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## **ONergy Case Studies: Seven Years of Impact and Innovation**

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# Case Studies

7 Years of  
Impact & Innovation



# Introduction

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ONergy Solar (PE Pvt Ltd) estd. in 2009, is a leading and multiple award winning social enterprise - providing decentralized solar energy solutions to households, communities and institutions across East & North East India. It provides reliable and affordable clean energy products for solar lighting, water pumping & electrification purposes.

ONergy's core value is in developing high quality products and a unique full service distribution infrastructure by establishing Renewable Energy Centres; operating through a network of trained rural entrepreneurs; and leveraging the existing networks of local NGOs, MFI's, channel partners & Banks.

ONergy through its solar solutions installations has impacted 5,00,000 lives till date. ONergy operates 19 Renewable energy service centres across East & North East India and has a goal to impact 10 million lives by 2022.



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# ONergyizing Women Groups by partnering with Microfinance Institutions



## Overview:

ONergy and Adhikar Microfinance has impacted over 10,000 households in Odisha by offering financing to purchase solar lanterns. This partnership allows ONergy to reach impoverished people with a household income of Rs 4,000 -10,000 per month. Villagers were previously spending Rs 100-180 per month on kerosene, firewoods and poor quality flashlights to get light during power cuts. They are now using high quality solar lighting product 'Beacon' which has multiple features and 3 modes of lighting, multipurpose solar lanterns to light various activities in the evenings ranging from kids studying, women folk working on income generation like garment sewing, toy-making to mobile charging. As ONergy continues to reach more of the 100,000 households that MFIs in Odisha serve, its impact in Odisha will continue to grow.

## Background:

Odisha is a challenging place for businesses and NGOs to work due to its rural location and complex social identity. Because its citizens have low household income, they are unable to get loans from banks and lack disposable income. It is also difficult for outsiders to communicate with the citizens due to the district's strong cultural local identity. Communities have their own tribal cultures and traditions, and many villages speak unique languages or local variations of Oriya. These barriers prevent many businesses from working in the district due to the difficulties they have both reaching the area and interacting with those inhabiting it.

Many parts of Odisha is connected to the electrical grid in spite of its remote location. However, residents complain that power cuts are extremely frequent due to load shedding. The quality of this lighting was poor, causing children difficulties when studying and damaging their eyes. The kerosene polluted the air when used within the household and the low quality lights broke frequently. Women folk had difficulties while cooking in such low light and it was a huge health hazard because of the smoke generated from it. Community members had limited choice and had to rely on them, until recently when ONergy introduced its household systems which solved multipurpose needs of households, small shops, businesses of villagers in this area. The lantern can be handheld or hung on the wall, depending on the need of the user. The Household systems are extremely durable, which is important to the people of the area because they've faced problems with cheap, breakable products in the past.

## Project:

ONergy's ability to reach such districts sets it apart from other solar companies. ONergy simplifies the process as much as possible by utilizing local partners like microfinance institutions, self help groups & NGO's. As ONergy's COO and cofounder, Vinay Jaju puts it, "we do not want to reinvent the wheel" ONergy leverages various partners' existing relationships to reach out to potential customers and establish credibility. This allows the company to reach those who need its products most without exorbitant scaling costs.

Adhikar Microfinance and ONergy have been partners for several years in Odisha. Adhikar works frequently with organizations which serve the purpose of empowering women, aggregating demand, and mitigating risk. Microfinance Institutions help people too poor to have access to financial markets get financing. They do this by grouping women to take out loans together, mitigating the risk of default for both the women and the bank. These groups of women are then held responsible as a group for their monthly payments. SHG's meet weekly or monthly with a representative of the MFI in order to ensure payment. Women in Self Help Groups receive much lower interest rates from MFIs than they might from a typical moneylender.

The SHG's Adhikar works with are composed of various women within a village. Loans are offered with payback periods ranging from 12-24 months. A large number of households presented a platform for ONergy to test demand for a small solar product in the area before potentially introducing larger products. Many of these customers would not be able to purchase ONergy's products without such financing options. The up-front investment is daunting and families in the area live month to month. By providing financing, ONergy helps its customers purchase a superior energy solution with monthly payments that are similar or lower and cost effective than what they previously paid for kerosene or other lamps.

## Outcome:

After several demonstrations to area conducted by ONergy and Self Help Groups, both ONergy and Adhikar were in agreement that there was sufficient demand for the MFI to begin selling ONergy's multipurpose Household Systems directly to loan recipients. While some of the household systems are relatively inexpensive products that costs only Rs 2500 – Rs 5,000 , it represents a significant investment to villagers in the district. Still, households in the community seemed eager to take advantage of the opportunity.

ONergy and Adhikar sold 10,000 Household lighting systems across Odisha . ONergy adheres to its goal of addressing maintenance issues within two days of notification from a customer. This is an easy promise to keep for the most part, as the household systems are quiet sturdy. Because the women are working with a known partner, there are no complications regarding a point of contact, as the women can simply get in contact with the MFI who will then notify ONergy if there is any issue. The women in the area love this system, pointing to the ease of receiving a loan due to their previously existing relationship with Adhikar.

Customers are already noting that the Household systems has made an impact in their homes during evenings. Women pointed to various benefits, such as improved vision when cooking and the ability to spot dangerous reptiles and insects when they enter their home. Several saw economic benefits, using the higher quality light at night to sew fishing





nets or garments. One woman states, "After installing a solar light my children can study and we can do tailoring work at night and we are also cooking. Now If there is power cut, it won't create any inconvenience for me. After 8:00 P.M. there is no power, so at that time we use the solar light." Nearly all of them cited increased opportunities for their children to study as an important benefit, with hopes that this may lead to increased job prospects and offer their family financial security in the future. Many are so excited by the quality of ovBeacon that they are already eager to purchase a bigger system from ONergy.

## Impact:

- Impacted over 10,000 households in Odisha
- Connected to the last mile low income households through support of MFIs network
- Increased availability and quality of work hours
- Increased study hours for children
- Increased safety in and around the household



**An OEnergy employee demonstrates the ovBeacon to several Self Help Groups.**



# ONergizing Institutions



## Overview of Rooftop:

ONergy has done more than 200 solar rooftop installations, which covers a range from educational institutions, industries, housing estates, petrol pumps, hospitals, banks etc.

ONergy provides both capex and opex model options. Capex model allows the customer to buy the system upfront and also get benefit of accelerated depreciation. The Project IRR is over 20 - 30%, and a saving of upto 20-40% can be made. It is also possible to get bank loan. For opex model – no capital investment is required from your business, it sells you cheaper power than the grid, the system is yours after our contract expires.

## Solarizing Petrol Pumps

### Overview:

Rooftop installations on petrol pump stations are an emerging application of solar energy in India. Indian Oil station owner Ramdas Mondal made the switch from a diesel generator to solar panels two months ago, and it has benefitted him greatly, decreasing his monthly electricity bill from over Rs 3,000 to under Rs 400. The solar panels are a reliable source of energy for the petrol pump station, unlike electricity from the grid which had frequent power cuts.





## Background:

Ramdas Mondal has owned an Indian Oil petrol pump station in Durgapur, West Bengal since 1986. Before solar power, running the pump and powering his office cost Rs3,000-4,000 in electricity bills per month. This made it difficult for the station to maintain its current pumps. In the past, the Mondal family used a diesel generator to keep their petrol pump station operational due to frequent power cuts and load shedding issues that are a byproduct of receiving energy from the electricity grid.

## Project:

ONergy installed a 3kW system on the roof of the station's office, which powers two petrol pumps, one diesel pump, and the office. The system has a battery, allowing the station to use energy generated by the solar panels at night. Since installing the solar rooftop system two months back, the monthly electricity bill for the petrol pump has dropped from Rs 3,000-4,000 per month to Rs 300-400

The solar rooftop system does not require frequent maintenance like their diesel generator used to, and on the rare occasion it does, ONergy is quick to provide support. "They are very supportive," Ramdas' son Nurag-Mondal said. "When we called the customer care they instantly helped us by repairing it when there was a minor problem."

With a robust and high powered solar rooftop system, the Mondal's only need to use electricity from the grid for small lighting purposes. They plan to use the money they are saving from switching to solar energy to build a better toilet at their station and maintain their petrol, diesel, and air pumps.

## Impact:

- Reduced maintenance costs
- Non-polluting energy source
- Paying 10% of previous electricity bill
- Do not a need diesel generator for power cuts

## Solarizing Hospitals

### Overview:

Many institutions are looking to install solar panels on their roofs to provide power when the electricity grid is unreliable. Hospitals in particular benefit from these installations, as power cuts during surgeries and deliveries can be detrimental to the health of a patient.

Dakhin Barasat Nursing Home installed a 75-watt solar rooftop system one year ago that powers eight lights throughout the hospital. The hospital saves Rs 800 per month that was previously spent on diesel for the backup generator. Reliable lighting in the hospital impacts the lives of its patients and staff on a daily basis.



## Background:

In the village of Dakhin Barasat, located just 40km from Kolkata, Dr. Tapas Kumar Saha is the Residential Medical Officer of Dakhin Barasat Nursing Home, a hospital that serves up to 20 patients at a time. Dr. Saha has been a surgeon at the hospital for 30 years, and has dealt with load shedding on the electricity grid throughout his time there. Load shedding creates a real problem in the medical field when light is needed for time-sensitive surgeries.

Then the demand for electricity is higher than the generation in a given region, service to certain areas shuts off. Dr. Saha explains the problem, "there are only 8 hours within 24, 8 hours where we can consume the power." Previously, during power cuts and load shedding the staff at the hospital would have to turn on the backup generator. Using a diesel generator was both time consuming and expensive. Dr. Saha became interested in the prospect of solar lighting because he desired a more cost effective and timely solution during grid failures.

## Impact:

- 20+ patients impacted daily
- Immediate backup lighting during surgeries
- More effective and convenient than a diesel generator
- Saving 800 Rs. (12 USD) per month
- Renewable and non-polluting energy source
- Hassel Free Operations can be conducted with proper lighting
- No noise from the digi sets, lets the patient rest peacefully





# ONergizing Education



## Overview:

ONergy has done more than 150 installations in Schools. One among them is Khardah Sibnath High School, located just north of Kolkata, an institution that serves above 800 students from an impoverished surrounding area. In the past, the school lacked budget to develop its infrastructure, devoting the majority of its funds to the bare necessities needed to run the institution. This has changed in the last eight months since the school had 5 kW of solar panels installed by ONergy on its roof as part of a program sponsored by West Bengal's government. Since then, the school has halved its electricity bill, from Rs 24,000 per month to only Rs10,000-12,000 , enabling it to devote those extra funds to sports programs, computers, and additional protein in students' lunches.

## Overview:

Khardah Sibnath High School is Located next to the historic Durga Mandir Temple, the school has been serving the surrounding neighborhood since the year 1928. Talking to the faculty and staff, the pride they take in the school's rich heritage and their dedication to a holistic approach to education despite socioeconomic difficulties is immediately evident.

Its 800 students and staff hew to a tight budget. The school's finances are consumed by necessities, such as electricity, leaving the school with limited financial flexibility. Electricity to run the school costs about 24,000 Rs. per month. This high recurring cost presents a challenge for the school as it continues to look for ways to develop its infrastructure and build beneficial programs that will allow its students to flourish.

## Project:

After being selected through a government-led bidding process, ONergy installed a 5 kW system on the school's roof in November 2015 with hopes to provide a budget-friendly solution for the school's energy needs. Khardah Sibnath High School was the second school to receive a solar rooftop installation as part of a program by the West Bengal Renewable Energy Development Agency to install solar panels at 100 schools in West Bengal.

In addition to powering light and fans, the panels are connected to the electricity grid. Any excess power the solar panels generate is sent back to the grid in return for a government subsidy. ONergy worked closely with the school to decide proper placement for the panels, explain the benefits of solar, and provide instructions on how to service the system over its lifetime. If maintenance issues occur, ONergy is committed to addressing the issue within 48 hours.



### User's Experience:

Since installing solar panels 8 months ago, KhardahSibnath High School is saving 50% on its electricity bills. The school is able to spend the money constructively on various sports programme, computer systems and other sundry expenses. . The principal of the school, Ashish Kumar Roy, is such a fan of the system that he proclaims, "We have already started the rooftop solar energy and we want more! We have 5 kW now generating. We want 25 or 30 kW."

Roy says he has become an advocate of solar installations for other schools, and notices his students have as well. The solar panels are spurring curiosity amongst students at the school, with many asking how exactly the solar panels work, and some building a small model of the system for a class project. Chemistry teacher, Tapan Kumar Manna, states, "Students will develop this on a small scale in their houses. They are familiar with it, we have it here on a large scale. They can install this on a mini scale in their houses. They will do it."





## Impact:

- Cut electricity bill from Rs. 24,000 to Rs. 12,000 per month
- Savings go toward developing school
- Savings used to increase protein in students' diet
- Students and faculty spreading word about solar energy
- School receives subsidy in return for supplying renewable energy to the grid





# Microgrids ONergizing Communities



## Overview:

40 households in Sergarh, Odisha, India are powered at night by a solar microgrid installed by ONergy. Previously, these households spent up to 200 Rs. per month on kerosene for their evening lighting needs because they lost their connection to the electric grid. Now, after an upfront payment of 5,000 Rs. to have the microgrid installed, they pay 30 Rs. monthly to have access to the energy. The microgrid provides the villagers with high quality lighting for four hours each night, enabling them to protect themselves from the area's dangerous snakes and engage in productive night time activities like studying and cooking. The villagers feel a sense of hope and dignity now that they have access to electricity once again.

## Background:

Sergarh is made up of just over 40 people. About 20 of them are landowners whose occupation is farming, while the other half rely on daily wages working as laborers or doing seasonal work. Household income in the village varies from around 3,000-6,000 Rs. per month. Income is highly variable because the community is largely reliant on agriculture. The bulk of villagers earn the majority of their income at two or three times during the year and save it for harder times.

In the past, Sergarh was dependent on the grid for its power needs. Like many other rural areas in Odisha, the grid in Sergarh is unreliable due to load shedding. Frequent power cuts required villagers to use kerosene as a source of light for nighttime activities like cooking, eating, and studying. Recognizing this need for kerosene, the government rationed each household one liter person. When disaster struck in the form of a broken transformer, the village lost power for seven months. The villagers became reliant solely on kerosene for energy.

The free kerosene that the government rationed to Sergarh was no longer enough to satisfy the needs of most households. So, villagers resorted to the black market where kerosene costed 40 Rs. per liter. Households in the area purchased four or five liters a month at this price. Villagers used this fuel begrudgingly. The light kerosene provides is even more costly than the 40 Rs. per liter customers pay. Kerosene lamps' weak lighting strains children's eyes while they study, which can cause them long-term damage. The lamps also emit a black smoke that pollutes households' air. With no affordable solution in sight, the village searched for alternatives.



## Project:

In partnership with The Mahashakti Foundation and The Energy Resources Institute (TERI), ONergy installed a microgrid in the village of Sergarh, connecting 40 households to solar energy via panels located on one house's roof. Sergarh stood out to The Mahashakti Foundation, who selected the placement, because houses in the village are situated in close proximity to each other and locals' expressed interest in having a solar microgrid installed by ONergy.

The project began with a meeting in the village. At the meeting, the citizens decided that there was a sufficient number of them willing to pay the 5,000 Rs. (75 USD) up front for a connection to the solar microgrid. From there they needed to find the best location for the microgrid to reach as many homes as possible. Eventually they concluded that the home of Rina Sahu would enable them to reach the most homes, as it is the most centrally located in the village. She agreed to this responsibility without hesitation. This placed her in the role of village entrepreneur, which entails running the system and cleaning the panels.

The 300-watt system now sits on Rina Sahu's roof. Maintenance is simple, as the system only requires a bi-monthly wipe-down of the panels and distilled water to be poured into the storage batteries every six months. Rina and other entrepreneurs estimate that these crucial activities take them as little as 20-30 minutes a month. The financial return on this small time investment is huge. When the villagers want power, starting up the system is as simple as the entrepreneur flipping an on-off switch connected to the storage batteries.

## Community Empowerment:

The community in Sergarh is reaping the benefits of the solar grid in various aspects of their lives. 40 houses are hooked to the microgrid and they have the capacity for ten more as the village grows. The village uses its solar power from 6pm to 10pm. People are experiencing a newfound sense of security because they are able to see snakes and insects as they enter their homes at night. This is a stark contrast to when they were without light and six people were bitten by scorpions. Now able to defend themselves, villagers have reported numerous stories of killing cobras since the switch to solar lighting.

The villagers are also freed from the dangers of kerosene now that they are able to utilize the cleaner, stronger light provided by solar energy. Students are able to prolong study hours without straining their eyes and mothers are able to prepare and serve food without the hassle and irritation of kerosene smoke. Three teachers in the village have begun to offer extra study sessions at night now that high quality lighting is available at that time. The local shop also makes use of the better light to stay open at night and provide food and other necessities.

Utilizing solar power adds economic value to the villagers in Sergarh. The recurring cost of using the microgrid comes out to 30 Rs. per household per month for a two bulb system that includes mobile charging. Villagers have the option of using additional bulbs at the cost of 15 Rs. a month per bulb. This money is collected by Rina Sahu and placed in a savings account to be used in case of a maintenance issue with the storage batteries. This payment--which has the added value of insuring against risk--is significantly less than the 160-200 Rs. monthly cost for kero



sene. Households' savings are put towards groceries, education, and other necessities. But perhaps the most rewarding thing these lights have brought to these villagers is a sense of dignity.

The head of the village, Tapan Bhoi, had much to say about how the microgrid is impacting Sergarh's local reputation. "I am getting more respect after receiving less earlier," Bhoi said. "We were in poor condition, there was no electricity line, and we are poor people. After all these electricity lines, people's hope increased." This impact is especially pronounced for Sahu, who notes that the responsibility brings her both joy and respect from the community. A sense of hope now replaces the despair that came with seven months of darkness. As Tapan Bhoi tried to put this feeling into perspective, he reflected, "I am feeling good. Earlier we were in darkness. After having this light, my body has rejuvenated. We've also received mental peace. Living in light is very comfortable compared to darkness."

## Impact:

- 120+ Rs. savings a month per household
- 40 households have access to high quality lighting during evening hours
- Longer and better quality study hours for children
- Empowerment of a local female entrepreneur
- Increased safety at night in households
- Sustainable power access for up to 25 years



# ONergizing Agricultural Livelihoods



## Overview:

**ONergy is improving livelihood of farmers in various villages of East & North East India.** One such case is in the village of Narandi in West Bengal, India by implementing a solar irrigation project in partnership with Pradan (Professional Assistance for Development Action). Farmers previously used diesel pumps to draw irrigation water from a nearby river. Using a diesel pump was resource-intensive, as it cost between 90-150 per hour to run, along with being time-consuming and laborious. Now, the solar irrigation pump allows farmers to save between Rs 60-90 per hour on irrigation because there is no operational cost for the solar pump. The farmers are utilizing these savings to multiply their crop production, it increases the yield of the crop by manifold and also save to, pay for their children's education, and sundry purposes. The pump also increases farmers' resilience to climate change by decreasing their reliance on rainfall.

## Background:

In Narandi, villagers are heavily dependent on agriculture for their income and food. Because of its rural location, electricity is accessible from the power grid, but is subject to frequent power cuts. This makes electricity from the grid too unreliable and expensive to be considered in agricultural activities. For this reason, farmers in the region often rely on diesel pumps to irrigate their fields.

While diesel fueled irrigation has been the status quo it is not advantageous for the farmers in the village. Using diesel pumps is a costly task in terms of money, labor, and time. Using the diesel pumps required the farmers to carry heavy pipes over to the river from which they source water for irrigation. This task was especially laborious for farmers whose plots are not located in close proximity to the river. In Narandi, before the introduction of a solar pump, using a large diesel pump cost up to 150 Rs./hr, while the cost of a smaller diesel pump was 90 Rs./hr.

Farmers closer to the river could use a small diesel pump, but those further away had to use a larger, more expensive pump. The farmers' communal attitude led them to divide these costs equally amongst themselves. The downside of this was that the use of such a large pump drove up prices that farmers were already struggling to pay. Perhaps worst of all, these pumps were unreliable in spite of their large price tag.



Diesel pumps are prone to frequent maintenance issues. Villagers were forced to wait over three days for repair if a severe issue arose with a diesel pump. Such maintenance problems occurred regularly. These long waits had serious implications for the farmers, who were unable to water their crops while they awaited repairs. This became more of an issue over the past several years, as the rainfall these crops depend upon has declined. Relying solely on the diesel pump sets could be catastrophic if this trend were to continue.

This region of West Bengal is a rain-fed area where farmers are dependent on rainwater to irrigate their crops. Therefore, these farmers are especially susceptible to negative fluctuations in precipitation. Pradan executive, Debashish Biswas, explains that this has been the case recently, as “the rainfall was good in the year 2013. The production was good and quantity was also good, but last year was dry. There was rainfall for the first five days and after that it was completely dry. So here people were unable to cultivate paddy.” Having access to consistent irrigation can mitigate the risk an unpredictable climate presents to farmers.

## Project:

Partnering with ONergy to install solar irrigation in Narandi was an easy decision for the NGO Pradan (Professional Assistance for Development Action). ONergy had successfully implemented similar projects with Pradan in Bihar, proving to the NGO that beneficiaries of ONergy’s solar solutions could expect exemplary service. For this project, ONergy has installed the solar irrigation pump and is now responsible for monitoring the condition of the pump along with providing any maintenance support necessary.

Solar-powered irrigation pumps are a one-time investment that reduce farmers’ dependence on diesel pumps and rainfall. Instead of buying diesel regularly or hoping for rain, farmers can use energy produced by the solar panels located on their land to run their pump. Cutting recurring costs for diesel allows farmers to irrigate their plots more frequently. Pumps can be either submersible or surface, drawing from groundwater sources or a nearby body of water. The farmers in Narandi use a surface pump to draw water from the river near their farms. Solar power provides a reliable and consistent irrigation solution for farmers in India because they have access to abundant sunlight throughout the year.



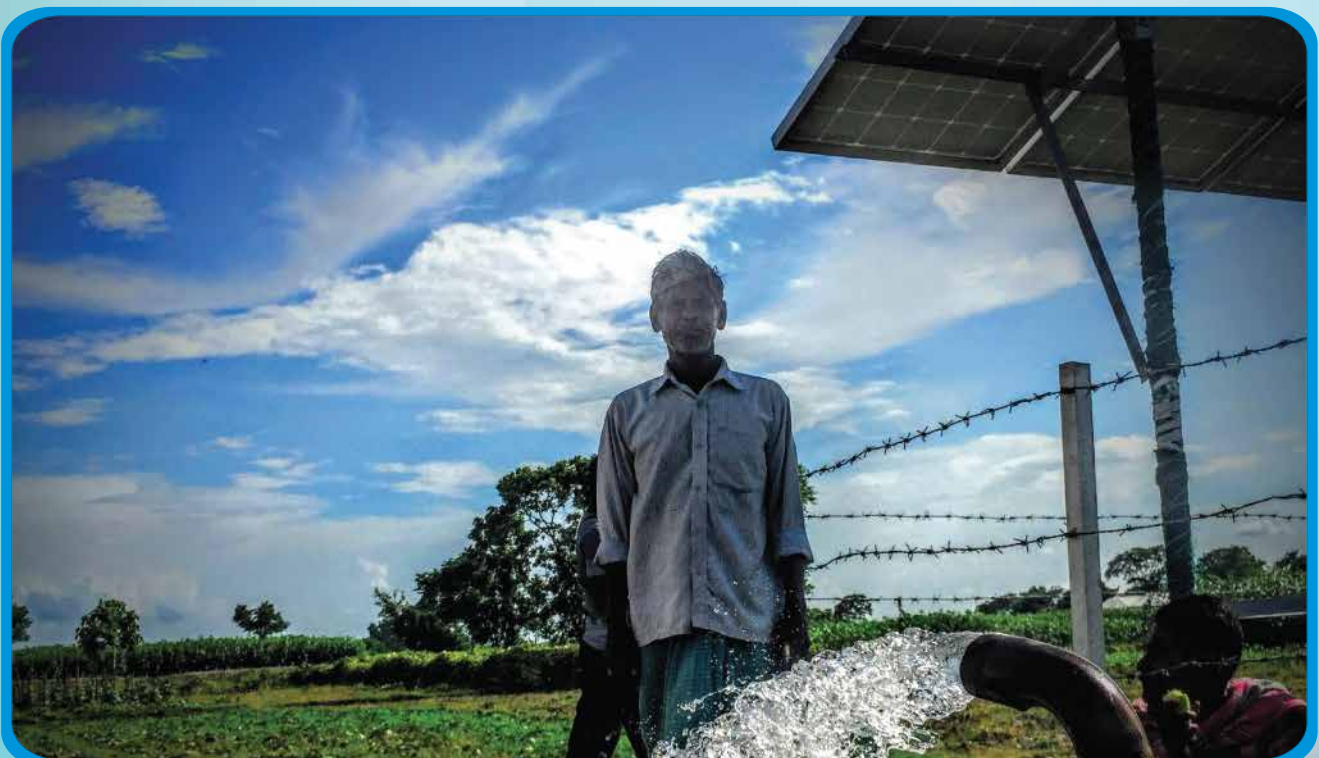


## Farmers' Experience:

Farmers are noticing the difference the solar pump is making for them after only eight months of use. The five farmers with fields close enough to irrigate using only the solar pump are saving Rs. 90 per hour they used to pay for diesel, as the use of this solar pump is free for them. Others, who used to need a larger diesel pump to reach their fields have also taken advantage of this opportunity to reduce costs through an ingenious innovation of their own. They have built four ponds throughout the farmland which they fill by pumping water from the river with the solar irrigation pump.

These ponds enable them to irrigate their plots with smaller, less costly diesel pumps. This saves them 60 Rs. per hour of irrigation. The farmers also use the ponds as fisheries for their own consumption. These benefits allow the farmers to invest in activities that will be productive in the long term, and what they don't spend on farming goes towards groceries for their families and the education of their children.

Many of these farmers only earn income for their families through agriculture. Having consistent access to a reliable irrigation pump can make their crop production more predictable resulting in a more stable income. This will become especially important if the reduced rainfall they've experienced recently becomes a long-term trend. Saving the money they were previously spending on diesel-powered irrigation allows them to increase their farming activities by growing additional crops and expanding their farms. Diversifying the crops they harvest leaves them less vulnerable when conditions change in either the climate or the market. Additionally, with a reliable source of irrigation the farmers are less dependent on rainfall, and can rotate crops to harvest throughout the year, instead of only farming when rain is available. The solar irrigation technology makes this diversification possible, increasing farmer income and land stewardship.





## Impact:

- Reduced costs from Rs 80-90/hr to free use of irrigation pump
- Savings are spent on productive activities
- Some farmers no longer need to travel 8km to purchase diesel
- Farmers no longer wait for days for frequent repairs
- Manmade ponds are used as fisheries for farmers' consumption



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Photo credit: Santa Clara University for photos on pages 4, 9, 13 & 15.





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