women achievers/ leaders in the water sector. The felicitation of

these women change-makers in the category of O&M of piped water supply and under Jal Shakti Abhiyan – Catch the Rain, clearly reflected a well-studied and established factum that community participation, and particularly the participation of women, is imperative in sustaining any public service provisioning or protection and conservation of natural resources such as water. Building community capacity to understand their water resources and the water supply systems would not only help in the adoption of localised measures in conserving the water resource but would also help in decentralisation of the operations and maintenance of the water supply systems.

Aga Khan Foundation as Thematic RWP Partner on Source Sustainability

Sustainability of source is a necessity to ensure that citizens have sustainable access to safe drinking water.

Lack of access to a safe and sustainable source would have its impact on the provisioning of rural drinking water services. As a thematic lead on Source sustainability to the JJM, Ministry of Jal Shakti, the Aga Khan Foundation envisions a huge potential in an approach where a mix of implementation of regulatory mechanisms, empowering the community to understand their local water resource, and harnessing the terrain specific technologies would go a long way in ensuring source sustainability. Back in 2015, the world committed to Sustainable Development Goal (SDG) 6 as part of the 2030 Agenda – which promises that everyone would have access to safely managed water and sanitation by 2030. Thanks to the vision of our Honourable Prime Minister, and the commitment of all the stakeholders, as set out in the Jal Jeevan Mission, India is on track to achieve universal access by providing tap water supply to every rural household by 2024. ■



Creating Sustainable Safe Drinking Water Solutions Where Every Drop Counts

- Sweta Arora
and
Pranav Shah
Piramal Foundation

Water is the essence of life, yet a stark reality that persists is that India is grappling with a severe water scarcity crisis. Groundwater is the major source for irrigation and drinking water supply. Currently, water levels face a serious threat due to the continuous extraction of groundwater from aquifers without allowing sufficient time for replenishment. Due to rapidly declining and contaminated water supplies, India is currently experiencing the worst water crisis in recorded history, as noted by NITI Aayog in 2018. The situation has further worsened over the past few years due to a 52% drop in groundwater levels.

Transformative Partnerships for Sustainable Water Solutions: A Tale of Piramal Foundation and Standard Chartered Bank's Impact

Quantity and Quality together form the twin challenges of drinking water in several parts of India. The increase in dissolved ionic contaminants in groundwater such as Fluoride, Nitrate, Iron are also posing a serious threat. Today, apart from facilitating access to drinking water, ensuring water security in villages has emerged as one of the major challenges. It has been observed that in semi-arid areas, around two-third of

groundwater is being used for irrigation and agricultural purposes. This extensive use of groundwater is further depleting the water tables. Continuous extraction with a limited focus on replenishment poses a serious threat for the water needs of the future. Thus, a comprehensive strategy is needed to address the water sustainability challenge. Piramal Foundation in collaboration with Standard Chartered Bank (SCB) is currently implementing a project with a twin focus on source sustainability and water demand management.

Piramal Foundation's partnership with Standard Chartered Bank Limited began in 2017 with a primary focus on addressing issues relating to drinking water accessibility and quality. During the project tenure, a holistic approach, with a focus on ensuring safe drinking water while also catalysing community ownership by creating village level institutions to plan and oversee water conservation efforts, was successfully implemented in 75 villages across four states: Maharashtra, Uttar Pradesh, Madhya Pradesh, and Rajasthan. Notably, 49% of these villages are situated in aspirational districts with low Human Development Index (HDI). This partnership has had an indelible impact, serving half a million beneficiaries across 123 villages and 25 schools in 7 states.



Preparing for the water conservation structure

The programme now extends its focus on water security and source



Farmers at Manpur, RJ, participating enthusiastically in the agri-water efficiency training

Creating Sustainable Solutions

Over the past 6 years, Standard Chartered Bank through its partnership with Piramal Foundation, has helped create water-secure villages benefitting more than five lakh people in the remotest parts of India. This implementation model ensures that the water solutions are sustainable, and the communities are being trained and empowered to maintain the water balance in their communities.

The programme's primary objectives now are to prepare water storage structures, strengthen existing water bodies, and increase community awareness to incorporate water-efficient practices into daily life.

As the team continues to conserve and harvest rainwater, the programme has been able to create 853 water-saving solutions, including soak pits and water storage tanks in 75 villages. With the aid of the solutions installed, about 2.94 crore litres of water is being conserved and about 3.74 lakh square feet of rooftop area is being used for rainwater collection. Additionally, IoT based tracking sensors using a remote monitoring technology developed by Piramal Sarvajal, have been added to monitor changes in groundwater levels and provide solutions for increased dependability.

Restoring Groundwater Levels

Parawa, an aspirational district in Maharashtra's Washim district demonstrates how a community works together to deal with the water crisis. A solution for storing rainwater that includes an IoT-based monitoring system to measure the impact was provided by Piramal Foundation. This has resulted in a significant rise in groundwater levels in the village, and the community has effectively

sustainability in 148 locations throughout the states. Additionally, this partnership is also now benefitting farmers through delivering training sessions on agri-water efficiency and empowering them with efficient farming techniques to save water, as well as gain access to government schemes for agriculture-related initiatives to a tune of Rs 1.9 crores.

Navigating Obstacles: Adapting Strategies for Sustainable Water Solutions

Determining the required land area for the conservation tanks proved to be one of the main challenges given the terrain and village size. Initially, the programme aimed to construct a tank with four lakh litre capacity in each of the 75 locations spread across four states. However, facing ground barriers, the team had to adapt the mode to the posed

challenges, opting to split the storage structures into conservation tanks with lesser capacities to hold one or two lakh litres of water and 10 soak pits in each of the villages depending upon land availability.

In addition to land availability challenges, there was also an issue with strengthening the borewells, due to unsuitable soil-profile in almost every village in Rajasthan and Uttar Pradesh. After careful consideration, the team devised a strategy that would improve the effects on the ground while simultaneously fortifying the borewell. Since 60% of groundwater is used for irrigation, the team initiated an education programme for farmers to adopt agri-water-efficient methods, which resulted in a significant reduction in groundwater usage. This training programme, implemented in 75 villages, leveraged the expertise of Krishi Vigyan Kendra knowledge centre.

established a system in which the water saved is used for meeting other community water needs.

Going forward with strengthening of local water bodies, the team has been able to revitalise and clean 46 local ponds in project villages in Maharashtra, Rajasthan, Uttar Pradesh, and Madhya Pradesh. Work is still ongoing in the remaining locations. By strengthening 40 borewells, there has also been an increase in the current water tables, which is helping 23 villages to replenish their sources. Additionally, 23 bore sensors are connected to these borewells, allowing the team to measure changes in both the quantity and quality of water. To empower the community and help them understand water budgeting, capacity building programmes have also been held in each of the 75 villages located throughout Maharashtra, Uttar Pradesh, Madhya Pradesh, and Rajasthan.

Decentralised Wastewater Management System (DEWATS)

Apart from devising strategies to restore the water levels, a pilot project is also being run in the village of Chirana in Rajasthan to manage greywater. Greywater refers to domestic wastewater generated in households without faecal contamination, i.e. all streams except for the wastewater from toilets. Sources of greywater include sinks, baths, washing or dishwashing.

In order to collect grey water discharged from homes, a rectangular structure measuring roughly 100x15 feet is built. This tank is connected with the wastewater pipeline. The entire structure is divided into various compartments that separate and process the chemical and Biological Oxygen Demand and Chemical Oxygen Demand (BOD and



Premrata Yadav

COD) in greywater through a natural process. This can reduce contamination to permissible limits, freeing up water for agricultural and irrigation uses and reducing the strain on groundwater.

Recycle And Reuse - About 250 households in Chirana, located in the Jhunjhunu district of Rajasthan, will be connected under this system. The wastewater from these houses will be collected, cleaned, and made useful again. The community will use the processed water for agriculture.

Building Systemic Reform, Facilitating Farmers and Training Them on Agri-Efficient Water Use

Recognising that systemic reform is fundamental to creating sustainable, scalable, and inclusive solutions, Piramal Foundation through its partnership with Standard Chartered

Bank Limited is also building the capacities of farmers through rigorous training sessions on agricultural-efficiency, that is empowering them with efficient farming techniques, and helping them gain access to government schemes for agriculture-related initiatives. Approximately, 3,096 farmers have been trained on agricultural-efficiency practices covering 15,390 acres of agriculture land. The initiative leveraged technical expertise of scientists from Krishi Vigyan Kendra (KVK) to train farmers in 75 villages across Maharashtra, Uttar Pradesh, Madhya Pradesh and Rajasthan on agricultural efficiency, micro irrigation, rainwater harvesting, best practices of local crops, and available government schemes. Agri-efficient practices entail encouraging soil health testing, using green manure, intercropping, and irrigation of high-yielding, short-duration crops in semi-arid areas.

Farmers have been given seasonal crop seeds to motivate kitchen gardening practices that will aid in the management of domestic wastewater. To further cut down on water waste, irrigation techniques like seed treatment are being promoted.

Farmer Benefitted through Convergence

Premlata Yadav, a 49-year-old woman from a farming family in Rewali, Alwar has 6 acres of agricultural land where she grows bajra, jowar, chana and seasonal vegetables. Earlier she used to spend most of her time ensuring that the land is watered. With Piramal Foundation's training programme on agri-water efficiency practices aimed

at enhancing the knowledge of the farmers, her family has applied for sprinklers and pipeline connection under the Pradhan Mantri Krishi Sinchayee Yojana (PMKSY), a micro irrigation programme, and has received the same. She says, "My watering efforts have now reduced, and I am now able to focus more on my family. We recently switched to neem oil as natural pesticide and are able to keep our crops healthy."

Our Approach Going Forward: Collaborating with the Government for a Lasting Impact

The community has actively participated and are being encour-

aged to assume responsibility and become the next generation of water ambassadors. Their role extends beyond enhancing the drinking water system to also advancing source sustainability. Through its safe water programme, Piramal Foundation is significantly contributing to the creation of water-secure villages. To amplify its impact, the team is also collaborating with the government. The team is hopeful that its collaborative efforts will advocate for equitable distribution of water resources, endorse efficient agricultural practices, foster sustainable development, enhance ecological well-being, and ultimately improve the overall quality of life for the citizens of India. ■



At Rampura, a large number of women farmers took part in the agri-water efficiency training

Enabling Community Participation in Planning for Source Sustainability

- Manisha Shah
Gurudutt Ramchandra
and
Madhavi Purohit
Arghyam¹

Jal Jeevan Mission (JJM) is predominantly dependent on groundwater as a source to supply tap water to households in most parts of the country. As per IMIS JJM, over 97% of the schemes² are dependent on groundwater as sources of water. This means that the conversation on source sustainability should also be largely focused on groundwater management, and that too at a large scale.

The challenges with managing groundwater are fairly well-known and understood now. Given its invisible nature, the competing users

and uses, private ownership and management despite being common-pool, it is absolutely necessary for all stakeholders to participate in its management. Depletion of this resource can affect drinking water security of the majority of population and it will result in rapid slip backs of the schemes created under JJM.

Managing groundwater with participation of key stakeholders has been central to Arghyam's work in the last decade. Our work with NGO partners on Participatory Groundwater Management (PGWM) has laid the foundation for our current

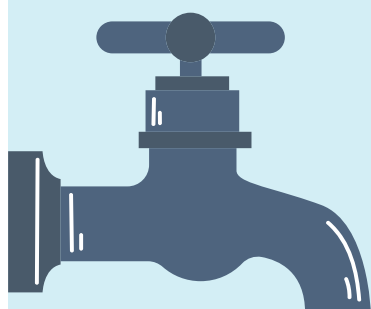
approach of enabling community participation. In this article we have synthesised the 8-step process necessary for managing sources sustainably followed by lessons from our more recent work, which demonstrate this approach in large-scale government programs. The core element is the critical role played by communities in taking a lead in the planning process for management of water resources in their village. Community Resource Persons (CRPs) or frontline workers have played an important part in enabling community participation.



¹ Arghyam is a public charitable foundation founded in 2005 to support sustainable water and sanitation solutions. Through partners across the country the institution building a blueprint to achieve safe, sustainable water for all of India. It operates with three core principles: Community-led approach; design for scale; and generate trusted data.

² Number of schemes by source as per JJM Report (dated 29th November 2023)
Groundwater schemes = 63,51,174, Surface water schemes = 1,32,727, Others = 37,832

The 8-Step Process for Water Security and Source Sustainability



Step 1: Secondary Data Collection

This pre-planning exercise helps to understand contextual issues.

Step 2: Social Mobilisation, Training and Capacity Building

It helps all stakeholders/ water users to be onboarded, and involves strengthening community knowledge and systems, and local governance institutions. CRPs are trained as a part of this process.

Step 3: Primary Data Collection

This step helps to gain confidence of the community and build trust for the water security project.

Step 4: Aquifer mapping Water Balance and Budgeting

Resource understanding, water balance and budgeting form core parts of the water security process. It involves aquifer mapping which helps in identifying recharge and discharge areas, and quantifying water availability through water balance. Demand management is also involved. These components are critical for participatory net planning and community consultations on Water Security Plans (WSP) or Village Action Plans (VAP).

Step 5: Water Security Plan (WSP)/ Village Action Plan (VAP)

Finalisation of the water security plan mandates community agreement on proposed interventions and protocols. Further, this plan is put forth for Gram Sabha approval and onward to Zilla Panchayat for implementation.

Step 6: Strengthening Community Institutions and Implementation

This step is for building internal capacities within the local system through frontline workers, officials, technical staff.

Step 7: Operation and Maintenance

It is a post-implementation process which involves repairs, de-siltation, concurrent monitoring, operationalisation of protocols, developing water balances for yearly planning, maintenance of assets and structures for ensuring water security.

Step 8: Monitoring, Evaluation and Sustainable Management

It is an important part of understanding, reviewing and evaluating the entire water security process.





From Theory to Practice at Scale: Experiences from Gujarat and Karnataka

Atal Bhujal Yojana in Nakhatrana block of Gujarat

Atal Bhujal Yojana (ABY) is a groundwater management scheme aimed to achieve systematic supply and demand side interventions for resource improvement. Arghyam's partners, Arid Communities and Technologies (ACT) and Socion, in consultation with the Ministry of Jal Shakti, developed a modified approach to strengthen participatory planning and improve governance at scale. ACT was selected as the District Implementation Partner (DIP) for Kutch district for ABY, and a pilot model was tested out in Nakhatrana block under the program.

To implement the 8-step process, the following model was experimented:

- 💧 ACT identified one CRP per GP. CRPs along with DIP, supported creation or revival of community institutions, organised training and mobilisation exercises, and performed crop water budgeting with community. CRPs are also a part of the village institution like Participatory Ground Water Management Committee (PGWMC) or Village Water and Sanitation Committee (VWSC).
- 💧 To ensure that the communities had confidence in the data collected, CRPs were trained and led the collection and verification exercise. This data was then used to prepare participatory WSP.
- 💧 The PGWMC played an important role in the process by building consensus amongst water users and farmer groups for demand management measures like cropping pattern changes or regulations on pumping hours etc.

To make sure that all these activities happen in parallel across the block, digital tools like Participatory Digital Attestation (PDA) were used in the process. Various features of PDA enable real-time insights into training of people and progress of tasks done and generates data to support governance and decision making at multiple levels.

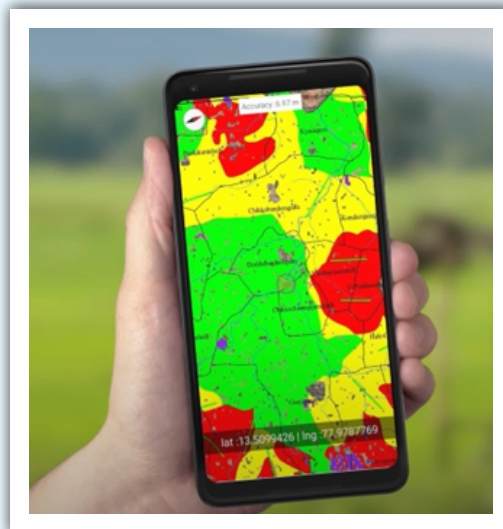
MGNREGS in Karnataka

The Government of Karnataka has embarked on an ambitious initiative to work with communities to increase groundwater levels across all the villages by leveraging MGNREGS. The Rural Development and Panchayati Raj Department (RD&PR) launched *Antarajala Chetana* in 2020, which was renamed as *Jala Sanjeevini* in 2022.

In partnership with Foundation for Ecological Security (FES), which is a capacity building partner to *Jala Sanjeevini*, Arghyam is training technical and non-technical staff to implement the programme through participatory planning in Karnataka.

One of the objectives was to ensure that community participation becomes more meaningful and is aided by scientific knowledge and data. To enable this, following model was rolled out:

- The foundation of the model for participatory planning at scale in this programme involves a detailed preparatory phase of mapping all the actors, their roles, tasks, training requirements, and necessary training material.
- The programme also deployed PDA and CLART (Composite Landscape Assessment and Restoration Tool) to empower the first mile and the field staff with knowledge, data and information they need to get the job done. CLART is used for scientific planning by the technical staff for supply-side interventions as it provides data to make decisions on types of useful interventions for water conservation and groundwater recharge in the local context.
- Barefoot Technicians, Technical Assistant Engineers and other technical staff of MGNREGS are trained to use CLART to follow a community-centric planning process along with social mobilisers known as Grama Kayaka Mitras (GKMs) to mobilise the community.
- The participatory rural appraisal process when used with CLART empowers local community members to participate in the decision-making process. It fosters inclusivity and ensures that local perspectives, needs and preferences are considered during the planning exercise in addition to being scientific.
- Every intervention submitted is reviewed by the Technical Coordinator to ensure that the proposed structure is correct before it gets into the Detailed Project Report (DPR) for gram sabha and panchayat approval.



The focus on building ground-up capacities, providing technical support through trained people and digital tools, and leveraging the cadre of frontline workers has ensured that community members are clued in on the entire planning process, and can participate through the CRPs or the GP members.

Key Learnings

1. Jal Jeevan Mission underscores the importance of community involvement to ensure the sustainability of water resources, particularly as many schemes rely on groundwater, and effective demand management plays a crucial role in ensuring long-term viability. To achieve this on a larger scale, it is imperative to engage frontline workers and community resource persons within the framework of community or village institutions. Notably, various states already have trained personnel in place, such as *Anurakshaks* in Bihar collaborating with Ward Implementation and Management Committees, and *Jal Surakshaks* in Maharashtra, among others, who can support this process.
2. JJM has the opportunity to leverage existing schemes and well-trained frontline staff to implement source sustainability measures across different states. For instance, schemes like ABY and MGNREGS incorporate significant components of groundwater recharge and water conservation. Given that, JJM is already mapping water sources; aligning with these initiatives can facilitate the prioritisation of aquifers and catchment areas, ensuring the safeguarding of drinking water sources.
3. The integration of digital tools can empower these stakeholders by providing regular training and access to knowledge and data, enabling them to prepare scientifically sound plans while involving communities in the decision-making process. These tools can serve as a key enabler at scale and can improve governance and observability of people and processes.



Story of Change

Nature-Based Solutions: Paving the Way for Community Resilience and Adaptability

Ravikant
Knowledge Management
Specialist;

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Project Coordinator and

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Water For People¹

Despite having 18% of the world's human population and 15% of its animals, India faces a stark reality: it has only 2% of the world's landmass and 4% of its freshwater resources. If the current trend continues, per capita freshwater availability will fall to 1,486 cubic metres in 2021, from 1,545 cubic meters in 2011. This perilous track propels India into a water-stressed reality. Immediate action is required; ensuring water security is non-negotiable. The message is clear: in order to protect our future, we must act decisively to assure a sustainable and secure water supply for future generations.

The Sundarbans, India's largest mangrove delta and home to nearly 4.5 million people, is facing increasing challenges as water levels rise and extreme events such as super

cyclones become more common. Despite efforts to raise dwellings and embankments, breaches continue to occur, as witnessed in the 2021 super cyclone Yaas. Extreme weather conditions are expected to increase, affecting houses, farms, and entire populations. The vulnerability is exacerbated by the peculiar rural terrain of low-lying beaches on Sagar, Namkhana, and Patharpratima Islands. Addressing these needs is critical not only for preparing the Bengal delta for a climate-stable future, but also for demonstrating climate-resilient groundwater management methods in the Sundarbans. Aside from water supply challenges, the region is dealing with water quality issues, with some places experiencing geogenic contaminations such as salinity. Urgent action is required to guarantee livelihoods, prevent health

problems, and ensure the long-term viability of this sensitive yet crucial ecosystem.

While considering the problem of water scarcity and over exploitation, Water For People came up with the idea of using traditional knowledge backed up with field level experiences to address the problem. Water For People experimented with different models and successfully implemented the following interventions in Patharpratima block of South 24 Pargana district, West Bengal in 2022-2023.

The Ridges and Furrows method

of cultivation is a traditional method of ploughing which helps to drain the field by allowing the excess water to flow through the furrows, thus reducing excess moisture stress on plants. This technique requires less time for irrigation. On an average about 30% less irrigation water is required compared to flatbed method, resulting in improved crop yields by more than 20%.

Aquifer Storage and Recovery (ASR)

is an innovative method of managing water resources in an area like Sundarbans. During the monsoons, extra rainfall is collected in a pond (55 ft/55 ft, 10 ft deep) through the watershed catchment area. The overflow drains into a soak pit, where it is cleaned by a simple filtration system. Following filtration, 1,000



¹ Water For People began working in India in 1996, and in 2008 WFP developed a locally registered arm to work in tandem on projects funded by Indian corporations, foundations, and individuals. To date, WFP reached over one million people in India through water and sanitation solutions.



litres of water is pumped and injected into a saline aquifer using a jet pump, lowering the Total Dissolved Solids (TDS) content. Sweet water is then stored underground. During the summer months or during natural calamities such as cyclones and floods, this stored water becomes a useful resource. Two borings are used in the operation, one at 80 metres depth to inject water into the saline aquifer and another at 90 metres depth to extract the stored sweet water used for drinking. The genius of ASR resides in its ability to offer an alternate solution for water resource management, reducing dependency on groundwater and maintaining a fresh water supply during emergencies/ summer season. This technology, which is primarily employed in agriculture, not only conserves water but also ensures a store of fresh water for future usage. ASR, in essence, is a proactive strategy to minimise water stress by properly utilising rainwater to create a buffer that protects populations from water scarcity during difficult times.

Rooftop Rainwater Harvesting is a simple method of collecting rainwater for a variety of uses. The roof collects rainwater, which can then be stored in tanks or channelled to an artificial recharge system. This water conservation technique, which

is widely used in residences and buildings, involves directing rainfall through pipes and drains, followed by filtration and storage for later use or recharge. Roofs consisting of reinforced cement concrete, galvanised iron, or corrugated sheets are appropriate for this application. Water is collected in channels along the edge of a sloping roof and sent to a storage tank. The proper size of canals allows for high rain flows. Pipelines or drains allow rainfall to be transported to the harvesting system. A valve that flushes off runoff from the initial rain is a vital element that prevents contaminants from entering the system. This preventive measure is crucial because the initial rain carries a higher quantity of airborne

and catchment surface contaminants. Overall, roof-top rainwater harvesting is a practical and efficient way for both residential and commercial structures to conserve water.

Stories of Impact from the Field

The use of different nature-based models impacted the individual as well as the community in many ways and helped to enhance the following:

- 💧 It helped in restoring and rejuvenating the nature-based solutions.
- 💧 It was easy to use with minimal training.
- 💧 It helped in generating livelihood and income generation opportunities.
- 💧 Improved the standard of living.

Shri Anup Maity, a 56-year-old marginal farmer who lives with his family (wife and son) in Dakshin Shibganj village, Patharpratima block, in South 24 Parganas district of West Bengal worked on a surface water management model i.e., High Ridge and Deep and Furrow model (HDRF) with support from Water For People. He used this technique in one bigha land (0.25 hectare). This model helped him in increasing crop productivity, and improved nutrient



efficiency. It also helped in reducing expenses which resulted in enhanced income level and improved standard of living.

His income-expenditure statement upto 29th June 2023 is listed below:

To put this idea into practice, Shri Sudhansu Giri, a 55-year-old farmer

from South 24 Parganas' Namkhana block, worked with the Water For People facilitator. Following the intervention, he is now able to grow more crops with fresh surface water

Upto 29th June, 23	Items	Quantity	Amount (INR)	Total (INR)	Profit (INR)
Income	Cucumber	602 kg	15,765	16,875	12,550
	Bitter gourd	17 kg	910		
	Ridge gourd	6 kg	200		
Expenditure	Seeds		1,500	4,625	
	Fertiliser		2,440		
	Medicine		685		

even after the rainfall. His crop production has increased, resulting in more income for the family. "I can now send my daughter to Kolkata for higher education," says Mr Sudhansu with joy.

Key Challenges

Water For People, being the primary organisation implementing low-cost nature-based models in South 24 Parganas, specifically in Patherpratima, Sagar, and Namkhana Blocks, faced significant initial

challenges. Convincing the community to transition from traditional to upgraded nature-based ideas proved difficult. Initially, there was a reluctance to provide land for demonstrating this model. After repeated meetings, a few individuals eventually stepped forward to experiment with the new approach. Overcoming misconceptions about the model's success and concerns about being held responsible for any failure were additional hurdles. However, as Water For People shared detailed information, including a Detailed Project

Report (DPR) and financial provisions, community members and the local Gram Panchayat (GP) Technical Engineer were convinced. After thorough discussion, contributions were secured, and the GP approved the plan, marking a significant success for the project.

Achievements and Learnings

The project implementation in South 24 Pargana district has been a collaborative effort with government officials, and the model designs have been shared with the block administration. The designs received appreciation and were adopted by the Block for replication across the entire area. Additionally, these activities have been incorporated into their Gram Panchayat Development Plans. Throughout the implementation, the team gained insights into community mobilisation and government funding provisions for such initiatives. It became evident that these models are highly effective in areas dealing with water quality and quantity issues. Despite the significant natural challenge of floods and waterlogging with saline water in South 24 Pargana, the team discovered that rainwater, managed through these models, can be a scientific solution to address these issues.



Ensuring Source Sustainability in India's Jal Jeevan Mission

Experience from the State of Uttar Pradesh

Reetika Rai
Executive Engineer,
State Water and Sanitation
Mission, Uttar Pradesh

The Burgeoning Thirst

It is widely acknowledged that freshwater resources are diminishing worldwide, especially in arid, semi-arid, and sub-humid regions of the globe. India, which constitutes approximately 17% of the global population but possesses only 4% of the world's freshwater resources, is also grappling with a significant water crisis. Water crisis in India is attributed to both quantity and quality issues, with water quality having a more pronounced impact. The Composite Water Management Index (CWMI) report of 2018 by NITI Aayog revealed that about two lakh people die every year in India due to inadequate access to safe drinking

water¹. Waterborne diseases resulting from the consumption of contaminated water are further estimated to incur an economic burden of approximately USD 600 million annually in India². While India has taken a series of measures to ensure the provision of safe drinking water to every household over the years, the move received an impetus, with the launch of the Jal Jeevan Mission (JJM) on 15th August 2019. JJM's goal is to ensure that all rural households in the country have functional tap connections, providing a regular supply of drinking water in the prescribed quantity and quality by 2024. This also aligns with the United Nations Sustainable Development Goals (SDGs) Target

6.1, which seeks to ensure universal and equitable access to safe and affordable drinking water for all by 2030. At present, more than 70% of households in India have been equipped with Functional Household Tap Connections (FHTC)³. Uttar Pradesh leads the way facilitating access to Functional Household Tap Connections.

Uttar Pradesh (UP), one of India's largest and most populous states (constituting about 16.16 per cent of the country's total population), has alone delivered over 1.85 crore Functional Household Tap Connections (FHTC). In addition to it, more than 92% of public institutions in villages of Uttar Pradesh, including schools, *anganwadis*, gram panchayat buildings, public health facilities, and wellness centres, have also been equipped with Functional Tap Connections (FTC). Significantly, in the Bundelkhand-Vindhyan region, which has long faced a severe water crisis, the percentage of houses with Functional Household Tap Connection (FHTC) is remarkably high, surpassing the State average.

Current State of Availability of Groundwater and Fresh Water Sources

While UP is making remarkable progress toward providing access to



¹ https://social.niti.gov.in/uploads/sample/water_index_report.pdf

² <https://documents1.worldbank.org/curated/en/586371495104964514/pdf/115133-WP-P152203-PUBLIC-17-5-2017-12-28-1-WaterlifeCaseApril.pdf>

³ <https://ejalshakti.gov.in/jjmreport/JJMIndia.aspx>



safe drinking water for all its citizens, the primary challenge for the mission in Uttar Pradesh lies in ensuring source sustainability and addressing quality issues stemming from anthropogenic activities, geogenic contaminants, and uncertainties posed by climate change. About 80% of drinking water needs in Uttar Pradesh are met by groundwater resources, and majority of Jal Jeevan Mission (JJM) schemes in the state are groundwater-based⁴. According to the Sixth water bodies census by the Union Ministry of Jal Shakti in 2023, Uttar Pradesh⁵ takes the lead with the highest number of Minor Irrigation (MI) schemes in the country, totalling 39.76 lakhs and constituting 17.2%. It also claims the top spot for Groundwater (GW) based schemes among all states.

Despite being situated in the alluvial plains of the 'Ganga-Yamuna Rivers' and boasting one of the world's richest groundwater reserves, Uttar Pradesh is not immune to the looming threat of freshwater scarcity. In 2022, Uttar Pradesh's annual groundwater extraction rate stood at approximately 45.84 billion cubic meters (bcm). Further, the Per Capita Water Availability Scenario in India indicates a decrease from 1545 bcm in 2011 to 1341 bcm in 2021, with a projected further decline to 1140 bcm by 2051. The concerning trend of utilising 90% of the available groundwater on average highlights a critical issue, presenting a substantial threat to the long-term water sustainability for future generations. A recent report titled 'State of Groundwater in Uttar Pradesh, 2021'⁶ jointly presented by WaterAid India and Ground Water Action Group, states that Uttar Pradesh has 82 blocks categorised as over-exploited, 47 as critical, and 151 as



semi-critical in terms of groundwater conditions. The ominous rise in groundwater extraction across various sectors paints a bleak future for the state. If the current trend persists, the projected gross extraction may soar to 70 bcm or beyond by 2030, surpassing the rechargeable resources.

Major Source Sustainability Interventions Undertaken in Uttar Pradesh

The provision of quality drinking water supply under JJM significantly hinges on the sustainability of water sources. Source sustainability entails maintaining a consistent and ample supply of drinking water throughout the year through responsible usage. This ensures that our current water consumption does not compromise the ability of future generations to access the same resources. In order to maintain the sustainability of drinking water sources, various water resource protection and conservation interventions, such as Jal Shakti Abhiyan- Catch The Rain (JSA-CTR), Greywater Management under

Swachh Bharat Mission (Grameen) 2.0 (SBM -II) and Atal Bhujal Yojana (ABHY), are currently being undertaken. Since its launch in 2019, JSA has been focused on effectively harnessing monsoon rainfall through various strategies, including the creation of artificial recharge structures, watershed management, recharge and reuse structures, intensive afforestation, and awareness generation. As of now, Uttar Pradesh has identified about 45,703 groundwater sources under JSA-CTR, with approximately 39,389 successfully geotagged. Additionally, the state has identified 351 spring sources, complementing the groundwater sources. Furthermore, a total of 53,227 recharge sites have been identified, with 38,566 geotagged. Among these sites, 33,085 recharge structures, constituting 62% of the total in the state, have been constructed. In another initiative, more than 2,36,698 community soak pits have been built in Uttar Pradesh for Greywater Management under SBM-II.

Launched on 25th December 2019, the Atal Bhujal Yojana (ABHY) aims to

⁴ https://loksabhadocs.nic.in/lsscommittee/Water%20Resources/17_Water_Resources_22.pdf

⁵ <https://jalshakti-dowr.gov.in/document/state-wise-report-of-first-census-of-water-bodies-volume-2/>

⁶ <https://cdn.cseindia.org/gic/state-of-ground-water-20210927.pdf>



were built in the first phase, followed by the construction of 3,384 ponds in the second phase in Uttar Pradesh.

The State Water and Sanitation Mission (SWSM), Uttar Pradesh is also running regular 'Jal Gyan Yatra' campaign for students of 5th to 8th grade, hailing from both government and private institutions across every district in Uttar Pradesh. *Jal Gyan Yatra* aims to orient young minds with the critical aspects of water conservation and the importance of access to safe drinking water. Gram Panchayats and the local community play a pivotal role in the planning and implementation of water conservation and management at the grassroots level. The Implementation Support Agencies (ISAs) empanelled with SWSM are actively cultivating a sense of responsibility for water conservation among villagers and the local community, emphasising its importance in ensuring regular access to safe drinking water. In conclusion, Uttar Pradesh has made significant progress in implementing water conservation and management initiatives. Nevertheless, there is still a substantial journey ahead to attain source sustainability in the state. ■

enhance the community-led sustainable management of groundwater resources in water-stressed areas of selected states. Initially limited to 550 villages across 10 districts (Mahoba, Jhansi, Banda, Hamirpur, Chitrakoot, Lalitpur, Muzaffarnagar, Shamli, Baghpat and Meerut) in Uttar Pradesh, this initiative is now set to expand statewide. As part of source sustainability efforts under Jal Jeevan Mission, another initiative titled *Amrit Sarovar Scheme*, was launched on 24th April 2022 which aims to

construct/ rejuvenate at least 75 Amrit Sarovars in each district across India to overcome the water crisis in rural areas. The state led the way by identifying approximately 15,497 Amrit Sarovars in village panchayats throughout Uttar Pradesh, with efforts focused on constructing and revitalising more than 8,462 of these water bodies. There are also plans to construct/ develop a total of 1.20 lakh Amrit Sarovars in Uttar Pradesh. Additionally, under the Khet Talab Yojana, approximately 2,000 ponds



Reviving Hope

A Tale of Addressing Water Security through Integrated Water Management Initiatives in Bundelkhand

- Avani Mohan Singh
Haritika¹

Bundelkhand, a region with a rich historical legacy, is facing a multifaceted water crisis today. The demand for domestic and irrigation water has surged, leading to a rapid depletion of groundwater levels. Historical factors, such as the deterioration of ancient canal systems and a colonial-era focus on large-scale engineering solutions, have contributed to the current predicament.

Today, the escalating demand for water, driven by domestic and agricultural needs, has placed immense stress on the groundwater regime. Many districts of Bundelkhand are perpetually faced with one of the three kinds of droughts—hydrological, meteorological and agricultural. The primary reason is the change in monsoon rainfall patterns. In addition to a decrease in the average amount of precipitation, the occasional heavy deluges wash away the region's topsoil, leaving the ground bare and rocky. The neglect of traditional water harvesting systems, which had developed over the last few centuries, combined with the absence of more modern water and soil management techniques, have left the region more vulnerable than ever before.

Against this backdrop, a transformative initiative was

undertaken in the aspirational district of Chhatarpur and Damoh, encompassing the Dhasan, Banne, Barana, and Sonar River sub-basins, covering 162 villages with a total population of 90,000 people.

Geography and Groundwater Regime

In Chhatarpur and Damoh, where the project is underway with support from multiple partners (such as EY India Foundation, Just A Drop, UK, Indusind Bank, Bajaj Finance, Climate Impact Partners, UK, and Pernord Ricard India Foundation), 162 villages within the Bhadar, Banne, Sonar, and Barana river basin in the Buffer Zone of Panna Tiger Reserve have a water table ranging around 10 metres. In contrast, in the remaining villages, the water table falls within the range of 10 to 30 metres. This decreasing trend, coupled with the excessive exploitation of groundwater, is transforming perennial water sources into seasonal ones.

The groundwater system in this region is characterised as a shallow unconfined aquifer system, coupled with a highly inhomogeneous deeper aquifer system. Geological factors, including the degree of weathering and the density of fractures, significantly influence the aquifer system.

The district's groundwater is present in phreatic, semi-confined, and confined conditions. Factors such as topography, drainage, lithology, and the arrangement of fractures and joints, especially in hard rocks, primarily influence groundwater occurrence. The exceptionally hard and compact sandstone, characterised by fractures, serves as an effective reservoir for groundwater. Shales, being clayey, exhibit medium porosity, and the movement of groundwater through these pore spaces occurs via capillary action. Limestone, while also hard and compact, has very poor porosity initially. However, due to secondary porosity, limestone forms reliable aquifers.

Alluvial formations, comprising unconsolidated sediments with high porosity, play a crucial role. The key water-bearing formations identified in the area are as follows:

- 💧 Alluvium – Unconsolidated sediments
- 💧 Shale – Unconsolidated sediments
- 💧 Limestone – Consolidated (Hard Compact)
- 💧 Sandstone – Consolidated (Hard Compact)

¹ Haritika was established in 1994 and endeavors to bring about change at the level of national policy on poverty reduction, water and sanitation and social progress. The organisation works with people whose lives are dominated by extreme poverty, illiteracy, disease, and other handicaps, striving to bring about positive change in the quality of life of the poor people of Bundelkhand region of UP, MP and Rajasthan. So far, Haritika has supported around 300 piped water supply schemes with source sustainability measures in Damoh and Chhatarpur district of MP.

New Dimensions: Integrated Water Resource Management (IWRM)

In light of the challenges, the geography and geological intricacies necessitated a comprehensive approach, and the project strategically adopted an Integrated Water Resource Management (IWRM) approach.

Navigating through the intricacies of the region's hydrogeology, the project aimed at not only securing water sources but revitalising the historical water infrastructure. The incorporation of check dams along the main Bharad River and the extensive drainage line treatments on local streams were pivotal components of this integrated strategy. These interventions not only enhance groundwater recharge but also address historical challenges that have contributed to the water scarcity predicament.

Programme Approach

The project adopted a community-based, demand-driven, and participatory approach with decentralised decision-making at its core. From the inception, the strategy focussed on creating awareness and ensuring community participation throughout the project lifecycle. Local institutions, particularly the Village Water Supply and Sanitation Committees (VWSC), formed a pivotal part of the entire project.

Steps of Programme Implementation

The project implementation strategy included multiple steps:

- **Creating Awareness and Community Participation:** From the planning phase to operation and maintenance, emphasis was placed on creating

awareness and fostering active community participation. Local institutions, such as the Village Water Supply and Sanitation Committee (VWSC), were formed and/or strengthened to execute the program effectively.

- **Participatory Water Need Assessment:** A participatory approach was adopted for assessing water needs, involving the community in the decision-making process to ensure improved and equitable access to drinking water.
- **Identification of Water Sources:** Geophysical and hydrological investigations were conducted to identify potential water sources, and groundwater potential was ascertained through pump tests.
- **Quality Testing:** Rigorous testing, including bacteriological and hydro chemical analyses, was conducted to ensure the quality of drinking water from the identified sources.
- **Project Report Finalisation:** Based on the selected option, a detailed project report was finalized, outlining the schedule of implementation.
- **Transparent Procurement:** Services and materials were procured through the VWSC to ensure transparency in the procurement process.
- **Integrated Approach for Drinking Water and Sanitation:** An integrated approach to drinking water and sanitation was adopted, minimizing sanitation-related risks.
- **Source Strengthening Measures:** All drinking water sources were supported with source-strengthening measures,

ensuring their long-term sustainability.

- **Monitoring Impact with Observation Wells:** Observation wells were strategically set up to monitor the impact of recharge measures, providing valuable insights into the effectiveness of the implemented strategies.

Chiefly, the project comprised three main components that played pivotal roles in achieving access to potable water:

Awareness Creation and Capacity Building

- Village-level institutions were reconstituted and strengthened through a series of awareness creation and theme-based training programmes.
- Emphasising community participation, a mandatory contribution of Rs 1000 per family was initialized, which was deposited in the VWSC account as a corpus.

Integrated Water Resource Management Approaches

- Extensive drainage line treatments were conducted on two local streams, covering five water supply schemes across five villages.
- In Nowgaon block, a 2.5 km local stream originating from an ancient pond was treated with seven check dams, while another stream from the north saw the construction of two stop dams.
- Future plans include expanding drainage line treatment to more villages, with the possibility of rainwater harvesting trials in specific areas.



- On the main Bharad River, five check dams were strategically constructed to reduce flow velocity.

Drinking Water Interventions

- Mini water supply schemes, relying on groundwater sources, were constructed, including source wells, pump houses, elevated storage reservoirs (ESRs), and household connections.
- All drinking water schemes are fortified by source-strengthening measures, focusing on improving groundwater availability.
- The per capita costs of these schemes range from Rs 850-1150, below the standard per capita norms of Rs 2200. Four schemes have been completed, three are in progress, and five more are planned for completion by the end of the year. The four schemes that have been successfully completed are being managed entirely by the user community.

The intervention in Nowgaon, Bijawar block of Chattarpur district, and Hatta Block of Damoh district demonstrates that concerted efforts toward source and system sustainability can ensure drinking water security in the water-stressed region of Bundelkhand. A projected population of approximately 90,000 people across 162 villages now has assured water supply for drinking and domestic needs.

For water-recharging structures to be successful, it is vital to have geological consultations before initiating such projects.

The project's success reflects the potential of informed and empowered local institutions to address the water needs of underserved communities. Broader issues of source sustainability, water quality, and sanitation were recognised as integral to addressing the drinking water crisis, and a holistic approach was thus adopted. Emerging findings have revealed that the project has been successful in ensuring better sanitation, improved hygiene, and overall community health.

In summary, this comprehensive initiative in Bundelkhand is not just about providing water; it's about revitalising communities, empowering local institutions, and securing a sustainable future. The success in 162 villages with a projected population of 90,000 showcases that, with the right strategies, a water-stressed region can experience a transformation. The challenges persist, especially in the context of Integrated Water Resource Management at the catchment level and preventing overexploitation. However, the transformative impact on communities, with respect to their health and well-being reaffirms the belief that water management, when approached holistically, is an agent for positive change. The story of Bundelkhand's revival is a testament to the power of community involvement, innovative solutions, and a commitment to sustainable water practices. ■



Nurturing Source Sustainability for a Water-Secure Future in India

- Lopamudra Panda
WASH Institute, NJJM

Water, the essence of life, stands as a cornerstone for human survival and sustainable development. According to the United Nations (UN), globally, the progress in providing safely-managed drinking water has improved significantly in the last two decades. The UN has estimated that around 785 million people in the world do not have access to even basic drinking water. However, India has accelerated its efforts over the past few years to assure its rural citizens, especially women and young girls, the right to access clean drinking water services.

The Jal Jeevan Mission – '*Har Ghar Jal*' emerges as a monumental initiative in India's pursuit of a water-secure future. This ambitious scheme not only seeks to deliver potable water to every rural household but places a

strong emphasis on the sustainability of water sources.

At the heart of water security lies source sustainability, encompassing responsible management and preservation of water sources. In India, grappling with water scarcity, ensuring the resilience of these sources becomes imperative. Sustainable practices not only safeguard the environment but also contribute to the socio-economic well-being of communities. The Jal Jeevan Mission, recognising this significance, strives to integrate source sustainability into its core objectives.

Operating on the principle of community participation for long-term sustainability of any developmental work, Jal Jeevan Mission empowers local communities to

manage and conserve their water sources. Village Water Sanitation Committee (VWSC)/ Pani Samiti, comprising community members, plays a pivotal role in this endeavour. These committees act as custodians of water resources, implementing sustainable practices, operation and management of in-village water supply infrastructure, and ensuring equitable & quality water distribution.

Pani Samiti members emerge as unsung heroes in water conservation in rural India. Beyond managing water sources, they actively engage in community education, advocating for sustainable water usage patterns. In many villages Pani Samiti members have taken proactive measures to rejuvenate the local water bodies. Through rainwater harvesting, afforestation, and efficient greywater management techniques, they have improved water availability while mitigating the adverse effects of climate change. Such grassroots initiatives illustrate the transformative power of community-driven efforts under the Mission.

These committees also play a crucial role in conflict resolution related to water usage, fostering a sense of collective responsibility among community members towards judicious use of water as water is now available easily inside household premises. The Pani Samiti members are scoring the effectiveness of community-led initiatives in achieving source sustainability.



- 💧 The World Bank states that, “Estimates indicate that 40% of the world population live in water-scarce areas, and approximately ¼ of world's GDP is exposed to this challenge. By 2025, about 1.8 billion people will be living in regions or countries with absolute water scarcity.” India is no exception to water scarcity.¹
- 💧 India receives about 4000 billion cubic meters (BCM) of precipitation in a year, but 80–95% of this is received during three to four months of monsoon season. The spatial distribution of water is also highly uneven. Annually, arid and semi-arid regions of western India receive 300–500 mm of rainfall, while humid regions of eastern India receive about 3000 mm of rainfall.²
- 💧 Over the past few decades, groundwater extraction has risen exponentially across India. India is now the largest user of groundwater worldwide, pumping out 25% of all the groundwater extracted in the world. More than half of India's districts are threatened by groundwater depletion or contamination. If current trends persist, 60 percent of India's districts are likely to see groundwater tables fall to critical levels within two decades, placing at least 25% of the country's agriculture at risk.³
- 💧 With increasing urbanisation and water demand, the per capita water availability in the country has declined by almost 20% in the last two decades and is likely to decline by another 20% by 2050, making India a water-scarce country.⁴

Sustainable Development Goal 6 – 'Clean Water and Sanitation,' represents a global commitment to ensure the availability and sustainable management of water for all. Jal Jeevan Mission aligns seamlessly with this goal, embodying the principles of equity, efficiency, and sustainability in its approach.

By focusing on providing clean water to rural households and emphasising source sustainability, the mission addresses the key components of SDG 6. The government's commitment to providing functional tap connections to all households is a significant stride toward achieving universal and equitable access to safe and affordable drinking water.

Current Challenges and Future Prospects

Despite the commendable progress made by Jal Jeevan Mission, chal-

lenges persist. Rapid urbanisation, industrialisation, and climate change pose threats to water sources.

If the current trajectory continues, India may face exacerbated water scarcity, impacting agriculture, livelihoods, and overall economic stability. However, Jal Jeevan Mission's holistic approach, combined with the relentless efforts of central and state governments with community participation, provides a ray of hope.

Increased investments in water infrastructure, technology, and capacity building are necessary to overcome future challenges. Fostering greater collaboration between government bodies, non-governmental organisations, and local communities is essential for sustaining the momentum of the Mission. In conclusion, Jal Jeevan Mission is a beacon of hope for a

water-secure future in India. By prioritising source sustainability and empowering local communities through Pani Samiti, it not only addresses the immediate need for potable water but also lays the foundation for a resilient and sustainable water ecosystem.

As we navigate the complex landscape of water security, it is imperative to recognise the interconnectedness of water with various facets of life. The Jal Jeevan Mission exemplifies how a comprehensive and community-centric approach can lead to transformative changes, contributing not only to the achievement of SDG 6 but also to the overall well-being of communities across the nation. As we continue on this journey, it is our collective responsibility to nurture and sustain our water sources for the benefit of present and future generations. ■

¹ Water and Related Statistics-2021 | Central Water Commission, Ministry of jal shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Gol (cwc.gov.in)

² Water and Related Statistics-2021 | Central Water Commission, Ministry of jal shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Gol (cwc.gov.in)

³ Helping India Manage its Complex Water Resources (worldbank.org)

⁴ Press Information Bureau (pib.gov.in)

Reviving Springs, Nourishing Lives

Enhulumi Village's Journey to Sustainable Water Security

- Ms Sentimongla
Kechuchar
Executive Director, NEIDA
Mr Divyang Waghela
Head - WaSH, Tata Trusts

Case Study: Enhulumi Village

Enhulumi village, nestled atop a hill in the Phek District of Nagaland, stands as a testament to resilience and community spirit. With 230 households, it is home to the Chakhesang tribal Christians, classified under the Scheduled Tribe category. (Figure 1) The undulating topography, marked by gentle slopes, high hills, deep gorges, and sharp crest ridges, receives an annual rainfall ranging from 1500 to 2000 mm. At the heart of Enhulumi's community structure is the Village Council, collaborating seamlessly with various community-based organisations.

The village relies heavily on climate sensitive resources for their livelihood, food and water security. Springs are the lifeline of the community for drinking water security and

domestic needs. Despite having 7 springs, the village has faced a water crisis in the last 10-15 years, particularly during the lean seasons from December to April.

Recognising the urgency, the Northeast Initiative Development Agency (NEIDA) (an associate organisation of Tata Trusts), selected Enhulumi as a pilot village for a water security programme. This initiative involves adopting springshed management principles integrated with a community-centric approach and scientific assessment.

The spring Mewi Dzukhou was selected through a participatory process that was undertaken in close collaboration with the Village Council, for rejuvenation based on its importance of providing safe drinking water to local communities. The spring is located at latitude N 2534'59.9" and

longitude E 09422'03.2" with an elevation of about 1500 m above mean sea level and is about 100-150m away from the main village. The spring recharge area is characterised by unconsolidated debris and weathered shale. Within this region, the unconsolidated weathered rocks and sediments serve as significant contributors to recharging the spring aquifer, playing a crucial role in supplying water to 100 households, benefitting approximately 500 people. In times of low water availability during lean seasons, the community previously relied on distant springs due to the scarcity of water in their immediate vicinity.

Community Leading the Way in Reviving Traditional Springsheds

Right from the very beginning, the involvement and empowerment of existing community institutions, coupled with community participation at each stage from planning to execution and monitoring, have ensured local ownership and management, sustaining the intervention under this project.

Traditional practices among indigenous mountain communities involve safeguarding the catchment area of the Spring shed and ecosystem to promote natural regeneration, ensuring water availability. NEIDA, through active capacity building of community members, revived traditional approaches,



Figure 1: Location map of the selected village

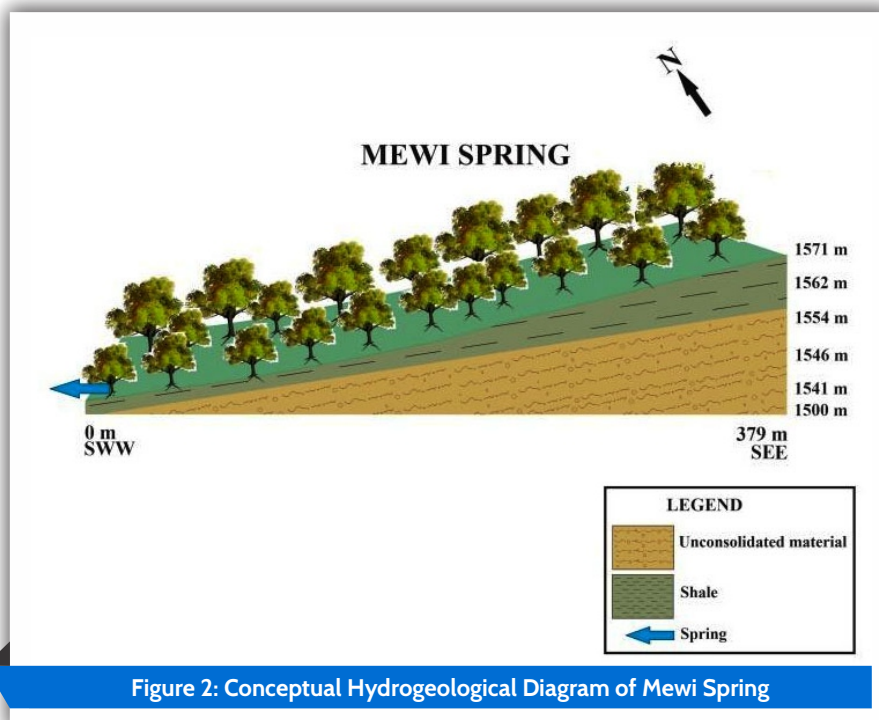


Figure 2: Conceptual Hydrogeological Diagram of Mewi Spring

allowing Springs to be collectively managed and accessed by the Enhulumi village community for generations, despite individual and clan land ownership in Nagaland. (Figure 3)

Implementing activities in the recharge area was challenging due to its small, fragmented land ownership structure. Water scarcity is a significant concern in the village, and the Village Council served as a catalyst for activity execution. The project involved demystifying science and

integrating local and scientific knowledge. Following village meetings and agreements with stakeholders and the Village Council, Para-hydrogeologists trained community representatives on the importance and technical aspects of delineating the spring recharge area. Activities such as measuring slope, contour line mapping using the pipe level method and A-Frame and constructing Staggered Contour Trenches (SCTs) were undertaken. Hydrological data collection, crucial for understanding spring behavior

and conducting impact assessments, involved training a community representative/ data collector to measure spring discharge and collect rainfall data.

The identified potential spring recharge area spans 2 hectares, characterised by mixed vegetation and an average slope ranging from 20% to 40%, as determined through geological mapping and engineering surveys. A total of 102 staggered contour trenches and two feeder channel ponds have been strategically constructed, employing technical measures. The purpose of these structures is to reduce the velocity of surface runoff, extend the path of rainwater flow, and capture surface runoff for infiltration into the ground. This process aims to recharge the aquifer supplying the spring, consequently augmenting the discharge of spring water.

The assessment of water demand and supply, based on spring discharge, reveals a substantial gap leading to water shortages, as depicted in Figure 4, considering a water requirement of 55 liters per capita per day (LPCD) for a population of 500 (equivalent to 27,500 litres required). For example, in March 2019, the measured spring discharge was 0.083 litres per minute (LPM), providing a daily water availability of



Figure 3: Traditional community actions being undertaken for the rejuvenation of the springshed

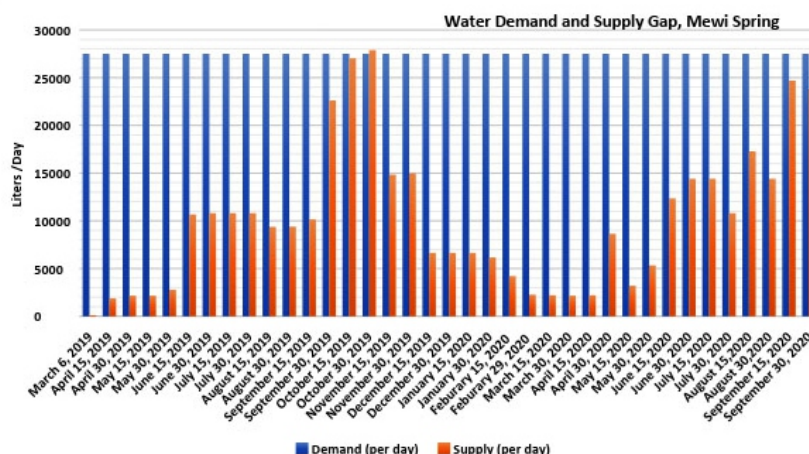


Figure 4: Assessment of water demand and supply, based on spring discharge from the period of March 2019 to September 2020.

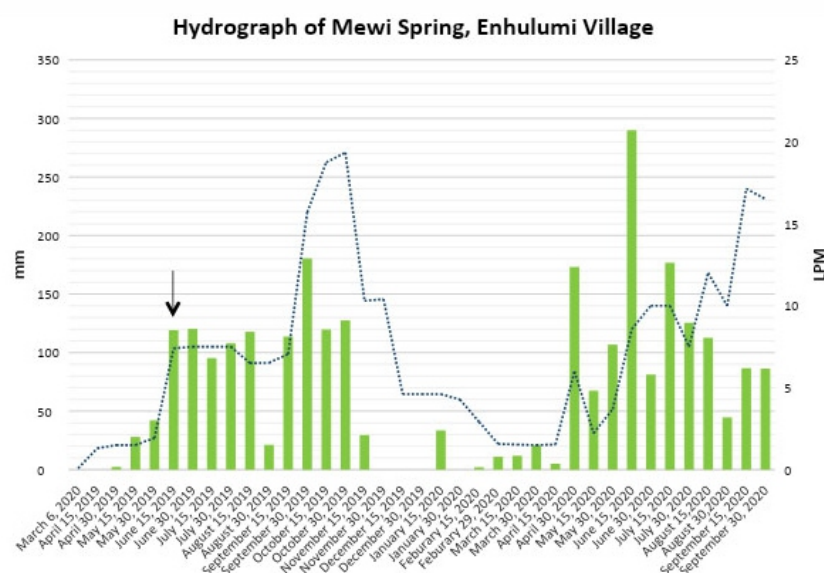


Figure 5: The hydrograph of Mewi Spring from 6th March 2020 to 30th September 2020

water are utilised for agricultural purposes in the terrace fields below the spring Figure 3. Spring recharge interventions Figure 4.

The hydrograph presented in Figure 5 demonstrates an increase in spring discharge following the intervention. It is noteworthy that this rise in spring discharge correlates with heightened rainfall, contributing to a reduction in the gap between water demand and supply, as illustrated in Figure 4. Consequently, the peak in spring discharge can be attributed to the elevated precipitation rate in the preceding month.

The water from precipitation accumulates in the recharge structures, gradually infiltrating downward under the influence of gravity. Over time, it flows slowly in accordance with the hydraulic gradient, eventually emerging at the surface. The hydrograph pattern indicates that Mewi spring is a depression cum contact spring with unconfined aquifers. Understanding the aquifer's behaviour, it is noteworthy that the lithology predominantly comprises clayey soil, a weathered product of shale, which impedes the easy flow of infiltrated water.

It is essential to mention that only 1.7 years of spring discharge data are available. Consequently, a comprehensive impact assessment will be more evident in the coming years as additional data is collected and analysed.

The water quality parameters, including pH, Total Dissolved Solids (TDS), Total Hardness, Alkalinity, Fluoride, Nitrate, Chloride, Iron, and Fecal Coliform, have been tested and found to be below the permissible limits established by the Bureau of Indian Standards (IS 10500:2012). Consequently, the water meets the safety standards for drinking water, ensuring that it is safe for consumption.

only 120 litres per day (LPD). This increased to 1.5 LPM, resulting in 1,800 LPD (Figure 4). Following the spring rejuvenation intervention, the highest recorded spring discharge occurred on 15th September 2020, at 17.14 LPM, providing 24,682 LPD, leaving a gap of only 2,818 LPD. With current rate of discharge which ranges between 19 to 21 LPM community is able to meet its drinking water needs.

The Implementation of Springshed activities has had a notable impact on the trend of spring discharge, with a slight increase, particularly during lean seasons, as depicted in Figure 4. It is evident that the community's daily water requirement has risen by 42%, marking an 11% increase since the initiation of spring rejuvenation activities. A spring box with a storage capacity of approximately 12,000 litres has been constructed near the spring. The seepage and overflowed





Before: Construction of Mewi Spring Box

During the initial village meeting where the concept of Springshed development was introduced to the residents, there was uncertainty among the villagers about its potential benefits for both the spring and the community, as it was a novel idea. However, during the process of mobilizing and transferring knowledge, the community members expressed their concern about water scarcity as a top priority in the village. They assured their support and cooperation in carrying out the activities, hoping to witness positive results in the form of increased spring discharge. Mr Wekhrolo Lohe, the data collector, enthusiastically reported a manifold increase in spring water discharge (refer to Figure 5).

The implementation of social fencing emerged as a crucial step, with the

Village Council Chairman highlighting that the community has established protocols to preserve the spring

recharge area. The Council has agreed to refrain from constructing houses in the area, and the Village Council, along with existing local institutions, is actively managing the spring and is taking responsibility for desilting trenches. The project, costing approximately 1.5 lakhs (which included the cost of covers earthen works and the construction of the spring box), received 100% funding from MGNREGA, with additional contributions from the community.

Enhulumi village's journey is a testament to the power of community-led initiatives in achieving sustainable water security. It echoes a universal truth: collective vision and action can turn adversity into triumph, offering hope and inspiration for communities worldwide. ■



After: Construction of Mewi Spring Box

Thinking Beyond Boundaries Innovative Solutions for Aquifer Restoration

- R.S. Sinha
Founder Convenor Ground
Water Action Group¹
&
Aga Khan Foundation

Large scale indiscriminate and unabated extraction of groundwater sources in Uttar Pradesh has led to significant resource depletion. Both rural and urban areas in the state are experiencing severe strain on their water sources. Areas that were once seen as potential aquifers in the Ganga basin are now nearing depletion. The ground water depletion is widespread and extensive all across the State, but can we get back the depleted aquifers to their original level for achieving source sustainability for future water supplies? It is a major policy concern and requires thoughtful understanding and targeted actions.

Various states in the country have been excessively extracting groundwater for years particularly since the beginning of the Green Revolution in the Eighties. Uttar Pradesh stands out as the largest groundwater extractor, drawing billion of litres from the aquifers annually. This amount is nearly one-fifth of country's total annual groundwater withdrawal.

In Uttar Pradesh, 70% of irrigated agriculture relies on groundwater. Additionally, groundwater serves as a primary water source for drinking water, industries, commercial establishments, infrastructural activities, mining, fisheries and horticulture. Groundwater has become a dominant and vital water for numerous development activities in the state, significantly contributing to the growth of the State's economy. In both urban and rural areas of Uttar Pradesh, the depletion of groundwater sources, has

reached a critical and irreversible state. This poses significant challenges to achieving source sustainability through conventional water conservation measures. The need of the hour is to develop a more robust management mechanism that envisions innovative solutions. This involves integrating a combination of area-specific regulations, technological and scientific approaches, practical methods, and community-based initiatives for coordinated implementation.

To ensure source sustainability, it is important to develop a comprehensive plan that outlines potential management approaches and pathways. This plan should focus on achieving long-term sustainability for groundwater resources in order to meet the future demands of the state. The key lies in implementing a composite management mechanism that is based on a thorough analysis of resource availability, associated stresses, and the evaluation of various policies, plans, and practices. By transforming these insights into efficient and actionable solutions, the state can move towards a more sustainable water future.

Restoration of Aquifers through RRR

With the goal of source sustainability, there is an urgent need to make a paradigm shift from focusing solely on recharge to actively restoring Aquifers. The current outcomes of rainwater harvesting, and recharge programmes are not promising. Therefore, the

future of groundwater resource sustainability cannot rely solely on recharge measures. A more comprehensive approach is necessary, involving a composite management process that integrates rainwater harvesting and groundwater recharge activities. This approach should incorporate various water efficient measures to arrest the rate of decline. It requires significant reductions in groundwater abstraction coupled with robust regulatory actions and interventions for reuse and recycling.

The current imperative is to introduce and incorporate a new, practical and feasible policy intervention for the Restoration of Aquifers through a Composite Aquifer Restoration Package termed as 'RRR'. The key components of this include 'Reduce Ground Water Demand and Consumption'; 'Reduce and Regulate Ground Water Extraction' and 'Recharge to Replenish Depleted Aquifers'. These actions aim to achieve the ultimate goals of bringing about a significant improvement in stressed groundwater conditions.

'RRR' represents a targeted strategy for the scientific management of groundwater resources. It is conceptualised based on three philosophical elements – 'Retrospection, Reimagination and Redesign'. This approach combines both demand and supply side measures, incorporating regulatory interventions tailored to the specific regional hydrogeological setting.

¹ Ground Water Action Group is a voluntary collective of water sector experts, policy planners, researchers, civil society organisations and practitioners to promote sustainable and integrated water management practices & support state's efforts towards developing sustainable water management policies, plans and regulatory frameworks.

Approach to Sustain Drinking Water Sources

Bihar's efforts in the face of climate challenge

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Bihar has commenced the endeavor to comprehend and tackle the sustainability requirements of drinking water sources. This entails ensuring safe, and readily accessible tap water to rural population within their homes. Through the Har Ghar Nal Ka Jal initiative, Bihar has achieved remarkable progress in ensuring the availability of functional household tap connection (FHTC) in all rural habitations in the State. Presently, more than 1.65 crore rural households have FHTC within their premises, receiving a daily water supply for 6 hours. It is noteworthy that Bihar's accomplishments have been realized in the last five years alone. Prior to 2016, only 2% of the State rural population had access to piped water supply in their household and as of now, 96.41% households have this access.

The majority of the piped water supply schemes in Bihar rely on groundwater. The State has adopted the construction of small water supply schemes to facilitate drinking water provision and utilise groundwater as the source even in areas where water quality is an issue. In habitations affected by Arsenic, Fluoride and Iron, the water supply infrastructure includes a contamination removal unit as the Water Treatment Plant to ensure the supply of potable water.

The global phenomenon of groundwater depletion is raising concerns

about the sustainability of water sources. Out of the 1.07 lakh piped water supply schemes in Bihar, 30% are grappling with sustainability issues related to resilience, efficiency, and quality. Water sources are contending with challenges such as increasing demand, aquifer depletion, and the threats posed by extreme weather conditions like hot summers, heatwaves, short spells of monsoon, and flash floods. The Long-Term Maintenance Policy of Piped Water Supply Schemes offers a comprehensive framework to address the sustainability aspects of these schemes and has paved the way for collaboration with the Aga Khan Foundation in Bihar.

As the lead partner for Bihar in Rural WASH Partner Forum (RWPF), Aga Khan Foundation has proposed collaborating on source sustainability initiatives with Public Health Engineering Department (PHED), Government of Bihar to implement a multi-pronged strategy for source sustainability. The initiative spans from policy development to community interventions.

The Gram Panchayats of Gaya and Nawada districts have been identified as demonstration sites for the Source Sustainability Model under the Long-Term Maintenance Policy of Har Ghar Nal Ka Jal. In this model, sustainable water supply is envisaged as a means to discover reliable and resilient approaches to water that neither depletes the water sources,

nor has a long-term negative impact on the environment.

The joint initiative involves two pilot projects (one each in Gaya and Nawada Districts) to demonstrate effective groundwater recharge for source sustainability using a catchment-based approach.

Pre-Pilot Survey Activities

During its recent field visit to Gaya and Nawada districts, the AKF team observed the available secondary data from observation wells at middle school in Kujap Panchayat. The data revealed a declining trend in the water table, except in 2021. The pre monsoon water table data indicates a depth of 36.3 feet in 2020, 33.1 feet in 2021, 37.0 feet in 2022 to 40.4 feet in 2023. Notably, the increase in water table in 2021 suggests the possibility of recharge in the area.

Strategy

Based on observations and findings from the field visit, a total of four villages have been identified for initiating demonstrative work. These villages include two villages, Niyazipur and Aaradeeh in Kujap Panchayat within Gaya Sadar block, and Repura village in Ba7yrat Panchayat and Alawan village in Tetaria Panchayat, Meskaur block, Nawada. The two villages in Gaya are characterised by water scarcity zones. The water scenarios, surface morphology, groundwater potential,

and hydrogeology have been assessed through field observations and available secondary data. Both locations are marked by inconsistent or no discharge from source wells and a high failure rate of such wells. An official from the Public Health Engineering Department (PHED) in Nawada also shared that they had more than 10 unsuccessful attempts of drilling dry borewells in Barat Panchayat before successfully supplying drinking water from a borewell installed near the village pond. Two source wells have been developed, one on the north and the other on the south end of the pond.

Project Design

A promising catchment area with lineaments and a north-south drainage system has been identified around the source well. To facilitate pilot intervention for source sustainability in Repura village of Barat Panchayat, Meskaur block, Nawada district, there is a need for a comprehensive delineation of the catchment area. This involves geophysical investigation and aquifer characterisation to identify the recharge zone. In the case of Tetaria Panchayat, the complexity of the catchment area and the high failure rate of bore wells pose challenges in finalising this area for a pilot intervention. Long-term measures, both by concerned departments and local communities, such as implementing Ahar Pyne, gaining a thorough understanding of natural conditions like flow patterns, silt deposition, and the geomorphology of the area, are essential for effective water management to restore and rejuvenate water sources.

Both the districts are characterised by hard rock terrain, inconsistent discharge and low yielding source (borewells) wells. To sustain the investments made on water supply schemes in south Bihar, urgent action was required. Therefore two pilot

interventions were proposed: one pilot in the catchment area lying in between Niyazipur and Aaradeeh village of Gaya and another pilot in Repura village of Meskaur Block in Nawada district. It was deemed essential to undertake a detailed hydro-geological study to understand the ground water characteristics in the catchment area and its potential to provide sustained discharge for village water supply over a long period of time.

Activities

In addition to development of water conservation structure based hydrogeological study, activities were also undertaken to foster community engagement:

Community level engagement

- Organising Jal Chaupal in all pilot villages: The team is actively organising Jal Chaupals to sensitise the communities and share knowledge and generate awareness on source sustainability, water conservation, and its possible solution. The team is involving all potential stakeholders such as the community, PRI members, students and frontline workers.
- In the Jal Chaupal sessions, there is a facilitation of water budgeting exercises to engage in discussions about source sustainability measures and their impact on the sustainability of drinking water. The key components of "Catch the Rain" campaign include raising awareness about rainwater harvesting and implementing structures to collect and use rainwater for groundwater recharge. Additionally, there is a focus on creating awareness about the efficient usage and management of water through a

Participatory Water Needs Assessment. The tool has been contextualised to enhance understanding and participation among Ward Implementation and Management Committees, Panchayati Raj Institutions (PRI's), pump operators, and other stakeholders at the village/ Gram Panchayat level.

Mission Jal Jeevan Haryali

- Water recharge campaign through Mission Jal Jeevan Haryali – the team is coordinating with Mission Jal Jeevan Haryali to promote activities related to source sustainability water recharging.
- Programmes under these campaigns are contributing to water-security and climate resilient villages.
- In this campaign, communities and all stakeholders are being encouraged to participate in a plantation drive, as well as support the construction of RWH structures, and in the rejuvenation of old water bodies.
- Roof top rainwater harvesting campaign for ground recharge covering 100% household in the identified villages has also begun.
- Through this campaign, the project is aiming to recharge groundwater, and enhance the overall availability of water resources.

Expected Outcome and Next Steps

- Undertaking water management/recharge measures at large scale based on scientific



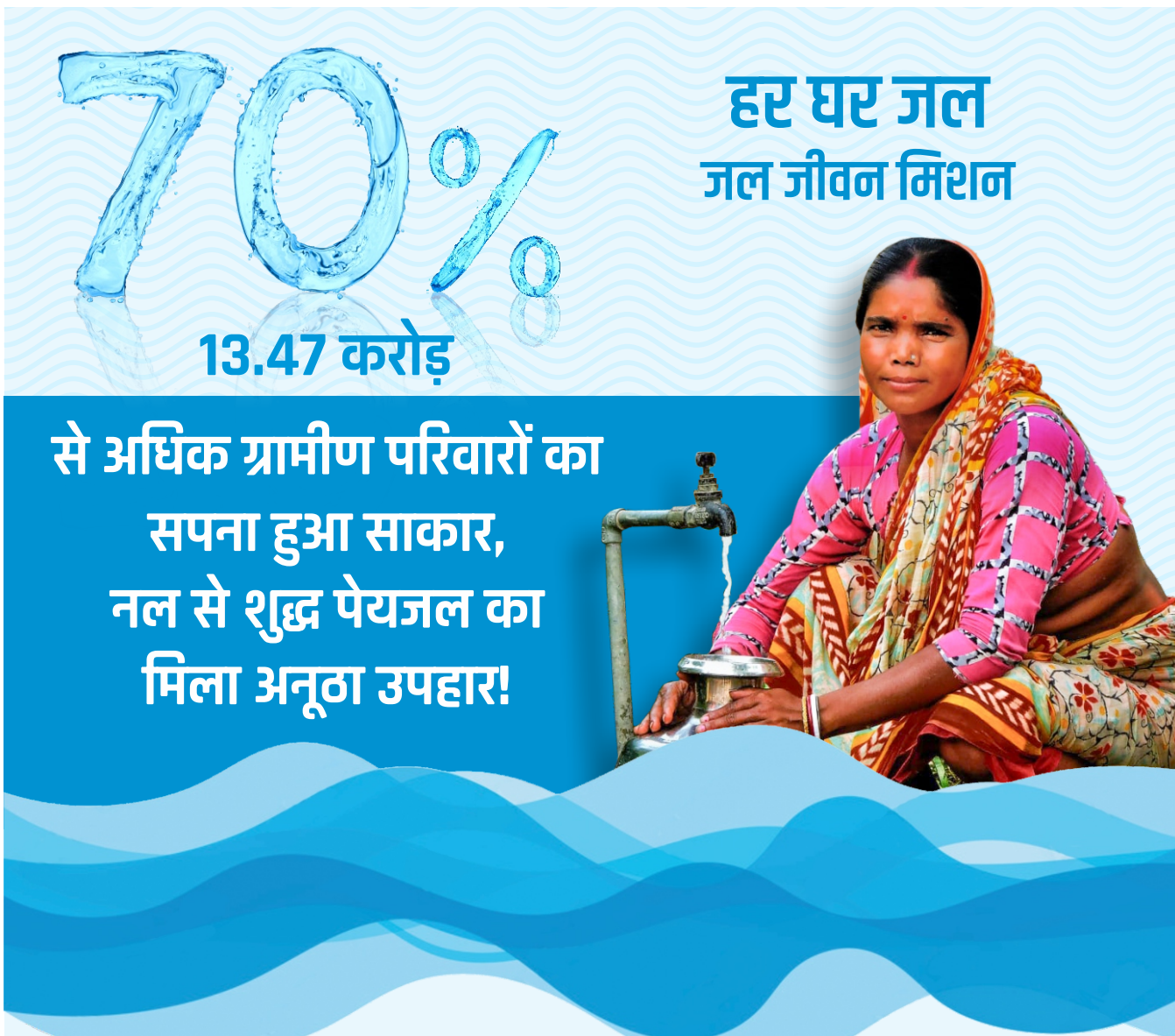
parameters and participatory approaches adhering to the SOP of 'Sustainability of Groundwater Sources' by Ministry of Jal Shakti, Government of India.

- Conducting groundwater table mapping, borewell strata/lithology analysis, and mapping of groundwater recharge potential zone using a GIS approach by integrating contributing factors such as lithology, land cover/land use, lineaments, drainage, and slope.
- Adopting and replicating the Aquifer Storage and Recovery

(ASR) approach as an effective intervention to augment the management of aquifers. However, site selection for ASR intervention should be based on available metrological, geospatial, and geohydrological data as well as socioeconomic parameters.

- Establish an effective monitoring system to track the quality of water being recharged, the quality of groundwater, and water table fluctuations through a series of observation wells while undertaking the pilot intervention.

- Minimise the wastage of water and optimise recharge for source sustainability, by promoting other methods such as roof-top rainwater harvesting through small household pits.
- To gain a proper understanding of hydrology and natural parameters to facilitate coordination between the government departments and local communities to undertake rejuvenation and water management, ensuring the sustainability of ground water sources.



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**से अधिक ग्रामीण परिवारों का
सपना हुआ साकार,
नल से शुद्ध पेयजल का
मिला अनूठा उपहार!**

Embracing Climate-Resilient Drinking Water Solutions through Sustainable Groundwater Replenishment in Catchment Areas

Harish Kumar Hingorani
Retd. Engineer-In-Chief,
PHED, Chattisgarh and

Ajay Kumar Sahu
Chief Engineer PHED,
Jagdalpur Zone,
Chattisgarh

The Jal Jeevan Mission program envisages development of reliable drinking water sources and/ or augmentation of existing sources to provide long-term sustainability of water supply system to ensure service delivery over a full design period.

Groundwater is still the primary source of agriculture and drinking water supply in rural areas. Over the past two decades, the depletion of groundwater resources has been substantial, primarily due to uneven rainfall distribution, climate variations, hydro-geological conditions, and excessive exploitation driven by pressing demands for self-reliance, particularly in agriculture and the industrial sector. Additionally, the increasing population has further intensified the stress on groundwater resources. The major thrust of these water demands has been on groundwater resource due to its readily availability at site, easy to use, cost-effectiveness and direct control by users.

Drought conditions exacerbate the scarcity of water. Additionally, the lack of robust legislation to regulate the development and management of this precious resource further worsens the situation.

Due to over extraction and drought conditions, groundwater has not been adequately replenished through the recharge of subterranean

aquifers. Excess depletion of groundwater has been observed during the dry season, which impact the groundwater-based water supply systems. Additionally, the deterioration of water quality in groundwater sources is having adverse effects on human health.

The current imbalance in the groundwater system poses a threat to groundwater sustainability. Therefore, there is a pressing need to implement water conservation measures to address this issue. One such approach for effective management and utilisation of available water resources is known as '**Watershed/ Springshed Management**' as conceived in JJM guidelines. The initial Dublin principle emphasises management 'across the whole of a catchment or groundwater aquifer' as the most effective approach for various interconnected land and water management issues¹⁸. As a watershed signifies a distinct hydrological unit, it is crucial to use it as the foundation for planning and implementation. The concept of watershed management adopts a holistic approach to optimise the utilisation of available water and other resources.

The basic purpose of artificial recharge of groundwater is to restore supplies from aquifers depleted due to excessive ground water development. Recharge techniques normally address to following issues:

- To enhance the sustainable yield in areas where over development has depleted the aquifer.
- Conservation and storage of excess surface water for future requirements, since these requirements often change within a season or a period.
- To improve the quality of existing ground water through recharge.

Basic requirements for Artificial Recharge projects are:

- Availability of non-committed surplus monsoon run off in space and time.
- Identification of suitable hydro-geological environment and sites for creating sub surface reservoir through cost effective artificial recharge techniques using remote sensing/ GIS as a tool.
- The Jal Jeevan Mission guidelines suggest the use of hydro-geomorphological maps (HGM Maps) for identification of probable location for recharge of aquifers through site specific recharge structures.

Presented below is a case study from the Patan block of Durg District, Chattisgarh that has demonstrated a viable model for groundwater recharge adopting the watershed approach.

¹⁸ The Dublin Statement on Water and Sustainable Development, also known as the Dublin Principles, was a meeting of experts on water related problems that took place on 31 January 1992 at the International Conference on Water and the Environment (ICWE), Dublin, Ireland, organised on 26–31 January 1992



A Case Study: Gajra Watershed

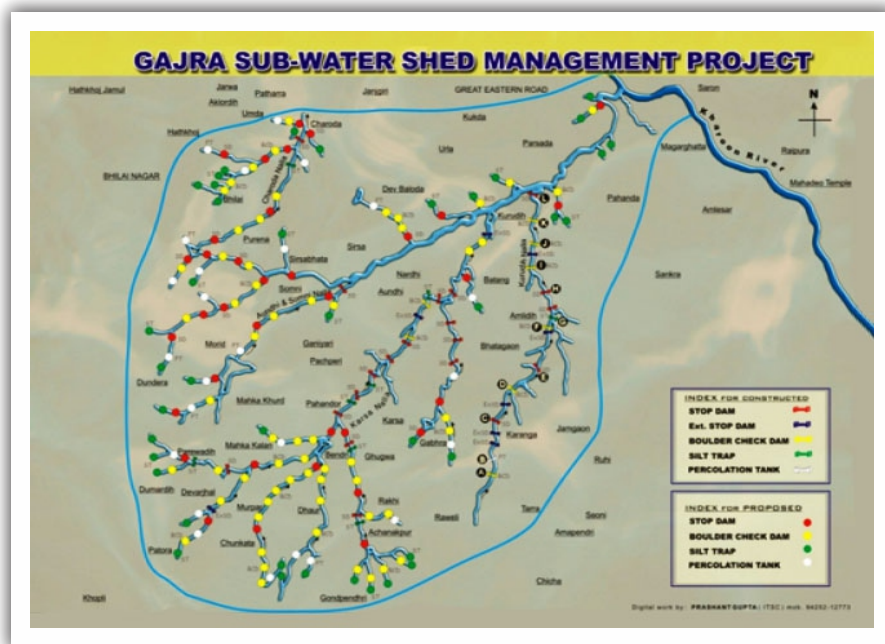
Block: Patan, District: Durg

The Patan block in Durg district of Chhattisgarh is characterised as a water stressed block and falls under the classification of a Grey block.

In the earlier decade, a pilot project covering an approximate catchment area of 250 sq km and comprising 47 villages/ 59 habitations was planned and implemented. The objective was to develop a comprehensive water security action plan to achieve drinking water security to every rural household at village level.

Methodology

The groundwater potential mapping methodology involved the acquisition of satellite data and the use of visual interpretation techniques, ground facts collection, and the preparation of final maps for themes like physiography, slope, soils, drainage, geology, faults, fissures, lineaments, hydrogeology, hydrogeomorphology, etc. In addition to groundwater prospects, factors such as rainfall, climate, groundwater fluctuation, groundwater quality, and



land use were taken into consideration for the final decision-making process in site selection for specific structures. Design guidelines for selecting structures were also considered during the final decision-making.

The study of individual thematic maps facilitated the analysis of various parameters in respect to each theme under study. Integration of thematic maps was done through

GIS, and the results were interpreted to produce the action plan for the proposed site selection of specific structures.

The developed action plan was further detailed by mapping it within the administrative boundaries of villages or gram panchayats.

Results

Following the implementation of identified site-specific recharge structures in the said watershed, there has been an observed rise in the groundwater table by approximately 25 meters, i.e., from 35-40 metres below ground level (mbgl) to 10-12 mbgl. No water quality problems have been reported in the area.

Recommendation

Members of the JJM task force visited several villages in the Gajra Watershed, engaging in discussions with the community regarding outputs and benefits. Subsequently, the JJM task force members expressed appreciation for the planning and implementation methods observed. In their report, it was recommended that the planning principles of the Gajra Watershed be replicated across the country for sustainability. ■



The Umbrella Effect Shielding Nagaland's Future with Rainwater

WSSO PHED, Nagaland
and

Utkarsha Rathi
NJJM

As the Hornbill Festival of Nagaland approaches, the 'Catch the Rain' initiative offers a fitting start to the festivities. Nagaland, known for its cultural diversity and picturesque landscapes, grapples with water scarcity and the need for sustainable water management. The initiative aligns with the State's climatic conditions, emphasising on harnessing of abundant rainfall as a valuable resource.

Rainwater harvesting is a pivotal component of source sustainability, offering an eco-friendly and cost-effective solution to water scarcity. The PHED Urban Division's commit-

ment to Information, Education, and Communication (IEC) at the grassroots level ensures that communities comprehend the importance of rainwater harvesting, ushering in a sustainable water supply that conserves water and reduces dependence on traditional sources. The recent Participatory Rural Appraisal (PRA) exercise at Kirha Village exemplifies the impact of community involvement in sustainability initiatives.

Officials from PHED Urban Division, Chumoukedima District collaborated with the community, fostering a sense of ownership and responsibility. Through engaging sessions, the

community was educated on the benefits of rainwater harvesting, focusing on the integral role played by every individual in the success of such initiatives.

Nagaland's annual average rainfall, a potential goldmine for effective rainwater harvesting, positions the state to benefit significantly from the transformative force of "Catch the Rain" campaign. On 10th November 2023, the Public Health Engineering Department (PHED) Urban Division in Dimapur, Chumoukedima District, Nagaland, conducted a Participatory Rural Appraisal (PRA) exercise to educate the village stakeholders, including the Village Council and WATSAN members, on the value and benefits of rainwater harvesting.

During the exercise, which was conducted at Dimapur Government College, Nagaland, Mr Staemyanger (JSF) emphasised the seriousness of the rate at which groundwater is being depleted in India by providing data from a recent study conducted by the University of Michigan in the United States, which mentioned that groundwater depletion in India is expected to triple as a result of global warming between 2041 and 2080. He further emphasised on the ground water depletion in context to Nagaland by providing the attendees with information and data from a state-level seminar on ground water conservation. Furthermore, it was stressed that unchecked groundwater exploitation in Dimapur would cause water scarcity in the next



twenty-one years, citing a recent incident revealing that two borewells of 350 feet were excavated beneath the surface with no groundwater available at ACD high court, Dimapur, Nagaland.

During the PRA campaign, "Catch the Rain," District Jal Shakti Fellow (Chumoukedima), Rhian used the slogan **"Catch the rain, where it falls, when it falls"** to encourage states and stakeholders to design Rain Water Harvesting Structures (RWHS) that are appropriate for the subsoil strata and climate.

The awareness programme's objectives were to raise public knowledge of the value of safe water, prudent water use, and source protection. She went on to discuss the need for water collection pits and rooftop RWHS for water conservation. The community can actively contribute to achieving the goal, and efforts should be taken to guarantee that every home in the village or urban setup adopts the practice of rooftop rainwater harvesting. The goal can be accomplished with the community's active participation and every home in the village or urban setup should adopt the practice of rooftop rainwater harvesting structures in order to collect and store the greatest amount of rainwater that

falls within their immediate vicinity. The only goal should be to restrict the amount of rainwater that overflows, since this will enhance and augment soil moisture and replenish groundwater. This will help reduce drainage damage, urban flooding, water logging and water flowing onto highways in the nearby areas.

People were sensitised on the impact of rapid urbanisation or growth and high population density within villages and towns, which depletes the quality and quantity of groundwater level, in addition to the issue regarding the availability of groundwater.

Participants were introduced with techniques of managing groundwater and its resources effectively at the home and community level with the right legislation in place, taking sincere steps towards source sustainability. By utilising the proposed strategies and methods such as using roof gutters, ground water recharge pits, wells, and borewell recharge pits, ground water rejuvenation, restoration and management can be successfully achieved. They were advised to adopt and implement rainwater harvesting structures which will enable them to have a sustainable approach towards ground water resources.

Mass involvement stands as a linchpin for the scalability and sustainability of water management initiatives. The implications of a united community dedicated to rainwater harvesting are far-reaching. Increased participation leads to greater water availability, diminished pressure on conventional sources, and a positive ripple effect on the overall ecosystem.

The interconnection between water management and public health is undeniable. Clean and sustainable water sources directly impact community health. By promoting rainwater harvesting, the community ensures a consistent water supply and mitigates the risk of waterborne diseases.

The convergence of "Catch the Rain," the PHED Urban Division in Dimapur, and the proactive Jal Shakti Fellows in Chumoukedima District present a model for sustainable water management in Nagaland. Through targeted awareness campaigns, community involvement, and the adoption of rainwater harvesting techniques, these initiatives empower communities to take charge of their water sources. As Nagaland strives for water sustainability, the "Catch the Rain" campaign serves as a beacon of hope, showcasing that collective efforts can indeed create a lasting impact on the region's water resilience. ■



IIT Jodhpur's Pioneering Solutions Nurturing Water Sustainability Through Technology, Training, and Transformative Practices

Pradip Kumar Tewari
JJM Professor Chair and
Head Department of
Chemical Engineering IIT
Jodhpur

Sustainability of drinking water sources is an important requirement for development, and economic-growth. Ensuring adequate quantities of good quality water for human consumption is a fundamental need to overall water security. India has been making enormous progress in ensuring the provision of safe water for drinking and other domestic purposes to the rural population under Jal Jeevan Mission (JJM).

The objective of providing safe drinking water to every household, in adequate quantity, quality, and reliability and within the dwelling premise have several dimensions. Getting adequate quantity of water locally throughout the year is quite challenging in certain parts of the country due to low mean annual rainfall and high aridity, resulting in extremely limited runoff and

recharge, and high evaporation. During droughts, the situation worsens, and water availability falls short of even the basic requirements. There are regions where groundwater is available throughout the year in large quantities as natural stocks, but the water contains excessive levels of chemical contaminants such as iron, fluoride, arsenic, nitrates and salinity; rendering it unfit for human consumption. There is another category of regions having high rainfall, mountainous regions producing large quantities of run-off, but lack adequate storage infrastructure. In other words, there are only a few areas in the country where freshwater is naturally available throughout the year, which can be supplied for drinking purpose with basic treatment. The issues are compounded due to the adverse impact of climate change. Technol-

ogy can play an important role in sustainability of drinking water sources for ensuring round the year availability of water for drinking and domestic purpose. It has potential to meet the requirements of the rural households in terms of quantity, quality and regularity. The technological interventions can help in protecting the source water from contamination and depletion.

In this context, the expertise available in the institute has led to setting up of JJM Professor Chair and Centre for Sustainable Drinking Water in IIT Jodhpur; funded by Jal Jeevan Mission (JJM), Ministry of Jal Shakti. Aimed at 'Sustainability of Drinking Water Sources', the mandate is Capacity building, Outreach, Research and Education (CORE) in the domain area. A number of activities have been carried out by the Professor Chair in this focus area.



Glimpse of Capacity Building Programme and Site Visit on World Water Day 2023



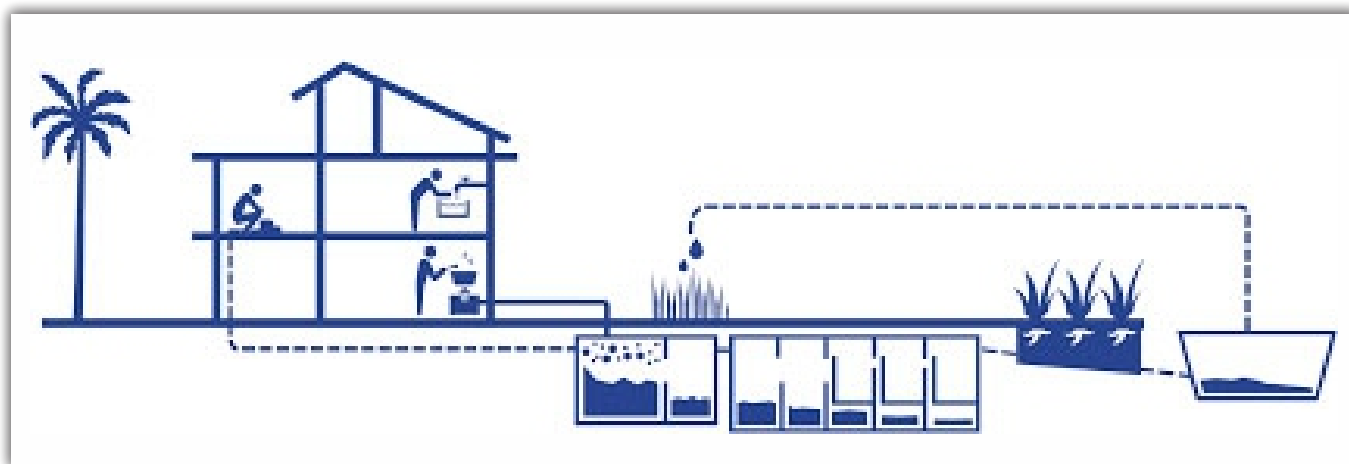
The draft document on 'National Guidelines on Water Source Sustainability' was prepared with inputs from UNICEF and further enriched by incorporating the relevant aspects from the documents of the Department of Water Resources (DoWR). It extensively addresses challenges related to ensuring drinking water security, government initiatives, strategies for ensuring sustainability, monitoring, evaluation, impact assessment, policy framework, and more. The relevance of source augmentation, water resilience, water efficiency, integrated water resource management, have been described in strategies for ensuring sustainability. Artificial ground water recharge, rooftop rainwater harvesting, source augmentation for islands/ coastal areas, spring shed revival and development have been discussed in detail and examined to address source sustainability. Greywater reuse, evaporation control, smart water distribution, and radio-isotopes in water resource management have been elaborated and explored. The document is aimed at providing guidelines on water source sustainability in the Indian context.

The training and capacity building programmes on water sustainability are conducted at regular intervals for

participants from different states and union territories. The programmes aim to equip participants with the advanced skills and knowledge required to address current water-related challenges and develop sustainable solutions in water resource management. The training programme includes lectures by academic experts with active and detailed technical discussions, providing a comprehensive overview of the issues related to water sustainability and possible solutions. JJM Professor Chair on Sustainability of Drinking Water Sources has provided capacity building training to engineers, chemists and other participants from U/T of Ladakh, Rajasthan, Gujarat, UP, Bihar, Haryana, North East states, Kerala etc in both online and offline mode. Issues such as water sustainability, case studies on sustainability of water sources, smart water supply grid for rural and remote areas, flood and drought risk assessment and management for a sustainable future were covered in great detail. These lectures were then followed by interactive sessions to discuss the challenges of their respective regions and deliberate over possible solutions. There are plans to train over 90 officials in the current year working on rural water supply and allied areas through training and capacity-

building programmes. One such training and capacity building programme was recently organised on 21st September 2023. The next capacity building programmes are scheduled on 21st December 2023 and 22nd March 2024.

Water source sustainability is practiced at IIT Jodhpur in a comprehensive manner. The grey water generated at the IIT Jodhpur campus from the housing complexes, academic buildings and hostels are treated through De-centralised Wastewater Treatment System (DEWATS) and recycled. DEWATS consists of sedimentation, clarification, aerobic treatment, anaerobic treatment, sand filtration and activated carbon filtration. The treated water is recycled and used for irrigation purpose. It is also used as make-up water in cooling towers and for other non-potable purposes. The process is environment-friendly. Further, pop-up and drip irrigation methods are used to water the plants and lawns, gardens, and sports fields. This ensures effective water use and reduces water consumption. A research-based case study on Decentralised Wastewater Treatment System (DEWATS) for recycling and reusing the treated water is being carried out. Impact studies aimed at capturing existing data related to



Decentralised Wastewater Treatment System



A Pictorial View of De-centralised Wastewater Treatment System (DEWATS) at IIT Jodhpur



Rainwater Harvesting Structure at IIT Jodhpur

social, economic, and health impact of the sustainability of drinking water sources including greywater treatment for groundwater recharge has also been initiated.

Rainwater harvesting is also followed on campus for enhancing the sustainability of water sources. The roof-top water is released onto a swale, which then transfers the water to a pond outside the campus in a local village. Swales connect the

entire campus and collect all surface run-off water in the pond. The nearby communities use this pond water. The underground storage tanks installed in each hostel building also catch rooftop rainfall. Water that is conserved is utilised for gardening.

Technical support in the domain area of sustainability of drinking water sources, is being provided to the States and Union Territories (UTs) as per the demand and need of the

concerned department. In conclusion, under the leadership of JJM-Professor Chair, IIT Jodhpur emerges as a trailblazer in the realm of water sustainability. The institute, through pioneering technologies such as De-centralised Wastewater Treatment Systems (DWATS) and rainwater harvesting, alongside impactful capacity-building programmes, is not merely confronting challenges but actively shaping the discourse on water resource management. ■



Shri Vikas Sheel

Additional Secretary & Mission Director, NJJM

on

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One-Day Symposium Making Sure, Sources Sustain and Taps Give Safe Water

The JJM chair on Operation and Maintenance (O&M) issues led by Dr Gopal Naik of Indian Institute of Management Bangalore - IIMB organised a one-day symposium in Bangalore on 1st November on “Ensuring sustainability of drinking water infrastructure: Emerging challenges and scalable models from rural India.” The symposium was in partnership with Arghyam, eGov Foundation and Pawan Sachdeva, a water expert. It was well attended by various stakeholders of the JJM such as Water Aid, Tata trusts, Water for People, INREM Foundation and other agencies who are part of the Rural WASH Partners Forum (RWPF). From JJM, the meeting had participation from Mr Pradeep Kumar Singh, Director JJM, Mr A Murlidharan, Advisor JJM and other dignitaries. Other agencies such as Well Labs, and various ISAs and KRCs participated in this event.

The symposium deliberated on four thematic areas for sustainability: Source, Operational, Financial, and Institutional.

The Source Sustainability theme focused on Water Source Sustainability and Water Quality issues.

Mr Pradeep Kumar Singh, Director - JJM, opened the discussion mentioning that the Village level action plans for JJM did include aspects of Source sustainability and Jal Shakti Abhiyaan is focusing on the source sustainability aspects. However, capability of the Village Water Sanitation Committee (VWSC) has been lacking. This aspect of sustaining the water source needs to be addressed as the next challenge. Mr Singh mentioned that digital tools that utilise GIS capability when combined with participatory

planning within villages can help in leveraging resources from other programmes such as NREGS and Atal Bhujal Mission, so that source sustainability plans can be made.

A majority of schemes are dependent on groundwater-based schemes which pose the biggest challenge for the source sustainability of drinking water supply schemes, especially because most of rural water (around 70% to 80%) is utilised for irrigation and other needs. Hence to sustain the water supply programmes, a holistic water management plan that prioritises drinking water in convergence with other departments is essential.

The group identified that the linkage between water source sustainability and water quality issues is very strong. In locations where groundwater sources are being used, deepening of borewells can lead to newer aquifer layers which could have water quality problems.

Water Quality Monitoring and Surveillance (WQM&S) programme in participation with the community has resulted in more than four million water quality tests across the country. Community awareness has also increased as shared by the WASH expert attending the meeting. However, this data is yet not accessible to the community except through websites and communication of such data back to VWSCs is not yet happening smoothly. By working more on this aspect, VWSCs can get





people's homes should be streamlined.

The discussion also resulted in sharing of some interesting examples in source sustainability and water quality management, which can be studied further and learnt from:

- 💧 The Karnataka government has been utilising a digital tool known as CLART for helping rural communities in using scientific knowledge for making local water conservation plans.
- 💧 JJM has started the WASH Digital Academy which is helping capacity building of JJM stakeholders upto the GP level.
- 💧 Efforts by several states such as *Jal Sahiyas* in Jharkhand and *Jal Doot* in Assam, are showing a path for effective village level communication of water quality data resulting into increased awareness and local participation

Overall, the discussion around water source sustainability and water quality in this workshop concluded by putting emphasis on the fact that long-term success of the Jal Jeevan Mission will now need increased attention and action on these critical aspects of the programme.

closer to water quality data which can help in getting a clearer picture about local water supply programmes.

With the Gram Panchayat (GP) at the centre, it was identified that the following suggestions should be taken ahead:

- 💧 Identification and regular measuring and monitoring of groundwater levels of the sources.
- 💧 A water supply source sustainability plan guideline document needs to be prepared for each scheme with specific attention given to local variabilities of geohydrology, climate and other aspects.
- 💧 Targeted capacity building of GP and VWSC along with frontline workers needs to be taken ahead for orienting the community on water source sustainability.
- 💧 Digital tools that enable the village community to identify activities which help locally with water source sustainability need to be adopted.
- 💧 A focused state-level effort on sustaining water sources needs to be taken up as a mission in convergence with other

programmes such as NREGS and ABHY. With clear monitoring goals, this needs to cover all water sources and include periodic monitoring so that concurrent issues are identified.

- 💧 WQM&S needs to be brought closer to the community by ensuring that water quality data is easily communicated back to the VWSC.
- 💧 Community of WQM&S data to the VWSC needs to be inter-linked with location; action to be taken up by VWSCs and resources needed to protect water safety at source and at



Workshop on 'Community Adaptability and Sustenance Mechanisms at the Intersectionality of Water and Climate Change'

Promoting Stakeholder Stewardship towards Sustainable Water Management
30th November 2023, New Delhi

S M Sehgal Foundation¹, in collaboration with DCB Bank, and National Institute of Rural Development and Panchayati Raj (NIRDPR) as the knowledge partner held the inaugural workshop in the capacity building and experience sharing workshop series in New Delhi

on 30th November 2023. Titled 'Jalagam', the workshop series was graced by Smt. Vini Mahajan, Secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti; Shri Ashok Goel, Commissioner, Ministry of Jal Shakti; and trustees of S M Sehgal Foundation

Smt. Neelima Khetan and Dr Suhas P Wani; and Mr. Avinash Mishra, former adviser, NITI Aayog. The panel sessions featured discussions around community adaptability and sustenance mechanisms in addressing water-related challenges. The proceedings from the four workshops



¹ S M Sehgal Foundation (Sehgal Foundation) has been working since 1999 to improve the quality of life of the rural communities in India. It has five main programme areas: Water Management, Agriculture Development, Local Participation and Sustainability, Transform Lives one school at a time, and Outreach for Development.

Link: <https://www.smsfoundation.org/about-us/>

in the series will form part of a white paper for sharing with policymakers, practitioners, and academia.

'Jalagam' marks a significant step toward featuring community adaptability and sustenance mechanisms at the intersectionality of water and climate change. The workshop series aims at fostering collaboration and sharing experiences in the field of water resources management and bringing out best practices across regions in the states of Delhi, Maharashtra, Telangana, and Uttar Pradesh.

Chief Guest, Smt. Vini Mahajan, Secretary, Department of Drinking Water and Sanitation, Ministry of Jal Shakti shared the various initiatives undertaken by the Ministry emphasising the aspect of community ownership in ensuring long term sustainability of infrastructure and impact. Encouraging convergence of efforts by stakeholders, she said "Capacity building of village level institutions, behaviour change communication, innovations and a range of partnerships are needed to

make people aware of both, their rights and responsibilities to sustain these services. It would be incredible if this empowerment is embedded into the issues around water and sanitation". She further reinstated the importance of the Jal Jeevan Mission and its focus on grey water management and crucial link with the Swachh Bharat Mission.

Describing the value of 'Contribute to Society' at DCB Bank and its impact, Mr Murali M Natrajan, Managing Director and CEO, DCB Bank, shared, "Water, the lack of it impedes progress and sustainability of the nation, its people, and the planet. We cannot ignore the relationship between water and waste management affecting the overall health and water of a nation."

Anjali Makhija, Trustee and CEO, S M Sehgal Foundation shared, "The joint efforts of DCB Bank Limited and Sehgal Foundation have contributed significantly to water conservation and sustainability, positively transforming the lives of many communities across India. The

success of the workshop series will mark a milestone in the ongoing efforts to build resilient communities and provide collective impetus to the pressing issues of water and climate change."

The collaborative efforts of DCB Bank and S M Sehgal Foundation, emphasise their shared commitment to addressing critical issues such as water crisis, climate change, and sustainable livelihoods. With impactful projects benefiting over 14,500 community members across five states, the partnership has harvested over 350 million litres of water through initiatives like groundwater augmentation and rejuvenation of ponds. The success of the workshop series that will mark its footprint in four locations in the states of Delhi, Maharashtra, Hyderabad, and Madhya Pradesh, is poised to become a milestone in the ongoing efforts to build resilient communities and address the pressing challenges of water and climate change. ■



Meetings and Events

Review Meetings

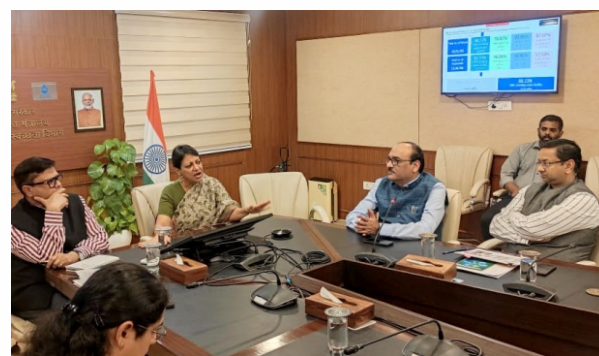
Top 50 districts exceeding 95% coverage

On 7th November 2023, a virtual review meeting, chaired by the Secretary, DDWS, which included the top 50 districts that exceeded 95% coverage under the Jal Jeevan Mission. The focus was on ensuring work quality and achieving the declaration of Har Ghar Jal. Attendees comprised Principal Secretaries, Secretaries, MDs, DM/DCs/CEOs of Districts, Chief Engineers, and various officials. AS&MD-NJJM and other officers were present from NJJM.



WASH services in Schools, Anganwadis & Health Centres

On 8th November 2023, the Secretary of DDWS and the Secretary of DoSEL conducted a joint review of the availability of WASH services in Schools, Anganwadis, and Health Centres. The meeting concluded with a decision to enhance the coverage of WASH services in these institutions. Representatives from DDWS included AS&MD-NJJM, JS&MD-SBMG, AS-MoWCD and JS-MoHFW. Representatives from MoHUA, World Health Organisation (WHO), and UNICEF India were also present.



Vibrant Villages

On 24th November 2023, AS&MD of NJJM led a virtual meeting focusing on the implementation and progress of the Jal Jeevan Mission in Vibrant Villages. Discussions during the meeting encompassed coverage, progress, and issues pertaining to LGD & IMIS. Attendees included Secretaries/MDs, E&Cs, CE, DCs/DMs, and other officials from Arunachal Pradesh, Himachal Pradesh, UT of Ladakh, Sikkim, and Uttarakhand, all of which have Vibrant Villages. NJJM was represented by Directors, Deputy Advisor, and other officials.

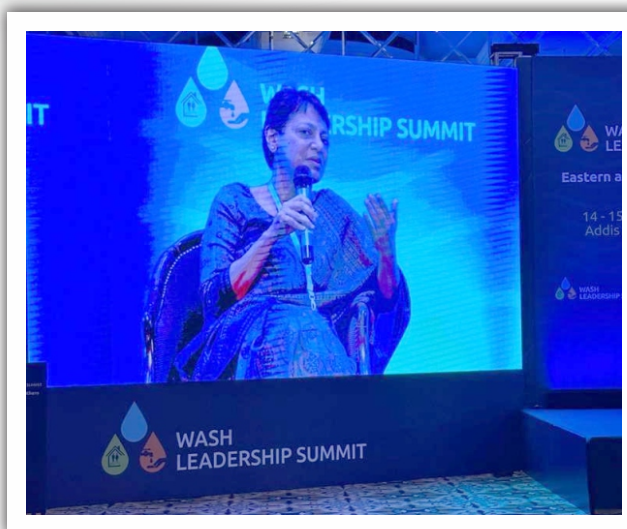


Secretary, DDWS participation at the Eastern and Southern Africa Leadership Summit on Accelerating Universal Access to Water, Sanitation, and Hygiene (WASH) 14th-15th November 2023, Addis Ababa, Ethiopia

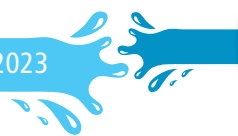
On the invitation of Vice President, Eastern and Southern Africa Region, World Bank, Smt. Vini Mahajan, Secretary – DDWS visited Addis Ababa, Ethiopia on 14th-15th November, 2023 to speak about the good work being done in WASH sector in India at the Eastern and Southern Africa Leadership Summit on Accelerating Universal Access to Water, Sanitation, and Hygiene (WASH) organised by Ministry of Finance, Ethiopia (Africa) in association with the World Bank.

This was a high-level conference with participation of finance ministers and sector ministries of 23 countries in Eastern and Southern Africa. There was a huge interest in learning how India dealt with these issues.

Secretary – DDWS, presented to the group about India's commitment in achieving SDG-6 WASH goals well ahead of schedule. She shared the financial commitments by the Federal and State Governments in achieving universal access to WASH services, policy and technological



intervention and community ownership leading to the successful implementation of Jal Jeevan Mission and Swachh Bharat Mission- Gramin.



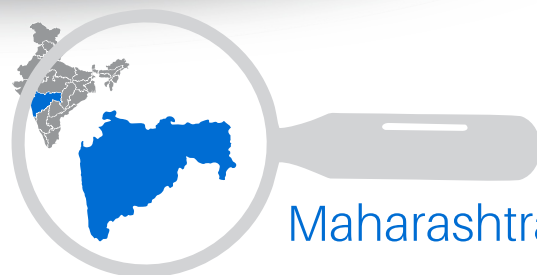
JJM: Action on the Ground



Gujarat

Secretary-DDWS, Smt. Vini Mahajan visited Walanker village in Vadodara district of Gujarat on 1st November 2023, which is an aspiring ODF Plus village. During the visit, she interacted with SHG members, ASHA and Anganwadi workers and discussed the possibility of women SHG members taking care of the O&M assets being created under SBM-G. she also had discussions with the lady Sarparch of the village regarding cases of open defecation and water quality and supply issued in the village. Later, she visited a Grey Water Management System (DEWATS-Decentralised Waste Water Treatment System) installed in the village and interacted with farmers regarding payment of user charges for using the treated water.

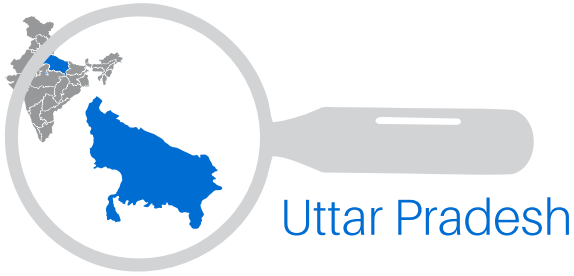
Secretary, DDWS also visited Dumad village in Vadodara, an ODF Plus model village, where she interacted with the Sarpanch, who is reportedly the youngest lady Sarpanch in the State and discussed about the issue of open defecation and water quality.



Maharashtra

A team comprising three members from the National Jal Jeevan Mission (NJJM) visited Maharashtra between 2nd-4th November 2023. The purpose of the visit was to interact with the officials of WSSD/MJP/GSDA to discuss the proposal of Marathwada Water Supply Grid. During the visit, the team interacted with Principal Secretary, Water Supply & Sanitation Department (WSSD) and Mission Director, State Water & Sanitation Mission (SWSM) along with Engineers of Maharashtra Jal Pradhikaran.





A four-member team of National Jal Jeevan Mission (NJJM) visited the state of Uttar Pradesh between 8th-9th November 2023 to attend the workshop held on 9th November on O&M of Rural Water Supply Schemes under JJM.

The workshop was organised on a collaborative initiative by SWSM-UP & UPJN, under guidance from IIT-Kanpur & NJJM, with the primary objective of evolving an efficient and sustainable methodology for the Operation and Maintenance (O&M) of water supply schemes in Uttar Pradesh under JJM. Teams from NJJM, SWSM, UPJN, and representatives of construction agencies actively engaged in the panel discussions, contributing diverse perspectives and insights. It was collectively decided that workshops of this nature will be an ongoing initiative until a robust and practically applicable methodology is evolved for the efficient and sustainable O&M of water supply schemes. During the interaction session, ideas on effective O&M shared among participants of the workshop. ■



The Vibrant Village Programme Transforming Lives, Witnessing Development along the Borders

The Vibrant Villages Programme, launched by the Government of India has led to notable development in the border villages. Residents now feel more secured, accompanied by the creation of new employment opportunities. The main objective of this programme is to provide growth, enhance connectivity, and ensure social and employment security. The Central Government envisions that this programme will help in improving the quality of life of the people living in the border villages. Migration of people in search of employment will stop and people will be encouraged to remain in their native places, which will strengthen the security of the borders.

The Central Government has made budgetary provisions to ensure that proposed changes, which will transform border villages into vibrant villages, happens well within time. Providing villagers in border villages with adequate supplies of water, electricity, irrigation, roads, health, communication, and other basic facilities are the main objectives of the programme. This ambitious programme has been allocated ₹4800 crore and will cover 2,967 villages in 46 blocks of 19 districts along the international border with China and Nepal. The purpose of the Vibrant Villages Programme is to also enhance security in villages located near the line of actual control (LAC) with China. These villages are in

Arunachal Pradesh, Sikkim, Uttarakhand, Himachal Pradesh and the Union Territory of Ladakh.

To implement our Hon'ble Prime Minister's vision on the ground, National Jal Jeevan Mission has prioritised these vibrant villages through its outreach programme. The mission aims to make every household in these villages 'Har Ghar Jal' and 'Har Ghar Nal se Jal.'

In this direction, National Teams of NJJM, conducted field visits to Arunachal Pradesh, Sikkim, Himachal Pradesh and Uttarakhand in the month of November 2023.

Sikkim

A one-member team visited villages of Sikkim between 15th-17th November 2023 to meet district officials and members of VWSC. In Gangtok district, Gnathng and Thegu village/habitation was visited by the team.

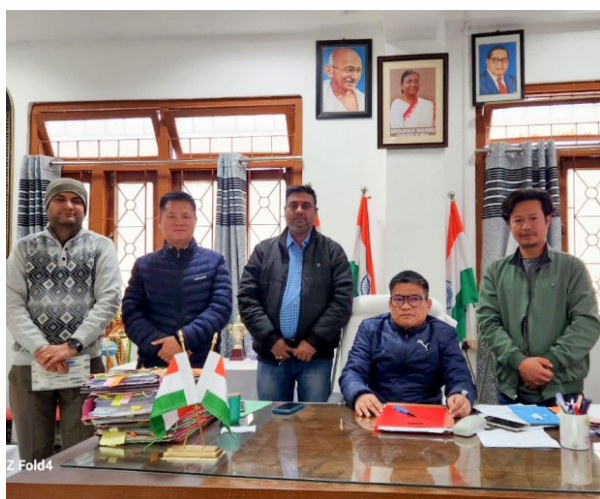
A de-briefing meeting was held with PCE-cum-Project Director (JJM) where it was discussed that the focus would be on *Har Ghar Jal* certification and on expediting the remaining work. Further discussions were on 100% saturated village information to be uploaded on the IMIS, WQM&S and IEC activities for raising awareness. It was observed that villagers have water supply connections and no user charges are being collected. People in the village expressed their happiness with the ongoing work.



Arunachal Pradesh

A three-members team visited the villages of Arunachal Pradesh between 18th-24th November 2023 to see the ground work done. The team visited villages in Kurung Kumey district, namely Pale, Wabia, Chote, Chomi, Nangram & Yumblem.

The team conducted a meeting with VWSC members and met various officials. At present, no user charges are being collected from the beneficiaries. The handing over of the O&M work to the Gram Panchayat is yet to take place.



Uttarakhand

A two-member national team from NJJM conducted a visit to the Pithoragarh district of Uttarakhand between 23rd-25th November 2023. The focus of the visit was on the villages of Garbyang, Kuti, Nabhi, and Gunjee in the Dharchula block. During their interactions with officials and beneficiaries, the team observed that out of the four villages, three were successfully implementing the Har Ghar Jal programme.

The district comprises eight blocks with a total of 0.95 lakh households, of which 0.86 lakh (90.52%) have tap water connections. Notably, the tap connections were operational in all households. Interestingly, no water quality issues were reported. Additionally, it was noted that user charges were not being collected. O&M for the water supply schemes are handled by Department Engineers, and handover to Gram Panchayat is pending.

Garbyang

In the village of Garbyang, which consists of two habitations, Chindu and Garbiyang, all 120 households have been provided with tap water connections. While the village has been reported under the *Har Ghar Jal* initiative, it is yet to receive certification.



Kuti

Kuti is located at an altitude of 12,300 feet above sea level. The village has only one habitation. All the households in the village provided with tap water connection, however, reporting about the same on the IMIS is yet to be done.



Nabhi

All 28 households in Nabhi village have been provided with tap water, however, as per IMIS, 27 out of 28 households are having tap connection. Beneficiaries informed that water is being supplied on regular basis, but during winter, freezing of water problem arises.



Gunjee

Gunjee villages, Maneela and Gunjee have 120 households, with 117 already having tap water connections. One school out of three has tap water, and the state is urged to provide connections to the remaining two schools promptly. Dharchula, a tourist spot on the Kailash Mansarovar route, needs increased IEC/wall painting activities and hoardings. Correct JJM logos should be used, and information boards, geotagged per JJM guidelines, must be installed. Efficient greywater mechanisms are essential to promote judicious water use. Pithoragarh district aims for saturation by March 2024, requesting the state to accelerate the implementation of JJM.



Himachal Pradesh

A team visited Vibrant Villages of Kinnaur district of Himachal Pradesh between 24th-27th November, 2023 to overview the progress of pipe water supply under JJM and identify the issues, if any, being faced in these villages. NJJM team and state government visited the vibrant villages of Kalpa Block of the district.

During the visit, it was observed that many of the vibrant villages in Himachal Pradesh are not inhabited during winters as a customary practice. The two villages Chitkul and Batseri are under Kalpa Block of the district and they are habituated throughout the year.

Chitkul village has about 147 households and all are provided with tap water supply in their households. The source of water is glacier spring that has flowing water throughout the year. There are flour mills installed on running water stream in the village. Shri Subhas Chand Negi, the Sarpanch of Gram Panchayat and field staff of PHE Department were very positive and they showed a commitment to ensure that they will supply water to households in coming winter as well despite the occurrence of freezing of water in pipelines. The primary schools and anganwadis situated in the village were also getting tap water supply throughout the year. To supplement the efforts of winter freezing, the department was planning to invest in methods to counteract the winter freezing by providing insulation to exposed pipe sections, ensuring bleeding of water, laying the main supply line below the freezing depth.

In village Batseri, the water was also coming through spring source fed by glaciers. All the households of this village were also getting water throughout the year. The work of storage tank and pre-filter is ongoing to strengthen the water supply.

Both the villages have adopted safe solid and liquid waste disposal technique. The Gram Panchayat was collecting user charges to collect segregated waste every day.

Economically speaking, both the villages were having good income from harvest of apples and influx of tourists; thanks to more reliable roads build by BRO for such areas. As such the basic services like road, education, electricity and tap water supply were available and villages were indeed vibrant as envisaged.



Viksit Bharat Sankalp Yatra

Flagged off by
Hon'ble Prime Minister

The Hon'ble Prime Minister, Shri Narendra Modi inaugurated the Viksit Bharat Sankalp Yatra on 15th November 2023, coinciding with Janjatiya Gaurav Divas, in commemoration of the birth anniversary of tribal icon Birsa Munda. The Sankalp Yatra commenced from Khunti in Jharkhand.

The Yatra saw the flagging off of five specially designed IEC (Information, Education, and Communication) vans carrying messages about the Government's flagship welfare programmes. These vans traversed various Gram Panchayats with a significant tribal population in Khunti district and nearby areas. Similar IEC vans were launched by notable dignitaries, including Governors, Chief Ministers, Union Ministers, and Ministers of State from 68 districts across the country with a substantial tribal presence.

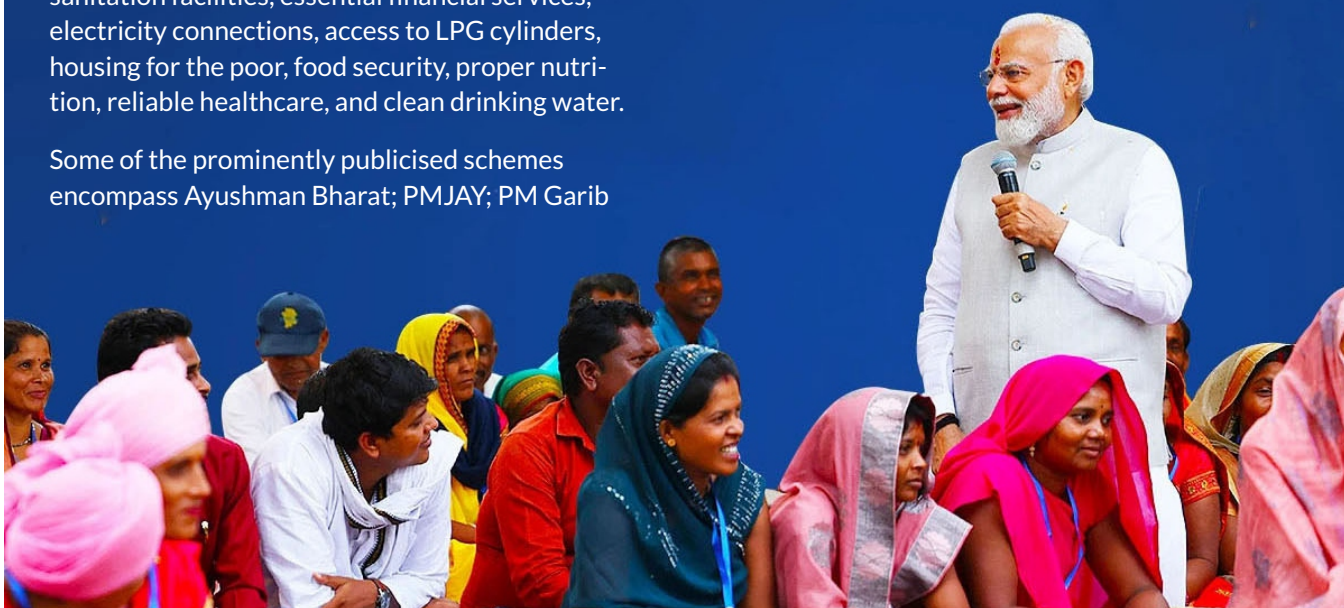
The primary focus of the Yatra is to engage with the people, create awareness, and communicate the benefits of welfare schemes. These include sanitation facilities, essential financial services, electricity connections, access to LPG cylinders, housing for the poor, food security, proper nutrition, reliable healthcare, and clean drinking water.

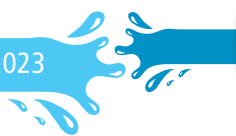
Some of the prominently publicised schemes encompass Ayushman Bharat; PMJAY; PM Garib

Kalyan Anna Yojana; Deendayal Antyodaya Yojana - National Rural Livelihoods Mission; PM Awas Yojana (Rural); PM Ujjwala Yojana; PM Vishwakarma; PM Kisan Saman; Kisan Credit Card (KCC); PM Poshan Abhiyan; Har Ghar Jal - Jal Jeevan Mission; Survey of villages and mapping with improvised technology in village areas (SVAMITVA); Jan Dhan Yojana; Jeevan Jyoti Bima Yojana; Suraksha Bima Yojana; Atal Pension Yojana; PM PRANAM; Nano Fertiliser, among others.

The Viksit Bharat Campaign, recognised as one of the largest outreach initiatives, aims to cover over 2.55 lakh Gram Panchayats and over 3,600 urban local bodies by 25th January 2024, reaching every district in the country. The campaign is being meticulously planned and executed with a 'Whole of Government' approach, involving active participation from State Governments, District authorities, Urban Local Bodies, and Gram Panchayats.

Source: <https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1977618>

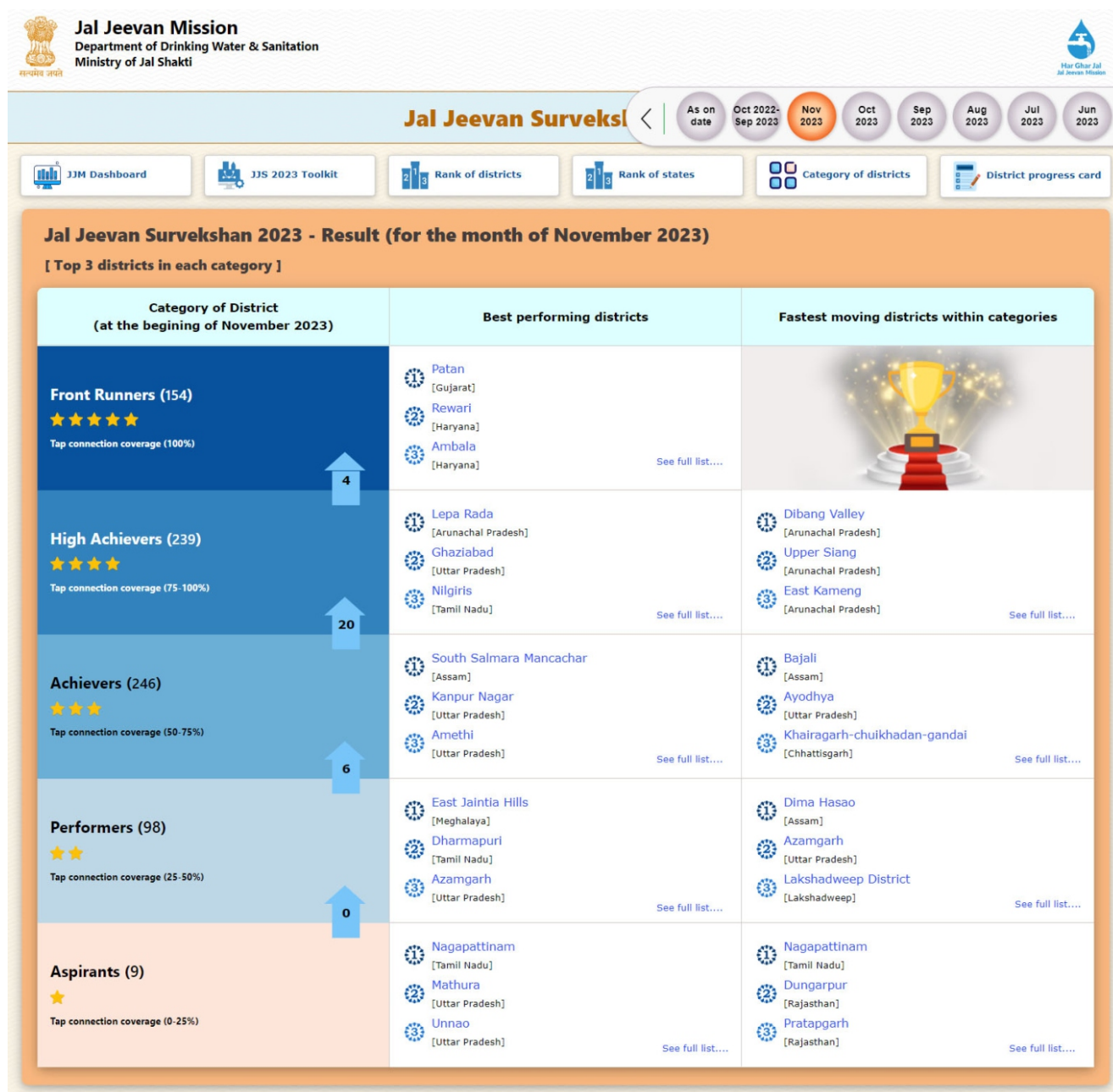




Jal Jeevan Survekshan

In the month of November-2023, Nagapattinam from Tamil Nadu, East Jaintia Hills from Meghalaya, South Salmara Mancachar from Assam, Lepa Rada from Arunachal Pradesh & Patan from Gujarat have secured first rank in Aspirants, Performers, Achievers, High Achievers, and Front Runners sub-categories respectively under “Best Performing Category”.

Followed by Nagapattinam district from Tamil Nadu, Dima Hasao from Assam, Bajali from Assam, and Dibang Valley from Arunachal Pradesh have secured first rank in Aspirants, Performers, Achievers, and High Achievers sub-categories respectively under “Fastest Moving Category”.



National WASH Experts' visits

In the month of November-2023, National WASH Expert visits were conducted in 17 Backward blocks and villages to be covered in JJM travelogue to observe the ground-level situation and provide suggestions to improve the quality of work done in the villages covered by MVS in Backward blocks, total 24 teams consisting of two wash experts visited 13 States to evaluate the quality of work done/ on-going in 193 villages. Star rating of villages visited by them is attached herewith. ■

S. No.	States	No. of villages rated under				
		1 Star	2 Star	3 Star	4 Star	5 Star
1.	Assam	0	0	0	0	1
2.	Chhattisgarh	0	0	7	2	0
3.	Gujarat	0	0	0	10	0
4.	Jharkhand	0	7	10	0	0
5.	Karnataka	0	0	0	1	1
6.	Kerala	0	0	2	8	0
7.	Odisha	2	3	12	3	0
8.	Punjab	0	0	0	3	13
9.	Tamil Nadu	0	0	0	10	0
10.	Tripura	0	0	0	1	15
11.	Uttar Pradesh	0	0	30	11	0
12.	Uttarakhand	0	0	0	1	0
13.	West Bengal	0	10	9	20	1





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