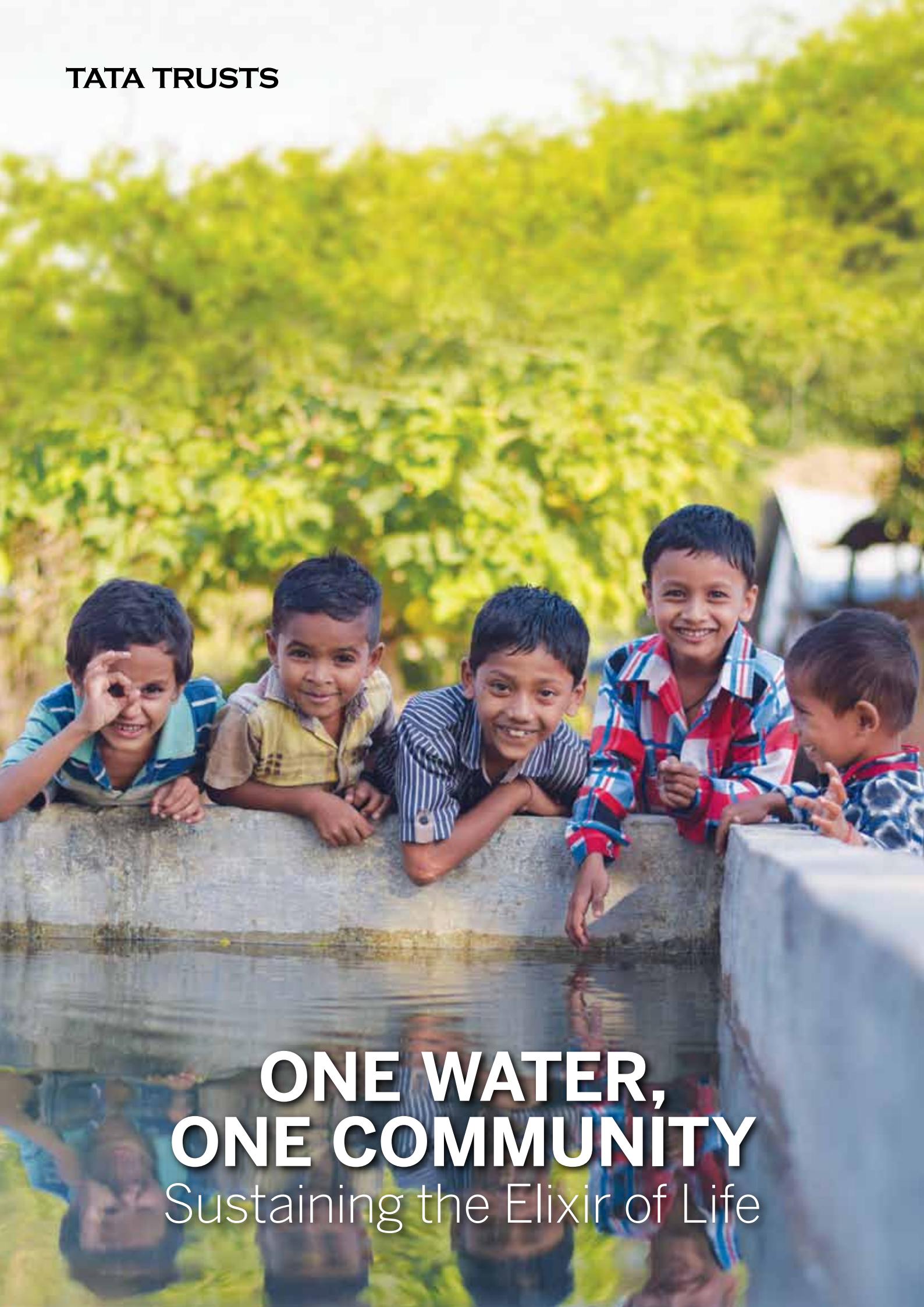


TATA TRUSTS



**ONE WATER,  
ONE COMMUNITY**  
Sustaining the Elixir of Life

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## ABOUT TATA TRUSTS

Since their inception in 1892, the Tata Trusts — India's oldest philanthropic organisations, have played a pioneering role in bringing about an enduring difference in the lives of the communities across the country. Guided by the principles and the vision of proactive philanthropy of the Founder, Jamsetji Tata, the Trusts' purpose is to catalyse development in the areas of health, nutrition, education, water, sanitation and hygiene, livelihood, digital transformation, migration and urban habitat, social justice and inclusion, environment and energy, skill development, sports, and arts and culture. The Trusts' programmes, achieved through direct implementation, partnerships and grant making, are marked by innovations relevant to the country.

# FOREWORD

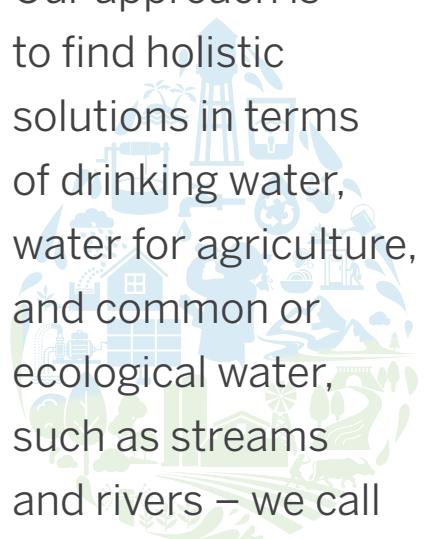
Water is the one and only element that is essential for life that makes existence, economy and ecology possible. Beyond the need for drinking water, what hangs in the balance is health, sanitation, livelihoods, industries, environmental and animal habitats, etc. Water scarcity has been an escalating issue for years. And yet it becomes ‘invisible’ and other social, political and economic issues take up mindspace and the front page.

Over 60% of the world lives in water-stressed areas. This means that three out of 10 people lack access to adequate drinking water. And this situation is rapidly worsening as climate change wrecks havoc on delicately poised natural ecosystems.

India stands to be more affected than most nations. Large parts of India are already water stressed, which puts the survival of our 1.4 billion population at risk. That’s an unimaginable humanitarian crisis which looms ahead.

To address some of these issues – in mission mode – the Tata Trusts launched the Tata Water Mission in 2015. Much of our work involves building sustainable solutions around water, sanitation and hygiene (WaSH) in villages and communities. Our approach is to find holistic solutions in terms of drinking water, water for agriculture, and common or ecological water, such as streams and rivers – we call this the One Water concept. The intent is to find the most effective, efficient and sustainable solutions to ensure that India’s vulnerable communities become self-reliant for their water needs.

This compendium covers real life stories from our work that is spread across 15 Indian states. These present a picture of the ground reality and the challenges that communities, civil society and government stakeholders face in making sure that India becomes water positive, together. 



Our approach is to find holistic solutions in terms of drinking water, water for agriculture, and common or ecological water, such as streams and rivers – we call this the One Water concept.

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**Srinath Narasimhan**  
CEO, Tata Trusts



# Mission: a water positive world

Water is more than an impending crisis, it is an escalating one, with over 2 billion people forced to live with no access to clean water. With climate change having an increasingly adverse impact on the world's water resources, there is an urgent need to conserve and sustainably manage this precious gift of nature that makes life possible.

## ACUTE WATER SITUATION

The situation is particularly acute in India. Our country accounts for about 18% of the world's population, but we have only 4% of the world's freshwater resources. Over the past few decades, we have consistently drawn upon our critical groundwater resources – which account for 60% of our water supply. Today, India is in the midst of the worst water crisis

in its history, and is projected to reach unprecedented water scarcity levels in the near future. Currently, more than 600 million people face high to extreme water stress, with 55% of rural households not having access to drinking water on the premises.

A McKinsey and Water Resources Group report\* estimates that in a business-as-usual scenario, the country's water demand is expected to

# SDG 2030

## Leave no one behind

rise to a level that is twice the available supply, by 2030. The continued excessive use of water for agriculture, low rate of wastewater treatment and low storage of rainwater will further worsen the situation in the years ahead. This would translate into ~40% of the population not having access to drinking water. This would be the biggest humanitarian crisis in the history of independent India.

### THE TWM COMMITMENT

Addressing this critical need for water as well as the ancillary causes of sanitation and hygiene in the country, we at Tata Trusts' Tata Water Mission (TWM) have been building holistic solutions around WaSH interventions in villages and communities since 2015. Today, TWM has a direct presence in 15 Indian states that have been identified as having high-to-extremely-high water stress areas. Our programmes cover more than 5,500 villages and benefit around 3.75 million people through initiatives for safe drinking water, assured water sources, improved sanitation services and hygiene practices.

Our work involves identifying and implementing solutions that are geared towards reviving and augmenting springs, rainwater

harvesting, improved access to safe drinking water to underserved communities and developing solutions suitable for local situations. Towards this, we work in partnership with governments, local bodies and other stakeholders to collectively make a difference. We have deployed technology solutions that address water contamination, as well as piloted IoT-based solutions in the field to enhance efficiency of the system and ensure sustainability. In the quest for 'One Water', TWM has nurtured the community to 'value water' and works toward sustaining this.

### COLLECTIVE EFFORT

The case stories in this report provide a glimpse into the diversity of India's water challenges. The compendium also offers insights into the field work that goes into developing and implementing sustainable community-focused projects – made possible by the expertise and effort of our partners and stakeholders. We welcome your thoughts on this and encourage you to become part of the discussion that we hope it ignites. You can write to us at [talktous@tatatrusts.org](mailto:talktous@tatatrusts.org).

\*2030 Water Resources Group - Charting Our Water Future

The figures mentioned in the document are up to December 2021

### 5 GENDER EQUALITY



Achieve gender equality and empower all women and girls

### 6 CLEAN WATER AND SANITATION

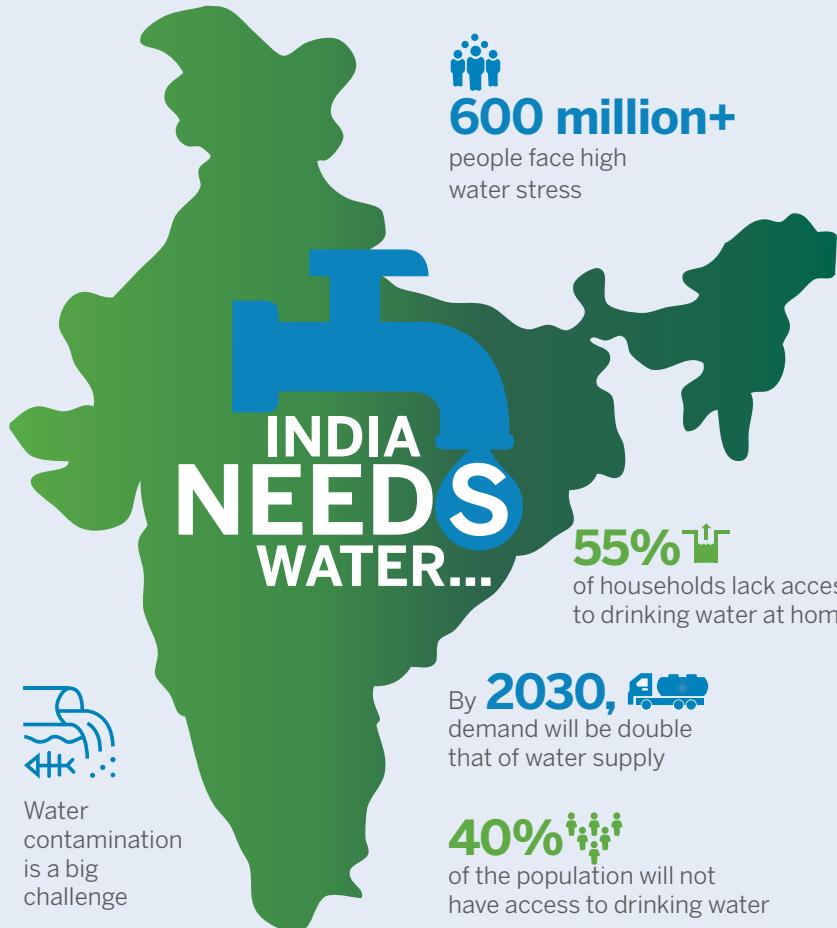


Ensure availability and sustainable management of water and sanitation for all

### 13 CLIMATE ACTION



Take urgent action to combat climate change and its impacts



**600 million+**  
people face high  
water stress



Water  
contamination  
is a big  
challenge

**55%** of households lack access to drinking water at home

By **2030**, demand will be double that of water supply

**40%** of the population will not have access to drinking water

**Water is the biggest humanitarian crisis in the history of independent India**

## ...AND WATER MANAGEMENT

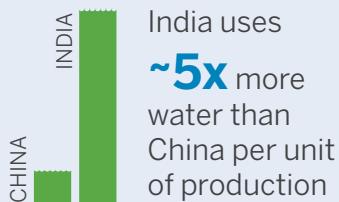


**83%** of India's water is used in agriculture



Only **~8%** of annual rainfall captured for storage

5 states contribute **60%** of total reservoir capacity



Wastewater treatment infrastructure is under-utilised

## TATA WATER MISSION WORKS TO



Reduce and reform water demand



Restore and recharge water availability



Operate and maintain water supply systems



Preserve and enhance water quality



Ensure safer sanitation, hygiene and waste management

**3.75**  
million  
beneficiaries

# Tapping the water flow

## THE ONE WATER APPROACH



Water is a finite and irreplaceable resource that needs to be managed sustainably to ensure its quality and availability in the long-term



How much water is needed by the community? What is the water needed for?



How much water is available? In what forms?



What is the gap between need and availability?



How can the gap be bridged in the most effective, efficient and sustainable manner?

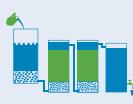
## TATA WATER MISSION PROJECTS COVER



Access to safe, assured, adequate and regular drinking water to rural communities



Water security through participatory groundwater management, watershed & springshed management



Water budgeting to make communities self-reliant for their water needs



Promoting technology innovations to address water quality issues



Water conservation and rainwater harvesting



Institution capacity strengthening



Social and behavioural change communication to promote sustainable water management by users



Sharing knowledge and best practices through policy and advocacy



Convergence with government, like-minded foundations and civil society institutions

## AND TOUCH

In  
**~5,500**  
villages

Through  
**80+**  
projects

Across  
**90**  
districts

In  
**15**  
states



GUJARAT

# The village of missing people

For the residents of Dharabandar village in coastal Gujarat, piped water supply has meant significant improvement in the quality of life and an end to migration that was the norm during the dry season

Sometimes called the village of missing men, Dharabandar village has a population that fluctuates wildly through the year. A coastal village in Gujarat's Amreli district, it is home to about 120 households whose main livelihood is fishing. In fishing season, most of the men head out to sea for a long time. About 30-40 families shift to other areas, such as Dwarka and

Porbandar. Locked homes and bolted windows are a common sight for months on end. The village returns to normal during the monsoon, when the fisherfolk come home after selling their season's catch.

Because of its high migratory population, Dharabandar had missed out on quite a few rural development programmes. Drinking water was one such issue.

The village did not have its

own water source. A well in the neighbouring village served as a lifeline for the people of Dharabandar. The well was built on land purchased by the Dharabandar gram panchayat, and was constructed with the help of local funds. Pipelines were laid out from the well to an underground sump in Dharabandar. A few stand posts were also constructed at key points.

For years, Dharabandar's women managed with this arrangement, collecting water from the sump or nearby wells and storing it in buckets for daily use. Bhikhiben

**Districts covered****9****Households covered****125,000+**

Mohanbhai Sankhat is 55 years old. But she had to walk 2km to a well to get water for her 5-member family. The women of Dharabandar deserved better.

**FINDING A WAY**

The problem was finally taken up by the Coastal Salinity Prevention Cell (CSPC), a Tata Trusts' associate organisation active in Gujarat. The Trusts' projects in Gujarat have been actively engaging with coastline communities to tackle the issue of rising salinity in ground water and to help mitigate the impact on lives and livelihoods.

The Trusts are aligned with the objectives of India's Jal Jeevan Mission (JJM) - *Har Ghar Jal*, which strives to provide a tap in every household. In 2021, CSPC contacted the Dharabandar gram panchayat and members of the pani samiti (the village water and sanitation committee) to make them aware of JJM. Thereon, CSPC was associated as an Implementation Support Agency (ISA) for JJM in Gujarat. The team also organised the screening of a short film focussing on water and why water conservation is essential.

**SKIN IN THE GAME**

A series of interactions were organised with all stakeholders, including Dharabandar's women

who had been facing the brunt of water scarcity. Bringing the women on board was the most important part of this project as the men were away for the better part of the year.

On World Water Day (22 March 2021), members of the gram panchayat and pani samiti, along with the local team, interacted with government officials to find a solution for Dharabandar's drinking water problem.

In consultation with the villagers and the officials, the team drew up a village action plan (VAP) that would bring regular tap water supply in each house. The plan was kicked off with a technical survey conducted by the Gujarat government's Water & Sanitation Management Organisation (WASMO). The estimated cost for regular tap water supply was drawn up. The programme mandates that beneficiaries contribute 10% of the cost of the project, as this secures community involvement and ensures sustainability after

the Trusts' team withdraws from the village.

Dharabandar's villagers were only too happy to contribute. Each household contributed ₹1,000. So high was the trust in the programme that the contribution drive concluded within two days. This support was driven primarily by Dharabandar's women who took the message of *Har Ghar Jal* to each family. Contributions from households that were away fishing were done when they returned home.

**LOOKING AHEAD**

The team helped the locals to get administrative approvals from the Amreli district collector and the district water and sanitation committee. The next step involved training the pani samiti members to manage the water project, and assigning roles and responsibilities. Says Soniben Rameshbhai Mer, one of the women who has benefited from the change: "This has been a learning experience for all of us. Instead of ignoring the issue, we were all able to do our bit in making this programme a success. It has changed the village and benefitted all of us. We women save so much time and effort spent in carrying water."

Dharabandar now sees water flow in each home. Life has taken a turn for the better. 



NAGALAND

# Springing back to life

A springshed management project has revived drying springs and restored water security to villages in Nagaland

**D**espite getting generous rainfall, annual water shortages were a way of life in Enhulumi, a hilltop village in Nagaland's Phek district. The village depended on seven local springs which slowly dried up

over the past 10-15 years. As a result, Enhulumi's 230 families had to endure hardships.

However, since 2018, a community-driven springshed management project has brought Nagaland's springs back to life. Launched by a consortium of the Nagaland

government, the North East Initiative Development Agency (NEIDA - an associate organisation of the Tata Trusts), and others, the project has rejuvenated 106 springs and made 96 villages 'all-weather water sufficient'.

## SPRING REVIVAL

Spring rejuvenation involves addressing the complex hydrogeological challenges

that cause the aquifers feeding springs to run dry. It requires data collectors to record hydrological data, hydrogeologists to undertake various activities related to spring aquifer recharge, and labourers for the manual work. In rural areas, these specialised tasks can only be done by transferring skills to the local communities so that they can sustainably manage their water needs.

In 2018, the programme team introduced the concept of springshed development to Enhulumi's residents. While the residents were anxious to solve their prolonged water crisis, some were not sure whether the project would make a difference for them. However, Enhulumi's village council was behind the project all the way. Their support would be critical for the project's future.

The perennial spring selected for rejuvenation, Mewi Dzukhou, is located on the village fringe and meets the needs of 100-odd households. A baseline study in March 2019 showed that water availability from the spring was only 1,195 litres per day as against the combined household requirement of 22,500 litres per day. Also, a spring box (a dug-out area near the spring to store water) had a storage capacity of just about 3,000 litres, which was not enough.

## COMMUNITY CONNECT

Another challenge was that Mewi Spring's two-hectare recharge area – where water enters the aquifer through the ground – has fragmented ownership. Having all the stakeholders agree to a unified, science-backed approach was thus crucial to sustain the spring rejuvenation project over the long term. But with the council's active intervention, an agreement was signed with all the stakeholders and a concerted rejuvenation effort got underway.

With capacity-building support from NEIDA and funding from the Nagaland government, Enhulumi's residents learnt how to demarcate the spring recharge area and undertake activities like measuring slopes, mapping

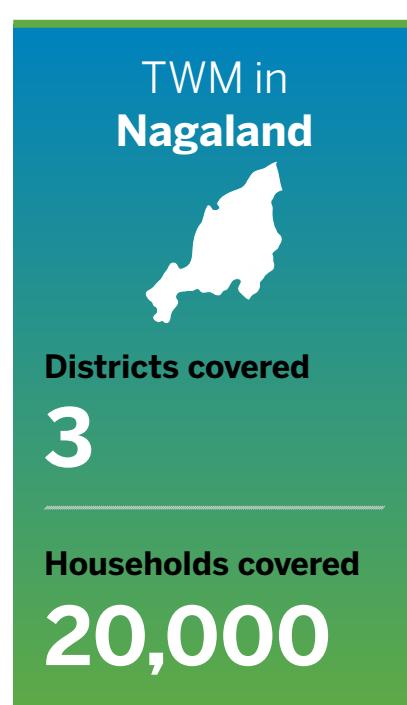
contour lines, and constructing staggered contour trenches. Over 140 villagers pitched in to construct 100+ trenches, which reduced and optimised the surface run-off and increased the flow of rainwater into the aquifer feeding Mewi. The villagers also built a new, larger spring box with a storage capacity of 12,000 litres.

## MONITORING THE FLOW

In addition, a data collector was trained to collect spring discharge measurement and rainfall data. These inputs help the villagers track the spring's behavioural pattern and analyse the impact of the rejuvenation activities. Regular water quality monitoring is also done.

The concerted efforts led to a significant improvement in the Mewi Spring's water availability levels. In September 2020, the daily water availability hit a high of 24,682 litres. The village's data collector, Wekholo Lohe, says, "The spring water discharge has increased manifold."

Today, Enhulumi does not want for water, thanks to the innovative public-private partnership project that's worked wonders across rural Nagaland. It illustrates how government resources, private expertise and community participation can effectively converge to build climate-resilient villages. 





UTTARAKHAND

# Water taps in the hills

Household tap-water connections have brought prosperity to a formerly water-stressed Uttarakhand village. And it happened after the Himmotthan Society helped the residents get their entitlements under the government's Jal Jeevan Mission

"had to keep looking for water because my livelihood depended on it," says Sudha Gunwant, a farmer who grows and sells flowers. Her

village Guna lies in the scenic hills of Almora, Uttarakhand, where it is difficult to believe that water is a scarce and precious commodity. Guna

is home to only 15 families, about 38 women and 42 men. And yet the village had barely enough water supply for drinking and cooking. Finding more water to irrigate crops was a formidable challenge for the locals who eked out a living from agriculture and horticulture.

Life changed for the village when Himmotthan

## TWM in Uttarakhand



### Districts covered

4

### Households covered

15,000

Society – a Tata Trusts' associate organisation – stepped into the picture. Himmotthan was set up to support mountain communities with sustainable development. In 2021, under the government's Jal Jeevan Mission, the Himmotthan team connected every household in Guna through tap connections.

That move didn't just solve Guna's water woes permanently – it transformed Ms Gunwant's business too. "More water at the stand post has helped me expand my business," says the 55-year-old.

The village's path to water sufficiency was anything but smooth. In the hills, water typically emerges through perennial ground water systems, known as springs. Like other mountain villages, it was reliant on 'naulas' (traditional water harvesting structures) and local spring water for its needs. Every summer, these sources would run dry. Jal Sansthan, Uttarakhand's local water department, had built four common water collection points, but these barely met the drinking water needs of the residents of Guna.

Life was especially tough for Ms Gunwant, who makes a living selling flowers, seasonal fruits and vegetables, pulses,

to the Jal Sansthan. (VAP is a guiding document that details all aspects of providing household tap connections to a particular village, including the cost estimates, implementation schedules, household contributions, plans to manage local water bodies and wastewater, and so on.)

Shortly after receiving the VAP, the Jal Sansthan installed personal tap connection in every household. It was a huge moment for all the residents, including Ms Gunwant. With enough water at hand, she has now expanded her business, set up poly-houses (polythene-covered greenhouses) in her fields, built more rainwater harvesting tanks, and upgraded her farm equipment. Productivity has increased and farming has become easier and more profitable. Water for drinking and domestic consumption is now secured.

"Water at the doorstep has transformed our life. We've begun cultivating off-season flowers, vegetables, and even saffron, for additional income," says Ms Gunwant.

It's remarkable what a simple tap can do. For the residents of Guna, getting household tap water for the first time has washed away their travails and flooded their lives with hope for a better future. 



ANDHRA PRADESH

# Kala Jaatra for water

Innovative social mobilisation tools such as transect walks and theatre shows helped mobilise villagers in three blocks of Andhra Pradesh to participate in managing their water situation

There's a 20ft drawing on the ground in a village in Andhra Pradesh's Krishna district. It's a map drawn in coloured chalk that shows how water flows and is used by the community.

The map drawing is part of the participatory rural appraisal (PRA) process followed by the Tata Trusts in the project to ensure community buy-in of development, implementation and management of drinking water systems.

India's Jal Jeevan Mission (JJM) rides heavily on the participation of people from local communities to make the programme self-sustaining. In Krishna district, the Rural Water Supply & Sanitation Department partnered with the Vijayavahini Charitable Foundation (VCF), an associate organisation of the Tata Trusts, to bring in this engagement in 107 villages of two districts. These included Keertirayunigudem and Velvadam villages in Mylavaram block; Reddigudem

and Rudravaram villages in Reddigudem block; and Narsaiyahpet and Lakkavaram in Chodavaram block. These villages had been identified as communities with low participation, where the villagers were less involved in water-based interventions.

To encourage and excite the community, the Trusts team decided to go in with a creative approach that would help build both willingness to own the process, and capacity among the villagers. The intent – to have the community take ownership and responsibility to drive and sustain solutions instead of relying on an external agency.

## NEW PERSPECTIVE

To find solutions, a walk through the village was organised to help residents get first-hand knowledge about the location and distribution of water resources. The walk is a tried and tested tool to build awareness about the challenges to provide safe and assured water to every household, and the potential solutions to address them.

Another solution that VCF engineered was engaging with all key stakeholders such as the mandal praja parishad, the panchayat secretary, the block development officer and other government officials, along with the village sarpanch, pani samiti members, school children, and ASHAs and anganwadi teachers. The PRA activity saw everyone, from young children to elderly women and men, getting enthused and informed. The atmosphere felt more like that of a festive celebration of sorts.

The transect walk covered all the water sources, existing infrastructures and discharge points in the village, with group discussions on topics such as the taste, smell and quality of the water from existing sources, issues related to regularity and quantity of water supply, and potential barriers to implementing the programme.

As expected, the transect walk attracted a lot of participation, especially from

women members who face maximum challenges for water management. Around 50 members of the community agreed to join the next PRA activity, and all stakeholders came together to help draw a map that showed their water sources and uses. The map showed people why they needed to work together to find effective solutions to water management.

## COLLECTIVE ZEAL

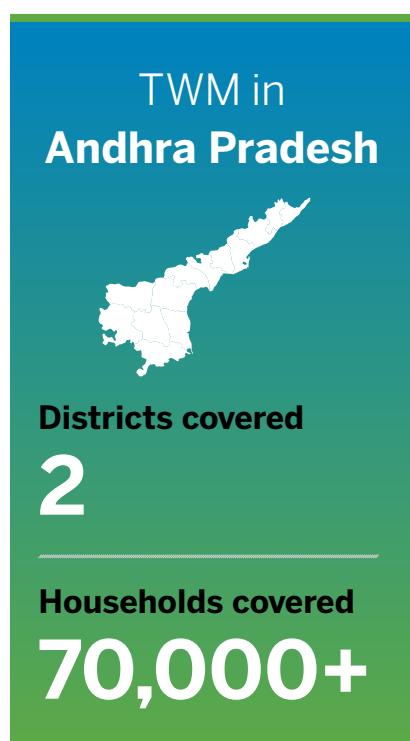
Another visual activity dealt with safety. The team tested water samples collected from different sources across the village, using field testing kits and showed the results to everyone present at the venue. The change in colour of the dirty water samples shocked everyone, especially the children. The test

results convinced participants about the need to keep water sources clean. The team also shared how important it is for every home to have a functional household tap connection (FHTC), with safe running water, for their families' health.

The next day, a series of training-cum-orientation workshops were conducted for the stakeholders. The success of the PRA activities was visible – participants turned up in much larger numbers than expected. They were told about JJM, the roles and responsibilities of various stakeholders in this project, the techniques of drawing up village action plans, geo-tagging, disinfection methods, and the importance of preventing water-borne diseases.

Here too, the team used a participatory approach adopting behavioural science theory – they used a local folk theatre art called Kala Jaatra. The Kala Jaatra show presented an entertaining skit with key messages on water. The emotional connect of the folk art helped people understand the solution-oriented approach and how the community can solve problems by stepping up.

It's innovative interventions like these that have led to a significant rise in community engagement levels with members taking ownership of the water-related issues in their respective villages. 





RAJASTHAN

# Women lead the way

Life has become easier and better for residents of Gharat in Rajasthan's Sirohi district after the installation of piped water connection in their homes

**L**ife was very difficult earlier. At times, we had to fetch water from an open well over a km away," says Chunki Bai Gharat (52), a resident of Pindwara in Gharat village in Rajasthan's Sirohi district, reminiscing about the hard days when she and others like her had to trudge long distances in search of water.

Shortage of drinking water is a major problem in the district, and Gharat village populated by the Grasiya tribal

community, was no exception. Despite efforts by government and other agencies, no permanent solution could be found.

## CHANGE AT PACE

However, change came in 2018, when Gharat residents learnt about a community level drinking water project and approached the Centre for microFinance (CmF), an associate organisation of the Tata Trusts, to set up a similar venture in their village.

## WATER FOR EVERYONE

The Government of India's Jal Jeevan Mission is envisioned to provide safe and adequate drinking water through individual household tap connections to all households in rural India by 2024. CmF, supported by the Tata Trusts and One Drop Foundation, is implementing a community managed habitation-level drinking water supply scheme in various parts of Rajasthan which complements the Mission.

The water initiative is currently being implemented in three blocks of the state and has benefitted 19,753 households. The plan is to extend it to 20,000 households.

In Gharat, as part of the groundwork, a meeting was convened of the 24 households that had evinced interest. The residents were informed about the requirements: the beneficiaries had to contribute 10% of the total scheme cost. The residents were quick to accept the condition.

The households were organised into a water user group or pani samiti. The samiti also had the task of collecting the 10% contribution from the beneficiaries in monthly instalments.

#### **EXTENDING THE NET**

The scheme, completed in 2019, comprises of a borewell, powered by a 3-HP solar pump, which supplies water to a 7,000 litre capacity elevated service reservoir with a chlorinator on



top. Water is supplied to homes and a cattle trough.

To ensure equitable distribution of water, the Tata Trusts and the Tata Community Initiative Trust, in partnership with the central and the state government, piloted an IoT-

based smart water management system to get data on the usage, gaps, challenges and the acceptance of the community. So far, six such pilots have been implemented across the country.

An advanced IoT-based monitoring was also installed in Upli Ubariya Fali in November 2020 which helps the pani samiti to distribute water equitably among the members. It helps to monitor situations like sudden drop in borewell water level, excess water usage by some households (beyond 55 litres per day) and leakages, etc. The advanced IoT system cost around ₹7 lakh.

To ensure sustainability, the pani samiti also undertook the catchment area treatment through development of staggered contour trenches in the hills around the village.

#### **QUENCHING THIRST**

The pani samiti in Upli Ubariya Fali, a locality of Gharat, has been managing the water supply since 2019. In addition to collecting regular monthly tariffs, the samiti has also assigned one member to operate the scheme. Maintenance costs are borne by the community themselves.

For Chunki Bai and others like her, the piped water supply has relieved them from the drudgery associated with the task of fetching water. 



Water Committee members and villagers meet to decide about the water supply scheme



KARNATAKA

# Power of the collective

Trained to use field testing kits, women have taken the lead to ensure quality of water in Manmutagi village in Karnataka

**M**anmutagi village in Karnataka's Yadgir district is an example of the ability of the community to

drive change. Here, the quality of water was a serious concern. Ensuring safe drinking water for her family was a daily battle for Parvati Rao and the other

women of her village. Despite raising it with authorities, the women of Manmutagi had failed to get any relief.

"We had met officials several times but they failed to provide us any concrete solution for our problems," says Ms Shashikala (40), a resident.



### District covered

**1**

### Households covered

**30,000+**

A big worry for the village was the threat of water-borne diseases. Shashikala's 10-year-old son Sharanabasava failed to attend school regularly as he often fell ill, due to the bad quality of water consumed.

### EMPOWERING WOMEN

However, things started to change with the rolling out of the Jal Jeevan Mission (JJM) in the village. JJM, the flagship scheme of the Government of India aims to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India.

Currently, the scheme is being implemented in three blocks with about 19,500

households connected through the piped water supply. Once complete, the project will cover another 140 villages and about 19,500 households.

The mission also provides opportunities for the empowerment of women. JJM has been designed to encourage women to participate at all levels of planning, implementation, management,

operation and maintenance of the water supply projects.

### WOMEN SHOW THE WAY

Government rules mandate that local self-government agencies such as gram panchayats need to have pani samitis (the village water and sanitation committee) in place. Moreover, the pani samitis need to identify and train five women from the local community to conduct water quality tests using field testing kits to check the potability of water. In practice, finding women volunteers was often difficult.

But it was different with the women of Manmutagi village, they were quick to accept their role in water quality surveillance. They also evinced interest in learning more about health issues caused by poor quality of water. About 20 women from Manmutagi were trained to use the field testing kits and also made aware about water-borne diseases.

With the women on the job, Manmutagi's water quality has improved significantly.

Now Shashikala is happy because she has access to safe drinking water, her son is regular to the school and the time saved from filling up water, they spend together on studies and play.



Students at the Manmutagi school learn about personal hygiene and sanitation through fun activity



ASSAM

## A drop to drink

Iron and arsenic pollution in drinking water pose serious health threats in rural Assam. But an affordable and low-maintenance community-based water purification system has put these concerns to rest in Nalbari district

Water is the giver of life. But pollution in drinking water sources, a common menace in rural India, can cut lives tragically short by

causing various cancers and cardiovascular, liver, or neurological diseases, besides other problems. Despite these hazards, most Indian villages still consume untreated water. Until 2017, Borigaon Kothora

in Assam's Nalbari district was one of them.

Things turned around five years ago when Borigaon Kothora became the site of Assam's first community-based arsenic and iron removal system initiated by the Tata Trusts. Today the village boasts an exemplary community-owned and operated purification system (COPS) that sustainably purifies the village's drinking water and promotes better health outcomes at low cost.

Implemented with support from the Trusts, its on-ground partners, and the villagers themselves, the COPS at Borigaon Kothora dispenses drinking water that is compliant with WHO standards. The dispersal is done through innovative 'water ATMs' that serve around 2,000 people in and around the village. The success of the project has even inspired 50 nearby gram panchayats to plan similar purification systems in their villages.

COPS, which has been conceptualised and executed under the Trusts' Tata Water Mission (TWM), supports TWM's goal of providing access to pure water to villages across the country. An estimated 100 million Indians live in areas of poor water

quality. Contaminants like iron, salinity, arsenic, fluoride, heavy metals and nitrates often put rural communities' health at risk. And when it comes to iron and arsenic, Assam and West Bengal account for an overwhelming majority of rural habitations whose drinking water contains these pollutants in worrying concentrations.

In May 2017, the programme team evaluated drinking water sources from five villages in Nalbari. The evaluation was accompanied by a carefully designed sensitisation campaign in these villages to educate residents about the health hazards of arsenic and iron-contaminated water. Borigaon Kothora was finally chosen for the pilot COPS due to the willingness of its residents to provide land for the purification system and also to operate and maintain it.

#### A COMBINED EFFORT

TWM's partners in the project were gramya vikash mancha, a community-based organisation, and Drinkwell Technology, whose patented technology has been used in the water purification system. Active support for COPS also came from the local MLA, district administration, and the state public health engineering department,

among other stakeholders.

The COPS system basically comprises two overhead tanks and three media-filled containers to treat the iron and arsenic present in water drawn from a tube well. The purification is carried out through chemical and other processes. The process includes balancing the pH level of the water. An activated carbon column then removes odour and taste before the water undergoes ultraviolet treatment to deactivate bacteria.

Finally, the water is dispensed through an ATM-like machine. Registered users can swipe their water ATM Cards – like they would use debit cards at bank ATMs – to collect their daily water entitlement of 20 litres per day

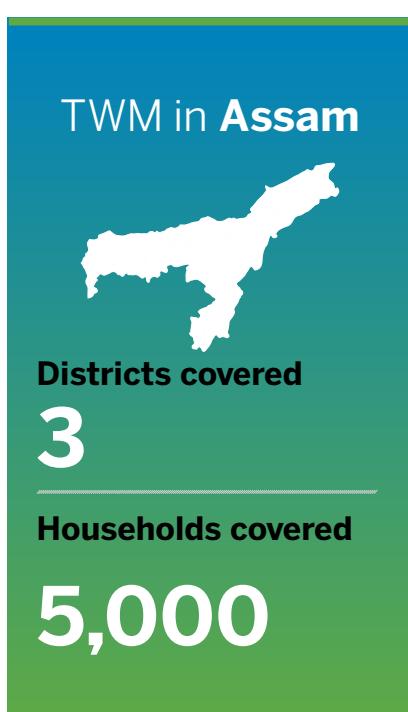
per family. A nominal charge of ₹7 is levied, which goes towards maintenance and the salary of the community-appointed operator who manages the system and collects payments.

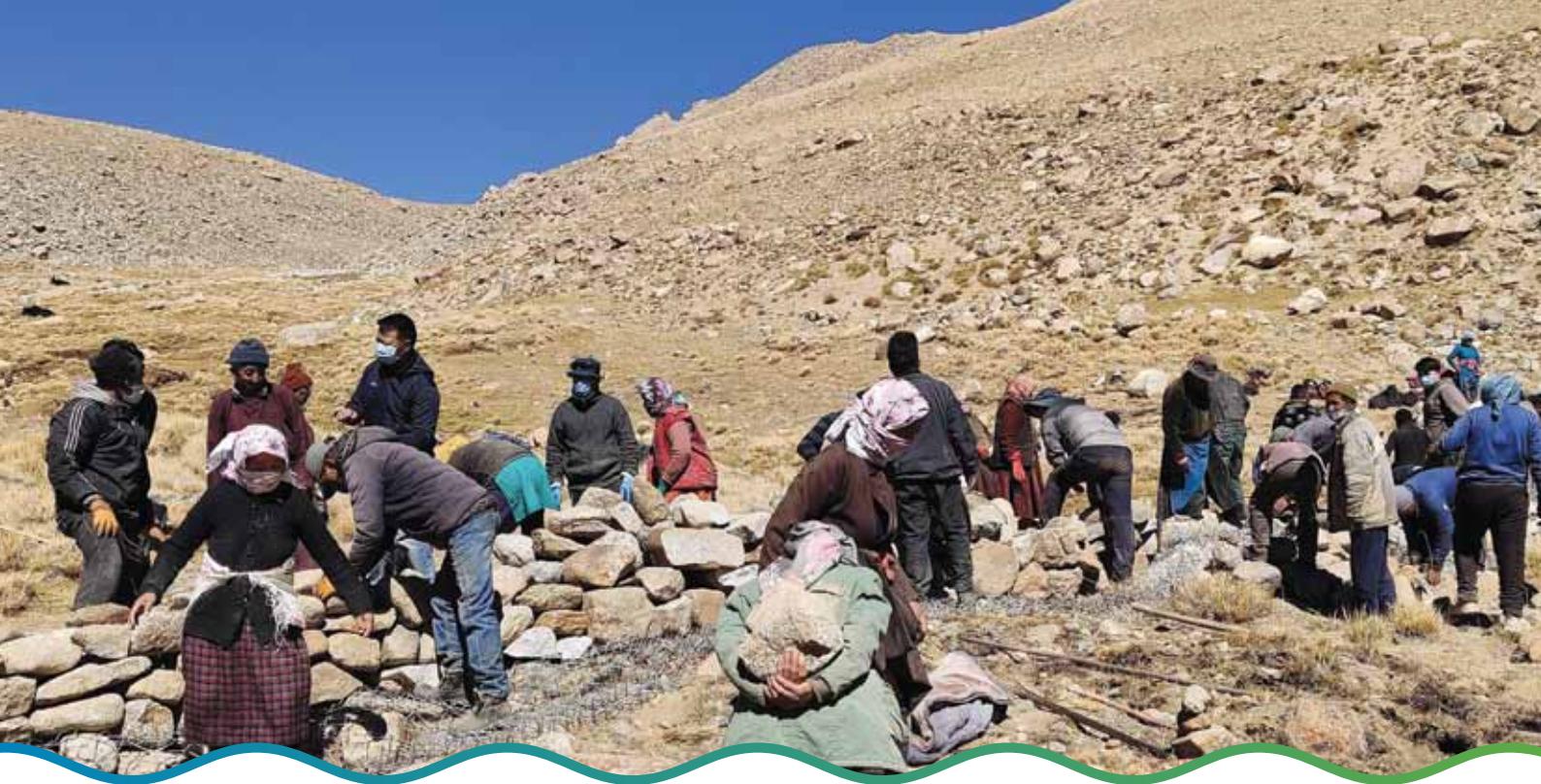
Since the system's launch, around 238 households on average have been getting their daily water entitlements from the COPS and 331 households have purchased water ATM cards.

#### THE BENEFITS OF COPS

In addition to its affordability for users, the system is also efficient and easy to maintain. Working up to eight hours a day, it can purify 5,000 litres of water in line with WHO-defined safety standards. Around 95% of the input water is recovered, minimising wastage. The column media can be used for 1-3 years at a time and can be regenerated and reused. The COPS also requires minimal energy and can operate on solar power. Real-time water utilisation data is available as well.

Today, the residents of Borigaon Kothora can look forward to better health from every sip of water they take. The success of the COPS has vindicated TWM's belief that mobilising rural communities can go a long way towards ending the drinking water pollution crisis in rural India. 





LEH, LADAKH

# For the people, by the people

Artificial glaciers built by residents of Sakti village in Ladakh helped solve a decades-long problem of water scarcity in this arid and rain-deficient region

**C**limate change has dealt a blow to the people of Ladakh. Receding glaciers has led to insufficient water in Ladakh's natural streams. "We faced severe shortage of water and didn't have enough to irrigate our fields. As a result it affected our agricultural production too," says Tsering Phuntsog from Sakti Tagar in Sakti village in Ladakh.

Seeing the deepening water crisis, Himmotthan Society, an associate organisation of the

Tata Trusts, stepped in to help local farmers through the Leh Livelihood Initiative.

## HOMEGROWN IDEA

Sakti village is located around 55km from Leh, at an altitude of 3,700m. The village has 1,718 residents in 370 households spread across two panchayats – Sakti Tagar and Sakti Taknak. Agriculture is the main livelihood of the villagers.

To tackle the water scarcity, Himmotthan decided to build artificial glaciers under the

**Leh Livelihood Initiative.** First conceived and implemented by Chewang Norphel, a retired civil engineer from Leh, an artificial glacier involves building a series of stone embankments and gabions (wire-mesh cages filled with rocks) to create shallow pools in natural water streams. The pools begin to freeze around late November, thus forming artificial glaciers.

These artificial glaciers help conserve water during winters. Built in lower altitudes, they begin to melt in April-May, earlier than higher-altitude natural glaciers. Their water helps supplement existing water resources and allows farmers to sow crops earlier.

## TWM in Leh, Ladakh



14

Artificial glaciers

1,500+

Households catered

### MAKING IT WORK

Local participation was key to making this solution work. Farmers in Sakti came together to build two artificial glaciers. From selecting the glacier site to conducting feasibility studies, collecting the construction material and the actual building of the artificial glacier pools, it was the villagers who drove the project, with financial assistance from NABARD and guidance from Himmotthan Society.

#### A Village Watershed

Committee was formed with 14 members – nine men and five women – to manage resource mobilisation, administration and disbursement of project funds and the creation of a watershed maintenance fund (₹100 per household).

Most critical was the labour involved. For two days, more

than 283 families from Sakti worked for free at the sites, collecting stones and building the embankments. In all, the community put in over 1,500 man-days of activity.

In Sakti Tagar, six stone embankments were built. The ice reservoir can store over eight million litres of water. Located at an altitude of 4,900m, the artificial glacier benefits 160 families and supplies water to 147 hectares of agricultural land.

Sakti Taknak has built four stone embankments that can

store six million litres of water in total. This artificial glacier is at an altitude of 4,500m, and benefits 210 families by supplying water to 138 hectares of agricultural land.

### LONG-TERM BENEFITS

So far 14 artificial glaciers have been constructed in Leh. The water availability has increased to ~100 million litres of water which is sufficient to cater to the needs of 1,500 households. It has also helped the villagers extend the land under irrigation to over 2,000 acres.

The artificial glaciers have made the lives of Sakti's farmers much easier – from having to wait up to a month for their share of irrigation water, the waiting time has been reduced to about 20 days or less. What's more, this solution helps the soil stay moist longer.

Given the success of the Sakti project, Himmotthan is active in similar interventions in Mudh and Tsaga villages of Changthang in eastern Ladakh, and in Hundri and Murgi villages in Nubra valley. "Nearly a third of the 113 villages in Leh district face water scarcity. Artificial glaciers offer the best solution in this mountainous region," says Mr Norphel, aptly known as the Ice Man of Ladakh. 



Glacier formation in Sakti

# Pipe dreams

Rural communities in Jharkhand are able to sustainably manage their water requirements from start to end with help from CInI, a nodal agency of the Tata Trusts working in Central India

**F**ew concerns dominated the lives of the women of Dhadkiboni village, as much as water, or more specifically, the lack of it. Like many parts of rural Jharkhand, the small village in Dhalbhumgarh area had no piped water supply. And the women of Dhadkiboni had the hardest time of it, spending 3-4 hours daily hauling water to their homes, on foot, from far-off places.

Twice a day, Rukmini Mandi would walk two kilometres to the Subarnarekha river to fetch water for her six-member family's cooking, drinking, and ablution needs. In the monsoons, the dead cattle floating in the river made the water unfit for consumption. So, she and the other women would trek to the nearest village with a pipeline, four kilometres away.

The lack of piped water created all kinds of challenges for the village's 30-odd families. The women and girls were always

exhausted from the constant water-fetching. Children often fell ill from water-borne illnesses like diarrhoea due to poor water quality.

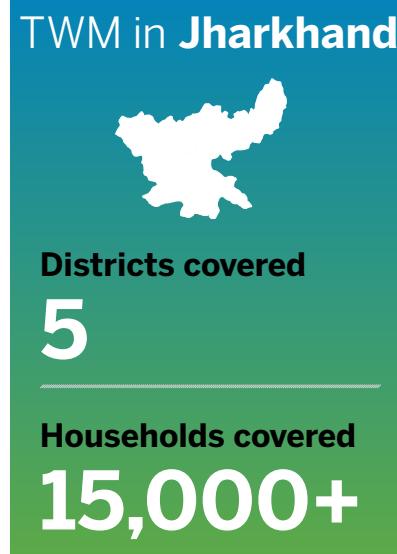
Those times are past. Dhadkiboni today has a water tank (*jal minar*) and household tap-water connections, and its women don't have to undertake strenuous treks for water any more. The incidence of water-borne illness has dropped and the children are visibly cleaner. Best of all, the entire system is

managed and maintained by the villagers themselves. "Water has come to every household. I am happy," says Ms Mandi.

The Dhadkiboni project is a stellar example of a community-managed water system in action. The Tata Water Mission model has been implemented by the Collectives for Integrated Livelihood Initiatives (CInI), the nodal agency that anchors the Tata Trusts' projects in tribal dominated Central India. The water intervention is spread across Deoghar, Dumka, East Singhbhum, Khunti and Hazaribagh districts.

The project in rural Jharkhand has proved that it is possible for local communities to sustainably manage their own water requirements. CInI mobilises locals from water-stressed villages into Nal Jal Samiti (tap water committee) that oversee the planning, implementation, and post-implementation of the project from end to end. Since 2016, CInI has launched community-managed water initiatives across eight villages in rural Jharkhand.

In 2018-19, CInI and its local partner, Rural



Development Association (RDA) met Dhadkiboni's residents to propose building a water tank with piped connections to each home to address their water woes. The latter were immediately on board. It was decided that every house in the village would contribute an up-front sum of ₹500 towards capital costs, ₹20 per month for maintenance, and construction labour for the building work.

For the community, it was a huge responsibility to own and manage a drinking water scheme, as they have never managed such large infrastructure before. However, inculcating a sense of ownership helps ensure sustainability as the community would have to pay for the monthly operation cost plus future wear and tear.

Next, CInI took a group of villagers to Phuljori village in Deoghar district to inspect a similar water tank. On the group's return to Dhadkiboni, a 12-woman Nal Jal Samiti was formed. The samiti had multiple discussions with villagers around the proposal's merits. A few residents were sceptical, but the village head (Pradhan) Karu Mandi threw his support behind the project, and even donated a part of his land for setting up the water tank.

Says Ms Mandi, "It is the women who suffer most, so the *jal minar* was absolutely



essential for the village. CInI's and RDA's persistence and hard work, finally cleared the decks for the project."

While CInI supported the construction of the water tank, the villagers pitched in with labour to dig trenches for laying the water lines. CInI also managed to obtain a solar powered pumping system from its partner Grundfos Foundation.

In rural Jharkhand, where most of the electricity connections are single phase and meant for domestic use, a solar powered pumping system was a better option. It has lower recurring costs and hence reduces the overall financial

burden of using water. It is also more efficient in delivering water, as a conventional electric pump would have faced frequent power cuts that are typical in rural areas.

Today, Dhadkiboni has piped water supply in every home. Every aspect of the system's operation and maintenance is handled by the villagers. The *jal minar* has not just made life convenient; it has also improved the residents' health and wellbeing. More importantly, it is a valuable reminder that empowering rural communities can solve even the most intractable problems India faces today. 

# Plainspeak

The mission to ensure water security has been an insightful journey. Here, the Tata Trusts' team members share some perspectives on the challenges faced, finding out-of-the-box solutions, use of technology, and empowerment of the community, especially women

— “

*Women's active engagement in the project's development, planning and implementation has made all the difference. The project has not only provided water to every household, but it has also reduced communities' seasonal migration.*

**Ketan Hingu**  
**Gujarat**

”— ”

— “

*The project's success hinges on its ability to manage water sustainably. Users have realised the significance of water supply and quality, and they have begun to value water as a finite resource.*

**Manoj Kumar**  
**Andhra Pradesh**

”— ”

— “

*Empowerment of rural communities has made them the process owner of the project. Water user group's active engagement in overall water management has significantly improved the lives of the rural community.*

**Vinod Kothari**  
**Uttarakhand**

”— ”

— “

*Multi-stakeholder collaboration has aided the springshed management programme in focusing on a solution-driven approach and the interventions have not only revitalised springs, but have also met the residents' water needs for drinking, household, and irrigation.*

**Khrolhiwe-u Tsuhah (Awi)**  
**Nagaland**

”— ”

*We used our existing women self-help groups and community federations to design, implement and maintain the drinking water project. Women have contributed from their savings and taken responsibility of managing finances and operational aspects.*

**Pankaj Papnoi**  
**Rajasthan**

*Village water and sanitation committee (VWSC) members participated in training and capacity building programmes which helped them to get clarity on their roles and responsibilities.*

*Accordingly they coordinated with gram panchayat, local Government departments to mobilise resources and enhance implementation of all activities.*

**Ramachandra Bhatt**  
**Karnataka**

*One of the goals of the community members we work with is to make clean drinking water available in the home and to ensure that they contribute money and kind to infrastructure development. This created ownership between communities.*

**Suraj Sekhar Murmu**  
**Jharkhand**

*Innovation and innovative practices have been key to the success of the project which serves as a role model for rural populations in need of safe and healthy drinking water.*

**Arnab Bharali**  
**Assam**

*Convincing the villagers and getting them to construct the ice glaciers was challenging. However, the effort has paid off and there is enough water now for the villagers to irrigate their fields.*

**Samten Choephel**  
**Leh**



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