ETC VIRTUAL PLENARY MEETING

Day 3 – 11 June 2020

TECHNOLOGY SOLUTIONS FOR A CHANGING HUMANITARIAN LANDSCAPE.

etc

WFP World Food Programme

ETC PLENARY MEETING - JUNE 2020

Partner updates and solutions

Facilitator: Omar Namaoui

TECHNOLOGY SOLUTIONS FOR A CHANGING HUMANITARIAN LANDSCAPE.

WFP World Food Programme

ETC voice and data solution evolution

Lars Ruediger - Ericsson Response

Gilles Hoffmann - emergency.lu

- Ericsson Response 2019/2020
- emergency.lu 2019/2020
- Current ETC voice and data solution
- ER: Improvement areas and HW evolution
- ER: Cyber security
- ER: Linking solutions
- e.lu: beyond 2020
- Conclusions and way forward

Ericsson Response 2019/2020

Deployments 2019: Mozambique (12), Colombia (4), Bangladesh (9), Bahamas (2)
Deployments 2020: Rome ETC HQ – COVID-19 project "Remote deployment" (1)
Active System in the field: Bangladesh (Ukhiya Hub, Teknaf), CAR (Batangafo)

Staff Members

Function	Name
Head of Ericsson Response	Heather Johnsson
Program Director	Lars Ruediger
Technical Expert	LP Svensson
Technical Expert	Mike Duffin

Volunteer Roster

Key	Number
Total Number of Volunteers	144
Countries	32
Languages	33
Emergency Responses	22
Cities	51

Key Points:
- In 2019 Ericsson Response was able to add one permanent staff member to the program
- In 2020 Ericsson Response is turning 20 years

Emergency.lu 2019/2020

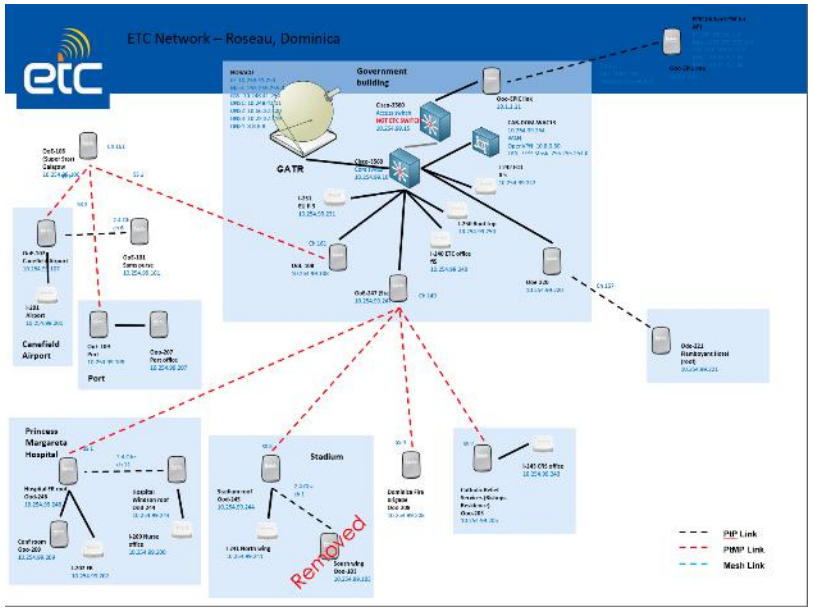
Key Staff Members

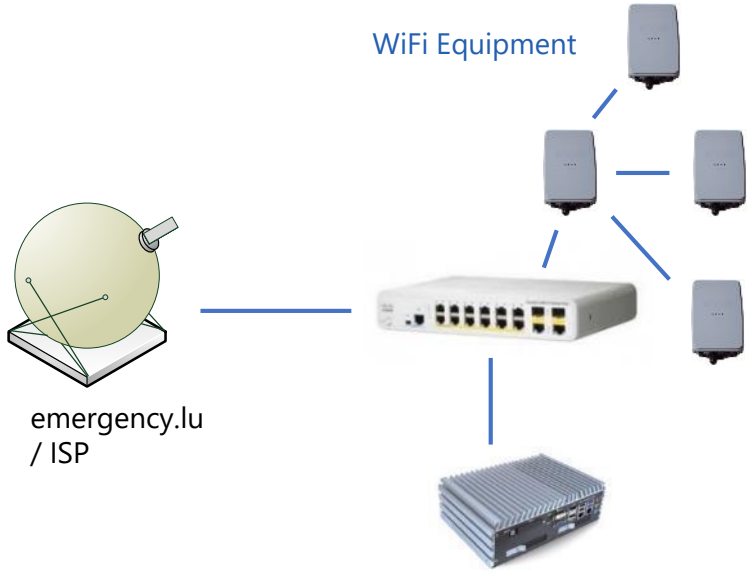
Function	Name
e.lu coordinator (MFEA)	Gilles Hoffmann
e.lu operations (MFEA)	Bram Krieps
e.lu technology (MFEA)	Roland Nurenberg
e.lu private partners PM (HITEC)	Sylvain Origer

Mozambique 2019 Nigeria 2017 (ongoing) CAR 2018 (ongoing)	JPO to the global ETC team Support of global activities CDEMA preparedness
Mozambique 2019 Bahamas 2019	Part of the European Civil Protection pool since 2019
Niger 2017 (ongoing) Chad 2018 (ongoing) Venezuela 2019 (ongoing)	Collaboration with RETS and UNHCR connecting refugees
Venezuela 2019 (ongoing)	

Current Components

- Access control server
  - Fanless -40-+60 Deg C
  - Cisco 3560 16 port PoE switch
- WiFi Equipment
  - Access points and/or links inparallel
  - Various antennas
    - Internal omni , internal directional
    - External omni, external directional
  - Dual band 2.4 and 5GHz (in parallel)
  - Linking: "Point-to-point", "point-to-multipoint", "mesh"





Independent deployment of components

- Access control and WiFi - **Mozambique**
- Access control and different Wifi – **Bangladesh**
- WiFi and different access control - **Colombia**

Wider Access Controller

WiFi Equipment

Switch

Access Control

- **Control and manage bandwidth distribution on limited uplinks**
  - Done with traffic profiles
  - Limit rate, time and/or total data

- **Controls access and prevent unauthorized access**
  - Supported registration options (can be selected by admin)
    - *Free internet* without registration
    - *Voucher system* to grant timely limited access without registration
    - *HumanitarianID* (users managed by OCHA humanitarianID)
    - *Self-registration* with 24h limited speed till verification of identity through ICT officer or well-known organizations via email. After verification full access.
    - *Portals* like Facebook, twitter, etc.. using can be integrated but are not currently in use. It would require a registration of the access controller with the respective portal. (usage could be a security concern and is not recommended)

    - *Single Sign On (SSO)* via Microsoft Active Directory (Office 365)
      - Supported for users from WFP, UNHCR, WHO, IOM, UNFPA and Ericsson
      - Less userdata stored (e.g. no password) less data protection concerns (**GPDR**)

The SSO implementation was joinedly done in a cooperation of ETC HQ, WFP IT, Humanitarian Booking Tool and Ericsson Response

Improvement areas

First wave equipment

- 2 access controller
- Personal luggage + PPE
- WiFi Equipment for initial deployment

Smaller packaging will result in more equipment being hand-carried

User traffic management

- Increased demand on bandwidth through video on demand, etc

The VSAT capacity is never enough

Hotspots

- User registration for ETC network access
- User support
- SSO was included after Mozambique

Additional access mechanisms and dedicated desktop support will result in more man-power on installation work

WIDER HW evolution

Features

- Quad Core Intel Atom® x7-E3950 SoC (Apollo Lake-I) supports lower power consumption
- Fanless, -40°C to 75°C Operating Temperature
- Supports HDMI & VGA Dual Display, up to 4K resolution
- DDR3L 1866MHz memory supports up to 8GB
- 2 GigE LAN support IEEE 1588 (PTP)
- 2 Isolated COM RS-232/422/485
- 6 USB, 1 SIM Socket
- 2 Mini PCIe, 1 SATA III
- SIM Socket for WiFi/4G/3G/LTE/GPRS/UMTS
- 12V DC Power Input
- TPM 2.0 supported

Improvements

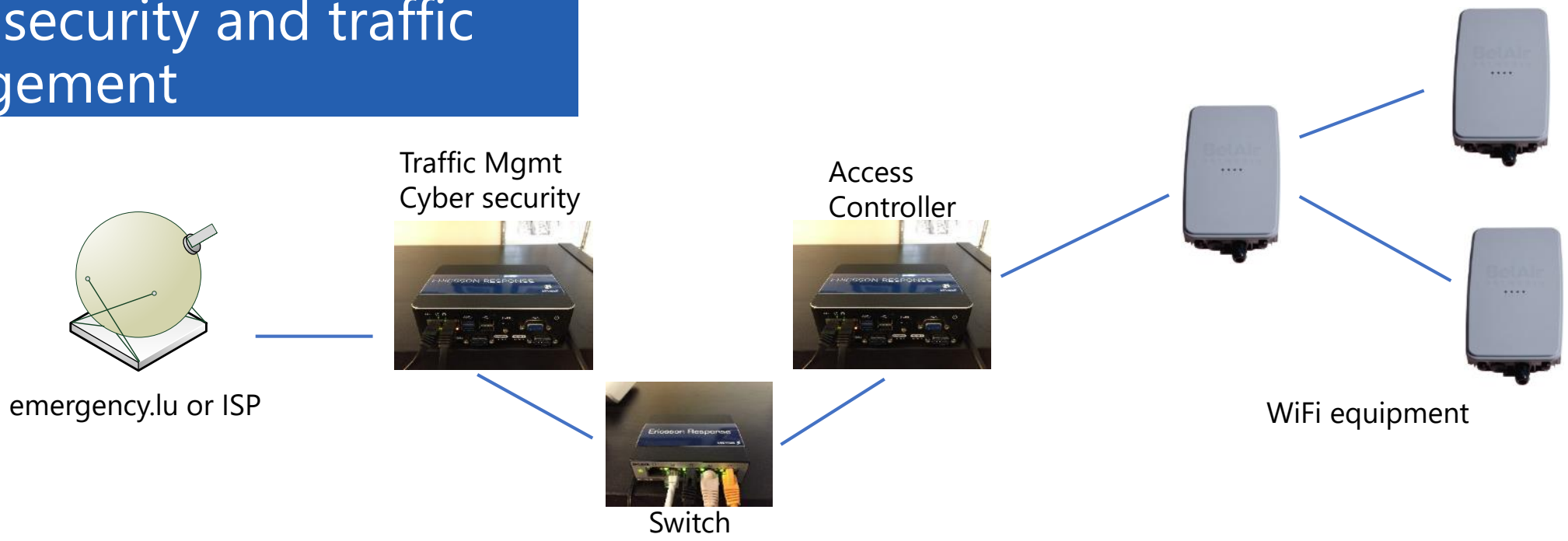
- Increase capacity
- Smaller unit and hence packaging
- Use as Cyber Security Server and/or Access Controller (WAC)
- 12V to be powered by battery and solar

Features

•5 x 10/100/1000BASE-T Ports
•Powered by IEEE 802.3af/at PoE through Port 5
•Supports PoE Pass-Through (Ports 1 and 2 Only)
•Compact design for convenient placement
•Fan less design for silent operation to 50 deg C
•Innovative D-Link Green energy saving features
•Complete web interface for comprehensive switch management

Different similar switches are under investigation right now

Cyber security and traffic management



- **Traffic management**
  - More control of amount of bandwidth used by traffic flows (WhatsApp, office, Gmail)
  - Deep packet inspection to block traffic (BitTorrent, Netflix, YouTube)
  - 250 services in categories including things like file sharing (BitTorrent), cloud (one drive, dropbox), chat (WhatsApp), VOIP, video, email, software updates, etc.

- **Cybersecurity**
  - Prevent client access to websites by preventing DNS address resolution
  - Prevent client access to dangerous web sites
  - Block suspicious inline activity on behalf of clients

- **Different configuration supported for different client networks**
  - ETC clients and affected populations have different policies

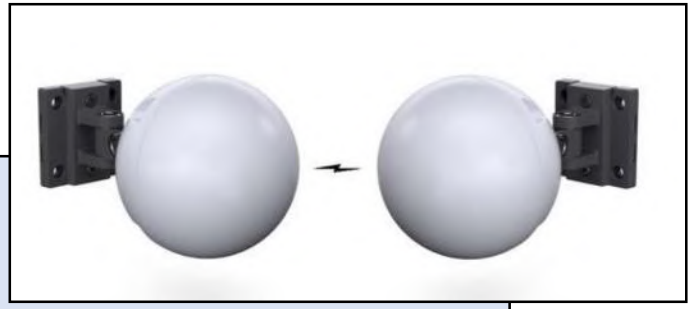
The system is ready to be deployed in the next emergency

ETC cyber security taskforce is established and other solutions or requirements might arise

Linking solutions

New VSAT solutions with higher bandwidth or available ISP connections make high throughput-links very useful

Various products in licensed and unlicensed provide throughputs upto 10Gbps



MiniLink 6351

- Band
  - License-free 60GHz
- Throughput
  - 1Gbps
- Range
  - 3-4 Km
- One Ethernet port with Power over Ethernet for power supply and if more Ethernet ports are needed

emergency.lu beyond 2020

Looking back

- Haiti EQ 2010
- First emergency.lu PPP contract signed in March 2011
- First MoU on emergency.lu between Luxembourg and WFP signed in September 2011
- First mission in South Sudan, January 2012
- Second emergency.lu PPP contract signed in December 2014
- External evaluation of the program in 2016
- Coalition agreement 2018 – 2023

From

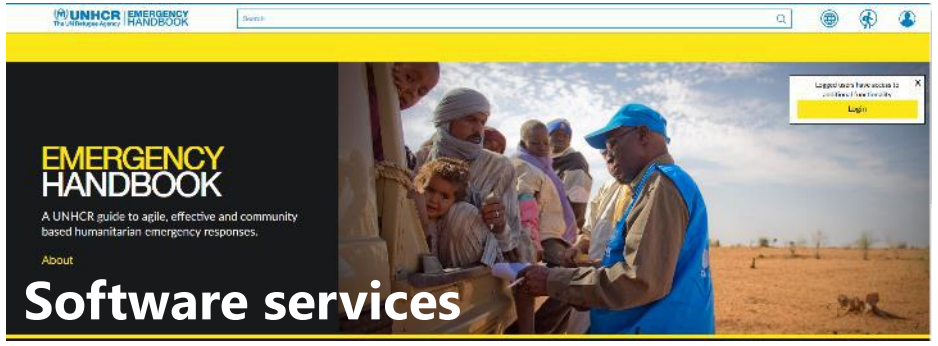
An end-to-end mobile satellite based communication solution

To

Luxembourg's in-kind operational response capacity to disaster situations and Humanitarian crisis

emergency.lu beyond 2020

emergency.lu



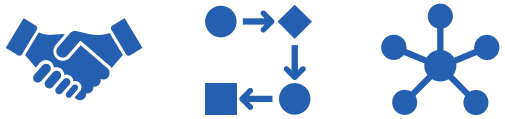
emergency.lu beyond 2020

- C and Ku band capacity, O3b as an option
- Pre-booked and flexible capacity allocation to missions
- Existing equipment to be used with C and KU band
- New quick deployable 1.2 m antenna for Ku band
- Small flat panel antennas (very portable solution, similar to BGANs)
- Power solution
- Central and “on field” hosting and computing
- AI and data analysis
- Cybersecurity
- Bandwidth management (central and on field)

Technology and infrastrutture

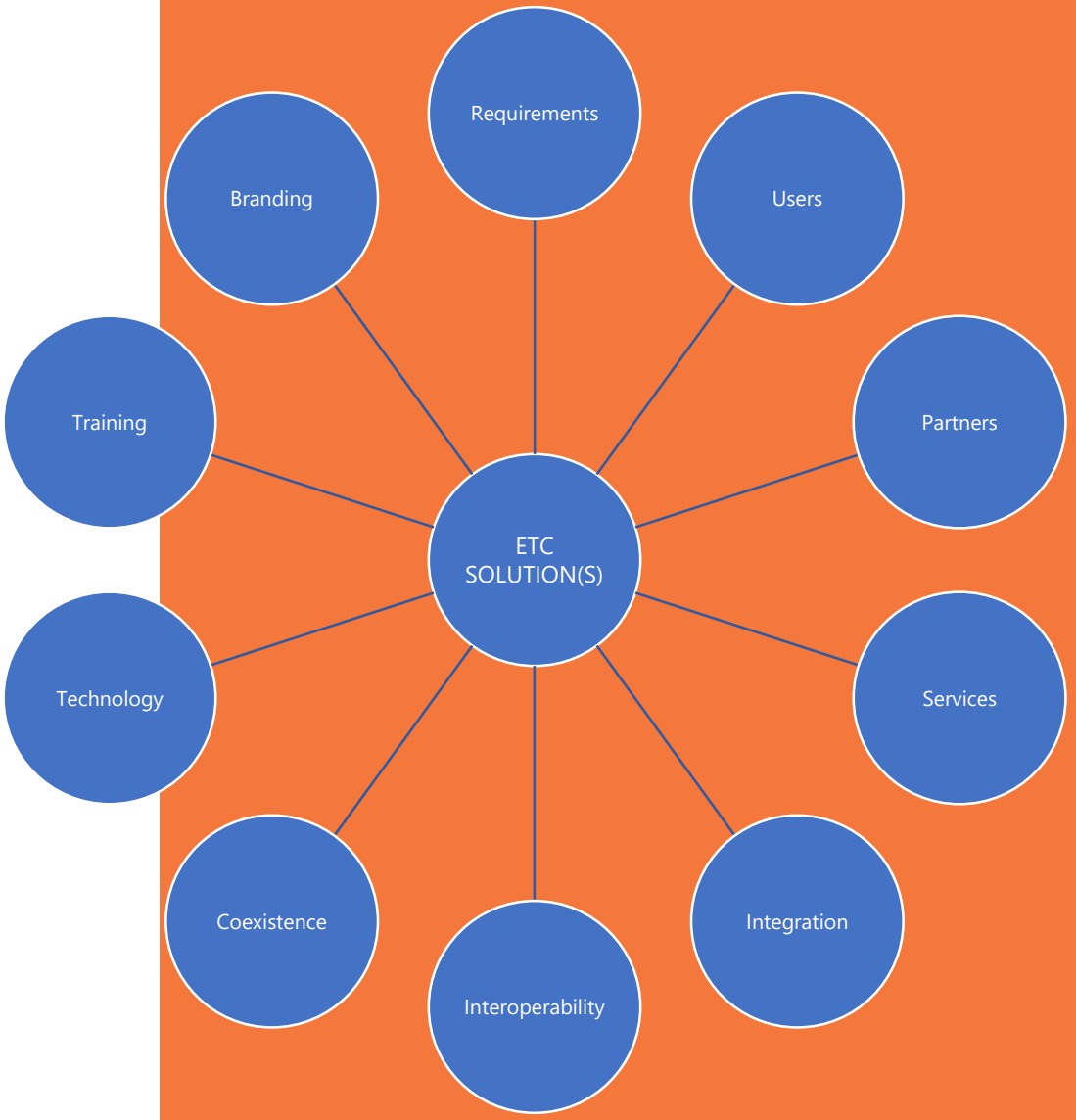
emergency.lu beyond 2020

- VAS for humanitarian / governmental users
  - Internet access
  - Telephony services
  - Storage and file sharing (local/central)
  - Welfare and moral services
  - Radio over IP
  - Image processing (AI)
  - Telemedicine (SatMed)
  - …
- VAS for affected population
  - Hotspot internet access with voucher management
  - Phone booth with voucher management
  - Multi channel broadcasting (SMS, WhatsApp etc.)
  - FM broadcasting
  - …



Value added Services

ETC voice and data solution evolution



Questions?

Disaster Connectivity Map

Paul Hamilton, ITU
Salma Farouque, WFP

CONTENTS

Disaster Connectivity Map

Supported by **ETC, ITU, WFP**

Serving **first responders**

Across **worldwide**

Timeline

2019 MARCH

Launch of DCM concept paper at ITU GET-19.

2019 JUNE

ETC launches DCM survey to ETC partners to collect feedback.

2019 AUG

First draft of DCM design report issued by ITU.

2019 NOV

Initial DCM prototype platform ready.

2020 JUNE

Presentation of DCM at ETC Plenary 2020.

Disaster Connectivity Map

Proof of concept:

Initiative presented and endorsed at ITU Global Forum on Emergency Telecommunications (GET-19, Mauritius) to conduct a feasibility study and proof of concept for a Disaster Connectivity Map that can provide information on the type, level and quality of connectivity that is available on the ground following disasters.

Problem:

How to show on a map something that is not there; how to detect complete or partial decreases in the level and quality of connectivity in disaster situations compared to normal service.

Solution:

- Collect real-time connectivity measurements from probes, sensors, geolocated IP addresses, and other sources.
- Process and display this data as historic baseline and near real-time connectivity performance map.
- Highlight differentials in connectivity performance between baseline and current.

South Ridge tower, Telecom Fiji. Radio Communication Experience, Telecom Fiji Ltd. Mesake Tuinabua, Manager Network Operations, Telecom Fiji. September 2016

Disaster Connectivity Map

ETC Disaster Connectivity Map Survey

Results and main requirements...

- 11 survey responses received from ETC partners.

Respondents indicated that they want info on:

- Most affected zones.
- Existing connectivity services available by network (eg. 3G+ networks, satellite, fibre, microwave).
- Power availability and/or gaps.
- Mobile network coverage.
- Estimated number of affected population in need of connectivity and in which locations.
- Location of Mobile Network Operator towers.

Similar Initiatives

Network infrastructure and coverage:

- ITU Interactive Transmission Map
- TeleGeography Submarine Cable Map
- GSM Coverage, GSMA/ Collins Bartholomew
- OpenCelliD

Disaster response specific:

- Facebook Disaster Maps
- Google Crisis Map
- OpenSignal
- SamKnows Cell Audit

Global Internet monitoring maps:

- Akamai Real-Time Internet Monitor Map
- European Commission (EC) netBravo
- Internet Health Report
- Oracle Internet Intelligence Map
- RIPE NCC Atlas

Disaster Connectivity Map

Fiji: Cyclone Winston, Feb 2016

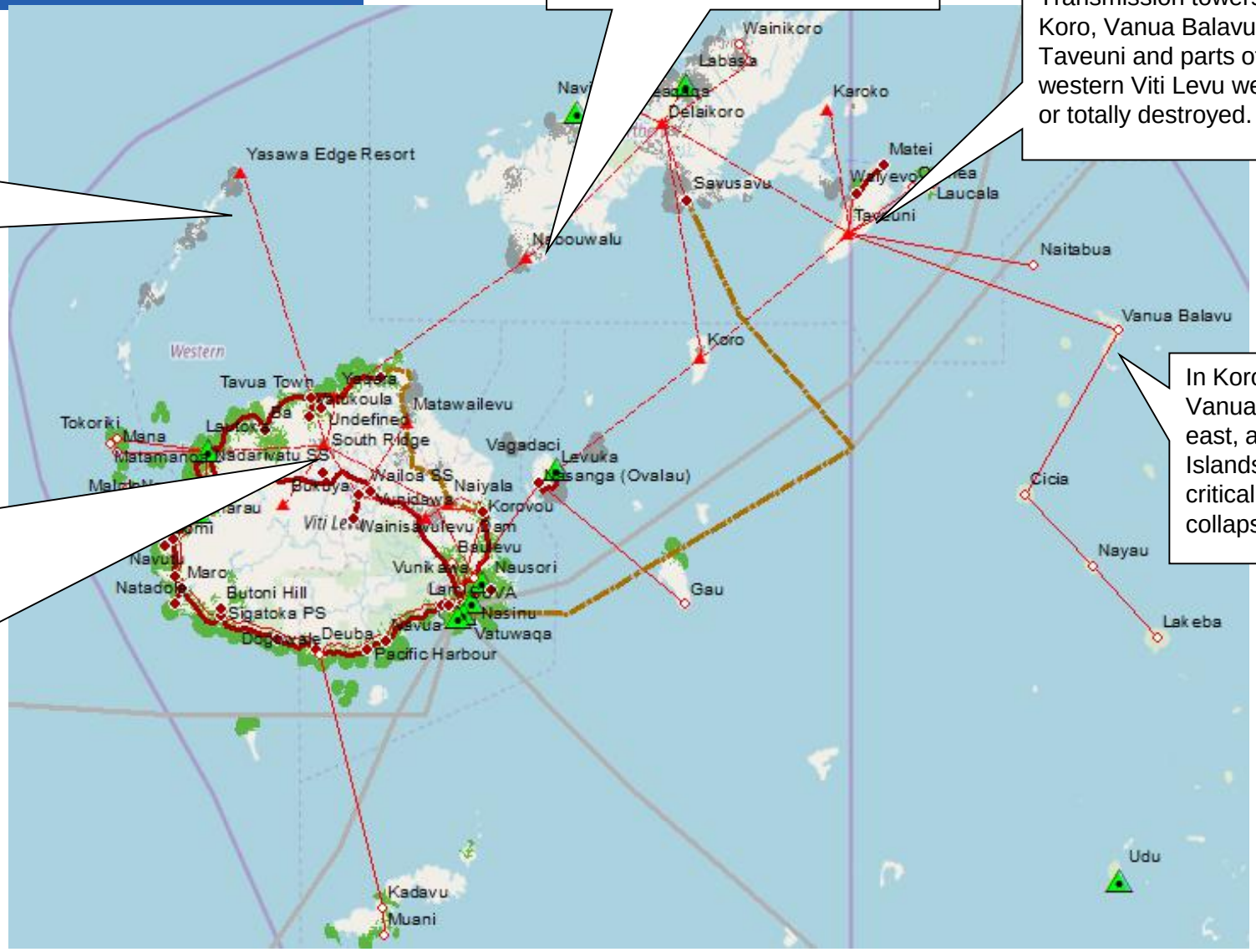
Cellular network coverage for the country was partially restored within a few days of the disaster, but about 30 to 50 % of sites are still operating on generators due to limited electricity supply.

TFL sustained massive infrastructure damage, mostly in the north of Viti Levu (particularly the towers and radios linking Suva to Rakiraki and Lautoka via the South Ridge).

TFL provided IP bandwidth from Vanua Levu to Viti Levu to other local operators during the post cyclone.

Transmission towers in Koro, Vanua Balavu, Taveuni and parts of western Viti Levu were partly or totally destroyed.

In Koro, Taveuni and Vanua Balavu in the east, and the Yasawa Islands in the west, critical link towers collapsed.



Source: Fiji Post-Disaster Needs Assessment: Tropical Cyclone Winston, 20 February 2016, Government of Fiji, May 2016. Radio Communication Experience, Telecom Fiji Ltd. Mesake Tuinabua, Manager Network Operations, Telecom Fiji. September 2016

Disaster Connectivity Map

Prototype

Near real-time, on-the-fly mapping of 3 pilot countries: Dominica, Fiji, Philippines (as well as Mauritius and Italy).

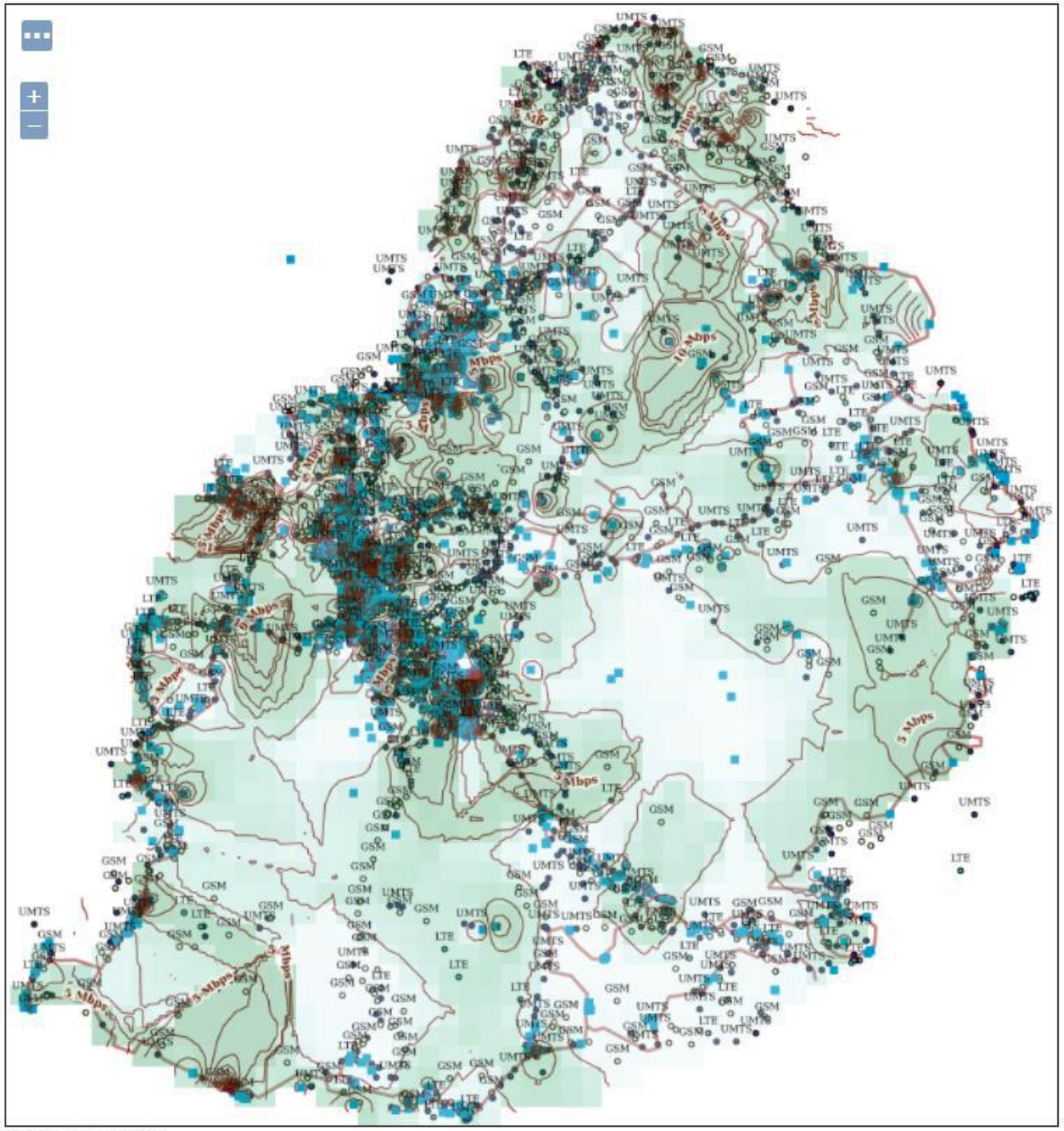
- Geoserver + WPS (Web Processing Service) extension
- PostgreSQL + PostGIS extension
- Web Map Service (WMS) output

Network infrastructure & coverage map layer

- Fibre & microwave transmission networks
- Submarine cables
- GSM coverage
- Cell sites

Connectivity performance map layer

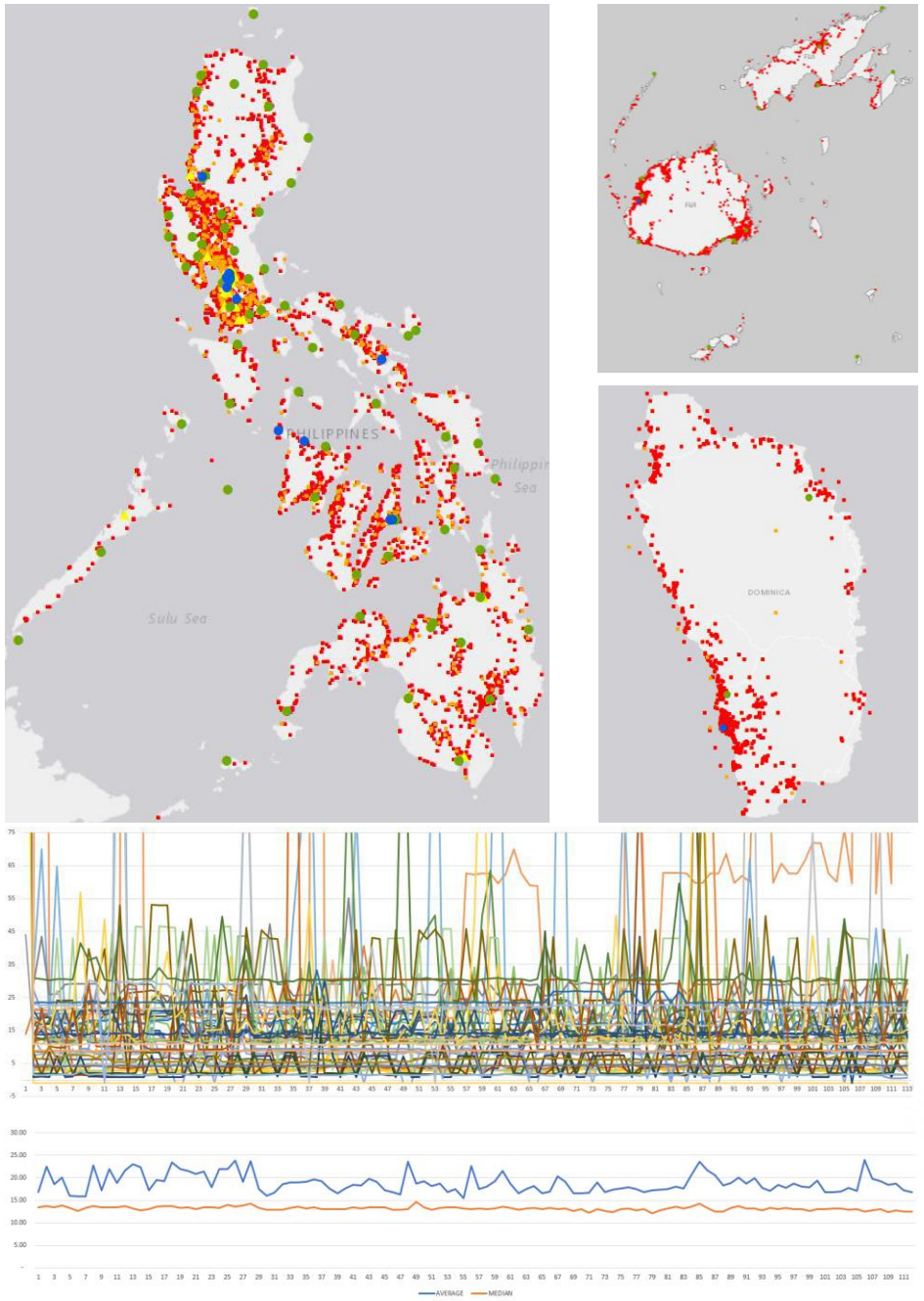
- Ping, reachability (yes/no)
- Latency, round trip time (Ms)
- Upload speed (Kbps)
- Download speed (Kbps)



Disaster Connectivity Map

Connectivity performance

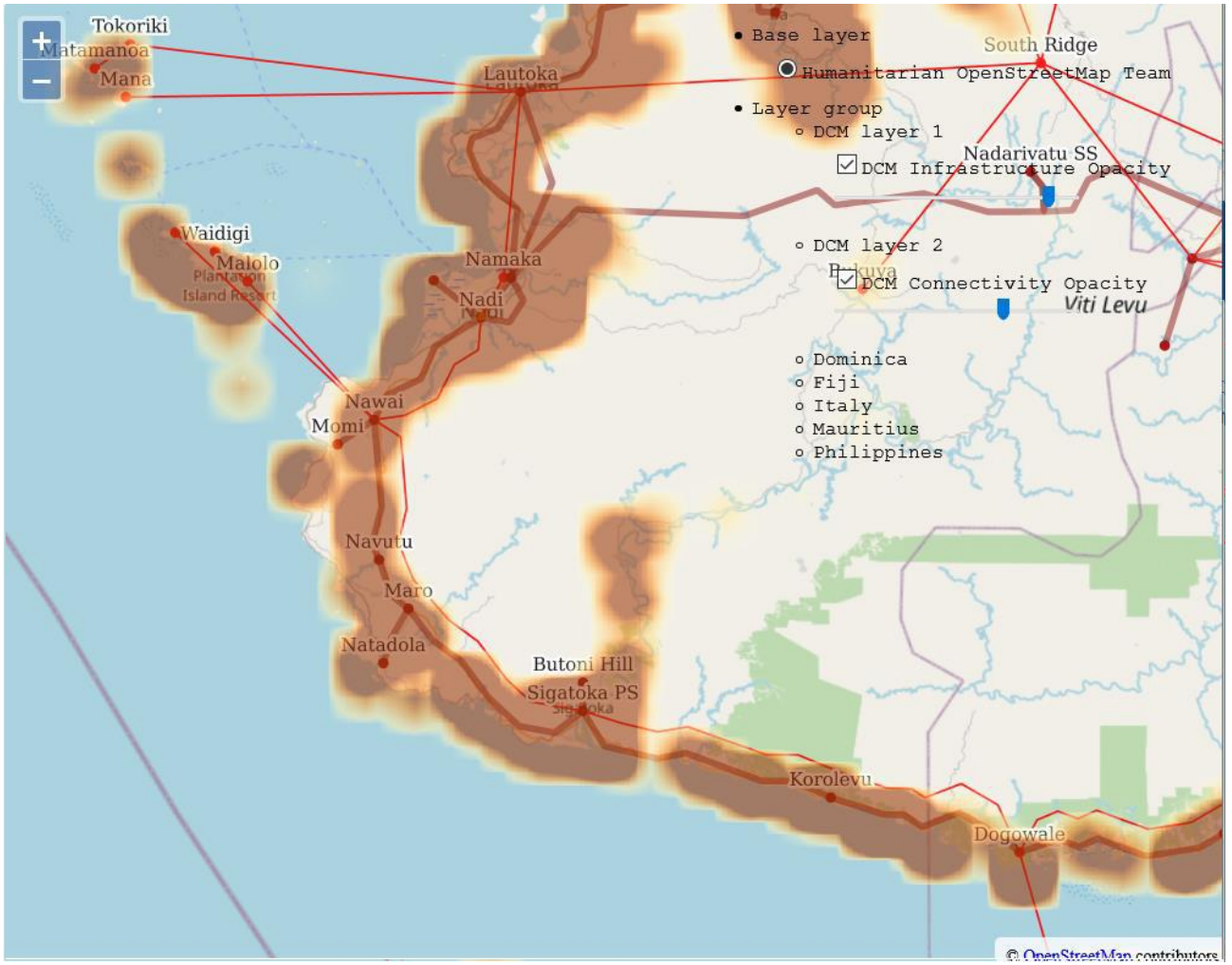
- Collect real-time connectivity measurements from probes, sensors and geolocated static IP addresses.
- Tested using two measurement platforms: RIPE Atlas (ping only) >11,000 hardware probes, Speedchecker API (ping, latency, upload and download speed) >200,000 software probes.
- Test results: 30,986 fixed and mobile Speedchecker datapoints for 3 pilot countries. 32,919 RIPE Atlas measurements from 311 RIPE probes in Italy taken every 3 hours for 2 weeks.
- Raw input data is processed in the PostGIS database, where it is aggregated by space and time.
- Data is then displayed as a connectivity performance map layer using heatmap, point grid or contour style appropriate to the indicator and scale.



Disaster Connectivity Map

Heatmap

This compares network infrastructure and coverage with an overlay heatmap of connectivity performance. Heatmap shows point density, weighted by the selected measurement.



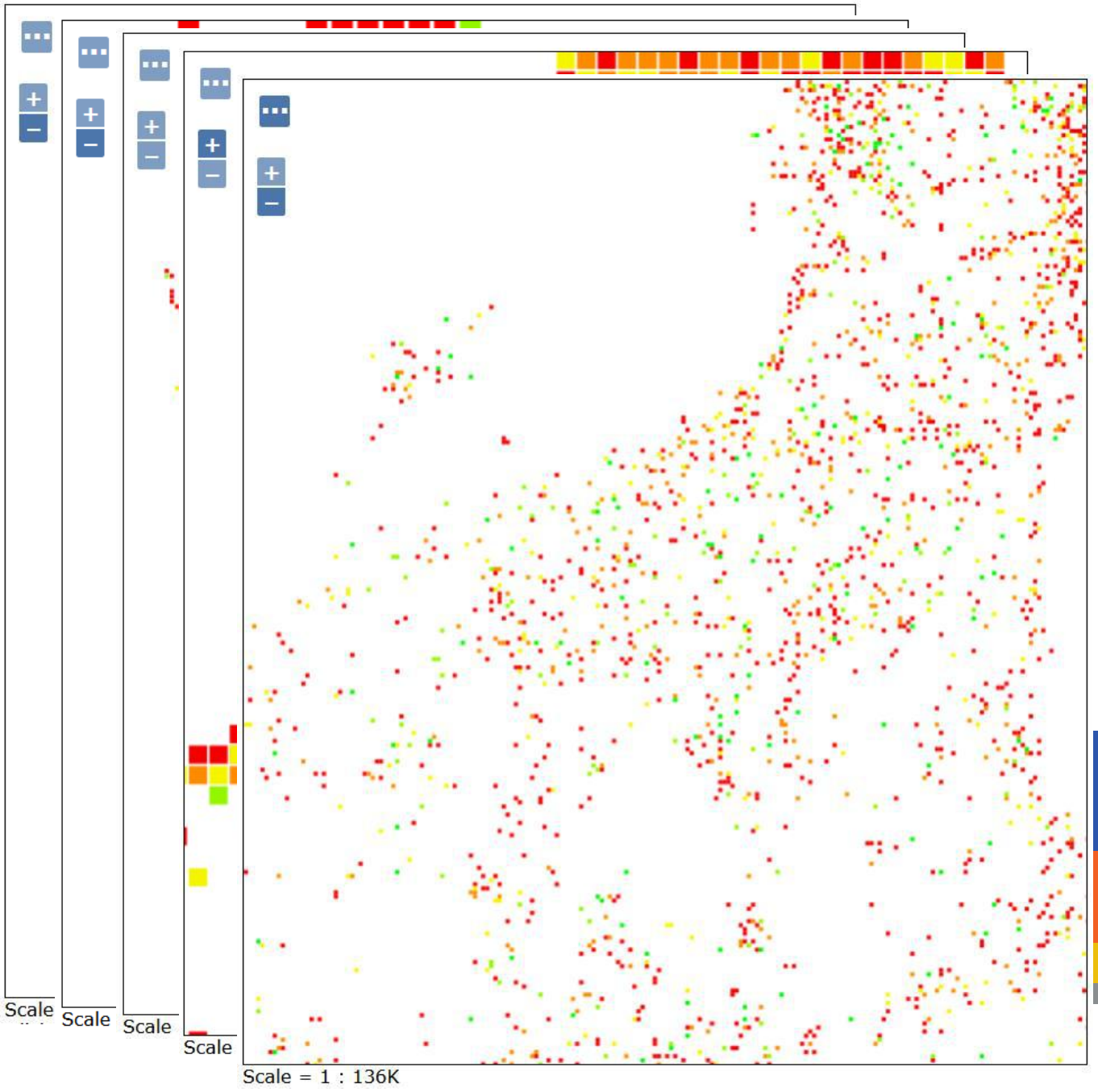
Disaster Connectivity Map

Point grid

Data is aggregated to a grid cell resolution that is appropriate to the scale it is displayed at in the current zoom level and extent of the map view.

For e.g. Philippines had 15,406 datapoints which shown at different resolutions:

- 100 sq.km grid = 69 cells
- 10 sq.km grid = 1,176 cells
- 1 sq.km grid = 6,102 cells
- 100 sq.m grid = 14,710 cells
- 10 sq.m grid = 14,889 cells

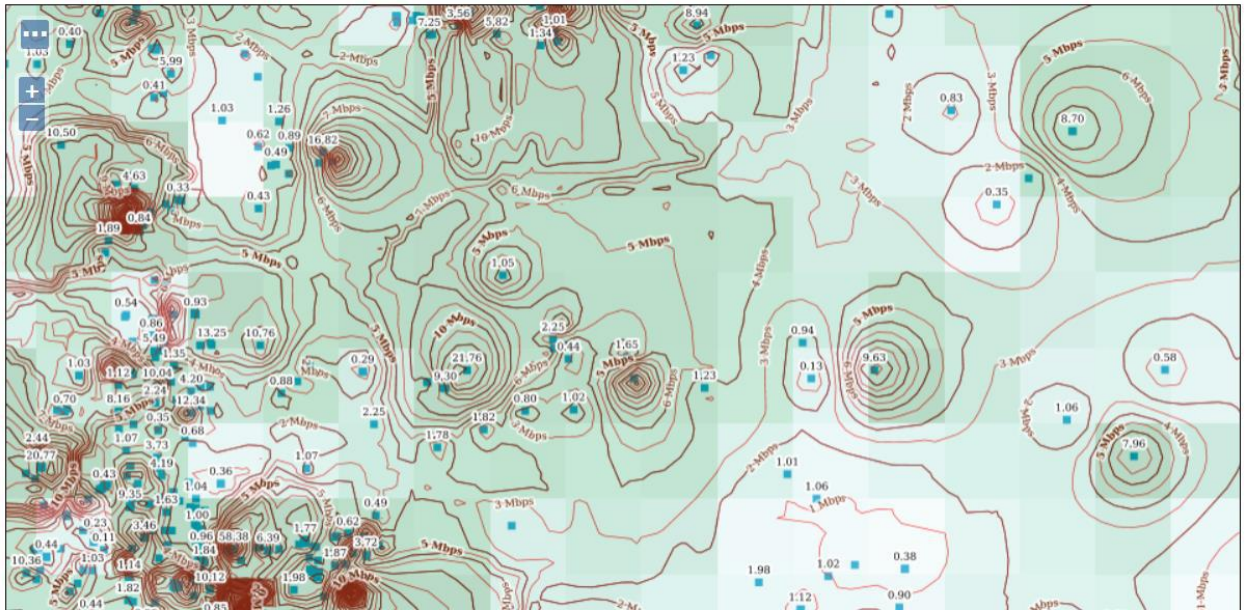


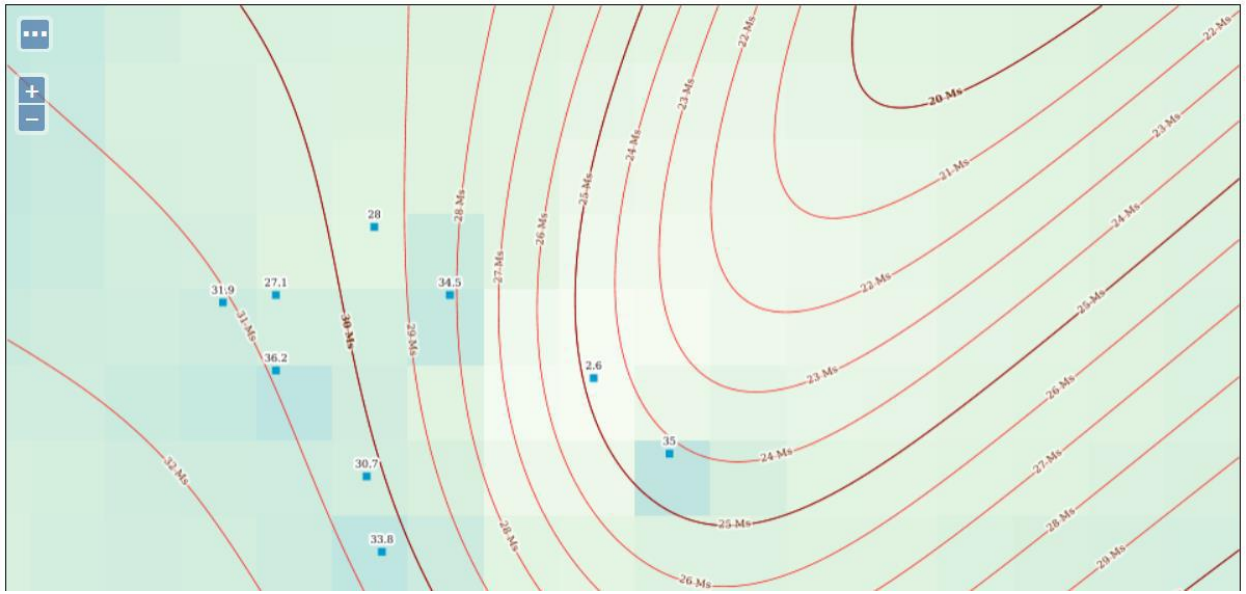
Disaster Connectivity Map

Contours

These isolines (contours) show lines of equal value by interpolating values between known points. Can be used for latency, download speed and upload speed.

- **Static baseline bandwidth contours:** The bandwidth contours can be generated from the historic dataset.
- **Dynamic bandwidth contours:** The bandwidth contours can also be generated on-the-fly by Geoserver from the input measurement datapoints. The contours change as the underlying datapoints change.

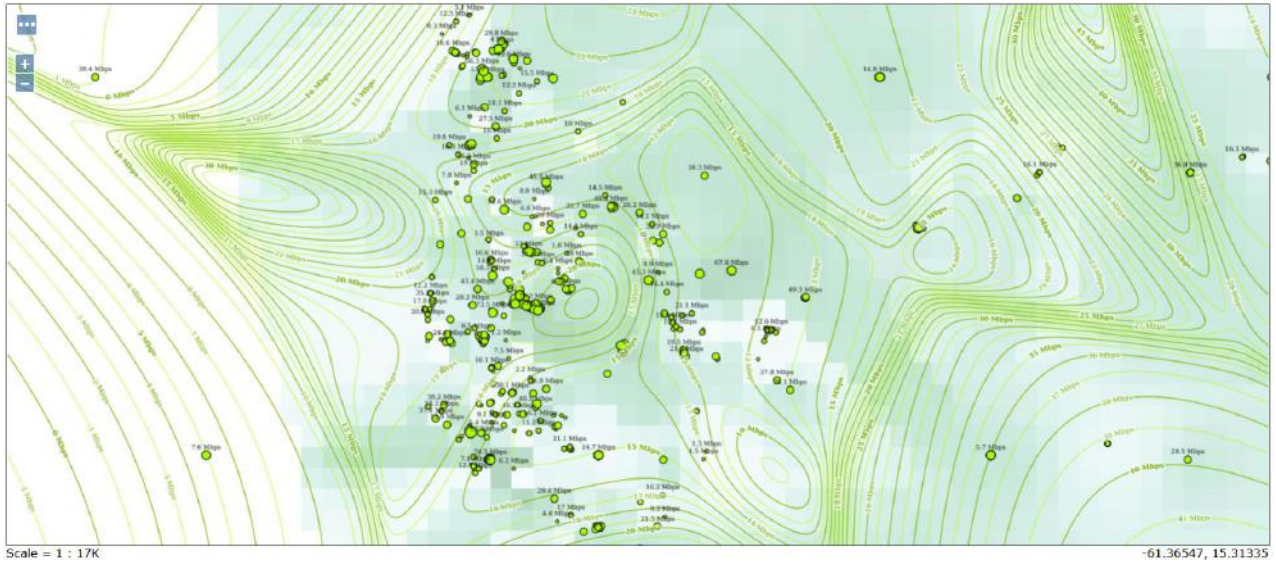


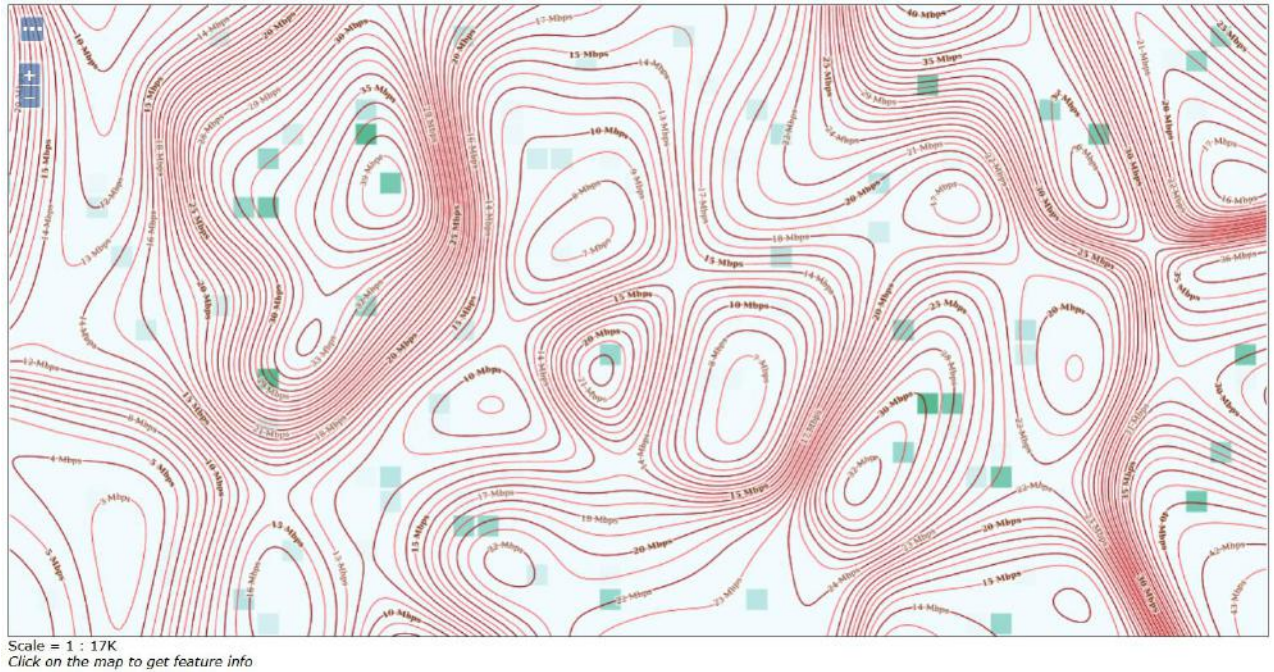


Disaster Connectivity Map

Conclusions

- The DCM proof of concept has identified input datasets and measurement platforms, and is working to overcome problems of lack of data, variability of data, and too much data.
- The prototype demonstrates that the Network Infrastructure and Coverage map service can be published using existing GIS datasets. This is basically the ITU Interactive Transmission Map + datasets from TeleGeography, GSMA/Collins Bartholomew, and OpenCelliD.
- The prototype also demonstrates that a Connectivity Performance map service can be produced, and a methodology has been developed to create and schedule measurements using RIPE Atlas and Speedchecker API, import the results into a spatial database, aggregate the raw input data to produce meaningful patterns, and to publish in near real-time.





Questions?

Disaster Connectivity Map Prototype

https://www.bandwidthmaps.com/dist_191016/

http://www.bandwidthmaps.com:8003/geoserver/web/

Delivering off-grid power

- Challenges in the field
- Senior leadership apathy
- Developing skills
- Response technologies
- Longer term sustainability

Mark Hawkins – Save the Children & NetHope Member

Field Challenges

- ☒ Poor safety
- ☒ Fire risk
- ☒ Lack of skills
- ☒ Unstable power supplies
- ☒ Poor quality components
- ☒ Fraud

- ☑ Improve skills
- ☑ Reduce consumption
- ☑ Switch to renewable energy
- ☑ Use better quality products
- ☑ Build in sustainability

Leadership apathy

- ☒ Energy is not our core business
- ☒ Somebody else will deal with it
- ☒ No budget
- ☒ No department to own this
- ☒ Perception that donors will not fund renewable energy
- ☒ We have more important tings to focus on.

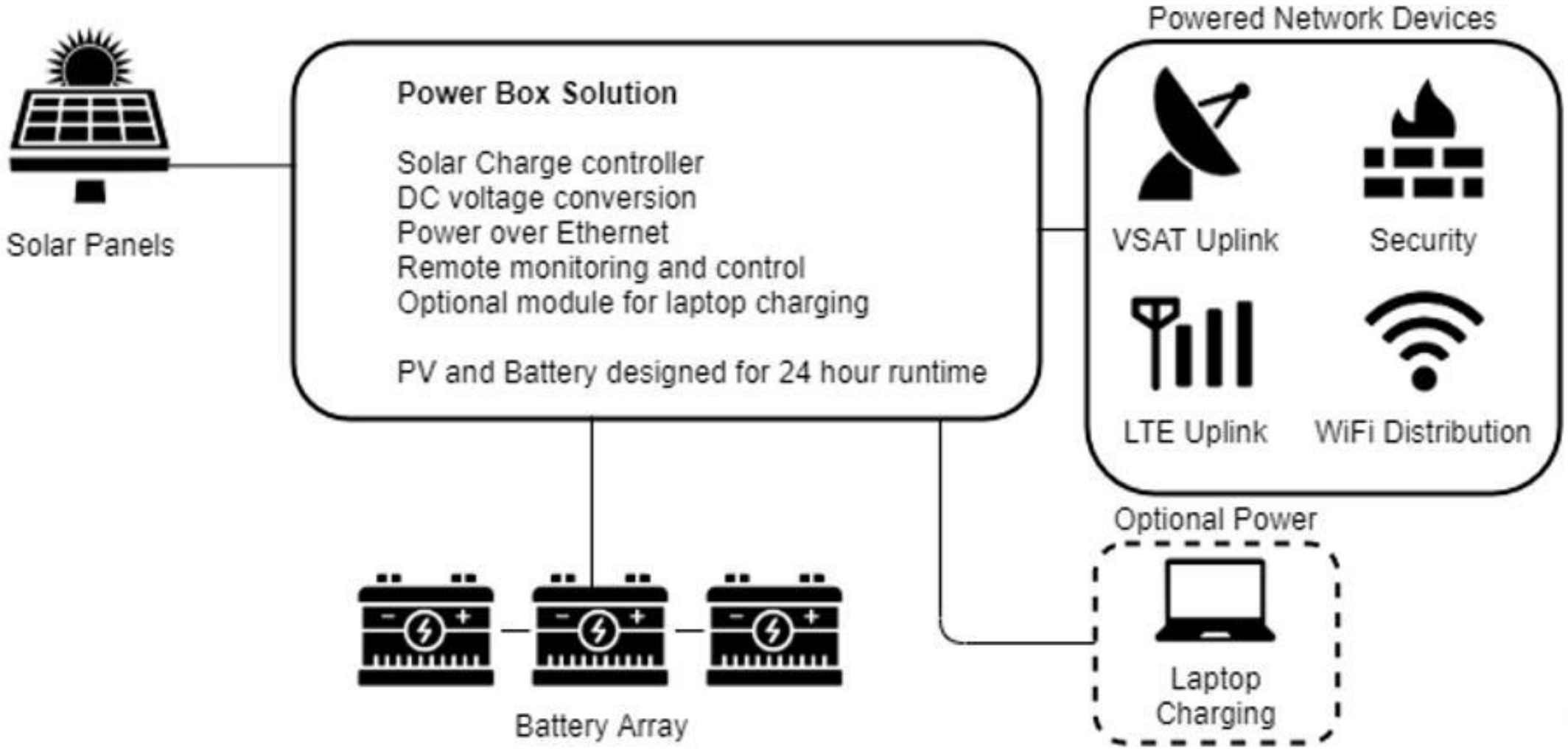
- ☑ Risk reduction
- ☑ Reduced carbon consumption
- ☑ Reduced costs

Capacity Building

- **UNDP Training – aimed at programme management**
- **Partners such as Schneider are delivering technician training in the global south.**
- **NetHope, UNICEF and Save the Children include electrical topics within their disaster response training programmes.**

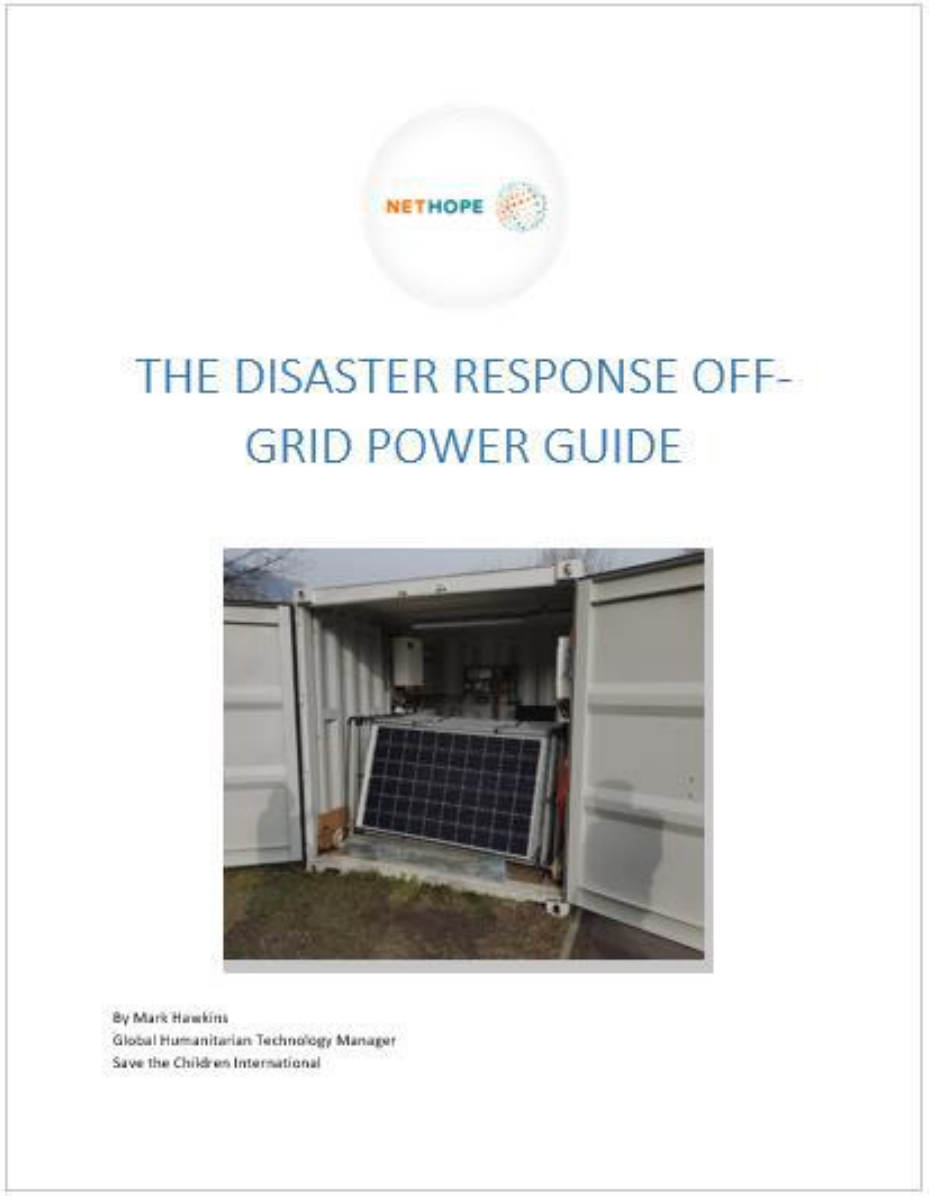
Solution example #1
Individual Responders

Solution example #2
NetHope – Schneider



Solution example #3
NetHope off-grid guide

- **Targeted at programme managers**
- **Quick response turnkey solutions**
- **Designing a solar system from local materials**
- **Procurement & fraud reduction**
- **Making systems last longer**



MSB sustainable power project

John Isaksson – MSB

- Why
- For whom
- How
- Findings
- Way forward

Why?

MSB delivering sustainable power!

- **To achieve the objective to have an efficient total life cycle system including price, function and environmental impact.**

- **We have to choose the right power solution, quality and design for the task.**

For whom

- **MSB and MSB partners**
- **Office construction**
- **Camp setup**
- **Rapid deployment emergency installations**

How?

A 100% project-assigned electrician in 2020 who will:

- **Follow up field trips to MSB installations**
- **Lead cooperation with partners**
- **Develop concept**
- **Test, purchase & make systems available !**

Findings!

- **Solar solutions needs to have a generator backup!**
- **Solar panels "industry standard" best price / W**
- **Solar panels Tarpulin best for flexible logistics**
  - **Ex: www.tarponsolar.nu**
- **Capacitor "battery" (life time efficiency, environmentally and transport friendly)**
  - **Ex: www.kilowattlabs.com**
- **Solar panel installations demand square meters not initially planned for → Prepare for flexible installations**

Forward !

- **Interested !?**
- **Please contact:**
- **Electrican Mr Linus Johansson !**
- **Linus.Johansson@mission.msb.se**

Questions?

ETC PLENARY MEETING - JUNE 2020

Emerging Humanitarian Trends and the role of Technology

Facilitator: Gianluca Bruni, WFP

TECHNOLOGY SOLUTIONS FOR A CHANGING HUMANITARIAN LANDSCAPE.

WFP World Food Programme

Humanitarian Trends

Objective

Examine Humanitarian Trends

Review future role of Technology

To

Initiate discussions on new Strategy

Task 1: Structure

Where is the (humanitarian) world going? - Presentations

How can Technology Help? – Exercise

Summary

2. Health & COVID, Karin

5. Digital, Anthony

3. Food Security (cluster), Cristina

4. People, Meghann

6. PS & Connectivity, Simon

1. Conflicts, Massoumeh

Community-based health care, including outreach and campaigns, in the context of the COVID-19 pandemic

Interim guidance
May 2020

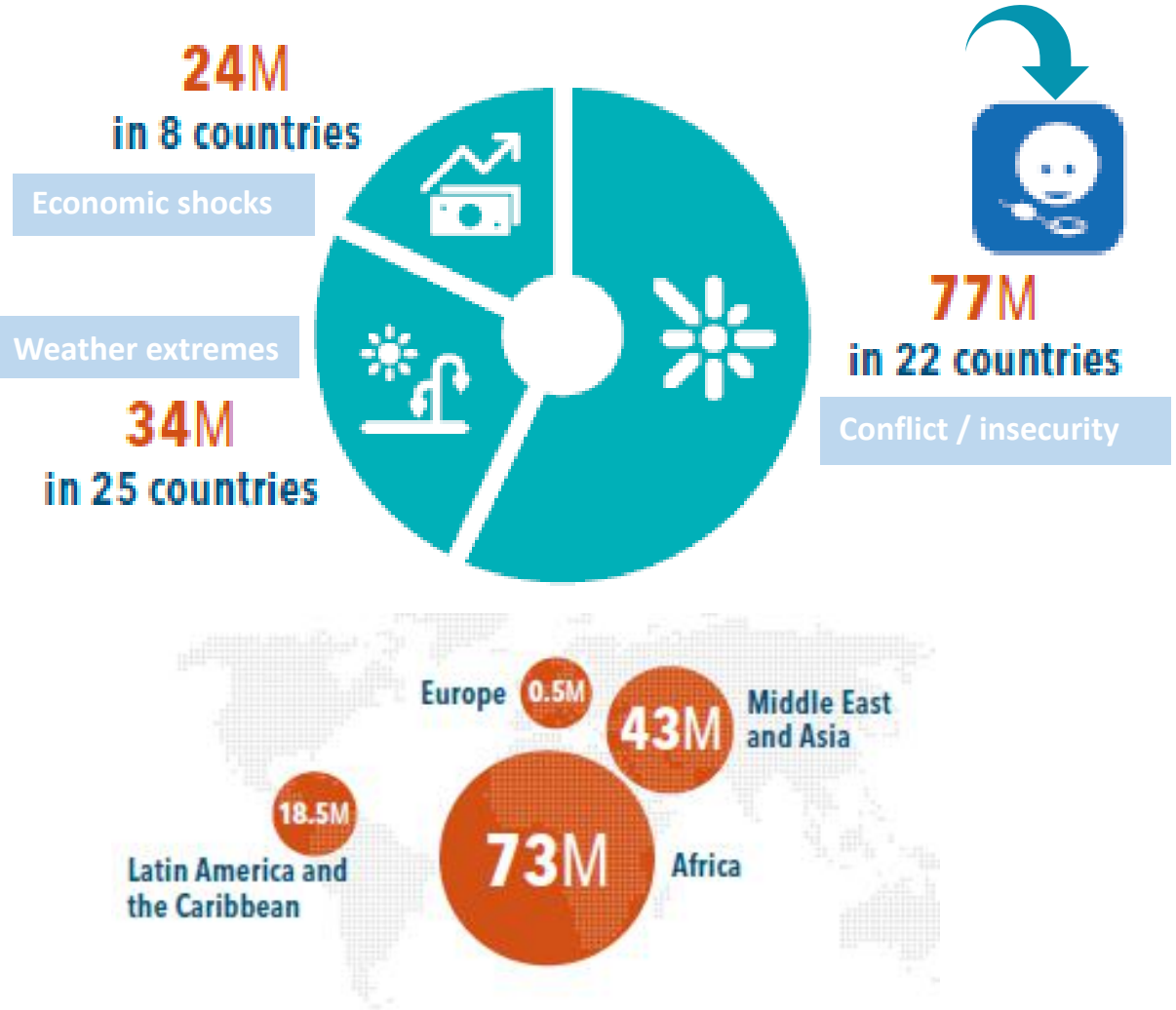
IFRC

World Health Organization

unicef
for every child

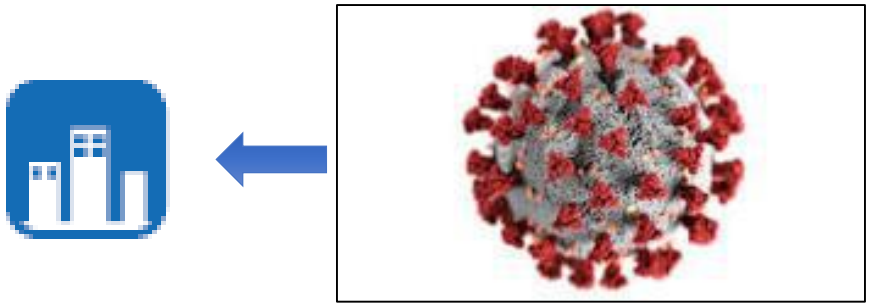
Key trends and changes in acute food insecurity

2019: 135M food-insecure people



2020 Outlook...

Timely & reliable data



... 183M people at risk of slipping into acute food insecurity

PEOPLE


JAN 2019
DIGITAL AROUND THE WORLD IN 2019
THE ESSENTIAL HEADLINE DATA YOU NEED TO UNDERSTAND GLOBAL MOBILE, INTERNET, AND SOCIAL MEDIA USE
TOTAL POPULATION
UNIQUE MOBILE USERS
INTERNET USERS
ACTIVE SOCIAL MEDIA USERS
MOBILE SOCIAL MEDIA USERS
we are social
we are social
7.676 BILLION
URBANISATION: 56%
5.112 BILLION
PENETRATION: 67%
4.388 BILLION
PENETRATION: 57%
3.484 BILLION
PENETRATION: 45%
3.256 BILLION
PENETRATION: 42%
7
SOURCES: POPULATION: UNITED NATIONS; U.S. CENSUS BUREAU. MOBILE: GSMA INTELLIGENCE. INTERNET: INTERNETWORLDSTATS; ITU; WORLD BANK; CIA WORLD FACTBOOK; EUROSTAT; LOCAL GOVERNMENT BODIES AND REGULATORY AUTHORITIES; MIDEASTMEDIA.ORG; REPORTS IN REPUTABLE MEDIA. SOCIAL MEDIA: PLATFORMS' SELF-SERVE ADVERTISING TOOLS; PRESS RELEASES AND INVESTOR EARNINGS ANNOUNCEMENTS; ARAB SOCIAL MEDIA REPORT; TECHRASA; NIKI AGHAEI; ROSE.RU. (ALL LATEST AVAILABLE DATA IN JANUARY 2019).
Hootsuite
we are social

2. Health & COVID, Karin

5. Digital, Anthony

3. Food Security (cluster), Cristina

4. People, Meghann

6. PS & Connectivity, Simon

1. Conflicts, Massoumeh

2nd Session – Exercise – 25min

GROUP	Topic	FACILITATORS	RAPPORTEURS
1	Connectivity	Facilitator: Simon / GVF	Isaac Kwamy, GSMA
2	Digital	Facilitator: Anthony / WVI	Alexander Thomas, UNHCR
3	Technology for Affected Populations	Facilitator: John / HCR	Joelle Khunn, ICRC
4	Support to the safety and security of humanitarian staff	Facilitator: Jalal / ETC	David Meltzer, GVF
5	Support to Health Crisis	Facilitator: Hani / UNICEF	Clement Bruguera, TSF
6	The 'new normal' in the field and conflicts	Facilitator: Joe / US SD	Brent Carbno, NetHope

Before we dive in…

Variables

Uncertainty

Open-minded

Strategic

High-level

Fast

Summary

Wrap up & Closure

Enrica Porcari, Chair of the ETC