Lifeline Restored

The Impact of Drinking Water Access in Okhamandal, Gujarat

A Project by Tata Chemicals Society for Rural Development (TCSRD)

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Contents

Impact Assessment of the Drinking Water Project by Tata Chemicals Rural Development Society

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Background

Tata Chemicals Limited, a part of over US$ 180 billion Tata Group, is a leading supplier of choice to Glass, Detergent, Industrial and Chemical sectors. The company has a strong position in the crop protection business through its subsidiary company, Rallis India Limited. Tata Chemicals has world class R&D facilities in Pune and Bangalore.

Tata Chemicals Society for Rural Development (TCSRD) is the social development arm of Tata Chemicals. Through initiatives focused on livelihoods, women's empowerment, education, healthcare, and sustainability, TCSRD works towards building resilient rural communities across India. Through Okhai, TCSRD continues to support artisan livelihoods while helping preserve India's rich craft heritage. An important CSR intervention is the Company's Drinking Water Project in Okhamandal and part of Kalyanpur blocks in Gujarat.

Drinking Water Project

Okhamandal and Kalyanpur is a coastal peninsula region in Devbhumi Dwarka district, Gujarat. It lies on the edge of the Arabian Sea and includes settlements, fishing communities, agricultural hamlets, and cultural heritage hubs like the temple city of Dwarka. Historically, Okhamandal had balanced freshwater systems, but over decades this changed dramatically due to ecological and hydrological shifts. Today, the region is challenged by salinity ingress, over-extraction of groundwater, low rainfall, and climate pressures, which have impacted freshwater availability for domestic use and irrigation.

The Project Objective

To ensure round the year availability of safe drinking water to people living in Okhamandal, especially in rural areas, through strengthening drinking water infrastructure, facilitating access, improving water quality, and increasing water conservation efforts at household & community level.

Project Outcomes (2004-2016)

TCSRD has been supplementing government efforts since early 2000s to fulfil this critical need of the population. TCSRD's vision for water has evolved through three stages– 'water for life', 'water for livelihood' and 'water for quality of life'. There work has gone through two phases.

In the first phase TCSRD partnered with Water And Sanitation Management Organization (WASMO), the government vehicle for providing drinking water delivery service across 42 villages in Okhamandal, from 2005 to 2016. This partnership focussed on building community-led water systems. During this period:

- Nearly 12,000 households were given tap water connections
- Pipeline networking & pumping machinery was installed in 42 villages

- Over 2000 Roof Rainwater Harvesting Structures (RRWHS) were constructed in 42 villages and their vadi vistars.

In the second phase, from 2016 onwards, TCSRD continued its work on drinking water, and shifted its focus on vadi vistars of Okhamandal.

Scope of the Assessment

The Context

Okhamandal has faced severe drinking water shortages over decades due to limited and erratic rainfall and no substantial natural sources of water in the region. In addition, Okhamandal is surrounded by the sea on three sides, giving rise to excessive salinity ingress, that has degraded land and quality of underground water to a great extent.

Okhamandal has 42 villages. Most of these have “Vadi Vistars” which are spread out, with scattered populations, often remote and hard to reach. Hence, while addressing the drinking water issue has been difficult in the villages, it has been a far bigger challenge in the vadi vistars. The vadi vistars have some wells and ponds, but the quality of water and its round the year availability is a concern. As per the 2011 census, there were about 6000 homes in the vadi vistars.

Over the last couple of decades, government has taken initiatives to reach drinking water to the villages, its main initiative being the construction of the Sani Dam, and connecting villages of Okhamandal block with pipelines from this dam. Moreover, the Okhamandal region has seen an increase in annual rainfall in the last 10 years. Greater availability of water due to rains, as well as government initiatives to bring piped drinking water to the villages, has brought a measure of relief to the population. It has also led to crop diversification, increased yield, rise in income levels, as well as construction of personal toilets.

While the drinking water issue has eased to a significant extent in the villages, vadi vistars have remained neglected. The remotest parts are still largely untouched, and people continue to struggle. Villages, due to their compact layout, are amenable to piped water supply. But in the vadi vistars, with their the habitation pattern of scattered houses located among fields, the long distances and the poor connectivity, servicing the drinking water need through pipelines is not a viable option.

Natural sources of water in these areas, such as wells, and ponds are few and far between. The water quality in these sources is less than satisfactory, Ponds are shared between humans and animals, and bore wells usually tap into saline water. Yet families living here have no choice but to depend on

them. There is also the added factor of the daily trudge from home to the source for collection of water, the burden of which falls upon women.

Drinking water scarcity has built immense drudgery into the lives of the women, especially for those living in the vadi vistars. For decades women have been acting the beasts of burden, walking long distances on tough terrain, in challenging weather conditions, 2-3 times a day to the local well or pond, and carrying head loads of drinking water to their homes. In a majority of cases the potability of this water is questionable. But the families have survived on it, and children have grown up on it, with compromised immunity and a host of health issues. Additionally, large sections of population have been spending money they can ill-afford on buying drinking water from tankers.

This report assesses the work of TCSRD from 2022 to 2025, and focusses on the interventions made during this three-year period to alleviate the drinking water situation.

Assessment Objectives

In February 2026, TCSRD commissioned an assessment of the Drinking Water Project across 28 villages of Okhamandal over the recent three-year period, with the following objectives:

- Study of the three intervention approaches spanning 28 villages, to understand their alignment with community needs, effectiveness, and long-term sustainability
- Understand the level to which key aspects of the drinking water challenge have been impacted, namely:
    - Water security
    - Economic Impact
    - Gender & Social Impact
    - Health, hygiene & Education
    - Environmental Impact
- Provide recommendations and future direction for the Drinking Water Project

Assessment Period:

Three years: FY 2022 to 2025

Sampling:

The sampling approach is as follows:

- A 30% sample of the 28 villages covered, distributed over the three assessment years.
- A 30% sample of the 246 RRWHS beneficiaries[1].
- 30% of pipeline and RO villages

The selection of villages and beneficiaries has been random, but weighted in favour of remote villages, core command villages and marginalized populations

[1] Homes with piper water supply were not part of the survey. They were covered intensively through FGDs.

Assessment Process

The assessment has been done using the OECD-DAC framework. Its six criteria serve as the basis for evaluating the project design and outcomes:

RELEVANCECE	COHERENCE	EFFECTIVENES	EFFICIENCY	IMPACT	SUSTAINABILITY
Is the intervention doing the right things?	How well does the intervention fit?	Is the intervention achieving its objectives?	How well are resources being used?	What difference does the intervention make?	Will the benefits last

The assessment process has included[2]:

- Study of the relevant documents and data provided by TCSRD
- Site visit to 14 villages out of 28, exceeding the 30% sample as originally planned, to get a more a nuanced understanding of the differing contexts across Okhamandal
- Survey of 80 HH through a format designed for this purpose
- Six focus group discussions
- Eight in-depth interviews with women, community leaders, SHG & panchayat members
- Detailed interaction with TCSRD team and leadership

TCSRD's Drinking Water Interventions:

The main drinking water interventions undertaken over the last three years are as follows:

1. Roof Rain Water Harvesting System (RRWHS) in individual homes in vadi vistars
2. Bringing drinking water pipelines from villages to vadi vistars (4)
3. Providing RO plants for water purification (3)

Roof Rain Water Harvesting Structures (RRWHS)

RRWHS is a focussed drinking water intervention in the vadi vistars. Over the assessment period, 246 RRWHS have been constructed in individual homes in 28 vadi vistars. RRWHS is a rain water harvesting system provided to individual homes, and is a highly effective means of making good quality and safe drinking water available to families round the year.

[2] LIST OF VILLAGES VISITED: Baradia – Chandrabhaga, Dhinki. Mojap, Rangasar, Mulvel, Samlasar, Mendarda, Gadhechi. Gaga. Suraj Karadi, Mewasa, Bhimrana, Juni Dhrewad and Koranga

The RRWHS harnesses rainwater during monsoons from the roof top of the home, which is stored it in a 10,000-litre tank to last until the next monsoons. The RRWH structure is equipped with pipes on the roof through which rain water is collected in the storage tank that is built half sunk into the ground. Once the tank is filled, it is estimated to fulfil the drinking water needs of a family 5-6 members for 12 months. The water remains clean and potable with a little lime treatment.

The construction of the RRWHS involves a one-time investment of Rs 50,000. Half of this is met by TCSRD and the remaining half by the family. TCSRD pays its share to the family upon completion of the RRWHS construction. This is to ensure that the family remains committed to building the RRWHS. (From 2025-26 the cost has gone up to Rs 67,000 and the share basis is 55% TCSRD & 45% beneficiary).

Once the RRWHS is made, and a basic training is provided to the owner, the role of TCSRD comes to an end. Maintenance of the structure is the responsibility of the owner. These structures last well over a decade (as has been seen in the structures built by WASMO).

Pipelines

Over three years 242 homes have been connected with pipelines in three vadi vistars - 60 in Chandrabhaga, 12 in Rangasar and 10 in Samlasar – Mendarda. 150 homes have also been connected in village Mulvel.

Each of these pipelines has been connected to a pond or a sump nearby. Some of these in-turn draw water from the Sami Dam. The mainline is constructed by TCSRD, and from this, each home pays for its own pipeline to get water into their house. Each family also pays a monthly user fee of Rs 100-150, to oversee the upkeep of the pipe line. Each village is supposed to have a Pani Samiti to make the intervention locally owned and sustainable. The pani samiti has defined roles, including collection of user fee from the beneficiary homes, regulating the daily supply of water in the village, and overseeing the maintenance and repair of the system. The pani samitis formed during the WASMO days eventually got merged with the gram panchayats.

RO Plants

Three RO plants have been set up to provide pure drinking water, in areas with low quality bore well or pipeline water. Two have been set up at a Kasturba Gandhi Balika Vidyalaya (KGBV) in Dhinki, and a government school in Ranavav for use by the students. A third one has been set up in an urban colony in Suraj Karadi town, which is now in its early stages of running as a business model.

In Dhinki and Suraj Karadi the government water supply was not potable, and water had to be purchased from private RO plants, including a spending a hefty transportation cost. TCSRD set up the RO plant in Suraj Karadi on demand of the municipal corporation, but the corporation did not make it functional for over a year, hence TCSRD handed it over to a temple next door to run it. The temple then converted it into a business model to meet the expenses of running it.

ASSESSMENT FINDINGS

The findings of the assessment cover the design and outcomes of the drinking water interventions of TCSRD in the last three years (2022-2025). It is pertinent to note, however, that the outcomes and impact are cumulative, factoring in:

- Several years of work done prior on drinking water prior to the assessment period
- Benefits of the other water initiatives – domestic and agricultural – that went on in parallel, and contributed to the increase in the well-being of families, communities, and the region.

In interactions with the community it was not possible to isolate the impact of the drinking water intervention of three years, without acknowledging the bigger picture, and the longer-term efforts in this area.

Of three interventions – RRWHS, pipelines and RO plants – the RRWHS constitute the lion's share in the last three years. Piped water supply has been provided in only 3-4 villages. RO plants have been provided to two educational institutions, and an urban colony. The RRWHS and the piped water supply have had similar outcomes on all the assessment parameters listed, therefore they have been presented jointly in the same narrative. The differentials in the outcomes have been highlighted where necessary:

1. Roof Rain Water Harvesting System (RRWHS)

The RRWHS have proved to be an apt solution for the drinking water challenge in the vadi vistars of Okhamandal, providing homes with high quality drinking water, collected during the rains, and stored in the tank to be used round the year. The homes that have installed RRWHS have seen a transformation in their daily lives and health parameters. The same transformative effects have been brought about by piped drinking water supply in villages. The latter are more stable and sustainable as compared to RRWHS, as per evidence that follows. On the whole with safe and good quality drinking water available in their homes, families have seen a significant rise in their incomes both through increased productivity and reduced expenses (mainly on medical bills and tankers). The RRWHS in particular has brought dignity to the lives of women, especially those living in vadi vistars. With the drudgery related to drinking water having abated, women now have higher aspirations, and are starting to make investments in their own as well as their children's future.

Shared below are the transformative changes occurring in the lives of the families, as their critical need of drinking water is met through the RRWHS and piped water supply:

a. Impact on Women

The RRWHS and the piped water have been, first and foremost, a boon for women. They have been relieved of a lifetime of daily drudgery of water collection from wells and ponds. Typically, women and adolescent girls of the household, are tasked with water collection. In the time prior to these interventions, women would make a round trip of 1-2 km, 2-3 times a day, and carry back headloads of drinking water. This was a daily affair, and had been their lot for years and generations.

The survey reveals that women made:

- Two trips daily in 75% of the households
- Three trips daily in 25% of the households

It also shows that:

- In 25% of homes two women were involved in water collection
- In 75% of homes a single woman walked to collect water

They would do this arduous task in all weather conditions, including intense cold and heat. They would do it in all health conditions, even when sick or pregnant. The women described how their bodies would feel exhaustion, and their backs and necks would suffer from chronic pain. They described the indignity of bathing and washing at the water source without privacy, or going without a bath for days at a stretch. They would restrict their own consumption of drinking water to make it last for the rest of the household.

Glimpses of women's daily struggle for water collection for years and decades:

- Women in Chandrabhaga, described how they would wake up every night at 2 or 3 AM, walk to the well in the dark, and climb to the bottom of the well to collect water as it slowly recharged. If they got late they would miss the water. They were deprived of proper sleep. *Chandrabhaga now has piped water in every home and several RRWHS.*

- Women in Mulvel talked about how they had to walk to the well thrice a day carrying heavy headloads of water, which made their knees, hips and neck joints ache. Over and above, they would walk with their ghungahts (veil) covering their faces, unable to properly see the path ahead, often stumbling. They described its immense drudgery. *Mulvel now has piped water in every home.*
- Women from Gaga shared how they had to walk long distances on uneven ground to collect water from the well. It was a very tough task, repeated twice daily. And if guests came, then they

had to go a third time. They had no free time. They were working all the time. Raji ben said that during peak summer, in the intense heat, when she went to collect water, she would carry two *odhnis* soaked in water. She would wrap one around her head and face as she walked. The heat would soon dry it out. Then she would wrap the second one. On the way back, she did the same. *In Gaga 14 HH now have RRWHS.*

Good quality drinking water in their homes has changed their lives. The women everywhere expressed their deep gratitude for these interventions. Of particular importance are the words of Ajai Ben, a grandmother – "*We have found a new janam* (birth)*, a new avatar (*life*) …. No one would give their daughter in marriage to a family that had such a big drinking water problem…..The coming generation will not have to see the struggle for drinking water that we faced in our lifetime, for our families."*

b. Impact on Family Health

Despite this humongous water collection effort made by women in vadi vistars and villages, the water that their families got to drink was of less than potable quality. Many ponds were polluted, sed by both humans and animals. The wells and bore wells were almost always saline. Filtering or boiling the water would add to women's work, but not improve the quality too much.

Consumption of this water for years on end led to a host of health issues – lowering of immunity being the biggest fall out, which translated into frequent fevers. Stomach ailments was mentioned by 100% of the survey and FGD respondents. People in many villages said that the high degree of salinity of water led to its over consumption to quench thirst, leading to bloating of the stomach and digestive issues. In some parts of the block people reported tumours, diabetes and kidney stones. In Mewasa two members of a family had to undergo surgery for kidney stones. In Bhimrana several families mentioned skin diseases as a major ailment.

In an in-depth interview in Gaga, Masari Bhai spoke about the impact the poor-quality water had on children from infancy onwards. He expressed great satisfaction that with RRWHS children are now growing up on safe drinking water.

Accessing medical facilities from vadi vistars is another challenge. The distances can be considerable and the quality of services mediocre. This also adds significantly to the financial burden of the families. It is hard to estimate medical expenses incurred by families, as they depend on a number of factors. Yet, conversations, FGDs, and survey data yielded the following figures per family:

- For 80% between Rs 1000 – Rs 5,000 per annum
- For 15% between Rs 5000- Rs 10,000 per annum
- For 6% less than Rs 1000 per annum

**The above, does not include the time and transport expense of visits made to medical centres*.

c. Reduction in Drudgery; and Reclaiming of Dignity

Every woman met, without exception, expressed her deep satisfaction at having drinking water available in her home. Women have reclaimed several hours of their time each day, freed from water collection responsibilities, as shown below:

- 18% saved 3 hours a day
- 22% saved 4 hours a day
- 16% saved 6 hours a day
- 4% saved 7-8 hours a day
- 20% saved 2 hours per day
- 18% saved 1 hour a day

Women said that more time for rest, helped them regain their health. Their overworked bodies recovered, and their aches and pains disappeared. Most importantly, they have reclaimed their dignity; with their life as 'beasts of burden' a thing of the past. Now they spend their time in things of leisure such as stitching and embroidery, or chatting with friends and family. One woman in Gaga said she gets to do her pooja twice a day, which she was unable to earlier, and this gives her much happiness! Some women are learning social media. In Mulvel women said they now have time to go for SHG meetings and engage in community activities.

d. Impact on Income Generation & Savings

Income Generation: Many women have invested their free hours in income generating activities:

- 63% said that they are now giving attention to their farms, which is increasing crop yield, and enabling the household income to go up.
- 53% go out for daily wage labour.

Many women do two or more of the above activities. In some parts of the block, with increased water supply and more time available to women, families have switched to cash crops which has pushed up their income substantially. Some women have found employment as anganwadi workers, pashu sakhis, in solar cell set ups, etc. There are cases of women stepping out of their homes to do odd jobs, for example, in Chandrabhaga they are working at dhabas, making rotis. A few young women are working in NGOs. There are a couple of standout examples of women with qualifications taking up jobs in companies.

Savings: The household incomes have been enhanced due to savings:

- Savings on medical bills is universal across the sample
- Reduced tanker reliance has brought about significant savings in homes with RRWHS, and eliminated it altogether in homes with piped water supply
- Women replacing daily wage workers on their farms is a direct saving

But all these expenses kick in again when water in RRWHS gets exhausted.

Arriving at an accurate measure of increase in income and savings is hard. Besides, women, who were the bulk of the respondents, did not display a good sense of financial matters. The FGDs, interviews and survey, however, revealed that the financial benefit of families covered by RRWHS are likely to be significant, as shown below:

Annual Increase in earnings due to RRWHS

Annual Increase in Earnings	4K-6K	7K-8K	9K-10K	11K-12K	13K-14K	15K-16K	17K-18K	19K-22K
Percentage of families	5%	8.5%	4%	15%	20%	21%	20%	7.5%

Annual Savings due to RRWHS

Annual Savings	3K-4K	5K-6K	7K-8K	9K-10K	11K-12K	13K-15K	16K-18K
Percentage of families	7%	10%	10%	16%	35%	20%	0.5%

e. Impact on Children & Education

Women are spending more time on their children, and paying attention to their schooling. Adolescents have gone back to college. The students, especially girls who were already enrolled are now focussing better on their studies. By and large, all mothers are committed to school completion of their children, and many want their daughters and sons to go to college. Some fathers and the grandparents were opposed to their daughters' education, but men who had greater exposure to life outside the vadis, were categorical that going up to college and working outside the home was the only way for a good future for their daughters.

The challenge of education is the lack of secondary schools in the region, due to which many girls end up dropping out after grade 8. Insufficient exposure and information on public transport, especially buses started by the government, is also a reason why girls drop out. There are, however, some shining cases of girls travelling on buses to senior secondary schools and colleges. We met one girl who travels 25 km one way for her job in a company in Dwarka. A counselling and support program from TCSRD could go a long way in enabling more girls to pursue their education.

f. New Knowledge & Skills

In vadi vistars, the community feeling evident in villages, was missing. The obvious reason is that houses are far from each other. Besides, the RRWHS is an individualised solution, unlike a pipeline which is a community solution and brings people together. Pani samitis exist only in villages that are serviced by pipe lines. There are no community collectives in vadi vistars.

The positive impact of a community collective and a pani samiti was most evident in Mulvel village which has a pipeline servicing all 150 homes. Women said they attend SHG and pani samiti meetings and take part in other community forums. One of them is a Sarpanch (even though her son handles the panchayat affairs). Women feel pride in being able to take part in community activities. This makes them better informed, more independent and empowered. These women are actively promoting schooling of girls of the village, with the aim is to make them all clear grade 10 and 12. They spoke with data about how many girls appeared for and cleared 10th board last year, and how

many are pursuing 10th and 12th board this year. The four communities in Mulvel – Rabari, Wagher, Charan, SC – have no divisions. The women are pursuing education of all girls of the village.

In Mulvel some women, are benefitting from TCSRD's NIOS centre in their village for improving their own skills and knowledge. Some are also working with *anganwadis* or as *pashu sakhis*. There are examples of some younger women who have taken up employment opportunities in nearby towns, like Dwarka.

Chandrabhaga, the vadi vistar of Baradia village, is like a compact colony, and has a pipeline. There is a pani samiti in this village too, but not active. A staff has been employed to collect user fee and release water every morning and evening, which is the minimal function of this pani samiti. The SHG has also been non-functional for years. Chandrabhaga lacks the vibrance of Mulvel; but the FGD revealed that these women too are aspiring, and looking for counsel and opportunities to go ahead.

TCSRD may consider ways to foster community collectives in vadi vistars, given their immense benefits.

g. Social Inclusion

TCSRDS aims to distribute RRWHS evenly across villages, but within a priority framework. Areas that are remote and difficult to access, areas facing acute water scarcity, families with higher socio-economic deprivation, and core command villages of the company receive greater attention.

The TCSRD policy is to prioritise:

- Villages / vadi vistars in the core command areas of the company
- 'No Source' villages, i.e. those without any ponds, wells or sources of drinking water
- The remote vadi vistars, far from the village and water sources
- Those families that have water sources too far to walk or cannot afford tankers Family selection is done in consensus with the local sarpanch.

Each year TCSRD sets an annual target of RRWHS to be constructed, based on the CSR budget of that FY. Sarpanches of different panchayats are asked to collect the demand for RRWHS from households, collect application forms and requisite documents and submit them to TCSRD. The demand is typically higher than the number of RRWHS that TCSRD can build in that year. Hence, upon receiving the demand, TCSRD staff visit the villages, and assesses the physical and technical, as well as the socio-economic aspects of each applicant. The final decision is taken based on a defined set of criteria, in discussion with the sarpanches and community leaders.

Of the total 246 RRWHS constructed in the three assessment years, the breakdown is as follows:

- 84 RRWHS (34%) have been constructed in the remote villages[3] (C- category)
- 65 RRWHS (26%) have been constructed in the core command villages of the Company
- The rest are distributed across other villages

Out of the 246 RRWHS, 24 are in SC families and 3 in Muslim. All the rest are with OBCs. The percentage of SC families in vadi vistars of Okhamandal is small because they are not land owners.

[3] Remote villages of Okhamandal provided RRWHS - Khatumba, Juni Dhrewad, Aniyari, Lowrali, Positra, Samlasar - Mendarda, Koranga

And those who do live there have been given land by the government on hard rocky ground, where it is difficult to construct a RRWHS. TCSRD is now working out a solution to put up smaller sized or syntax tank based RRWHs for these families.

Finally, two major reasons stand in the way of inclusion:

- Affordability of families
- Budget limitations of TCSRD

As of today, only about 40% HH in the vadi vistars have RRWHS out of a total of 6000.

h. Sustainability

Harvesting rainwater for the purpose of drinking is a sublime example of environmental sustainability - especially in a region where natural water resources are highly scarce, and much of the underground water has turned saline. With the annual rainfall on the rise in the region, RRWHS of the right size can collect and store enough water to take care of the drinking water needs of a family round the year. The RRWHS, hence, is a sustainable solution.

The RRWHS is practical and easy to use. The only investment it requires is the one-time capital cost of building it. After that it requires minimal maintenance - lime treatment for purification of water, and cleaning the roof and the tank before the rains each year. The life of the structure is a decade or more. Most of the RRWHS built years ago by WASMO are still working.

Not only is the RRWHS sustainable, so are the other benefits it brings such as health, women's empowerment, increase in income, improvement in education & livelihoods, participation of women in citizenship activities (in piped water villages), etc

i. Climate Resilience & Water Security

Over the 3-year assessment period the 10,000 litre RRWHS, constructed at a cost of Rs 50,000, was the standard option offered by TCSRD. (2025-26 onwards the costing has been increased to Rs 67,000.) Half of cost was paid by the beneficiary, and other half[4] by TCSRD[5] post construction. This size of the storage tank is expected to last for the full year for a 5-member family. For 75% of the families, however, the RRWHS water does not last round the year. There are differing scenarios on the ground that prevent this from happening:

a. Family sizes are larger: Almost 100% of the people who run out of water in 6-10 months said that their families are larger.
b. A wedding or a function in the family can deplete the water: 30% people experience this.
c. Some households generously share water in the neighbourhood where water quality is poor. Samlasar is an example. Their water lasts for only 4-5 months.

Site visits and a survey of 80 households showed that:

- 25% of the households have water for 11-12 months
- 27% have water for 9-10 months
- 30% for 8 months
- 15% for 6-7 months
- 3% for 4-5 months

[4] In 2024-25, TCSRD share was increased to 55%.

[5] In 2025-26 with rise in input costs, the RRWHS cost for a 10,000 Litre tank has been raised to 67,000 with 50% cost share.

After the water runs out, families go back to the old practices of well trips by women and buying water from tankers. Drop in quality of water means drop in quality of life - drudgery for women, expenses shifting back to water, health compromise, etc.

Money spent on purchase of water from tankers during the dry months:

Expense during dry months	No expense (no dry month)	Rs 400-1000	Rs 1K-2K	Rs 2K-3K	Rs 3K-4K	Rs 4K-6K
Percentage of families	10.5%	17.5%	24%	15%	20%	10%

This shows that 90% of the families incur expenditure when water comes to an end. Even those who have water for 11 months have shown an expense. Only the 9-10 families (out of 80 surveyed) who have water for all 12 months have showed no expense.

To overcome this, those who can afford are investing their own money to make larger RRWHS of 12,000 to 15,000 Litres. One household in Mewasa has even built a 20,000 litre RRWHS, spending Rs 1.4 Lakh (receiving Rs 25,0000 from TCSRD in 2023). But there are many who do not have the means to do so. The demand is growing for TCSRD to allow 50% share in building larger RRWHS to ensure water round the year.

There are other issues related to cost:

- Many families do not have the means to invest 67K upfront, with TCSRD share coming after construction. This deters them from going in for an RRWHS.
- In many areas the ground is rocky and labour costs go up considerably in digging the ground for the RRWHS.
- In remote areas the transportation cost of construction materials is high, and the cost of RRWHS has been reported to exceed Rs 80,000.
- The Sarpanch of Goriyari, Veja Bhai, said that in his vadi vistar of about 30 families 10 have got RRWHS till date. 10 more have made a demand for it this year. The remaining families also desperately need quality drinking water. If the support from TCSRD went up from 37K to 50K, they would all be able to afford RRWHS, and the drinking water problem of this village would be solved.
- In some parts of the block, the ground is so hard that the RRWHS cannot be dug sufficiently into the ground. With the greater part of it is above ground, the longevity of the structure is reduced.
- In exceptional instances the RRWHS cannot be dug into the ground at all. To build it in these places an RCC structure would have to be put up entirely above ground, increasing the cost a lot.

TCSRD has recently floated an initiative of building an RRWHS free of cost for families that are extremely deprived. Given TCSRD's commitment to reach the absolute last mile, they may like to consider building some flexibility into the existing model including:

- 50% cost share for larger RRWHS and get quality drinking water round the year
- 50% cost share of additional costs in remote locations or rocky terrains

j. Scale & Coverage

Despite the substantive benefits that RRWH have brought in the lives of individual families, there are still over half the households in the vadi vistars of Okhamandal that do not have a solution for potable water, and continue to depend on the sub-standard water of local wells & ponds or tankers.

Between 2004-05 and 2024-25, in the 6000 households in the vadi vistars of Okhamandal block, 2558 RRWHS have been built. Of these, about 2000 were built during WASMO days, most of which are still functional. Close to 500 have been built by TCSRD. A small number of families have built their own RRWHS, but the percentage would be negligible. There are still likely to be around 3500 homes without RRWHS and which continue to face the disadvantage of poor-quality drinking water, while bearing the expense of buying water from tankers or women undertaking the drudgery of water collection.

While there is a budget limitation of TCSRD, but given that drinking water is the foundational and most critical issue in Okhamandal, and a high impact solution that has led to transformative effects in multiple other areas such as gender, health, income, education, environmental sustainability, aspiration building and overall upliftment of the vadi vistar community, it makes for a compelling case for not only scale-up but universalisation.

2. The Piped-Water Supply in Vadi Vistars

The piped water supply intervention that has been highly effective in villages, with compact housing, has not shown much leverage in vadi vistars.

Only four villages out of 28, that fall into the domain of this assessment, have been serviced by drinking water pipelines. Of these Mulvel is a proper village with 150 homes and Chandrabhaga, is a vadi vistar but like a compact colony with 60 homes. All homes in the two villages have received a tap connection. This has made a tremendous difference to the daily lives of the people as discussed in the sections above. The other two are Rangasar and Samlasar (Mendarda), which are vadi vistars. Rangasar is highly spread out, with an undulating and rocky terrain and just 12 homes and Mendarda is also quite remote with 8-10 homes. Here TCSRD has provided pipelines to a water storage closer the homes of the families living here, easing access. (This is not the same model as house-to house piped water connection in Mulvel and Chandrabhaga.) In both these places, however, the problem is not resolved. In Rangasar, for over one year the government has not provided the electricity connection to pump water through the pipeline. In Mendarda, the borewell that the pipeline connects has turned saline, with sweet water available only during monsoon. As a result, both areas continue to depend on tankers or water collection by foot or vehicles. This shows that piped water supply is feasible only for compact villages with a large number of homes, and not spread out areas with a handful of homes.

3. RO plants in Educational Institutions

RO initiative is a small one. Only three RO plants have been installed, of which one is in a Kasturba Gandhi Balika Vidyalaya (KGBV) in Dhinki village and the other in a school in Ranavav. Both these have been immensely beneficial to the students. At the KGBV prior to the RO the students and teachers in the hostel had been struggling with poor quality drinking water. Students would fall ill frequently. KGBV staff had to undergo the daily rigmarole of buying RO water from a private player in Baradia a distance away, and having it transported to the hostel. This came at a considerable expense. The

installation of the RO brought much relief to the hostel. Health parameters of the students have improved.

Certain problem, however, remain. For instance, without proper maintenance, the RO breaks down frequently. Then the staff has to report this to their seniors, get permission for repairs, and find the right agency to do the job. In the meanwhile, the students go back to drinking unsafe water. It was found that KGBV had made no annual maintenance contract (AMC) with the company at the time of installation of the RO. The second issue is that, the RO was installed for a student strength of 100, one year ago, but since then enrolment has gone up to 170, with its capacity now falling short. These issues need to be resolved to get the full benefit of this facility.

The third RO is installed in a temple in Suraj Karadi. This was originally done on demand of the government. But after its installation, the nagar palika did not pay attention to it, and it was lying unused for over a year. Finally, TCSRD stepped in again and negotiated with the temple next door to take it over and run it. The temple trust needs money to run it and has converted it into a business model, with people in the neighbourhood paying Rs 10 per 20 litre of water. Prior to this RO they were buying water from a private player at twice the cost, but that was home delivered, while for this they have to walk to the RO and carry the 20-litre bottle back. This process is just 3 -4 months old and its results are yet to become evident.

The Assessment summed up in the OECD DAC Framework

This framework has been applied for examining the project from six lenses:

Relevance	Is the intervention doing the right things?	The project's relevance is unquestioned. It is fulfilling the most critical need of the community – potable water. The RRWHS and piped water supply are fully aligned with the community needs and culture. People are highly satisfied with good quality drinking water available in their homes. It has cut out the endless drudgery from women's lives of water collection from wells and ponds at a distance, involving daily trips on foot and carrying head loads. Safe drinking water has brought about enormous improvement in family health, especially that of women and children. This has led to significant increase in income with more attention to agriculture, crop diversification, and replacement of hired labour with family (woman) labour. This has cut down on medical bills and costs of purchasing water from tankers adding significantly to savings. The free hours gained by women are going into their own rest and leisure, as well as focus on their children. RO is a good solution for a girls' hostel and a school. But as a business model in an urban colony, it still has to prove itself.
Coherence	How well does the intervention fit?	The community finds the RRWHS design appropriate and easy to use. Piped water supply is a well-entrenched and most convenient solution. While piped water supply is more or less is consistent throughout the year, the RRWHS water does not last the whole year for many families, and they fall back on traditional sources like wells, bore wells and ponds, or call tankers. The various options available these days has added to a higher degree of water security than was available in the earlier days. RO is an apt solution for schools and hostels. The RO plant in the urban colony of Suraj Karadi, however seems to be an outlier. It was originally supposed to be a government initiative, and presumably free or at nominal cost. But it ended up in private hands and as a business model, with a higher cost and has its inconveniences of women having to cart water 2-3 times a day. This model is just a few months old and needs to evolve.
Effectiveness	Is the intervention	The RRWHS intervention is indeed achieving its core objective in providing good quality water for individual homes in the challenging environment of vadi vistars of Okhamandal; as well

	achieving its objectives?	as alleviating a host of other related problems that families struggled with in absence of easy access to safe drinking water (see sections above). The effectiveness, however, falls short on two counts: • The standard size of 10,000 liter RRWHS is insufficient for many. In 75% of homes the water lasts for 4-10 months, pushing the families back into water collection and tanker reliance • The reach of RRWHS is limited. Only 40% of the families in the vadi vistars have RRWHS; 60% are still facing the same old struggle for drinking water. TCSRD prioritises social equity in distribution of RRWHS But on economic grounds, there are many who lose out, because they cannot afford the 50% share of an RRWHS. Some struggle with additional costs that they have to bear due to the remoteness of their location or rocky ground. The Piped Water Supply intervention is the most effective solution, as it ensures water supply round the year. This affords stability in the related benefits of women's empowerment, health, rise in income throughout the year with no disruptions. It is however not a workable solution in vadi vistars, due to scattered houses, rocky ground and long distances. RO Plants have been very effective in educational institutions, but lack of an AMC causes frequent disruptions. Besides, longer term planning would make them more effective (such as factoring in rise in student enrolment.) As a business model in an urban colony, it is too early to comment. The model needs time to evolve.
Efficiency	How well are resources being used?	TCRDS tries to maintain efficiency by trying to receive all requests for RRWHS even prior to the start of the financial year, so that maximum number of RRWHS can be installed well in time for monsoons. They achieved 65% efficiency in FY2025 The remaining RRWHS continue to get built post monsoon, and fill with water only in the next monsoons. But since the RRWHS cannot be left empty, the beneficiaries have to fill it with tanker water till the next season. No issues surfaced during the assessment with respect to funds transfer to beneficiaries and quality of construction

Impact	What difference does the intervention make?	Rainwater, the best quality drinking water available in homes is the biggest boon for families who have faced untold struggle for this critical need in the past. Today, for those families who have the RRWHS, the impact is tremendous. Multiple aspects of women's lives have transformed- improvement in personal and family health, time for rest, leisure and embroidery, small businesses like tailoring, focus on family agriculture, option for daily wage labour, leading to significant increase in income. Plus cutting down of medical bills and tanker costs have ratcheted up savings. Overall there is a clear improvement in the well-being of the families. And this has led to their focus shifting to children's education, self-improvement, and a better future.
Sustainability	Will the benefits last?	Rainwater is the most sustainable solution to quality drinking water, especially with rainfall graph going up in the Okhamandal region over the last decade or so. Once built, the RRWHS are long-lasting and largely maintenance free. The WASMO structures have lasted well over a decade and still operational. Harvesting rainwater for drinking purposes in a highly water scarce region, with ground water turning saline, is a shining example of sustainability.

Recommendations

1. The project has brought transformational outcomes and should be extended

   The project is fulfilling a critical need of potable water for the community in Okhamandal People are highly satisfied with good quality drinking water available in their homes. Women empowerment, improvements in family health, rise in household income, and reduction in medical and water purchase costs. Families are now investing in their children's future

2. Certain challenges, if addressed, can take the project to greater heights
   - Inadequate water storage capacity: Standard 10,000 litre tanks are insufficient with many families running out of water before the year ends.
   - Affordability constraints for households: Even with 50% subsidy, many families cannot afford their contribution, or additional costs due to difficult terrain and logistics.

   With some flexibility into the model, more people can benefit from this powerful initiative.

3. A compelling case for reaching universal coverage through strategic partnerships.

   Today around 40% of the households in the vadi vistars are covered. To reach drinking water to all, TCSRD may consider options such as:

   - Leveraging CSR funds in the region
   - Partnering with development organisations (including Tata Trusts)
   - Cross-subsidising
   - Engaging with the government
   - Creating newer drinking water solutions that complement RRWHS

   This could be tied in with the company's vision to meet SDG Goal 6 '*Universal and equitable access to safe and affordable drinking water by 2030*'.

4. RO plants are a boon for educational institutions.

   The RO plant translates into immediate health benefits for children. A couple of difficulties observed could be addressed through Annual Maintenance Contract (AMC) to prevent breakdowns; and larger RO capacity for new and growing institutions.

5. Nurturing Rising Aspirations:

   Improved water security has ignited new aspirations among families, with women and youth increasingly eager to pursue education and work opportunities. TCSRD may like to look at the possibilities of leveraging its existing portfolio—including NIOS, skill training, and transport support—to empower this new generation as community catalysts.

6. Fostering Community Collectives in Vadi Vistars:

   TCSRD may like to engage in some innovative thinking around how the vibrance of community collectives in compact villages (example Mulvel) can be extended to the spread-out vadi vistars, and how Pani Samitis and SHGs, can be reimagined to encourage knowledge sharing and collective action in these areas.

ANNEX

NOTES ON THE VILLAGE VISITS

Baradia vadi vistar

Chandrabhaga, the vadi vistar of Baradia village has 60 HH. It is a settlement of the Vagher community. The vadi vistar has faced significant drinking water challenges in the past. Now, nine homes have opted for Roof Rain Harvesting Structures (RRWH), sweet drinking water available to them. There is also a pond nearby made by the government several years ago. In 2023 TCSRD connected a pipeline from this pond to all 60 HH in Chandrabhaga. With this, things the scenario in the vadi vistar has changed for the better.

A Household Visit

To understand the impact of the RRWH, we visited a household, and had interactions with: *Mansingh Bhai, Teji Ben, Bhavna Ben, Asulu Ben*

This is a joint family of four brothers and their wives and children, 12 members in all. TCSRD built the RRWH in their home 2-3 years back. And the pipeline came to their home 2.5 years back.

Before the RRWH and the pipeline, women from the family used to walk down to the pond and fetch drinking water from a well. It was a 500 m walk, and 2-3 trips consumed 3-4 hours a day. They boiled it before drinking. Clothes were washed at the pond and bathing water was carried home.

The family faced many health issues. Poor quality of water caused Indigestion, vomiting, typhoid, malaria and even cholera. Mosquitoes were a problem due to poor hygienic conditions.

After the installation of the RRWH and pipeline, the women started saving at least three hours a day, that they spent in collecting water. Now they get rest and focus more on their housework and children. They spend time on their fields. From just jowar and bajra for home consumption, the family has now diversified into cash crops like ground nuts and jeera, which according to Mansingh, fetches them an extra 3-4 L of income a year. Health has improved for all family members, and with that their health bills have gone down by Rs 5000-7000 a year. One year back, with the availability of the pipeline water, the family constructed toilets. This improved hygiene in their home. Toilets were constructed by all 60HH in Chandrabhaga. While the pond has been there for long, but women had to walk to bring water home as head loads. The pipeline has made the use of pond water much more convenient.

The RRWH in this family, however, lasts about 10 months only. This is because of the family size of 12 members. Once the water if over, they call the tanker to re-fill the RRWH tank.

The family spent 50% on the RRWH from its savings. They covered some of the expenses by using family labour in construction of the RRWH. The construction of the pipeline cost Rs 9,60,975, which was distributed over 60 HH. They pay a user fee of 100. Since the last census, the number of HH has gone up, but the exact number is not available.

A Focus Group Discussion

About 20 women of Chandrabhaga collected for the FGD. A two-hour long discussion revealed many facets of their struggles of the past, and the changes that easy access to quality drinking water has brought in their lives.

Women described how they would walk to the well, which was at 500m -700m distance, at 2:00 am in the night. They would climb down to the bottom of the well, and slowly fill their vessels as the water recharged. They had to be there on time to catch the water, because of which they were constantly sleep deprived. They would even wash their clothes and bathe at the well or in the pond. It wasn't easy or comfortable for the women to do this publicly.

Now that they have water available in the privacy of their homes through the RRWH, it has made all the difference to them. It has brought back dignity to their lives.

When they faced health problems, they had to go all the way to Dwarka, 3 kms away, as local doctors cannot treat anything more that basic fevers. Now their health problems and medical bills have come down.

Almost all homes now have toilets, which is major outcome of water availability.

About 50% of the women have RRWH. The rest of them also want to have an RRWH.

Now, with more hours free, the women are engaging in a number of activities, such as stitching, and agriculture. Some of them earn extra money through wage labour. Some have taken up jobs with Anganwadis and the Mid-Day-Meal (MDM) scheme in schools. A few are earning out of making rotis in highway dhabas.

Many women expressed their keenness for something useful to do. Opportunities close to home are limited, they said. Travelling to Dwarka or Khambaliya, the nearest towns, takes a long bus ride. Their low education / literacy levels are also a constraining factor.

The SHG, once run by started by Gram Vikas Trust, is now defunct. Nor is there an active Pani Samiti in the vadi vistar. It only collects the monthly user fee of Rs 100-150. The lack of civic engagement is the also reason why the vibrance visible in Mulvel is lacking in Chandrabhaga.

Their response to education of their children, especially girls, was positive, but a little mixed. Unlike Mulvel, where the entire community was literally tracking the education of each girl, and taking pride in their success, Chandrabhaga was falling a little behind. They need more support and exposure.

The success of the drinking water project, and the reduction of drudgery, had led to higher aspirations in women. But see no way forward to meet them. TCSRD may like to consider how to support women in meeting their aspirations, which is very important. An obvious way is to see how they can layer their existing programs on top of the drinking water program, such as NIOS.

Dhinki

Kasturba Gandhi Balika Vidyalaya (KGBV) had made a request to TCSRD in 2023 to install a RO plant as the poor-quality drinking water was posing a major problem for the 100 enrolled students and teachers.

We interacted with Principal Shobha, and teachers Heena, Mamta and Pratibha. Barring Pratibha, all others were new to the KGBV, having been posted here just 2-3 months back. Pratibha has been here for 5 years

RO plant was installed two years back at a cost of Rs 100,000/- and a capacity of 70 litres /day.

Prior to the installation of the RO at KGBV, the management would purchase 30-40 bottles (20 litre) of water daily from a RO plant at Baradia, and paid for their transportation by auto. The expenditure on water and its transportation was substantial. Plus, they had to deal with an irregular supply due to frequent disruption in electricity. At such times students would drink the water supplied by the pipeline which was not up to the mark, leading to health issues that the management had to constantly deal with. The RO installation, and the availability of pure water on their premises has been a boon for the KGBV students and their teachers and staff.

By now the student strength has increased to 170, and the water is not enough for them all. Besides, in the target is to reach an enrolment of 250 by the next academic year, for which a new building has come up.

There are challenges:

- The RO needs repair from time to time. Because of *khara pani* the filter gets jammed. This happened twice in 3 months recently. When it stops working, then for a week or so the teachers have to run around for permissions and repair. And the girls have to drink pipeline water after boiling. In fact, right before the assessment visit, when the TCSRD team came to KGBV, they found the RO not working, and funded the repair with a sum of Rs 11,000/-. This situation prompted a question from us - Why was an AMC not taken at the time of installation of the RO?

  In case TCSRD goes for installation of more RO plants in its project areas, they may consider asking the beneficiary institution to commit to funding an AMC as a pre-condition to this investment.

- With increasing student strength, the drinking water problem is again raising its head. This RO has a capacity of 70 litres, not enough for 170 students. And the storage is also falling short. Soon the student numbers will increase to 250, as per plan.

Mojap vadi vistar

Wagher community

Murvi Lakshmanbha, Jethi ben, Shobhan ben, Nathi ben, Lila Ben, Santok (the daughter)

A total of 21 RRWHS have been constructed in this vadi vaster over the last three years.

This family comprises three brothers, their wives and children. Two of the brothers constructed RRWHS of 10,000 litre capacity each, installed two years ago, in 2023. The third brother moved here a year ago and, and seeing its advantages, now plans to get one for his family.

Prior to the RRWH, the women of the household – mother, daughter, daughter-in-law – walked to the bore well 0.5 km away, twice in a day, and carried headloads of water. Each trip took half an hour of walking. And each family spent a combined 3-4 hours a day on drinking water. The bore well is 15 years old and has khara pani, which they would survive on. If there were guests in the house, the trips to collect water would go up.

Men and boys played no role in water collection and storage. But the daughter Santok, a smart young woman, who has completed 1.5 years of BA and then dropped out, also collected water for the 1.5 years.

The poor quality of water caused many health problems – such as weakness and fever, basically due to compromised immunity – and the family would end up spending up to Rs 2000/- a month on medical bills.

The RRWH has been a boon. The drudgery for women has come down. They feel a greater sense of dignity now that they don't have to be the beasts of burden. They can rest during the day. One of them has started stitching and also earns through this work. The family health has improved significantly, and their medical bills have come down.

They still grow the same staple crops as before, because the soil is not good for cash crops. But now with more focus of the women on agriculture, the yield and hence the annual income is now higher.

The rocky soil has not allowed the RRWH to be dug too much into the ground, which reduces the life of the structure. In the first year the rain water lasted for 12 months. But in the following year, due to a wedding in the family it got over in 9-10 months, so the family was back to the well until the next monsoons.

Mulvel

Sarpanch Jeevan Jagatia

Mulvel has a pipeline built by TCSRD from the Kanero pond nearby. This pond gets water from the largest pond in Okhamandal called Bhimgaja / Sani which is 100 Km away in Kalyanpur. The pipeline is supplying water to 150 HH in the village. There are four communities in Mulvel – Rabari (20), Vagher (60), Charan (10) and SC (25). The following day a community meeting was organised with women in Mulvel - Rabaris and Vaghers attended. SCs were occupied with someone's passing away. There were no Charans either.

The village is divided into 6 areas. The pipeline supplies water to 3 areas per day. The water is used for drinking as well as domestic purposes. Prior to the pipe line, women depended on a well in the just outside the village. Because the distance was not much, women said that they made more number of trips (3-4) trips to the well daily. Water collection took up 2-3 hours of their time. They said, how carrying heavy headloads made their knees, hips and neck joints ache. Over and above, they would walk with their *ghungahts* (veil), unable to properly see the path ahead. It was very tough.

During summer with water scarcity increasing, they would do the washing at the talab (pond). The storage tank of the village is old and now needs repair.

Now the women of this village have seen their bodies recover from the drudgery. They have seen their own, and their family's health improve. They do not have to be subject to the inefficient government health system and the extortionist private dispensaries.

The women said that now, with the 3-4 extra hours of time available to them, they do their craft and embroidery, they devote time to their farms, they pay attention to their children, some have even learnt social media. Some have become *pashu sakhis*, one of them works with an NGO called Gram Vikas Trust (GVT), or with a wind farm. They are active members of the SHG and the village Development Committee (VDC). One of them is a sarpanch, although her son runs this charge. They said that now they have time to go out of their homes and attend meetings. TCSRD's NIOS program also runs in their village, which is benefitting them.

The women were enthusiastic about their girls' education. They proudly said that last year 13 girls from their village appeared for 10th Board and all of them cleared it. And they gave number of the girls appearing for 11th (7) and 12th (1) boards for this year. They said that they observe no distinction between the different communities, and the village is quite united. The Rabari girls are also going up to grade 10.

Rangasar Vadi Vistar

This vadi vistar has got a pipeline, built by TCSRD over a year ago. The mainline was laid by TCSRD in 2024, to fill water in a storage tank that would be the source of drinking water to the 12 families in the vadi vistar. The pipeline was not to be connected to each home. Its purpose was to bring the water closer to the families so they could collect from here rather than walk all the way to the village. The pipe line however has not been working, as the government has still not provided electricity to run the motor at the village end. The Sarpanch has been awaiting some permissions. The *pani samiti* was not active in the village. In absence of a functioning pipeline, people from vadi vistar were dependant on getting water from the village, or calling for tankers. The vadi vistar is arid and spread out with rough and rocky *kuccha* paths, making walking extremely strenuous. The farthest home was 2.5 km away. Hence men of the family would collect water from the village on motor bikes. We could not meet any beneficiaries from the vadi vistar, as the homes we went to were locked up. Apparently, the families had moved to Dwarka for a few months after the monsoon crop was harvested. There was no second or third crop in this area due to lack of irrigation. Water, in general, seemed like a huge challenge in this area.

Samlasar

Kumbha Rajabha

The vadi vistar of Samlasar is one of the remotest parts of Okhamandal, falling in the A-category. It has 16 RRWHS. Kumbha Rajabha's RRWHS was set up in this house two years back. The rainwater in the RRWHS lasts only four months of the year. This short duration is because, one, the family has 17 members. And, two, the family is generous and allows several of their neighbours to take water from their RRWHS. There is a major shortage of drinking water in the area.

In the remaining months of the year, until the next monsoons Kumbha Rajabha fills the RRWH twice, calling tankers, and paying Rs 1500 each time.

The RRWH had cost him Rs 80,000, much above the Rs 50,000 that TCSRD estimate, because of the high cost of transporting construction material from Mithapur to this very remote area.

Rajabha's family grows *mungphali.* For domestic and agricultural water, they have a well nearby.

Samlasar

Devubha

Devubha lives next door to Kumbha and has a RRWHS. Their rainwater also lasts for 5 months. Devubha's wife said that she gives her young calves water from the RRWHS, although the bigger animals go out to drink. As with Kumbha's family, they also allow neighbours to take drinking water from their RRWH, and call for tankers later in the year.

Mendarda vadi vistar

This part is likely the remotest part of Samlasar, and on the edge of the sea. From here Beyt Dwarka can be seen across the water. A group of 7-8 Vagher families live in a small cluster in impoverished conditions. They are all daily wage workers. Their drinking water situation is quite difficult currently.

There are two government pipelines in this area – one that is exclusively for Beyt Dwarka, and the other for a school nearby. The source is a government sump for the Sani water. Earlier the school would allow these families to take water from the pipeline. But recently the quantity of water coming in the pipeline has started to reduce, and it is not even sufficient for the school. So now these families cannot get the pipeline water. TCSRD built a tank for these families and connected it to a borewell 500 m away. But the project failed because the water in the bore well turned out to be khara. The residents said that when the pipeline was working properly they would get sweet drinking water.

The children in these homes completed elementary school. Because the high school is far, the boys have continued, but the girls have dropped after grade 8.. Apparently, there is a bus route that is accessible, but the families did not seem confident or exposed enough to know or use these things.

Khiraj Bha

This was the next HH visited, close by. Khiraj Bha has 12 members in the family. Naturally the RRWHS water does not last the entire year. But their use of the RRWH was indeed quite strange. They use this water for all domestic purposes – drinking, washing, animals - throughout the year, not restricting the use of rain water for drinking, even for a few months. In fact, they keep mixing tanker water or water from other sources with the RRWH water throughout the year. Since the water source they use is in the village 3 Km away, the men of the house often go on the bike and bring back two containers of water from a government pipeline. Sometimes they call a tanker. All the water goes into the RRWH at all times of the year, even when rainwater is in it.

This family also depended on the government pipeline for the school, and now they are waiting for it to get repaired. I asked the TCSRD team why they agreed to build the RRWHS here because once the pipeline is repaired this structure will become a duplication. They said that since the repair has taken several months, the family made a request, and they built it.

Gaga

This is a remote village, and the vadi vistar is even more remote with high water scarcity. TCSRD has supported this community with 14 RRWHS.

Vijay Bhai, Ajubha

Two brothers have two RRWHS in their homes adjoining each other’s. They built their RRWH in 2024

It was hard to build because of the hard, rocky ground. They grow moong and cotton. Before the RRWHS they depended on the well nearby and tankers for drinking water. Women would make trips to the well. The water quality was not good. Khara water has to be consumed in greater quantity, and the stomach swells up. It causes significant health issues. The RRWH water is not sufficient for 12 months. Water gets exhausted, and then they resort to their previous means.

Ajaiben, Vediben, Rajiben, Masari Bhai

This HH / kutumb also has three RRWHS.

This is a progressive family with a larger outlook. Raji Ben's daughter is doing MSc in Data Science and her son works in an IT company. They are both in big cities – Ahmedabad and Baroda. Her husband had worked in the diamond polishing industry in Surat for many years.

In the earlier days, the women of the house had to walk a long distance to collect water from the well. It was a very tough task, repeated twice daily. And if guests came, they went a third time as well. They had no free time. They were working all the time. Raji ben told us that during peak summer, in the intense heat, when she went to collect water, she would carry two odhnis. She would soak one in water and wrap it around her head and face as she walked. The heat it would soon dry out. Then on the way back she would wrap the other one. This is a glimpse of women's struggle every day of their lives for years, for the sake of drinking water for their families. Getting tankers could cost Rs 6000 per annum. Now the three families of the kutumb have three RRWHS with a total capacity of 50,000 L, at the total expense of Rs 2.5 L. 70% of that has been paid off.

Good quality rain water available in their homes have transformed their lives. The women expressed their heartfelt gratitude. The mother in law said that they have found a new *janam*, a new *avatar.* She said that noone would give their daughter in marriage to a family that had such a big drinking water issue. She said the next generation would not have to see the struggle for water as they have seen. Rajiben, the daughter in law said they have found God. She also said that now she finds time to pray twice a day which she was unable to do earlier. Masari bahai, her husband, observed that children's health would now be better as they grow up on good quality water.

This has had such an impact on the health of people that one private clinic has gone out of business.

The water sources for domestic work (washing, cleaning, etc) are also at a distance from their home. Hence, monsoon onwards when they have water in the RRWHS, they use it for drinking as well as other domestic purposes. This prevents the hardship of collecting water. The downside is that the rainwater does not last for all 12 months. After some months they have to fall back on tankers or collection process. One tanker costs Rs 400 per month. The three families of the kutumb have to earmarked two of the RRWHS for domestic use and one purely for drinking water.

They grow jeera and mungphali. Jeera cultivation started after TCSRD gave them a pond three years back.

Suraj Karadi

Interview with Jeetendra Singh Jhala, Temple Trustee

The RO plant was established by TCSRD in 2023-24, in Shaktinagar basti of Suraj Karadi, adjacent to a temple compound. This was done on demand from the Nagar Palika. Yet, after its installation, it was not made functional by the nagar palika, and lay unused for about 1.5 years. Then TCSRD handed over the RO plant to the temple authorities, who offered to take charge of it. The RO faced further issues. The ATM had to be changed as the earlier one only had a QR code system, and many people in the area did not have smart phones. The new ATM installed has coin, card and QR code facilities. The ATM, along with servicing and repair, of the damage caused by many months of disuse, cost over Rs 35,000, which was paid by the temple. In addition, an RRWH was built by TCSRD in the temple

complex and connected to the RO plant, as the ground water was too saline, for the RO system to filter. Finally, the RO became functional and open to public in January 2026.

The RO can filter 500 litre of water per hour. Currently about 40-50 families in Shaktinagar have started using it. As word goes around, they expect more people will start availing of this facility. There are 500 HH in the basti and the RO has capacity to meet the drinking water needs of all.

Due to lack of options for potable water there is a flourishing RO business in the area, which supplies water at Rs 20 / bottle (20 litres), at the doorstep, and people have been buying water at this cost, which they say strains their budget. This plant charges for water are Rs 10 per bottle (20 litres). With the ATM card it goes down to Rs 8 per bottle. This definitely has been a relief to people, and they have started switching to it. The downside is that they have to come to the RO to collect water. Often women have to bear this burden. They have to collect water from the temple, which means one or more trips per day, waiting in a queue, and carrying a head load back. Men also take water sometimes, on their bikes.

The temple buys one tanker a week of 12,000 litres of water at Rs 1500, and stores it in the RRWH tank. This water is filtered through the RO. Only 30% of the water is used, 70% goes waste. The temple has plans to use the waste water for growing plants in their compound.

Adjacent to the temple there is a significant muslim population, in addition to SC, OBC and Vagher. Clearly drinking water had been a struggle for them. Prior to this RO, they spent Rs 20 per bottle. Smaller families, with 4-5 members took one bottle per day, and larger ones took two per day.

This new RO installed by TCSRD at the temple, has been converted into a business model. Even though this water is at half the price – Rs 10 per bottle - it is expensive for them. They said they have to economise on consuming water.

By and large the value and the sense of satisfaction that the RRWH has brought to the women in the vadi vistars was not so evident here.

Gadhechi vadi vsitar

Deviben and Munja Bhai SC community

This area has a high per centage of SC population and 18 RRWH have been constructed here by TCSRD.

The kutumb visited has 5 RRWH. Two are old, done during the WASMO period, but are still functional. Three are recent. They are used for drinking water purpose only. For domestic purposes water comes from a bore through a pipeline.

Water availability has taken them from single crop to three crops annually. Today they grow urad, jeera and mung phali. Five years ago they built their toilets.

All the children study. Two daughters are studying MSW at Porbandar. One of them is doing an internship on the NIOS program with TCSRD alongside her studies. They did their BA at Mithapur, 15 Km away, and now for MSW they are enrolled at Porbandar, but doing distance learning. They did their schooling by walking daily to the school at Goriyari, 3 km away.

Sharada ben

She has not been so lucky. The water problems of their family continue. They dug a bore well which had only khara pani. This area has a huge amount of salt ingress. Sharada ben has 3 children. The two sons have studied till X. Now one works on a JCB, and the other at a dhaba. The daughter is studying in grade VII.

Mewasa

Toriapa Bha and Jethi Ben

This village is centrally located. The vadi vistar has 100 Households and 19 RRWH already. Many more are under construction. In this area, the families that are building new homes, include and RRWH in it at their own cost.

This is a family of six. They built a RRWH of 18000 litre three years ago. It lasts them 12 months of the year. For the rest of the water they have a well on their land.

Before RRWH they used to drink the saline water from the well. Saline water had to be consumed in large qualtities. It causes kidney stones. Some family members also had to undergo surgeries. The grandmother said that even the tea or the dal they made from that saline water does not taste well.

There is a source of water 2 km away and they sometimes fetch water from there on a bike.

They planted 500 coconut trees five years ago. Now they sell coconut at the Shivrajpur beech nearby.

Miabha

This family looks very sound economically. Miabha used to drive a chhakda until he met with an accident. Now he has disability in his leg and arm. But he has overcome these to such an extent that he drives a vehicle and lives a fully active life, perhaps better than before.

He has built a RRWH of 20,000 L at a cost of Rs 1.4L. Of this Rs 20,000 came from TCSRD. He has a coconut plantation. Tata has promoted coconuts in their region.

They have four children. The girls are of school age and both are studying. Mia Bha is of the view that education has to be upcontinue till college for his girls, there is no other way. He is fully committed to the education of his girls.

Moti Bai

This house is in the neighbourhood of the earlier one. Moti Bai's husband passed away. Her son and daughter in law live with her. Her RRWHS has given the family a lot of ease of mind.

Bhimrana Vadi Vistar

This is a village in the core command area of Tata Chemicals. It suffers from very high salinity in its underground water, hence the land has become incapable of supporting cultivation. There are no ponds or wells in the area with good quality drinking water. Tata Chemicals has adopted Bhimrana village and has been providing water through tankers for many years. One tanker fills enough water in a tank for 10-12 days. About 150 tankers come here every month. The entire population has to depend on daily wage labour and small transport businesses. Many families have one member employed at the plant. TCSRD has addressed the drinking water challenge with 44 RRWHS up till now.

WE visited a HH of three brothers and large family sizes. Each has an RRWHS. The RRWHS of one of these families had exhausted the water because of a wedding in the family.

The water does not last for 12 months, so when it finishes, depending on family size, they have to mix it again with khara tanker water. According to the residents, especially men, the quality of the tanker water is not up to the mark. They have resigned to the health impacts of the water quality.

Juni Dhrewad

ValuBen, Raja Bhai and three other women from the neighbourhood

This is a very remote vadi vistar with 260+ households. It has a total of 9 RRWHS.

Families in this vadi bring drinking water from a 50,000 litre sump at Goranja, connected to Sani Dam, built by the government to supply water to the entire block. They make weekly trips by the chhakda. Now the few families that have RRWH have water at home.

7-8 families in the vadi vistaar have contributed to install a pump at the well in the main village, and invested in a pipeline to get water for their agriculture and animals.

Earlier these families grew one crop, now they grow two - jeera and mungphali. For any health issues they have to go to Dwarka at a distance of 17 Km

Koranga

Koranga vadi vistar has 23 RRWHS. This is one of the last villages of Okhamandal, on the highway, 70 km from Mithapur.

This village and its vadi vistar faces major water stress related to water. A significant proportion of population in this vadi is from the Charan and SC community. Their closest water source is 2 Km away. Prior to the RRWH they used to bring drinking water from a sump 2 km away on a chhakra.

The Charans rear animals. The family met had 35 members and 25 buffaloes. They have two RRWHS. A pond nearby has turned saline, but the buffaloes drink that water. The SC family met is quite impoverished. They cut wood and sell.

The two RRWHS have proved to be a great boon for the families.

Khatumba

Spoke with Payal Ben and another ben, both of whom work with the Aanganwadi.

They are both from the village, not the vadi vistar. The village also has a great demand for RRWHS.

The vadi vistar, according to them, has no sources of drinking water. People go to the main pipeline and fill their drinking water from the air cork. Some people go to Bheemgaja pond for their water.