

URJAMITRA TRAINING REPORT



IMPACT REPORT OF TRAINING ON BASIC SOLAR PUMP-OPERATION & MAINTENANCE

MEMO NO - 118/1(4) - 20/HQ

Supported by
Department of Agriculture

Prepared by
Environment Conservation Society (SwitchON Foundation)

TABLE OF CONTENTS

Sl No	Topic	Page No.
1	Executive Summary	2
2	Objectives	2
3	Background	3
4	Introduction	4
5	About Urjamitra Training Programme	4
6	Methodology	5
7	Feedback Analysis	8
8	Overall impact	9
9	Way Forward	9
10	Stories of Vocational Classes & Training	10
11	About SwitchOn Foundation	11
12	Feedback Form	13

EXECUTIVE SUMMARY

Usage of solar energy is very important to achieve clean energy in the future. Everyday the sun gives enough energy to power everything we need on this planet. Solar can be considered the way of the future due to its versatility. This means that wherever people choose to live their lives, solar energy will always be there to help. For example, for those who are living in a place with no form of electricity, such as in rural communities, using solar panels can bring renewable energy to them without hassle. Both the Central Government as well as State Nodal Agencies (SNAs) offer multiple subsidy schemes to the people for installing rooftop PV systems. The customer can also sell the excess solar power back to the grid, for which the customer would get a predetermined fare as decided by the local DISCOM. Subsidies and other schemes offered by the government enable us to exploit renewable energy. Though the upfront cost of installation of a rooftop solar system is high, it is inexpensive in the long run. There are loans available at lower interest rates that overcome the problem of high upfront payment associated with solar projects.

Recently SwitchON Foundation launched its flagship programme known as 'Urjamitra Training Programme.' The Urja Mitra Programme has taken on the task to add more skilled workers to the Nation's labour force under GOI flagship of Skilling India Mission Programme. Under the programme, SwitchON Foundation has developed special employment linked short term and long term tailor made courses and modules, much suited to meet the needs of the current generation. Solar machines are here to stay and thus it will be very useful for the farmers if they gain the basic knowledge on operation and maintenance of the solar pumps. The training also aims to develop the skills of youth, considering the opportunities for employment in the growing Solar Energy Power Project installation, operation & maintenance in India and abroad. The course is designed to prepare the candidates to become new entrepreneurs in the Solar Energy sector. This report is constructed to highlight our skill training programmes and major achievements made in West Bengal with some glimpse from the ground as well as classrooms.

Title of the training: Basic training on maintenance and operation of solar pumps

Training facilitated by : Environment Conservation Society (SwitchON), Kolkata

Training Venue : District -North 24 Parganas, Murshidabad, Nadia, Hooghly, Bardhaman State - West Bengal

Period of Training:

01 day of training at 5 districts of WB

Total number of participants:

- 163

Objectives :

- To train the farmers on basic operation and maintenance of solar pumps.
- To train unskilled youth on Grid based solar power plant operation and maintenance.
- To improve employability of students undergoing training on solar engineering by imparting hands-on practical training on upcoming technologies like grid based solar power plants & offgrid solar appliances.



1. Background: The Indian government launched its mega solar pump scheme PM Kusum Yojana, also popularly known as PM Kusum, in 2019. The scheme aims to improve farmers' income by installing grid-connected solar pumps up to 2 MW and transform existing diesel pumps into solar. While the larger goal was to develop decentralized solar energy systems, it also focuses on reducing power transmission and distribution losses. As of 2021, a total of 24,688 stand-alone solar pumps were running in India. The core objective of renewable energy deployment in India is to promote economic growth, enhance energy security, increase energy access, and reduce climate change. Sustainable development is possible by the use of clean energy and by ensuring access to affordable and reliable energy for every citizen. In Solar energy, the most abundant natural resource, is easily capable of providing many times the total current energy demand. India is endowed with vast solar energy potential of about - 5,000 trillion kWh per year, with most parts receiving 3-5 kWh per sq.m per day. Solar power is the conversion of sunlight into electricity. Two main commercial ways of conversion of sunlight into electricity are Photovoltaic Plants (PV) and Concentrating Solar Power system (CSP). The Ministry of New Renewable Energy, Government of India has taken an initiative to install 100 GW solar projects by 2022 in coordination with State Nodal Agencies. The largest focus on power generation for the next 4-5 years is on solar PV generation systems. To match the ambitious target, a large workforce of skilled and trained manpower is needed to achieve that target and sustain the pace of development. Under the skill development initiatives of the MNRE, NISE is mandated as the nodal agency for implementation of Suryamitra Skill Development Programme. Six years since the inception of this training programme, it has trained 78,000 people across the country to install solar panels, connect them to grids and maintain batteries. However, there are gaps in the capacity and quality of training infrastructure as well as outputs, insufficient focus on workforce aspirations, lack of certification and common standards and a pointed lack of focus on the unorganized sector. In order to achieve this mission more than 50,000 skilled manpower are required for installation, commissioning, operation and maintenance in the field of solar technology.

2. Introduction: Youth contributes to around 35% of Gross National Income (GNI). This can be further improved by adding more skilled workers to the labor force. The best way to do so is employment linked to free short term custom programs, Recognition of prior learning workshops and residential programs which are all part of Skilling India Mission and programmes run under them. SwitchON foundation is dedicated to promote Skill development leading to gainful employment and sustainable livelihood. We have a Mission to Skill 1 lakh youths in the next 5 years. SwitchON Foundation shall be actively participating in Central Government, State government run skill training programs as well as CSR programs on Education and Skill development. We as an organization are also connecting up with Vocational Schools, ITI colleges and Universities to deliver the best of skill development programs to the most diversified youth groups across geographies.

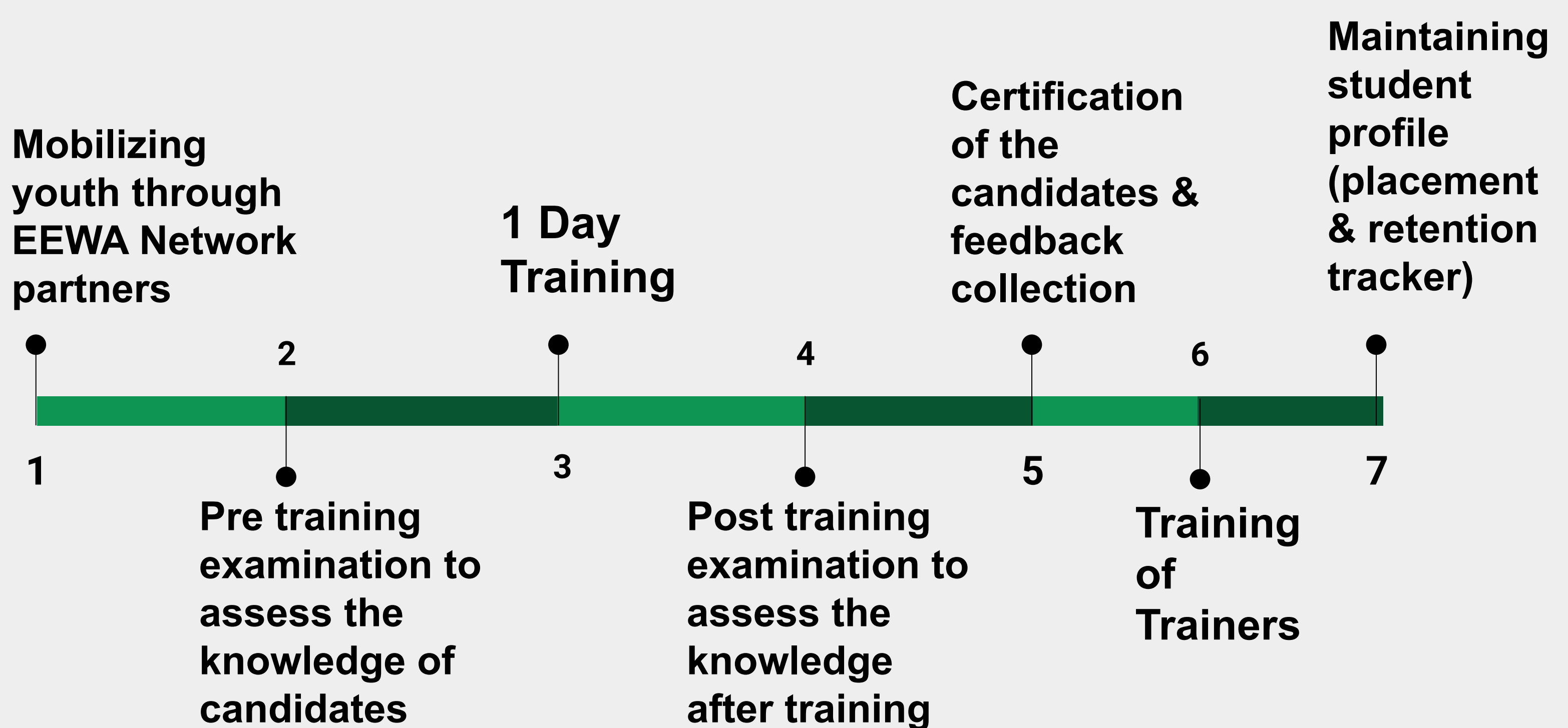
3. About Urjamitra Training programme: Our newly launched training programme is Urjamitra Training Programme aims to make the farmers aware about green energy particularly solar energy and why it is important to shift to green energy in coming days. They are also taught basic operation and maintenance of solar pumps. The training also aims to develop the skills of youth, considering the opportunities for employment in the growing solar energy sector such as: installation, operation & maintenance in India and abroad. The Training Programs are further bifurcated in the following six subthemes – solar farmers workshop, solar youth workshop, solar introductory training, solar advance training, solar entrepreneurship training and solar financing training.

Why is this training important?

- In recent years, the application of solar energy is consistently increasing as an ideal renewable and green source of energy. It has become the need of the hour due to diminishing availability of expensive fossil fuels and environmental problems.
- Solar powered pumping systems are an affordable alternative to replace conventional diesel or electric pump sets. The solar water pump is reliable and environmentally sustainable.
- MNRE (Ministry of New & Renewable Energy) under PM KUSUM Project decided to meet the target of 1.75 million solar pumps along with 1 million solar systems for 1 million grid connected pumps.
- The indigenous nature of clean sources gives local economies an advantage and brings meaning to the term “energy independence”. Dependence on fossil fuel imports results in subordination to the economic and political short-term goals of the supplier country, which can compromise the security of energy supply.



4. Methodology:



Methodologies adopted in training session:

- ☐ Participatory & interactive.
- ☐ Experience sharing of entrepreneurs
- ☐ Discussion on case stories
- ☐ Groups and individual exercises.
- ☐ Powerpoint presentation
- ☐ Pictorial presentation.
- ☐ Displaying charts, demonstration of various models & discussion



Training Facilitators:

Qualified and experienced staff of Environment Conservation Society (SwitchON), successful entrepreneur & practical experienced staff on Solar appliances implemented by SwitchON.

Training materials:

A complete color printed book in local languages with all description of contents provided to each participant, models and other reading materials also be provided to participants.

Key Points covered in various sessions

1. Basics about solar energy
2. Basic concept of solar pumping system
3. Site survey & solar array installation
4. Design of solar system
5. Installation of Solar pumps and its various components
6. Maintenance & step wise system diagnosis process

DETAILS OF THE TRAINING

Urjamitra Training Programme aims to make the farmers aware about green energy particularly solar energy and why it is important to shift to green energy in coming days. They are also taught basic operation and maintenance of solar pumps. The training also aims to develop the skills of youth, considering the opportunities for employment in the growing solar energy sector such as: installation, operation & maintenance in India and abroad. The training will help the participants to become aware about environment and climate change and why it is important to shift to clean energy access. The solar energy utilization is here to stay for a long time now. Hence, there will be loads of opportunities for a trained person to find jobs. He can join a concern that works in this sector and once equipped with the technology, he can also become an independent installer opening up huge earning potential for himself. The training was held in 5 districts in West Bengal. The government had helped us to mobilize farmers from that area to attend the training programme. There were a total of 163 participants including all 5 sessions. The trainer had sound technical knowledge and he tried to impart his knowledge to the students. The participants were given training manuals in their vernacular language where everything taught in the session was written in brief.

The participants got to know about all the basics of solar energy, basic concept of solar pumping system, Site survey & solar array installation, Design of solar system, Installation of Solar pumps and its various components, maintenance of the pumps, and lastly if any problem occurs in the pump they were also trained stepwise diagnosis report. The trainers also conducted pre-assessment tests and post-assessment tests to get some idea how much they learned from the training session. After every learning session there was a role play activity organized where the participants had to showcase what they learned, thus providing them first hand experience in operating solar machines. Those who had still not installed solar pumps were told about the subsidy scheme the government is offering to install solar pumps. During the training programme, participants were also made aware about various governmental schemes like PM-KUSUM, FSSM Jawaharlal Nehru National Solar Mission and , Suryamitra Programme etc.

SwitchON Trainers/ Resource Persons:

- Mr. Shankar Sahoo
- Mr. Mritunjoy Sheel
- Mr. Barun Jana
- Mr Subhajit Saha
- Mr Goutam Sutradhar

Fig-1

Opinion of Training Participants on Training Aspects

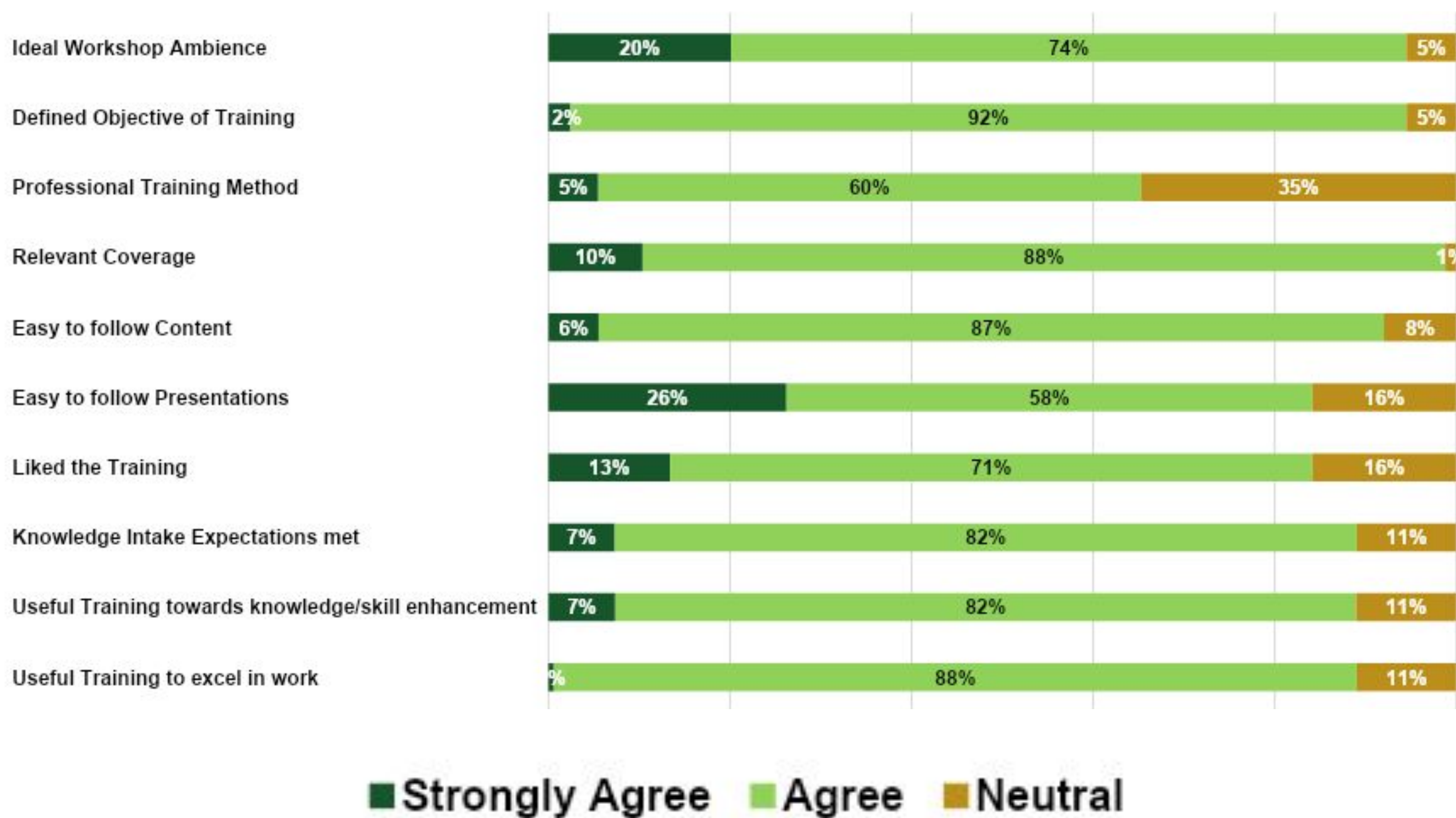


Fig-2

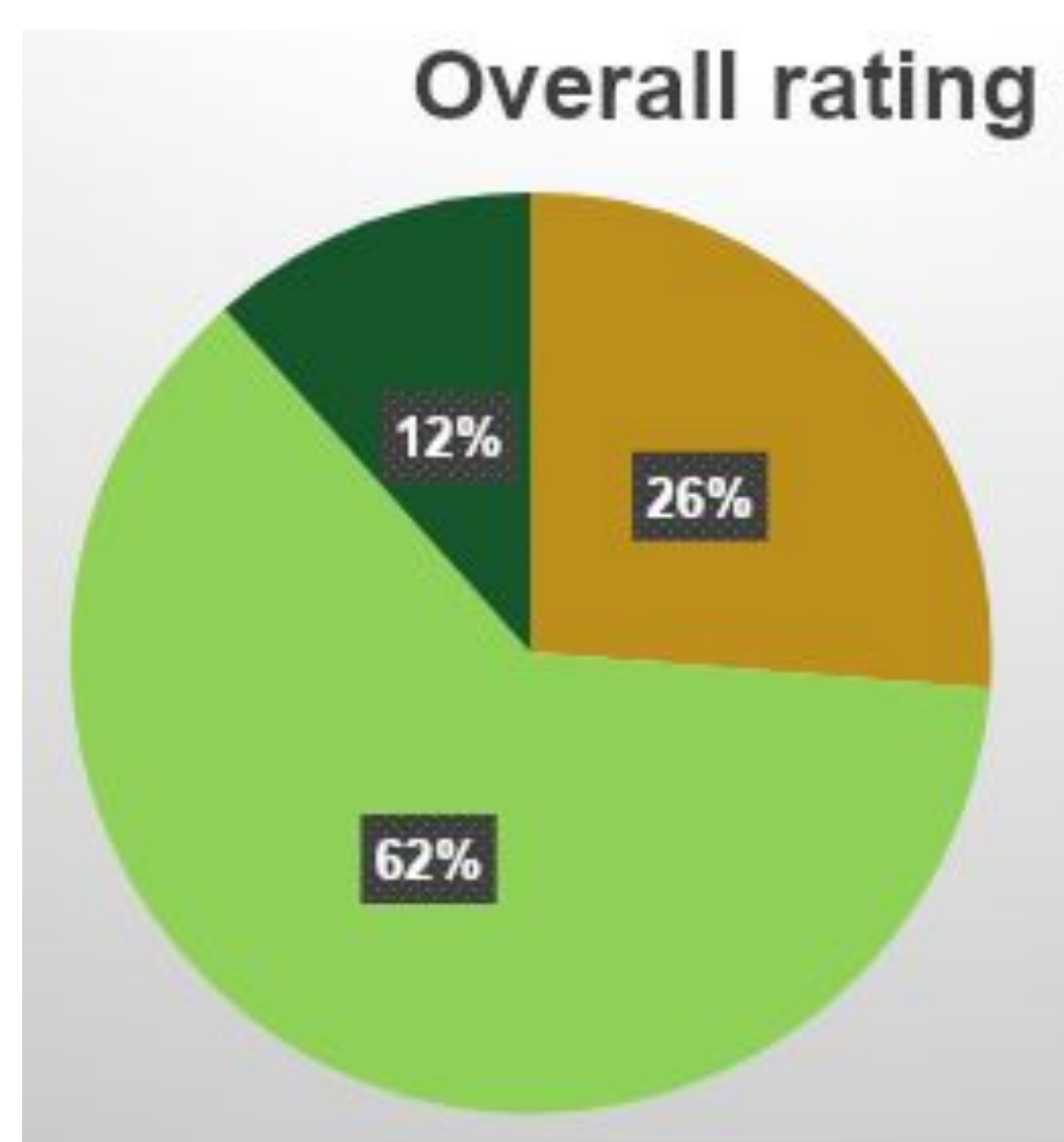
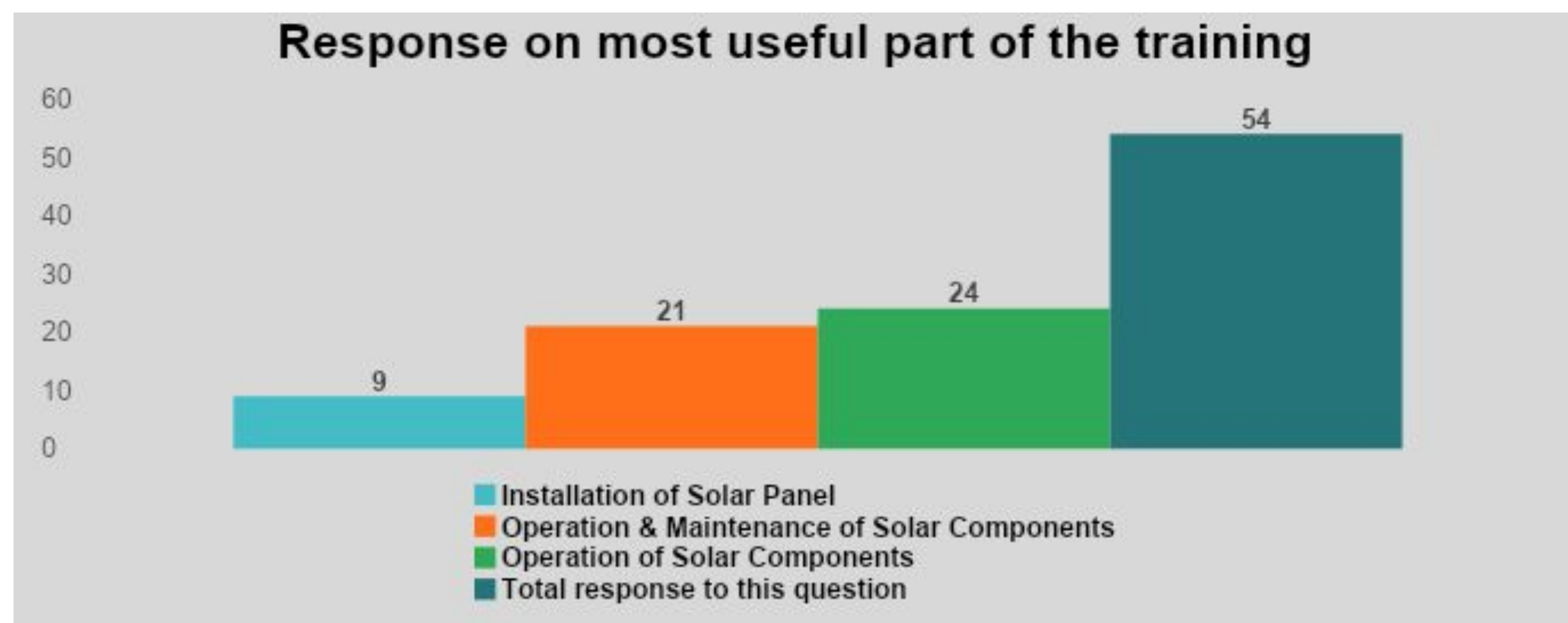


Fig-3

Summary of the Feedback: The entire facilitation was done in Bengali languages by the training facilitators that resulted in better understanding, free sharing and easy communication among participants. The participants have been motivated and built confidence to take up green jobs and connect with more youths who are seeking for employability. Participants who were farmers have learnt how to use solar pumps in their own fields. Some participants were also motivated to start their entrepreneurial journey. The participants have expressed their learning from the workshops and how it can benefit them in the long run of employment.

6. Overall Impact of the Training

- **Awareness-** After participating in the training, farmers get a clear idea about climate change and clean energy. They understand why it is important to use solar energy in their daily lives instead of diesel machines.
- **Basic knowledge on operation & maintenance-** The farmers through this training learnt the basic working of solar pumps, how to use and maintain them.
- **General Troubleshooting-**After the training farmers have learnt to troubleshoot their solar pumps if any problem arises. Now they don't have to look for technicians if any minor problem occurs in their machines.
- **Usage of the Agro-volt area-** There is some space under the solar panel which is called Agro-volt area, and they can use that space for farming.
- **Scheme linkages-** Once they get the basic training of solar pumps they become eligible for various government schemes like FSSM & PM Kusum.

7. Way Forward

India's shift to a green economy could add 3 million jobs in the renewable energy sector alone by 2030, estimated the International Labor Organization. Green jobs are in the spotlight. Green jobs contribute towards the environment, in traditional sectors such as manufacturing and construction, or in emerging green sectors like renewable energy. As more sectors are transitioning to low-carbon models, every job can be green. As there is still a void in the experienced technicians of solar panels and appliances, this kind of training will be very useful for the rural youths who are looking out for jobs. In the coming days SwitchON foundation is planning to conduct these training workshops in WB at a large scale with improved learning material and modern teaching techniques.

STORIES OF VOCATIONAL CLASSES & TRAINING



**Sk. Ahad
Ali Mondal**

Dhoniakhali Block,
Hooghly

“

I am a small scale farmer residing in Hooghly district. The training was very helpful as I learnt many things about solar pumps. I learnt how they operate and also basic troubleshooting. I would advise everyone to use solar pumps as it saves a lot of money. Earlier when I did not use solar pumps my yearly electricity bill used to be around Rs 40,000.00 and now after shifting to solar my electricity bill is around Rs5,000.00 per year. ”



**Krishna
Patiyar**

Arambagh Block,
Hooghly

“

We have learnt a lot of new things from this solar pump training we attended. We understood how solar pumps work and how to take care of the pumps so that they can work in full capacity. My heartfelt gratitude to the organizers. ”



**Bojroddhor
Ray**

Purba Bardhaman

“

The solar pump training was very useful. I Learned a lot of new things. I shall definitely share this knowledge with people in my locality. Everyone should use solar pumps. Also I got to know that the government has reduced the subsidy for solar pumps. I am requesting the government to give us enough subsidy so that we all can install solar pumps. ”

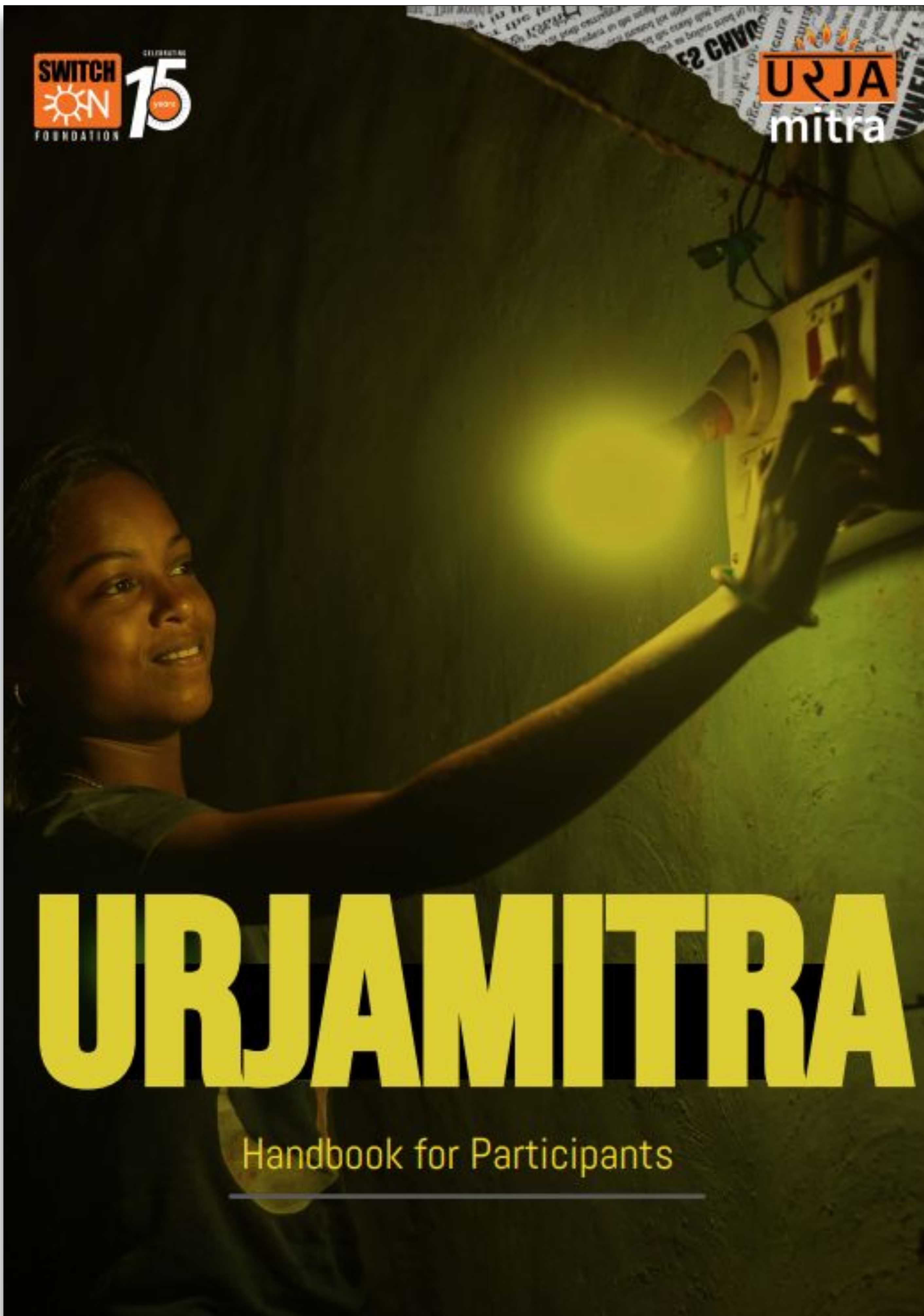


ABOUT SWITCHON FOUNDATION

We, Environment Conservation Society (SwitchON Foundation) an award-winning not for profit organization with operations spread across 7 states of India. Since 2008, SwitchON Foundation has led many innovative projects and incubated several admirably successful ventures and initiatives, impacting 5000 rural and remote villages; 10,00,000 lives of underprivileged across Eastern, Western and North Eastern States of India.

SwitchON Foundation has various national and international organizations, bilateral agencies that include NISE, DDUGKY, PMKVY, Utkarsh Bangla, USAID, UNDP, MNRE/NISE, NABARD, SFAC, GIZ, American Embassy, Climate Group UK, Shakti Foundation, etc. Our work has been featured in The Guardian UK, NIKKIE Japan, CNN-IBN, NDTV, Times of India, ET, etc.

For more details, please visit our website – www.switchon.org.in.



Link to the training manual

https://docs.google.com/presentation/d/168OqkqVCy2Uhb7ZHeljoxoKMLA5Py2OWgYmYxBdQX3M/edit?usp=share_link

FEEDBACK FORM

Student Feedback Form

Student Name _____

Date: _____

Trainee Name: _____

Batch: _____

Ph.No: _____

Instructions: Please indicate your level of agree with the statements listed below in (Please tick appropriate)

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Punctuality in the Class of your trainer					
Was the training area comfortable and was there enough light and air?					
The topics covered were relevant.					
The content was well organized and easy to follow					
Did you like the training?					
Do you like trainer's training methods?					
What do you think about trainer's communication skills?					
Is the trainer technically sound?					
The trainers were well prepared					
The training room and facilities are adequate and comfortable					

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
How do you rate the lab facilities?					
Is this training Useful for enhancing your present/future Knowledge and skills?					
Knowledge and information gained from participation at this training met your expectation					
Could you see and hear the presentations clearly?					
Environment of campus is good?					
The training experiences will be useful to my work					
Uses of teaching aids (OHP/Blackboard /PPT's)					
Availability of teacher in the lab for whole duration of lab hours					

11. How good was the knowledge of the trainer?
☐ Very Good ☐ Good ☐ Average ☐ Needs to Improve

12. Were the trainer attentive?
☐ Yes ☐ No

13. How do you rate the training overall?
☐ Very Good ☐ Good ☐ Average ☐ Needs to Improve

15. What part of the training was the least useful to you?

16. Any Comments or Suggestions:



ANNEXURE



UrjaMitra Basic Solar pump Workshop under Department of Agriculture



Date: 8th September 2022

Location: Bongaon, North 24 Parganas

Participants : 32



Date: 8th September 2022

Location: Baharampur, Murshidabad

Participants : 42



Date: 9th September 2022
Location: Krishnanagar, Nadia
Participants : 15



Date: 22nd September 2022
Location: Dhaniakhali, Hooghly
Participants : 12








Date: 26th September 2022
Location: Pursurah, Hooghly
Participants : 32



Date: 27th September 2022
Location: Purba Bardhaman
Participants : 42





www.switchon.org.in      @SwitchONIndia 1A, D. L. Khan Road, Kolkata 700027

SwitchON Foundation is a leading, award-winning not-for-profit, established in 2008 with a focus on Environment Sustainability and Equal Opportunities. Presently working in 10 states across India, the organisation spearheads and supports interventions on Clean Energy Access, Sustainable Agriculture, Skilling - Education, and Wellbeing. SwitchON's core competencies lie in testing innovative technologies and business models, communication for advocacy and awareness, capacity building through skilling and training, and implementing / supporting field operations.

