

WATER ACCESS

and Improved Living Standards

Water access as a parameter in the study has been used to ascertain the efforts that go into ensuring adequate water for drinking and domestic needs. This aspect is a major factor that affects the lives of people. In intervention villages, there has been considerable impact on this front after implementation of the solar power-based water supply scheme.

People from intervention schemes in both the states narrated their experiences prior to scheme implementation.



"Before the solar scheme, we drew water from an open well that was away from our homes. Also, since we could only bring drinking water back, other chores like washing clothes were done there. Now, the case is completely opposite. We have easy water access and convenience at our doorsteps,"

shared Pani Samiti member Rasilaben from Koli Bariya, Gujarat.

It was also reported that easy water access had a direct impact on more employment opportunities since no need to fetch water manually from source has resulted in saving up a lot of time for residents of these hamlets.

"Now we can save time on fetching water and use that for farming, that has increased our profit. Earlier, I needed about 3 to 4 hours per day to fetch water and had no time to work on the farm. So, I would hire labourers for the purpose and had to pay them ₹2000-2500 a month. I can save the money now,"

shared Seema Devi from Himava Fali, Rajasthan.

Such is the story of many respondents in both Gujarat and Rajasthan. An old lady from Dharohiya Fali in Rajasthan reminisced the old days and water related struggles she faced during her youth.

"I have spent more than half my life in the sun- walking to get water, digging for water. That was long ago. Before we would have to carry clothes and go to the water source to wash. Now since we have bathrooms and enough water, we can wash them in the bathroom,"

shared Somibai from Dharohiya Fali in Rajasthan.

Water access is a basic necessity for human settlements and being devoid of this has resulted in social alienation of some hamlets sampled. People reported that bachelors of the community could not marry as no girl was willing to relocate to their hamlet where there is no water availability. Some instances of marriage break-ups were also reported soon after the wedding.

“Our hamlet has a reputation of a water scarce hamlet and within the nearby community there was apprehension in marrying women to men from our community. After the implementation of the solar scheme, we have become an example of a reliable and assured water supply system,”

shared Ravatram from Solanki Fali in Rajasthan.

A positive impact was observed on the lives of kids as well. School-going children were able to attend classes regularly and happily. Earlier, they might have to miss school to tend to other chores like taking care of livestock while women went to fetch water. Furthermore, now filling water was an easy task that children could also take care of themselves.

“Our kids would be unwilling to go to school before the scheme. They would say that the teacher scolds them for not bathing and coming. It was not possible to have water available early in the morning. Now water is easily accessible and they are able to bathe before going to school. It has improved attendance in a way,”

shared WUG member Dhapi Bai from Dharohiya Fali.



REDUCED COSTS AND CONVENIENCE

of Solar Based Water Supply Systems

RAJASTHAN



Grasiya ki Dhani is one of the hamlets of Kagdara village (Amliya Panchayat) in Pali district of Rajasthan. The 23 households in this hamlet are spread in a scattered manner over a distance over 1.5 kms.

The hamlet is mostly populated by people belonging to the Grasiya Tribe and are employed in agriculture, livestock and daily wage labour activities. The topography of the place is a mixture of hilly and rocky terrain.

Initially, people from this hamlet collected water directly from the source when CmF approached the community in 2017 with the proposal for installing an electricity-based water supply system.

“CmF team visited the panchayat first with the proposal to start the scheme. Thereafter, the panchayat suggested Grasiya ki Dhani hamlet,”
 shared a CmF representative.

Further, people from Grasiya ki Dhani met CmF team and agreed to implement the scheme. They formed a Pani Samiti and agreed to source the capital contribution.

“For a year, everyone in the hamlet contributed a monthly amount of INR. 100 to arrange for the community contribution part of the capital cost,”
 shared Pani Samiti leader Mitharam.

This was the first such community led scheme in the block which was run using an electricity grid connection. However, procuring a connection was no cakewalk. With all the other infrastructure in place, the scheme was yet to operate due to unavailability of electricity connection.

Applying for an electricity connection in remote areas starts with a lengthy application process and takes time for approvals. To add to it, the electricity connection requires the applicant to deposit a security amount which was, in this case, INR. 1,00,000.

“Panchayat had promised the community to apply and arrange an electricity connection but nothing happened. Later, people from the community resorted to setting up an illegal connection from the agricultural power supply to run the scheme. This went on for 1.5 years,”
Pani Samiti operator Belaram informed.

However, problems for the community were far from over as they had an electricity connection yet no assurance of regular power supply to run the scheme. This made factors of drudgery come into play again and direct collection from water sources prevailed. Another challenge was to deal with the consequences of using an illegal electricity connection.

“We waited for two years before resorting to electricity theft. But there were power fluctuations that would burn the motor or cable. This happened once every three months and became a regular cost for us”,
shared a Pani Samiti member.

In 2020, solar panels were installed.

“We approached CmF for a solution and they offered to set up a solar panel in our hamlet as a reliable substitute to the errant electricity connection. We immediately agreed and since then there has been no problem with water supply in our hamlet. There is a fixed time for supply every day, we incur no additional and exorbitant costs and don't have to steal or rely on electricity anymore. Life is good for us now,”
shared a WUG member from Grasiya ki Dhani.

Respondents from Grasiya ki Dhani reported that there has been a reduction in drudgery after installation of solar panels as they work efficiently and have never malfunctioned. So, there is assured water supply. Moreover, water related conflicts in the community have reduced drastically, as reported.

Today, Grasiya ki Dhani is a star habitation and the flagbearer of solar based drinking water scheme in the region. CmF representatives shared that they bring people from other hamlets here for exposure visits.



GUJARAT



Prior to installation of the solar scheme, costs to access and acquire water were encountered on multiple fronts in Gujarat. These included expenses on installation of electric grids, complaints related to water supply, and purchase of water.

“Costs of installation for electric grids range between INR 3,00,000 to 4,00,000 but it also varies based on the topography of the hamlet or village. If households are scattered, long pipelines are required or if congested, short pipelines are required. Moreover, in some hamlets, we may need to modify local resources such as borewells or wells”,

stated by Dhiraj Lal Modhiya, Water and Sanitation Management Organisation (WASMO) Unit Manager.

Among those who accessed water via an electric supply-based connection, challenges were faced around access and costs of maintenance and repair of their units.

“We had an electric-based water supply connection before. To complain about any issues faced around the water supply, we had to travel all the way to Limkheda. And sometimes, resolving these issues would take 1-2 months to resolve,”

stated Champa ben Bamaniya and Mansingh Bamaniya, WUG members from Bamaniya hamlet in Kheriya village, Gujarat.

Representing the same hamlet, Kanu bhai Bamaniya, Ward member of Kheriya village highlighted a one-time expenditure of INR 8000 to repair the burnt electric motor, which had burned due to power fluctuations. He also mentioned the long periods of time spent on repairing faults, during which residents would need to resort to utilising water from the handpump or the well adding to their drudgery in accessing water. Further, given that electricity would come at night during one week and during the day in the subsequent week, villagers needed to organise their sleep around the water supply schedule. This would inadvertently affect residents' ability to work in their fields or at their jobs.

Among those who did not have electric supply-based supply, situations of scarcity necessitated purchase of water or using alternate sources of water. In Tekari hamlet in Limbdi Mendhari village, hamlet residents would spend INR 1200 to purchase 5000 litres of water via a tanker that arrived from the Dhanpur block. During the summer season especially, they would need to call for such tankers 5-6 times. Similarly, in Roz Haveli in Bavka village, INR 300-400 was spent each time on accessing water via a tanker from Dahod, although frequency was lower at twice a year.

“We needed to travel to the neighbouring hamlet when we would encounter a water shortage in our hamlet. Now except for some days in summer when the water level goes down, we don't encounter water shortage. Plus, water reaches our home directly.”

Representing Kali Paani hamlet in Chilakota village, Seniben, WUG member said

DRUDGERY

RAJASTHAN

Thala Fali in Ranora gram panchayat falls under Abu Road block and Sirohi district in Rajasthan. It is a remote settlement inhabited by people belonging to the Grasiya community. The settlement is scattered over 3 kms with households spread in small clusters. Total number of households covered under the scheme are 21 and are mostly involved in agriculture and animal husbandry.



The topography of this hamlet can be described as a hilly terrain with rocks. Due to high surface run-off owing to slopes, water recharge during monsoon is not much and causes acute water shortage in summers.

Thala Fali is spread across uneven terrain where walking is treacherous. Before the solar powered water supply scheme was implemented, water was collected directly from source, an open well which involved walking up to one kilometre. The route involved a 300-metre patch of walking downhill and climbing it back later with two to three pots filled with water.

“We would plan our day around water availability, most of the time, we spent half the day on getting water. We would go early in the morning and evening, sometimes even in the dark. If we count hours, an average of 5 hours were spent per day on multiple trips,”
 said WUG member Umibai from Thala Fali.

Regular activity as such resulted in women developing health problems like knee-pain and body ache yet fetching water was a necessity they could not avoid. The problem was worsened during monsoon as the downpour would loosen the mud and destabilise the rocks on the trail. Due to which walking became difficult and sometimes women would fall and injure themselves.

I remember once while returning from the open well, my feet slipped and I fell down due to which the earthen pot filled with water broke and I was injured,"
said a female villager.

Post implementation of the scheme, water is being provided through individual water connections, due to which drudgery aspect has improved. Respondents have reported that time to fetch water has been reduced to just 15 minutes from earlier 4-5 hours involving multiple trips.

Women of our village tell me that their time and effort has been saved a lot and there is some peace of mind,"
said Ranora Gram Panchayat Sarpanch Somaram Grasiya.



GUJARAT



Bavka village in Dahod district was predominantly a hilly terrain. It was home to almost 2000 households, scattered over 32 clusters with residents engaged in agriculture and daily wage labour.

In Roz hamlet in Bavka village, villagers would spend between 30-60 minutes on a single trip to access water from their nearby river and/or the hand pump. In addition to the high time spent on collecting water, they were only able to access limited quantities of water, more so in summer months. Quality of water from the handpumps was also a concern due to bad taste, smell, and contamination of the water. As a result, villagers also had to resort to purchasing water, where they paid INR 300 to acquire 4000 litres of water via a tanker from Dahod.

“Previously, especially during functions, we would need to call for a water tanker,”
 said Vanitaben Devabhai Rathod, WUG member.

In comparison, villagers, especially women, saved a total of 2 hours on a daily basis as compared to their previous situation.

“After the installation of the solar scheme-powered drinking water, water is reaching the homes directly as compared to the previous set-up where hamlet residents spent so much time and effort to collect water,”
 stated Jaykumar Bamaniya, Panchayat Ward member, Bavka village.

Similar instances were noted in other hamlets as well.

“Before when the solar pump was not there, we needed to go to the hand pump or well to fetch water. It would take us 1-1.5 hours. We needed to keep the containers on our head and carry them over long distances. Even the kids had to partake in these activities. But now that water reaches our home directly, all this trouble to fetch water has reduced.”
 stated Budhliben Palas, WUG member of Palas Faliya in Jhaliya Palas, Gujarat

Reiterated by Ramilaben Palas, another WUG member of Jhaliya Palas in Gujarat,
“We had to make multiple trips in a day, with each trip taking us 1 hour approximately. Carrying those water containers on our heads would cause headaches sometimes. All our tasks, washing clothes, cleaning the house, would take a lot of time. Now it takes one hour for everyone to get water in their homes, and the saved time and effort is utilised for other activities. Children can study, we can work in the fields or take proper care of our homes.”

This reduced level of drudgery in collecting water has had other associated impacts on overall hygiene and cleanliness as well. Women were able to clean clothes regularly, bathe frequently while all residents fell ill less due to improved water quality.

Women in the village would take a bath in less water since it was tedious to repeatedly go and get water from the wells. Similarly, people would even defecate in the open due to the huge effort associated with procuring water”,
stated Jaykumar Ratansinh Bamaniya, Panchayat Ward Member, Bavka village.

“My daughter used to have severe stomach pain after drinking water from the handpump. Now since we have installed the solar scheme in our village, there is no such issue”,
said Kaushalya ben Solanki, WUG member, Roz Haveli, Bavka village.



HEALTH

and Hygiene Outcomes

Water is a common carrier of disease-causing microbes and it gets worse when the only source of water available is contaminated and compromised. This was the case in hamlets before solar scheme intervention. Most of the sources were either hand pump or unprotected open wells that were prone to contamination.



In the case of a hand pump, the water was contaminated with rust particles accumulated in the pipeline over the years. The water output would be discoloured and not fit for drinking. Yet people consumed it. This problem is still prevalent in the comparison villages in water schemes without solar panels and where the schemes are not maintained by the community.

Solar powered water supply scheme had an aspect of water purification, mostly through chlorination, which added safety to the water supply scheme. And communities religiously followed best chlorination practices.

“Earlier our only source of water was the hand pump and it was a very old hand pump so the pipes were rusted. We got red water from it. Many people from our hamlet fell ill and complained of stomach-ache and diarrhoea. After drinking that water, even my daughter fell ill once. This problem has been solved now,”

said WUG member Kaushalya Ben from Roz Haveli, Gujarat.

“Water was less and the quality was bad. Knee pain was a problem since we carried the containers and walked long distances, while the kids would get diarrhoea (vomiting and loose motions) due to saline water from the well. Now this is much less. We can wash more frequently, plus we are now using sanitary napkins,”

shared Pani Samiti member Phuli Devi from Obarla Fali in Rajasthan.

Sufficient and easy availability of water has ensured community members can regularly take baths, clean toilets and wash clothes regularly which was not the norm before the scheme implementation. For women, menstrual hygiene outcomes improved, as reported.

“We were not able to clean ourselves properly before. We would have to go to get water all the time. We can wash clothes frequently now, no need to accumulate and carry to the source to wash. For women, menstrual hygiene is better. They can wash their clothes more often now and maintain hygiene,”

shared Phuli Devi from Obarla Fali in Rajasthan.

“Before the scheme, toilets were not regularly cleaned and lack of water made us defecate in the open. However, the case changed when we had regular water supply. Now we can maintain the toilets and use them every day”

shared Pani Samiti member Bhagabhai from Kali Pahani hamlet in Gujarat.

In a nutshell, the solar water supply scheme has been effective in driving health and sanitation outcomes. This can be well substantiated when compared to villages where the schemes have not been implemented.



WATER QUALITY

Quality of water was a concern in most of the sampled hamlets before implementation of the scheme. Respondents reported that water was prone to contamination before and there were instances where water tasted, smelled bad or was discoloured. As per scheme implementation guidelines, water quality was checked before work began and later on monitoring at regular intervals took place. Additionally, community members were trained to chlorinate the water and purify it. There were timelines to chlorinate water either at source or storage tanks.



"When we used to get water from an open well, it was smelly and was not clear. It would attract mosquitoes. Also, the well walls had moss deposits. But this changed for the better when the solar based water supply system was introduced,"

Pani Samiti member Sarlaben from Koli Bariya, Gujarat informed.

In hamlets where respondents did not report any problem with water quality before the solar scheme implementation, they reported that water quality improved after they started adding chlorine to water and cleaning the well and storage tanks.

"Water from the handpump was sometimes salty. It was hard water. Everyone in the community had a stomach ache at some point of time due to drinking it. Now, it is different since water is sweet and also safe to drink due to the addition of chlorine,"

shared Pani Samiti Member Vanita Ben from Roz Haveli in Gujarat.

Earlier, purification methods were basic filtration through a cloth that was not effective in filtration and reducing contaminants such as high fluoride or bacterial contamination. In comparison hamlets, manual filtration through cloth is still the norm while the water quality remains bad.

"Unprotected well water was black in colour and was unfiltered before drinking. Hand Pump water was yellow and was also unfiltered,"

Seema Devi, Pani Samiti member from Himava Fali, Rajasthan shared.

In Amla village, Rajasthan, it was reported that though they had good quality water available through electricity run water supply scheme, they had to take water from a hand pump as the supply is irregular due to unreliable power supply. This makes it a point that solar powered water supply systems indirectly influence the quality of water available.

Overall, respondents from sampled villages shared that water quality has been better after the implementation of the scheme since it has brought about guidelines on water chlorination and purification measures to be undertaken.