

Solar Irrigation for Agricultural Resilience in South Asia (SoLAR-SA)

Minutes of 4th Project Steering Committee (PSC) Meeting

4 October 2021 | Time: 4:00-5:30 PM (IST)

Venue: Online meeting on Zoom

A) Attendees

Name and designation		Attended
Corinne Demenge, Head of SDC, New Delhi	Chair, PSC	Yes
Mark Smith, Director General, IWMI	Co-Chair, PSC	Yes
Aditi Mukherji, Regional Project Leader, SoLAR-SA, IWMI	Member Secretary, PSC	Yes
Divya Kashyap, Senior Advisor and Project Manager, SoLAR-SA, SDC	Regular Member, PSC	Yes
Alok Sikka, IWMI Country Representative, India	Regular Member, PSC	Yes
Tushaar Shah, Emeritus Fellow, IWMI (Special Advisor to the SoLAR Project)	Regular Member, PSC	Yes
Rajeev Gyani, Additional Director, International Solar Alliance (ISA)	Co-opted Member, PSC	Yes
Akhilesh Magal, Head of Advisory and Consulting, GERMI, India	Co-opted Member, PSC	No
Laxman Prasad Ghimire, Senior Officer, Solar and Wind Energy, AEPC, Nepal	Co-opted Member, PSC	Yes
Kazi Ahsan Uddin, Manager, IDCOL, Bangladesh	Co-opted Member, PSC	Yes
Kifayat Zaman, Director General, FWMC, MNFS&R Pakistan	Co-opted Member, PSC (Taken over from Dr Tahir Anwar, who completed his tenure as DG, FWMC)	Yes
Representative from SAARC Energy Centre (SEC), Islamabad	Co-opted Member, PSC Dr Shoaib Ahmed has completed his term; a new member is yet to be nominated by SEC	No

Mohsin Hafeez, IWMI Country Representative, Pakistan	Special Attendee	Yes
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Abbreviations: AEPC: Alternative Energy Promotion Centre, Nepal; FWMC: Federal Water Management Cell, Pakistan, GERMI: Gujarat Energy Research and Management Institute, India IDCOL: Infrastructure Development Company, Bangladesh; ISA: International Solar Alliance; IWMI: International Water Management Institute; SDC: Swiss Agency for Development and Cooperation

B) Agenda

1. Welcome Remarks

- Mark Smith, Director General, IWMI and Co-Chair of SoLAR PSC, welcomed all the members to the 4th Project Steering Committee (PSC) Meeting. He acknowledged the substantive data coming out of all the four countries, viz, Bangladesh, India, Nepal and Pakistan, as the project is halfway through its 4-year timeline, despite the many challenges of Covid-19. He appreciated the insightful presentations from the eight Innovation Fund Grantees. He mentioned carefully revisiting the timelines, anticipating delays early on and planning accordingly.
- Corrinne Demenge, Chair of PSC, extended her warm welcome to all the participants. She highlighted the challenges posed by the Covid-19 pandemic that has delayed some of the most important projects globally. She highlighted some of the preliminary findings and methodologies and stressed the need to adjust the timelines. She expressed her gratitude to the various government entities of the four countries in South Asia who are a part of the PSC and provide their active support to the project. In addition, she appreciated the outreach activities through the quarterly newsletters.

2. Introduction by PSC Members

Engr. Kifayat Zaman, Director General, Federal Water Management Cell (FWMC), formally introduced himself as the new PSC member from Pakistan. He replaced Engr. Tahir Anwar, the earlier PSC Member from Pakistan who retired from his position as DG, FWMC. Mr Zaman highlighted the Government of Pakistan's keen interest in solar irrigation projects. FWMC focuses mainly on water management, helping small landholders in Agri-water management and also mentioned that a few developments have taken place under various subsidy schemes. For example, there have been quite a few proposals to convert diesel pumps into SIPs, but not at the cost of groundwater depletion. He further highlighted the challenges under solar irrigation in Pakistan and urged the project findings to be shared with him in a timely manner for him to include those findings in overall policy discussions in Pakistan.

This was followed by a brief introduction by all the PSC Members.

3. Updates from Year 2 (Progress and delays)

Dr Aditi Mukherji, Regional Project Leader for SDC SoLAR, shared project updates since the inception of the SoLAR project, which included the progress made so far and the delays arising out of Covid-19.

Key highlights from the presentation:

- Dr Aditi explained the rationale behind the SoLAR project.

- She gave a brief overview of the work packages and highlighted the constraints due to the second wave of Covid-19, primarily in Bangladesh and Nepal, which adversely affected the fieldwork. Grid-connection activities in both countries suffered a delay but will be completed by the end of 2021 as field activities have resumed from August 2021.
- The SoLAR project highlighted four aspects: mitigation, adaptation and resilience building, GESI and groundwater sustainability, and she summarized the main findings under each of these themes. These are tabulated below:

Questions	Impact on Countries
Do SIPs contribute to adaptation and reduce vulnerability to climate risks?	<ul style="list-style-type: none"> • From a risk reduction point of view, SIPs provide assured irrigation in case of rainfall variability. E.g., In Nepal and Bangladesh, as rainfalls have become erratic in the recent past, irrigation in the Kharif season will become more common. • Crop diversification is seen as a climate adaptation strategy. In Bangladesh, farmers receiving irrigation from SIP and electric pumps grow more summer paddy. No cropping pattern changes have been observed in Gujarat, i.e., before and after implementing the SKY scheme. New crops were introduced in the case of Nepal upon the implementation of SIPs. • There has been an enhanced income from agriculture using SIPs, due to the cultivation of high-value crops, like orchards in Pakistan and vegetables in Nepal. Farmers are saving on diesel costs leading to lower cost of cultivation. • There has been an increase in income from selling electricity to the grid in Gujarat.
SIPs and equity outcomes are mixed and not well understood	<ul style="list-style-type: none"> • GESI policies studies have been taken up in Nepal, and similar studies will be taken up in India and Pakistan. • AEPC's role was highlighted in using GESI criteria to select

	<p>beneficiaries. In Bangladesh, IDCOL SIPs serves sharecroppers and marginal landholders through its water services model.</p> <ul style="list-style-type: none"> • In Gujarat, the SKY scheme was designed in such a way that it has primarily benefitted larger farmers, and the implications for smallholder farmers are not very clear.
<p>Would SIPs lead to more or less groundwater pumping?</p>	<ul style="list-style-type: none"> • Highlights from the SKY scheme in Gujarat were presented. It was mentioned that almost 95% of the farmers are injecting electricity back into the grid, though this may not have resulted in a reduction in groundwater pumping. More empirical work is being done in India and Bangladesh to carefully tease out the groundwater impacts of SIPs.

- Dr Aditi gave an overall update on the progress made so far in terms of communication and outreach. There has been an improvement in maintaining the website with the publication and circulation of quarterly newsletters covering the four countries' various activities. The newsletter is sent to around 950 people who have attended one or more SoLAR events in the past. A blog series is expected to start by October 2021. Photo stories and podcasts are also being planned for better information dissemination.
- She informed the participants about the new SoLAR logo, and a Zoom poll was created towards the end of the session to finalize the logo. The new logo will be used in all SoLAR communications materials henceforward.

4. Discussions

- **Rajeev Gyani (ISA)** acknowledged the overall capacity building within the project. He emphasized the importance of capacity building measures extended to farmers and solar technicians from a sustainability point of view. He further stressed the O&M and demand management which needs to run parallel as per the project activities.
- **Dr Aditi (IWMI)** mentioned that O&M and capacity building of farmers and technicians is an integral part of the SoLAR project. A plan is underway to train over 2000 SKY (Suryashakti Kisan Yojana) farmers using RCT (Randomised Control Technique) trials. So far, technicians training has been successful in Nepal, and O&M training has been conducted in Pakistan. She further mentioned a plan on regional training for policymakers in the context of the food-water-energy nexus.

- **Divya Kashyap (SDC)** looked into the possibility of integrating some of the training modules prepared as a part of the SoLAR project to ISA's Training Programs.
- **Kifayat Zaman (FWMC)** reiterated the need to take stock of the solar irrigation projects to present findings to the government. He emphasized the need to have more collaborations at the local and regional levels. He mentioned that Baluchistan as a region needs greater focus on groundwater depletion.
- **Mohsin Hafeez (IWMI)** mentioned that taking stock of solar irrigation projects is essential to share information among different departments and that under the SoLAR project, case studies have been commissioned to take stock of the situation in Sindh, Khyber Pakhtunkhwa and Baluchistan provinces in Pakistan.
- **Laxman Prasad Ghimire (AEPC)** mentioned that there would be closed group discussions based on the results of the phone surveys in the near future, and the team is in coordination with the IWMI-Nepal office to set up this meeting.
- **Kazi Ahsan (IDCOL)** briefed how Covid-19 and monsoons drastically impacted the field studies, suggesting having a tagline for the new SoLAR logo.
- **Mark Smith (IWMI)** emphasized the need to manage risks related to Covid-19 as another wave would be extremely worrying for the project. He acknowledged all the members who have become adept in implementing various activities despite the pandemic's adversities. Instead, he focussed on the need to build capacities for farmers in the Indian context.
- **Dr Aditi (IWMI)** reiterated that 2500 farmers would be trained through RCT trials as soon as an agreement is ready with GUVNL (Gujarat Urja Vikas Nigam Limited).
- **Rajeev Gyani (ISA)** proposed circulating the reports coming out of the project on a global scale through the ISA (International Solar Alliance) network for better outreach.

5. Selection of SoLAR Project Logo

A zoom poll was created for the SoLAR logo, wherein five options were available to choose from. The highest votes went to option 1, and the PSC members selected this logo.



5. Concluding remarks and vote of thanks

- Divya Kashyap thanked all the participants, especially Mr Kifayat Zaman, who kindly agreed to join the SoLAR PSC.
- She acknowledged the interesting insights from the project in all four countries.
- She emphasized the need to enhance the outreach of the project overall.

- She extended her gratitude to all the innovation fund grantees who had come up with interesting presentations showcasing the aims and objectives of their respective projects.
- Divya further mentioned that the SoLAR project would be featured in the upcoming edition of the One World SDC Magazine.
- She agreed with Mark on the need to look at further adjustments in the wake of Covid-19 with an added focus on trainings and capacity-building measures.

Action Points:

- Finalizing an agreement with GUVNL to take forward the training of farmers using RCT trials.
- Finalizing an MoU with IHE Delft.
- Preparing the 'Year 3 Workplan' of the SoLAR project.
- Conducting regional and national forums either virtually or physically whenever the situation improves.
- Further dissemination activities through blog series, photo series etc.
- Organization of the 5th PSC Meeting for approval of Year 3 Workplan in January-February 2022.

Meeting notes prepared by Ms Zeba Ahsan, Communications Consultant, IWMI.

Annex 1. Activity level update January-June 2021

1.1.1 Impact evaluation and GESI case studies of existing and new SIP programs in Bangladesh

Table 1. Progress on implementation of sub-activities in 1.1.1:

Details of sub-activities	Start date*	End date*	Outputs/Comments	Status with details (Completed/On track/Delayed)	Additional comments
SIP Survey Rabi 2021	15/04/2021	30/05/2021	Primary data on SIP operations for three seasons from 82 schemes	Completed	
SIP survey Kharif 1 2021	15/07/2021	30/08/2021		Delayed	17 out of 82 completed. Rest to start again in August as lockdown opens
SIP survey Kharif 2 2021	15/10/2021	30/11/2021		Should be on track depending on Covid	
Journal article draft based on three(Kharif 2, 2020, Rabi 2021 and Kharif 1 2021) rounds of SIP surveys	1/10/2021	31/12/2021	Draft journal article ready for submission to a journal	Should be on track	
HH level survey	01/05/2021	30/07/2021	- Sampling note, and Questionnaire - Primary farmer level data from 900 households	Delayed	Sampling note, Questionnaire completed. Fieldwork delayed due to Covid. Will start as soon as lockdown is over (August 08 expected)

Details of sub-activities	Start date*	End date*	Outputs/Comments	Status with details (Completed/On track/Delayed)	Additional comments
Baseline analysis	01/10/2021	30/12/2021	<ul style="list-style-type: none"> - Baseline report based on descriptive analysis of HH level data - Blog post 	Should be on track	
Policy analysis	01/01/2021	30/06/2021	<ul style="list-style-type: none"> - Research article based on analysis of policy documents through GESI lens (Bangladesh and Nepal combined) - Blog post 	On track	Work on the final draft is ongoing

Table 1: Status of Deliverables in 1.1.1

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	SIP level database for three seasons in 2021 (i.e., Rabi, kharif2, Kharif 1) through telephonic survey	30/11/2021	On track (middle survey delayed, but should recover within a year)	All three should be completed by 2021
2	A draft of a journal article with findings from three rounds of SIP surveys (Kharif 2, 2020, Rabi 2021 and Kharif 1 2021)	31/12/2021	Should be on track	
3	Household survey sampling note and Household survey questionnaire	30/4/2021	Completed	
4	Household-level database	30/09/2021	Delayed	Fieldwork will start soon as lockdown is over (August 08). The target is still to have the database ready by September

5	Two to three blog posts and regular contributions to the SDC-SoLAR newsletter – throughout the year	All throughout the year	On track	One newspaper article (Daily Star) published
6	Draft Journal article note based on analysis of policy documents through GESI lens a combined paper with data from Bangladesh and Nepal	31/08/2021	On track	Work on the final draft is ongoing

Activity 1.1.2: Impact Evaluation (IE) and GESI Case Studies of SIP Program in Nepal

Table 2: Progress on implementation of sub-activities 1.1.2

SN	Details of sub-activities	Start Date	End Date	Outputs/Comments	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Draft journal article based on the report submitted to AEPC in May 2020, plus additional work done as a part of Situation Analysis Report	01-01-2021	30-06-2021	-Journal article submitted -Situation analysis report	Completed -Journal article draft complete, preparing for submission to Climate and Development -Situation analysis report complete.	-
2	Phone surveys with AEPC grantees in all Provinces except Province 1 and 2	15-03-2021	31-06-2021	Compiled and clean data from phone surveys, and preliminary reports, blogs	Completed Phone survey completed with both SIP and non-SIP farmers from 20 Terai districts in the list provided by AEPC.	- A phone survey was planned due to a delay in the household survey due to COVID.
3	Qualitative data collection (by FCB vendor) from GESI lens and data analysis	01-01-2021	30-09-2021	Data analysis and preliminary report, blogs	Delayed Orientation on the GESI checklist with FBC Social Science Researchers is scheduled for August 03 2021.	- The second wave of COVID affected the plan to collect empirical data on the GESI impact of SIP, which will be done hopefully starting the second week of August by FBC.
4	Develop a journal article from quantitative aspects of IE study and phone survey	01-05-2021	31-12-2021	- Submission of Journal Article	On Track Concept note drafted for one paper about differential impacts of SIP by social identity, gender, and wealth status.	- Household survey delayed by six months plus due to COVID-19.
5	Review of GESI policies and/or programs in solar	01-01-2021	31-08-2021	Research article based on analysis of	On Track Working paper draft complete	-

	irrigation in Nepal and Bangladesh and create a working paper			policy documents through GESI lens (Bangladesh and Nepal combined)	and submitted to project lead for further feedback.	
6	Develop a journal article from qualitative aspects of IE study	01-05-2021	31-12-2021	Research article/paper – Impacts of SIP from GESI lens in Nepal using field data	<p>On Track Six online interviews were completed as part of understanding the GESI perception of SIP project implementers.</p> <p>Delayed -Qualitative Paper outline in progress -Delayed due to delay in empirical data collection.</p>	-

Table 3: Status of Deliverables for 1.1.2

SN	Deliverable details	Due Date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	A journal article based on the report submitted to 2020	30-06-2020	<p>Completed</p> <ul style="list-style-type: none"> - Journal article draft complete, preparing for submission to Climate and Development. 	-
2	Impact Evaluation Report (Draft and Final versions) based on phone surveys and IE surveys	31-12-2021	<p>On track</p> <ul style="list-style-type: none"> - Phone surveys completed. - Data analysis in progress. 	-
3	Draft Journal article note based on	31/08/2021	<p>Completed</p> <ul style="list-style-type: none"> - Working paper draft complete and 	-

	analysis of policy documents through GESI lens (A combined paper with data from Bangladesh and Nepal)		submitted to project lead for the second round of feedback.	
4	Research article/paper –Impacts of SIP from GESI lens in Nepal using field data	31/12/2021	On Track - Paper outline in progress.	- Household survey delayed by six months plus due to COVID-19.
5	Two to three blog posts and regular contributions to SDC- SoLAR newsletter – throughout the year	31/12/2021	On Track - Newsletter posts provided on technical training, interns' experiences, and Interaction with a Farmer.	-

1.2.1 Groundwater-related studies embedded in demonstration pilot in Bangladesh

Table 4: Activities for 1.2.1

Details of sub-activities	Start date	End date	Status with details (Completed/On track/Delayed)	Additional comments
Spatial analysis of groundwater data and overlay with SIPs.	01-12-2021	28-03-2021	Delayed	Data is still being procured. We have shared the final stations for which data is to be collected, but lockdown delays the procurement. Also, data shows that spatial location data is not available, which will limit overlay analysis.
Collection of plot-level water application for SIP farmers and adjoining diesel farmers through surveys, installation of field instruments	01-01-2021	30-04-2021	Completed: data collection Delayed: Installation	For the SIP, all data has been collected. Based on the data, SIP and outlets within SIP for monitoring will have been selected. Installation of instruments is delayed because of COVID lockdown.
Monitoring and data collection [pumping, GW levels, agriculture and climatic data]	30-04-2021	31-12-2021	Delayed.	Will start once the instrumentation is done.
Data analysis of Kharif II season collected data	01-08-2021	31-12-2021	On track (expected)	
Set up of soil model to estimate return flows and groundwater model of the region	01-06-2021	31-12-2021	On track (expected)	
Annual Reporting	01-12-2020	31-12-2020	On Track (expected)	

Table 5: Deliverables for 1.2.1

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Database on farmers' pumps, wells, groundwater, and water management practices in selected SIPs and diesel plots in NW and SW Bangladesh.	30-04-2021	Completed	
2	Report on instrumentation installation and data collection protocol	30-06-2021	Delayed	
3	Brief report on data analysis of Kharif II season	31-12-2021	On track (expected)	
4	Report on conceptual soil and groundwater model for the study area.	31-12-2021	On track (expected)	

1.2.2 Groundwater-related studies embedded in scale pilot in India

Table 6: Activities for 1.2.2

Details of sub-activities	Start date	End date	Outputs/Comments	Status with details (Completed/On track/Delayed)	Additional comments
Spatial analysis of state groundwater data and overlay with SKY feeders.	01-12-2020	28-02-2021	Preliminary report on groundwater levels and trend in SKY and non-SKY areas	Completed	Presented during partners meet
Census/survey at farm level in selected feeders to collect data on Pump and well details	01-12-2020	28-02-2021	Selection of farmers in selected feeders for groundwater monitoring	Completed	It was delayed due to covid but now done
Installation of instruments in the field	30-02-2021	30-04-2021	Instruments installed on monitoring site	Delayed	Delayed due to lockdown. Trial installations have been completed. Currently ongoing and expected to finish in 1-2 weeks
Monitoring and data collection, and data analysis based on data from Kharif season	30-04-2021	31-12-2021	Database on collected data, a draft report on data analysis	Delayed	Will start in 1-2 weeks once the above task is completed.
Data analysis of Kharif season collected data	01-08-2021	31-12-2021	Draft report on data analysis	On track	
Set up of conceptual Groundwater model of the region	01-12-2020	30-08-2021	Draft report on conceptual groundwater model	On track	
Report/journal article	01-12-2020	31-12-2020	Draft report showing energy-groundwater pumping relationship	On track	

Table 7: Deliverables for 1.2.2

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Preliminary report on groundwater levels and trend in SKY and non-SKY areas	28-02-2021	On track/completed.	Results were presented in partners meet but were inconclusive to be put in a report.
2	Census database on farmers' pump, well, groundwater and water management practices in selected feeders	01-04-2021	Completed	Has been shared
3	Report on instrumentation installation and data collection protocol	31-05-2021	Delayed	Currently ongoing and expected to finish in 1-2 weeks
4	Report on conceptual groundwater model (31-08-2021)	31-08-2021	On track	
5	Brief report on data analysis with draft GW abstraction-energy relationship	31-12-2021	On track	
6	Blog posts and regular contributions to SDC-SoLAR newsletter – throughout the year	All throughout the year	On track	

1.2.3: Groundwater-related studies embedded in demonstration pilot in Pakistan

Table 8: Project update on activities

Details of sub-activities	Start date	End date	Outputs/Comments	Person/s responsible	Status with details (Completed/ On track/Delayed)	Additional comments
Rapid Enumeration of Diesel and SIP Farmers	01/01/2021	31/04/2021	Data Set	Azeem/Zain/Kashi Yashodha	Completed	A survey of 624 solar and non-solar farmers has been completed. A working paper has been drafted based on the initial analysis. This will form the basis of the detailed socio-economic survey
Main <socio-economic survey> Survey of Diesel and SIP farmers	15/04/2021	31/06/2021	Data Set	Azeem/Zain / Kashi/ Yashodha . Main survey to be conducted through Survey firm	Delayed but will be completed in the next couple of months	We had conducted a very detailed rapid enumeration survey which has provided excellent insights. We have analyzed this data and are confident to design a comprehensive socio-economic survey based on the data gathered
Weekly collection of data for	01/04/2021	30/10/2021	Data Set	Zain	Delayed	This will start once the data from the main

Kharif season on groundwater abstractions						socio-economic survey is available
Analysis of Data <Data groundwater and socioeconomics> survey	01/06/2021	31/07/2021	Working paper	Azeem/Kashi	Delayed – will be delivered once the survey is complete	A working paper based on the rapid enumeration survey is complete.
Collection of Data<<Data groundwater or socioeconomics>> for Rabi Season	15/10/2021	30/04/2022	Data Set	Azeem/Zain	On track	This will start for the Rabi season

Table 9: Deliverables for 1.2.3

Deliverables as per the work plan	Status Update
Data set on groundwater usage of diesel vs solar pumps in Punjab sites – July 2021 socio-economic survey and Nov 2021 for Kharif season report/working paper on impact of SIPs on groundwater – Nov 2021	Dataset, as well as the working paper, will be completed by Nov. 2021.
A policy brief for the Government on the promotion of SIPs – Dec 2021	Will be delivered on time
Collection of Data for the Kharif season – April 2021 – October 2021	This is a bit delayed due to the Rapid enumeration survey. It will be started in a couple of months.
Draft Manuscript based on analysis – Dec 2021	Will be delivered on time
Blog posts and regular contributions to SDC-SoLAR newsletter – throughout the year	This is ongoing – regular updates are being provided for the newsletter – a blog post based on the rapid enumeration survey is being drafted.

2.1.1 Scale pilot for testing different SIP promotion models in Bangladesh

Table 10: Activities of 2.1.1

Details of sub-activities	Start date	End date	Status with details (Completed/On track/Delayed)	Additional comments
Develop the Research note after collecting secondary data, literature review, develop instruments for FGD and key informant interview, a sample section	01-01-2021	30-04-2021	Delayed	The object of the case study for this year has been changed. Telephonic interviews are to be conducted instead for part of the sample. Field visit interviews are to be conducted by NGO Forum in the later part of the year.
Conduct FGD and Key informant interview	01-05-2021	30-06-2021		
Data Analysis	01-07-2021	30-08-2021		
Final Report	01-09-2021	30-12-2021	Should be on track	

Table 11: Deliverables of 2.1.1

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Descriptive journal article based on different SIP models 31/12/2021	31-12-2021	Delayed	These are expected to be delayed till the first half of 2022
2	A case study report on Upazila permit policy and its implementation, and its implications for SIPs 31/12/2021	31-12-2021	Delayed	

2.2.1 Demonstration pilots for grid connection of SIPs Bangladesh

Table 12: Activities of 2.2.1

Details of sub-activities	Start date	End date	Status with details (Completed/On track/Delayed)	Additional comments
Getting approval of Utility, identify different systems architecture and designs, and identify equipment requirements.	01-01-2021	28-02-2021	Delayed	IDCOL approved the selection of sponsors and financials. The sponsors are in the process of getting approval from Utility once government offices open. The expected installation completion is September/October
Identify the EPC for the installation and commission of grid connection equipment and connecting SIPs to the grid	01-03-2021	31-06-2021		
Baseline data collection and SIP level survey at selected sites (also see 1.1.1)	01/06/2021	15/08/2021	Delayed	The data collected using the HH survey is delayed and will start from August

Table 13: Deliverables of 2.2.1

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Detailed report on each of the five grid integration projects with technical parameters and socio-institutional features (IDCOL)	31-12-2021	Should be on track	The installation is delayed, but the report is expected to be ready by the end of the year

2.2.2: Scale pilot on institutional aspects of grid-connected SIPs in Gujarat, India

Table 14: Activities of 2.2.2

Details of sub-activities	Start date	End date	Outputs/Comments	Status with details (Completed/On track/Delayed)	Additional comments
Collection of Non-sky feeder data, Cleaning and analysis of SKY data	1/01/2021	28/02/2021	SKY feeder and farmer level data	Completed	
Intermediate report on SKY data	1/03/2021	31/04/2021	Technical report/draft research paper/blog post	Delayed	Quick enumeration has been brought to know the status of the SKY farmers before we go for a household survey. Going to the field was delayed due to COVID related lockdown. Also, farmer's training through RCT approach was brought in, worked to develop reports and MOU agreement with GERMI and GUVNL
Sample selection and questionnaire preparation	1/04/2021	30/05/2021	Questionnaire	Delayed	Part of the work is done on sampling. COVID lockdown and delay in GUVNL LOA, we were unable to move to field for enumeration
Carrying out the household survey (piloting and monitoring survey)	1/06/2021	30/08/2021	Primary data	On track	

Analysis of primary data	1/09/2021	31/12/2021	Report /research article	On track	
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Table 15: Deliverables for 2.2.2

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Compilation of secondary data from SKY web-portal and GUVNL	28/02/2021	On track	
2	Compilation of primary and secondary data	30/08/2021	On track	There is a slight delay in terms of primary data collection due to the COVID lockdown
3	Technical report/paper/blog piece on SKY feeder data	1/06/2021	Delayed	Due to lockdown were unable to collect field data. The report prepared now is only based on secondary data
4	Preliminary report on the impact of the SKY program.	31/12/2021	On track	

2.2.3: Demonstration pilots on Grid Connection SIPs in Nepal

Table 16: Activities on grid connection SIPs in Nepal

Details of sub-activities	Start Date	End Date	Outputs / Comments	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
Baseline surveys (including GESI studies) in selected grid connection and control sites	01-05-2021	31-07-2021	Draft baseline report summarising results from qualitative and quantitative surveys, including GESI outcomes	Delayed This activity will start once the Site Survey Report is finalized and one of the sites is selected.	Delayed due to the COVID second wave in Nepal, the site survey activity was delayed until mid-July.
Procure a consultant/vendor to install MG	01-04-2021	31-05-2021	Agreement with vendor / consultant	Delayed A consultant is hired to perform the site survey. The consultant will also estimate the BoQ and cost required for the pilot. The same will be used to perform the pilot.	Delayed due to the COVID second wave in Nepal, delays in previous activities impacted the timeline of this activity.
Installation of grid connection in one or two SIP site	01-06-2021	30-08-2021	Grid connection completed in at least one site Technical report with installed MG system & its functioning	Delayed Not started.	Due to the COVID second wave in Nepal, delays in previous activities impacted the timeline of this activity.
Develop a framework, including indicators/parameters to monitor, monitoring frequency, etc. for evaluating the effectiveness of the MG system	01-03-2021	30-05-2021	A framework for evaluating the effectiveness of the MG system	Delayed The monitoring framework will be finalized once the site survey is completed and the type of	Due to the COVID second wave in Nepal, delays in previous activities impacted the timeline of this activity.

				system we plan to install is finalized.	
Regular monitoring of various parameters related to the micro-grid system, crop production, change in farmers' behaviour, etc.	01-09-2021	31-12-2021	An Excel database of regular monitoring	On track This activity will start once the installation is completed.	-

Table 17: Deliverables on grid connection SIPs in Nepal

SN	Deliverable details	Due Date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1.	Technical note, methodological note and instruments for surveys	31-07-2021	Completed This activity is completed. The technical note, methodological note, and instruments for surveys are conducted by the MG consultant in coordination with Shisher before the site surveys.	-
2.	Draft baseline report summarising results from qualitative and quantitative surveys, including GESI outcomes	31-07-2021	Delayed This activity will be performed once the survey report is finalized and one site is selected based on the survey report.	Due to the COVID-related restrictions, the site visit for the survey was not possible until mid-July. Additionally, previous, pending activities need to be completed to complete this deliverable.
3.	Technical report with installed micro-grid system and its functioning	31-12-2021	Delayed Not started.	Due to the COVID related restrictions, the site visit for the survey was not possible until mid-July. Additionally, earlier pending activities need to be completed to complete this deliverable.

2.2.4: Demonstration pilots and simulation of grid-connected pumps through heat sinks in Pakistan

Table 18: Progress update on 2.2.4

Details of sub-activities	Start date	End date	Outputs/Comments	Person/s responsible	Status with details (Completed/ On track/Delayed)	Additional comments
Method Statement including design of Choice Experiments	01/04/2021	31/07/2021	Methodological Note	Azeem/Kashi/Yashodha	Not Started yet	This activity will build on the main socio-economic survey and utilize a subset of the respondents from the main survey. The project team is considering postponing this for the next year as we have significantly expanded our scope under the training component.
Procurement of hardware/instruments	15/08/2021	31/09/2021	Hardware	Azeem/Zain		
Field deployment of Instruments and Data collection for Rabi Season	01/10/2021	30/04/2022	Data Set	Azeem/Zain		
Pilot for testing the choice cards and making sure tariff range are relevant	01/10/2021	30/10/2021	Data Set	Zain		
Choice Experiment Survey	15/11/2021	31/12/2021	Data Set	Azeem/Zain		

2.3.1 Administration of innovation funds

Details of sub-activities	Start date	End date	Outputs/Comments
Finalization of IF grant call and announcing the call on the IWMI SoLAR website	01/01/2021	01/03/2021	Completed
Screening of applications, shortlisting by Country Leads, further scoring by technical panel members, interviews with semi-finalists and announcement of final awardees	01/04/2021	31/07/2021	Completed
Signing of contract and commencement of work by 2 nd round of IF grantees	31/07/2021	31/10/2021	In process

3.1.1 Training of farmers and local technicians in Bangladesh, India, and Nepal and Pakistan

Table 19: Training of farmers in Bangladesh

Details of sub-activities	Start date	End Date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
Preparation of training curricula, training modules and selection of trainers and trainees	1/01/2021	31/12/2021	On track (expected)	Curricula already developed by IDCOL
Training workshop/school (3-5 days training)	1/07/2021	31/12/2021	On track (expected)	To be completed in last quarter on 2021

Table 20: Deliverables on training in Bangladesh

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Training curricula, including training modules	31-12-2021	On track (expected)	Curricula already developed by IDCOL
2	Training report, including details of personnel, trained	31-12-2021	On track (expected)	To be completed in last quarter in 2021

Table 21: Activities on training in India

Details of sub-activities	Start date	End Date	Status with details (Completed/On track/Delayed)	Additional comments
India: <ul style="list-style-type: none"> Contractual agreement with GERMI Preparation of training curricula, training modules and selection of 	1/01/2021	31/12/2021	On track On track	

trainers and trainees				
Training workshop/school (3-5 days training)	1/07/2021	31/12/2021	Might delay	Early in 2021, training farmers under SKY feeder is conceptualized as the capacity building of farmers and track how the capacity building training workshop will help farmers make a better decision. Therefore, now we have decided to train about 2000 farmers under 48 SKY. The training itself might take 2-3 months. Therefore, this activity will be extended till early next year.

Table 22: Deliverables on training in India

SN	Deliverable details	Due date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Training curricular, including training modules	31/12/2021	On track	
2	Training report, monitoring trained farmers	Throughout the year 2022	Delayed	Due to structural change in the plan of the activity as mentioned above

Table 23: Activities on training in Nepal

Details of sub-activities	Start Date	End Date	Outputs/Comments	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
Training workshop/school (3-5 days training) (Training 1)	1/07/2021	31/12/2021	Training conducted	Completed -The training was conducted in Itahari, Nepal, from February 28, 2021, to March 06, 2021, with	-

				local partner Pathibhara Polytechnic. The training manual undergoing final edits by the IWMI team would then be translated into Nepali by an external consultant (to be identified).	
Training - 2		31-12-2021		Likely to be held in the last quarter of 2021, also based on the COVID situation.	
Preparation of training curricula, training modules and selection of trainers and trainees	1/01/2021	31/12/2021	Training materials are finalized, and trainees are chosen, and all technical, logistical arrangements for training done	On track Additional work on previous training modules is being conducted for the next training activities.	-
Training workshop/school (3-5 days training)	1/07/2021	31/12/2021	Training conducted	On track This activity is being planned for the last quarter of 2021.	This activity will be affected if there are any COVID related restrictions in October as this activity requires extensive field visits at multiple locations

Table 24: Deliverables on training in Nepal

SN	Deliverable details	Due Date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
1	Training curricula, including training modules	31-12-2021	Completed -Training conducted in Itahari, Nepal, from February 28, 2021, to March 06, 2021 The training manual undergoing final edits by the IWMI team would then be translated into Nepali by an external consultant (to be identified).	-
2	Training report, including details of personnel, trained	31-12-2021	Completed (Training 1) On-track (Training 2)	Training 1 The pandemic had impacted the dates of Training 1; however, it is now complete. Training 2 This activity will be affected if there are any COVID-related restrictions in the last quarter of 2021, as this activity requires extensive field visits at multiple locations.

Table 25: Activities on training in Pakistan

Details of sub-activities	Start date	End Date	Outputs/Comments	Person/s responsible	Status with details (Completed/On track/Delayed)	Additional comments
Preparation of training	1/01/2021	31/12/2021	Training materials finalized	Azeem	Completed – more planned	-Under this activity, we have completed successful trials

<p>curricula, training modules and selection of trainers and trainees</p>			<p>and trainees are chosen, and all technical logistical arrangements for training done</p>		<p>during the year</p>	<p>of the wheat crop at a partner university through solar-based precision surface irrigation – results have been analyzed, and the manuscript is under preparation.</p> <p>Two more trials at two different partner sites are underway for the Maise and pulses for the Kharif season. This will provide robust evidence of SIP use in precision surface irrigation, which can potentially impact millions of farmers. The trial at PARC will compare this technology with other HEIS techniques as well</p>
<p>Training workshop /school (3-5 days training)</p>	<p>1/07/2021</p>	<p>31/12/2021</p>	<p>Training conducted</p>	<p>Azeem</p>	<p>Delivered and ongoing</p>	<p>-A training on "Design of Solar Pumping Unit for Precision Surface Irrigation" was physically delivered to 70 participants at partner university</p> <p>-A hands-on training on "Operation and Maintenance of Solar Pumping Unit and</p>

						<p>Precision Surface Irrigation" was delivered to 19 farmers at the field site where IWMI has installed a SIP through SDC funding.</p> <p>-A physical training to PARC staff was delivered in Islamabad on laser grading to prepare the field for precision surface irrigation</p> <p>-A virtual training to KFUEIT researchers and staff was delivered on laser grading to prepare the field for precision surface irrigation</p>
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Table 26: Deliverables on training in Pakistan

Deliverables as per the work plan	Status Update
Training curricula, including training modules	Delivered
Training report, including details of personnel, trained	Delivered

3.1.2 Training of groundwater, energy and agriculture officials in all four countries

Details of sub-activities	Start date	End Date	Outputs/Comments	Status
Preparation of training curricula, training modules and selection speakers/lecturers	1/01/2021	30/06/2020	Training materials finalized and trainees are chosen, and all technical logistical arrangements for training done	In progress, but delayed
Partnership with an academic institution to host the program and issue certificate to the participants	1/01/2021	30/06/2021	Partnership agreement signed	In discussions with IHE Delft
Selection of participants (nominated by respective country Ministries)	30/06/2021	31/08/2021	Participants nominated and selected	Delayed
Online training conducted and curated	1/09/2021	31/12/2021	Training conducted and training report prepared	Delayed

3.2.2 National forums

Table 27: Activity on National Forum in Bangladesh

Details of sub-activities	Start date	End date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
National forum (20-30 participants – primarily policymakers) or else, a webinar	01/08/2021	31/12/2021	On track	National Forum was organized as a Webinar in the first half of the year Depending on Covid situation, 2 nd National Forum is likely to be online again

Table 28: Activity on National Forum in India

Details of sub-activities	Start date	End date	Status with details (Completed/On track/Delayed)	Additional comments
National forum (20-30 participants – primarily policymakers) or else, a webinar	01/08/2021	31/12/2021	ON track	It will be conducted in September – October 2021

Table 29: Activity on National Forum in Nepal

Deliverable	Start date	End date	Outputs/Comments	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
National forum (20-30 participants – mostly policy makers) or else, a webinar	01/08/2021	31/12/2021	National Forum Workshop Reports	Completed -The NPL national forum on Appropriate Institutional Modalities for Grid-Connected Solar Irrigation Pumps in Nepal took place on February 04, 2021.	It had to be shifted to an online forum due to the pandemic.

				-The webinar summary report had been completed.	
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Table 30: Deliverable on National Forum in Nepal

Deliverable details	Due Date	Status with details (Completed/On track/Delayed)	Comments, including COVID related impacts
National workshop reports	31/12/2021	Completed -The NPL national forum on Appropriate Institutional Modalities for Grid-Connected Solar Irrigation Pumps in Nepal took place on February 04, 2021. The webinar summary report had been completed.	It had to be shifted to an online forum due to the pandemic.