International Workshop

Prospects for solar-powered irrigation systems (SPIS) in developing countries

Ethiopia Room (C 285/9) | FAO HQ | Rome, Italy | 27-29 May 2015
Solar-powered water technologies are increasingly in demand in developing countries, as they can provide a cost-effective solution to increase agricultural productivity.

Access to water for irrigation is key to many small-scale farmers in order to sustain their livelihoods and food security. Running such irrigation systems is still extremely challenging. There are still no electricity grid-extensions in many rural areas in many developing countries. In the absence of a reliable electricity supply, farmers have to resort to diesel-based pumping systems. These systems create high operating costs, often experience service gaps, contribute to GHG emissions, and contribute to the energy bill in countries that do not produce such fuels.

Therefore renewable energy options, and in particular solar power, seem very promising solutions for sustainable agriculture in regions with high-solar-insulation, given its environmental advantages, low maintenance and increasingly low investment costs.

Until recently however, solar irrigation had not generated a lot of interest amongst governments, farmers and development agencies. As investment costs are being reduced, and with growing concerns of climate change, there has been renewed attention to this technology. It seems therefore, timely to take stock from existing experiences on solar irrigation, in order to derive conclusions and recommendations regarding its future use in developing countries.
Objective

The overall goal of this event is to take stock of and identify key challenges and constraints for the development of solar-powered water technologies in developing countries.

Outputs

- A stock take of experiences and existing tools.
- An assessment of the potential, constraints and challenges of solar powered water technologies in agriculture in developing countries.
- A set of recommendations on how to expand the use of solar powered water technologies.
- To create a network of experts/institutions to develop, share, adapt and build capacities to enable affordable and sustainable water technologies in agriculture.
- A document containing the conclusions and recommendations of the workshop.
# Workshop overview

## DAY 1: 27 May 2015

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>PM</td>
<td>Registration</td>
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<tr>
<td>PM</td>
<td>State of the art of SPIS for sustainable development</td>
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## DAY 2: 28 May 2015

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>AM</td>
<td>Techno-economic feasibility and environmental impacts</td>
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<tr>
<td>PM</td>
<td>Policies, institutions and financing mechanism</td>
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## DAY 3: 29 May 2015

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>AM</td>
<td>Capacity development</td>
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<td>AM</td>
<td>Concluding session: Outcomes and the way forward</td>
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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>12.00 – 14:00</td>
<td>Delegates Registration, FAO Entrance and Turkish Lounge</td>
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<tr>
<td>14.00 – 15.00</td>
<td><strong>INTRODUCTION SESSION</strong></td>
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<tr>
<td>14.00 – 14:20</td>
<td>Welcome and opening remarks by Moujahed Achouri, Director, Land and Water Division FAO and Martin Frick, Director, Climate, Energy and Tenure Division FAO</td>
</tr>
<tr>
<td>14.20 – 14.40</td>
<td>Objectives and outcomes of the workshop by Georg Bokeloh, Facilitator</td>
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<tr>
<td>14.40 – 15.00</td>
<td>Solar Irrigation in the context of the Global Water-Energy-Food Nexus and Sustainable Development by Jean-Marc Faurès, Senior Officer, Land and Water Division, and Olivier Dubois, Senior Natural Resources Officer, Climate, Energy and Tenure Division</td>
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<tr>
<td>15.00 – 15.30</td>
<td>Coffee Break</td>
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<tr>
<td>15.30 – 17.30</td>
<td><strong>SESSION 1: State of art of SPIS in different regions and countries</strong></td>
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<tr>
<td>Objective</td>
<td>• To present an overview of current experiences on SPIS in different countries and regions.</td>
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<tr>
<td>Presentations</td>
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<tr>
<td>15.30 - 15.50</td>
<td>Relevance of solar-powered irrigation systems for agricultural development with particular reference to smallholder farming by Jan Sass, Director Africa Department, GIZ/ Powering Agriculture - Energy Grand Challenge for Development (PAEGC)</td>
</tr>
<tr>
<td>15.50 - 16.10</td>
<td>Solar irrigation for sustainable agriculture and rural development in Mexico by Octavio Montufar Aviles, Regional Manager Renewable Energy for Agriculture program, FIRCO</td>
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<tr>
<td>16.10 - 16.30</td>
<td>Solar irrigation from a farmers perspective by Baker Ibrahim Mohammed Al Rabee, farmer, Jordan</td>
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<tr>
<td>16.30 – 17.20</td>
<td>Discussion</td>
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<tr>
<td>17.20 - 17.30</td>
<td>Wrap – up (Rapporteurs)</td>
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<tr>
<td>18.00 – 19.30</td>
<td>Cocktail at FAO Aventino Room, 8th Floor, Building B</td>
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### SESSION 2: Techno-economic feasibility and environmental impacts

#### Objectives
- To present current technology options for SPIS and the conditions for its application in developing countries.
- To provide evidence of the economic viability of SPIS in different locations compared to other technologies, and discuss its life cycle costs.
- To present evidence of the environmental costs and benefits of SPIS compared to irrigation systems using conventional energy sources.

#### Presentations

<table>
<thead>
<tr>
<th>Time</th>
<th>Presentation</th>
<th>Speaker/Institution</th>
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<tbody>
<tr>
<td>9.00 – 9.20</td>
<td>Technology options for solar-powered irrigation systems by Andreas Hahn</td>
<td>Managing Director, ah Advice International</td>
</tr>
<tr>
<td>9.20 – 9.40</td>
<td>Life cycle cost and feasibility of solar pumps for sustainable irrigation in Bangladesh by Ayub Hossain</td>
<td>Senior Engineer, Bangladesh Agricultural Research Institute Farm Machinery and Post-Harvest Division</td>
</tr>
<tr>
<td>9.40 – 10.00</td>
<td>Solar water technologies in Egypt: options and applications</td>
<td>Dr. Ahmed Mohamed Alhady, Technical Manager, Ministry of Water Resources and Irrigation, Egypt</td>
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<tr>
<td>10.00 – 10.30</td>
<td>Coffee Break</td>
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<tr>
<td>10.30 – 10.50</td>
<td>Environmental Performance of Solar Photovoltaic Technologies by Felix Reinders</td>
<td>Vice President Honoraire International Commission on Irrigation and Drainage, Agricultural Research Council, South Africa</td>
</tr>
<tr>
<td>10.50 – 11.10</td>
<td>Cleaning Up After Clean Energy: PV commodity chains, hazardous waste and environmental justice by Dustin Mulvaney</td>
<td>San Jose State University, USA</td>
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<td>11.10 – 12.20</td>
<td>Discussion</td>
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<td>12.20 – 12.30</td>
<td>Wrap – up (Rapporteurs)</td>
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<tr>
<td>12.30 – 14.00</td>
<td>Lunch Break</td>
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<tr>
<td>14.30 – 17.30</td>
<td>SESSION 3: Policies, Institutions and Financing Mechanism</td>
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<td><strong>Objectives</strong></td>
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<td>• To present and discuss enabling conditions for the development of</td>
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<td>SPIS in developing and emerging countries.</td>
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<td>• To discuss different financing arrangements, business models and</td>
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<td>institutional arrangements to promote and up-scale SPIS.</td>
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<tr>
<td>14.00 -14.20</td>
<td>Market assessments for solar-powered irrigation pumps in Morocco,</td>
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<td>Yemen and South Africa by <strong>Richard Colback</strong>, Senior Operations</td>
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<td>Officer, International Finance Corporation, World Bank</td>
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<td>14.20 – 14.40</td>
<td>Rajasthan solar water pump programme by <strong>Dinesh Kumar Goyal</strong>, Chief</td>
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<td>Secretary to Government of Rajasthan, Horticulture Department,</td>
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<td>Secretariat, Jaipur, Rajasthan</td>
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<td>14.40 – 15.00</td>
<td>Policies and case studies for developing SPIS in China by <strong>Liu Jing</strong>,</td>
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<td>Department of Irrigation and Drainage, IWHR China</td>
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<td>15.00 – 15.30</td>
<td>Coffee Break</td>
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<tr>
<td>15.30 – 15.50</td>
<td>Policy and institutional arrangements to promote SPIS in Chile by</td>
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<td><strong>Victor Alejandro Medina Sepulveda</strong>, Irrigation Department Manager,</td>
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<td>INDAP, Ministry of Agriculture</td>
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<tr>
<td>15.50 – 16.10</td>
<td>Solar irrigation in Tunisia in the framework of agricultural development and climate change by <strong>Aissa Aggoune</strong>, Irrigation Manager, Commissariat Régional au Développement Agricole de Kébili, Tunisia</td>
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<tr>
<td>16.10 – 16.30</td>
<td>Energy-Irrigation Nexus in South Asia: Improving Groundwater</td>
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<td>Conservation and Power Sector Viability by <strong>Verma Shilp</strong>, Consultant,</td>
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<td>IWMI-TATA</td>
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<td>9.00 – 10.30</td>
<td>SESSION 4: Capacity Development</td>
<td>To present current training programs and tools to promote SPIS in</td>
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<td>developing countries and discuss the needs for further action</td>
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<tr>
<td>9.00 – 9.20</td>
<td>Experiences from the Solar Market Garden project in Benin, West Africa</td>
<td>Robert Freling, Executive Director, Solar Electric Light Fund (SELF)</td>
</tr>
<tr>
<td>9.40 – 10.00</td>
<td>Rationale and concept for a planning and promotion manual for solar-powered irrigation systems</td>
<td>Andreas Hahn, Managing Director, ah Advice International</td>
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<td>10.30 – 11.00</td>
<td>Coffee Break</td>
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**SESSION 5: Outcomes of the workshop and the way forward**

What have we learned regarding the prospects for SPIS in developing countries and what are the next steps?

Note: This session will be organized around relevant issues emerging from workshop sessions.

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<td>Closure of the workshop</td>
<td>Moujahed Achouri, Director, Land and Water Division FAO and Martin Frick, Director, Climate, Energy and Tenure Division FAO</td>
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Upon arrival at FAO

Building Pass pickup
Make your way to the Security Access Pavilion. Present an ID to a Security Officer. You will then be directed to the Turkish Lounge (main entrance of FAO building) to collect your building pass. The venue of the workshop is in the Ethiopia Room (C285/9).

Security
The FAO Security Office operates from 07.30-17.30 hours from Room B062 (extension 55159). Participants are requested to wear their Building Passes at all times. Briefcases and valuables should not be left unattended.

Meeting room
The five day workshop will take place in the Ethiopia Room (C285/9). Please see map below.
Services at FAO

Banking and Currency Exchange Facilities
The building has two ATM’s for cash withdrawal:

- Banca Intesa San Paolo: Ground floor, Building B.08.35 to 16.35 hrs, Mon-Fri.
- Banca Popolare di Sondrio: Ground floor, Building D.08.35 to 16.35 hrs, Mon-Fri.

Medical Services
The Medical Service provides emergency medical assistance in the FAO premises.
Dial 30 from all in-house telephones.

WiFi Coverage
FAO offers free WiFi coverage in the main Meeting Rooms. To connect, please follow the below steps:

Step 1: Turn on device in WiFi areas

Step 2: Allow device to detect the network ‘guest_internet’

Step 3: Open a browser to connect to the internet. The password is wifi2internet

No technical support can be provided if problems arise when connecting to, or using, the wireless internet service.

Catering Facilities
The FAO Cafeteria is on the eighth floor, Building, it is open from 12.00-14.30 hours for lunch.
There are several snack bars on the premises:

- Polish Bar (Ground Floor, Building A)
- Blue Bar ‘C’ (Eighth Floor, Building C)
- Eighth Floor Bar (Eighth Floor, Building B)
- Bar D (Ground Floor, Building D)
Other important information during your stay in Rome

Emergency Telephone Numbers in Rome

The following numbers may be useful in case of emergency:

- Medical Emergencies 118
- General Emergencies 113
- Fire 115
- Ambulance (Red Cross) 06-5510
- City Physician on Call 06-58201030

Currency / credit cards

The official currency is the Euro (€). Most restaurants and shops accept credit cards (but please check to be sure).

Exchange rates

Current exchange rates are approximately US$1.12 = 1 Euro. The most up-to-date exchange rate can be obtained from the following site: www.xe.com/ucc

Weather

Average weather and updated information can be seen at: www.eurometeo.com/english/forecast/city_LIRA

Time zones

Rome is GMT + 1 for details on time zones see: www.timeanddate.com/worldclock/

Electricity supply

Italy has a 220 volts electricity supply, the sockets are 3 round pins in a row.
Contact

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Climate, Energy and Tenure Division (NRC)

For more information please visit: