



## Actionable Messages

**Message 1:** Farmers and other interested parties must be educated about the advantages of solar irrigation systems. Education programmes can inform farmers about the value of solar irrigation and motivate them to purchase the equipment.

**Message 2:** Farmers can construct solar irrigation systems with the aid of government subsidies or other forms of financial assistance. This can help make the technology available to farmers, especially small-scale farmers who might have limited financial resources.

**Message 3:** Promoting the use of solar irrigation systems in India would be possible with the support of the private sector. Private businesses can finance agricultural research and developmental projects, and offer farmers technical assistance and financing.

**Message 4:** Farmers and technicians' technical abilities can be improved through the development of training programmes, which will aid in the installation and upkeep of solar irrigation systems. These training courses might be offered in regional community centres, colleges for agriculture, or other organizations.

**Message 5:** The design and installation of solar panels, as well as the use of more efficient pumps and motors, should be improved to boost the effectiveness of solar irrigation systems. This would enable farmers to maximize their investment and increase the appeal of solar irrigation as a sustainable and affordable replacement for conventional irrigation techniques.

## Narrative

The thematic track session titled, “Fulfilling the Promise of Solar Irrigation in India” was conducted as part of the World Sustainable Development Summit (WSDS) – the annual flagship initiative of The Energy and Resources Institute (TERI). The aim of the session was to provide a platform for experts and thought leaders to deliberate and discuss ways in which solar irrigation can be scaled up in India in the coming years. Particular focus was given to PM KUSUM scheme that aims to provide clean energy to 38 lakh farmers and contribute towards India’s updated Nationally Determined Contribution (NDC) target of achieving 50% of installed power generation capacity from non-fossil fuel sources by 2030. The moderators for the session were **Ms. Kritika Kumar, Energy Advisor, GIZ** and **Mr. Siddharth Goel, Senior Policy Advisor, International Institute for Sustainable Development (IISD)**. Discussions on various topics unfolded, which included: solar irrigation as a sustainable alternative, challenges in promoting solar irrigation, government initiatives such as the PM KUSUM scheme, need for collaboration between the government, private sector and farmers, benefits for farmers and future prospects.

The session started with the welcome address by **Mr. Nilanjan Ghose, Senior Advisor, GIZ** who discussed the PM KUSUM scheme and its aim to provide clean energy to 3.8 million farmers by 2030 and addressed that under this scheme, there are over 180,000 solar pumps installed and 88 megawatt of decentralized solar plant capacity deployed across the country. PM KUSUM has the potential to focus on the procedural and the distributional goal of energy justice. It is one of the few renewable energy schemes which reaches the farmers and promotes distributed energy deployment with a specific focus on decarbonization of the agricultural sector. Despite the scheme’s immense potential, its roll-out has been slowed. The extension of the timeline of PM KUSUM scheme until 2026 provides an opportunity to examine what has worked and what hasn’t and deliberate on the optimum path forward for solar irrigation. He concluded by highlighting the fact about a GIZ-supported research consortium, which has been working to support state governments in cooperation with India’s Ministry of New and Renewable Energy (MNRE) to achieve the socio-economic objectives of solar irrigation schemes.

Following the welcome address, **Mr. Anas Rahman, Policy Advisor, International Institute for Sustainable Development (IISD)** gave a brief presentation on the current status of solar irrigation in India. He initiated the discussion by presenting three key promises of solar irrigation. First of all, it is about providing affordable and quality energy access for farmers for irrigation; second, it’s about the clean energy transition in agriculture, and finally, it’s about increasing farmers’ income as well as reducing the current states’ subsidy which goes to supporting irrigation. Many states had identified this potential early on and they had designed their own schemes in 2012, for example, states like Chhattisgarh and Rajasthan had successfully deployed a huge number of off-grid solar pumps under the state schemes. In 2019, the government of India launched a scheme known as PM KUSUM, which is an umbrella programme for all the solar irrigation schemes

in India. Mr. Anas explained the three components of the scheme, namely: Component A, which is about facilitating farmers to set up power-plant on their barren or uncultivable land; Component B is about off-grid solar pumps targeting farmers who have diesel pumps or farmers who currently don't have access to irrigation, and Component C is about targeting farmers who already have access to grid-conducted irrigation. He also talked about several challenges, particularly in terms of market factors and end-user financing. One of the biggest challenges for the PM KUSUM scheme is the lack of a well-developed market for solar energy products in many parts of the country. This makes it difficult for farmers to access quality solar pumps and other solar-powered equipment at affordable prices. The lack of competition in the market also makes it challenging for the government to negotiate better prices for solar products. Another significant challenge is the issue of financing for end-users. While the government provides subsidies and grants to farmers under the PM KUSUM scheme, many farmers still face difficulties in accessing loans to finance their solar energy projects. This is because the cost of solar energy systems is often prohibitively high, and the financial institutions are often reluctant to lend to farmers due to the perceived risk associated with agriculture.

Following Mr Anas's address, the discussion steered towards whether the PM KUSUM scheme needs a rethink in its design and incentives for the states in implementing it. **Ms. Shweta Kulkarni, Prayas** pointed out the challenges in the implementation of the scheme, specifically in the state of Maharashtra. In many other states, PM KUSUM scheme has received good responses, especially with reference to Component B. However, in the state of Maharashtra, there has been a little lag. According to her, the challenge of implementing the scheme is mainly due to lack of state participation and another challenge which she pointed out is, the number of applications received is way higher than the state's target. So, in reality, the response to the scheme is actually good in Maharashtra. Due to some local obstacles, the implementation could be a bit delayed, but the farmers' response to the programme has been excellent. She concluded by adding that these issues can be resolved through some specific frameworks that the states can establish in terms of monitoring and verification.

**Mr. Amit Saraogi, Co-founder, Oorja Development Solutions Limited**, commented on the design of the scheme and how it can be improved. The scheme is lacking in many aspects and also it is badly designed and at least with reference to the Component B and Component C in Uttar Pradesh and Bihar, the uptake of the scheme is really failing, he said. It is poorly targeted in the sense that small-holder farmers are being left out in the scheme because there are no alternative business models built into the scheme that would allow them proper access, and there is a lack of awareness as well, since most farmers haven't even heard about the PM KUSUM scheme. Another issue that he brought up was that the farmers who have access to the programme and have acquired the assets remove them and use them to power up their own homes instead.

The next speaker was **Ms. Bigsna Gil, Program Manager, Sustain Plus Energy Foundation**, who talked about whether PM KUSUM scheme needs a rethink in its design in terms of ecosystem development. From an ecosystem development perspective and in the larger scenario of getting these pumps on to the ground, the deployment from a logistics perspective and from centralizing the whole process such as by centralizing the tendering process and by centralizing all of the empanelled vendors who are going to be deploying these pumps, they are facing problems around logistics including their own supply chain. The volume at which they have to work is making it difficult for them to actually deploy on the ground. She mentioned the merits in thinking about decentralizing the tendering process or the vendor empanelment process for KUSUM B pumps. First, it can ensure more transparency and accountability in the process as it will involve more stakeholders at the local level. Second, decentralizing the tendering process can also help in identifying and utilizing local resources effectively. Moreover, it can promote local entrepreneurship and generate more job opportunities. Additionally, it can lead to better communication and coordination between stakeholders, which can improve the overall efficiency of the scheme.

**Mr. Surajit Chakraborty, DGM and Lead, Energy Programs, Switch ON Foundation** listed out some of the challenges of the scheme in West Bengal. First, West Bengal has a high percentage of small and marginal farmers who may not have the financial resources or technical knowledge to install and maintain solar pumps. The lack of awareness and support from the government has also made it difficult for them to avail the benefits of the scheme. Second, the distribution network for solar pumps and other equipment is not well developed in West Bengal. This has resulted in delays in the delivery and installation of the equipment, leading to a lack of interest among farmers. Third, there is a lack of coordination between various government agencies and departments in West Bengal, which has resulted in a delay in the implementation of the scheme. The state government has not taken adequate steps to promote the scheme, which has led to low participation from farmers. Finally, he mentioned that since bankers are not aware of schemes and technology, the implementation is lagging in West Bengal, and to overcome this challenge, regular meetings are conducted with the bankers under the farm sector mechanization scheme.

## Making Words Count @WSDS 2023

“	<p>PM KUSUM scheme is an umbrella program for all the solar irrigation system in India. The high upfront cost of installing solar pumps is one of the primary problems of the PM KUSUM plan, which may dissuade small and marginal farmers from adopting the technology.</p>
“	<p>The PM KUSUM plan is a significant step towards the farm sector's decarbonization, which is essential for meeting India's climate goals. The installation of solar pumps and solar power plants under the PM KUSUM scheme would support the use of local resources and help decentralize the energy sector.</p>
“	<p>In Maharashtra, the implementation of PM KUSUM scheme is lagging but the farmers' response is very good. To ensure the success of the PM KUSUM plan, all stakeholders, including farmers, state governments, financial institutions, and technology suppliers, must be involved.</p>
“	<p>Although the PM KUSUM initiative has the potential to completely transform India's agriculture industry, there have been numerous problems with its implementation. The farmers' lack of knowledge and comprehension of the PM KUSUM scheme are main obstacles to its implementation.</p>
“	<p>The lives of rural communities in India have the potential to change as a result of decentralized solar plants and solar pumps. While decentralized solar plants can supply clean, dependable electricity to power homes and businesses, solar pumps can provide water for irrigation. For the PM KUSUM scheme to reach the farmers, particularly those in rural and isolated locations, effective outreach and communication activities are crucial.</p>
“	<p>The implementation of PM KUSUM scheme in West Bengal is lagging since bankers are not aware of the schemes and technology. In West Bengal, they are tackling the challenges in the implementation of PM KUSUM scheme by conducting regular meetings with the bankers under the farm sector mechanization scheme to create awareness.</p>

**Mr. Anas Rahman**  
**Policy Advisor, IISD**

**Mr. Nilanjan Ghose**  
**Senior Advisor, GIZ**

**Ms. Shweta Kulkarni**  
**Prayas**

**Mr. Amit Saraogi**  
**Co-founder, Oorja Development Solutions Limited**

**Ms. Bigsna Gill**  
**Program Manager, Sustain Plus Energy Foundation**

**Mr. Surajit Chakraborty**  
**DGM and lead of Energy Programs, Switch ON Foundation**