WATERSPOUTT

Water Sustainable Point Of Use Treatment Technologies

2016 - 2020

WP2 - EVALUATION OF SOLAR JERRYCANS FOR DRINKING WATER DISINFECTION

INTRODUCTION

In 2015 nearly 660 million people around the world remain without sustainable access to safe drinking water. The majority of these live in rural areas with no realistic hope in the foreseeable future of access to distributed treated water systems. Solar water disinfection (SODIS) is a household water treatment that uses freely available solar energy to inactivate pathogens in water stored in transparent containers placed in direct sunlight. SODIS is used by approximately 5 million people in developing countries on a daily basis (Figures 1 &2).

The Water Sustainable Point of Use Treatment Technologies (WaterSPOUTT) programme aims to provide safe drinking water to communities who rely on unsafe sources using SODIS technologies. Funded by the European Union, WaterSPOUTT is a consortium of 18 higher education institutes, organisations and small to medium enterprises. It will carry out a technological development programme to advance water treatment technologies based on SODIS, by designing, piloting and bringing to market three novel solar based technologies; Solar rainwater reactors - South Africa and Uganda, Solar jerrycans - Ethiopia and Solar-ceramic filtration - Malawi. In parallel, a social science programme has been structured to ensure that the technologies are adopted by the target communities in rural Africa, with the support of the local authorities and in an economically sustainable way.

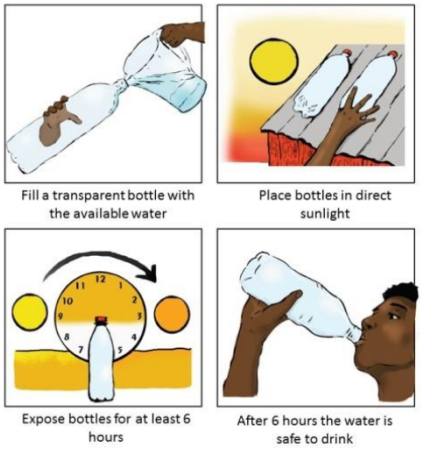


Figure 1: Summary of basic SODIS use to treat unsafe drinking water using transparent bottles

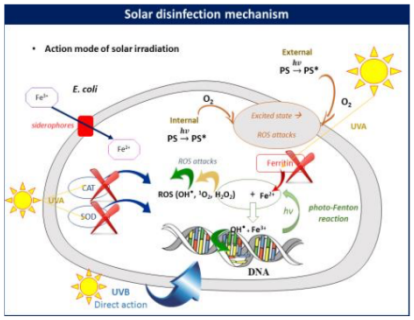


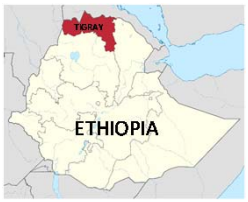
Figure 2: Brief summary of the actions involved in SODIS against E coli

SOLAR JERRYCANS

In Ethiopia we will evaluate the application of solar jerrycans for water disinfection to treat drinking water from unprotected sources. Rather than the 2 L treated volumes usually provided by the standard batch SODIS process, WATERSPOUTT technology will provide larger volumes (≥20L) of treated water per day in each household.

- A baseline survey at house hold level will be conducted including microbiological, environmental and social factors.
- Different materials composition will be evaluated to get a compromise between the efficiency of the disinfection process and the long-term stability of the jerrycans.
- Health impact assessment will be carried out to determine the efficiency of the actuations in comparison with reference control groups using the 2 L bottle standard process.
- The results of the project will be feed to local health educational programs addressing the perception towards safe water and the acceptance of solar disinfection technology.

Site 1:
Water source: Open pond
Zone: South-Eastern Tigray
Woreda: Enderta
Tabia: Serawat
GPS: 13°29'12.78"N, 39°24'28.10"E
10 km West of Mekelle



Study sites were selected based on the following criteria:
- Communities relying on untreated water
- Prevalence of diarrhea / dysentery
- Families with under 5 years old children

Site 3:
Water source: Open pond
Zone: South-Eastern Tigray
Woreda: Enderta
Tabia: Harena
GPS: 13°33'0.88"N, 39°32'24.60"E
15 km North of Mekelle

Site 2:
Water source: River (spring)
Zone: South-Eastern Tigray
Woreda: Hintalo-Wejerat
Tabia: May Nebri
GPS: 13° 8'12.25"N, 39°29'16.53"E
50 km South of Mekelle

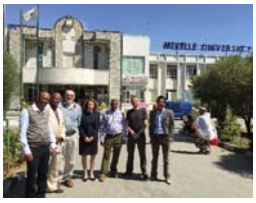


Figure 4: Selection of study sites during a recent visit to Mekelle of Prof. Kevin McGuigan (RCSI, coordinator), Dr. Javier Marugán (URJC, WP2 leader) and Prof. Honor Fagan (MAYNOOTH, WP5 leader)

Site 4:
Water source: Open pond / River
Zone: Eastern Tigray
Woreda: Kilte-Awlalo
Tabia: Hayelom
GPS: 14° 0'49.27"N, 39°27'23.39"E
55 km North of Mekelle

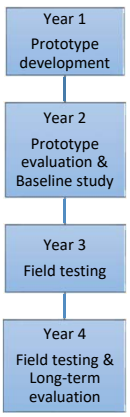


Figure 4: Brief summary of the planned activities for the solar jerrycan evaluation

Project execution will be supported by parallel work packages which explore the disinfection mechanisms and models, dissemination and communication of outcomes and a strong analysis the social sciences and decision-making aspects on uptake and adoption of solar water disinfection technologies.

WATERSPOUTT PARTNERS

RCSI, INNOVA, DCU, Universidad Rey Juan Carlos, EPFL, University of Strathclyde, HELIOZ, ecosystem, bucks new university, USC, UNESCO-IHE, Ciemat

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 688928

http://www.waterspoutt.eu