

Solar Irrigation for Agriculture Resilience in South Asia (SoLAR-SA) Project Nepal - Country Project Management Committee (C-PMC) | 6th Meeting

Date: 13th March 2023 | Time: 11:00 – 12:30 hrs. | Venue: IWMI, Nepal Office / Virtual

C-PMC Members SoLAR-SA Project – Nepal Attendee

SN	Name	Role	Institution	Attendance	Remarks
1	Manohara Khadka, Dr.	Chair	IWMI Country Representative	No	-
2	Laxman Prasad Ghimire, Dr.	Member	Representative of AEPC	Yes	In-Person
3	Asha Khanal, on behalf of Sagar Mani Gnawali	Member	Representative of NEA	Yes	In-Person
4	Pramila Shrestha	Member	Representative of DWRI	No	-
5	Santosh Raj Paudel	Member	Representative of DoA	Yes	In-Person
6	Tara Giri	Member	Representative of NARMIN	Yes	In-Person
7	Kumar Raj Shahi	Member	Representative of NiFUAN	Yes	In-Person
8	Prashant Shrestha, on behalf of Hari Shrestha	Member	Representative of Private Sector (SunFarmer Nepal)	Yes	In-Person
9	Binaya Raj Shrestha	Member	Representative SDC-Nepal	Yes	In-Person
10	Aditi Mukherji, Dr.	Member	IWMI Nepal - Regional PL, SoLAR	No	-
11	Shisher Shrestha	Member Secretary	IWMI – Consultant RE Expert, SoLAR-NP Country Lead	Yes	In-Person
12	Labisha Uprety	Invitee	IWMI Nepal – Sr. Research Officer	Yes	In-Person
13	Marlene Buchy, Dr.	Invitee	IWMI Nepal, Sr. Researcher	Yes	In-Person
14	Divya Sharma	Invitee	SDC India	Yes	Virtual
15	Deepak Varshney, Dr.	Invitee	IWMI New-Delhi	Yes	Virtual

Abbreviations: AEPC is Alternative Energy Promotion Center; NEA is Nepal Electricity Authority; DWRI is Department of Water Resources and Irrigation; DOA is Department of Agriculture; SDC is Swiss Agency for Development and Cooperation; NFIWAN is National Federation of Irrigation User's Association, Nepal; NARMIN is National Association of Rural Municipalities in Nepal; IWMI is International Water Management Institute

Agenda, Discussions, and Decisions

The session program and agenda of the C-PMC meeting are in Annex II.

Welcome Remark and Purpose of the meeting

Mr. Shisher Shrestha (Member Secretary of C-PMC), on behalf of IWMI started by welcoming all the C-PMC members and guests to the meeting. Mr. Shisher Shrestha requested Dr. Laxman Ghimire to Chair the session in the absence of Dr. Manohara Khadka.

The welcome remark was followed by a brief self-introduction session moderated by Mr. Shisher Shrestha.

SoLAR-SA Nepal Y3 updates

Mr. Shisher Shrestha initiated the presentation by presenting the summary of the 5th C-PMC meeting, discussions, and actions taken by IWMI.

The project activities planned for Nepal for Year 3 and the progress achieved was highlighted. The summary of Progress in Y3 is as follows:

Activity 1.1.2 Impact evaluation and GESI case study of existing and new SIP programs in Nepal

- The manuscript of a Journal article based on a Qualitative study of GESI in SIP and a Policy review on GESI in SIP in Nepal and Bangladesh is currently being reviewed by Frontiers.
- Research Reports on Quantitative surveys finalized. Abstract of the journal article based on Quantitative research report to be submitted in 2023.
- The report for desk assessment for country-specific emissions (research on behalf of MoFE) has been finalized. Dissemination workshop in coordination with the Ministry of Forest and Environment (MoFE) and NDC Partnership Nepal organized on March 3, 2023
- Issue brief on AEPC subsidy delivery published on the SoLAR website and widely shared in the SoLAR Regional forum in Gujarat. Another Issue Brief on Diesel use is drafted and needs copy editing before publishing.
- National dialogues or conferences on Gender and Solar Irrigation during World Water Week or other forums were completed. In Y3, 13 GESI-related presentations were made led by Dr. Manohara Khadka, Ms. Labisha Uprety, and Ms. Gitta Shrestha.

- Final draft reports on the Review of Commission WEF policy through the consultant of Pakistan and India from the GESI lens are received.
- IWMI Summary Research Report and orientation with the local government moved to 2023 (Y4) activity.

Activity 2.2.3 Demonstration pilots on grid-connected SIPs in Nepal

- The qualitative baseline survey was conducted, and the research report is drafted.
- The exposure visits of a 13-member delegation to observe India's grid-connected Solar Irrigation was conducted in Feb 2022.
- Installation of grid-connected connected solar irrigation pilot at Chhipaharmai Rural Municipality is completed. Net-metering is delayed as the Net-metering mechanism had expired, but NEA did renew it.
- Regular monitoring of various parameters is on track and progressing through Inverter RMU and manual monitoring of Local field assistant (LFA).

Activity 3.1.1 Training of local technicians in Nepal

- Dual-language manual (English and Nepali) development in the final stage. This should be finalized in a couple of months and will be handed over to AEPC as a knowledge product.
- 2-day technician training organized in Chitwan organized in December 2022, with 20 participants (10 male and 10 female).

Activity 3.1.2 National Forum in Nepal

- The SoLAR National Forum on Solar Irrigation is planned as part of World Water Week in Nepal on March 17 as one of the Technical Sessions.

Research Highlights

Qualitative Baseline Study at MG Pilot Site

Ms. Labisha Uprety summarized the finding from the qualitative baseline survey at the Grid-connected SIP Pilot site at Chhipaharmai Rural Municipality, Parsa.

- The study aimed to investigate farmer interest, understanding, and motivation regarding the micro-grid pilot project and related gender and social inclusion aspects.

- Study looked at six themes: current irrigation behavior, knowledge and motivation regarding participation in the micro-grid pilot of farmers, water markets, agriculture markets, solar irrigation pumps, and understanding of climate change
- Among men, the common mindset is that women do not know how to operate these pumps because they are women rather than because they have not been taught how to use technology. Even if women had been taught how to use the pump, controllers were often dismantled from the field site for fear of theft, causing women to not be actively involved in operating the technology.
- All MG participants, to some extents were able to express a basic level of understanding of the project. The level of understanding was correlated to exposure to project information – therefore, women were not able to articulate the same benefits.
- The most quoted expected advantage was getting electricity at night and being able to extend irrigation hours. A few articulated more benefits such as selling water to other farmers, typically at rates cheaper than that of selling diesel water –quoted at NRs. 100. No water was currently sold for irrigation through SIPs, women typically did not seem to buy water.

Hurdles in Implementing the Grid-connected SIP Pilot

Mr. Shisher Shrestha summarized the hurdles encountered in implementing the Grid-connected Pilot project.

- When there is an overlap between on-grid (NEA) and off-grid (AEPC) areas, there is no clarity on which government organization should lead such projects.
- Local government is well placed to lead grid-connected Solar irrigation projects with support from organizations like AEPC and NEA. They have a local presence and are already working with the farmers.
- Specific policy needs to be developed for grid-connected Solar Irrigation, and NEA needs to promote it.

Desk assessment to determine country-specific emission factors and emissions due to Diesel pumps in Nepal

The Summary of findings from the desk assessment was highlighted by Mr. Shisher Shrestha.

- Desk assessment to determine the emissions factors due to various GHG.

- Top-down and bottom-up approaches are used to determine the inventory of diesel consumption for irrigation.

Key Activity Highlights

Major activities of Y3 under the SoLAR project were highlighted as follows:

- Participation of a 15-member Nepal delegation with representation from NEA, AEPC, DoA, DWRI, NARMIN, IWMI, and the Private Sector in the SoLAR Regional Knowledge Forum on Energizing Agriculture and Enabling Just Energy Transitions in South Asia.
- SoLAR Grid connected pilot awarded outstanding solution in world Water Challenge 2022 in Korea International Water Week.
- Technician training with 20 participants (10 male and 10 female) was organized in Chitwan in December 2022. Two colleagues (one male and one female) from AEPC joined the training.

Year 4 Plan

Shisher Shrestha presented the draft work plan for Y3, which mainly focused on the following:

- Research publication, findings dissemination, and policy uptake.
- The SoLAR Grid-connection pilot monitoring and Capacity building of the community.
- Training for technicians and entrepreneurs, local government officials, etc., and knowledge forums.
- The detailed Y3 plans are provided in the presentation material in Annex III.

Discussion / Feedback / Closing Remarks

The discussion session was moderated by Mr. Shisher Shrestha where all the CPMC members, SoLAR team members, and Ms. Divya Sharma participated.

- Since the project is in the final year, we need to conduct an internal audit to evaluate the achievement vs target on the activity and financial progress. SDC plans to conduct an evaluation of the SoLAR Project this year.
- The role of the Local Government (LG) in solar irrigation programs (especially grid grid-connected connected solar irrigation) was discussed, and the need for LG-level sensitization was developed. A local-level event for LG orientation would be necessary.

- Currently, AEPC is considering if they need to be involved in solar irrigation as other government agencies are working in the same area. Once that decision is made, more concrete reforms in the policy will be made based on SoLAR research.

The detailed discussion script is given in **Annex I**.

The meeting was concluded- with concluding remarks from all C-PMC members and concluding remarks from Dr. Laxman Prasad Ghimire and thanked everyone for the fruitful discussion around Solar irrigation.

Annex I: Discussion Session – detailed script

Shisher Shrestha: We take data from farmers and never go back, so we are trying to disseminate this work. Even though AEPC wants to prioritize smallholders, smallholders are not able to access these subsidies. We want to engage with local governments on how to prioritize smallholders and women farmers.

Kumar Raj Shahi: Is the research only focused on women?

Labisha Uprety: No, not only women, though as men are migrating, but women are also becoming main actors on farms so we need to see how they can access support such as subsidies. However, the project aims to increase access for smallholders, and marginalized farmers including women, not only for women alone.

Kumar Raj Shahi:

- Diesel use needs to be stopped at the local level
- Where did you get the data from for the diesel pumps? – is it that high? DoI is trying hard to reduce this thing but seems efforts may not be working (?)
- We need a pilot project for solar lift irrigation – you can provide technical support, local governments can then take it up...

Divya Sharma:

- Thank you to IWMI Nepal for giving us these deep insights.
- By June next year, the first phase of the project will come to an end. Starting from sometime in May – in about Sept, SDC will be launching an evaluation
- Many of you will be contacted will be contacted about this evaluation
- This is being led by a well-known professor – Chris Scott of UPenn – familiar with South Asia and Latin America. He continues to be part of ICIMOD as a chair. He is supported by national level consultant – Ms. Rashmi Kiran Shrestha – she is the founder of a company called NERICA group. She works in promoting in traditional agriculture and helping smallholders and women farmers.
- Will get back to Shisher and Labisha to set up meetings with you.

Binaya Raj Shrestha:

- This is the final year of the project.
- Will be beneficial for us to know what the target was and what was achieved against this. We have a set of indicators in the project document – so did we achieve what we wanted to do, or are we far away from that target?
- Maybe that will come in the physical progress? And the financial progress – are we close to what we have targeted? Or are we far behind?
- In addition, learnings – we have passed 3 years so what are major learnings that can be disseminated?
- Local governments have a huge role now based on the constitution. Solar development is not explicitly mentioned in the policy documents but they are the closest to the farmers. We are not promoting a short-

term solution, if we want to see long term sustainability – like the MG connection – local government are in the right position to promote this. How can we link these activities with local government?

- In summary we need to see achievement vs target, financial progress, major learnings, and role of local governments in promoting solar irrigation

Laxman Ghimire:

- I am well updated on the progress of this project.
- AEPC provides some subsidy for technology solutions, but we require some other value chains as well to succeed – we are not able to optimize these pumps.
- We should integrate the tech into value chains, increase tech awareness, and increase utilization of system.
- We are not well experienced in implementing these systems, but we are doing so at individual/ community level. We have learnt of some user level problems, problems of maintenance (after 2 years particularly), there are theft issues as well.
- We have been trying to pilot some community level systems in the Tarai so we can scale up the system – there are some cost efficiency issues involved.
- AEPC is working with DFID to pilot some fund modalities – such as microfinancing. We have implemented several models. It's time to make a comparison with all these models. Which model works for Nepal?
- I also visited Gujarat along with IWMI team; we need to pilot this system first. We have KFW funds to help support such a system. My team had also requested some technical information as well regarding the site we visited last time.

Shisher Shrestha:

- There is a PhD student with us who is looking at various models of solar irrigation – which could be useful for AEPC.
- Regarding the KFW DKTi project, they had also come here and asked if IWMI could compare AEPC's older system with other systems.
- Last time APEC did some community level projects in Tarai – need to see what the social challenges are. If financially it makes sense, then we need to stick with these kinds of projects.
- We are almost at the end of this project, but we could plan some things for the next phase.

Santosh Paudel:

- There are some problems identified in all presentations you made
- Regarding user group issues – we can register them at the local government as an irrigation group
- Maintenance of solar systems – we have to develop technicians at the local level for O and M purposes
- Subsidy mechanism – not reaching smallholders, women farmers
- Sensitization and capacity building of local government to promote this irrigation system is needed
- Operation and management of SIPs – manual is needed, wider dissemination

Shisher Shrestha:

- We have already highlighted the problem of the O and M issues for SIP in our work – it's a key issue.
- Even if there is a small wiring problem, farmers end up calling the company, which ends up taking a lot of time if they have to manage a technician from Kathmandu. The capital cost ends up being really high.
- We have developed a pool of solar technicians – they can hopefully be contracted to solve these issues at the site.

Prashant:

- We can do the AMC contract from farmers for this...

Tara Giri:

- While you were mentioning that you want to disseminate these research findings – on this, local people and local governments consider you to be experts so let's not reach them with such a result that is already known
- Research results should be fascinating/interesting to them; Until and unless we can influence them, they will not take it up
- As Labisha ji also noted, we should not reach them with our agenda, do not reach local governments with superficial results
- I have participated in generic results dissemination which hardly contribute to any knowledge
- If we understand their interest first, then they will own the results
- NARMIN has been partnering with IWMI in engaging local level government in several activities in other projects

Labisha Uprety:

- One of our major results has been that access to subsidy is based on social capital, what we want to do is take this result and engage local governments in understanding how we can increase this information dissemination

Tara Giri:

- Yes that's a good idea, most farmers do not have information about the subsidy
- Local governments are always welcoming, they are enabling – but we should have to make them interested in our work

Kumar Shahi:

- Political problem might also be an issue... they (local governments) have political agenda.

Shisher Shrestha:

- We had a political problem at our MG pilot site, but in the end up worked more with the JTAs and are trying to complete the problem

Tara Giri:

- Yes, there is a political agenda, but why don't we try to grab that as an opportunity?
- If there is no political engagement, commitment, will – there will not be any success
- Why should we focus on areas with no political engagement?
- Results can be shown in these areas

Kumar Shahi:

- Then those who are able to have connections, only they will be able to access things...

Shisher Shrestha:

- People don't even have information that these kinds of subsidies exist
- We want to engage local governments to understand how they could increase this access

Santosh Poudel:

- If farmers have to contribute 40% of the cost, then of course this would be a disincentive for farmers
- But if we get local governments the power to give these subsidies, then they will only grant it to their own people – and not to those marginalized

Laxman Ghimire:

- Even though it says 60%, it typically covers most of the capital cost
- We are trying to interact with local governments regarding subsidy disbursement

Binaya Raj Shrestha:

- This blanket policy could perhaps be more targeted...

(discussion in group regarding different targeted mechanisms to get pumps to smallholders and women such as the ICIMOD project)

Laxman Ghimire:

- The thing is we are discussing if irrigation needs to be under AEPC portfolio or not – there is already the irrigation department, there are local governments now, there is also the agriculture department, there is the groundwater board – so we are questioning whether AEPC engages in irrigation or not, so there may be discussion in removing the 60-40% subsidy as well

Santosh Poudel:

- We are trying to get a farmer categorization process activated, so we could have categories to base subsidies on
- Local governments could verify if the farmers are part of that category
- We are trying to do this for the last 2 years but it has not taken full shape yet
- Local governments don't prioritize agriculture though – they do not have separate budget themselves on agriculture

Labisha Uprety:

- If there is no policy from top or regulation, then we cannot expect that it will somehow automatically happen at the local level
- The subsidy policy is being revised right now so this would be the right time for making this targeted

Marlene Buchy:

- When you say we need to come up with interesting results – are you talking about local government or are you talking about farmers?
- What kind of result is expected for them? I think you are implying that results so far are not useful...

(discussion with Tara ji: we need to see if the results are being worked on by local governments, has this happened yet? I think IWMI is already aware of farmer needs but the results cannot be very superficial or basic)

- Do we have data by IWMI on how irrigation would help farmers economically? (SS: we will do that in NEXUS Gains)
- It seems what we are researching is the institutional arrangement, but maybe Tara ji is saying that they don't care about the framework by the local level...

Shisher Shrestha:

- This sort of project the MG project will not be demanded by the local government; we are showing a new kind of concept that's working in India and Bangladesh
- We selected this site with a lot of considerations – with a technical feasibility study
- We also on boarded the local government
- In our research, on the AEPC subsidy, we find that there is a lot of discrimination in who is getting the solar pump...

Marlene Buchy:

- The study we are doing is engaging with different stakeholders...to convince the AEPC, the NEA etc. to tell them, which is the best model, but then asking how we will now convince the local government.
- We are not connecting with local governments first, so what is in it for them?
- Do we have the data to tell farmers what profits they may see if using solar irrigation?

Tara Giri:

- The local government expects action-oriented research
- This project is working at the institutional level research...which is not uninteresting to local governments

Labisha Uprety:

- The data will depend on the research question
- We began with an institutional question which was our starting point, and with the MG pilot we have managed to convince at least one local government to work alongside us
- But for the new phase we need to ask local governments what their interest is when it comes to renewable energy tech. This could guide research for the next phase.

Asha Khanal:

Major thing to consider here:

- Technology selection: can we convince any one local government financially in any way with the pilot?
- After that, can we copy this to other sites– can we convince other governments?
- With NEA – it was so hard to convince local governments, their perspective is very different
- We have DC and AC pumps for irrigation in Nepal – DC or AC pumps or hybrid pumps?
- We are doubting ourselves which pump is better then we cannot convince the local government
- The ministry has subsidized tariff for electricity --- which tech would now be most suitable for farmers amongst grid, hybrid, and solar.
- Also, what should be written in the AMC contract with farmers? - What should be the exact price of the pump? What is the rate of inflation?
- There will be many doubts in the AMC contracts later otherwise - How will they give money to the technicians?
- Operation modality needs to be clear for any project
- We have experience of working with Lalitpur municipality – where the head of the municipality took up the project, and took up a lot of responsibility to enable solar streetlight done

- Tariff is also to be seen by Tariff Regulatory Committee; this meeting does not have presence of policymakers from the ministry, from WECS
- NEA is handling everything in Nepal because our area is small, but the main work of utility is only to buy and sell energy
- There is a new guideline for net metering, it has three years of time after which the guideline will expire
- NEA is a profit-oriented company and is not responsible for essentially making these policies

Shisher Shrestha:

- For NEA it will not be profitable if farmers get power for cheap and sell it back to the grid at a higher price
- If the pumps became grid connected, then farmers would use the pump for longer hours or sell water, using more energy
- In case of Gujarat, they have forced farmers to take up solar irrigation as the government has a target for renewable energy. They have subsidized energy from companies and are selling a lot of water. so they have put in solar grid tied components to reduce electricity tariff burden and increase renewable energy portfolio
- Our case is a little different – our energy is already green, and we have energy surplus, and seasonal variations

Asha Khanal:

- We also need to be mindful of the 15% energy mix when we talk about energy surplus, which NEA has not given much thought to
- Each year our water recharge levels are decreasing, when we talk of climate change
- Hydropower alone cannot be the single energy source; we need to have an energy mix of solar, wind etc.
- If we can also get water to unused land using solar irrigation – for example in areas such as Chitwan - that would be more useful
- If any local government can enable a public irrigation system – community farming system, and create some quantitative benefits – by saying they could sell this much electricity, they have this much profit, that would be a good case

Kumar Shahi:

- Is the 100 rupees amount per hour for solar irrigation in your research? It seems expensive?

IWMI:

- Yes, Rs. 100 per hour for solar irrigation (prospective rate as quoted by respondents)
- It is half of the rate of diesel pump water – sold at about 200 Rs. per hour

Asha Khanal:

- We need to find where there is interest and uptake of this research, let us find and tap into young dynamic leaders of local governments

Binaya Raj Shrestha :

- What would you say about the evaluation of the project? Have we achieved our targets?

Shisher Shrestha:

- We have used up most funds, and substantial funds are not remaining
- In terms of targets, we have met them for 1.1.2, we are in publication phase, for the micro-grid we have set up the pilot, for capacity building, we have been doing these technician training which will also continue this year.
- We are also going to have two national forums this year – it has been mostly virtual forums so far; one we are thinking of doing at the province level

Binaya Raj Shrestha:

- We are short term actors; we need to see how we can get local governments could own this

Kumar Shahi:

- It would be good if you could do a solar lift project somewhere – in coordination with the community, the local government...

Shisher Shrestha:

- we do not have funds for this
- but local governments have enough funds for this
- if they are interested, we could provide technical advice

Annex II: Session Program

Time	Activity	Responsible Person
10:30 AM – 11:00 AM	Welcome / Coffee-Tea	Mr. Om Acharya
11:00 AM – 11:05 AM	Welcome remarks & Purpose of the meeting	Dr. Manohara Khadka (On Behalf – Shisher Shrestha)
11:05 AM – 11:15 AM	Introduction – C-PMC Members and Guests	Self
11:15 AM – 11:25 AM	Year 3 Progress	Mr. Shisher Shrestha
11:25 AM – 11:40 PM	Research Highlights <ul style="list-style-type: none"> • Qualitative Baseline Study • MG Pilot • Desk Assessment – Emission Factor Activity Highlights <ul style="list-style-type: none"> • SoLAR Regional Forum • Technician Training • Desk Assessment Emission Factor 	Ms. Labisha Uprety Mr. Shisher Shrestha
11:40 PM – 11:50 AM	Year 4 Plans Presentation	Mr. Shisher Shrestha
11:50 AM – 12:20 PM	Discuss / Feedback	All C-PMC Members and Guests
12:20 PM – 12:30 PM	Closing Remarks	Dr. Laxman Prasad Ghimire
12:30 PM – 13:30 PM	Lunch	Mr. Om Acharya

Annex III: Presentation

Annex IV: Photographs from the Meeting



FIGURE 1 IN-PERSON PARTICIPATION



FIGURE 2 VIRTUAL PARTICIPATION