

KHETHWORKS

PROBLEM:

Only 48% of the total net sown area in India has access to irrigation resources. Yet 54% of the population earns its livelihood through agriculture and 86% of farmers are small and marginal farmers. Over-dependence on inconsistent monsoon rains and a lack of irrigation facilities affect the productivity and income of smallholder farmers the most, particularly in eastern India, where productive electricity is less prevalent. There are over 38 million farmers who tend an acre or less of land in east India, where recharging water sources are available, but lifting the water is expensive. Diesel prices are increasing and kerosene availability is decreasing. With irrigation energy costs estimated to be 20-40% of production costs, smallholder farmers are

choosing to abandon farming outside of the monsoon and migrate for labor.

INTERVENTION:

Khethworks developed solar pumps specifically for and with marginal farmers, primarily in eastern India. It is a solar pump that is small enough to carry with a flow rate big enough to satisfy marginal farmer's preferences at a bankable price point that does not depend on subsidy. With over 60% in peak wire-to-water efficiency as tested by the Central Power Research Institute, the performance leads the market. As per the Ministry of New and Renewable Energy specifications for micro-pumping, the Khethworks pump provides over twice as much flow as similarly-sized pumps at a price at least 40% below the suggested benchmark cost. Women and men farmers carry the Khethworks solar pump system from their homes to their fields, choosing where

and when they want to irrigate, and connect the plug-and-play system. With the push of a button, they can cultivate year-round to increase productivity and incomes. Khethworks is working to create an end-user finance retail market for small solar pumps to scale through distributors and dealers.

Khethworks partners with organizations working on the livelihoods to reach smallholder farmers, primarily in the tribal belts of Jharkhand and Odisha. Khethworks has systems deployed in Assam, Madhya Pradesh, Karnataka, Tamil Nadu, Andhra Pradesh, Rajasthan, Chhattisgarh, and West Bengal.

IMPACT:

Khethworks has sold hundreds of their solar pump products across 10 Indian states and also exported them to three countries over the last two years. If farmers cannot pay the

full cash amount up front, Khetworks allows them to make down payments for INR 20,000 and pay the remainder of the pump system cost over the next two cropping seasons. Khethworks is also working with farmers in under-electrified geographies, who aspire to be year-round commercial farmers with a focus on vegetable cultivation.

Working with partners like Collectives for Integrated Livelihood Initiatives (CINI), a Tata Trusts initiative, Khethworks identified clusters of aspiring commercial farmers in Odisha.

In one of these clusters, three women farmers decided to purchase the Khethworks pump jointly in March 2021 with grant support from CINI. Last year, only Kanchan cultivated chilli during the summer season, earning INR 8,000 using a watering can for manual irrigation. This summer, with the Khethworks pump system, all three of them practiced cultivation. Kanchan was able to earn INR 38,000, Subhadra earned INR 15,000, and Sarita earned INR 6,000.

This represents a 7X increase in their cumulative income in a single season, during which the pump system paid for itself.

With the Khethworks solar pump, there is an estimated annual reduction of 425 kg CO₂ per farmer (assuming replacement of a 1.5 Hp Kerosene pump used 240 hrs per year with 0.7 L/hr fuel consumption).

ABOUT THE ORGANIZATION:

Khethworks Private Limited is a social enterprise with a mission to enable year-round irrigation, cultivation, and income generation for smallholder farmers. Conceptualized at the Massachusetts Institute of Technology (USA), the patented Khethworks system features a hyper-efficient, portable, open-well submersible pump.

