



# **Forging of a Public-Private-Partnership for Development**

## **The PH TVWS Adoption Initiative**

**ITU Regional Development Forum  
2015**

**Bangkok, Thailand**



# TV White Space (TVWS) Technologies

*“The Philippines Adoption Program,  
Pilot and Deployment Initiatives”*

## ITU Regional Development Forum 2015

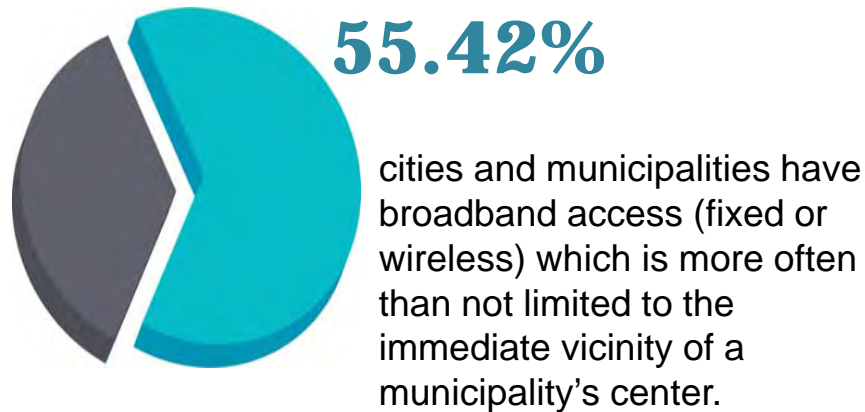
Bangkok, Thailand

**LOUIS NAPOLEON C. CASAMBRE**

**Executive Director**

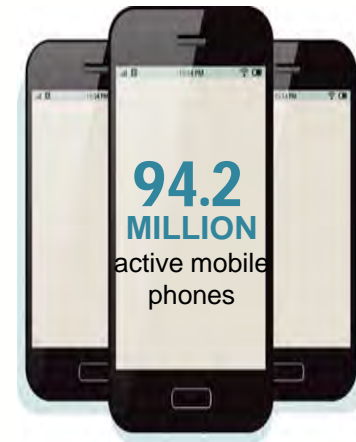
**Information and Communication Technology Office**

# PH ICT Situation



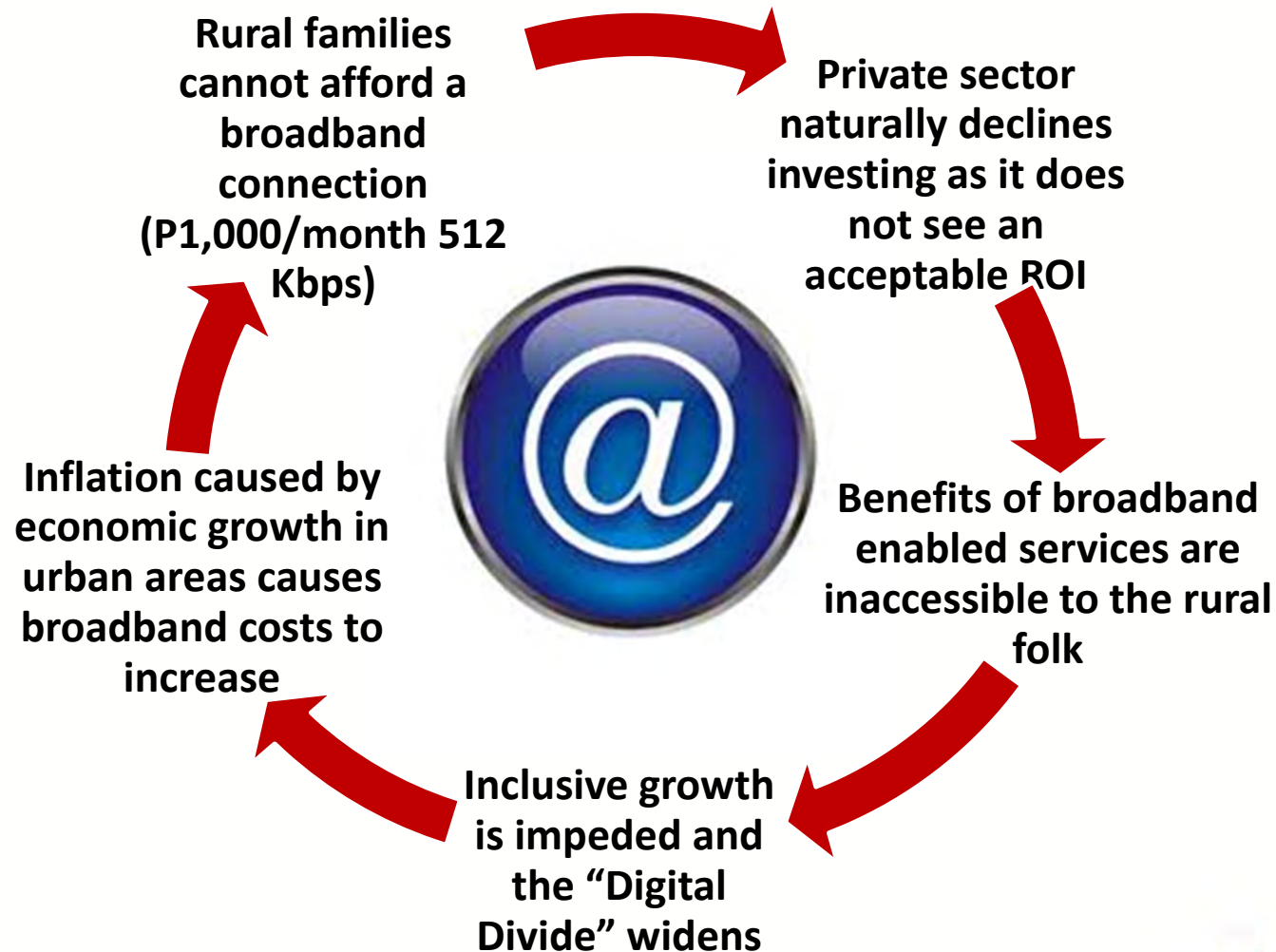
## Cellular Mobile Telephone Service

**98.52%**  
of municipalities



**2**  messages handled daily  
**BILLION**

# Philippine Broadband Scenario



# Why TV White Space....

**Challenge:** Internet for All

## VHF/UHF Allocations for Broadband Deployment Nationwide

- Utilizing long range characteristics
  - Rural broadband/backhaul
  - Wide-coverage hotspots
  - Bridge among small networks
  - Sensor network
  - Wireless surveillance system
- Utilizing obstacle penetration/avoidance characteristics
  - Indoor distribution
  - Machine-to-Machine
  - Non-line-of-sight
  - Over water propagation



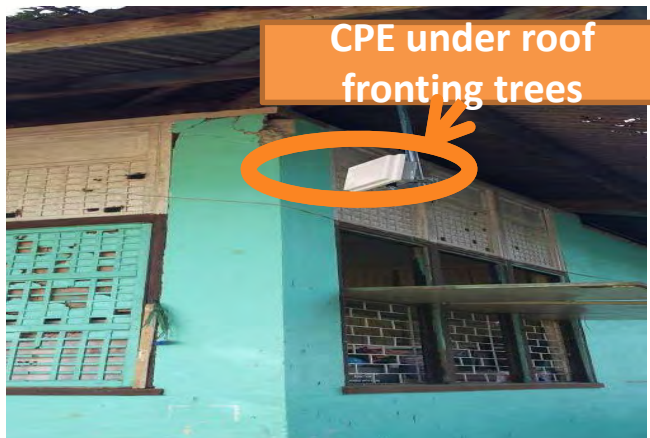
TVWS technologies are ready for deployment.

A perfect solution for last mile distribution

IDEAL for the Philippine landscape.

# ICT for Public Education

- Multimedia instruction, access to the better teachers
- Information access and delivery



# TeleHealth for Rural Health Units

- Primary healthcare delivery, access to specialists
  - Health management, health care access for all
    - eHEALTH using Rxbox and Skype



# Disaster Response & Management

- Disaster reporting from devastated area
- Internet access.... (skype, social media, etc..)





# Governance

- LGU/NGA coordination ,
- Access to e-Government services and great public engagement



# Public Free Wi-Fi Internet Access

Free Public Wi-Fi in  
Tubigon Bohol  
(below)

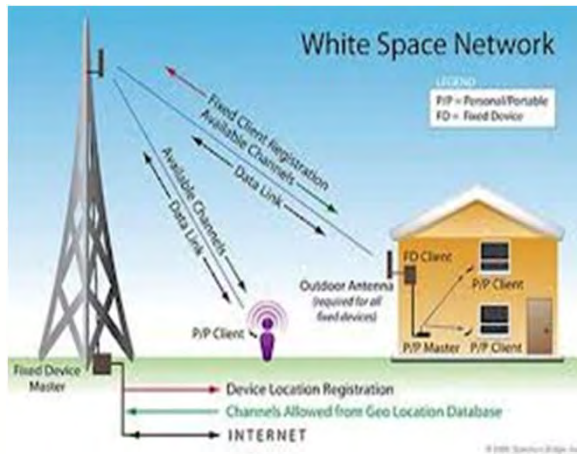


Launching of PHL Free  
Public Wifi  
“JUAN KONEK”  
(08 May 2015)

# What can be...

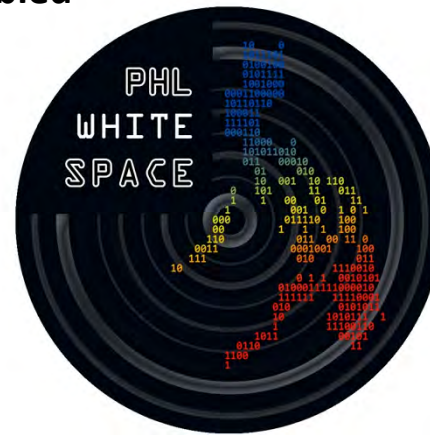
POLICY INTERVENTION

**TVWS Technologies**



Rural communities have access to broadband enabled services

Economic development is fostered by e-Learning, e-Commerce, e-Gov't, e-Health, etc.



Private sector sees an acceptable ROI from investing in the developing rural areas

Rural incomes increase, and commercial broadband is demanded

# Philippine TVWS Space Initiative



## *A National Program for the Study of TVWS Technologies*

### **OBJECTIVES:**

- To demonstrate the macroeconomic viability of using an unlicensed access to TV white spaces model (dynamic spectrum allocation – cognitive radio);
- To demonstrate the technical feasibility of using TVWS with particular attention to any detrimental effect to incumbent services in the TV spectrum;
- To develop the policies, rules and regulations that will cause the rapid adoption of TVWS technologies;
- To develop the necessary capacities: human, institutional, and essential infrastructure towards the proposed nationwide adoption of the TVWS technologies

# The Partners

## Government

- National Telecommunications Commission
- Department of Education
- Department of Environment & Natural Resources
- NICT of MIC Japan
- Province of Cavite
- City of Pulilan

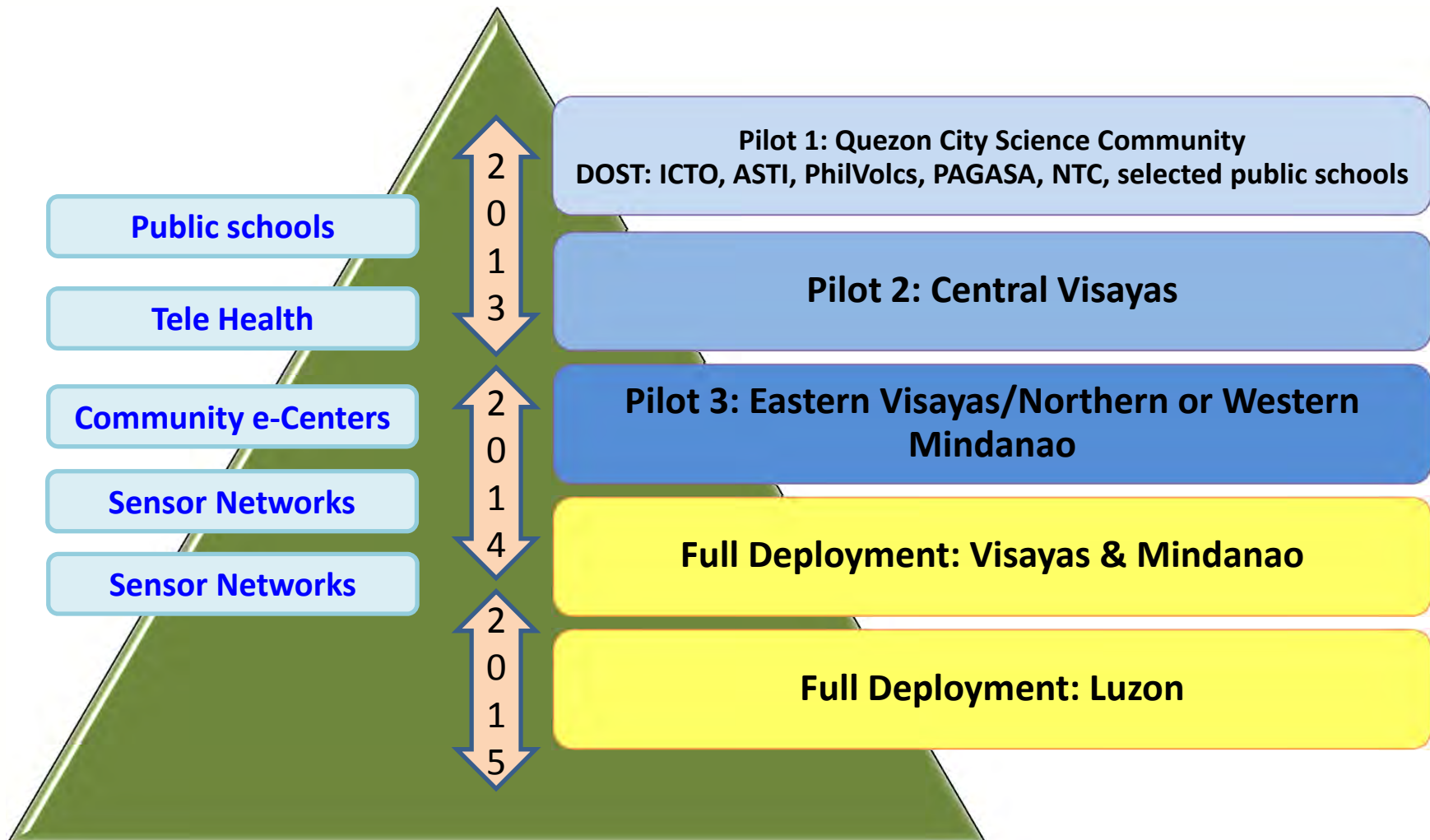
## Civil Society / Industry Org.

- USAID – Ecofish Project
- Federation of International Cable TV and Telecom Assn of the Philippines
- Dynamic Spectrum Alliance

## Private Sector

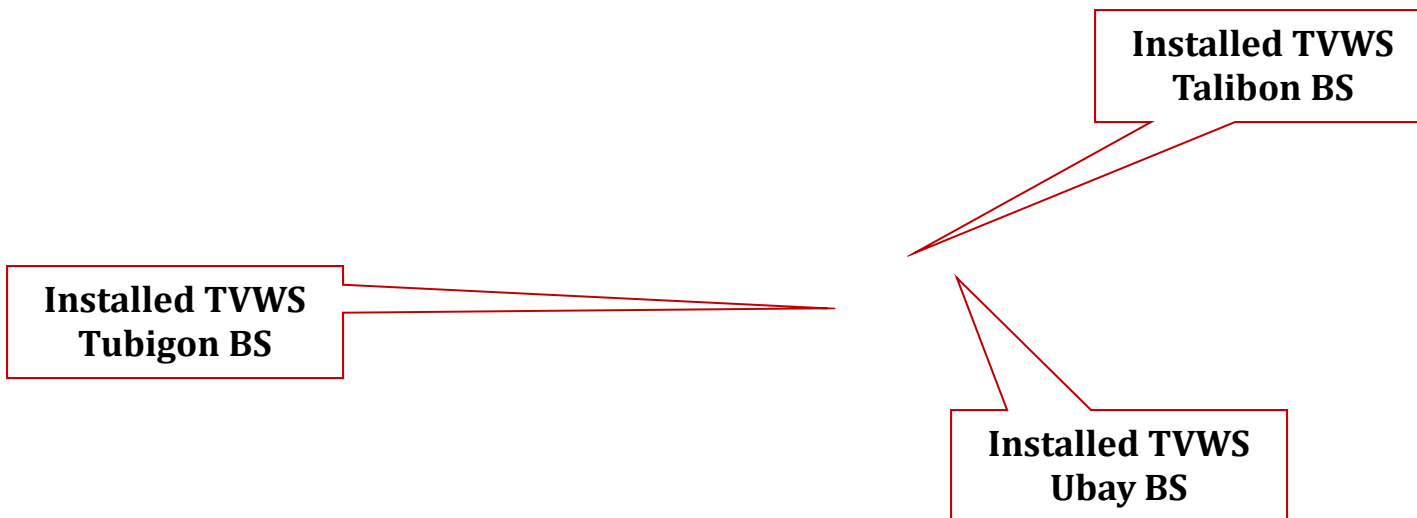
- Microsoft
- ADAPTRUM, Inc.
- Nityo Technologies
- ABS-CBN
- FilAsia System Technologies

# DOST-ICTO Roadmap for TVWS Deployment

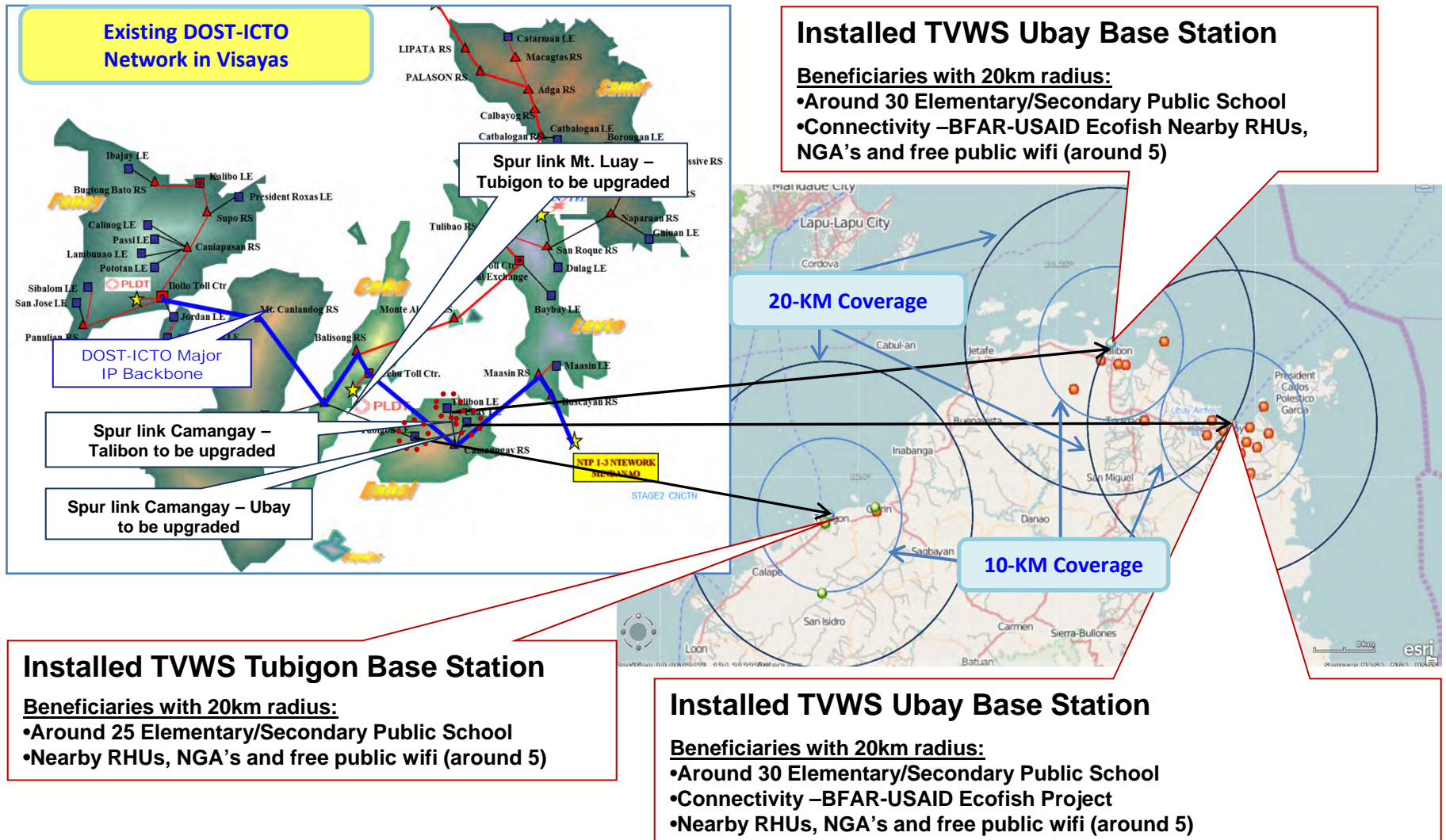


# DOST-ICTO TVWS 1<sup>st</sup> Technology Trial

ICTO – Transmission Backbone  
Visayas Regions

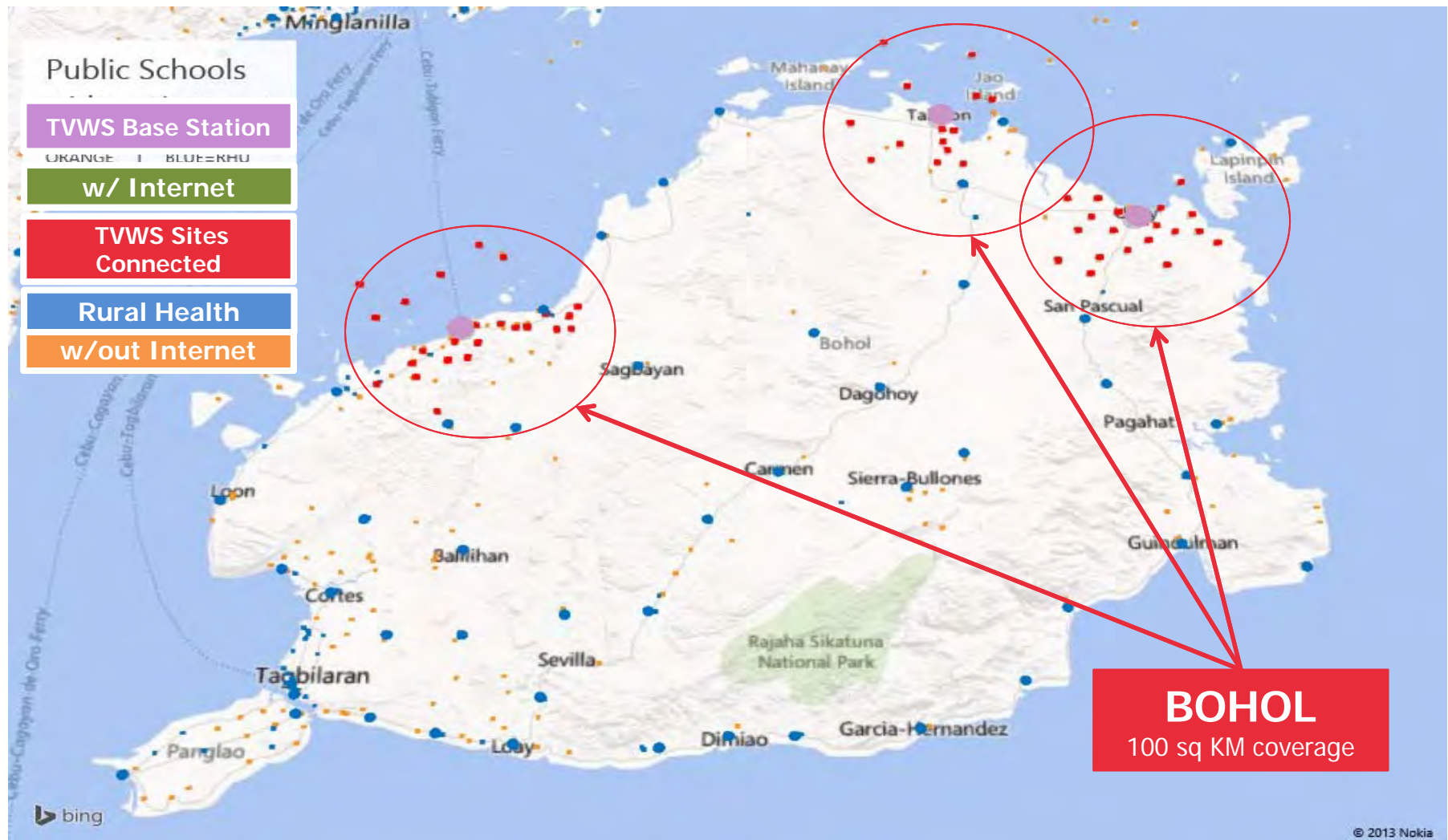


# Technology Trials – Bohol Area (Visayas)





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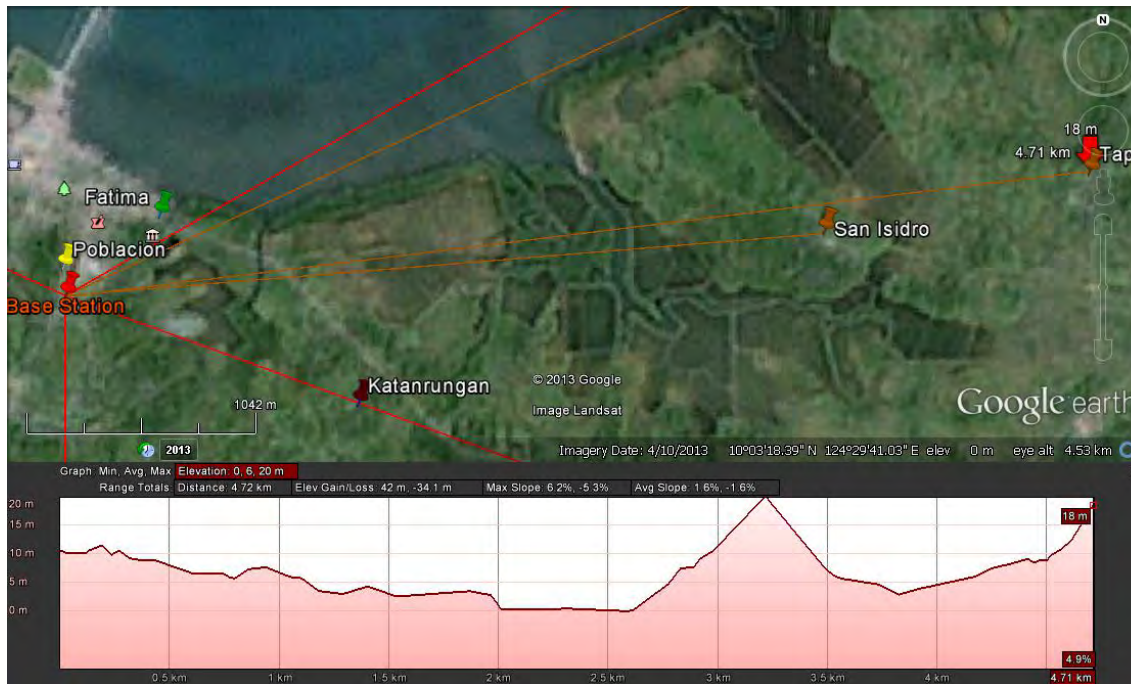
# TVWS Supported Fisherfolk Registration

Connected around 26 public schools and public areas across 6 coastal municipalities of Tubigon, Talibon, Ubay, Bien Unido, Trinidad and Carlos P Garcia in Bohol:

*“serve as mobile registration hubs for BFAR-USAID ECOFISH Project in Danajon Reef”*

- ✓ A total increase of 3,532 registrants across the 6 municipalities
- ✓ An average improved performance of 504% across the 6 municipalities
  - Bien Unido: 1,538%, Carlos P. Garcia: 603%, Talibon: 134%, Trinidad: 458%, Tubigon: 183%, Ubay: 109%
- ✓ The institutionalization of at least 2-3 "mobile registration enumerators" per municipality

# Notable Result of TVWS Trials (1/2)



Location	Tapal (Bohol)
Distance	4.72km
Base Station Antenna Gain	17dBi
Destination Antenna Gain	6dBi
Avg. Bandwidth	1.75 Mbps

**As you will notice, despite of obstruction (mountains, trees), we are able to measure around 1.75 Mbps at the range of almost 5 kilometers....**

# Notable Result of TVWS Trials (2/2)

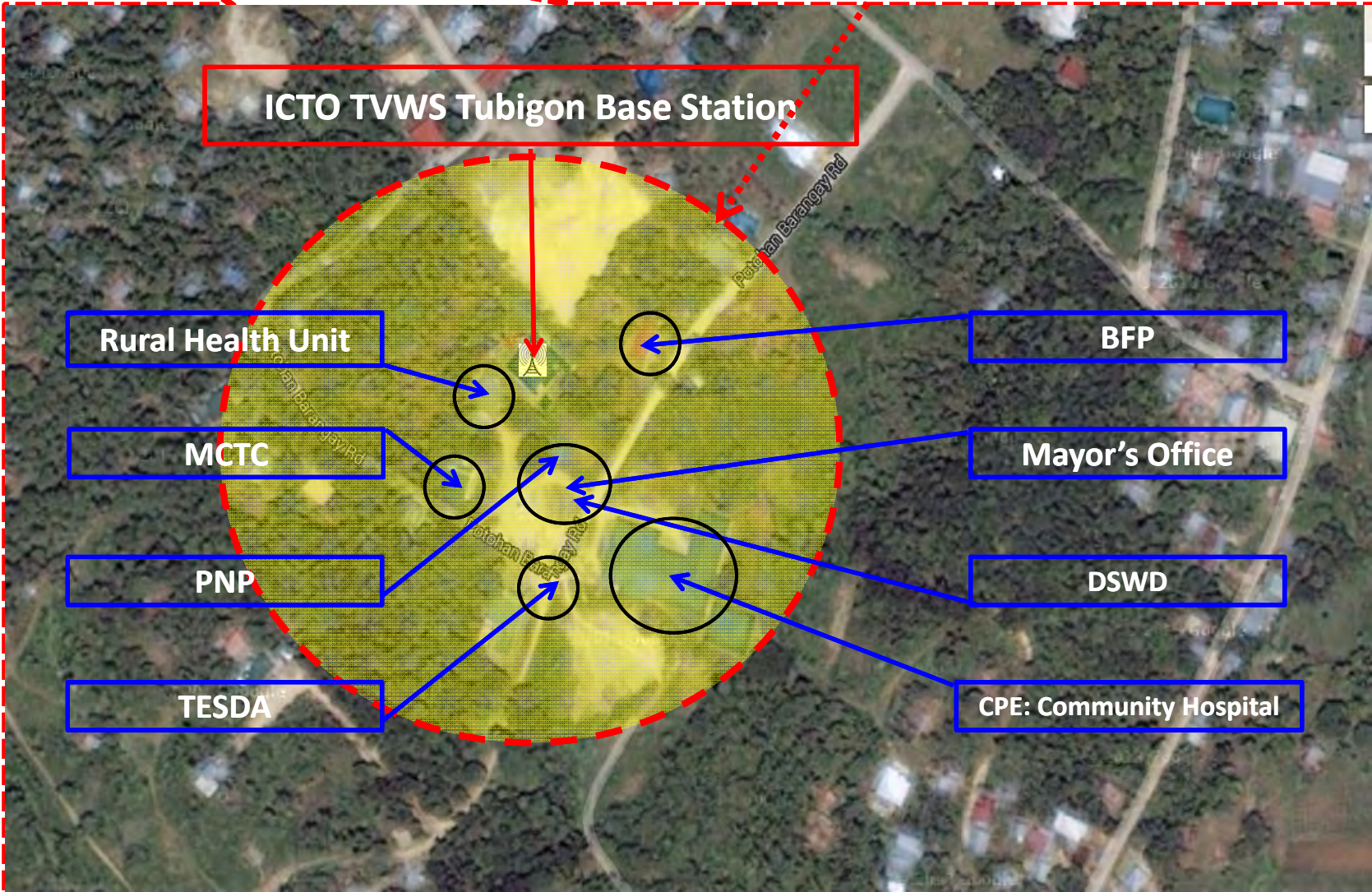


Location	Imelda (Bohol)
Distance	4.99km
Base Station Antenna Gain	6dBi
Destination Antenna Gain	6dBi
Avg. Bandwidth	2.37 Mbps

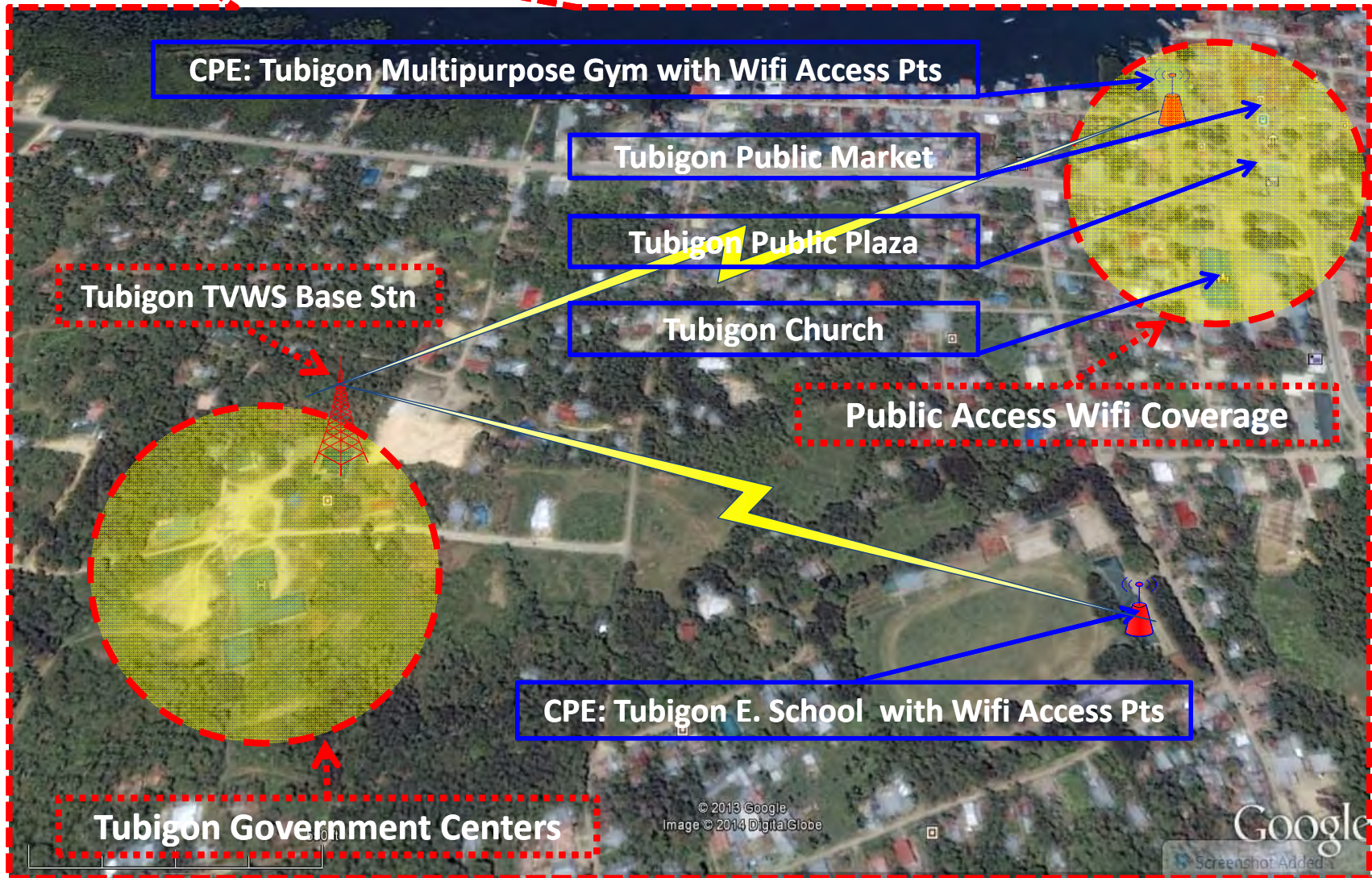
**Without much obstruction but passing thru the trees, an increased of bandwidth speed at the reception side....**



# Tubigon Government Centers



# Maximizing CPEs thru Hotspots

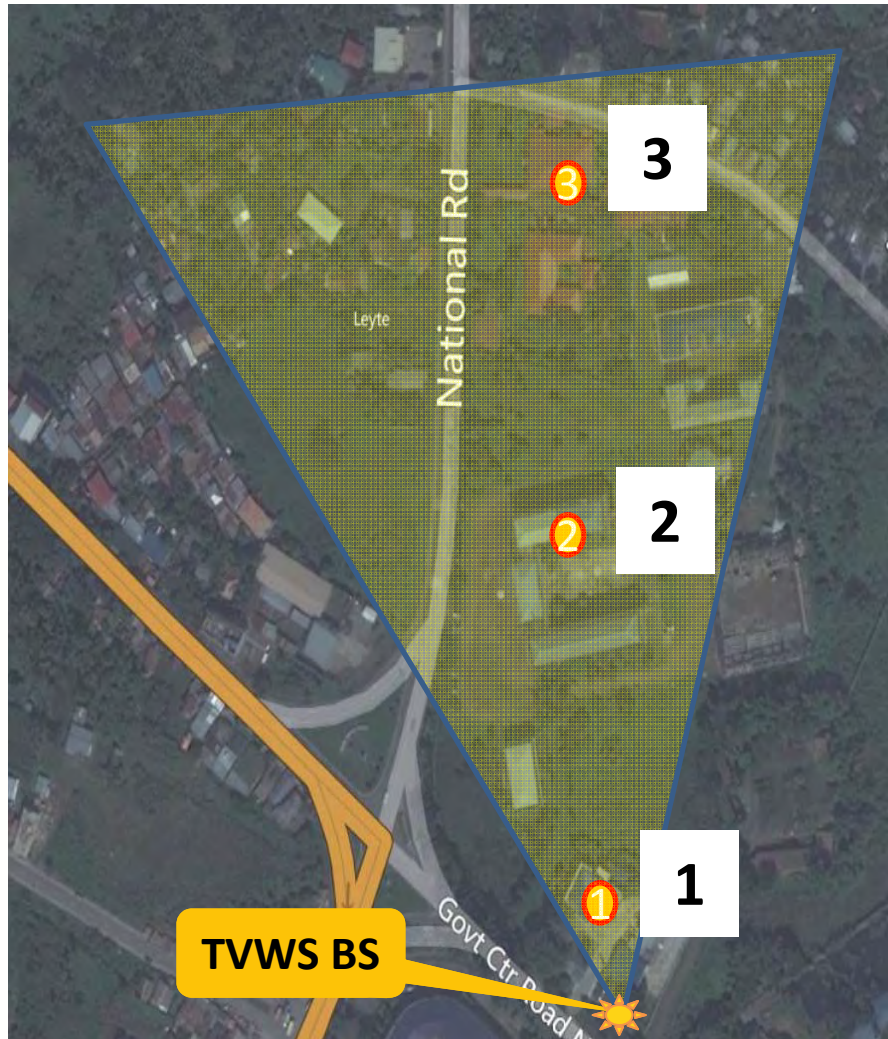


# Deployment for Disaster Response

## Deployment Site: Palo Leyte (November 2013)

- Purpose: Restore connectivity after Typhoon Haiyan/Yolanda
- Coverage: Government Center in Palo, Leyte
- Backhaul provided by DOST thru VSAT (initially) and later switched to Telco network after they had restored their service
- Total Beneficiaries: approx. 4 government agencies
- Number of radios installed: 3 (initially) later expanded to 5
- Radio Supplier: Power Automation
- Installer: Systech
- System Integrator: Nityo Infotech

# TVWS Network Coverage (Palo, Leyte)



The three marked points were connected:

1. the base station at the DOST Regional Office where the VSAT was located. The internet backhaul was a satellite connection provided by the ITU.
2. a CPE at the Philippine Science High School Office, approx. 500m away, the primary users were the administrative staff of PSHS
3. another CPE at the PSHS Campus Dormitory (top), approx. 1000m away, where the first set of users were the Bombero Unidos, a humanitarian group from Spain which sent a team of relief workers to Leyte. They were headquartered at the dormitory for several weeks. The internet connection was used to communicate with other NGOs and with their home base in Spain. When they left, the dormitory was used as temporary housing for the PSHS faculty and their families. The internet connection was used in helping the faculty rebuild their lesson plans and instructional material in preparation for the re-opening of classes in mid-January.



# Three End Points....



DOST Region 8 Office  
(showing solar-powered  
VSAT) where the base  
station was located

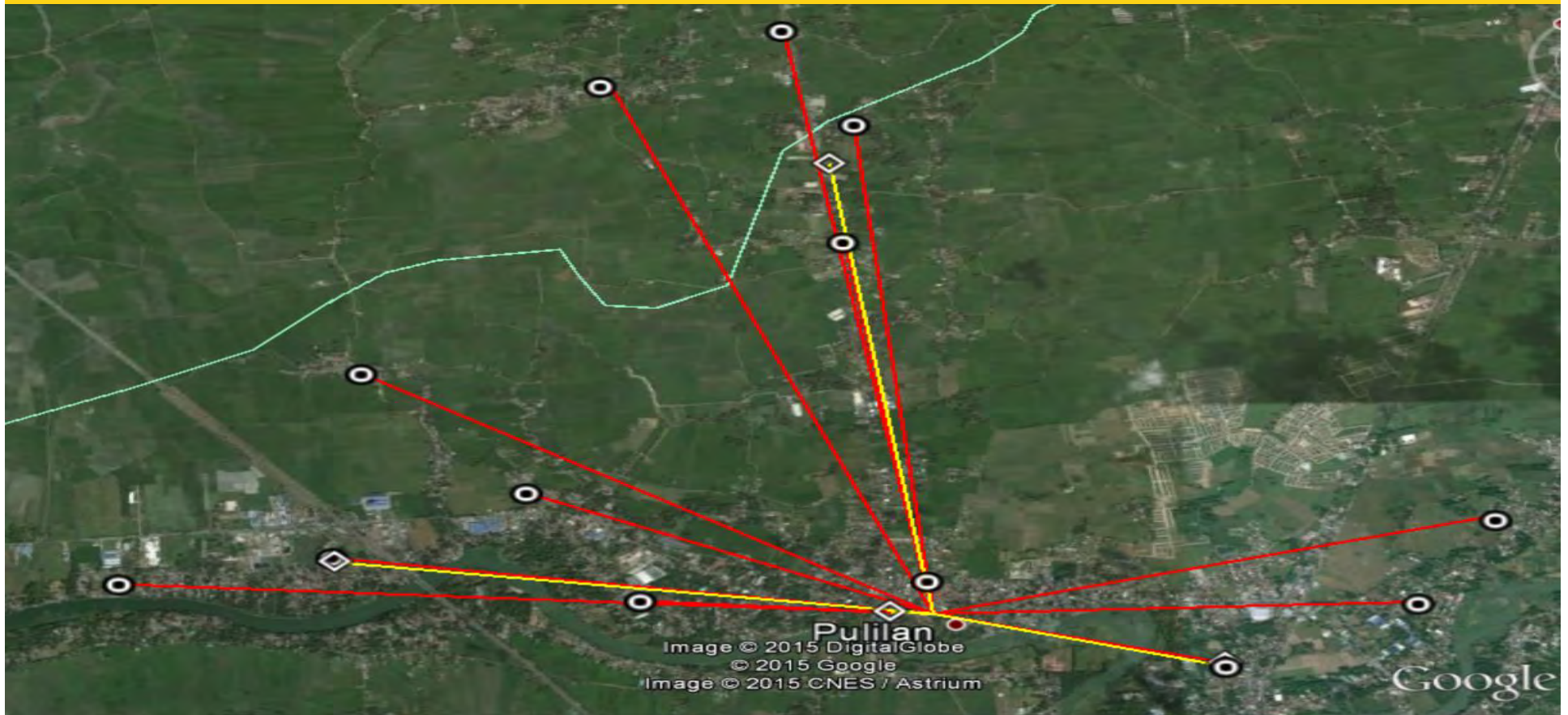


PSHS Administrative  
Building (the CPE antenna  
is the white square in the  
center of the photo).



PSHS Campus  
Dormitory

# PULILAN PILOT



Provision of Broadband Connectivity to rural elementary and secondary schools in Pulilan, Bulacan and providing connectivity for the Philippines Free Public Wifi Project “**JUAN KONEK**” in rural areas.

# INTERFERENCE STUDY



Photos courtesy of Mr. Patrick Ongchangco – ABS-CBN

## OBSERVATIONS/RESULTS

TVWS is interfered by Analog/Digital TV transmission (same tower)

Analog/Digital TV transmission is not interfered by TVWS (same tower)

## RF SWEEP Observations

When there is no broadcast; spectrum is clear / only TVWS signal will be seen

TVWS data transmission to/from the BS and the CPE are acceptable

# How Do we Do That?

**DOST – ICTO 's partnership with various gov't agencies, technology providers, service providers, broadcasters and stakeholders thru MOU/MOA:**

<b>National Telecommunications Commission (NTC)</b>	<b>Department of Education (DepEd)</b>
<b>Microsoft</b>	<b>Nityo Infotech</b>
<b>Federation of International Cable TV and Telecom Assn of the Philippines (FICTAP)</b>	<b>Ecofish, BFAR &amp; USAID</b>
<b>ABS-CBN</b>	<b>FilAsia System Technologies</b>
<b>ADAPTRUM, Inc.</b>	<b>Still Growing.....</b>

# Moving Forward

- Draft interim regulations completed, waiting for finalization of DTTB ISDB-T channel plan
- Database infrastructure pre-operational
- Conceptualizing large scale pilot to bring connectivity to disarming rebel camps

# What We Did Right?

- Technology agnostic
- Open to all, non-exclusive
- No monetary exchange
- Right partners

Thank you...

