



# 1<sup>st</sup> Project Steering Committee Meeting

**Dr. Darshini Ravindranath**  
Project Lead, SoLAR  
International Water Management Institute (IWMI)

**Dr. Muluken Adamseged**  
Deputy Project Lead, SoLAR  
International Water Management Institute (IWMI)

November 27, 2025  
New Delhi, India

[solar.iwmi.org](http://solar.iwmi.org)





# AGENDA

Time	Session	Facilitator
2:00 – 2:10	Welcome	Ms. Mirjam Macchi Howell Head of the Climate, Disaster Risk Reduction and Environment, SDC
2:10 – 2:20	Remarks by PSC Co-chair	Dr. Vidhisha Samarasekara Program Director- Water-Climate Change and Resilience, IWMI (On behalf of Dr. Mark Smith, DG, IWMI)
2:20 – 2:30	Introduction	All
2:30 – 2:40	SDC Phase 1 Learnings	Dr. Darshini Ravindranath Project Lead, SDC-SoLAR, IWMI
2:40 – 3:10	SDC Phase 2 overview	Dr. Darshini Ravindranath Project Lead, SDC-SoLAR, IWMI and Dr. Muluken Adamseged Deputy Project Lead, SDC-SoLAR, IWMI
3:10 – 3:30	Reflections from the field	All partners
3:30 – 4:00	Discussion on future steps	All

# MEMBERSHIP



**Ms. Mirjam Macchi Howell**

Head of the Climate, Disaster Risk Reduction (DRR), and Environment (CDE), SDC  
Co-chair



**Mark Smith**

Director General, IWMI  
Sri Lanka  
Co-Chair



**P C Sharma**

Joint Director,  
International Solar Alliance  
Global,  
Member



**Eng. Vincent Kabuti**  
Irrigation Secretary -  
State Department for  
Irrigation, Kenya



**Suman Chandra (IAS)**

Director,  
Ministry of New and  
Renewable Energy,  
Government of India



**Md. Sarwar Hossain**

PD (SIP) & Deputy Chief  
Engineer  
Bangladesh Agricultural  
Development Corporation  
Bangladesh, Member



**Elias Awol**

CEO, Smallholder Irrigation  
Development  
Ministry of Agriculture  
Ethiopia  
Member



**Divya Kashyap**

Deputy Head of  
Cooperation  
SDC  
India  
Member



**Darshini Ravindranath**

Project Lead  
IWMI  
India  
Member



**S. M. Monirul Islam**

Deputy CEO and CFO,  
Infrastructure Development  
Company Limited (IDCOL)  
Bangladesh  
Member



# THE CO-OPTED MEMBERS OF PSC WILL BE:

**Vidhisha**

Program Director,  
IWMI  
UK



**Alok Sikka**

Country Representative,  
IWMI  
India & Bangladesh

**Muluken Adamsegad**

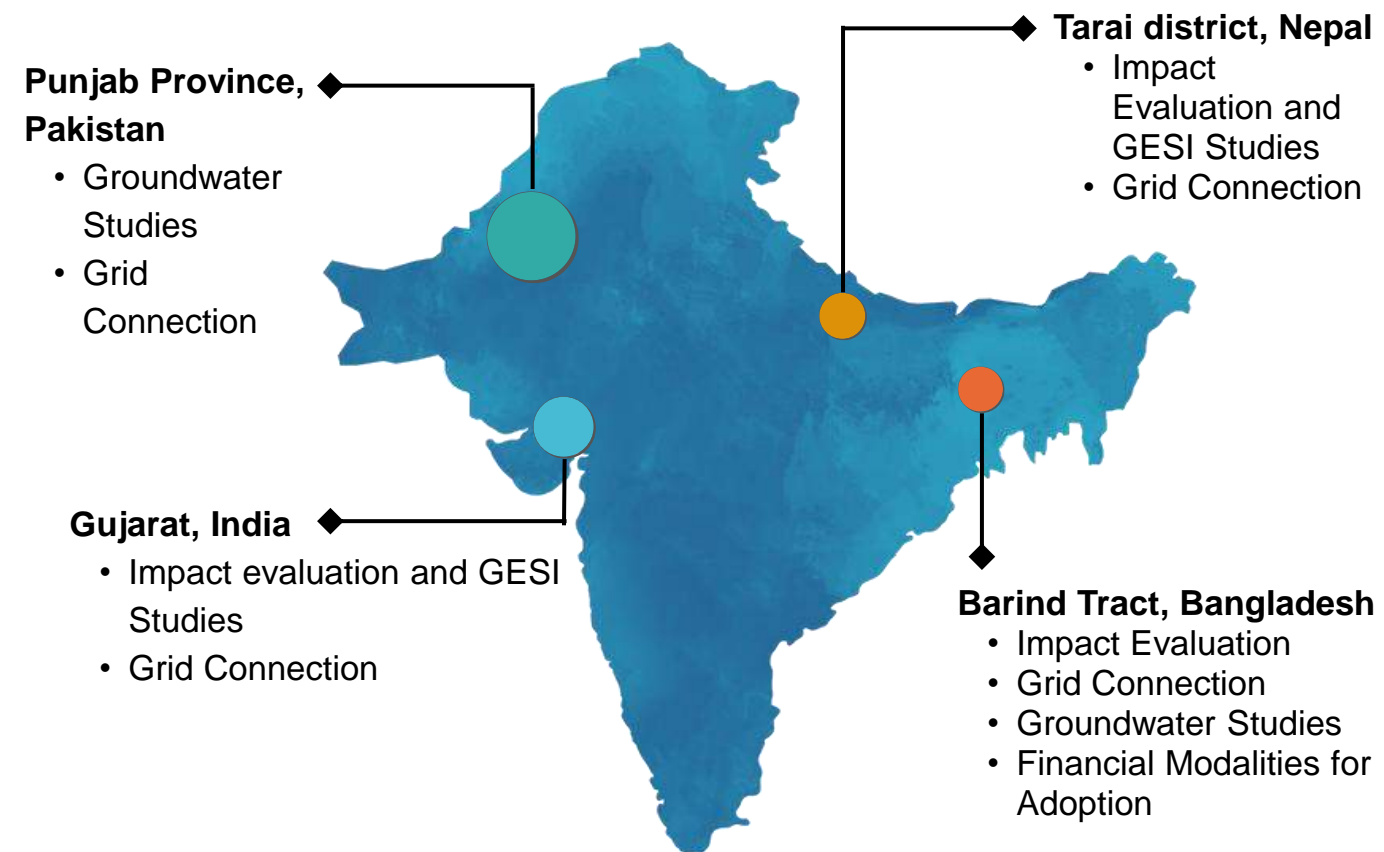
Deputy Project Lead,  
IWMI  
Ethopia



**Abdulkarim Seid**




Country Representative,  
IWMI  
Ethopis & Kenya

# Learnings from Solarising Irrigation in South Asia (Dec 2019 - May 2025)



**Fig:** SoLAR project locations in South Asia

## Goal

-  Producing robust **empirical evidence** to inform the creation of climate-resilient, gender-equitable, socially inclusive, and groundwater-responsive solar irrigation policies.
-  Testing and **validating innovative strategies** and interventions that advance sustainable and inclusive scaling of solar irrigation.
-  Enhancing **national and global knowledge and capacity** to design and implement solar irrigation policies and practices.

## Key impact

### Gender-Inclusive Solar Irrigation



Advocated for gender-sensitive policies and piloted financial models to ensure equitable access to SIPs for women farmers and marginalized groups.

Introduced micro-financing, grant-based investments, and First Loan Default Guarantee to enhance SIP accessibility, reducing financial barriers for smallholder farmers.



### Innovative Financing Models

### Sustainable, Climate-Resilient Agriculture



Advocated for solar-powered irrigation to replace diesel systems, leading to lower CO<sub>2</sub> emissions, groundwater conservation, and high-value crop adoption through region-specific irrigation strategies.

Piloted first of its kind grid connected SIPs and net metering and surplus electricity sales, enabling farmers to generate additional income while encouraging responsible groundwater use.



### Grid-Connected Solar Irrigation

### Capacity Building & Knowledge Sharing



Strengthened technical skills and system maintenance through GERMI training programs, field visits, and collaborative learning, ensuring the long-term sustainability of SIP adoption across regions.



# Driving Policy Changes in South Asia (2019 - 2025)



In **India**, our findings have been shared with MNRE and are expected to influence the design of PM-KUSUM 2.0 in 2027.



In **Nepal**, AEPC will revise its subsidy disbursement criteria in favour of women and small farmers and first grid-connected solar irrigation pilot was established via a net-metering agreement.



In **Bangladesh**, using evidence from our pilots, IDCOL have approved 56 new SIPs, of which 39 sites will be connected to the grid.



In **Pakistan**, web-based modules for solar suitability mapping and a solar irrigation pump sizing tool have been developed and extended to three provinces.

## Key learning

- 1 SIPs support **climate mitigation and adaptation by reducing diesel use** and helping farmers cope with rainfall variability—without notably increasing groundwater use.
- 2 Diverse business models, including **grid integration pilots and innovation funds**, offer scalable solutions across different agro-economic contexts.
- 3 Policy advocacy has made **solar programs more inclusive** and effective.
- 4 Community involvement and **targeted capacity building, especially for women**, have strengthened technical ownership and advanced gender and social inclusion (GESI).

## Partners



## Beyond Project Countries: South-South Learning

*The team was approached by the BTF to assist in implementing two solar lift irrigation systems in Bhutan, which was successfully completed with additional support from SDC.*





# Achievements



## Farmer Income

- In India (Rajasthan, Gujarat) 27% rise in farm income and USD 125/year saved on diesel costs as a result of SKY
- ~25% higher Boro profits in Bangladesh (USD BDT/acre) following introduction of SIPs



## Water Saving

- In India-600 mm/year less water pumped by grid-SIP users. 14% energy use reduction reported by SKY farmers
- Lower groundwater abstraction in Pakistan due to SIP capacity limits



## GHG Mitigation & Energy Efficiency

- ~2.8 tCO<sub>2</sub>/year avoided per SIP (India)
- 61% (rice) & 44% (wheat) reduction in use of diesel for pumping (Nepal)



## Capacity Building & Outreach

- Project outreach to around 36,000 people
- Around 5000 benefitted from pilot studies and GESI-focused awareness activities.
- More than 20 trainings conducted including ~3500 farmers, ~300 technicians (~30% women) and policymakers



*Having access to these portable micro-solar irrigation pumps has freed up some of our time. For example, I used to take my cattle to the river to bathe, but now I can use pumped water. This means women like me can shift more of our time from domestic work to economic activities.*



**Mariam Bibi (30)**

*Agricultural worker, Kayumer Char, Fulchari, Gaibandha District, Bangladesh*



*Photo: Tanmoy Bhaduri/IWMI*





## SoLAR Program Innovations

- Strong partnerships with agencies in country to support in strategy and capacity building activities
- Regular consultation with government through CPMC meetings, national and regional forums
- Scalable, data-informed decisions and policy linkages
- Inclusive Capacity building
- Build national systems for long-term data and tool ownership.
- South-South knowledge exchange



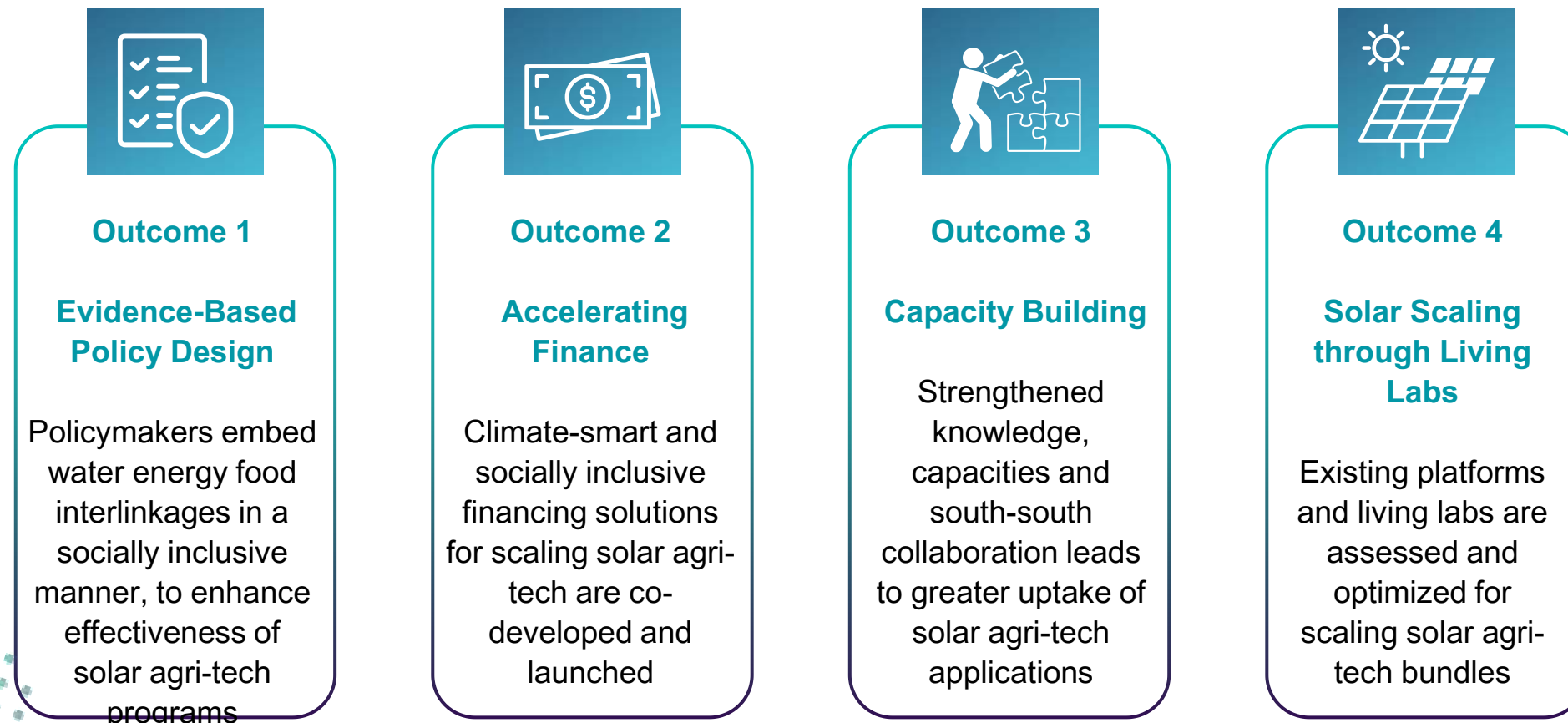
# Expanding Impact through South-South Collaboration

Building on key learnings from Phase 1, the goal of Phase 2 (July 2025- Dec 2028) is to **strengthen the enabling environment for promoting socially inclusive and climate-resilient solar energy systems in agricultural settings across South Asia and East Africa.**

**Phase 2** will directly benefit vulnerable populations in **India, Bangladesh, Ethiopia** and **Kenya** by enhancing energy and water security, supporting agricultural emissions mitigation, and boosting adaptive capacities and climate resilience.



*Proposed SoLAR project locations in South Asia and East Africa.#*

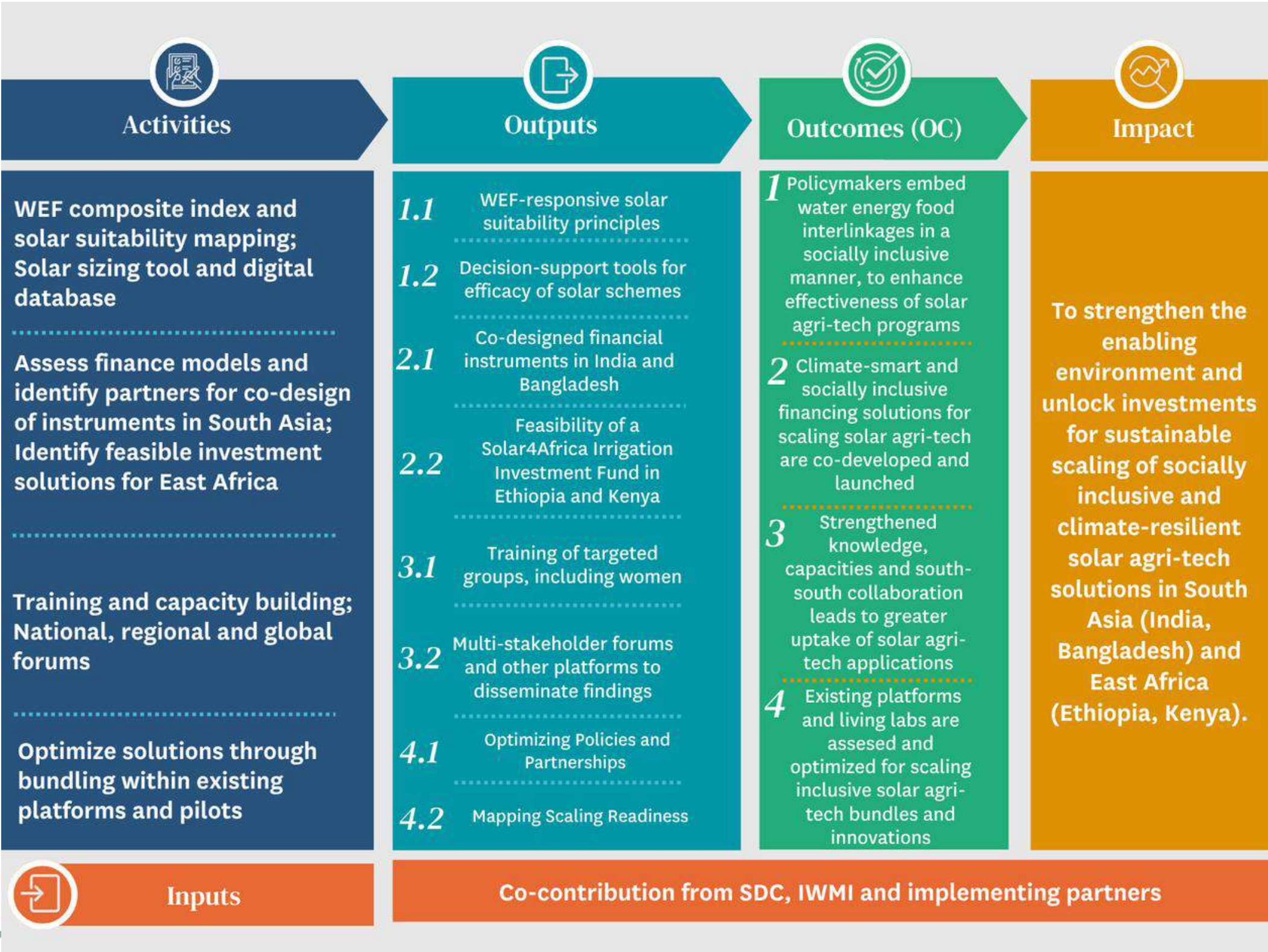


*Photo: SunCulture*

# The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by IWMI, CGIAR, our partner institutions, or donors.



# Theory of Change: SoLAR Phase 2 (July 2025 - Dec 2028)



## Level and Target of Intervention

- 1 Macro Level**  
Influence policies and institutional practices of government organizations—our direct beneficiaries—in India, Bangladesh, Ethiopia, and Kenya.
- 2 Meso Level**  
Collaborate with partner-led projects to validate and adapt approaches at the regional or district level.
- 3 Micro Level**  
Implement research, demonstration, and capacity-building activities with farmers, solar technicians, and local businesses.
- 4 Target Groups**  
Government organizations (primary), with indirect benefits extending to farmers, service providers, and the private sector through improved implementation and outreach.



# Outcome 1: Evidence-based Policy Design

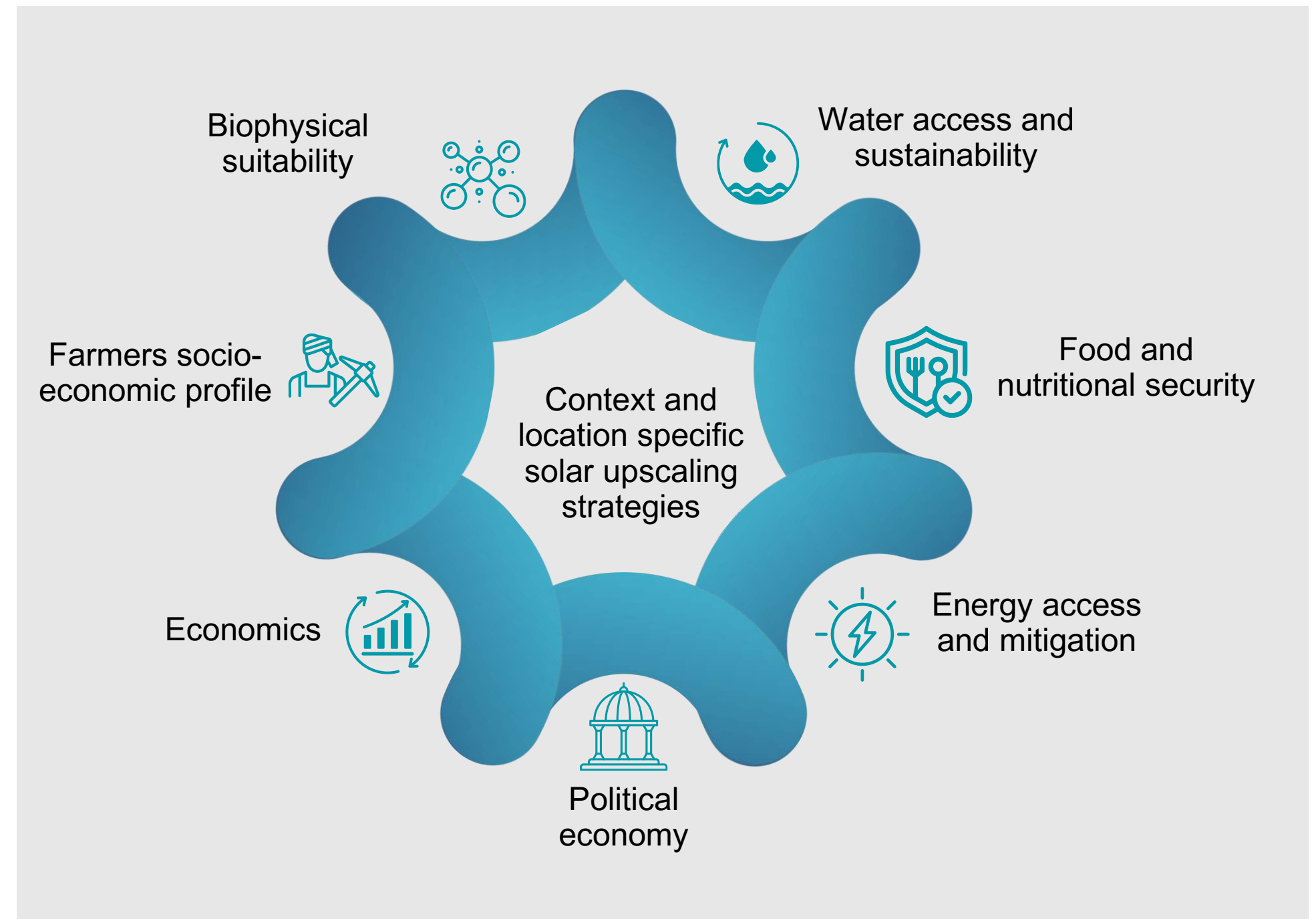
**WEF responsive digital tools and methodologies developed to enhance efficiency and effectiveness of policies and programs for solar energy promotion**

**Output 1.1:** Assess the impact of solar energy use on food security, nutritional security, livelihoods, climate resilience and groundwater resources.

A first of its kind **Water-Energy Food-Solar Suitability (WEF-SS) composite index** for India, Bangladesh, Ethiopia and Kenya that supports identification of context-specific priority options for regions.

**Output 1.2:** Design SIP Sizing Tools and digital database providing data to decision-makers to improve efficacy of solar schemes.

A jointly developed digital platform, **SIP Sizing tool** and **‘User Manual’** for wider use and application – with government and private sector stakeholders, building on IWMI’s existing work in East India (supported by GIZ).





## Outcome 2: Accelerating Finance

**Climate-smart and socially inclusive financing solutions are recommended for scaling of solar energy systems for agriculture**

**Output 2.1:** Identify and validate financial instruments and incentives to improve equitable access to technology, finance, and markets in India and Bangladesh, including:

- Assessments of **promising financial market and non-market-based instruments/business** models for increasing access and use of solar for different stakeholders. E.g. pay-as-you-go model, earn first-pay later model, revolving fund for loans, credit facilities, mobile SIPs with irrigation service providers etc.
- Co-design **bespoke climate-smart financial instruments/business models** alongside partners [e.g. with NABARD, IDCOL, Oorja] and **develop an implementation plan.**

**Output 2.2:** Assess the feasibility of Solar4Africa Irrigation Investment Fund in Ethiopia and Kenya

Market Scoping and Final East Africa Investment and Financing Landscape Assessment Report for Irrigation, and a Final Investment Solution Feasibility Report [working alongside existing investment funds such as SunFunder].



*Photo: Jeffery M Walcott/IWMI*



## Outcome 3: Capacity Building

**Strengthened knowledge, capacities and south-south collaboration leads to greater uptake of solar agri-tech applications.**

**Output 3.1:** Targeted groups, including women, are trained on tools created  
: Farmers, implementing officials and local technicians.

- Identification of extension agents and technicians at different scales
- Training and curriculum development for extension agents
- Policy briefs developed

**Output 3.2:** Multi-stakeholder forums and other platforms held to disseminate findings across all target countries .

- National and Global forums
- Policy Hackathons, where necessary, for small conceptual policy brainstorming
- South-South knowledge exchange/key partner meet-ups



Photo: NGO Forum for Public Health



## Outcome 4: Piloting and Validating

**Solar energy innovations are validated and optimized through existing platforms and living labs**

**Output 4.1:** Validating and testing of new tools and services and products in a real-life context.

Linked to OC1 and OC2, working alongside existing initiatives, and placing citizens at the heart of innovations, test and validate concepts with key stakeholders, particularly focusing on women and marginal farmers.

**Output 4.2:** Scaling Readiness and Scaling Pathways.

Linked to OC1 and OC2, identify actors, partnerships, resources, and specific interventions required to move from pilot or small-scale use to broader, sustainable implementation. It uses previous outputs for example Solar suitability index from OC1.









Photo: Tanmoy Bhaduri/IWMI



# GESI Strategy for SoLAR Phase II

While Phase I achieved notable progress, persistent **Gender Equality and Social Inclusion (GESI)** barriers remain:

-  Limited land and asset ownership among women and marginal farmers
-  Technology inaccessibility
-  Exclusion from credit, subsidies, and market access
-  High unpaid labor burden and restricted mobility for women
-  Gender-blind design of solar and agri-tech tools
-  Underrepresentation in planning and governance

Phase II embeds **GESI as a core principle**, ensuring equitable participation of **women, youth, indigenous, and marginalized farmers**. The strategy adopts a **flexible, country-responsive approach** tailored to local socio-economic, environmental, and gender contexts, promoting **actionable, intersectional, and context-specific inclusion** across all project components.



*Photo: Tanmoy Bhaduri/IWMI*



# Vision and Objectives

## Vision

A future where women, youth, and marginalized communities are active agents and equitable beneficiaries of solar agri-tech solutions

**Expected program Impact: 50,000 women & marginal farmers benefit from solar technologies with 35% increase in farm income.**

## Objectives

1. Ensure policies and finance mechanisms integrate and mainstream GESI considerations.
2. Enhance access to solar technologies for marginalized groups
3. Strengthen inclusive capacities and leadership

## Outputs

- 4 inclusive agri-tech business cases/ Policy briefs (1 per country)
- Financial instruments are co-developed to improve equitable access to 40% towards technology, finance, and markets in India and Bangladesh
- National dashboards have GESI integrated in the design-developed and operational in selected countries.
- 600 smallholder farmers, including marginalized groups have access to formal financial services for SESA in Ethiopia
- 5,000+ women and youth trained. 30% GESI participation in trainings and pilots. Additional 6000 women reached through video and mobile-based training materials in India, Ethiopia, and Kenya.
- 4 GESI inclusive training modules developed, incorporated by at least four government and/or private sector implementing agency (one in each country)
- At least 75 women farmers get access to SESA through bundling pilots in Ethiopia and Kenya. At least 200 farmers in India and Bangladesh adopt water efficient practices



# Strategic Pillars for GESI

		Strategic Approach	Actions/Tools
	<b>Inclusive Policy &amp; Governance</b>	Embed GESI in solar and agriculture policies, standards, and allocation criteria	GESI-responsive policy brief; PM-KUSUM allocation revision; GESI-integrated WEF-SS maps
	<b>Equitable Finance Access</b>	Develop accessible, inclusive financing models and de-risking instruments	PAYGO, PAY-OWN models, and blended finance; Bundled insurance-credit tools; Targeted subsidy design with GESI scorecards
	<b>Capacity &amp; Agency Building</b>	Empower women, youth, and marginal groups through training, tools, and leadership opportunities	ToT programs for women; Training modules; Partnerships with rural livelihoods, entrepreneurship, and extension platforms
	<b>Inclusive Technology Pilots</b>	Prioritize pilots that meet the needs of women and marginalized groups	Living labs with 30% women participation; Bundled agri-tech for women's tasks (dryers, storage)
	<b>Data, Learning &amp; Accountability</b>	Track GESI progress with data and participatory learning	Gender-sensitive evaluations; Disaggregated MEL indicators; Case studies



# Country Specific Plans



# Bangladesh

Activities/Plan	2025-2026	2027	2028	Expected Results
<b>Outcome 1</b>				
Design WEF-responsive solar suitability ‘principles’; decision support tool for policymakers	Report on WEF index to assess the impact of different solar interventions; training on SIP sizing tool	WEF-SS maps using by partners, develop user manual, WEF principles using by ministry or implementing organization	Evaluate trade-off using WEF on solar irrigation models & policies Training on decision support tool	At least 2 partners and 5,000 people using WEF-SS map; Research paper/Policy brief on WEF-SS composite maps & integration WEF solar mapping
<b>Outcome 2</b>				
Accelerating finance through financial instrument and co-developed access to technology, finance & Market	Analyse scalability of solar business models on access for women, smallholder & marginal farmers	Feasibility study on market- based models with recommendation for scaling of SESA	Report on choice experiment on institutional & financial models for SIPs; alternative approaches for increasing return on solar investments and identifying policy actions	1 financial instrument adopted for implementation 40% target group benefitted including women, smallholder & marginal farmer & increasing farm income
<b>Outcome 3</b>				
Targeted groups, including women, are trained on tools created; Multi-stakeholder forums and other platforms to disseminate findings	Develop training module for scaling solar energy & inclusive community managed SIP systems	1 Trainings by DAE officials, extension agents Organize national and regional policy forums for disseminate findings	Scaling brief and roadmap from regional and global events	At least 50 officials trained One events trained 100 participants for govt. Officials & extension agents
<b>Outcome 4</b>				
Scaling SIPs through bundling innovations and validated through existing platforms and living labs	Piloting bundled AWD solutions for SIPs using groundwater with alternative incentive mechanisms	Piloting SIP financial model at least 2 locations with appropriate stakeholders, policy brief on pathways for carbon financing	Assessment of bundling SIPs with AWD effect on irrigation behaviour, ground water use & productivity	1000 farmer adopt AWD practice bundling with SIPs, 10% farmer reduction ground water use and increase productivity by 15%



# Inception Workshop in Bangladesh



***Stakeholders from Government, Private Sector, Researchers, Extension Agents, Policy Makers, Donors were present in Inception Workshop in Bangladesh on 27 October 2025. The participants focus on scaling strategy of Solar Irrigation through Govt. Agencies and private energy sectors which may role to lead expansion of solar irrigation, reduce ground water extraction and pathways for carbon financing.***



# India

Activities/Plan	2025-2026	2027	2028	Expected Results
<b>Outcome 1</b>				
Design WEF-responsive solar suitability 'principles'; decision support tool for policymakers	<ul style="list-style-type: none"> <li>Report on Composite WEF (Water-Energy-Food) index to assess the impact of different solar and associated WEF interventions, accounting for climate change, across sectors.</li> <li>Context specific solar irrigation suitability maps, using (Website visit and sign-ups) using WEF-SS maps</li> </ul>	<ul style="list-style-type: none"> <li>WEF composite index and/or its 'principles' adopted by a ministry/implementing organization.</li> <li>A fully functional online solar sizing tool and user manual tailored to the specific country contexts, and usable by end users, implementors and policymakers.</li> </ul>	<ul style="list-style-type: none"> <li>Field evidence on how these diverse solar irrigation models influence farmers' behavior</li> <li>Official reports by government and private sectors showing the integration of the WEF solar mapping.</li> <li>Number of partners (direct govt and non govt partners) using online solar pump sizing tool (Website visit. signups)</li> </ul>	At least 2 partners and 5,000 people using WEF-SS map; Research paper/Policy brief on WEF-SS composite maps & integration WEF solar mapping
<b>Outcome 2</b>				
Accelerating finance through financial instrument and co-developed access to technology, finance & Market	<ul style="list-style-type: none"> <li>Number of financial instruments developed, partnerships built and social inclusion targeted</li> <li>Identify and engage to build partnerships in India with SRLMs and FPOs.</li> </ul>	Report analyzing proportion of women, smallholders, and marginalized groups with better access and affordability to SESA	A report presenting results of the choice experiment on institutional and financial models for SIP Reports documenting impacts of adoption of SIPs. Business models studied	2 financial instruments and atleast 35% inclusion of marginalized groups
<b>Outcome 3</b>				
Targeted groups, including women, are trained on tools created; Multi-stakeholder forums and other platforms to disseminate findings	Training module for energy extension agents (KUSUM-Mitra) Policy brief based on the pilot's findings, develop a comprehensive roadmap to institutionalize the KUSUM-Mitra model	Produce a final impact assessment journal article detailing the causal effects of the energy extension agent model on solar demands	Gender disaggregated Impact study data. Including % increase in income levels, diversified livelihoods, improved food security, and reduction in emissions compared to farmers who have not adopted SESA.	Outreach to 19200 farmers, 10% adoption of SIPs by farmers
<b>Outcome 4</b>				
Scaling SIPs through bundling innovations and validated through existing platforms and living labs	A policy review on rules and regulations for solar system sustainability, after-sales service, and e-waste management Report on assessment of how bundling SIPs with water-efficient technologies affects farmers' irrigation behavior, groundwater use, and crop productivity	Data generated from scaling activities on a) how many solar users adopt water efficient practices and b) how many new farmers get access to SIPs through pilot models and other scaling support activities	Assessment of bundling SIPs with AWD effect on irrigation behaviour, ground water use & productivity	At least 1000 farmers in India adopt water efficient practices bundled with SIPs through the pilot studies showing at least a 20% improvement in water-use efficiency among participating farmers.



# Community-Based Solar Lift Irrigation: A tribal women-led SHG model in India

**Context:** A pilot intervention targeted two tribal-dominated villages, where over 75% of farmers—economically poor and reliant on rainfed agriculture—lacked access to reliable irrigation, limiting crop diversification and productivity.

**Intervention type:** Community-based Solar Lift Irrigation

**Business models piloted:** 1) Earn First, Pay Later, 2) 10% Upfront Cost, with recovery through water sales.

**Institutional structure:** Water User Associations with women farmers were formed. 15 members in Kevlari and 13 members in Chimkatola.

**Preliminary results:** Each WUA saved over INR 10,000 (USD 115) from water sales. Farmers shifted cropping patterns toward more profitable crops like wheat and vegetables.

**Behavioural Change:** Initially hesitant to invest or take loans, the women farmers are now leading efforts on a solar-powered mini-rice mill for off-season income.



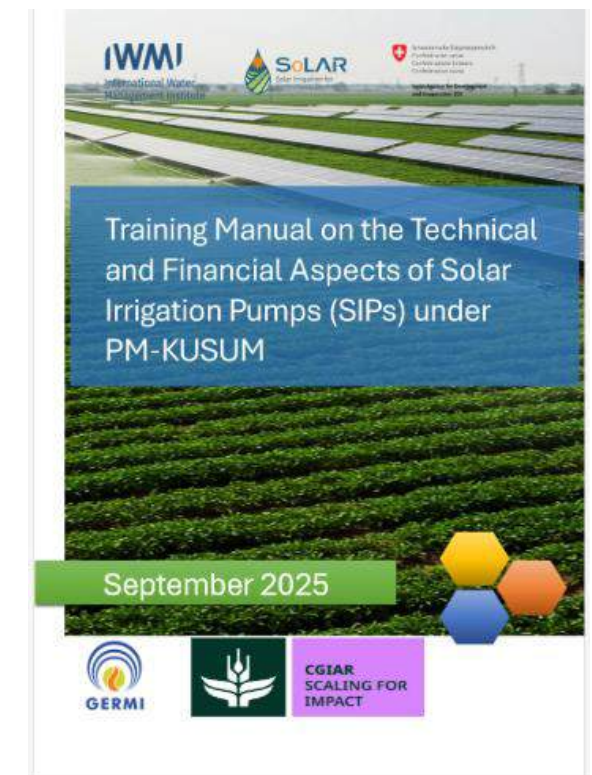


# India focus in 2025

## Publications

- Training Material on Extension agent and CSC workers- for publication
- Scaling Solar Irrigation through Grassroot Institutions: Meta-Analytic Evidence and Pathways for Inclusive Delivery – Submitted to Energy policy

## Capacity Building for EEAs for Inclusive Solar Irrigation Adoption under PM-KUSUM'



On 23-24 September, workshop organized at ICAR-IISR, Lucknow that brought together 30 EEAs from 26 districts – 19 men and 11 women



Training session for 26 JSKs organized on 13 November – focus on PM Kusum and filing of application forms




Organized JSK camps in treatment villages for PM Kusum application




# SolaReady Dashboard




CGIAR  
RESEARCH  
CENTER




IWM  
International Water  
Management Institute







IWM  
International Water  
Management Institute




CGIAR  
RESEARCH  
CENTER





SOLAR  
Solar Energy for  
Agricultural Resilience



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra  
  
Swiss Agency for Development  
and Cooperation SDC

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Dashboard

Solar irrigation readiness assessment by country

India

Dashboard

Bangladesh

COMING SOON

Ethiopia

COMING SOON

Kenya

COMING SOON

State

All States

District

All Districts

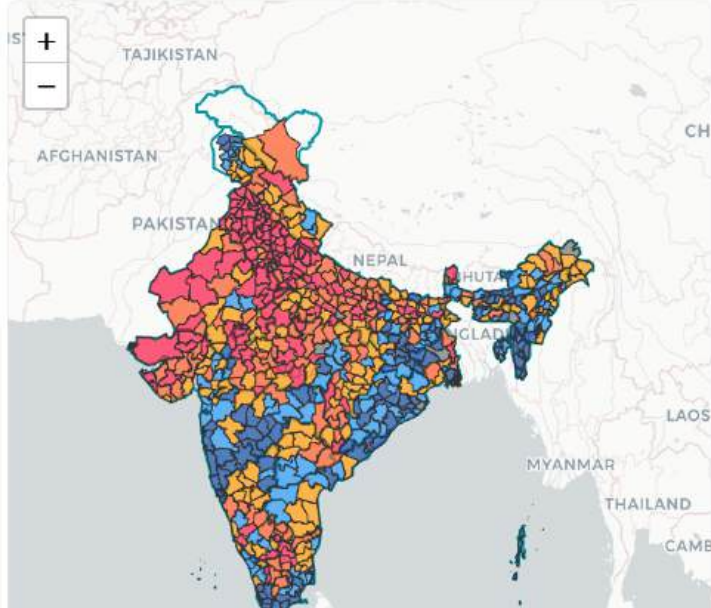
Objective

Adaptation


Advanced Configuration

Suitability

17.3% 18.6% 22.2% 18.8% 21.5% 1.6%



Distribution



Very High

High

Moderate

Low

Very Low

No data

Key Parameters

Solar Irradiance

4.93 kWh/m<sup>2</sup>/day

Cropping Intensity

151.24 %

Irrigation Intensity

48.98 %

IWU (% of CWU)

56.65 %

Electric Pumps

62.53 %

GW Development

57.02 %

Surface Water Area

6.31 %

Cultivated Land

56.24 %

Electricity Subsidy

131.31

GW Share of IWU

51.87 %

Water Level Depth

8.33 m

Small & Marginal Holdings

78.24 %

Summary

666

TOTAL DISTRICTS



# Ethiopia and Kenya

Activities/Plan	2025-2026	2027	2028	Expected Results
<b>Outcome 1</b>				
Design WEF-responsive solar suitability ‘principles’; Decision-support tools are developed	Report on WEF index to assess the impact of different solar interventions; User manual for solar sizing tool	WEF-SS composite maps Trainings on solar sizing tool	Country policy briefs on WEF-responsive solar suitability tool Trainings on solar sizing tool	At least 2 partners and 5,000 people using WEF-SS maps
<b>Outcome 2</b>				
Conduct assessments on irrigation investment and financing landscape, and identify promising investment solutions	Investment and Financing Landscape Assessment Report for Irrigation	Investment Solution Feasibility Report		At least 1,000 farmers have access to formal financial services
<b>Outcome 3</b>				
Targeted groups, including women, are trained on tools Multi-stakeholder forums and other platforms	Training modules development	Trainings Organization and participation in national regional forums	Scaling brief and roadmap	At least 50 participants trained At least two events per country
<b>Outcome 4</b>				
Conduct a project inception workshop Create awareness, conduct outreach events and establish partnerships	Inception workshop in Kenya Institutional landscape analysis Demand-supply linkage workshops	Demonstration of pumps and increasing outreach Facilitate systemic changes in scaling solar	Demonstration of pumps and increasing outreach	At least 300 (including 25% women) farmers get access to SESA through bundling support provided in scaling



# Kenya updates



**Context :** Most mature SWP market in SSA (65% of sales; ~35,000 units in use, 2021), yet <3% of arable land irrigated.

- Kenya has the highest solar water pump uptake in SSA but low adoption of solar cooling, drying, and processing due to cost and awareness barriers.

•**Drivers of Growth:** PAYGo financing, falling technology costs, demand for high-value crops, stronger market linkages and strong presence of private sector innovators.

**What Works:**

- Affordable, durable, low-maintenance SWPs for varied irradiance.
- Innovative finance models (SACCO/MFI credit guarantees, leasing, risk-sharing).
- Bundled service models linking tech, inputs, and assured markets.
- Integration with water harvesting & efficient irrigation methods.

•**Lessons Learned for interventions:**

- Supportive policies exist, but operational integration of solar in agri-programs is limited.
- High upfront costs and lack of tailored finance limit smallholder uptake; PAYGo and lease-to-own models promising but underdeveloped.
- Quality and trust issues persist due to substandard products and limited technician capacity.
- Coordination gaps among private sector, local governments, and cooperatives weaken last-mile service delivery.
- Need for blended finance, quality assurance frameworks, and systematic capacity building to scale solar-powered agriculture sustainably.



# Ethiopia updates



**Context:** In Ethiopia, solar use in agriculture is expanding as farmers seek reliable, off-grid irrigation solutions to support high-value horticulture. The need to reduce dependence on costly and polluting diesel pumps, and government initiatives promoting climate-smart, small-scale irrigation for increased productivity and resilience.

## **Strengths**

- A supportive policy environment
- Emerging private sectors.
- Supportive renewable energy policies emerging.
- Diverse stakeholder base

## **Lessons Learned for interventions:**

- Policy frameworks supportive but fragmented; need for a National Solar-in-Agriculture Strategy. (e.g. Solar Standardization)
- Implementation of cross-sector actions need to be coordinated
- Uptake requires knowledge, services, and trust-building, not just equipment supply.
- Affordability barriers persist; innovative finance (PAYGo, revolving funds) and de-risking needed.
- Technical capacity constraints and supply chain challenges limit scale.
- GESI barriers remain: women and youth face unequal access to training, finance, and markets.

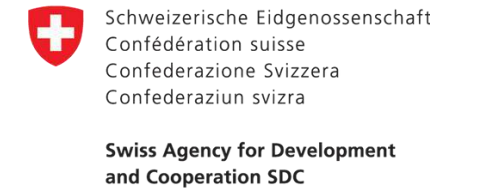


# Reflections from Field – Mandla. Madhya Pradesh (25 November 2025)





# Thank you.



Solar Energy for Agricultural Resilience (SoLAR) is a global project implemented by the International Water Management Institute (IWMI) and supported by the Swiss Agency for Development and Cooperation (SDC).



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