The solar distillation unit at Bandhiya (Gangwara) village, in Dewa, Barabanki

Using green tech to tap solar power

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Around 35km away from Lucknow, this village in Barabanki is among a handful of villages in the country using solar power for extraction of essential oil from aromatic crops like mint and others grown in agricultural fields.

Treading on the path of becoming a flagbearer of sustainable farming, over 35 farmers from Bandhiya (Gangwara) village, in Dewa, Barabanki, are using solar power to save nature and resources. This green technology adoption became a reality for this small village with the support of CSIR-Central Institute of Medicinal and Aromatic Plants (CIMAP), Lucknow. The initiative, named 'MintUP' project, is sponsored by Haleon UK Pvt Ltd.

In a groundbreaking achievement, CIMAP developed an eco-friendly centralised solar hybrid distillation unit (CSHDU) for essential oil extraction from aromatic crops. According to scientists, this innovative technology is set to revolutionise the agriculture sector by reducing carbon emissions, increasing farmers' income, and promoting sustainable practices.

"The CSHDU technology uses solar energy to generate steam, eliminating the need for wood burning (during the daytime) and reducing environmental pollution. A one-ton capacity prototype was successfully commissioned at a farmer's site in Barabanki. The unit consists of 40 solar panels, a hybrid steam boiler, and steam generation units, ensuring uniform control of steam generation," said CSIR-CIMAP director Prabodh Kumar Trivedi.

"This eco-friendly technology has several benefits, including zero CO2 emissions during daytime operation, low maintenance charges, and a one-time investment cost. The centralised solar hybrid distillation technology is expected to improve the financial condition of Indian farmers, generate employment opportunities, and promote sustainable farming practices," he said.

Tech Features

- Zero CO2 emissions during daytime operation
- Low maintenance
- One-time investment
- Improved oil yield & quality
- Income generation for farmers
- Promotes sustainable farming practices
- Aligns with 'Make in India' programme

A farmer, Sunil Kumar, said that the installation of solar distillation units transformed their lives. "Earlier, we burned wood for four hours and even more to extract essential oils from mint, but today the distillation unit has not only reduced our hard work, but we also don't need manpower and investments for oil extraction. It's friendly to our pockets and environment too," Sunil said. "It reduces pollution, generates employment, improves earnings, and promotes sustainable agriculture practices. This innovative technology is a significant step towards a sustainable future and is expected to have a positive impact on the lives of farmers and environment," said CSIR-CIMAP principal scientist Ashween Nannaware.

He said by adopting technology, farmers cultivating aromatic crops could expect higher purity essential oil, enhanced yield, and increased income. "Farmers in Bandhiya are also using solar panels for other farm-related applications like water pumping sets, battery charging, household electricity, and others. This initiative has reduced the dependency of farmers on diesel-operated water pump sets, resulting in zero carbon emissions during irrigation operations. Also, they can reduce input cost, which was earlier incurred on the purchase of diesel for operating the pumps," said senior principal scientist CSIR-CIMAP Manoj Semwal.