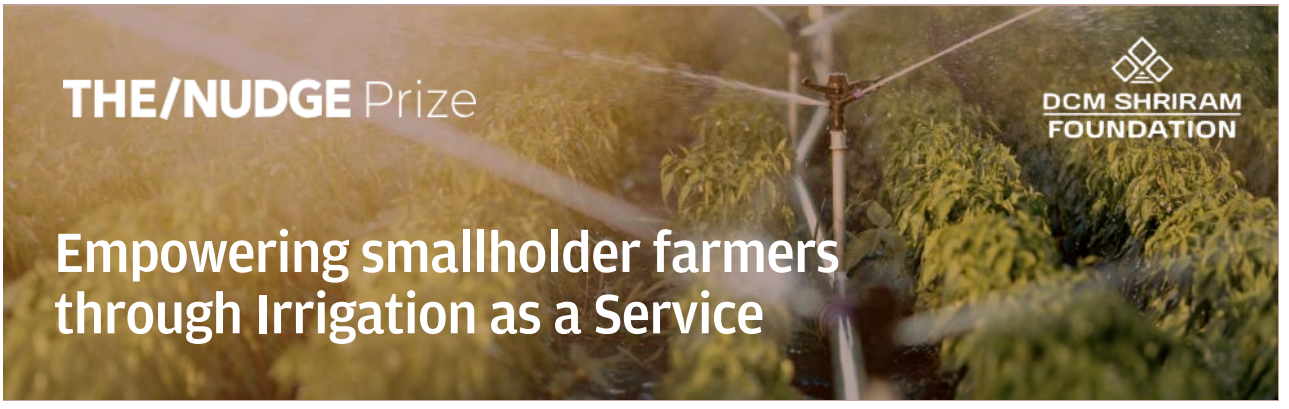

Empowering smallholder farmers through Irrigation as a Service

While the Software as a Service (SaaS) model is well-known in India's IT hubs, Irrigation as a Service is a model that has the potential to significantly impact the agricultural sector.

Both models are similar – instead of a one-time investment, users can get on-demand services on a pay-as- you-go basis. In the world of software, this allowed even small companies to use enterprise-grade software, unlike earlier when they would have to purchase the entire system to access that one piece. The situation in agriculture isn't very different. Although we have systems like drip irrigation which are effective, they are out of reach for many small-holder farmers because of their cost, even after government subsidies. They can also be complicated to operate and maintain, especially if farmers need to use them only sporadically when rains are insufficient. In contrast, Irrigation as a Service providers can offer immediate and affordable solutions to small-holder farmers who do not own their own equipment.

AgriRain and Oorja are two organizations providing these services selected to be part of the DCM Shriram AgWater Challenge cohort to improve agricultural water utilization for smallholder farmers. The challenge was launched in June 2023 as a partnership between DCM Shriram Foundation and The/Nudge Prize. and aims to promote disruptive AgWater solutions. The core objective of the challenge is to nurture an ecosystem of industry-led solutions to India's water crisis, offering a cash purse of ₹2.6 crores to the winner, along with mentorship and investor access support to all contestants.

While other contestants cover a gamut of solutions from biotechnology to mechanization and information services, players like AgriRain and Oorja play a key role in ensuring that small-holder farmers of every type are supported.

Although both provide the same service model, they use contrasting technologies to address different needs. AgriRain has developed an innovative mobile hose reel rain-gun system that has been adapted to work for small land parcels. It is a movable and towable irrigation system that mimics rainfall and serves a cluster of 60-100 farmers using a trained operator. The system is complemented by an array of supporting tech solutions, from satellite imagery to monitor soil moisture and weather parameters to on-ground moisture detection using field devices with Bluetooth sensors that send information to a mobile app. This combination of technologies ensures irrigation schedules can be optimized for maximum yield, with the company's estimates suggesting a 30-50% increase in yield and an irrigation efficiency of 79.4%. Continuous monitoring of soil health in geo-tagged farms also enables farmers to get short-window insurance coverage and targeted advisory through AgriRain's constellation of services. Farmers need to pay only ₹1,000 per acre for 10 mm, which includes irrigation along with labor, fuel, and all associated costs, in contrast to ₹5,000 - ₹20,000 per acre per season for traditional irrigation.

Oorja, as the name suggests, is dedicated to using clean solar energy to provide farming as a service, with solar irrigation being one of many solutions. Oorja provides an alternative to diesel-powered pumping and allows 15-25 farmers with adjoining farmlands to access irrigation water year-round on demand at a cost of ₹3.5 - ₹4 per cubic meter using solar-powered pumps that can be shared by farmers. This helps them escape the high operational expenses of diesel fuel, engine rental, and maintenance, while improving yield by 15%, along with an estimated 15-20% water savings.

Oorja is focused on Uttar Pradesh and paddy and wheat crops, while AgriRain is spread over 5+ states spanning from Uttar Pradesh to Andhra Pradesh and Karnataka, covering all crops but especially beneficial for water-intensive sugarcane cultivation. The complementary nature of these services helps address different needs of farmers across regions as well as other socio-economic realities.

With small-holder farmers making up 86% of India's farming households and the agricultural sector accounting for 78% of our freshwater and groundwater usage, we need many varied technological solutions to solve the problem from different vantage points. As the DCM Shriram AgWater Challenge races to a conclusion in 2025, two of the largest cities in India, Bengaluru and Chennai, are already struggling with depleted water sources. While city residents waiting for tankers dominate the headlines, we might need to look at the margins of our news coverage to understand the true state of our water conservation efforts.

Our water security is inextricably linked to the prosperity and livelihoods of smallholder farmers who grow the most water-intensive crops and consume a sizable portion of our water resources. In the face of a looming water crisis, the true measure of our progress might lie in how well we support them.