

# Solar Irrigation for Agricultural Resilience (SoLAR)

## Newsletter

### Issue 1: Updates from July- September 2020

I am very happy to welcome you all to the first issue of the SoLAR newsletter. Through this newsletter, we hope to provide periodic updates on the Swiss Agency for Development and Cooperation (SDC) supported and IWMI implemented SoLAR project, and bring you news and views from the wider world of solar irrigation and its role in clean energy transition.



In much of South Asia, often the only reliable source of irrigation that offers on-demand water control is groundwater. Yet, in spite of historical gains such as increased food production, the consequences of South Asia's over-dependence on groundwater have had deleterious impacts on long-term groundwater and energy sector sustainability.

Solar Irrigation for Agricultural Resilience (SoLAR) in South Asia aims to generate knowledge to sustainably manage the water-energy and climate interlinkages in South Asia through the promotion of solar irrigation pumps (SIPs). 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 will attempt to tackle second generation issues such as groundwater sustainability and inclusion of women and marginal farmers as its core focus.

Can South Asia de-carbonize its irrigation sector, and put itself on a climate resilient development pathway, without a negative water footprint, and with checks and balances that ensures equity and inclusion? We hope to answer this very important question as we continue our SoLAR journey till December 2023. Happy reading, and we will love to hear your feedback. Keep them coming.

*Dr. Aditi Mukherji, Regional Project Leader, SoLAR-SA,*

## Role of Renewable Energy in the COVID-19 Recovery Phase: Reflections from the SDC- SoLAR Project Steering Committee

The members of the Project Steering Committee met virtually in July 2020 to take stock of the project progress and adjustments made in the wake of COVID-19 pandemic. They discussed the role of Solar Irrigation Pumps (SIPs) and renewable energy in the building back phase from the pandemic. Since field work was affected due to the situation, everyone brainstormed on alternative strategies and outputs to keep the work going, e.g. moving National Policy Level Forums to online Webinars, conducting telephonic surveys where feasible etc.



Ms. Marylaure Crettaz Corredor, Co-Head Global Programme on Food Security at the SDC, also the Chair of the PSC, acknowledged the progress made by the project team despite the challenges created due to the pandemic. <https://solar.iwmi.org/reports/>

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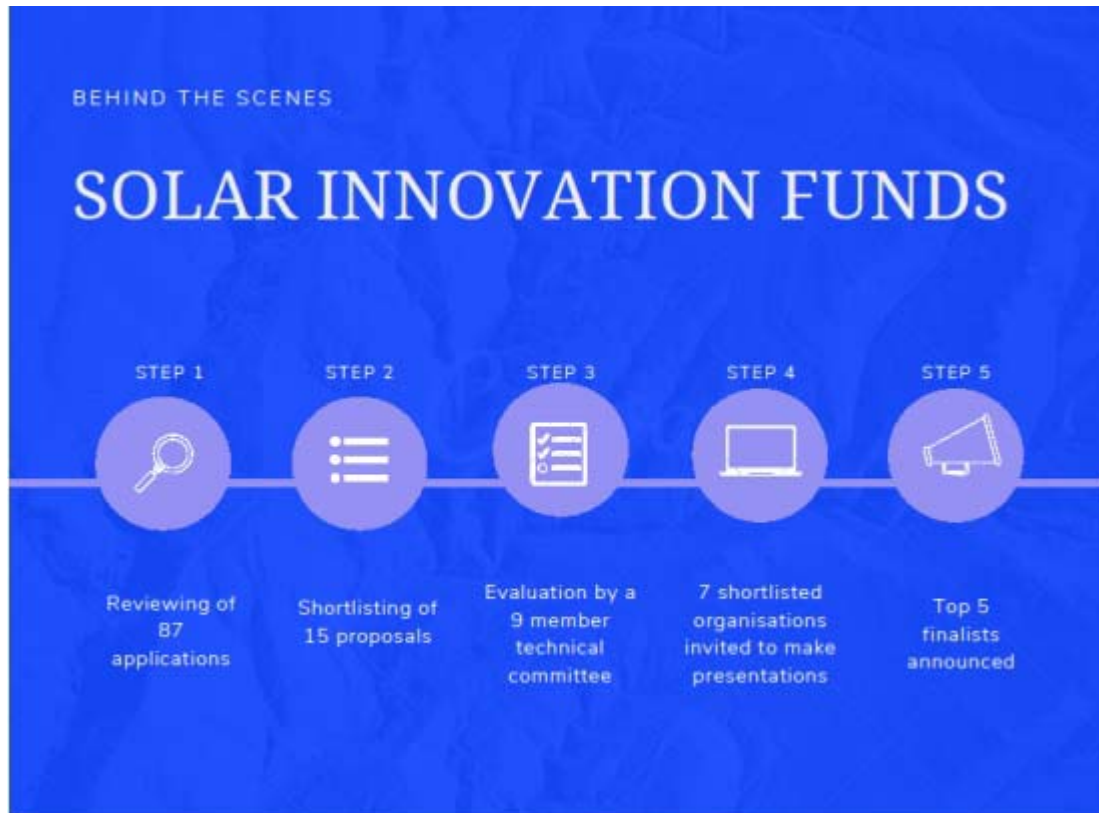
## SDC-SoLAR Innovation Funds Grantees announced

2020-21 Grantees for SDC- SoLAR Innovation Funds were announced in September 30<sup>th</sup> 2020. Five Grantees were chosen from among 87 applicants. <https://solar.iwmi.org/innovation-fund-awardees/>

- **Gham Power Nepal Private Limited, Nepal**- Their integrated solution called *Yield Improvement in a Box* provides personalised agri-advisory to farmers using digital platform.
- **Kalinga Renewable Energy Manufacturers Pvt. Limited (KARMA), India**- Their innovative energy service platform, Mobile URJA allows solar panels and mobile power units to be moved around and shared by multiple users. The system can be operational within 5 minutes of moving to a new site.
- **KHM Power Limited, Bangladesh**- This innovation encourages development of allied livelihoods such as poultry/duck/cattle farming beneath the Solar Panels for small and marginal farmers.
- **Environment Conservation Society (SwitchOn Foundation), India**- They will provide financial support to women farmer entrepreneurs in the form of loans to acquire micro solar pumps which can prove to be a scalable and sustainable solution.

attempt to solve the dug wells using a new but low cost solution of solar water pumping coupled with *Responsive Drip Irrigation* (RDI) system, and thereby alleviate the living conditions of dug well dependent farmers.

Through these projects, the SoLAR Innovation Fund (IF) will support the development and testing of on ground technological, financial and institutional innovations to address the constraints of upscaling solar irrigation, with a focus on the problems faced by small-scale, marginal, and women farmers in South Asia.



## Country highlights

### Director of Alternative Energy Promotion Centre (AEPC), Nepal deliberates on recommendations by IWMI

The Executive Director of AEPC, Mr. Madhusudhan Adhikari, convened a meeting, with researchers from IWMI, on 28<sup>th</sup> of August 2020, to discuss IWMI's Report on Rapid Assessment of AEPC's Subsidy Delivery Mechanism submitted to AEPC as a part of the SDC-supported SoLAR project. The IWMI-Nepal team presented the report, which



AEPC.

AEPC also expressed their willingness to pilot grid-connected SIPs at a suitable location.

<https://solar.iwmi.org/country-updates/nepal/>

## IWMI signs MoU with PARC and FWMC in Pakistan

Expanding on IWMI's mission to provide sustainable and climate friendly water solutions globally, IWMI Pakistan recently entered into a 3-year agreement with Pakistan Agricultural Research Council (PARC) and the Federal Water Management Cell (FWMC) to implement the Solar SoLAR project in Pakistan. The agreement was signed by IWMI's Country Representative, Dr. Mohsin Hafeez and the Secretary of the PARC, Mr. Wiqar Ahmad and the Director General of the FWMC, Mr. Muhammad Tahir Anwar on 19<sup>th</sup> August, 2020. <https://solar.iwmi.org/country-updates/pakistan/>



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## Stories from the field

### Understanding groundwater implications of Gujarat's SKY scheme

Can we incentivize farmers to pump less groundwater, even when they shift to using solar irrigation pumps, given that marginal costs of pumping from solar pumps are nearly zero? Gujarat's Suryashakti Kisan Yojana (SKY) provides incentives to grid connected solar pump farmers to sell electricity to the grid, thereby providing them incentives to pump less, while also adding to their income. IWMI and its partner Gujarat Energy Research and Management Institute (GERMI) will work together in understanding the impact of SKY scheme on groundwater pumping behaviour of farmers. Earlier in the year, before pandemic related travel restrictions kicked in, IWMI team visited Botad and Anand districts in Gujarat to understand farmer's perception about the SKY scheme. The team found that farmers are aware and involved with the SKY scheme and understand the billing calculations, including how incentives will work. In Botad district, cotton was the major crop grown during Kharif season and farmers here were primarily dependent on dug wells. With limited groundwater availability at Botad, farmers felt that selling electricity back to the grid via grid connected pumps was a source of extra income which they were keen to take up. In contrast, farmers in Anand district, where water tables were higher and farmers grew more water intensive crops like paddy and tobacco, were interested in selling water to other farmers through well established, but informal water markets.



Figure 1- Solar irrigation setup in Botad district with farmer's dug well and solar panels.



Figure 2- Overhead tanks in Anand district to store excess groundwater which is then distributed to farmers via pipelines

The actual impact of SKY scheme on farmers' pumping behavior will be context specific and will depend on the relative scarcity/abundance of groundwater, among other things. IWMI-India team has carefully chosen these two locations with contrasting hydro geologies and is working closely with its partners to understand the impact of grid connected SIPs on farmer's groundwater pumping behavior.

## Freedom from diesel: Experience of farmers served by IDCOL sponsored SIPs

Infrastructure Development Company Limited (IDCOL), the nodal organization for the promotion of solar irrigation in Bangladesh has sponsored solar irrigation pumps (SIPs) in off-grid areas. This has been done to substitute the diesel irrigation prevalent in these areas with a cleaner and cheaper alternative. What happens to the excess energy generated from solar irrigation pumps during non-agricultural season?

A team comprising groundwater experts and socio-economists from IWMI visited select SIP locations in Bangladesh in January-February 2020. During interactions, farmers shared how they preferred the reliability and quality of irrigation provided by solar pumps as compared to diesel pumps which entailed errands of purchasing the diesel, carrying pump to the fields and maintenance and labor associated with it. Under the new irrigation system with SIPs, their entire irrigation needs for the whole year is met by an operator hired by the solar company in lieu of fixed water fees. However, there is the issue of excess energy generated by the SIPs, especially during non-irrigation season. Some solar entrepreneurs (also called sponsors) in Bangladesh have developed interesting models where they integrated additional activities along with irrigation services to optimize the use of solar panels and also to create additional employment opportunities for the small and marginal farmers.

*The Kalinagor site of the Birganj district saw a diverse cropping pattern with mustard, maize and boro rice being grown. The excess energy during the non-agricultural season was being used for rice husking. In another site, excess energy was being used to run banking offices. These multitude of services provided, harnessing the full potential of the solar panels was is particularly important for long term financial sustainability of the SIP projects.*



Figure 3- Mustard cultivation at Birganj District, Kalinagar, Bangladesh



Figure 4- Solar power operated Rice Husking Machine

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## What keeps IWMI-SoLAR staff busy?

We hear from Dr. Vishnu Pandey this Month



**Q. What is your role in the project?**

**A.** I am the County-Lead for the Nepal component of the SoLAR project and therefore, overall, in charge of the Nepal related project activities.

**Q. What are the important policy questions that the Nepal team is trying to answer?**

**A.** Nepal-specific activities of the project are structured around three areas, namely, impact evaluation of solar irrigation pumps (SIPs), piloting of micro-grid system for connecting SIPs to national grids, and capacity strengthening of local technicians and sectoral stakeholders. With these activities, we aim to answer following key policy questions:

- What are the impacts of investment in SIPs through subsidy so far? What are the areas of improvements in subsidy delivery mechanism to maximize the outcomes?
- How can the off-grid SIPs be integrated appropriately to the national grid so that return from SIPs be optimized and they can continue contributing the national goal of achieving energy self-sufficiency?

**Q. What do you find the most exciting about the project?**

**A.** The most exciting part about the project is that we get to co-design the project together with the government partners like the AEPC and the Nepal Electricity Authority. We are working together with them in implementing the project and aim to address a set of policy questions that government partners are keen to answer. Therefore, we are optimistic about the uptake of project's findings by the government agencies.

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## What's happening in the Solar space?

- [Unshackling India's Energy-Water-Agriculture Nexus: Is Solar Power the Panacea It Promises to be?](#)
- [Why We Need Smarter, Targeted Subsidies to Promote Solar Irrigation?](#)

### **Other solar related news**

- [NLC India: Central Public Sector Unit with Largest Capacity of Solar Installed](#)
- [Boeing Turns to Solar; Jinko, Risen, ZNShine Announce Supply Orders](#)
- [Solar Curtailment Could Rise Globally as PV Penetration Increases](#)



*We thank Dr. Azeem Shah, Mohammed Faiz Alam, Archisman Mitra and Dr. Vishnu Pandey for their contribution to the Newsletter.*

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