**Promoting sustainable techniques and practices increase agricultural productivity**

*By Upasana Upadhyaya*

Water is the primary need for agriculture to flourish. However, most smallholder farmers do not have reliable access to water and have to buy water for irrigation. Underground water resources are extracted using diesel pumps for which farmers have to rent on an hourly basis from people who have borewells. This is a significant cost for farmers, especially smallholder farmers. Considering the available resources, farmers either have to choose between fewer irrigation cycles for their total crop area or the optimum number of irrigation cycles for a smaller area, both of which affect their income and productivity.

In the absence of a reliable electricity supply due to a lack of grid connection or erratic availability, farmers must rely on diesel-driven pumps. However, not all farmers can afford to install diesel pumps, which require a high operational cost. In addition, using diesel pumps results in high carbon emissions that leave a large footprint on the environment.

Under a village development project in Bihar, *Gram Utthan* (village rise), aimed at providing sustainable and inclusive development, Sehgal Foundation is working to promote sustainable practices and technologies to increase farm productivity. These technologies are environment friendly as well as cost-effective.

The foundation team promotes the use of solar energy to reduce the cost of irrigation and the carbon footprint. Solar irrigation pumps are direct current (DC) pumps that draw energy directly from solar panels, leaving no carbon footprint on the environment. The pumps can operate six to eight hours daily during daylight, depending on the availability and intensity of sunlight.

Jitendra Sharma from Ramban village, Bihar, says, "As a farmer, one of the major problems I used to face was obtaining water for irrigation. I used to access water through a diesel irrigation pump, which would cost around Rs 120 per hour. The total amount for the entire irrigation cycle would cost 4,000–5,000 rupees."

Jitendra learned about solar irrigation pumps when he attended a community meeting on farming techniques organized by Sehgal Foundation. He was quite impressed with the demonstration of the pump and decided to buy the pump. He had been skeptical at first and his fellow villagers were also wary. The total cost of the 2HP pump was around three lakhs. The foundation contributed Rs 30,000 of the cost, and the remaining was financed through a bank fixed deposit and government subsidy. "The pump was installed on my farm, and since then it has been working fine. I saved a lot on the input cost. Besides the cost, my dependence on labor was reduced. The diesel pump required two people for irrigation, but the solar pump is easy to operate and only requires one person. Anyone from my family can operate it, which gives me time to focus on other productive work," he adds.

Jitendra is one of fourteen people who have benefited from this project. He also shares this benefit with fellow farmers, providing a sustainable solution for irrigation.

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