



MASTERCLASS REPORT

"SWA LEARNING AND FIELD EXPERIENCES OF SOLAR PUMP USAGE BY SMALLHOLDER FARMERS"

NATIONAL IRRIGATION ACCELERATION PLATFORM

Date: 7th Sep 2018
Venue: SNV Office, Ngong Road, Nairobi

Contents

1.0	Background to the program	3
1.1	About the Master class/Workshop	4
1.2	Objectives and expectations of the masterclass	4
2.0	Opening Remarks and Introductions	4
2.1	Welcoming Remarks	4
3.0	Presentations	5
3.1	Introduction to WARREC and Background to National Irrigation Acceleration Platform.	5
3.2	Opportunities around Smart Water Solutions – SWA: Studies and potential Decision Making Tools. 5	
3.3	Solar Powered Irrigation: Experience by Sun culture	7
3.4	Solar Powered Irrigation: Experience by KickStart Int.	8
3.5	Solar Powered Irrigation: Experience by Futurepump	10
4.0	Group Discussions	11
5.0	Way Forward	12
6.0	About the Organizers	13

1.0 Background to the program

Smart Water for Agriculture (SWA) is a 4-year program implemented by a Consortium of partners that consist of SNV Kenya, MetaMeta, The Royal Tropical Institute (KIT), Practical Foundation and Aqua for All. The program aims to improve food security through optimized water availability and efficiency by small and medium farmers and businesses. SWA promotes more effective irrigation development jointly with farmers, and interaction, joint learning, coordination and cooperation among stakeholders involved in the development of farmer-led irrigation.

To address the issues of water stress in Kenya and to ensure the uptake of irrigation solutions among smallholder farmers, SNV in collaboration with the Water Research and Resource Center (WARREC) of Jomo Kenyatta University of Agriculture and Technology through the SWA program has set up the National Irrigation Acceleration Platform (NIAP). NIAP is a multi-stakeholder consultation framework, which aims to initiate, support and scale innovations around smallholder irrigation in Kenya.

On 12th April 2018, WARREC and SNV had organized a workshop “Promoting Farmer-led and Market based Smart Water Solutions for improving smallholder irrigation in Kenya”. The workshop brought out the key developments in the smallholder irrigation sector and challenges faced by the different stakeholders in upscaling Smart Water Solutions (SWS) in Kenya. This led to the development of various themes for discussion among them being utilization of solar water pump technology in prompting irrigation in the country hence the masterclass on “*SWA learning and field experiences of solar pump usage by smallholder farmers*”.

1.1 About the Master class/Workshop

This was a one-day workshop organized by the SNV in collaboration with the Water Research and Resource Center (WARREC) of Jomo Kenyatta University of Agriculture and Technology (JKUAT). The forum convened key financial institutions, market off-takers, government officials and impact investing stakeholders to share experiences and lessons learned on solar pump irrigation in Kenya.

Organizations represented:

- | | |
|---|----------------------------------|
| ❖ Sun culture | ❖ Irrico International |
| ❖ SNV- Netherlands | ❖ Interica Advisory services. |
| ❖ Future Pump | ❖ Musoni micro- finance limited. |
| ❖ Kickstart international. | ❖ KARLO |
| ❖ Frigoken | ❖ AquaForAll |
| ❖ Rafiki Bank | ❖ Practica |
| ❖ Musoni | ❖ Africa Agribusiness Academy |
| ❖ MoALF - State Department of irrigation. | ❖ JKUAT –WARREC. |

1.2 Objectives and expectations of the masterclass

The following were the objectives of this masterclass:

- i. Networking and knowledge sharing on cutting edge technologies on irrigation today;
- ii. Link Stakeholders with technology providers for enhancing best practices in irrigation.

The following were the expected outcomes of the masterclass:

- Get a better understanding of cutting edge solar power technologies for irrigation,
- Get to know modalities of technology dissemination
- Facilitate knowledge share between stakeholders focused on farmer-led irrigation;
- Learn about financial institutions for solar powered irrigation
- Improve linkages and networking between stakeholders/members of NIAP.

The master class targeted Tech companies, policy makers, private sector, financiers of irrigation, service providers as well as development partners.

2.0 Opening Remarks and Introductions

2.1 Welcoming Remarks

By Prof. Bancy Mati, Director WARREC

In her welcoming remarks, Prof. Mati welcomed the participants to the workshop and facilitated a round of introductions and affiliations from all the participants.

2.2 Opening Remarks

Eng. Sebastian Oggema - SWA Program Manager,

In his opening remarks, Mr. Oggema welcomed the participants to the workshop and gave a brief introduction to the Smart Water for Agriculture (SWA) program. He outlined the SWA program objectives as to make irrigation more profitable in terms of energy use, time management, and efficiency and tries to ensure irrigation is easy for farmers. Mr. Oggema further pointed out that: NIAP aims to initiate stakeholder's talks on solving irrigation challenges and articulated on the SWA program's outcomes:

- ❖ Technology – Adoption of irrigation technology by farmers.

- ❖ Access and adoption – Access to finance to increase adoption of irrigation technology.
- ❖ Information- Ensuring the farmers have information on irrigation technology, financing opportunities ETC.
- ❖ Business linkages and market.

He categorically stated that the adoption of the master class aims to bring together stakeholders to discuss solutions on challenges faced by smallholder farmers on adoption of solar power irrigation. He welcomed all the participants to the masterclass and wished them all in their deliberations.

3.0 Presentations

3.1 Introduction to WARREC and Background to National Irrigation Acceleration Platform.

By Prof. Bancy Mati, Director of WARREC

In her presentation, Prof. Mati introduced the Water Research and Resource Center (WARREC) giving its objectives, mission vision as well as elaborating on WARREC's collaboration with SNV's Smart Water for Agriculture (SWA) program. She introduced the participants to the National Irrigation Acceleration Platform (NIAP) which was launched on 12th April, 2018 whose aim is to provide a "Platform" for knowledge sharing, learning and sharing of synergies to advance actions that promote and advocate for smallholder irrigation in Kenya.



Prof. Mati making her presentation during the workshop

Prof. Mati advocated for the use of solar power irrigation to achieve sustainable irrigation and increase food security. She cited the use of solar technology as being inexhaustible source of clean energy found virtually everywhere, abundant, use friendly with low cost after installations including for pumping irrigation water, are negligible. She called on policy makers to consider creating enabling environment to promoting solar powered irrigation in the county.

3.2 Opportunities around Smart Water Solutions – SWA: Studies and potential Decision Making Tools.

By Ms. Jackline Muturi, SWA Technical Advisor

In her presentation, Ms. Muturi gave a brief breakdown on the status of irrigated agriculture in Kenya from a research perspective. She further explained on the Smart Water Agriculture (SWA) program activities

aimed at increasing access and uptake of smart water solutions as well as the lessons learned and challenges faced.



Ms. Muturi making her presentation during the workshop

Citing from a research survey she pointed out that:

- ❖ There is high demand for smart water solutions.
- ❖ Farmers highly believe in testimonials from other farmers.
- ❖ Farmers are not keen on keeping records which hinders them from getting financial support from financial institutions.
- ❖ It takes significant financial effort to adopt a smart water solution.
- ❖ Access to finance hinders farmers to adopt smart solutions.
- ❖ Technology suppliers are willing to set up demonstrations even at their cost.



Demonstrations on the use of portable solar water pumps

3.3 Solar Powered Irrigation: Experience by Sun culture

By Churchill Ododa

In his presentation Mr. Ododa introduced SunCulture as a technology company that provides end-to-end solar-powered irrigation products and services, making it easier and more affordable for farmers to grow higher quality crops and increase their yields especially in Africa which has 65% of the world's uncultivated arable land, produces only 15% of global agricultural output and smallholder farms produce on average 50% less output per acre than their global counterparts.

He shared an example of a story of a farmer in Nanyuki and how she can change her life by embracing solar powered irrigation.



Mr. Ododa making a presentation

Story of a farmer in Nanyuki and how she can benefit from the use of a solar water pump

Ann a farmer in Matanya Nanyuki. She lives with her husband and 2 sons on 1acre farm. Their main source of income is Milk which she sells 4Ltrs a day and maize. These earns KES 43800/year plus KES20000/yr. from maize. She sources water from shallow well (25m deep)-10 buckets a day (4buckets for domestic, 6buckets for cow and Only Practices rain-fed agriculture

Ann represents 570m Small Holder Farmers around the world. However, if she bought the RAINMAKER SOLAR PUMP from sunculture. She could double amount of milk as well as maize yield, grow higher value crops to sell at local market and save more than 17 hours a week spent physically moving water. He further added that ensure that more farmers like Ann adopt the solar pump, sunculture is ensuring that their technology can;

- *Move Water-Access and move enough water to meet domestic and Agricultural needs (do this with little behavioral change at first time)*
- *Use increased amount of water to boost Income-Drip Irrigation*
- *Continue increasing productivity*

He underscored on Subculture's financing model "Pay-As-You-Grow" designed for small scale farmers with affordable monthly repayment and no collateral required.

Lessons Learned:

- **Policy** - educate governments on access to water and agriculture
- **Funding** - meet funder who are interested in productive use assets
- **Partnerships** - find strong distribution partners all over the Kenya



3.4 Solar Powered Irrigation: Experience by KickStart Int.

By John Kihia

Mr. Kihia introduced KickStart International as a social enterprise developing small scale Irrigation businesses in Africa with the mission to lift millions of people in Africa out of poverty, quickly, cost-effectively and sustainably by enabling them to make more money. He further articulated on the question Why Solar? & Why Now? Especially in the Kenyan context:

- ❖ The price of solar cells has dramatically reduced in the last 5 years.
- ❖ Replacing 100W human power with solar is now affordable
- ❖ Africa has huge youth bubble. → Solar is attractive to Youthful generation



Mr. Kihia making a presentation during the workshop

He further pointed out that the increase in demand for solar irrigation products on the other hand has been fueled mainly by;

- ❖ Growing population means an increase in food demand
- ❖ Farmers appreciate solar is a sustainable and profitable system – Attract women and youth.
- ❖ Donors/NGOs like renewables
- ❖ Fits well with mitigation and adaptation to climate change.

Mr. Kihia further articulated on Kickstart's financing model of "Pay as you Grow" model designed in three categories; Time Used- The Farmer pays for the time spent using the pump, Time Passed and Hybrid System.

Lessons learnt from the financial models

- *Pay for time used is less sustainable and risky to KickStart when pump is used less frequently – Adjusted the deposit & hourly rate*
- *Pay for time passed can discourage farmers especially during rainy period when the pump is not in use – Constant standing charge*
- *Hybrid payment is more favorable to the user and KickStart – Standing charge and consumption rate*
- *Some users would want to complete payment so as to reconfigure the panel to offer lighting too.*



Demos on the use of solar powered irrigation

3.5 Solar Powered Irrigation: Experience by Futurepump



Kinya Kimathi- Distribution Manager of Futurepump

Ms. Kinya introduced Futurepump as a manufacturer of efficient and durable solar irrigation pumps. Before introducing the participants to the Futurepump solar pumps she reiterated her co-speakers' sentiments that this was a great time to talk about solar pumps because they offer solutions to currently there are two major issues; Climate change and fuel costs.



Ms. Kinya making a presentation during the workshop

She articulated on the company's focus having designed its pumps that serves farmers including farms with fish ponds, livestock, domestic use, Small construction works and semi-urban farmers. Ms. Kinya underscored the benefits of the pump as being flexible and can handle sandy and dirty water making it perfect to use in any part of the country alongside being fitted with a data logger for data collection. She pointed out that the usage of the solar pumps has helped to increased yields, reduce costs or effort, Improved food security and promoted Income generation.

	
Illustration of what irrigation do	Solar pump

The following concerns raised:

- ❖ Need to involve farmers in irrigation policy development forums.
- ❖ Need for solar pump companies to consider manufacturing pump in Kenya without lowering solar pumps locally.

4.0 Group Discussions

To get more insight on the solar pump technology especially by smallholder farmers three (3) groups were formed each discussing on different subjects/questions as shown below:

Group 1 - Bottle necks facing solar powered irrigation.

Group 2 - Emerging Opportunities.

Group 3 - How to reach the unreached.

Feedback from group discussions

Group 1: Bottlenecks facing solar powered irrigation

- Initial cost / Access to finance
- Access to information
- Climate change
- Water scarcity
- Different cultures and beliefs
- Lack of appropriate financing models
- Lack of efficient distribution methods and water storage solutions.
- Lack of enabling policies on irrigation e.g policy on taxation, regulatory framework and county and national levels, promoting irrigation among others.

Group 2: Emerging Opportunities for solar powered irrigation

- Youthful / young farmers are now engaging in agriculture.
- Collaboration – selling technology as part of a package i.e. training, markets, and finance and business skill.
- The reality of climate change – there is need for climate smart / renewable energy technologies/ green energy among others.
- Lobbying policy makers for harmonization of taxes, regulation and certification.

- Other accessories that harness the ability of the solar pumps e.g. applications methods, different water types other solar uses e.g. household use storage, finance.
- Taking advantage of the Last mile connectivity – Need table the case on utilization of solar energy.
- Water harvesting.

Group 3: How to reach the unreached on solar powered irrigation

- Through partnerships with stakeholders in the entire value chain.
- Testimonials and workshops.
- Farm Demonstrations.
- Mass media and advertisements.
- Government policies and strategies.
- Sensitization of county and local government leaders.
- Water harvesting.
- Increased partnerships between technology distributors, financial institutions and users.



Sessions during group discussions

5.0 Way Forward

1. There is need for the National Irrigation Acceleration Platform (NIAP) to push on policy issues affecting irrigation in the Country.
2. Formation of an irrigation technology working group whose aim will be to come up with innovative ways to increase land under irrigation in Kenya.
3. Including policy makers in the NIAP workshop to ensure implementation of the workshop deliberations.
4. Increase the frequency of the masterclass and involve more stakeholders.
5. Include field visits as part of the masterclasses to promote successful partnerships with focused farmers.
6. Need for continuous innovation in the irrigation sector.
7. There is need to develop a finance model that can work and work well for the farmers to promote smart water solutions
8. Participants to share information on other partners that can be brought on board- NIAP platform.
9. There is need to partner with focused farmers to have success and greater impact of the initiative.
10. Enhanced collaborations and action plan on what to do next.

11. There is need to move from narratives to qualitative diversification.

12. Share workshop proceedings to all the participants.

6.0 About the Organizers

WARREC – JKUAT

JKUAT is an Institution of higher learning established in Kenya under the Universities Act No. 42 of 2012, through the JKUAT Charter signed on 1st March 2013. The University's objectives and functions include inter alia, to provide directly or indirectly, or in collaboration with other institutions of higher learning; facilities for quality training, research and innovation in agriculture, engineering, technology, enterprise development, health sciences, social sciences and other applied sciences, and integration in teaching, research and effective application of knowledge and skills to the life, work and welfare of the citizens of Kenya. JKUAT has established the Water Research and Resource Center (WARREC) as a center of excellence for research, science, technology and innovation in the broad fields of the water sector.

SNV

SNV is a not-for-profit international development organization, working in Agriculture, Energy, and Water, Sanitation & Hygiene. Founded in The Netherlands in 1965, SNV has built a long term, local presence in 38 countries across Asia, Africa and Latin America. SNV's global team of advisors work with local partners to equip communities, businesses and organizations with the tools, knowledge and connections they need to increase their incomes and gain access to basic services – empowering them to break the cycle of poverty and guide their own development.

Annex I: Workshop Programme

ime	Agenda	Facilitated by:
08:30	Arrival and Registration	NIAP Secretariat
09:00	Opening Remarks and Introductions	Prof. Bancy Mati, WARREC
	1. Welcome remarks and Introduction to SWA 2. Introduction to NIAP 3. Objectives/programme of the Master Class	Sebastian Oggema Prof. Bancy Mati Prof. Bancy Mati
09:30	Opportunities around Smart Water Solutions – SWA Studies and potential Decision Making Tools	Ms. Jackline Muturi, SNV
09:45	<u>Case Presentations:</u> Solar Powered Irrigation: Experiences by Sun culture Solar Powered Irrigation: Experiences by Kick start Solar Powered Irrigation: Experiences by Future Pump	Mr. Churchill Ododa Mr. John Kihia Ms. Kinya Kimathi
10:30	Q & A	Prof. Bancy Mati
10:45	Tea Break	All
11:00	Group Discussions to identify: <ul style="list-style-type: none"> ▪ Bottlenecks facing solar powered irrigation ▪ Emerging Opportunities ▪ How to reach the unreached 	Prof. Bancy Mati/ Jackline Muturi
12:00	Presentations from Group Discussions	Group Rapporteurs
12:30	Way forward and Wrap-up	Prof. Bancy Mati
13:00	Lunch and departure	All

Annex II: List of Participants

S.No.	Prefix	Name	Job Title	Company
1	Mr.	Churchill Ododa	Head of Sales	Sun Culture
2	Ms.	Kinya Kimathi	Manager	Futurepump
3	Mr.	John Kihia	Director of Field Innovations	Kickstart
4	Ms.	Edwin Onger		Frigoken
5	Mr.	Charles Gitau	Chairman	Africa Agribusiness Academy
6	Mr.	Alex Kiragu	Relationship Manager Agribusiness	Rafiki
7	Mr.	Jackson Echoka	Manager - AFC Risk Unit	Agricultural Finance Corporation (AFC)
8	Mr.	Aaron Munzaa	Business Consulting and Research	Intellectap
9	Mr.	Felix Musinga	Regional Manager	Musoni
10	Mr.	Isaya Sijali	Head irrigation and drainage	KARLO
11	Mr.	John Ndungi	Director, Irrigation Services	MoALF
12	Mr.	James Mwaniki	Electrico Eng	Kickstart Int
13	Mr.	Niraj Pattni	sales	Irrico
14	Ms.	Ruth Njoki	Project officer	Africa Agribusiness Academy
15	Prof.	Bancy Mati	IAP Facilitator	WARREC
16	Mr.	Wycliffe Oenga Nyang'au	IAP coordinator	WARREC
17	Dr.	Sebastian Oggema	Project Manager, SWA	SNV
18	Ms.	Florence Kariuki	Access to Finance Advisor	AquaForAll/SNV
19	Ms.	Jackline Muturi	Technical Advisor	Practica/SNV
20	Ms.	Charity Gichobi	NIAP Associate	WARREC - JKUAT
21	Ms.	Bibiana Wanalwenge	Communications Officer	SNV