Hi-tech holds promise for small landholders

Stanford Engineer's Novel Drip Irrigation Product Benefits Farming Community Across States

Omkar Sapre
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ARSAJUL Mani from Hubli in north Karnataka experimented with a new irrigation equipment, which to his delight halved his effort and the quanta of water needed while doubling the output from his two-acre farm.

Mani, a small landholder, could not afford costly and complex traditional irrigation systems. What won him over was a drip irrigation innovation from a Stanford graduate — and produced out of a start-up at Palo Alto — which is designed for small farms like his apart from being three to four times cheaper than normal systems. And to boot, it worked without electricity.

A mechanical engineer from Stanford, Peter Frykman, stumbled upon the idea of using a low-cost plastic tubing assembly that uses gravity to deliver water to the plant's roots. He refined the idea at his California socio-commercial start-up and called his product, Driptech.

"Water and labour shortages result in hard toil for small farmers across the world," Frykman says. "Traditional irrigation control systems are costly and complex for them. They resort to flood irrigation which wastes a lot of water. Small farms need cheap, low-maintenance, drip irrigation systems to reduce effort and use of water, which is what Driptech does." Driptech comprises a low-cost laser-punched plastic tubing linked to a water tank. Gravity drives water through the tubing and to the plant's root from these holes. Simple tap valves control the flow of water and the farmer can even install, and maintain it, all by himself.

While a traditional drip irrigation system costs Rs 40,000 an acre, Driptech costs a modest Rs 10,000, not to talk of reliability and easy maintenance. The low cost is because Frykman's proprietary production technology can use the same machines that make plastic carry bags for the Driptech tubing.

Driptech in action **(left and right)** and engineer-innovator Peter Frykman **(centre)**, the product's creator

"That is where innovation is," he says. "There are thousands of such machines across cities. This enables low-cost, speedy, distributed production. We can deploy production facilities directly where the product is being sold, which also enables customisation." Traditional drip irrigation systems are made in specialised factories and need skilled technicians to install and maintain them.

Frykman's insights came from a visit to drought-hit Ethiopia as part of his course. "It was the worst drought Ethiopia had experienced in 20 years. Farmers had no means to grow crops with the meagre water available. The drip irrigation products that were locally available were too expensive for most farmers and seldom worked properly," he said.

After incorporating the firm as a for-profit social enterprise in the United States — in which Postini founder Scott Perry invested $40,000 — Driptech's team travelled to rural India for a five-month pilot with 15 farmers who were unable to afford drip irrigation. Following this, Driptech raised another round of funding, recruited people, established relationships with partners and began scaling up the business.

He is touring India and China to market the product vigorously having signed on the Usha Martin group in Jharkhand, Husk Power Systems in Bihar and the Godrej group in four districts of Maharashtra and Karnataka, to hawk his system.

Frykman says he sees a huge potential in India for his innovation, and not without reason. Government data says 86% farmers here have landholding of less than two hectares.

Accentuating the problem and increasing the business potential, is falling average landholding — from 1.67 hectares in 1982 to 1.34 hectares during 1992 to 1.06 hectares in 2002. And income-wise, most small farmers are worse off than the lowest-paid government employee with an average monthly income between Rs 1,500 and Rs 8,300, according to the Confederation of the Indian Farmers Association (Cifa).

omkar.sapre@timesgroup.com