

Freezers to vegetable data

How tech and solar power are changing lives in rural India



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Mahendra, a fisherman in Karnataka's Kundapur, procured a solar-powered deep freezer that would help him store his produce and sell at a better price. But due to technical issues and uneven cooling, the storage is out of use. Mahendra is back to using ice boxes and losing additional earnings of Rs 5,000-6,000. Similarly, horticulture farmers in Odisha and Gujarat have access to solar-powered cold storage, however, limited understanding of the correct temperature settings for different fruits and vegetables leads to losses.

These cold value chain issues are rife among small and marginal farmers, and micro-entrepreneurs in India. In a study by the Central Institute of Post-Harvest Engineering and Technology (CIPHET), about 16 per cent of perishable produce goes to waste in India. The country is the largest producer of milk and comes second in farm output production, but this critical gap limits the incomes that farmers could potentially earn, thereby, deepening socio-economic inequalities. Even where the technologies are present, adoption of affordable smart infrastructure to support effective and quick troubleshooting and real-time monitoring are largely missing.

So, there are innovations being built at the intersection of sustainability, affordability and accessibility at the grassroots. At Powering Livelihoods, a CEEW-Villgro initiative, we have been supporting smart technologies powered by solar energy with an aim to mainstream decentralised clean energy.

Cool Crop, an enterprise that provides cold storage infrastructure at the farm gate, is integrating smart features into its systems to optimise the produce value for farmers. For example, farmers would store green leafy vegetables and tomatoes at the same temperature, thereby, affecting the quality of the produce and their saleable value. A remote monitoring system (RMS) has been developed and integrated within the cold storage that

monitors and controls the temperature and humidity. The RMS system, being piloted in Gujarat and Himachal Pradesh, has resulted in improved management of produce and awareness among farmers. Further, to eliminate the pen-paper recording, RMS will integrate sensor-based weighing scales and grade identification to inform farmers, financiers and market retailers. This is being envisioned as a technology-based crop management platform.

Similarly, Devidayal Solar Solutions uses an RMS to monitor temperatures, record data on opening and closing of the refrigerator lid, and voltage in its solar-powered deep freezers. The RMS was piloted in about 100 instalments with an intention to customise the product as per the end-users' need and enable remote troubleshooting by identifying systems that are not being used or are faulty. The pilot was conducted with small fishery vendors in Maharashtra's Sindhudurg district. Post-pilot, the enterprise has productised the RMS for deep-freezers. However, the cost remains a challenge. The technology cost (Rs 6,000-7,000) is almost 10 per cent of the refrigerator cost, thus, leading to low uptake among its target population - small-scale retailers or road-side vendors. The development and integration of advanced data analysis, like the Internet of Things, can have a high-impact potential by giving end-to-end visibility on temperature settings, storage details, ensuring longer shelf-life of the produce and enabling farmers to get a better price.

Smart technologies are a powerful innovation to enhance productivity and efficiency in a business using automation and data, especially at the last mile. Especially in regions where the sun shines the most. Powering Livelihoods has enabled at least 17,000 livelihoods through the programme. The changing lives of Mahendra and many more farmers and small business owners give hope to leverage the potential of solar and advancing technologies to light the way to sustainable prosperity.



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