

Capacity-Building Workshop for Department of Agricultural Extension Personnel on Scaling Solar Irrigation in Rangpur, Bangladesh



Workshop Report

August 19–20, 2026

Additional Director's Office, Department of Agricultural Extension
Rangpur, Bangladesh

International Water Management Institute (IWMI)

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About

The Solar Energy for Agricultural Resilience (SoLAR) Phase 2 project builds upon learnings and experiences from Phase 1 of SoLAR (2019-2024) in South Asia while expanding its scope to East Africa through meaningful south-south collaborations. The program aims to strengthen the enabling environment and unlock investments for the sustainable scaling of socially inclusive and climate-resilient solar agri-tech solutions in South Asia (India and Bangladesh) and East Africa (Ethiopia and Kenya). Read more: www.solar.iwmi.org

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Front cover photo: A sub-assistant agricultural officer from the Rangpur region of Bangladesh presents her group activity during a workshop in Rangpur. (Photo: Tanmoy Bhaduri/IWMI)

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Highlights of the Workshop

- IWMI and DAE organized a two-day, hands-on capacity building event in Rangpur that combined technical instruction on solar irrigation pumping systems (SIPS) with a field visit to an operating installation in Kaunia Upazila, Rangpur, Bangladesh.
- Participants engaged directly with DAE's own technical cadre Agriculture Engineers and the Project Director (Solar) rather than external trainers, strengthening the extension system's internal capacity to sustain training beyond the project cycle.
- Group work and a discussion of challenges/opportunities surfaced with practical scaling obstacles (financing linkages, technician availability and farmer awareness) that DAE and SoLAR can address in future activities.
- A structured pre- and post-training evaluation was used to gauge knowledge gained, supporting evidence-based refinement of future modules.
- The training design targeted meaningful participation of women SAAOs (30% women representation).

Summary

Bangladesh is among the most irrigation-dependent agrarian economies in South Asia, with over 7.9 million hectares of irrigated land served largely by diesel-powered groundwater pumps that account for close to 16% of national diesel consumption. Rising fuel prices, energy insecurity, and climate impacts on water availability have made the shift to renewable energy-based irrigation a national priority. Solar Irrigation Pumping Systems (SIPS) have expanded rapidly over the past decade under the Infrastructure Development Company Limited (IDCOL) and the Sustainable and Renewable Energy Development Authority (SREDA), with over 1,500 solar pumps installed nationally, concentrated in the drought-prone northwest and southern coastal zones.

Despite this progress, adoption remains constrained by limited farmer awareness, weak financing linkages, and a capacity gap among the DAE's frontline workforce more than 13,000 Sub-Assistant Agricultural Officers (SAAOs) who are the primary point of contact for smallholder farmers. This workshop was the first in-person session of a multi-tier capacity building workshop, implemented under the SoLAR (Solar Irrigation for Agricultural Resilience) Phase II project, designed to build DAE personnel's competency in solar irrigation extension, farmer mobilization, technology facilitation, and institutional linkage.

The Rangpur workshop brought together SAAOs and Agriculture Engineers from solar irrigation implementation sites across the northern region (8 Upazila/sub-division), alongside representation from NGOs (ESDO Foundation and RDRS Foundation). The training workshop overall reached 30 participants spanning 3 districts (Rangpur, Lalmonirhat and Kurigram), with 30% women's participation.

Workshop Objectives

- Enhance knowledge of solar irrigation technologies, components, and system operations among DAE extension officers.
- Build practical skills for field-level demonstration, farmer advisory, and site assessment for solar pump installation.
- Strengthen linkage-facilitation capacity to connect farmers with IDCOL, BADC, commercial banks, and microfinance institution (MFI) financing windows.
- Develop communication and behaviour-change skills to promote technology adoption among smallholder and marginal farmers, including women and youth.
- Equip participants with monitoring and reporting tools for tracking solar irrigation adoption in their coverage areas.
- Introduce gender-responsive extension approaches to ensure the inclusion of women farmers in solar energy practices.

Sessions

Session 1: Foundations of Solar Irrigation Technology (Day 1, morning)

- Key points discussed: IWMI Bangladesh's ongoing activities and the prospects of solar irrigation; objectives of the SoLAR Phase II capacity building workshop; the irrigation landscape and solar opportunity in Bangladesh; types of solar panels and the benefits of solar irrigation; components of solar pumps and types of pumps and motors; and the criteria used to select solar pumps and plan system installation.
- Methods used: Online briefings, an inaugural address, lecture and PowerPoint presentations, and a pre-training evaluation using self-assessment forms.
- Resource persons included IWMI's Bangladesh Country Focal Point and SoLAR Project Country Lead, DAE's Additional Director (Rangpur), Deputy Director (Rangpur Head Office), the Project Director (Solar), and two district Agriculture Engineers with technical and irrigation experience.

Session 2: Operations, Maintenance and Scaling Challenges (Day 1, afternoon)

- Key points discussed: Solar irrigation structure and pump maintenance, including common technical problems and their solutions; and the challenges, opportunities, and scaling obstacles facing solar irrigation adoption in DAE's coverage areas.
- Methods used: Lecture and PowerPoint presentation, followed by a facilitated group discussion.
- Group work and recap: Participants worked in six groups to analyze scaling obstacles and presented their findings in five-minute group presentations, followed by a group reflection to close Day 1.

Session 3: Irrigation System Design and Inclusive Energy Use (Day 2, morning)

- Key points discussed: Irrigation system types buried pipe, groundwater, and surface-water irrigation; and alternative uses of solar energy, water-saving technologies (AWD), and approaches to inclusive solar irrigation system design.
- Methods used: Lecture and PowerPoint presentation delivered by DAE's Project Director (Solar) and the SoLAR Project Country Lead.

Session 4: Field Visit to Kaunia Upazila, Rangpur (Day 2, afternoon)

- Key points discussed: Direct observation of an operating solar irrigation installation, with interaction between participants, farmers, the landowner, and the system operator.
- Methods used: Site visit and structured interaction, followed by a facilitated question-and-answer session to capture observations, learnings, and reflections.
- Analysis and closing: A post-training evaluation was administered to measure knowledge gained, and the training closed with remarks from DAE's Additional Director, Rangpur.

Lessons Learned

- Pairing classroom instruction with a field visit to a working installation strengthened participants' practical understanding of pump selection, maintenance, and troubleshooting more than lecture sessions alone.
- Group-based analysis of scaling obstacles was an effective way to surface locally specific barriers such as financing access and after-sales technician availability that a standard lecture format would not have captured.
- Using DAE's own Agriculture Engineers and the Project Director (Solar) as trainers, rather than relying solely on external experts, helped build ownership and left DAE better placed to repeat similar sessions independently in future.

Action Plans and Follow-Up

Findings from the group discussion on scaling obstacles will be compiled and shared with DAE in an issue brief form from the SoLAR Project team to inform the design of future implementation plans.

Gender and Youth Related Achievements

The training was designed with an explicit target of approximately 30% women's participation, recognizing that women and youth are often underrepresented in technical agricultural extension training despite their central role in on-farm decision-making.

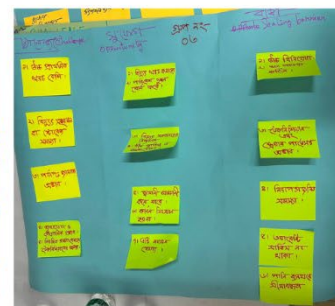
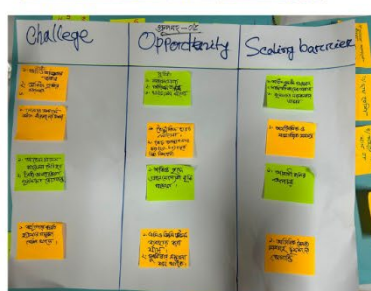
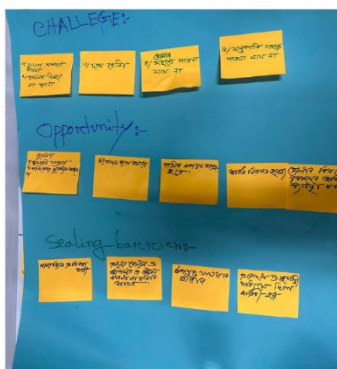
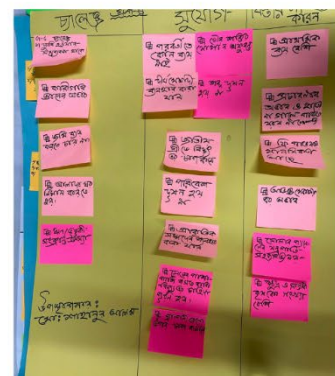
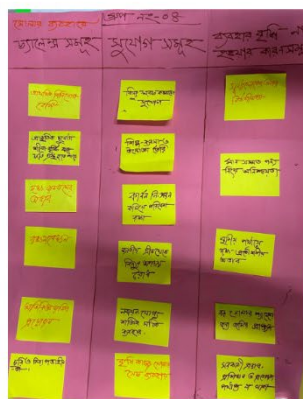
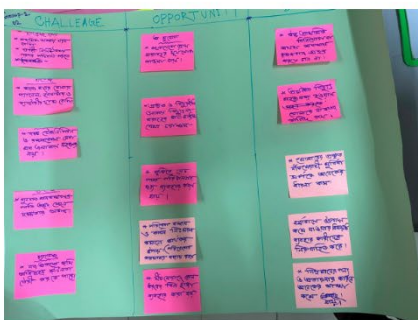
Recruitment of trainees for the Rangpur batch prioritized SAAOs from solar irrigation implementation sites who could bring practical field experience back to their coverage areas, with attention to gender balance in the final participant list.

Participation by gender: 9 female and 21 male participants.



A structured pre- and post-training evaluation was used to gauge knowledge gained, supporting evidence-based refinement of future modules.

Photo: Tanmoy Bhaduri/IWMI



Participants identify challenges, scaling barriers and opportunities for promoting solar energy to strengthen agricultural resilience during a group activity in Rangpur, Bangladesh.

Photo: Tanmoy Bhaduri/IWMI

Appendices

Appendix A: Detailed Training Schedule

Day 1 – August 19, 2026

Time	Session Topic	Method	Resource Person
9:00–9:30	Registration of participants	Filling forms	IWMI
9:30–9:35	IWMI Bangladesh activities and prospects of solar irrigation	Online presentation	Shreya Chakraborty, Country Focal Point, IWMI Bangladesh
9:35–9:45	About SoLAR Phase II and objectives of the capacity building workshop	Online presentation	Jayanta Bhattacharya, Associate Scientist – Solar Energy and Climate Resilience, and Country Lead for SoLAR Project, Bangladesh
9:45–10:15	Inauguration; Irrigation landscape and solar opportunity in Bangladesh	Address	Md. Sirajul Islam, Additional Director, DAE, Rangpur
10:15–10:30	Pre-evaluation of the training workshop	Self-assessment forms	Jayanta Bhattacharya
10:30–11:15	Solar irrigation, types of solar panels and benefits of solar irrigation	Presentation (PPT)	Md. Abdul Aziz Sarkar, Agriculture Engineer, DAE, Rangpur
11:15–11:30	Tea break		
11:30–12:30	Components of solar pumps, types of pumps and motors	PPT	Md. Helalur Rahaman, Agriculture Engineer, DAE, Narail
12:30–13:15	Selection criteria for solar pumps and system installation	PPT	Ashok Kumar Biswas, Project Director (Solar), DAE
13:15–14:00	Prayer and lunch		
14:00–15:00	Solar irrigation structure, pump maintenance, common problems and solutions	PPT	Md. Sadrul Alam Sarkar, Agriculture Engineer, DAE, Rangpur
15:00–16:00	Challenges, opportunities and scaling obstacles for solar irrigation	Group discussion	Jayanta Bhattacharya
16:00–16:15	Tea break		
16:15–16:45	Group presentations (6 groups, 5 minutes each)	Presentation	Jayanta Bhattacharya
16:45–17:00	Day 1 wrap-up and reflection	Group reflection	Ashok Kumar Biswas,

Day 2 – August 20, 2026

Time	Session Topic	Method	Resource Person
9:00–10:00	Irrigation systems: buried pipe, groundwater and surface-water irrigation	PPT	Ashok Kumar Biswas
10:00–11:00	Alternative use of energy, water-saving technology and inclusive solar irrigation systems	PPT	Jayanta Bhattacharya
11:15–14:00	Field visit to Kaunia Upazila, Rangpur	Interaction with farmers, landowners and pump operators	Participants
14:00–15:00	Prayer and lunch		
15:00–16:30	Field visit observations, learnings and reflections; post-evaluation	Q&A, discussion, evaluation forms	Jayanta Bhattacharya
16:30–17:00	Wrap-up and closing of the training session	Closing remarks	Md. Sirajul Islam

Appendix B: List of Participants

Sl. No	Name	Designation	Organisation	Location
1	Md. Sirazul Islam	Additional Director	DAE	Rangpur
2	Sayada Sifat Zahan	Deputy Director	DAE	Rangpur
3	Ashok Kumar Biswas	Focal Person, SIP	DAE	Dhaka
4	A.M.Helalur Rahman	Agriculture Engineer	DAE	Narail
5	Md. Abdul Aziz Sarkar	Agriculture Engineer	DAE	Rangpur
6	Md. Sadrul Alam Sarkar	Agriculture Engineer	DAE	Rangpur
7	Jayanta Bhattacharya	Associate Scientist	IWMI	Dhaka
8	Tanmoy Bhaduri	Communication Specialist	IWMI	New Delhi
11	Md. Masud Rana	SAAO	DAE	Hatibandha
12	Md. Golam Rabbani	SAAO	DAE	Hatibandha
13	MST. Tanjila Akter	SAAO	DAE	Hatibandha
14	Md. Abdus Sattar	SAAO	DAE	Gangacheria
15	Md. Rezaul Karim	SAAO	DAE	Pirganj
16	Shanto priya	SAAO	DAE	Pirganj
17	Most. Selina Khatun	SAAO	DAE	Pirganj
18	Md. Lelin pathan	SAAO	DAE	Priganj
19	Md. Shohidul ISLAM	SAAO	DAE	Bhurungamari
20	Najmin Aktar	SAAO	DAE	Bhurungamari
21	Md. Shahanur Alam	SAAO	DAE	Bhurungamari
22	Khondokar Mosharaf	SAAO	DAE	Nageshwari
23	Md. Rashedul Hoque	SAAO	DAE	Nageshwari
24	Md. Shekhdar? [unclear]	SAAO	DAE	Pirganj
25	Md. Alamin Islam	CMD-General	RDRS	Rangpur
26	Md. Akhter Jamil	SAAO	DAE	Nageshwari
27	Md. Anisul Haque Kokhon	SAAO	DAE	Nageshwari
28	Mst. Julekha Akhter	SAAO	DAE	Pirganj
29	Md. Jamul Islam Sarkar	SAAO	DAE	Pirgachha
30	Md. Mohidul Islam	SAAO	DAE	Patgram
31	Md. Mizanur Rahman	SAAO	DAE	Patgram
32	Md. Shadimor Rahman	SAAO	DAE	Patgram
33	Mst. Farjana Akter	SAAO	DAE	Nageshwari
34	Shaymole Rani Biswas	SAAO	DAE	Fulbari
35	Beauty Rani Bairingee	SAAO	DAE	Lalmonirhat
36	Md. Shobikul Islam	SAAO	DAE	Lalmonirhat
37	Md. Farhad Hossain	SAAO	DAE	Lalmonirhat
38	Ferdous Islam Nur Alam	SAAO	DAE	Lalmonirhat
39	Md. Reazul Islam	SAAO	DAE	Fulbari
40	Md. Ashaduzzaman	SAAO	DAE	Fulbari



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