Solar Electricity Buybacks May Reduce Groundwater Depletion in India

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Ramanbhai Parmar, a wheat and banana farmer in India's dry state of Gujarat, was the first to sell electricity back to the power grid from the solar panels that drive his water pump. Photo credit: CCAFS/Prashanth Vishwanathan

It's hard to find solutions that confront water depletion, climate change and rural poverty all at once, but an innovative scheme being piloted in the Indian state of Gujarat does just that.

The idea is to enable farmers using solar-powered irrigation pumps to sell excess electricity back to the grid. That gives them an incentive to pump only the water they really need for their crops, slowing the depletion of groundwater. It also diversifies and boosts their incomes. And by pumping with solar energy rather than diesel, they reduce climate-altering carbon emissions.

Last week, the International Water Management Institute (IWMI), based in Colombo, Sri Lanka, and the mastermind of the new buy-back scheme in Gujarat, announced that Ramanbhai Parmar, a grower of bananas and wheat, would receive the first payment for his "solar crop."

Innovative solutions to groundwater depletion are sorely needed in many parts of the world, but especially in India. More than 15 percent of India's food is produced by mining groundwater.

In addition to Gujarat, groundwater levels are falling extensively in the breadbasket states of Punjab and Haryana in the northwest, as well as in Andhra Pradesh, Maharashtra, Rajasthan and Tamil Nadu.

Much of the depletion has been driven by the availability of inexpensive motorized pumps, along with heavy subsidies for electricity and fuel.

In recent years many Indian farmers have switched from diesel to solar-powered pumps. While the shift to clean, renewable energy is a positive development, farmers still have an incentive to pump more water than they need because the near-flat rates for electricity make the cost of pumping additional water practically zero.

"'Solar crops' are a very exciting example of a triple-win," said IWMI senior fellow Tushaar Shah in a press release. "Farmers, the state, and precious water reserves all benefit from a single intervention."

IWMI estimates that around 11 million farmers connected to the electricity grid could, in theory, benefit from such electricity buy-back schemes.

As part of its pilot study in Gujarat, IWMI is monitoring on-farm electricity generation, income, water efficiency and crop production.

While a small pilot scheme at the moment, this initiative is one worth watching.

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