

# DECENTRALISED CLEAN ENERGY TECHNOLOGIES CAN IMPACT 37 MILLION LIVELIHOODS

Renewable energy technologies have a market potential worth ₹4 lakh crore in India

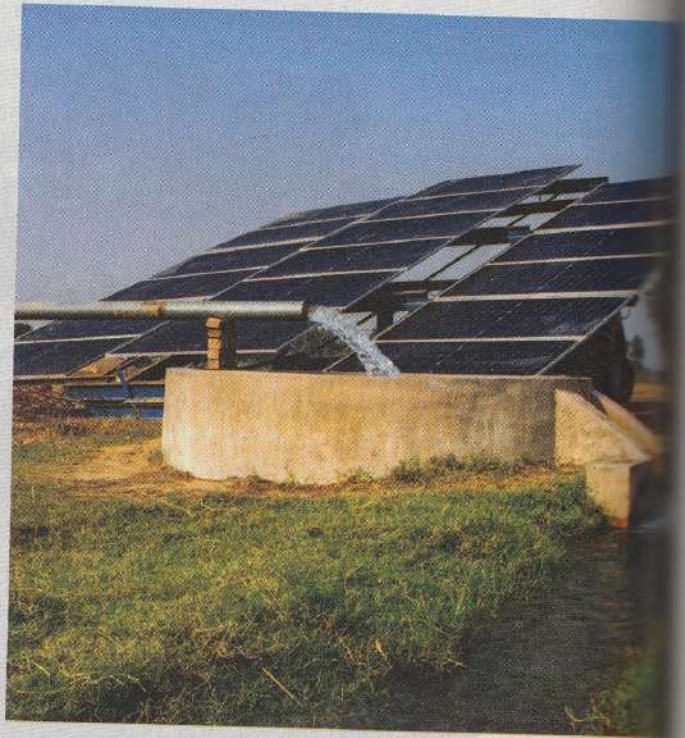
**SEEMA PRASAD**

**IN ITS** "Report on Optimal Generation Mix 2030 Version 2.0" released in May 2023, the Union Ministry of Power's Central Electricity Authority (CEA) offered updated projections on what India's energy mix for the power sector could look like in 2030. The country generated 73 per cent of its power from coal in 2022-23; CEA expects this to go down to 55 per cent by 2030. A greater share in the electricity mix will be held by renewable sources such as small hydro, pumped hydro, solar, wind and biomass, whose generation is expected to rise to 31 per cent in 2030 from 12 per cent currently.

Technologies that are powered by decentralised renewable energy (DRE) could potentially impact 37 million livelihoods in India's agriculture and textile sectors, notes a May 2023 report jointly published by Delhi-based non-profit Council on Energy, Environment and Water and Chennai-based Villgro Innovations Foundation. DRE technologies include solar-run textile manufacturing units, biomass-powered cold solar storages and micro solar pumps, among several others. DRE has a market potential of ₹4 lakh crore in rural and peri-urban communities in India, adds the report.

On the ground, the deployment of DRE technology is limited and scaling becomes difficult due to the lack of evidence on the commercial viability of such solutions, researchers ascertain. Therefore, they chose to study its usage on the ground. Currently, India has 12 mature technologies powered by DRE, they find. These are the higher capacity irrigation pumps as well as the micro pumps, silk reeling machines, dryers, *charkhas*, small horticulture processors, small refrigerators/ deep freezers, cold storages, vertical fodder growing units, grain milling machines, looms and bulk milk chillers. Together, they collectively have the potential to impact 37 million livelihoods, the study finds. There are 547,380 installations of these twelve technologies, with an estimated livelihood impact of 566,827 people.

Solar-powered technologies such as high-capacity



irrigation pumps, micro irrigation pumps, solar-powered vertical fodder growing units and solar dryers have the maximum potential to be deployed. Solar pumps, in particular, are the most mature technologies due to the government subsidies provided, the study says. The ability of the product to give livelihood opportunities and generate income may increase the likelihood of its adoption. For example, solar-powered silk-reeling machines and micro solar pumps have higher chances of adoption because they help generate more income than solar-powered cold storage.

The number of days the asset comes in handy also makes a difference to users. A solar pump is generally viewed as more economically viable than a diesel pump. However, if the diesel pump is used for only 20 days a year despite high running costs, it would be more advantageous to users, the researchers write. Uttar Pradesh leads in terms of estimated future adoption of

solar-powered technologies, followed by West Bengal, Bihar, Gujarat, Maharashtra, Madhya Pradesh and Karnataka, the researchers say.

Another report released by the Union Ministry of New and Renewable Energy earlier had findings from the ground, including details of the technology used in the impact assessment. Solar silk reeling and spinning machines with 15 watts capacity within a price range of ₹15,000 to ₹30,000 that were used by silk reelers and weavers in Chhattisgarh and Odisha were studied. Small solar refrigerators with a capacity of 65-155 watts in the price range of ₹80,000 to ₹145,000 that were deployed in departmental stores in Uttar Pradesh, Rajasthan and Karnataka were assessed. Micro solar pumps with 0.3 horsepower capacity, costing between ₹45,000 and ₹50,000, used by small and marginal farmers in Odisha, Jharkhand and Madhya Pradesh were also studied. Similarly, Solar vertical fodder growing units with 30 W capacity at a price of ₹40,000-45,000 that was used by small dairy farmers in Rajasthan, Andhra Pradesh and Karnataka were part of the assessment. The first phase of the study covered 767 end users across 19 Indian states who had had access to and used the technologies for at least six months. This was to understand the impact of these technologies on communities struggling with limited access to energy. The researchers are planning the second phase of this analysis.

About 91 per cent of the users received the technologies at a subsidised cost from the government without being aware of the same. Nearly 71 per cent of the respondents to the survey said they experienced an increase in income by 35 per cent. Some of them were able to independently afford the purchase of these machines with the enhanced ability to pay loans. This was particularly true for 81 per cent of the users of silk reeling machines, who could double the productivity compared to the previous reeling methods. Using DRE technologies improved the confidence of 86 per cent of end users to work. It helped 88 per cent of end users extend financial support to their family members.

One barrier faced by the users, in general, was the lack of direct contact with the manufacturers to address technology defects, because the technologies were provided through philanthropic efforts and government subsidies. The authors proposed introducing loans offered over a longer period at a lower interest because the users now have the ability to pay loans.