

5th SDC-SoLARCOUNTRY Project Management Committee Meeting India

Venue: Academic Block 7/103 at IIT-Gandhinagar

Date: 07 February 2023

Time: 14:30-16:00 PM (IST)

Attendees:

Name	Role in C-PMC	Attended
Dr Alok Sikka	Chair, India C-PMC	Yes
Dr Deepak Varshney	Researcher SoLAR	Yes
Dr Aditi Mukherji	Member, Regional Project Leader, SoLAR	Yes
Dr Tushaar Shah	Member, Emeritus Scientist, IWM	Yes
Divya Sharma	Member, Swiss Agency for Development and Cooperation (SDC)	Yes

Agenda

The C-PMC India meeting was held during the Regional Knowledge Forum held from 6-8 Ahmedabad, Indian Institute of Technology (IIT), Gandhinagar, Gujarat. It was the 1st in-person closed meeting for the members of the India C-PMC Members since the start of the project. During the meeting, the progress of the project was discussed, activities and outputs were presented, and recommendations from India C-PMC members were discussed and noted.

Discussions

Opening remarks were by Divya Sharma, SDC, who opened the meeting stating that this CPMC meeting was the first one to be held in-person since the beginning of the project. She recognized that with Year 3 having picked up significantly in terms of activities, the project was now progressing well. MoU with GUVNL had picked up, and the end of year SDC review meeting is also upcoming. Reviewers for the same will be announced soon. She reiterated for the panel that the SDC original commitment was originally for two phases and requested the team to provide recommendations to reviewers for Phase 2.

Dr Deepak Varshney presented the activities and outputs under the India components, which are given as under –

Impact Evaluation

Output 1.1: Impact of solar irrigation adoption on livelihoods (women and men farmers), agriculture, and climate resilience documented and shared with policy makers.

Training of farmers

Output 3.1: A cadre of women and men technicians were trained and water energy-agriculture experts in the region got sensitized about cross-sectoral interlinkages.

Groundwater sustainability

Output 1.2: Impact of large-scale SIP adoption on GW sustainability documented and shared with policymakers.

Under these components the following activity progress report was presented:

1.1 Impact Evaluation –

Scheme 1

- Journals papers - (5 papers completed and to be communicated): details of papers and status were presented.
- Policy Briefs
- Data Collection

Scheme 2:

- A quick assessment of the Chief Minister's Saur Krishi Vahini Yojana (completed)
- Case study of farmer responses to solar irrigation in five states - (completed)

3.1. Training of farmers in India

- Training for 1120 farmers covering 1500 consumer numbers in 40 SKY feeders (including pilot SKY feeder) – (completed)
- Data collection for the pre-training survey of 1120 farmers to assess their awareness level about SKY – (completed)
- Monthly energy accounting data collection (in progress)
- Training workshops with stakeholders (completed in August 2022)
- Research study on capacity-building intervention on energy outcomes, pumping behavior
- A report on the pre-training survey of farmers to assess the awareness level of SKY.

1.2 Impact of large-scale SIP adoption on GW sustainability documented and shared with policymakers.

- Assessing the impact on groundwater resources - by converting farmers' energy-consumption data to water abstraction

III. Findings:

Through the presentation, the following findings and outcomes of the activities were presented:

Output 1.1 & 3.1

Who participated in SKY: The profile of the participants was positively correlated with age, land size, water selling, etc. The relationship showed immense prospects but also raised Equity concerns due to lower participation from small and marginal land-holding farmers (due to capital constraints).

Why have they decided not to participate in the SKY scheme? The major reasons for non-participants were risk aversion behaviour, capital constraints, land size, etc.

How is the generation performance of solar units under SKY? Large variation in performance across utilities (UGVCL > PGVCL > MGVCCL > DGVCL). However, over the years – performance remained the same or increased marginally.

What are the determinants of electricity generation under SKY? The major factors which determined the electricity generation such as the Actual number of days generation down, Frequency of panel cleaning, Number of bills received, Training received.

How do the technical and financial models of SKY work on the ground? 90 pc farmers evacuated energy to the grid, and out of the 98 pc, 58 pc have positive income.

Key Points:

How much income is earned through SKY?

- The average annual income for SKY beneficiaries is INR 17,533, which is roughly 17% of the average annual. The actual subsidy received by farmers in the form of EBI is significantly lower than the intended subsidy. Thus, the DISCOMs who are performing poorly are not benefitted from evacuation-based incentives. It was also statistically inferred that extending the loan period from a 7-year loan period to a 15-year loan would increase the % of farmers earning incomes.
- Cost-effective calculation shows the efficacy of the scheme, at the rudimentary level it is evident that one-fourth of the financial cost incurred by the government (state and central) has already been recovered in the first two years of implementation. 22 pc covered in the first two years of installation, 6 rupees when government incurs the cost of the subsidy. Estimated savings of the government and cost of recovery by the government – needs a cost-benefit assessment from the government perspective.

Impact of SKY on Pump energy & Time - Impact of SKY on pumping time (growth in pumping time is negative reduced pumping), in Rabi season, growth in pumping time for SKY farmers over the period 2019-20 and 2021-22 was -10%. Similarly, growth in pumping time for non-SKY farmers over the period 2019-20 and 2021-22 was +8%. In the case of energy usage of pumping, Growth in pumping time for SKY farmers over the period 2019-20 and 2021-22 was -6%. Growth in pumping time for non-SKY farmers over the period 2019-20 and 2021-22 was +11% implying pumping time is also lower under SKY versus non-SKY. SKY farmers have shown a tapering impact in terms of resource usage while there is an increase in resource usage by non-SKY farmers. Thus, EBI and grid-connected installation would lead to sustainable usage of groundwater levels while contributing to the income levels of the farmers.

Broader transition and impact of the SKY scheme: such as reducing energy loss; potential to replace millions of diesel and coal-based electric pumps; energy justice (farmers are made a part of energy transition and earn benefits); provide a groundwater management tool (creating opportunity cost of energy); providing day time electricity for agriculture.

Assessment of MSKVY:

- MSKVY had a target of reaching 5000 MW by 2025: As of March 31, 2022, a total of 724 MW capacity have been commissioned under MSKVY, of which 29 private players commissioned 372 MW through the bidding route.
- The survey also showed an overall increase in daytime electricity after the implementation of the MSKVY scheme. However, the district-wise results show, in some cases, no change, and even a decrease in the duration of daytime electricity.

- One of the consistent observations we had from the farmer's survey was the reduction in load shedding after the implementation of the MSKVY scheme; however, the same cannot be attributed to the scheme conclusively.
- The survey also indicated marginal upward use of pumps (2.5%) and a handful of farmers changing crop patterns post-MSKVY scheme.
- One of the interesting findings of the study is the improvement in voltage quality during daytime with the advent of the MSKVY scheme.

Output 1.2:

- On assessing the impact on groundwater resources, the study tries to examine the relationship between power consumption and the quantum of water pumped. The study investigated four feeder areas representing alluvial and hard rock patterns. It was evident that electricity and volume of water consumed was due to different geological types. With a 10pc reduction in the SKY feeders, there was no statistically significant difference between solar and non-solar farmers from the modeling exercise.
- A suggestion was made regarding the potential for convergence – *Atal Bhujal Yojana* can work together with SKY on capacity building for water saving while SKY provides incentives for water saving. This can focus on hard rock areas to investigate the aspect of resource use changes and income differentials.

Discussion Points and Comments from C-PMC Members:

- A few suggestions were made by the committee members on the technical evaluation of SKY schemes, particularly regarding the calculation of income. It was recommended to revisit the comparison of PM KUSUM with SKY in the Remove PM Kusum comparison and RJ Vala insisted on referring to subsidy valuation and costs from tariff documents.
- Representing the DISCOM, **R.J. Vala** appreciated the IWMI training of farmers that are benefiting from this training. Overall, the discussion on the training exercise has received a positive response from the farming communities.
- Based on the impacts and findings, The committee was suggested to present positive aspects of the SKY scheme to change the mindset of the decision-makers & policy farmers. The committee came to a consensus that a meeting with the MD of DISCOM, (GUVNL) for the IWMI team to present SKY findings and implications.
- The committee arrived at the consensus to share documentation, papers, and summary briefs for GUVNL advocacy based on the assessment of SKY scheme. Dr. Aditi Mukherjee restated the idea about publication with partners (Co-authorship from GUVNL)
- Some more work and data may be needed on the groundwater sustainability aspect for statistically significant results. Dr Sikka & Dr. Mukherji pushed for modelling exercises across different geological terrains including hard rock areas, which can be used to estimate parameters such as well depth, aquifer status etc.
- Suggestion was made regarding the potential for convergence - *Atal Bhujal Yojana* can work together with SKY on capacity building for water saving while SKY provides incentives for water saving. This can focus on hard rock areas to investigate the aspect of resource use changes and income differentials.

- The water-Energy-Food nexus presents an opportunity to manage unsustainable groundwater abstraction. Innovative on-grid solar systems provide the incentive for the efficient use of groundwater. In terms of water use, very early impressions indicate no change in water use.

Closing remarks by Dr Alok Sikka: All valuable inputs from the C-PMC members were taken note of and well received, and he stated that the IWMI team will incorporate them.