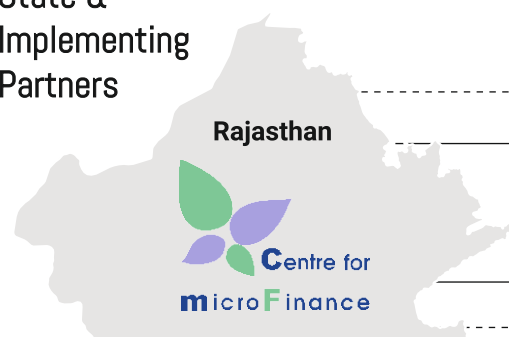



Program Overview

CInI with Sustain Plus and Government departments have ensured regular supply of drinking water at a household level, through the installation of solar pumps for drinking water schemes.

The main objectives of the programmes were to address issues of safe drinking water access, capacitate communities to operate and maintain water supply systems and reduce operational and maintenance costs of accessing potable water. These in turn aimed to have community level impacts of reduced drudgery among women and improved health status.

State & Implementing Partners

	District	Block	Number of schemes	Number of beneficiaries (HHs)
 <p>Rajasthan Centre for microFinance</p>	Pali	Bali	25	508
	Sirohi	Abu Road	13	198
		Pindwara	15	242
		Swaroopganj	13	309
			Total	67
 <p>Gujarat CInI An Initiative of TATA TRUSTS</p>	Dahod	Dahod	5	206
		Limkheda	61	2275
		Dhanpur	7	321
		Singvad	7	438
			Total	80

Context And Need For Water Supply Systems

- When there are no water supply systems available, people collect water directly from the source like open wells, handpumps, borewells, etc.
- Monsoon brings risk of water borne diseases as water sources are not protected and water is not purified at a community or household level. Summer is harsh and people have reported buying water for drinking and domestic purposes since many times the source dries up.
- In places with no water supply system in place, people have to walk long distances and carry water back home, and hence they tend to use water only for essential purposes, having negative implications on health and hygiene practices.
- Water available directly from the source was reported to be discoloured, with high saline levels, and non-potable. In places where hand pumps were used, water drawn had accumulated rust from the old pipes. Chlorination was not undertaken in these villages and neither was regular water testing conducted.
- Not only multiple trips are required in a day to fetch water, but multiple hamlets using a single source of water makes the task time-consuming forcing people to miss out on employment opportunities. Women need to carry the water-filled containers over long distances causing knee pain and headaches.

Comparative Analysis

This summary document offers a comparative analysis of solar powered water systems and electricity grid-based water supply systems, outlining the potential of solar systems to enable reliable water supply in remote locations.

Outcome Areas

Solar Powered Water Systems

Grid Based Water Supply Systems



INSTALLATION PROCESS AND TIMELINE

Timeline for installing solar based water supply systems ranges between a few days to a month. Solar based water supply systems begin with identification of a suitable hamlet through consultation with panchayat, government bodies and local community members. Pani Samiti formation and technical tests are then undertaken. This is followed by identification of water sources and technology installation.

It usually takes more than 1.5-2 years from application to installation of electricity based grid systems. The application process is tedious and even after building the infrastructure, power connections are delayed from the department. Many times people own an agricultural power connection that makes them ineligible for another connection for water supply. Many times, the electricity connection could be illegal that causes loss to the electricity department and eventually to the government.



MAINTENANCE AND ISSUE RESOLUTION

Very few complaints were received in operations and functioning of the solar based water systems. This is very relevant for interior locations, where communities don't know how to address and repair transformers, and where local politics also occurs over electricity, owing to which grid connections lie defunct for a long time.

Since most of these villages are remote, repair and maintenance take weeks to a month. Irregular supply and power fluctuation render the supply line and pumping equipment damaged.

Timeline for issue resolution ranges between a week to a month depending on the severity of the problem and nature of resolution, which needs local intervention or professional intervention.

There has also been a focus on convergence and negotiation with vendors on providing timely and reliable post installation services which improves issue resolution processes.



INSTALLATION COSTS AND COMMUNITY CONTRIBUTIONS

Solar pump installation costs comparatively higher at an average of INR. 2,24,000 and much higher at an average of INR. 7,20,000 when considering all installation cost components. Costs also differ as per the capacity of the solar pumps.

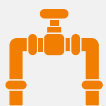
Solar based water supply system incurs one-time capital investment of which 10% of the total cost of the project is contributed by the community. Habitations reported paying an amount of INR. 2000 per household as community capital contribution towards the schemes. This strengthens the community involvement in the project.

No bills for electricity while using solar powered water supply systems. India's solar power tariffs hit a record low of ₹1.99 per unit in December 2020 at an auction conducted by Gujarat Urja Vikas Nigam Ltd.

For procuring an electricity connection, the applicant is required to pay around one to two lakh in the form of security deposit. Actual installation costs of electricity are around INR. 1,04,000 on average for 21 households in Rajasthan.

In Gujarat, installation costs differ from hamlet to hamlet and village to village because the cost of one system depends 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, there is a need to modify local resources such as borewells or wells. Once a detailed survey is conducted then the price quotation is decided. But on average it requires INR 3,00,000 to 4,00,000 to install a grid connection. The Government has now put a limit of INR. 1,00,000 for installation costs under JJM.

There is a fixed charge for usage of electricity in Gujarat, i.e.: up to 2kW is INR.1.5/month, at the range of 0-50 units, its cost is INR.3.05 per unit, for above 250 units consumed, the cost is INR. 5.2 per unit, etc.



WATER SUPPLY SYSTEMS

The operator is responsible for switching on the motor pump and ensuring regular supply and equal distribution of water to every household. Generally, the solar pump would be switched on in the morning when there is sufficient sunlight available. In case of direct to household supply, it would be operated for a few hours (time depends upon the size of hamlet) till each household receives water.

Habitations see power cuts and are unable to maintain a systematic regular water supply despite having a water supply system (motor, pipeline, taps) in place. 6-12 hour power cuts are a regular occurrence.

Lack of regular electricity is aggravated by an irregular supply mechanism and causes trouble for villagers in terms of access to water and conflicts.



REDUCED DRUDGERY

Earlier, fetching water entailed multiple trips that would require several hours in a day. This was generally done by women and hence women were worst affected by drudgery. Now, scheduled water supply directly at house is available, so people, especially women, save time for other activities and spend more time in economically productive activities like taking MNREGA work, engaging in labour or agriculture.

Unreliable power supply reinforces drudgery in electricity grid-based water supply schemes. Operational faults are common every other month. When there is a bigger fault in the electricity supply which takes days to get repaired, residents have no choice but to walk to distant sources like hand pump, well or even to a neighbouring hamlet. Thus, drudgery comes into play despite having a water supply system. The case is almost similar to having no water supply system.



HEALTH AND HYGIENE PRACTICES

Owing to improved water access, people can engage in handwashing and bathing more often and washing clothes more than before. Water available at household level directly impacted use of toilets for the basic reason: having enough water to drink, now water could be spared for using toilets. Cleaning of toilets also increased. Menstrual hygiene has improved with adequate water available at the household level. People have observed a decrease in diseases among kids.

Since the water availability is dependent on power supply, it also bears an indirect effect on health and hygiene. Direct collection from source means limited water that results in lack of water for cleaning and hygiene purposes like toilet use.

