Tackling Challenges of Drinking Water After Disaster

GLOBAL WARMING IS REAL!





- Warmer temperature
- Ice sheets are melting and Glaciers are retreating backwards
- More extreme & frequent natural disasters

When Disaster Strikes...

- Damaged roads
- Power outages
- Contaminated water sources

PAST DISASTERS SNAPSHOTS

Nepal Earthquake 2015

"...Clean water supplies have been dwindling in some camps as aid organizations rush to meet the escalating need. In Sangachok, the earthquake damaged the natural spring that had supplied the village's water, leaving residents dependent on their existing stores. The army began transporting tanks of water to villages throughout the district, but their supplies aren't sufficient to meet demand..."

Marshall Islands Drought 2016

"... Water is being carefully distributed, with residents in the capital Majuro given an allocation once a week for a four-hour period. "We're receiving complaints from the public that they're out of water," said Majuro mayor Ladie Jack as the emergency declaration was made..."

Lombok Earthquake 2018

"... The earthquakes have affected the most crucial areas of people's lives, including water for drinking and irrigation. Water sources and systems have been destroyed or contaminated, and rivers have dried up. Many people are forced to ration drinking or cooking water, and some families depending on water-intensive crops like rice have lost their only or main source of income. ... six months on, many people are still reliant on trucked water..."

Challenges Aftermath

- Long recovery of basic infrastructure
- High risk of full-blown health & sanitation crisis
- Accessibility to affected areas to supply basic needs such as food & water.

GUEST SPEAKER PROFILE

Tomoko TANAKA (Ms.) Deputy Director Emergency Relief Division 2 and 1 Secretariat of Japan Disaster Relief Team Japan International Cooperation Agency (JICA)

JICA's Emergency Disaster Relief

Secretariat of Japan Disaster Relief Team,

Japan International Cooperation Agency

Japan International Cooperation Agency

What is JICA?

JICA's Emergency Disaster Relief

Japan Disaster Relief Team

Search and Rescue Team 20 times

Medical Team 59 times

Infectious Disease Response Team 6 times

Expert Team 53 times

Self-Defense Force Unit 22 times

History1979Support to Cambodian refugees in Thai border
>Started as Medical team manned by volunteered practitioners1982Japan Medical Team for Disaster Relief (JMTDR) organized
>Secretariat established in JICA

- 1987 JDR added Search and Rescue capacity: USAR team
- 1992 Self Defense Force became a part of JDR Team
 - > PKO Law for complex emergencies
 - > JDR responsibility confined only for natural disasters
- 2015 Infectious Diseases Response Team was established

Provision of Relief Goods

Emergency Relief Goods 558 times since 1987

Search and Rescue Team in 2017/ Mexico

Medical Team in 2015/ Nepal

JICA stockpile warehouses

Emergency Relief Goods

Challenges on Emergency Goods

- Variety of Needs
- Frequent Changes in Needs at Emergency Phase
- Consideration of Effect to International and Domestic market
- Accountability as Governmental Organization (appropriate stock management, selection of items / specs etc.,)
- Tight Freight Transport

JICA's Seamless Assistance to cover Whole Disaster Management Cycle

Emergency Relief

WHAT CAN BE DONE...

(1) Palletized Bottled Water

- Most Common & Easily Accessible
- Heavy Logistics
- Difficult Distributions
- Disposals neglected

Puerto Rico – Hurricane Maria (2018)

WHAT CAN BE DONE...

(2) Portable Water Filtrations

- Less Space but More Water
- For Fresh/Sweet Water only
- Easily carried around
- Durability & Reliability

WHAT CAN BE DONE...

(3) Mobile Desalination

- Less Space = More Water
- For any water source
- Easily carried around
- Self-powered (Solar Panel)

GUEST SPEAKER PROFILE

John Wright (Mr.)

Business Development Manager Disaster Response Team Leader (water solutions) Katadyn Group

Spectra Watermakers. Making fresh water worldwide.

Spectra Watermakers. Making fresh water worldwide.

Spectra Aquifer – Disaster Deployments

Spectra Watermakers/Katadyn Group History

- > The Katadyn Group is a global corporate group
- > Specialized in the area of self-sufficient nutrition and drinking water supply

Spectra Watermakers is A Katadyn Group brand

- > Spectra Watermakers: Pioneers in small-scale low-energy desalination
- > Purchased by the Katadyn Group Jan. 1, 2015 Company became Katadyn Desalination
- > Katadyn Desalination currently has 24 employees
- > Distribution and service worldwide
- > 19 US and 70+ distributors worldwide

Katadyn Group and Partners providing drinking water

Disaster Response Work

Bahamas 2019 – World Hope Intl.

Colombia 2020 - World Hope Intl.

Water Solutions For Disaster Response: Key Technology Needs

- > Mobility Ability to arrive in the disaster zone immediately after the event.
- > Ability to make drinking water from any water source including Seawater using any power source including Solar.
- > Technology solutions that can be operated with minimal training.
- > Solutions with a minimal environmental footprint.
- > Proper WASH sanitation protocols in place.

Aquifer Flight Ready 360 Solar Desal System:

Spectra Aquifer Watermaker – Disaster Response

- > Aquifer Watermaker 200-360 GPD
- > Makes water from any water source Purifies seawater, brackish or fresh water
- Makes water using any power source 120VAC, 220VAC, 24 DC, 12VDC, Solar
- Ready for use in 10 minutes
 Simple to operate minimal training
- > Portable, flight & Luggage Ready
- > Technology tested & proven in disasters
- > No plastic footprint or single-use plastics

Recent Aquifer Disaster Deployments

Venezuela, Displaced Persons Crisis

Colombia, lota

Turks & Caicos, Irma

NC, Florence

Bahamas, Dorian

LA, Laura

Saipan, Tinian

The Bahamas

Total litres of water distributed to settlements as reported to the BHS 3W WhoWhatWhere as of 25th September 2019 15:00 EDT

MA093 v2

To add your presence and activity please go to: http://bit.ly/BHSUsefullinks or use the QR code and follow link for BHS (3W WhoWhatWhere) The volume of water illustrated here represent only those deliveries reported to the link above. Please record your activity there (preferably in litres*) to better represent the total			Settlement Green Turtle Cay Treasure Cay Dundas Town Fox Town Cooper's Town Freeport City West End Smith Point Hope Town Grand Cay Cedar Harbour	Litres of water delivered 26,500 25,162 25,000 20,144 14,479 12,544 9,500 1,292 576 168 144
	diana cay			
Gra	nd Cay			
16	8 LITRES			
West Grand Bahama 9,500 LITRES Freeport City City of Freeport 13,836 LITRE	East Grand Bahama	Fox Town North Abaco 34,767 L Cedar Harbour	ITRES	Town 076 RES Dundas Town Hope Town
			50.162	LITRES
Top 5 Agencies Delivering Wa	ter	Moore's Island	13.2-	- 5°
		A.		
Organization Litre:	s delivered			
World Hope International	56,800			
Samaritan's Purse	48,773	A.		
UKAid	21,800		South	
Mercy Corps	4,336		Abaco	
Water Missions International	3,800		Contraction of the second	
1				

A Viable Alternative to Single Use Plastics

> Air shipping costs for a single pallet of single use plastic bottles compares equally to the cost of a single Aquifer Flight Ready 360.

Prepositioned Aquifers = Disaster Resilience

World Hope International Preposition in St. Petersburg, Florida.

Flight Bridge Partner:
 SOL Relief Hanger

Disaster Response Teams in Disasters:

Aquifer Capabilities

Training local residents on Aquifer Use - Colombia

Water Relief after Hurricane Dorian: Gratitude!

Communities we serve

OUTDOOR	✓ MARINE	TACTICAL	EMERGENCY PREPAREDNESS RELIEF	₩ HUMANITARIAN AID	
 Adventure & Sports Caravaning Travel Health Hunting & Fishing 	 Sailboats Powerboats Survival at Sea Commercial Boats 	 Hydration Solutions Nutrition Solutions Cooking Solutions COTS Private Use 	 Disaster Relief First Responders Survival Kits for Liferafts Emergency Stock 	 WASH Camps WASH Villages & Schools WASH HWTS & Storage WASH Remote & Off Grid Communities 	 Food Co-Packing Plastic Injection Molding Desalination Infrastructure Industrial Water Treatment Product Development

Spectra Watermakers. Making fresh water worldwide.

WHAT CAN BE DONE...

(4) Containerized Desalination

- Sustainable for Long term
- Bigger serving capacity
- Remote/Less Accessible Area
- Self-powered (Solar Panel)

GUEST SPEAKER PROFILE

Benjamin Materna (Mr.) VP of Deployment GivePower Foundations

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www.GivePower.org

givepower

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BENJAMIN MATERNA

VP of Deployment, GivePower

- Over **16 years of experience** in Solar/ Microgrid Deployment
- Managed Tesla's Microgrid, Executive's Special Projects, and Disaster Relief Deployment Teams
- Leads Project Execution of Solar Water Farms at GivePower, including Engineering, Project Management, Site Development, and Contractor Network

GIVEPOWER AREAS OF FOCUS

Our mission is to electrify the world with clean energy, and provide greater health, economic and educational opportunities to developing regions that need it most.

TREKS

Deliver once-in-a-lifetime, team-building experiences building clean energy projects in remote villages

SOLAR WATER FARMS

Create sustainable access to clean water in water-scarce regions around the world

SOLAR IMPACT PROJECTS

Provide clean energy solutions to developing regions that need them most

3

2014 THRU END OF 2021

OUR FORECASTED IMPACT

POWERED OVER 2,514 schools

INSTALLED 34 microgrids

OPERATING 7 Solar Water Farms daily

PROJECTS IN 25 different countries

CHANGED THE LIVES OF **710,000+ people**

CANADA GREAT BEAR RAINFOREST SOLAR SYSTEM Coming Oct. 2021 HAITI EARTHQUAKE RELIEF EFFORTS August 2021 Ongoing

DRC GARAMBA NATIONAL PARK AND PEACE SCHOOL WITH GOOGLE Completed June 2021

15 SCHOOL SYSTEMS Coming Nov. 2021

> MYANMAR MICRO-GRID KAN BIN VILLAGE Completed Mar 2020

COLOMBIA MAMARONGO CONSERVATION SYSTEM Coming Sept. 2021

KENYA BAMBURI SOLAR WATER FARM MAX Completed June 2021

THE TECHNOLOGY

GIVEPOWER SOLAR WATER FARMS

MAX	
OUTPUT	70,000 liters of water / day
IMPACT	Provides access to clean water for up to 35,000 people / day
SOURCE	Seawater
APPLICATION	Larger/ permanent community supply

SOLAR V VATER FARM M

MOBI & MOBI +

OUTPUT	6,000 and 15,000 liters / day Provides access to clean water for up to 3,000 or 7,500 people / day		
IMPACT			
SOURCE	Seawater or brackish water		
APPLICATION	Rapid deployment/ mobile optional		

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Disaster Relief Case Study HAITI

PREPOSITIONED ASSET Solar Water Farm (Max System)

BUILT Feb 2020

- Supporting the community of Anseà-Galet, La Gonâve, Haiti
- Local Staff of 12
- Virtually no damage from earthquake
- Making approximately 65,000 liters / day
- ~8,000 liters of which in surplus to support DR efforts to mainland

Pictured: Solar Water Farm Max, La Gonâve, Haiti

HAITI EMERGENCY RELIEF - AUG. 14 TO SEPT. 5

300,151 LITERS 79.291 GALLONS

of clean water from GivePower's Solar Water Farm Max on La Gonâve has been supplied since the earthquake on Aug. 14 thru Sept. 5. Distribution of ~30k liters per day through Sept. 5 funded by World Hope.

PARTNER ORGS

working across the hard-hit areas of Haiti

4 PORTS

Miragoâne, Pestle, Jeremie, & Petit-Trou-de-Nippes

4 HOSPITALS & HEALTHCARE FACILITIES

HAITI EMERGENCY RELIEF - AUG. 14 TO SEPT. 5

Determine sources of relief distribution effort and still serve local community

Deliver water to local port via tens of thousands of 2.5 gallon bags and bulk distribution in 1000+ gallon tanks

Water transport to mainland

RESPONSE STAGES

KEY TAKEAWAYS FROM HAITI RELIEF EFFORTS

EMERGENCY RESPONSE (0 – 3 WEEKS)

EXISTING ASSET

Solar Water Farm continue to serve community and add value to relief effort

KEY PARTNERSHIPS

Quickly establish core competencies for each partner for rapid deployment

EARLY RECOVERY PLAN (3 WEEKS - 6 MONTHS) REFINING THE NEED

Identify relief beneficiaries and connect with new partners Create distribution efficiencies and pricing / cost structures

COMMUNICATION EFFORTS

Share the story, provide impact numbers, secure funding to sustain effort

MID - LONG TERM DEVELOPMENT (6 MONTHS AND BEYOND) PREPARE FOR FUTURE

Assess plans for future deployments in region

LEARNINGS AND FINDINGS

Establish improvements of design and implementation, integrate protocols for future disasters and continue to serve the community

CONCLUSION

Preparation instead of Response

Mobility instead of fixed installations

Prepare for different location

Long term instead of during the support period only