

Advancing Solar Irrigation in India: A Science Policy Forum

National Forum by IWMI-SDC-SoLAR project

Venue: Jaypee Siddharth Hotel, Rajendra Place, New Delhi, India

Date: 12th March 2024, Time: 9:00 am – 15:45 pm IST

Background:

The surge in carbon emissions in India, driven largely by the agriculture sector's escalating energy demands and reliance on fossil fuels, poses significant environmental challenges. Groundwater irrigation, which accounts for a substantial portion of India's carbon emissions, is heavily subsidized, with electricity provided to farmers at significantly lower rates than domestic users. This subsidy, coupled with policies promoting irrigation and high-yielding crop varieties, has led to widespread groundwater exploitation and depletion. The adoption of solar irrigation pumps (SIPs) presents a promising solution to mitigate these challenges. SIPs offer environmental benefits by reducing CO₂ emissions and decreasing reliance on power subsidies. While off-grid SIPs provide energy access in remote areas, grid-connected SIPs offer the additional advantage of stabilizing groundwater withdrawals by allowing farmers to sell surplus electricity back to the grid, thereby augmenting their income. India's abundant solar potential and government schemes like PM KUSUM further underscore the importance of solar irrigation in achieving sustainability goals. However, the adoption of SIPs remains limited, highlighting the need for scaling to realize the full potential of solar irrigation in India's agricultural landscape.

The primary aim of this forum is to present and discuss recent insights into i) challenges associated with the adoption of SIPs by smallholder and women farmers, ii) their impact on livelihoods and groundwater, and iii) the need for capacity building interventions to improve the implementation effectiveness of SIP programs. Additionally, the forum will engage in an in-depth discussion about scaling strategies and policy interventions.

About SoLAR:

Solar Irrigation for Agricultural Resilience in South Asia (SoLAR-SA) aims to sustainably manage the water-energy and climate interlinkages in South Asia through the promotion of SIPs. The project is funded by the Swiss Agency for Development and Cooperation (SDC). The project's main goal is to contribute to climate-resilient, gender-equitable, and socially inclusive agrarian livelihoods in Bangladesh, India, Nepal, and Pakistan by supporting government efforts to promote solar irrigation. In the process, the project will pave the way for sustainable and equitable groundwater governance by tackling policy distortions related to solar irrigation, such as perverse electricity subsidies that have led to negative interlinkages between the water and energy sectors in South Asia. In India, IWMI has partnered with Gujarat Urja Vikas Nigam Limited (GUVNL), the Government of Gujarat, and the Gujarat Energy Research and Management Institute (GERMI).

Agenda:

| TIME | Presentation/panel (with panelists) | | |
|---|---|--|-----------------------------------|
| 9:00 – 9:30 | Registration | | Participants |
| 9:30 – 10:15 | Welcome remarks: International Water Management Institute | | Alok Sikka/ Darshini Ravindranath |
| | Welcome remarks: Swiss Development Cooperation | | Divya Kashyap Sharma |
| | Opening remarks: Deputy Secretary, Ministry of New and Renewable Energy | | Suman Chandra |
| | Opening remarks: Advisor, Ministry of Finance | | Geetu Joshi |
| | Opening remarks: Deputy Director General, Agriculture Extension, Indian Council of Agriculture Research | | Udham Singh Gautam |
| | Opening remarks: Chairman, Central Groundwater Board | | Sunil Kumar Ambast |
| TEA BREAK (15 mins) 10:15–10:30 | | | |
| SESSION 1 – Adoption and Impact of SIPs: Inclusive Scaling Strategies and Policy Lessons | | | |
| <i>Impact Evaluation and GESI</i> | | | |
| 10:30 – 10:45 | Empowering Farmers with Grid-Connected Solar Irrigation Pumps: Evidence from Gujarat, India | Deepak Varshney (IWMI) | 15 min |
| 10:45 – 10:55 | Solar irrigation and GESI: Some insights from Nepal | Manohara Khadka (IWMI) | 10 min |
| 10:55 – 11:05 | Q+A | Participants | 10 min |
| 11:05– 12:00 | <p><i>Panel Discussion 1: Inclusive Scaling Strategies and Policy Lessons for Solar Irrigation in India</i></p> <p><i>Panelist</i> J V Meenakshi (IIIT)/Veena Srinivasan (WELL)/ Santosh Rai (AEPC) / Nilanjan Ghose (GIZ) / Monali Zeya Hazra (USAID)/Amit Saraogi (Oorja)</p> | Chair/Moderator– Tushaar Shah (IWMI) | 55 min |
| <i>SIP and Groundwater</i> | | | |
| 12:00 – 12:10 | Impact of Grid-Connected SIPs on Groundwater Withdrawals | Faiz Alam (IWMI) | 10 min |
| 12:10 – 12:15 | Q+A | Participantss | 5 min |
| 12:15– 13:00 | <p><i>Panel Discussion 2: Potential of Grid-Connected SIPs for Sustainable Groundwater Solutions</i></p> <p><i>Panelist</i> Ratan Jain (GWRDCL)/Saumava Dey (IIT)/Adlul Islam (ICAR)/D K Singh (ICAR)</p> | Chair/Moderator–Alok Sikka (IWMI) | 45 min |
| LUNCH BREAK (1 hour) 13:00 – 14:00 | | | |
| SESSION 2- Solar Empowerment: Unleashing Full Potential through Knowledge and Skills | | | |
| 14:00-14:10 | Design and Implementation of Capacity building intervention for the grid-connected solar farmers | Nikunj Usadadia (IWMI) | 10 min |
| 14:10-14:20 | Impact of capacity building intervention designed for solar farmers on solar energy generation: Evidence from the Randomized Control Trial (RCT) | Deepak Varshney (IWMI) | 10 min |
| 14:20-14:35 | Capacity building intervention for grid-connected SIP farmers: Understanding Farmers' Perspectives | <i>Farmers:</i> Manubhai/Kanabha/Bhikhubhai/ <i>Deputy Engineer</i> Hiran H Ganatra | 15 min |
| 14:35-14:45 | Q+A | Participants | 10 min |

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| 14:45-15:30 | <p><i>Panel Discussion:</i> Necessity of Awareness and Knowledge for Accessing and Optimizing Solar Irrigation Pump Usage</p> <p><i>Panelist</i> R J Vala (PGVCL)/ Akash Davda (GERMI)/ Manohara Khadka (IWMI)/Shilp Verma (IWMI)/ Atul Dhir (USAID)</p> | <p>Chair/Moderator-Darshini Ravindranath (IWMI)</p> | 45 min |
| 15:30-15:40 | Closing Remarks | <p>P C Sharma (ISA) Divya Kashyap Sharma (SDC)</p> | 10 min |
| 15:40-15:45 | Vote of Thanks | Darshini Ravindranath (IWMI) | 5 min |

Photo: IWMI



| Speakers | Designation and Organisation |
|---------------------------|---|
| Dr. Adul Islam | Assistant Director General (S&WM), Indian Council of Agricultural Research (ICAR), New Delhi, India |
| Dr. Akash Davda | General Manager and Scientist, Gujarat Energy Research and Management Institute |
| Dr. Alok Sikka | Country Representative-India, International Water Management Institute |
| Mr. Amit Saraogi | CEO & Co-founder, Oorja Solutions |
| Mr. Atul Dhir | Objective Lead - RE, USAID South Asia Regional Energy Partnership (SAREP) |
| Bhikhubhai | Farmer, Paschim Gujarat Vij Company Ltd |
| Dr. D.K. Singh | Principal Scientist, Indian Agricultural Research Institute (IARI), New Delhi, India |
| Dr. Darshini Ravindranath | SoLAR Project Lead, International Water Management Institute |
| Dr. Deepak Varshney | Regional Researcher-Economics and Impact Assessment (ECA), International Water Management Institute |
| Ms. Divya Kashyap Sharma | Deputy Head of Cooperation, Swiss Agency for Development and Cooperation |
| Mr. Faiz Alam | Regional Researcher, International Water Management Institute |
| Ms. Geetu Joshi | Advisor, Ministry of Finance, Govt. of India |
| Mr. Hiran H Ganatra | Deputy Engineer, Paschim Gujarat Vij Company Ltd, Gujarat |
| Dr. J V Meenakshi | Senior Professor, Indraprastha Institute of Information Technology (IIIT), Delhi |
| Mr. Kanabhai | Farmer, Paschim Gujarat Vij Company Ltd |
| Dr. Manohara Khadka | Country Representative-Nepal, International Water Management Institute |
| Ms. Monali Zeya Hazra | Regional and Clean Energy Specialist, USAID |
| Mr. Manubhai | Farmer, Paschim Gujarat Vij Company Ltd, Gujarat |
| Mr. Nikunj Usadadia | Research Officer – Action Research, International Water Management Institute |
| Mr. Nilanjan Ghose | Senior Advisor, GIZ, New Delhi |
| Dr. P.C. Sharma | Joint Director, International Solar Alliance |
| Dr. Ratan Jain | Adviser (Groundwater), Gujarat Water Resources Development Corporation Limited, Government of Gujarat |
| Shri R J Vala | Chief Engineer, Paschim Gujarat Vij Company Ltd, Gujarat |
| Shri Santosh Rai | Senior Officer, Solar and Wind Energy, Alternative Energy Promotion Centre, Nepal |
| Dr. Saumava Dey | Assistant Professor, IIT-Delhi |
| Mr. Shilp Verma | Deputy Country Representative – India and Senior Researcher, International Water Management Institute |
| Ms. Suman Chandra | Deputy Secretary, Ministry of New and Renewable Energy |
| Dr. Sunil Kumar Ambast | Chairman, Central Groundwater Board |
| Dr. Tushar Shah | Scientist Emeritus, International Water Management Institute |
| Dr. Udham Singh Gautam | Deputy Director General, Agriculture Extension, Indian Council of Agriculture Research |
| Dr. Veena Srinivasan | Executive Director- WELL Labs, Bangalore |

