

SoLAR IRRIGATION FOR AGRICULTURAL RESILIENCE (SoLAR)

Why SoLAR in South Asia?

South Asia is the world's largest user of groundwater for agriculture, withdrawing approximately 250 km³ of groundwater annually for irrigation. It is estimated that there are roughly 22 million water extraction pumps in **Bangladesh, India, Nepal and Pakistan**, of which roughly 12 million are electric and 10 million are diesel pumps. Groundwater pumping, fueled by either electricity or diesel, has substantial carbon footprint.

With growing concerns about climate change and carbon emissions, this project will contribute to respective country governments' NDC commitment of reducing emissions from agriculture through promotion of solar irrigation. So far, more than 200,000 solar irrigation pumps (SIPs) have been installed in the region, but often without explicit consideration for groundwater sustainability and gender and equity concerns. The project will work closely with all relevant stakeholders to support development of gender and socially inclusive, and groundwater responsive solar irrigation policies through three inter-linked work packages (Fig. 1).

The project aims to work closely with national governments and help test solutions that promote triple wins – improved livelihood outcomes for women and men farmers; reduced emission of black carbon and other short lived climate pollutants from agriculture; and promote sustainable groundwater use – all leading to a more sustainable and climate resilient agrarian future in South Asia. Given that groundwater-energy typologies in the region are different, solutions tested will be regionally differentiated (Fig. 2).



Photo: Prashanth Vishwanathan/IWMI

A woman farmer using solar irrigation pump in Haryana, India

Goal

The main goal of the project 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. This project aims to achieve three broad outcomes:

Outcomes

1. Generating improved empirical evidence to support the development of climate-resilient, gender-equitable, socially-inclusive, and groundwater-responsive solar irrigation policies;
2. Validating innovative actions and approaches for promoting gender-equitable, socially-inclusive, and groundwater-responsive solar irrigation; and
3. Increasing national and global knowledge and capacity for developing gender-equitable, socially inclusive, and groundwater-responsive solar irrigation policies and practices.



Photo: Hamish John Appleby

A farm using drip irrigation

Fig - 1: Work packages (WP) of SoLAR project at a glance

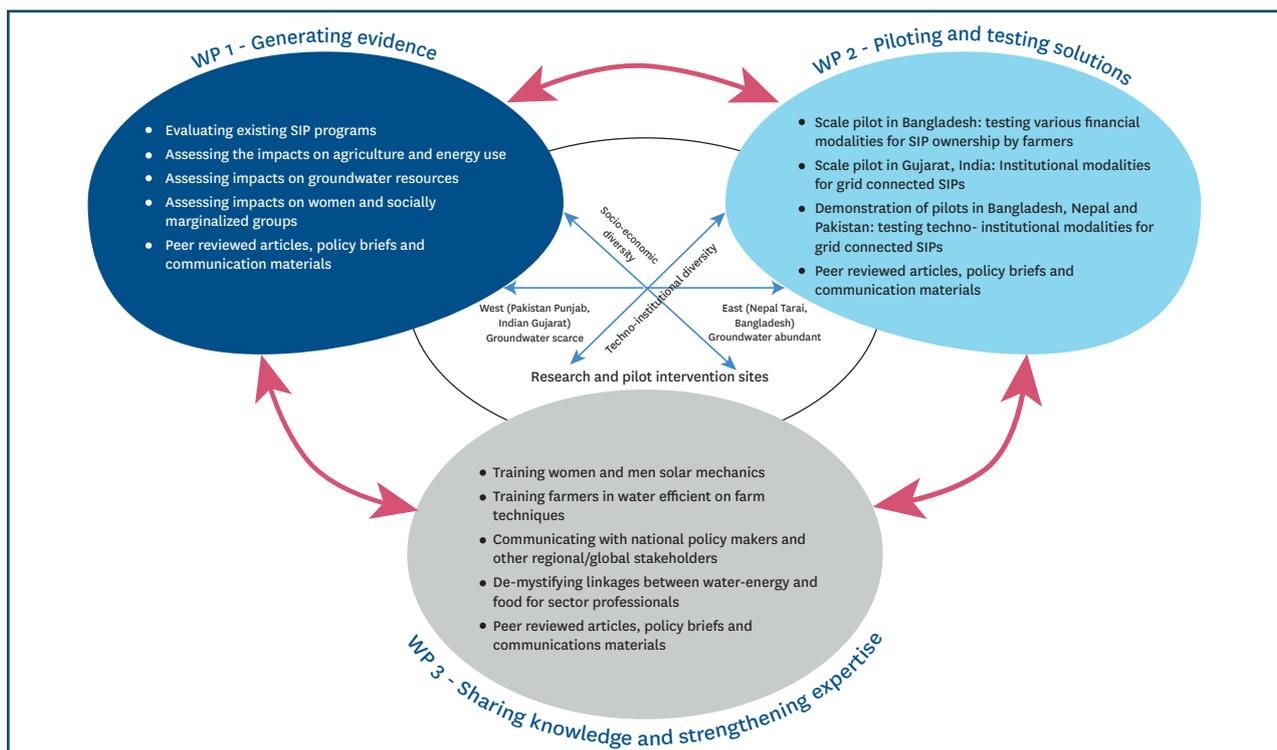
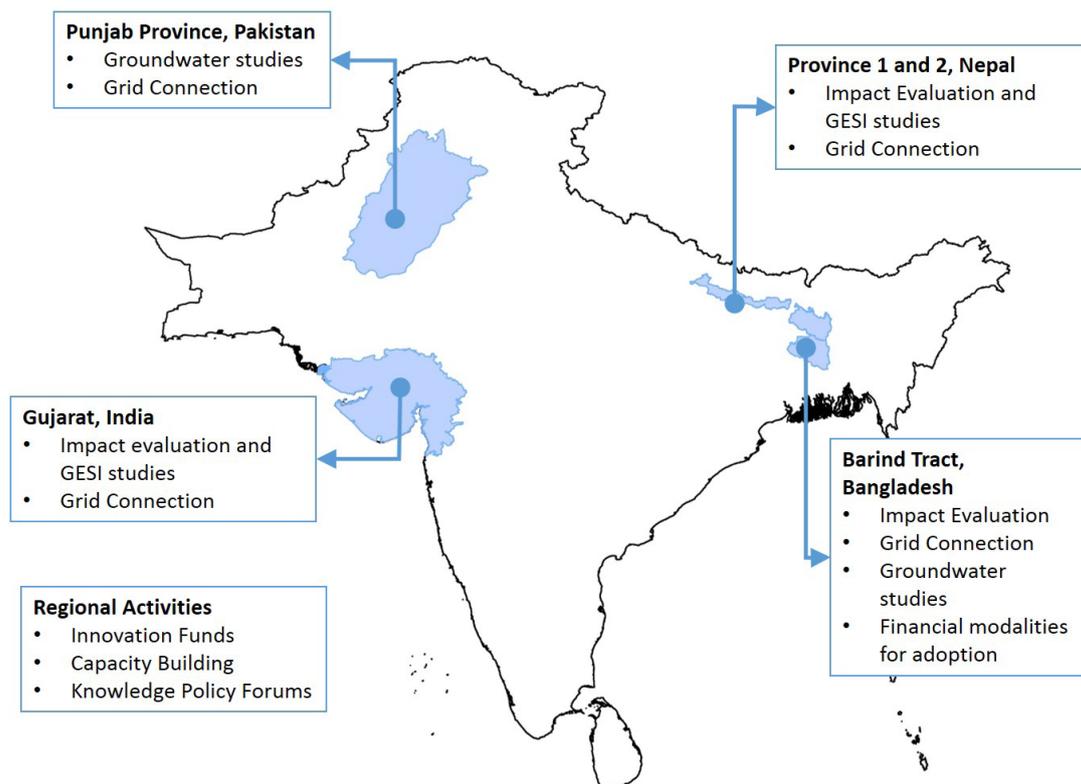


Fig - 2: SoLAR project locations in South Asia



Partners

Infrastructure Development Company Limited (IDCOL), Bangladesh

Infrastructure Development Company Limited (IDCOL) is a Government owned financial institution set up in 1997. IDCOL's aim is to encourage private sector participation in infrastructure and energy projects and they are currently the largest financier for renewable energy projects in Bangladesh.

Gujarat Energy Research and Management Institute (GERMI), India

Gujarat Energy Research & Management Institute (GERMI) is a centre of excellence in the energy sector, promoted by Gujarat State Petroleum Corporation Limited (GSPC), a Government of Gujarat Undertaking

Alternative Energy Promotion Centre (AEPIC), Nepal

Alternative Energy Promotion Centre (AEPIC) is a Government institution established in 1996 with the objective of developing and promoting renewable energy technologies in Nepal. It is under the Ministry of Energy, Water Resources, and irrigation. It functions independently and has a board with representatives from the government, industry and non-governmental organizations.

Nepal Electricity Authority (NEA), Nepal

Nepal Electricity Authority (NEA) was created in 1985 under the NEA Act (1984) through the merger of the Department of Electricity of Ministry of Water Resources, Nepal Electricity Corporation, and related Development Boards. The primary objective of NEA is to generate, transmit, and distribute adequate, reliable, and affordable power by planning, constructing, operating, and maintaining all generation, transmission, and distribution facilities in Nepal's power system both interconnected and isolated.

Federal Water Management Cell (FWMC), Pakistan

Federal Water Management Cell (FWMC) was established in 1979. It provides strategic support and helps the Ministry of National Food Security and Research in formulation of policies at the federal level in consultation with the respective provinces. It deals with irrigation water sector problems, solutions, formulation of water resources development projects, agricultural mechanization policies & strategies and land development projects prepared in consultation with the stakeholders for ensured food security on sustainable basis.

Pakistan Agricultural Research Council (PARC), Pakistan

Pakistan Agricultural Research Council (PARC) is the apex national organization working in close collaboration with other federal and provincial institutions in the country to provide science based solutions to agriculture of Pakistan through its statutory functions.

Development Partner

Swiss Development Cooperation (SDC)

The Swiss Agency for Development and Cooperation (SDC) is the agency for international cooperation of the Federal Department of Foreign Affairs (FDFA). Swiss international cooperation, which is an integral part of the Federal Council's foreign policy, aims to contribute to a world without poverty and in peace, for sustainable development. SDC, through its Global Programme Climate Change and Environment (GPCCE), helps find solutions to global challenges linked to climate change. It engages in global political dialogue and manages specific projects in the fields of energy, climate change adaptation, sustainable development of mountainous regions and prevention of natural hazards that are likely to influence regional and international policy.



Photo: IDCOL, Bangladesh

A farmer using a solar irrigation pump in Bangladesh



Photo: Pakistan office/IWMI

Farmers using irrigation pumps in Pakistan



Photo: Prashanth Vishwanathan /IWMI

A farmer using a solar irrigation pump in Gujarat, India



Photo: Nepal Office/IWMI

A solar irrigation site in Nepal

For more information:

Regional Project Lead

Aditi Mukherji, Principal Researcher
A.Mukherji@cgiar.org
IWMI New Delhi Office, CG Block C,
NASC Complex DP Shashtri Marg,
Pusa New Delhi 110012, India
P: +91-11-2584 3536/2584 0812

Country leads

Bangladesh (interim)

Archisman Mitra, Researcher
IWMI India office, 2nd Floor, CG Block C, NASC Complex,
DPS Marg, Pusa, Opp Todapur, New Delhi 110 012, India
Email: a.mitra@cgiar.org

India

Shilp Verma, Researcher
IWMI-India Water Policy Program,
Near Smruti Apartment, Behind IRMA,
Mangalpara, Anand 388001, Gujarat, India
Email: Shilp.Verma@cgiar.org

Nepal

Vishnu Pandey, Researcher
IWMI Nepal Office, Shree Durbar Tole, Pulchowk,
Lalitpur – 3, Kathmandu, Nepal
Email: V.Pandey@cgiar.org

Pakistan

Azeem Shah, Researcher
IWMI Pakistan Office, 12KM Multan Road, Chowk Thokar Niaz Baig,
Lahore 53700, Pakistan
Email: A.Shah@cgiar.org

IWMI
International Water
Management Institute



CGIAR

IWMI is a CGIAR Research Center

The International Water Management Institute (IWMI) is a non-profit, research-for-development organization that works with governments, civil society and the private sector to solve water problems in developing countries and scale up solutions. Through partnership, IWMI combines research on the sustainable use of water and land resources, knowledge services and products with capacity strengthening, dialogue and policy analysis to support implementation of water management solutions for agriculture, ecosystems, climate change and inclusive economic growth. Headquartered in Colombo, Sri Lanka, IWMI is a CGIAR Research Center and leads the CGIAR Research Program on Water, Land and Ecosystems (WLE).

**International Water
Management Institute (IWMI)
Headquarters**
127 Sunil Mawatha, Pelawatte,
Battaramulla, Sri Lanka
Mailing Address: P O Box 2075,
Colombo, Sri Lanka
Tel: +94-11-2880000
Fax: +94-11-2786854
Email: iwmi@cgiar.org
www.iwmi.org