Vanuatu: APT EBC-J3 Project for Public Safety

Project:

Full Time Active Volcano Surveillance, Geo-hazards monitoring, and Creating Disaster/ Emergency Information Dissemination Station in Vanuatu

VMGD   OGCIO   JTEC   TRR
Telecommunications & Radiocommunications Regulator

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Brief Career of Pramanik

Dr. Kader Hiroshi Pramanik
Advisor to the President, (Telecommunication & Broadcasting), JTEC, Tokyo Japan
Japanese Citizen
Academic Career:
Ph.D. Degree in Electrical and Communication Engineering, Tohoku University Japan.
License:
• Specialized Maritime Radio-communication Operator
• Specialized Terrestrial Radio-communication Operator
Awards:
•Received "ICT Accomplishment Award 2013" from the Ministry of Internal Affairs and Communications (MIC) Japan (executed by the ITU Association Japan) .
•Received "The International Cooperation Award 2007" from the Ministry of Internal Affairs and Communications, Japan(executed by the ITU association of Japan).
Professional Career
1. OKI Electric Ind. Ltd, Tokyo, Japan: Senior Engineer, Telecom Engineering Division.
2. ITU: Technical Cooperation Dept (early retirement in 1988)
3. Japan International Cooperation Agency(JICA): Expert, "ICT Capacity building at the University of the South Pacific" a grant aid project of the Japanese Govt., Fiji & Pacific region.
4. Recruit Co. Ltd, Tokyo, Japan: various executive positions in ICT networks & services.
6. Japan International Cooperation Agency (JICA): Expert in Satellite Communication Systems, and Curriculum Advisor (Net-Centric Computing) at USPFiji & Pacific region.
7. Taking part in Various APT activities including EBC projects.

Main Points

① What is APT EBC-J projects? Objectives and Outline

② Purpose and Design of this Vanuatu Project

③ Project sites, Information Pickups & Dissemination

④ Project activities & achievements

⑤ Lessons Learned and way forward

Baseline

Climate Change Is a Social Issue now,
Not Just an Environmental Issue

Climate Change Increased Frequency & Intensity of Natural Disasters

• Climate change affects biodiversity and reduce food production
• Rural and urban poor population are the most affected
• Small farmers/Fishermen feel the effects most
• Communities forced to relocate (but information missing)

Policymakers continue to play specific role in response to climate change and to formulate related procedure.

Information is collected but hardly returned to the communities

APT J3 Vanuatu Pilot Project Outline

- ➢ To introduce disaster information network to response at risk and to alert people in the White Sands locality in the event of ensuing natural disaster.
- ➢ The same disaster information is to display at the Meteo office at Tanna airport to provide a real time update.
- ➢ These information and services are essential for the **safety, security, and well-being of people**.

Objectives
- Seamless information gathering from volcano site, store in database at national centre, send back to inhabitants with added information.
- Deliver disaster information to the public promptly to keep the inhabitants updated on current status.
- Demonstrate uses of ICTs to improve public safety at disaster risk areas especially when get isolated.

Outline of this pilot project
- Introduced active volcano monitoring ICT System from site.
- Provisioning of creating an Information Station to display volcanic activity information locally, along with necessary Govt information.
- Provisioning required Internet connectivity for such needs, and connectivity to the schools, health centers, local airport and community.
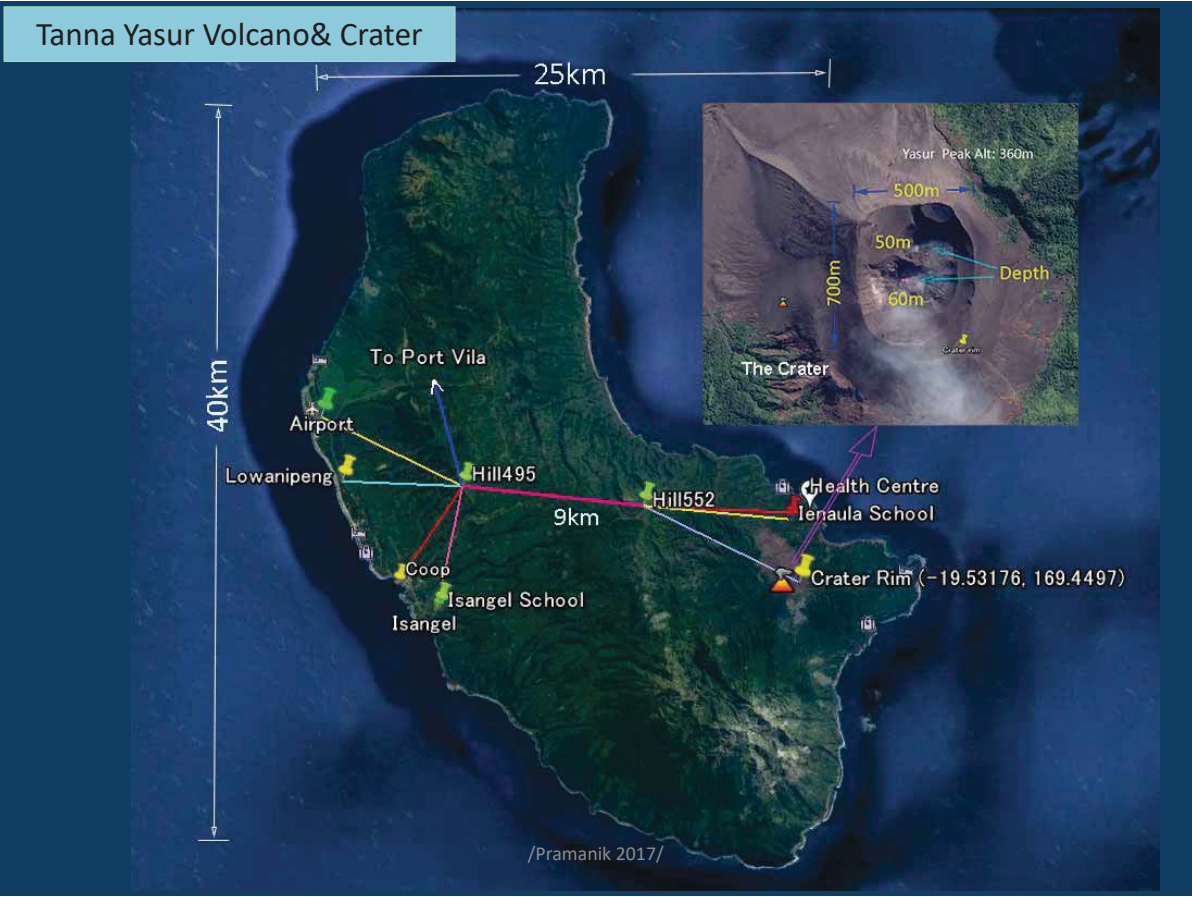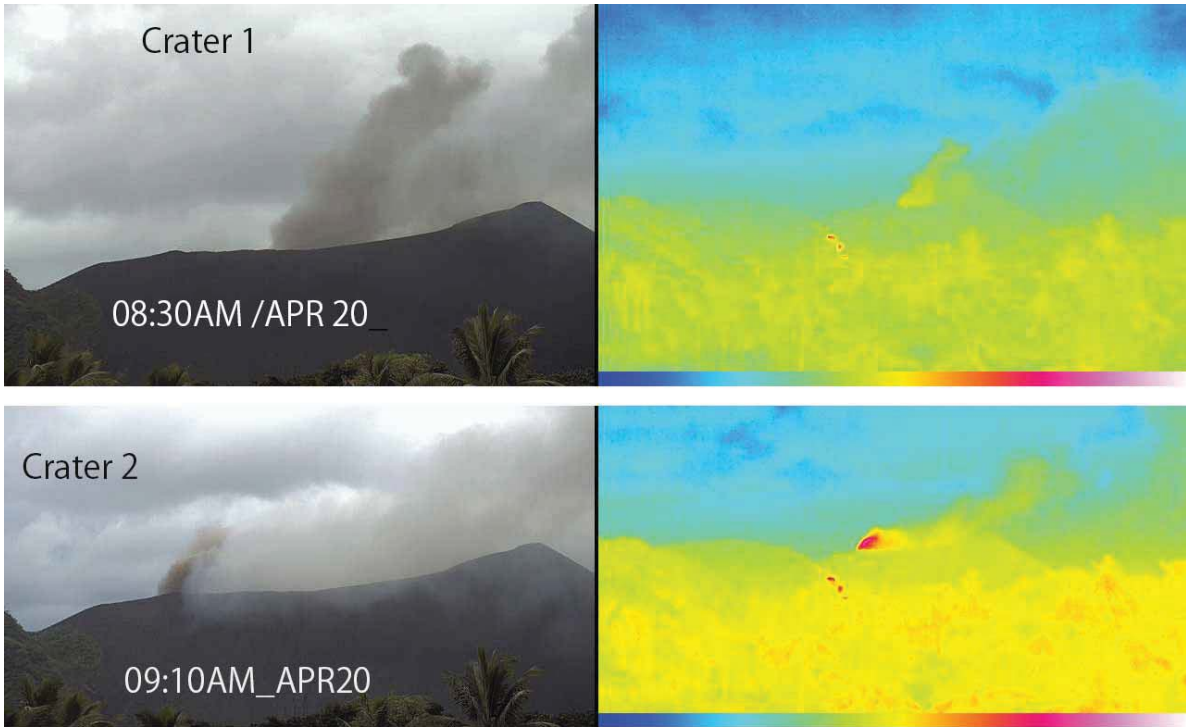
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Purpose & Design

This pilot project in White Sands area in east Tanna develops a model for an appropriate solution to connect and use broadband Internet for disaster information collection, delivery and management, as well as Internet access to local community. These will improve public awareness, access to information and to knowledge bases around the world.
The Pilot Project is designed with four basic functions.
1) **Information gathering** from site to the national centre, the most important in emergency to stream information upward.
2) **Information dissemination** to the White Sands area of Tanna Island, which will keep the community updated about the emergency situation and the relief supply situation when situation arises.
3) **Broadband Internet access** to schools and community where people can access the media to gather information. The schools will be able to enhance their IT education with broadband , and the facilities as **local Information Station**.
4) **Broadband Internet access** to health center assists the medical staff to communicate in their daily routine activities and in emergency .

Situation Change & Project design adjustments

After the cyclone PAM, the project was partly modified.

- Real time data collection using Installed monitoring equipments and broadband network
- Disseminate desired data along with other necessary information related to Yasur Volcano, seismic variations, cyclone and meteorological information to keep informed and alert the residents at the White Sands area in case of emergency.
- Exchange information in the event of emergency, and guide the public to safety as well as providing timely information on any medical assistance that may require to the injured due to unforeseen accidents.
- Keep updates the residents as well as tourists visiting the volcano area, and provide real time information through the Information Station to be developed during this APT J3 Pilot project.
- Upon the success of this project, Vanuatu plans to replicate it for other volcanoes in the country leading to public safety in the region.

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Project Sites: Tanna Island

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Tanna Yasur Volcano & Crater

Camera Locations

Mobotix camera

HD camera

Monitoring Camera Pictures

Crater 1

08:30AM /APR 20_
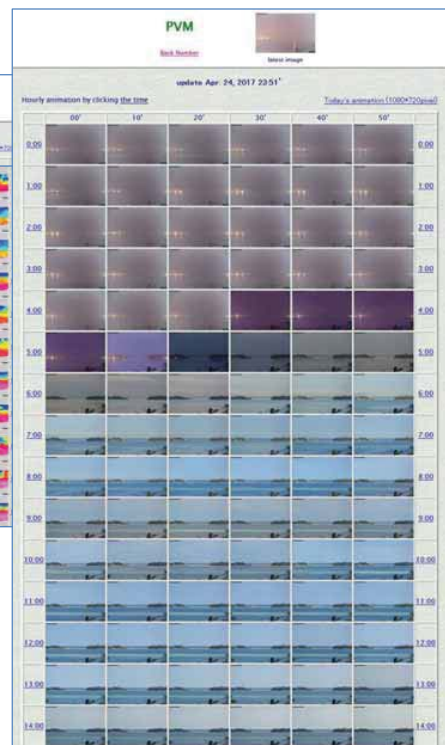
Crater 2

09:10AM_APR20

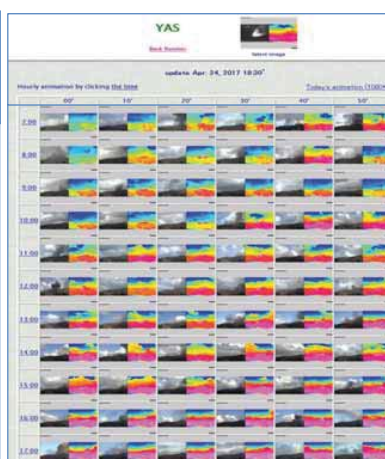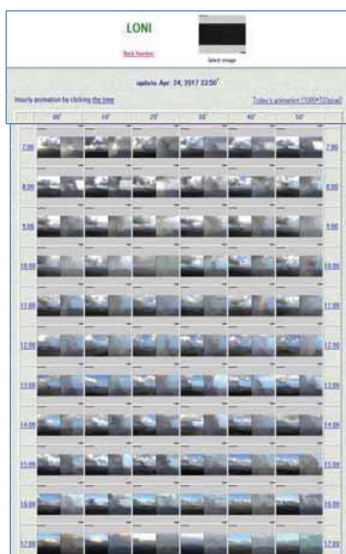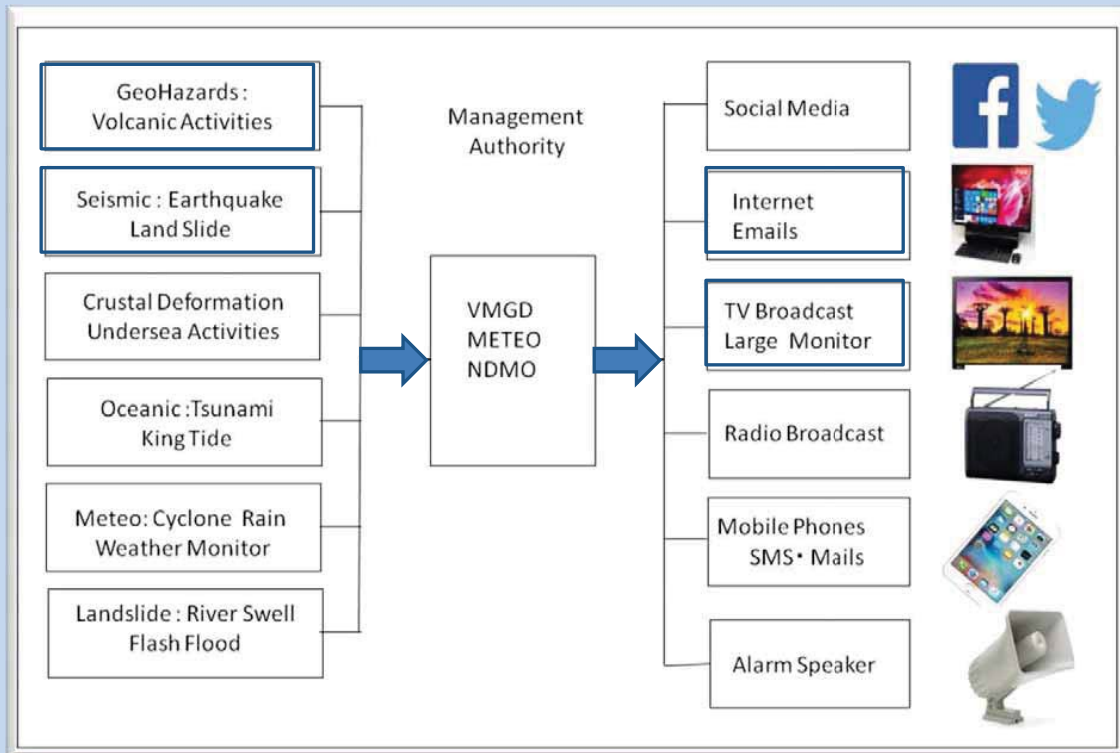Tanna Yasur Volcano Monitoring Data

Observed Different Face of Yasur Volcano

Port Vila Bay Monitoring

Data Configuration in Server

Information service flow

GeoHazards: Volcanic Activities

Seismic: Earthquake Land Slide

Crustal Deformation Undersea Activities

Oceanic: Tsunami King Tide

Meteo: Cyclone Rain Weather Monitor

Landslide: River Swell Flash Flood

Management Authority

VMGD METEO NDMO

Social Media

Internet Emails

TV Broadcast Large Monitor

Radio Broadcast

Mobile Phones SMS · Mails

Alarm Speaker

The Common Reality

Send from Community

Picture (Visual)

Sensor (Seismic)

Voice (Mobiles)

Center

Various Parties

Stays Idle Or used by specialists

Need Timely return to the community

Unfortunately NOT

Awaiting Community

Complexity and Limitations

- While the project was in its first stage in 2015 and going to be implemented, the Cyclone PAM destroyed the facilities in Tanna and other locations.
- This caused a total standstill.
- Ultimately post disaster mitigation with top priority caused delay in all other activities, and so happened with this J3 project.

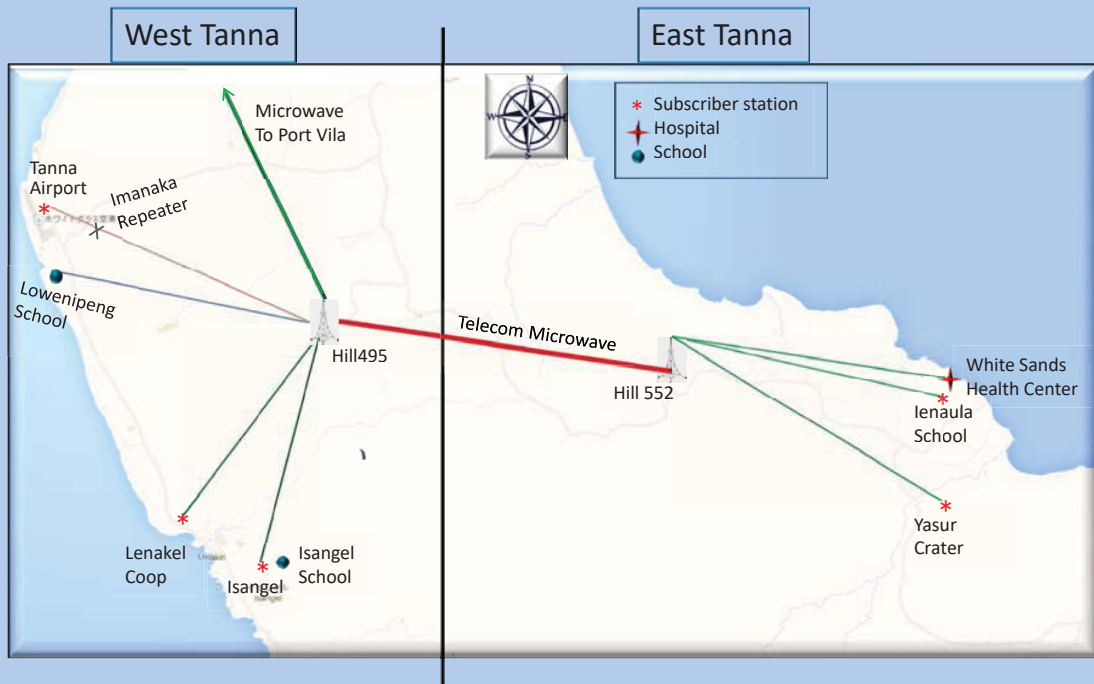Tower in 2014

Tower in 2015

Tower in 2016

Tower in 2017

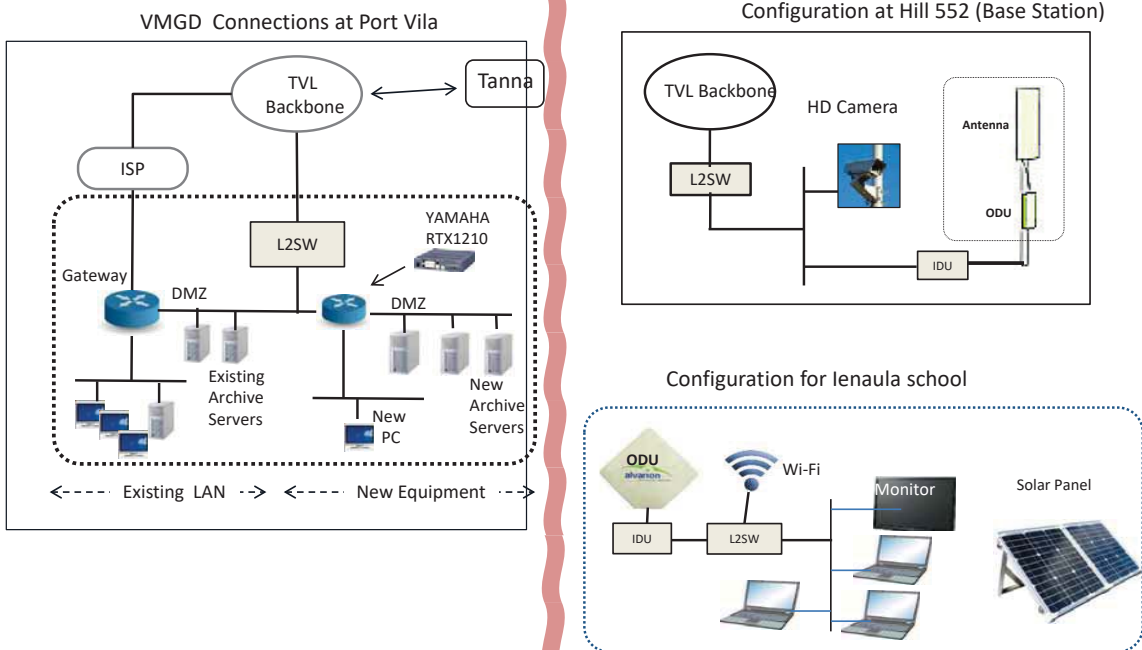## Volcano Status Changed by Time

2014

2015

2015

2016

J3 Broadband Wireless Network System

West Tanna

East Tanna

Microwave To Port Vila

Tanna Airport

Imanaka Repeater

Lowenipeng School

Telecom Microwave

Hill495

Hill 552

* Subscriber station
+ Hospital
● School

White Sands Health Center

Ienaula School

Yasur Crater

Lenakel Coop

Isangel

Isangel School

Station Wise Configurations

VMGD Connections at Port Vila

TVL Backbone

Tanna

ISP

YAMAHA RTX1210

L2SW

Gateway

DMZ

DMZ

Existing Archive Servers

New PC

New Archive Servers

<---- Existing LAN --> <---- New Equipment --->

Configuration at Hill 552 (Base Station)

TVL Backbone

HD Camera

Antenna

L2SW

ODU

IDU

Configuration for Ienaula school

ODU
alvarion

Wi-Fi

Monitor

Solar Panel

IDU

L2SW

Installation Works

13m Tower at Ienaula School

18m Tower @Health Centre

Solar Panels

Inverter/Control   Batteries
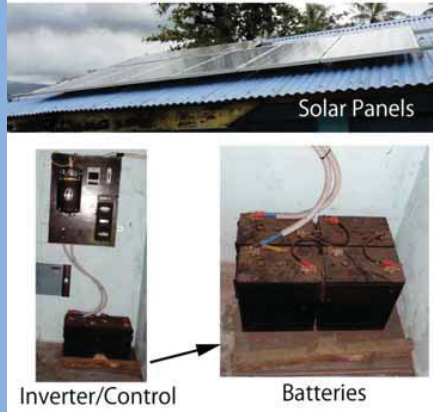
TV Monitor at School

Power & Setups at School

Pictures at Completion & Opening Ceremony

Opening Ceremony at Ienaula School

Installation at Tanna Airport Meteo

Completion at VMGD in Port Vila

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Information to/from Outside World

Distance between Port Vila and Tanna is over 230km

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Equipment & Broadband Connection Capacity

Provided Equipment

- ➤ Long range Wi-Fi System: Base station. Subscriber stations
- ➤ Towers (Masts), Routers, Archiving Servers, PCs & UPS
- ➤ Large TV Monitors, Power Supply (Solar), Other Related equipment

Network connections capacity

Sites	Capacity	Remarks
White Sands Health Centre	4 MB	Internet Connection
Ienaula School & ICT Station	4 MB	Internet Connection
Camera @ Ienaula School (for Crater)	2 MB	Ienaula Camera connected to E. Gov VPN Network
HD Camera @ Hill 552	2 MB	HD Camera connected to E. Gov VPN Network
Tanna White Grass Airport Meteo Station	2 MB	Connected to E.Gov VPN Network
Isangel VMGD	2 MB	Connected to E.Gov VPN Network
Lenakel Coop	2 MB	Connected to TVL Network Infrastructure

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The Job is Done
But until now the Volcano remains unfriendly
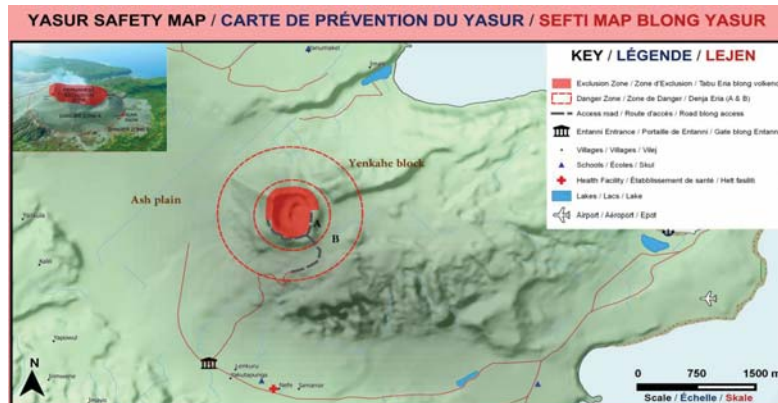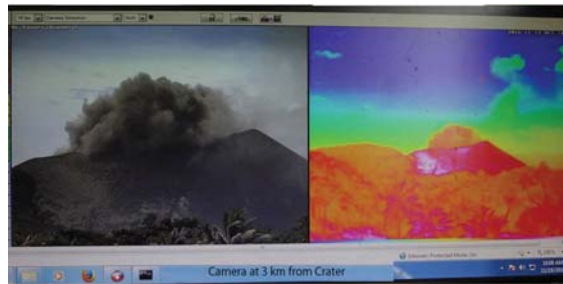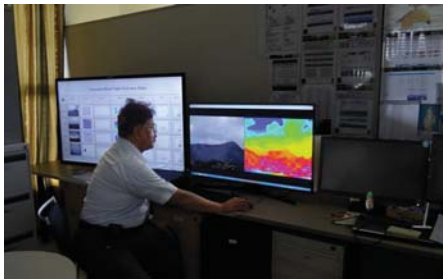
Achievements with this project

1 White Sands health Centre
- Wi-Fi connection
- Nurse Midwife are Really happy
  - Using email
  - Skype
  - Medical advice
  - Video conference

2 White Sands Junior secondary School
  - Wi-Fi and LAN connection

3 Tanna White Grass Airport:
  - Large Monitor Display at VMGD
  - Wi-Fi provision

4 Port Vila VMGD/Meteo
  - Ocean level monitor
  - Visual Wind monitor
  - visual Cloud flow monitor

Lessons learned

- Accessibility to sites & access time
- Maintenance difficulties/personnel safety
- Information Transmission to local community
- Security of facilities, Support from local community
- Local Transport and costs
- Unexpected Personnel transfer
- Telecom Coordination and devotion attitude

- Wind Direction and volcanic ash flow
- Power stability
- Solar power limitations
- Solar panel and batteries estimation
- Password control and availability

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Recommendations: Way Forward

➢ Pilot projects in Disaster prone areas is a necessity and not just an experiment.

➢ Real time data on weather parameters, Rainfall, Humidity, Depression, Wind Velocity, Temperature etc. should be stored for information generation.

➢ Data Collection can be done also through mobile network.

➢ Government initiative decrease casualties, and more ICT uses decreases information gathering and dissemination constraints.

➢ Successful applications of ICT increase efficiency in Comprehensive Disaster Management on earthquake/Tsunami, Cyclone and other hazards, and action is required without delay.

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In future to formulate similar projects:
- ➢ Use **MDRU**(Movable and Deployable ICT Resource Unit) can play a role in disaster information network quick recovery
- ➢ Use low cost equipment to be within limited funds
- ➢ Use maintenance free equipment to extend lifetime of equipment
- ➢ Replacement units/parts to keep at hand

Thank you