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GLOBAL PLAN OF ACTION

23 JUNE 2020
14:30-16:00 CET

POWERING WASH - RENEWABLE ENERGY FOR WATER SUPPLY IN HUMANITARIAN SETTINGS

Moderators

RANISHA BASNET, energypedia

LISA FELDMANN, energypedia

Webinar Series: Sustainable Energy in Humanitarian Settings

PAST WEBINARS

- MAY 2020: Powering Humanitarian Health Operations: Sustainable Energy Solutions
- FEB 2020: Energy Efficiency and Designing for Sustainability in Humanitarian Response
- JAN 2020: Powering Humanitarian Facilities: Dialogue on Implementation Models
- DEC 2019: Sustainable Energy for Household Cooking Needs in Humanitarian Settings
- NOV 2019: Sustainable Energy for Powering Household and Community Lighting Needs in Humanitarian Settings
- SEP 2019: Sustainable Energy for Essential Humanitarian Services: Outline of Energy Solutions and a Case Study on Solar Pumping
- JUNE 2019: State of Play: Sustainable Energy in Humanitarian Settings

Upcoming Webinars

- Stay tuned for our webinars.

Tell us about you!

- Poll -

- Agenda-

Presenter

MARCO ALBERTINI, International Committee of the Red Cross (ICRC)

With a background in Environmental Engineering and Business Administration, Marco has 15 years of international experience in team coordination and project management in the fields of water and power supply and rehabilitation of infrastructures for essential services.
He joined the ICRC in 2005 and undertook field missions coordinating humanitarian operations in Ethiopia, Pakistan, Palestine, Mauritania, Philippines, Lebanon, South Sudan. He is currently the Knowledge Manger for the ICRC Water and Habitat Unit at Geneva HQ.

Presenter

ASENATH KIPRONO, OXFAM

Asenath is a Water and Solar specialist working with Oxfam, managing the Global Solar and Water initiative, a project that supports agencies towards adoption of quality solar powered water supply solutions through field assessments, technical workshops as well as development of knowledge material and tools. She holds a bachelor’s degree in Civil Engineering from the University of Nairobi and previously worked in the private sector developing and implementing suitable water supply and energy solutions for a wide range of stakeholders.

Global Solar & Water Initiative

- Solar for water supply in humanitarian settings
- What were the gaps?
- What does GSWI do?
- What is happening now?

USAID FROM THE AMERICAN PEOPLE

IOM • OIM

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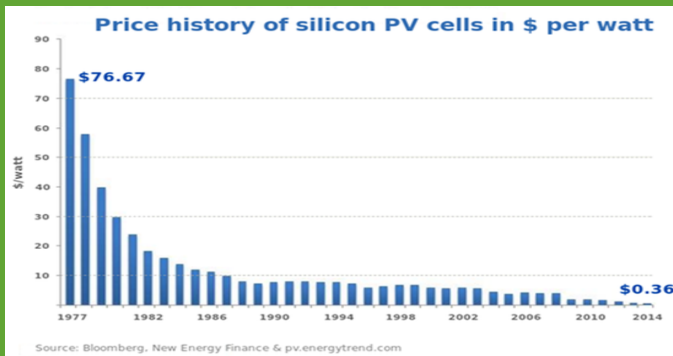
BENEFITS OF SOLAR

- Renewable Energy that is cost effective, durable, sustainable
- Improved water service levels
- Increases affordability (in rural contexts)
- Environmentally friendly
- a greener planet

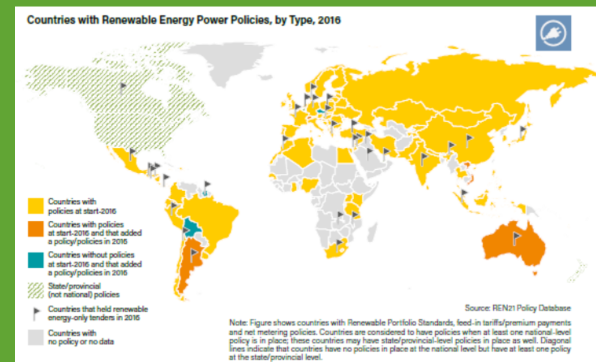
OXFAM

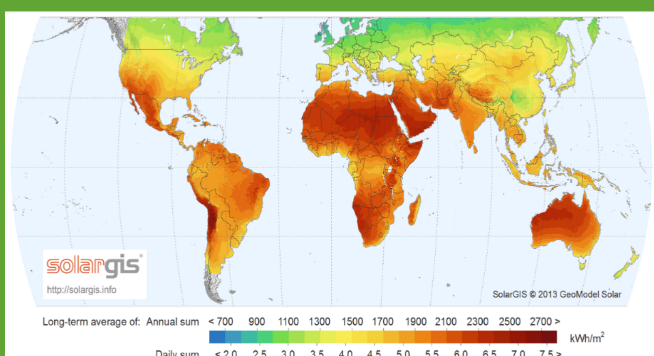
Enabling factors for solar powered water supply (SPWS)

Reduction in Solar PV prices



Countries with renewable energy policies

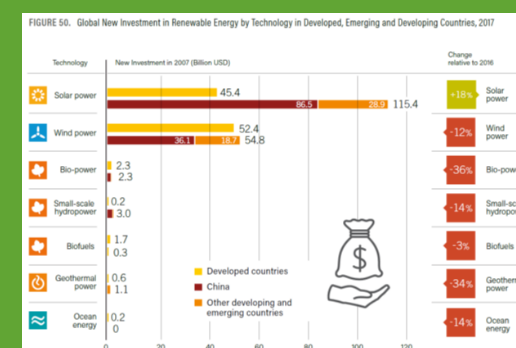




High, constant solar radiation

Robust & reliable technology

Booming solar private sector



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OTHER FACTORS SUPPORTIVE OF SPWS

- Difficult and expensive logistics of delivering fuel to remote locations including camps (South Sudan)
- Lack of access due to insecurity (Darfur, NE Nigeria)
- Locations cut off due to extreme weather conditions such as floods, snow (Ethiopia, Lebanon)
- Irregular fuel supplies and fuel shortages (Sudan, Nigeria)
- Present but unreliable grid (Lebanon, Iraq)

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Findings & Lessons for the sector

- Very suited for long term displacement [specially camp situations with no access to reliable electricity grid]; should be default option.
- Solar technology can be used in first phase emergency too, under certain conditions; no need of waiting for long years to think about it – Bidibidi, Imvepi
- Solar schemes at host community level: high acceptance but need strong community cohesion to keep fees, as the repair costs are more scattered in time but potentially greater than for most other water supply systems
- Most of the problems recorded with solar schemes are not solar related – proper dimensioning is critical
- Extended network of private Sector with quality solar products > large projects feasible

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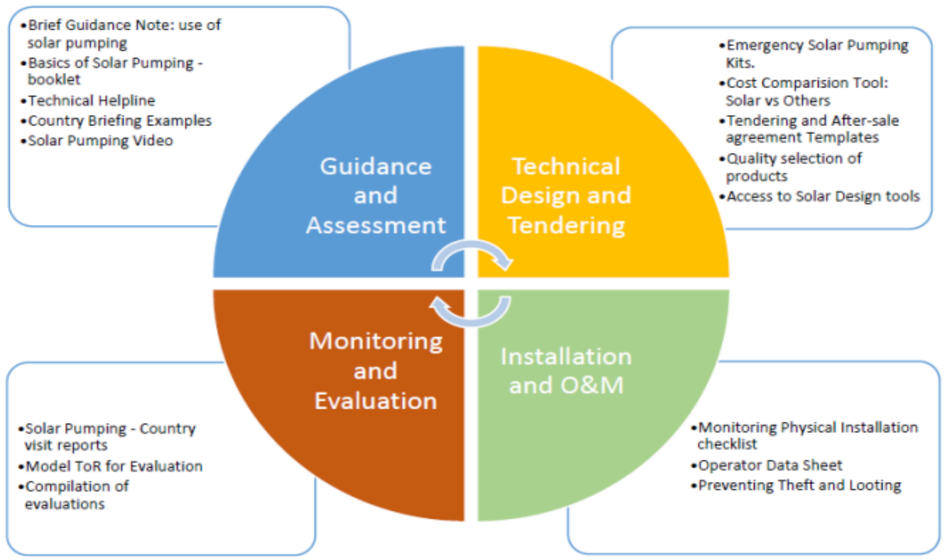
Findings & Lessons for the sector

- Need to look at life cycle cost analysis to realize benefits, show donors and prioritize those that give greater benefits
- Paramount to think of After-Sale service scheme before hand, focusing only on technology is wrong approach – Ensure success in the first critical 18-24 months!
- Holistic view before, during and after installations vs tech focus
- Use quality AND known technology for ease of service
- Hybrid solutions are relevant and appropriate in certain contexts: when aquifer characteristics are largely unknown or large fluctuations of population in short period of time is possible

Technical resources – solar pumping toolkit



Future Resources:

- Online Solar Pumping course – March 2020
- Guidelines for Solar Pumping projects – full book – March 2020
- Country Case studies, evaluation of practices – April 2020
- Operation & Maintenance Note - January 2020

https://energypedia.info/wiki *<Search: Solar pumping>*

https://www.oxfamwash.org/water/solar-pumping

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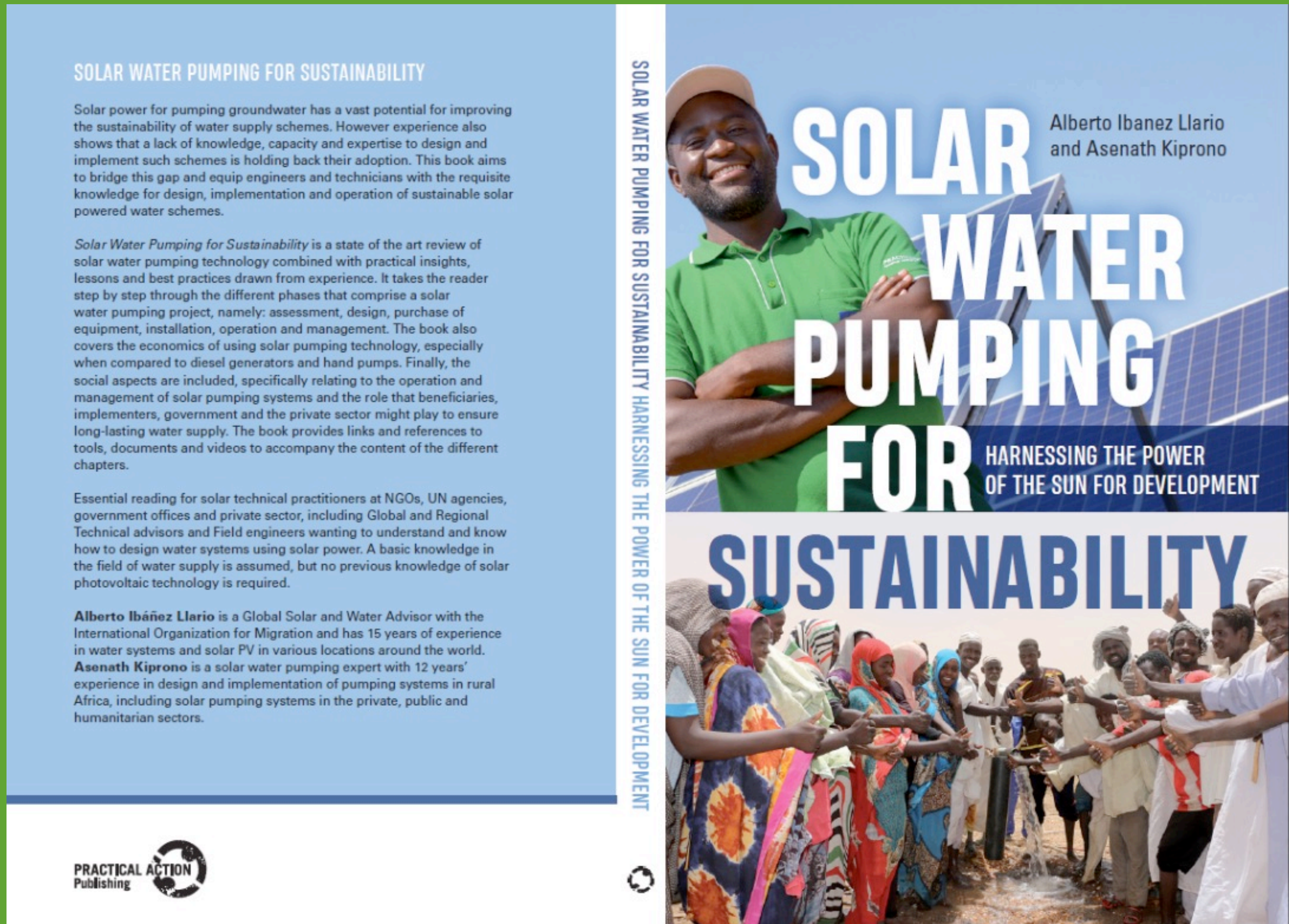
Technical resources – book



SOLAR WATER PUMPING FOR SUSTAINABILITY

Solar power for pumping groundwater has a vast potential for improving the sustainability of water supply schemes. However experience also shows that a lack of knowledge, capacity and expertise to design and implement such schemes is holding back their adoption. This book aims to bridge this gap and equip engineers and technicians with the requisite knowledge for design, implementation and operation of sustainable solar powered water schemes.

Solar Water Pumping for Sustainability is a state of the art review of solar water pumping technology combined with practical insights, lessons and best practices drawn from experience. It takes the reader step by step through the different phases that comprise a solar water pumping project, namely: assessment, design, purchase of equipment, installation, operation and management. The book also covers the economics of using solar pumping technology, especially when compared to diesel generators and hand pumps. Finally, the social aspects are included, specifically relating to the operation and management of solar pumping systems and the role that beneficiaries, implementers, government and the private sector might play to ensure long-lasting water supply. The book provides links and references to tools, documents and videos to accompany the content of the different chapters.

Essential reading for solar technical practitioners at NGOs, UN agencies, government offices and private sector, including Global and Regional Technical advisors and Field engineers wanting to understand and know how to design water systems using solar power. A basic knowledge in the field of water supply is assumed, but no previous knowledge of solar photovoltaic technology is required.

Alberto Ibáñez Llario is a Global Solar and Water Advisor with the International Organization for Migration and has 15 years of experience in water systems and solar PV in various locations around the world. **Asenath Kiprono** is a solar water pumping expert with 12 years' experience in design and implementation of pumping systems in rural Africa, including solar pumping systems in the private, public and humanitarian sectors.

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Technical resources – online course

SOLAR POWERED WATER SYSTEMS

Since : 5/9/20 | **Up to :** 11/29/20 | Campus Virtual | Online

Pre-registration Since 4/9/20

Promoted by :

Instituto Interuniversitario de Investigación de Reconocimiento Molecular y Desarrollo Tecnológico

Lead by :

Salvador Seguí Chilet

Registration →

https://www.cursofotovoltaica.com/solar-powered-water-systems/

OXFAM

Thanks for Listening

andegwa@oxfam.org.uk / allario@iom.int

Presenter

SILVIA GAYA, UNICEF

Silvia Gaya is an Engineer with an advanced degree in Politics and International Relations. Silvia is currently the Senior Advisor on Water and Environment for UNICEF Headquarters and has worked for UNICEF for more than 19 years. Silvia has been in this role since mid-2018 and leads UNICEF’s global efforts on Water (access, safety, sustainability) and Climate Resilience in WASH programmes, (climate resilience, use of solar energy in WASH, water scarcity), in addition to leading UNICEF’s global work on WASH in Healthcare Facilities and WASH in Schools.

Silvia has worked in development and emergency contexts, having worked in seven different countries including high profile emergencies such as Eastern Chad (Darfur conflict) and Haiti (immediately after the earthquake). Prior to that, Silvia worked for 10 years in the private sector, working in different countries, primarily in Europe, and has worked for several years with civil society in Catalunya as a volunteer in youth programmes.

Presenter

FIONA WARD, UNICEF

WASH Specialist (Water, Sanitation and Hygiene) working in UNICEF's Programme Division, in New York HQ. Fiona works in the Water Team and has a focus on Water Scarcity and Climate Change, and how these will impact UNICEF's programmes, as well as supporting WASH programmes on how to scale-up solar programming to make programmes more resilient. Fiona has a background in Hydrogeology and has worked in Nigeria, Ghana, Sudan, Kenya, Somalia (Kenya support centre), Haiti, Bangladesh and most recently in Jordan

UNICEF’s use of solar powered water systems in WASH humanitarian programming

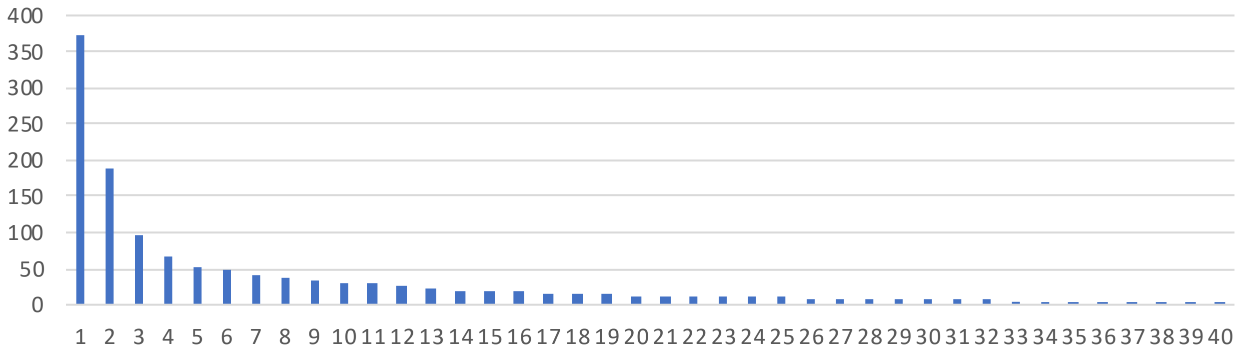
unicef
for every child

Silvia Gaya, Senior Advisor Water and Environment
UNICEF HQ, New York

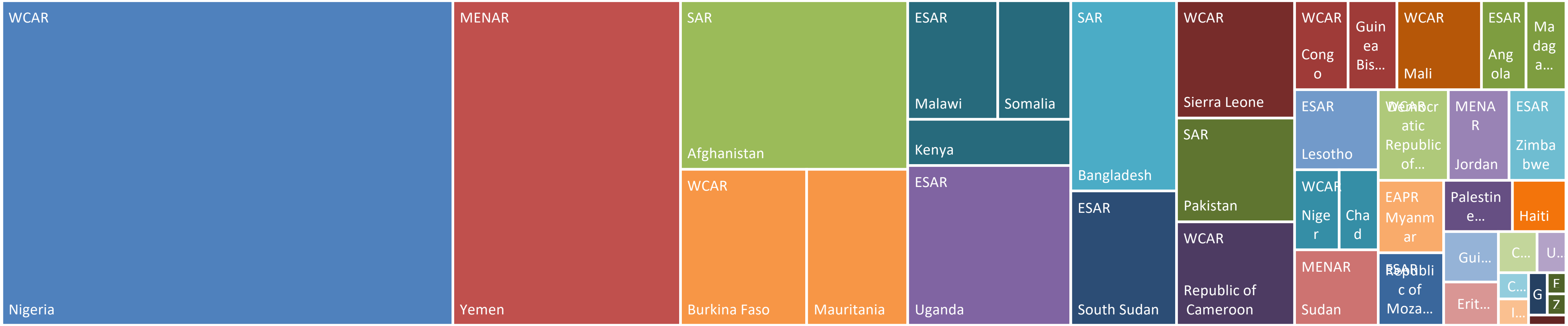
23 June 2020

Overview of UNICEF’s WASH programmes

- US$1B per year
- Approx 51% budget spent on Humanitarian
- About 700 Water, Hygiene and Sanitation (WASH) staff
- WASH programmes underway in 105 countries



Distriution of solar systems installed in 2019

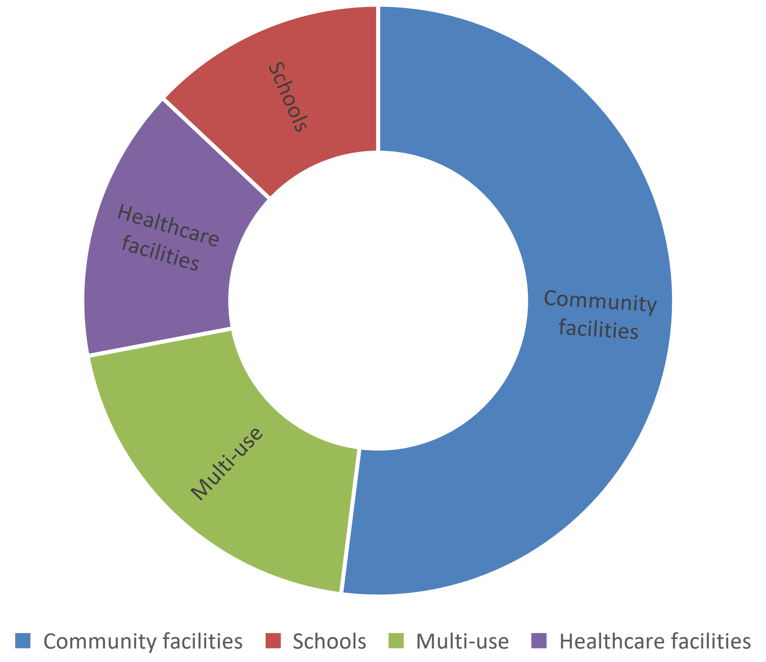


Overview of UNICEF's WASH Solar programmes

Scale of UNICEF's Solar programmes

- 1,286 solar powered water systems installed in 40 countries in 2019
- Variety of types - Community water systems, Schools, Healthcare facilities and multi-use systems
- 63 countries (including Health & UNICEF office, compounds, warehouses)

Distribution of solar powered water systems uses



Main Humanitarian solar programmes

Overview of Yemen Solar water programme

- Started in 2016 (as fuel exit strategy and sustainable energy)
- Started in rural areas (issues to access deeper water) - the success led to scale-up to urban settings incorporating lesson learned
- In 2018 - UNICEF scaled-up solar after conducting a technical study on feasibility of solar power at different locations across Yemen - study resulted in designs of suitable hybrid systems
- In 2019 - UNICEF installed 187 systems including mega projects in partnership with WB, KfW, DFID and Qatar Foundation
- Largest project is in Sana'a city (targeted 17 water sources by UNICEF, 4 sources of UNOPS and 3 from ICRC) pumping water to over 1.5 million people in Sana'a city (hybrid)
- Solar energy has now become the national approach of Ministry of Water and Environment in Yemen
- Implementation of projects led by UNICEF have different modalities (Governmental partners, NGOs partners and directly by UNICEF) with different technical operational modalities (rural versus urban).
- All Solar systems are operational - challenges include conflict damage (Sa'ada solar projects has been targeted by an airstrike, however it has been repaired and functional)

Overview of Gaza Solar water programme

- UNICEF constructed in Gaza, the first phase of a desalination plant (6,000m^3/day) for 75,000 people, and is expanding it at present to 20,000m^3 for a total of 250,000 people
- In the first phase, solar panels were installed (on the roof - 126kWh for office power needs)
- The Solar field of 0.56MW was later added to supply about 30% of the electricity demand (1 stream) of the Plant Phase I
- Solar installed to reduce fuel consumption and save on electricity costs as an alternative to the limited on-grid electricity supply (available only 4-8 hours per day) and the logistical challenges accessing/importing fuel
- The Solar field is a system is part of a hybrid system (runs on the grid/generators are operational - no batteries used)
- During operation with the diesel generators, a phenomenon called high Total Harmonic Distortion (THD) has been observed
- More solar fields have been installed including those for the operation of a wastewater treatment plant

Challenges encountered/Lessons learned

Challenges

- Sub-optimal staff capacity/sector experience
- Design of solar based systems need longer time frame - often beyond the grant period (humanitarian)
- Poor quality products/solar services available
- Challenges to do procurement with limited options for pre-contract testing (Yemen equipment samples tested at university)
- Importation restrictions/embargoes on equipment/spares

Lessons learned

- Multi-use systems improve the level of service
- Solar systems need an associated service delivery model that is professional (small scale operators)
- Look at the 'enabling environment' (Mauritania)
- Opportunities to combine different dimensions such as water conservation/reuse and solar
- Need Go-To online place for all things related to solar

What UNICEF is doing to address these challenges

Available

- Online training course on solar (with Water Mission) – 2019 (800 applicants for 100 places)
- Solar Hub for West and Central Africa (April 2020)
- Long Term Arrangements for complete self-contained units (A/C) (20m^3/day at 25m TMH; 9m^3/day at 80m TMH; and 3.8m^3/day at 25m TMH)

Under development

- Solar Manual - in English (July 2020)
- Solar Manual - in French (September 2020))
- Advanced solar course (late 2020)
- Basic solar course - in English (early 2021)
- Basic solar course - in French (early 2021)

Future

- Solar Bottleneck analyses at national level
- Assessments of our systems
- Different financing mechanisms

Presenter

MELISA BONZO, International Committee Of The Red Cross (ICRC)

Melisa has worked for the International Committee of the Red Cross for 10 years, working in Zimbabwe, Nigeria, South Sudan and now Syria. She has worked on water supply , sanitation and shelter projects in Internally Displaced People (IDP) camps, Areas of return, Places of Detention (PoD)s and Health Facilities. Melisa was part of the ICRC team that was involved in the of large solar water yards in Juba city to increase access to water supply and WASH services.

She is a holder of a Diploma in Civil Engineering Water Supply, Post Graduate Diploma in Water and Sanitation and a final year Bachelor of Administration – Public student.

Solar Water Yards in Juba city

Sustainable energy in humanitarian settings
Webinar series, 23.06.2020

Melisa Bonzo – ICRC Water and Habitat Engineer

ICRC

- ❑ Problem analysis
- ❑ the ICRC response
- ❑ Solar water yards (technical description)
- ❑ Solar Water yards (financial considerations)
- ❑ Community management of solar yards

Background

Covid-19 in South Sudan represent an emergency within an emergency as the country remains affected by conflict, violence and displacement. In Juba city, it is necessary to guarantee continuity of water supply and sanitation services and, to this end, power supply as their main enabler. In the ICRC response, different interventions tackle in parallel emergency needs but also construction of medium term project and long term centralized solutions.

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SOUTH SUDAN
Humanitarian Snapshot

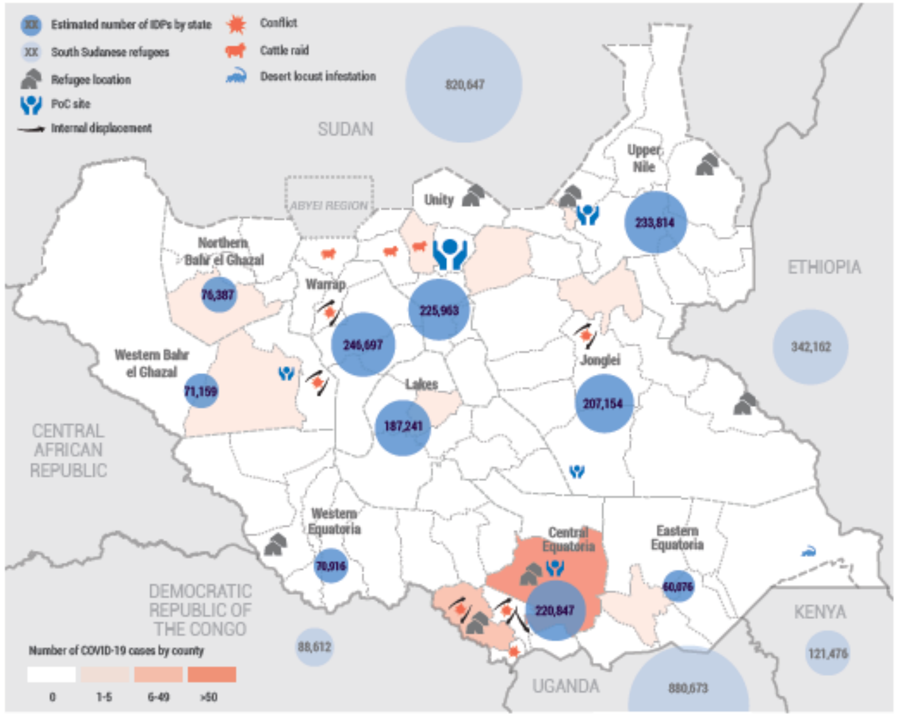
OCHA

Violence and insecurity persisted in May and drove humanitarian needs, alongside the onset of the annual lean season, increasing rains and COVID-19. More than 17,000 people were displaced in Lainya, Yei and Morobo counties in Central Equatoria by armed clashes involving Government and opposition forces and the National Salvation Front. Intercommunal violence in Uror County, Jonglei, affected more than 23,000 people, displacing thousands and leaving hundreds dead. Clashes in Gogrial East County, Warrap, and Jur River County, Western Bahr el Ghazal, uprooted an estimated 33,500 people. Cattle raids in Twic County in Warrap and Mayom and Rubkona counties in Unity displaced more than 10,000 people. By the end of May, South Sudan confirmed 994 people with COVID-19, including three inside the

KEY FIGURES

7.5M	1.60M	182K	2.26M
PEOPLE IN NEED	INTERNALLY DISPLACED PEOPLE	IDPS IN PROTECTION OF CIVILIANS SITES	SOUTH SUDANESE REFUGEES

DISPLACEMENT AND HOTSPOTS



Source UN OCHA (May 2020): https://reliefweb.int/sites/reliefweb.int/files/resources/ss_20200615_humanitarian_snapshot_may.pdf

ICRC South Sudan @ICRC_SSudan · May 14

How do you observe physical distancing when you must fit 3 people under a mosquito net made for 1 person to protect yourself from malaria?

Our latest footage on the challenges displaced persons are facing during the #COVID19 pandemic in #SouthSudan.

South Sudan: Tens of thousands of people at-risk as COVID-19 reaches c...

How can you observe physical distancing when you must fit three people under a mosquito net made for one person to protect yourself from ...

icrcnewsroom.org

Source ICRC: https://twitter.com/ICRC_SSudan

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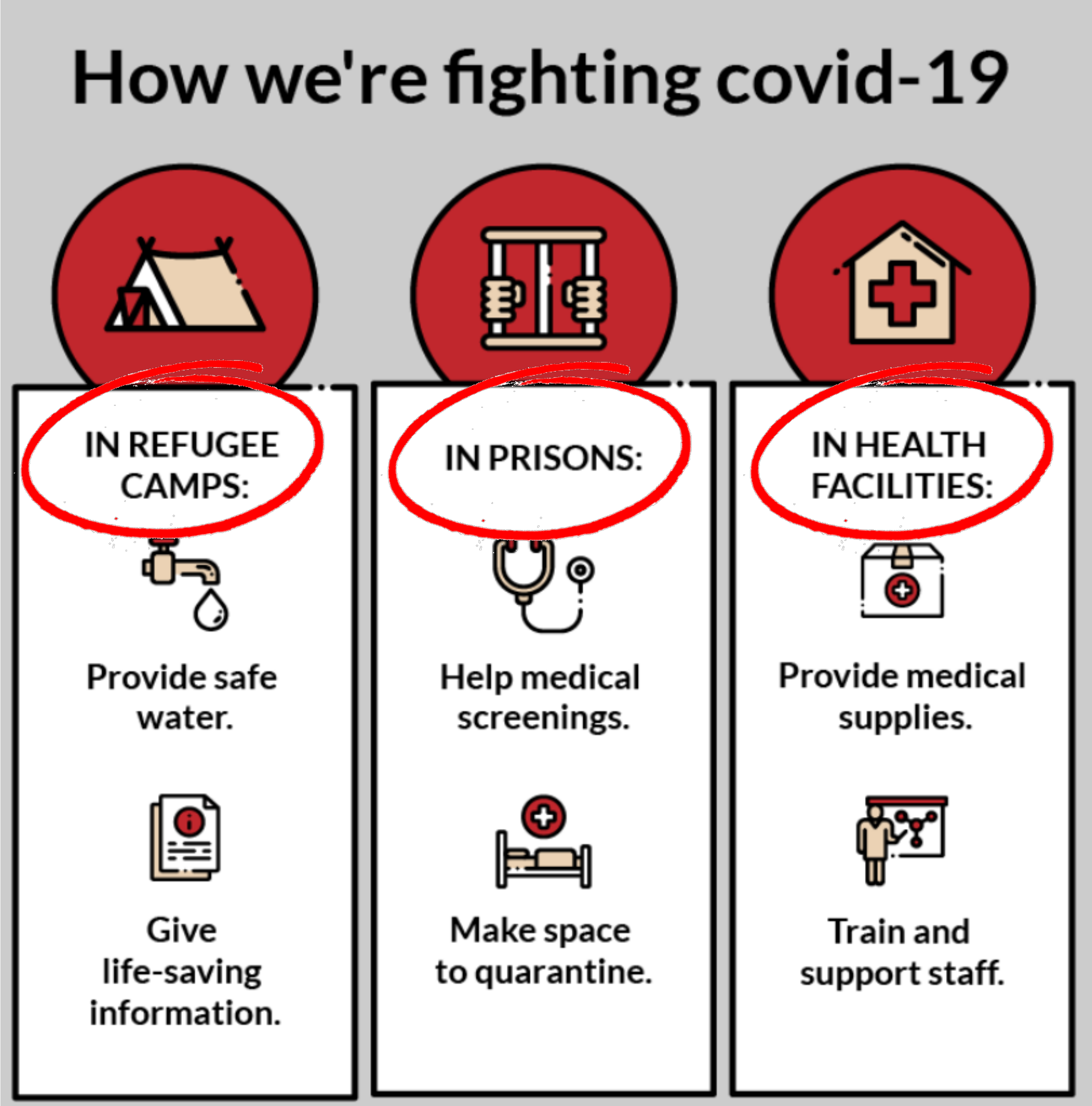

POWER SUPPLY is essential to guarantee access to safe drinking water and enable preventive WASH measures against Covid-19

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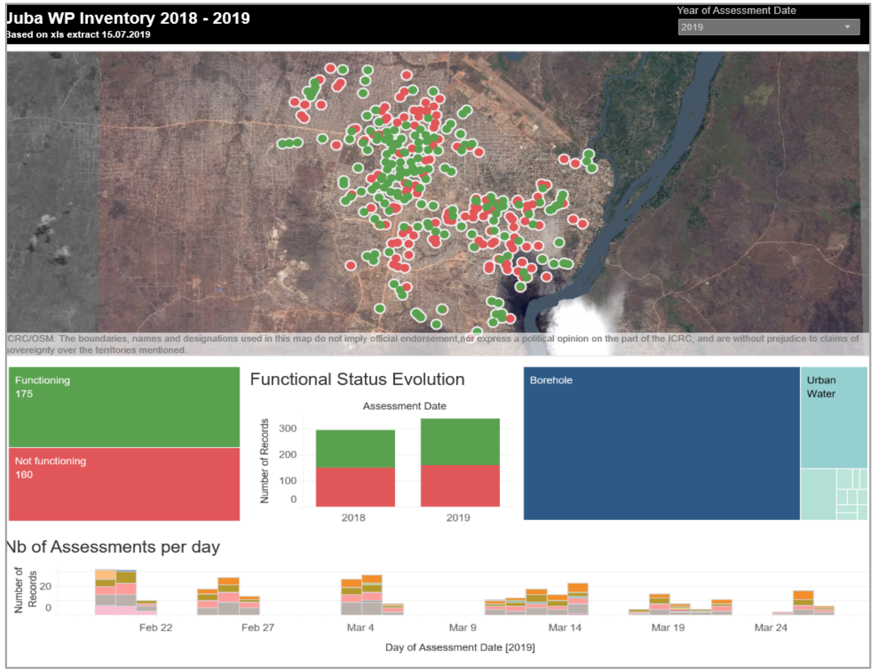

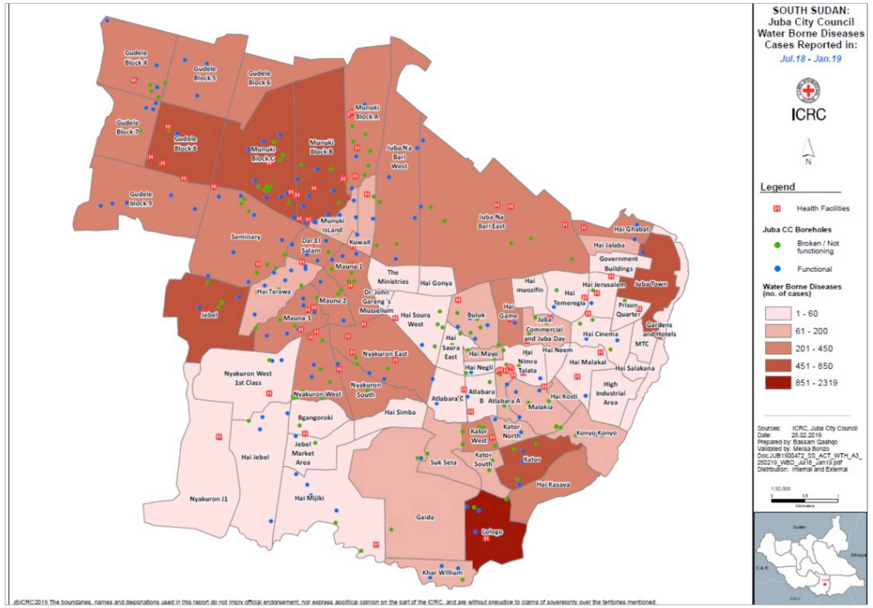

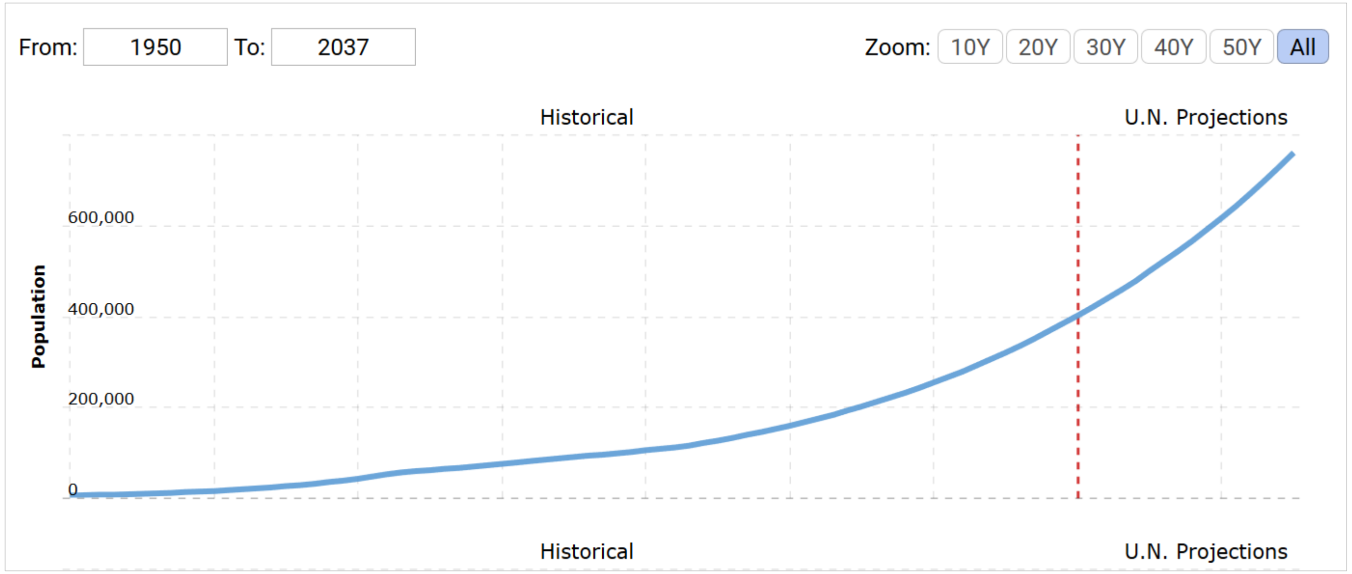

Source: https://www.macrotrends.net/cities/22577/juba/population

- Juba city population grows rapidly
- Infrastructures for essential services have a limited coverage
- Cholera cases are reported seasonally

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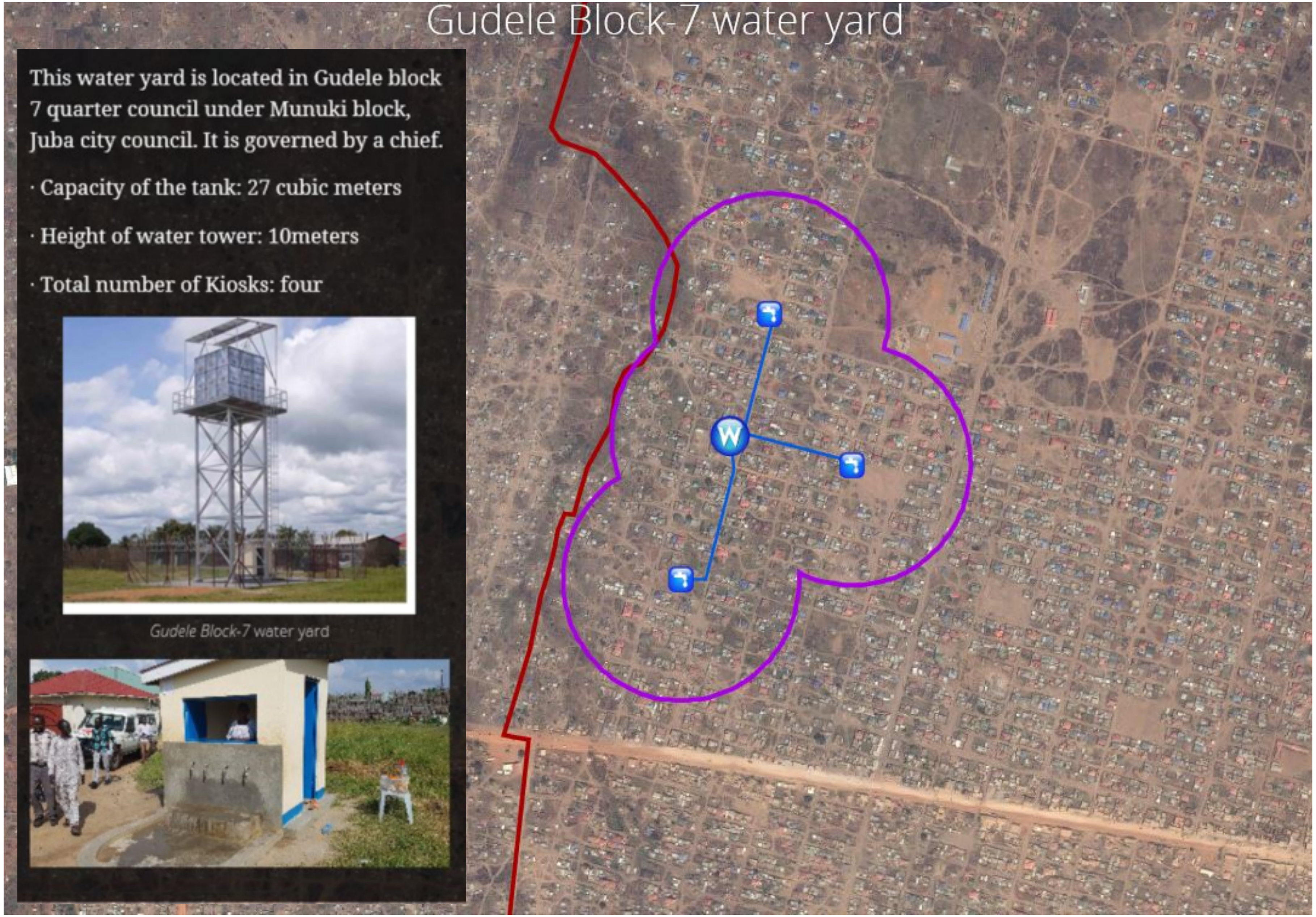
- Water treatment station with generators
- Water Trucking

- Solar Water yards of large size
- Distribution and water trucking

- Upgrade of water treatment plant
- Extension of urban network



Solar water yards have been located in areas most exposed to water-borne diseases

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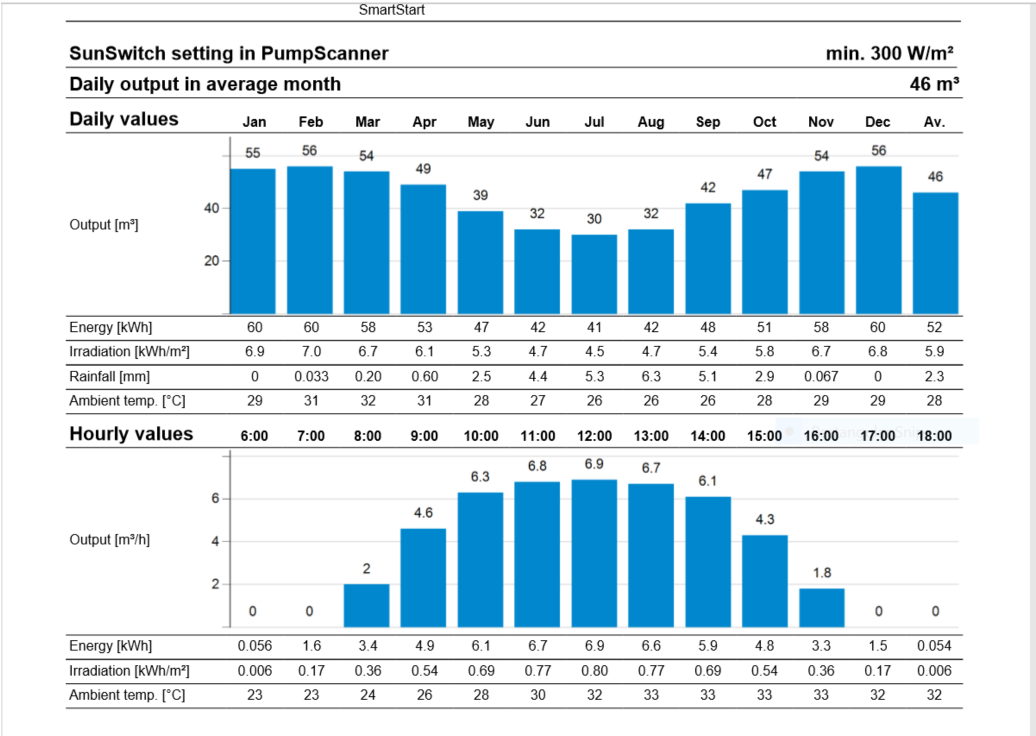
Technical Description of Solar Water Yards:



	10m³	27m³	48m³
Tank stand	2'000	21'000	26'000
Pump and accessories	1'100	11'000	11'500
Tap stand and filling station	1'000	16'300	16'300
Pipeline construction	500	17'100	19'300
Security fence	800	2'700	2'700
Total	5'400	68'100	75'800

ICRC

Construction costs

	10m³	27m³	48m³
Tank stand	2’000	21’000	26’000
Solar pump and accessories	1’100	11’000	11’500
Kiosk and filling station	1’000	16’300	16’300
Pipeline construction	500	17’100	19’300
Security fence	800	2’700	2’700
Total (USD)	5’400 USD	68’100 USD	75’800 USD

ICRC

Operational costs

	Gudele block 9 10^3	Gudele Block 7 $27m^3$	Check point $48m^3$
Cost of water	7c/ 20l	2c/ 20l	7c/ 20l
Operator	50	93	30
Maintenance	28	20	20
Income	450	500	90

ICRC

Community committees

A committee including a technician, a book keeper and representatives of the community is organized for each site.

They collect fees on a shared bank account and do regular maintenance of the installation.

ICRC

Video

Access to safe water for proper handwashing is essential for preventive measures against covid-19

Solar Water Yards in Juba city improved access to safe water in areas most exposed to water-borne diseases

Communities can afford the cost of maintenance with small contributions

Links

- https://www.icrc.org/en/document/south-sudan-using-solar-power-bring-water-15000-people
- https://twitter.com/ICRC/status/1245232431839563778/photo/1
- https://drmkc.jrc.ec.europa.eu/inform-index/Results/Global
- https://reliefweb.int/sites/reliefweb.int/files/resources/ss_20200615_humanitarian_snapshot_may.pdf
- https://www.unicef.org/southsudan/sites/unicef.org.southsudan/files/2019-12/%20UNICEF-South-Sudan-WASH-Briefing-Note-Dec-2019.pdf
- https://www.who.int/water_sanitation_health/monitoring/investments/country-highlights-2017/south-sudan-glaas2017-country-highlight-20180903.pdf?ua=1
- https://www.researchgate.net/publication/322924929_Struggles_for_Electrical_Power_Supply_in_Sudan_and_South_Sudan
- http://www.africanreview.com/energy-a-power/power-generation/south-sudan-to-restore-reliable-electricity-supply-to-juba-s-central-business-district

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Presenter

JEAN-BAPTISTE SIVERY, RENEWGIES

President and Co-founder of ReNewGies

Manager, Senior Engineer

Adept of the humanist philosophy, keen on dedicating a great part of my spare time to philanthropy basing my actions on skill-based sponsorship which I learn in my professional activities

Presenter

AYMAN JABBERI, RENEWGIES, RENEWGIES

Project and Study Engineer

Expertise in energy production and efficiency

As a young engineer, always keen on making use of my skills and my training in a useful way to people in need. Committed to providing opportunities for access to basic needs like water and energy in order to reduce social inequalities.

Solar for Water Pumping in Humanitarian Settings

Non-profit organization that promotes access to sustainable energy

June 2020

Who we are:

A non-profit organization that gathers high level technical experts who dedicate their time to:

- promote the access to the most efficient sustainable energy available in each specific situations
- develop partnerships with NGOs to share our expertise in solarization projects around the world

What we do:

Previously conducted Feasibility Studies with UNHCR

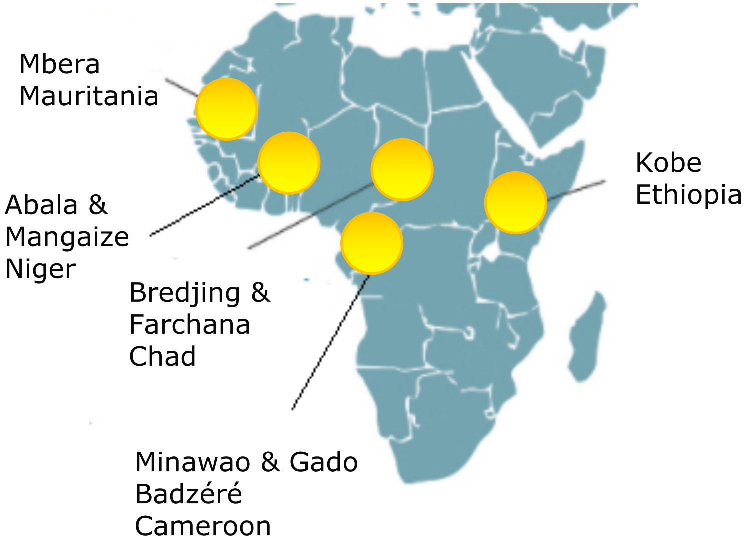
A Dozen of solar pumping feasibility studies held in subsaharian countries for drinking water inside refugee camps

<u>What we have done there:</u>

- Water system assessments
- Solar pumping technical studies and cost estimations
- Tenders writings
- Works assistance
- Local trainings

<u>Various specificities:</u>

- Intakes in rivers or boreholes
- From simple drinking water supply system to very complex
- 5 000 to 50 000 people



FEEDBACK FROM OUR PREVIOUS MISSIONS

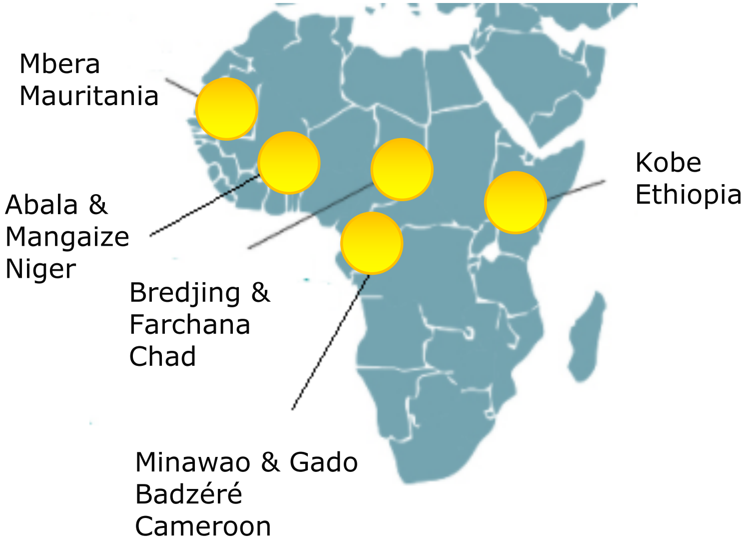
2 key learnings:

Long term vision is complex:

- Volatile contexts of refugee camps (*Niger*)
- Facilities built in emergency (*Chad, Mauritania*)
- ➢ **Selection of compatible camps is key**

Data collection is challenging:

- High turnover of IP/UNHCR people
- Data archives is often an issue (*Cameroun*)
- Security, logistical issues and costly missions (*Ethiopia*)
- ➢ **Enhance EDM to support operational efficiency and projects designs**



GENESIS OF A TOOL FOR EMERGENCE OF SOLAR PUMPING WITHIN THE CAMPS

Necessity to put forward a quick and easy to use tool:

- Facilitate the data collection for the UNHCR operators on the field
- Avoid sticking to pump manufacturers tools that do not take account of the complexity of the networks and the operational conditions
- Estimate quickly the solar potential without being a solar pumping professional

Based on our common experience, we have decided to co-build the tool with the UNHCR

Objectives of the Rapid Assessment Solar Tool built with the UNHCR:

- Easy assess the drinking water network thanks to an ergonomic interface
- Create a compatible database which interacts with the existing borehole database
- Simulate solar potential and the costs of the works
- Deliver a report displaying the main characteristics of the solar pumping potential

➡ **Let us give you an overview of the tool beta version!**

On-going Project: Rapid Assessment Solar Tool

How it works:

- Users : WaSH officers on the field that have the credentials to upload data and update it.
- An ergonomic UI that helps the users upload necessary data in order to provide the calculus core with inputs.
- Established communication protocols with the GIS Portal Borehole Database in order to use the necessary info.
- A background working calculus core that processes the data and generates a report on the solar potential and the probable costs.
- Generated reports for the concerned camps will be public and accessible via the GIS portal.

ON-GOING PROJECT: RAPID ASSESSMENT SOLAR TOOL

Inputs

- Weather Data
- Data about the hydraulic network.
- Data about the installed equipment (pumps, storage tanks, etc…)
- Data about the distribution profiles.

→

Background Calculus Core

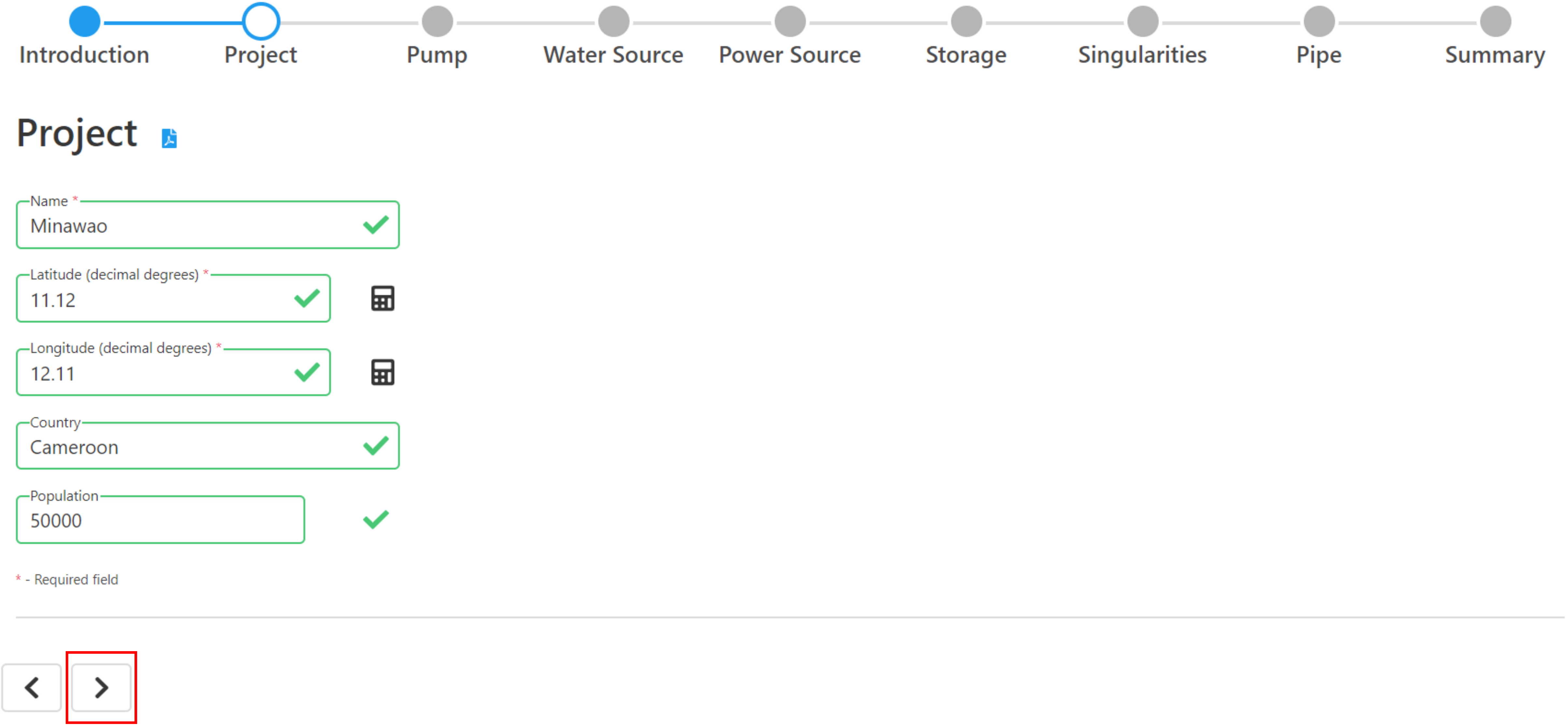
→

Outputs

- Solar Potential
- Estimation of Costs
- Estimation of cost-efficiency.
- Estimation of CO2 impact

ReNewGies UNHCR The UN Refugee Agency

A quick look at the UI



A quick look at the UI

Pump

Enter data about the existing pumps

( ) Immersion ( ) Surface ( ) Booster

Average pumping rate (m^3/h) *
Average pumping rate

Diameter of pumping pipe (DN) * (2)
Diameter of pumping pi

Depth of pump (m) * (1)
Depth of pump (m)

Electric power (kW) *
Electric power (kW)

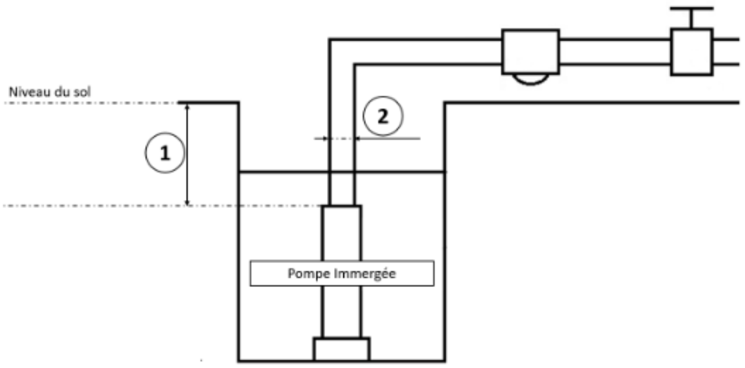
Total manometric head at nominal power (m) *
Total manometric head a

Item name
Item name

Material of pumping pipe

- Concrete pressure pipe (CPP)
- Ductile iron (DI)
- High-density polyethylene (HDPE)
- Polyvinyl chloride (PVC)
- Poly reinforced vinyl (PRV)
- Steel (ST)

Pump reference
Pump reference



Add

Data		Action
Average pumping rate	10.5	
Depth	50	

A QUICK LOOK AT THE UI

Water Source

( ) Borehole ( ) River ( ) Source capture

Drilling depth (m) * (1)
150

Static level of drilling (m) * (2)
70

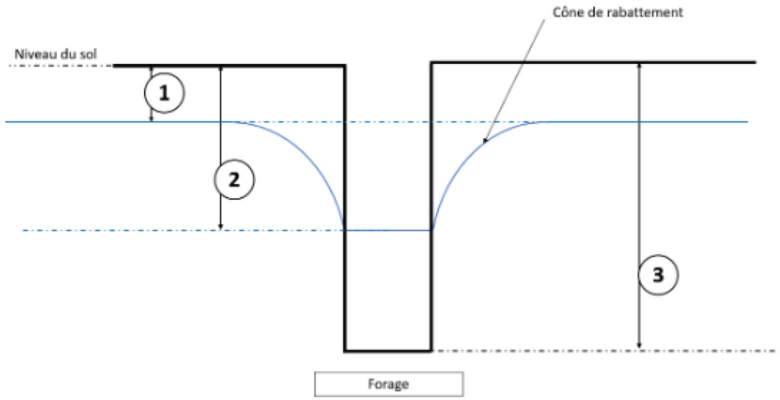
Dynamic level of drilling * (3)
75

Altitude above sea level (m ASL) *
300

Latitude (decimal degrees)
Latitude (decimal degrees)

Longitude (decimal degrees)
Longitude (decimal degrees)

Nominal source flow
12



Item name
Item name

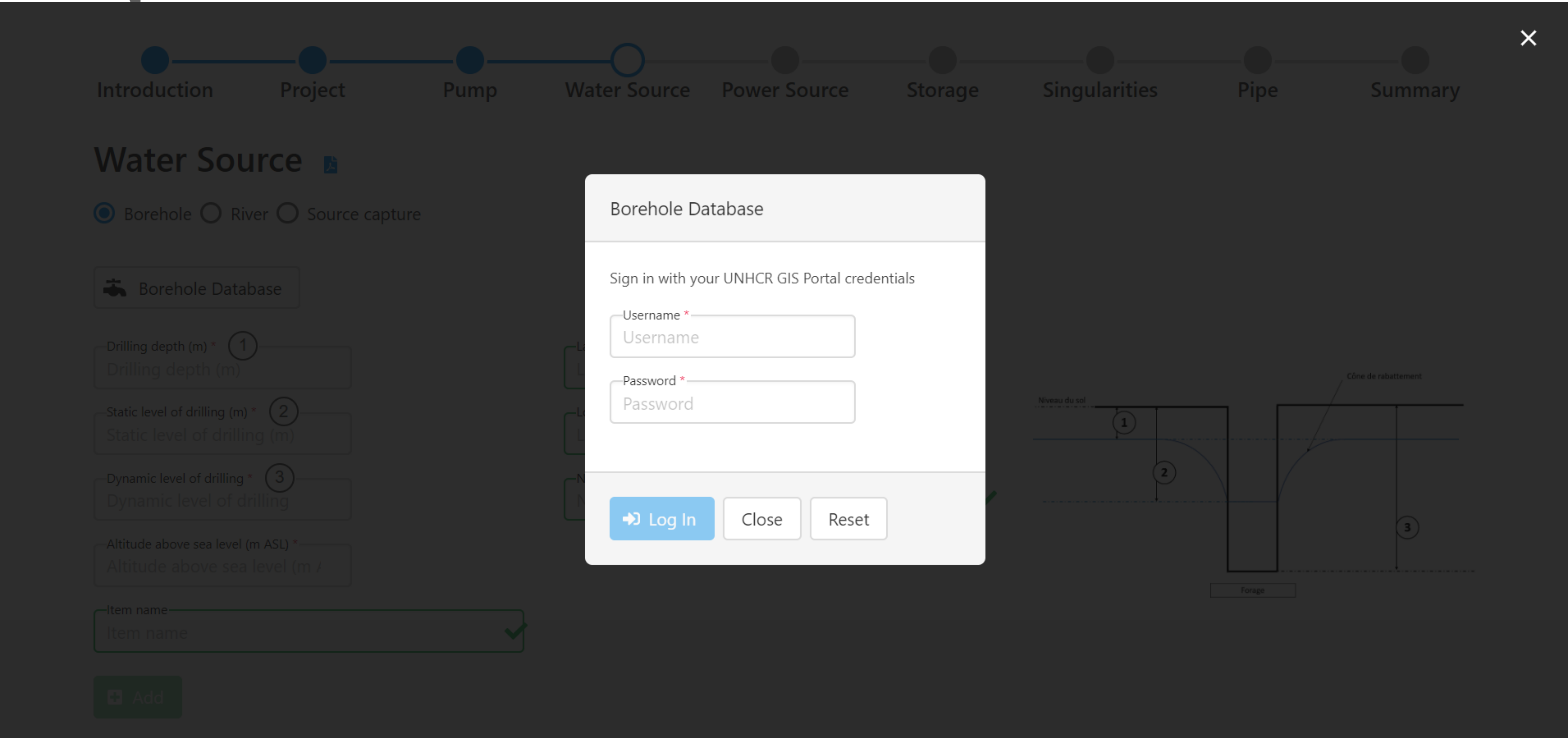
Add

Data	Action

* - Required field

ReNewGies UNHCR The UN Refugee Agency

A QUICK LOOK AT THE UI



ReNewGies
UNHCR The UN Refugee Agency

A quick look at the UI

Power Source

Enter data about the existing power sources

Solar Generator Hybrid

Number of panels *
10

Unit power of panel (W) *
305

Inverter power (kW)
3.5

Sunniest month

Least sunny month

Add

A QUICK LOOK AT THE UI

Introduction · Project · Pump · Water Source · Power Source · Storage · Singularities · Pipe · Summary

Storage

(•) Water tower ( ) Underground water tank

Altitude above sea level (m ASL) *: 360 ✓

Ground height to tank bottom (m) * (1): 10 ✓

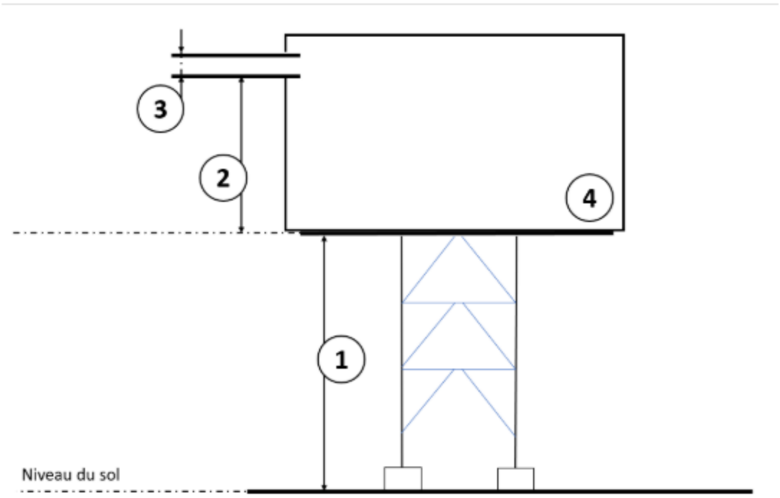
Tank bottom to feed point (m) * (2): 3 ✓

Volume (m^3) * (4): 200 ✓

Diameter of supply pipe (DN) (3): 63 ✓

Latitude (decimal degrees): 11 ✓

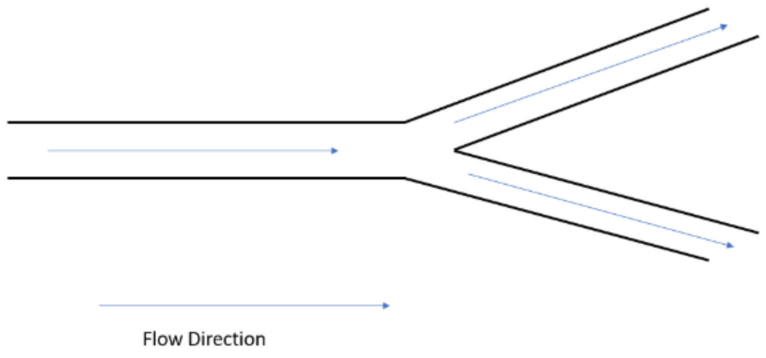
Longitude (decimal degrees): 12 ✓



Introduction — Project — Pump — Water Source — Power Source — Storage — Singularities — Pipe — Summary

Singularities

- (●) Bifurcation
- ( ) Narrowing
- ( ) Enlargement
- ( ) Connection



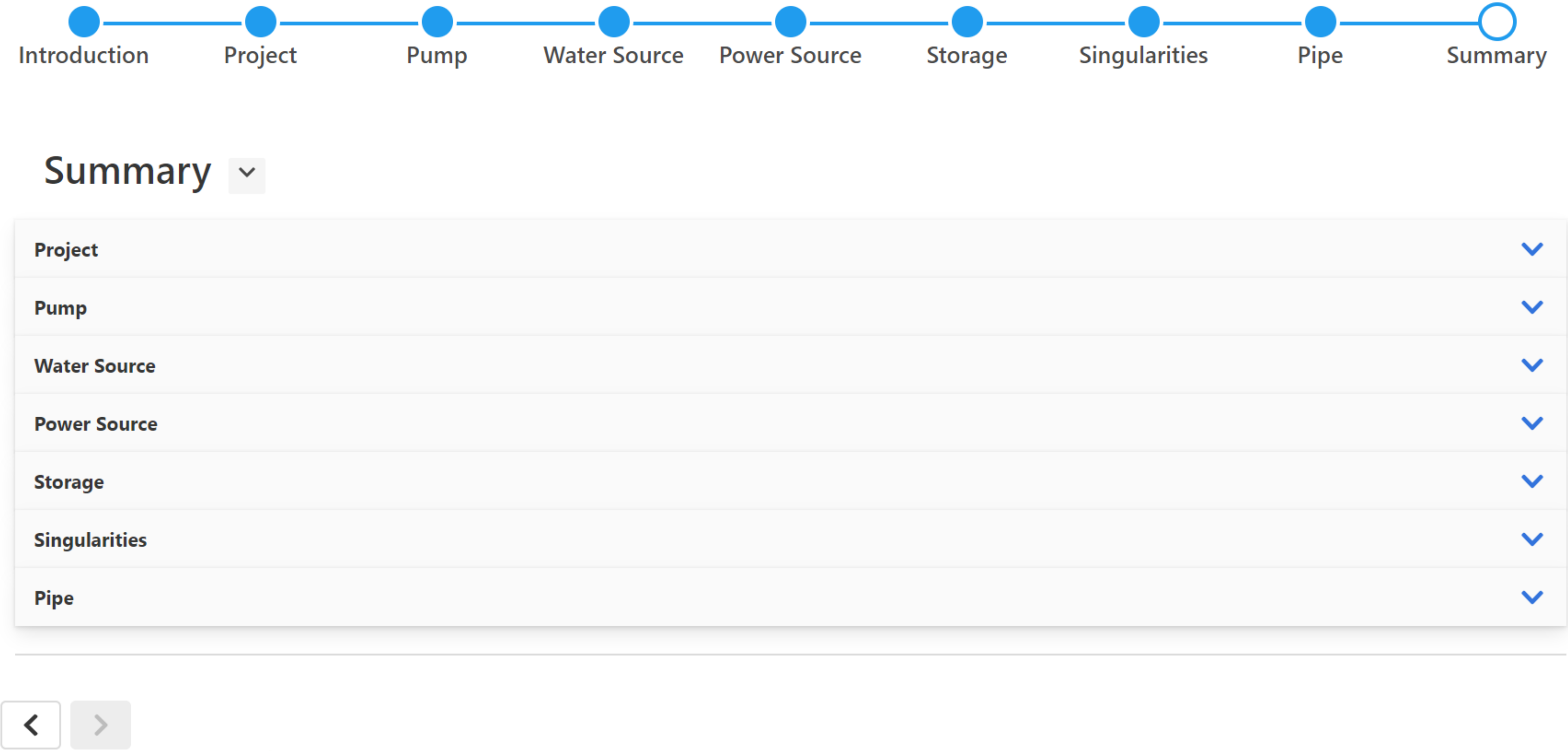
Item name

Item name

Add

Data		Action
Item name	B1	
Multi choice option	Bifurcation	

A QUICK LOOK AT THE UI



OUTPUTS: REPORT FORMAT

- **Page 1: A summary of input data:**
  - Water sources entered by the user
  - Information about the water storage points
  - Structure of the hydraulic network

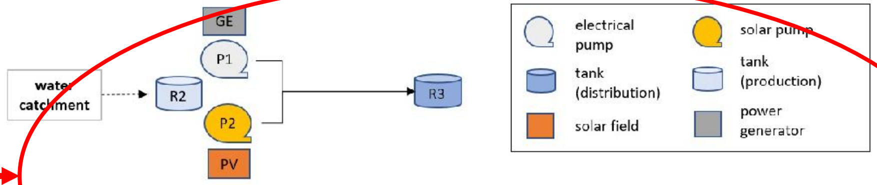
Solar Assessment Report - Automatically Generated for the Project of : NAME OF PROJECT

This report is automatically generated from the Rapid Solar Assessment tool. It is designed to give an estimation of solar potential of a specific project and calculate a quick estimate of the generated costs.

Specificities of the project

- **Current population** : 25 319 people
- **Selected Water Sources** :
  - Boreholes :
    - Borehole B1
    - Borehole B2
    - Borehole B15
  - Water Catchments :
    - None
  - Rivers :
    - None
- **Inserted Water Storage Points** :
  - Tank T1
    - Volume : 20 m^3
    - Height : 9 m
  - Tank T2
    - Volume : 20 m^3
    - Height : 9 m

Entered Structure



Structure Details

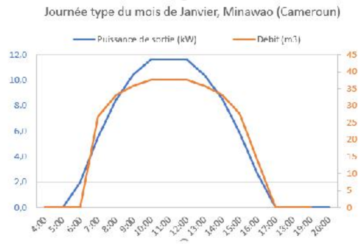
- Pipe Extremities - Length : xx m - Diameter xx mm
- Pipe Extremities - Length : xx m - Diameter xx mm
- Pipe Extremities - Length : xx m - Diameter xx mm

OUTPUTS: REPORT FORMAT

- **Page 2: Output figures:**
  - Solar share for each pump
  - Peak solar power to be installed
  - Water volume produced daily
  - Amounts of fuel and CO2 avoided
  - Ballpark of the investment and payback time

Solar Data Used

Because solar data was probably not available for the exact position you entered, the tool may not have used the solar data for your exact location, but approximated it with a similar solar field from a close region.
The used solar data as well as the exact coordinates are displayed in the graphic across.



Model Results : key figures

Solar figures

Peak Power to be installed	Solar Share
• **P1** : $6,5kWp$ • **P2** : $4,5kWp$	• **P1** : 79% • **P2** : 65%

Water volume figures

Water Volume Produced
• $119m^3/day$ on average

Fuel related figures

Amount of CO2 avoided	Fuel savings
• $4,4t_{CO2}/year$	• **On sunny days** : **4.5** l/day

Economic figures

Estimated Costs	Gross Payback time
• **CAPEX : 15 000 €**	• **10,8 years**

Disclaimers

- This is the result of rapid assessment tool. The results given in this document should, in no way, be considered as the results of a feasability study. It only gives a ballbark of solar potential and costs based on limited information. It does not go into the specific needs of a camp or a structure.
- This report should not be a basis for buying pumping products, nor it can be considered sufficient information to start construction works to install solar panels and equipment.
- In order to obtain a more accurate study of the camp or structure at hand, please contact specialists to assess the hydraulic and energetic specificities that are involved, and produce a proper feasability study and determine accurate technical specifications in order for you to start construction works.
- You can contact the organisation ReNewGies, which is responsible for developing this tool for further questions. You can also get in touch with ReNewGies for a potential feasability study of your camp and pumping structures.

Thank you for your time

Don’t hesitate to contact us

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aymen.jabberi@renewgies.org

- Q&A -

7 AFFORDABLE AND CLEAN ENERGY

Global Plan of Action for Sustainable Energy in Humanitarian Settings

The GPA is an inter-agency initiative to achieve universal energy access in humanitarian situations, steered by:

GPA GLOBAL PLAN OF ACTION

UNHCR The UN Refugee Agency; unitar United Nations Institute for Training and Research; IOM UN MIGRATION; WFP World Food Programme; Food and Agriculture Organization of the United Nations; UNDP Empowered lives. Resilient nations.; giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH; MERCY CORPS; Practical ACTION; CHATHAM HOUSE; SUSTAINABLE ENERGY FOR ALL; CLEAN COOKING ALLIANCE; UNEP DTU PARTNERSHIP

More on Humanitarian Energy

LinkedIn Group: https://www.linkedin.com/groups/12310695/

Online: https://www.humanitarianenergy.org/

Thank you

- Feedback: info@energypedia.info
- Webinar documentation/Additional Resources: https://energypedia.info/wiki/Webinar_Series:_Sustainable_Energy_in_Humanitarian_Settings#June_2020

- Stay tuned for our upcoming webinars!