



Nepal Science-Policy Dialogue on Solar Irrigation

Empowering Agriculture with Renewable Energy for Sustainable Irrigation and Inclusive Policies

Venue: Kailash Conference Hall, ICIMOD

Date: Monday, April 22, 2024, | Time: 09:00-17:15

Overview:

The irrigation system covers only 40% of Nepal's agricultural land, and only 19% of the irrigated land in Nepal receives year-round irrigation (YRI)¹. With many farmers relying on rain-fed cultivation, the escalating challenges posed by shifting weather patterns are exacerbating difficulties in sustainable production and livelihoods. Moreover, Nepal's diverse physiographic zones lead to unequal irrigation and technology access distribution between the hills and plains, necessitating tailored solutions. Major policy changes are required to reimagine Nepal's modern irrigation programs to ensure YRI through Renewable Energy irrigation and expedite this energy transition in the agriculture sector, making them more inclusive, sustainable, and scalable.

Renewable energy solutions like Solar irrigation have gained traction as a climate-resilient technology among Nepali farmers over the last decade. Recent data shows that Nepal is gradually moving away from fossil fuel-based irrigation to more sustainable renewable energy sources such as solar. The ICIMOD PURE platform also shows that the area with unmet irrigation in Nepal requires an additional estimated power capacity of 1300 MW for lift irrigation.

The one-day workshop, jointly organized by the Alternative Energy Promotion Center (AEPC), International Water Management Institute (IWMI), and International Centre for Integrated Mountain Development (ICIMOD), aims to bring policymakers, researchers, the private sector, development partners, civil society, and other key stakeholders together to engage in a science-policy dialogue on scaling renewable energy programs. This workshop will showcase evidence and research findings from the Swiss Agency for Development and Cooperation (SDC) funded Solar Irrigation for Agriculture Resilience in South Asia (SoLAR-SA) and the GEM Nepal project funded by the Royal Norwegian Embassy. The workshop primarily focuses on scaling solar irrigation programs, prioritizing inclusivity and sustainability by harnessing evidence and collective insights to overcome challenges and promote effective solutions.

¹ IMP 2019

Objectives

The key objectives of the National level Science-Policy Dialogue on Solar Irrigation are:

1. Provide a platform to exchange knowledge on solar irrigation in Nepal.
2. Facilitate policy dialogues with policymakers, development partners, and stakeholders to improve the government's solar irrigation initiatives and make them more socially inclusive, scalable, and sustainable.
3. Identify key gaps in research and opportunities for future work in Nepal's solar irrigation sector.

The workshop focused on three thematic areas.

Theme 1 - Scaling Solar Irrigation in Nepal

Solar irrigation is an established technology that has been widely adopted in Nepal for over a decade. The government has actively promoted solar irrigation pumps (SIPs) as a climate-friendly alternative to diesel pumps and in areas with limited grid electricity access. However, because of the significant upfront capital investment required, the adoption of solar irrigation programs in Nepal heavily relies on subsidies. As a result, the market size for solar irrigation is often determined by the available budget for subsidizing pumps rather than actual demand. This session will delve into strategies for scaling up solar irrigation in Nepal with an innovative business model, including exploring opportunities for off-grid solar irrigation systems and investigating the possibility of grid integration of SIPs.

This session will explore the following:

- Identifying the potential renewable energy demand (on/off-grid) for irrigation in Nepal.
- Benefits of integrating Solar Irrigation Pumps (SIPs) with the grid and their role in enhancing the scalability of solar irrigation.
- Cost optimization of solar irrigation system for hills
- Building a scalable business model for solar irrigation with subsidies and financing options.

Theme 2 - Social Inclusion in Solar Irrigation

Solar irrigation programs hold immense promise in Nepal, but their success hinges on the ownership and adoption of the technology. However, a critical shortcoming exists: a disproportionate focus on the electro-mechanical and technical fixes. This neglects the vital socio-political and economic context within which these programs operate. Failing to account for societal realities as an integral part of planning, design, and implementation hinders the effective transfer of solar irrigation technologies. This session dives into this challenge, exploring the need to integrate social inclusion into solar programs.

This session will explore the following:

- The importance of gender and social inclusion for sustainable solar irrigation programs.
- Practitioners' experiences, both successes and challenges.
- Strategies to build ownership of solar irrigation programs, ensuring their adoption and long-term success.

Theme 3 - Making Solar Irrigation Programs More Sustainable

In Nepal, more than three thousand solar irrigation pumps have been installed by AEPC, and even more are installed by provincial and local governments. The demand for solar irrigation pumps is growing, and a significant investment has been made. However, various reports have highlighted the sustainability issues of the systems. Some of the sustainability issues are related to poor construction standards and poor operation and maintenance (O&M) services. Furthermore, frequent issues result in farmers not trusting the technology, limiting its adoption.

Without ensuring challenges related to the sustainability of solar irrigation programs, the government's investment is wasted, and farmers cannot maximize the benefits of solar irrigation systems.

This session will explore the following:

- While poor O&M services have been widely reported, what practical challenges limit timely and effective O&M services?
- Beyond the technical issues, what issues (social aspects, groundwater sustainability, etc.) limit the sustainability of solar irrigation programs?
- What initiatives are being taken by solar irrigation programs, installer companies, and supplier companies to overcome the challenges?

Expected Outcomes

1. Increased understanding and knowledge exchange among participants about solar irrigation practices in Nepal.
2. Enhanced policy dialogues may improve the government's solar irrigation initiatives.
3. Identify critical research gaps and opportunities for future work in Nepal's solar irrigation sector.

Knowledge Partners



Agenda (Emcee Ms. Shivani Chemjong, IWMI Nepal)

Time	Agenda
08:00 – 09:00	Registration
OPENING SESSION	
Session Chair: Mr. Nawa Raj Dhakal – ED, AEPC	
09:00 – 09:10	Welcoming the Dignitaries National Anthem
09:10 – 09:20	Welcome Remark – Dr. Manohara Khadka – CR, IWMI Nepal
09:20 – 09:30	Opening Remark – Dr. Pema Gyamtsho – DG, ICIMOD
09:30 – 09:40	Opening Remark (virtual) – Ms. Divya Sharma – Deputy Head of Cooperation, SDC
09:40 – 09:55	Keynote Presentation – Status of Solar Irrigation in Nepal Dr. Laxman Ghimire, AEPC
09:55 – 10:05	Special remarks from the Chief Guest – Mr. Keshab Kumar Sharma – Secretary, WECS
10:05 – 10:15	Remarks by Session Chair – Mr. Nawa Raj Dhakal – ED, AEPC
10:15 – 10:45	Group Photo and Tea/Coffee Break
SESSION 1 – SCALING SOLAR IRRIGATION IN NEPAL	
Session Chair – Dr. Laxman Prasad Ghimire, AEPC	
10:45 – 11:00	Presentation 1.1 – Lessons from the Grid-connected Solar Irrigation Pilot in Parsa – Mr. Shisher Shrestha, IWMI
11:00 – 11:15	Presentation 1.2 – Opportunity for renewable energy for irrigation in the mountains – Mr. Avishek Malla, ICIMOD
11:15 – 11:25	Experience from the field <ul style="list-style-type: none"> • User of grid-connected Solar Irrigation Project in Parsa – Amin Miya • User of solar water pumping system in Rautahat – Januka Devi Upreti and Mahesh Upreti
11:25 – 12:15	Panel discussion Scaling solar irrigation in Nepal. (40 mins) Moderator: Mr. Badri Nath Baral, NREP Panelists <ol style="list-style-type: none"> 1. Ms. Bimala Rai Tilung, Mayor, Halesi Tuwachung Municipality 2. Mr. Kiran Timilsina, Ghampower 3. Mr. Madhab Neupane, Mero Microfinance 4. Mr. Sagar Gyawali, NEA Q&A (10 mins)
12:15 – 12:45	Lunch

SESSION 2 – SOCIAL INCLUSION IN SOLAR IRRIGATION	
Session Chair: Mr. Nabin Chandra Adhikari, Secretary – Ministry of Water Resources and Energy Development, Karnali Province	
12:45 – 12:55	Presentation 2.1 - Making Solar irrigation equitable and inclusive: Some insights from Nepal – Ms. Sumitra KC, IWMI
12:55 – 13:05	Presentation 2.2 - Enabling GESI in the Renewable Energy Powered Decentralized Lift Irrigation Systems – Dr. Shiba Satyal Banskota & Ms. Simran Silpakar, ICIMOD
13:05 – 13:15	Experience from the field – Ms. Sabita Maharjan, Chairperson, Chhahari Krishi Ekal Mahila Farm
13:15 – 14:15	<p>Panel discussion on gender and social inclusion in solar irrigation. (45 mins)</p> <p>Moderator: Dr. Darshan Karki, IWMI</p> <p>Panelists</p> <ol style="list-style-type: none"> 1. Dr. Indira Sthapit Shakya, Independent Consultant 2. Mr. Ishwari Tiwari, BCIRMP 3. Ms. Pratima K.C, AEPC 4. Mr. Krishna Prasad Parajuli, SEMAN 5. Ms. Usha Maskey Manandhar, MinErgy Nepal <p>Q&A (15 mins)</p>
SESSION 3 – MAKING SOLAR IRRIGATION PROGRAMS MORE SUSTAINABLE	
Session Chair – Prof. Dr. Shree Raj Shakya, CES	
14:15 – 14:25	Presentation 3.1 – Groundwater dashboard and Impact of GW-based pumped irrigation on GW table – Pratik Bhujju, CIMMYT
14:25 – 14:35	Presentation 3.2 – Needs and instruments available for capacity building in the Irrigation sector – Kushal Gautam, GIZ POSTED
14:35 – 14:45	Presentation 3.3 – DFS Framework for pump irrigation – Mewang Gyeltshen, ICIMOD
14:45 – 15:45	<p>Panel discussion on Sustainability: Quality of system design, Operation and maintenance, capacity development issues, and groundwater depletion. (45 mins)</p> <p>Moderator: Dr. Bharat Poudel, GIZ POSTED</p> <p>Panelists</p> <ol style="list-style-type: none"> 1. Mr. Asit Saha, Aqua Flow Technologies 2. Dr. Anusuya Joshi, AEPC/DKTI 3. Mr. Jeevan Baidya, Sunbridge Nepal 4. Ms. Kalpana Kumari Katuwal, Mayor, Barahathwa Municipality 5. Mr. Santosh Raj, AEPC 6. Ms. Sadikshya Neupane, GIZ <p>Q&A (15 mins)</p>
15:45 -16:00	Tea/Coffee Break

PLENARY CLOSING SESSION

16:00 – 17:00	<p>Plenary Panel discussion on the Future of Solar Irrigation and Research (45 mins)</p> <p>Moderator: Dr. Darshini Ravindranath, IWMI</p> <p>Panelists</p> <ol style="list-style-type: none">1. Prof. Netra Chhetri, Arizona State University2. Mr. Niraj Subedi, KfW3. Dr. Ram Prasad Dhital, ADB Consultant4. Ms. Resha Piya, British Embassy Nepal <p>Q&A (15 mins)</p>
17:00 – 17:15	Closing Remarks – AEPC