



Community Cellular Networks in the Philippines: Experiences from the VBTS Project

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Outline

- Community Cellular Networks in the Philippines
- Deployments
- Challenges in sustainability
- Future of CCNs in the Philippines

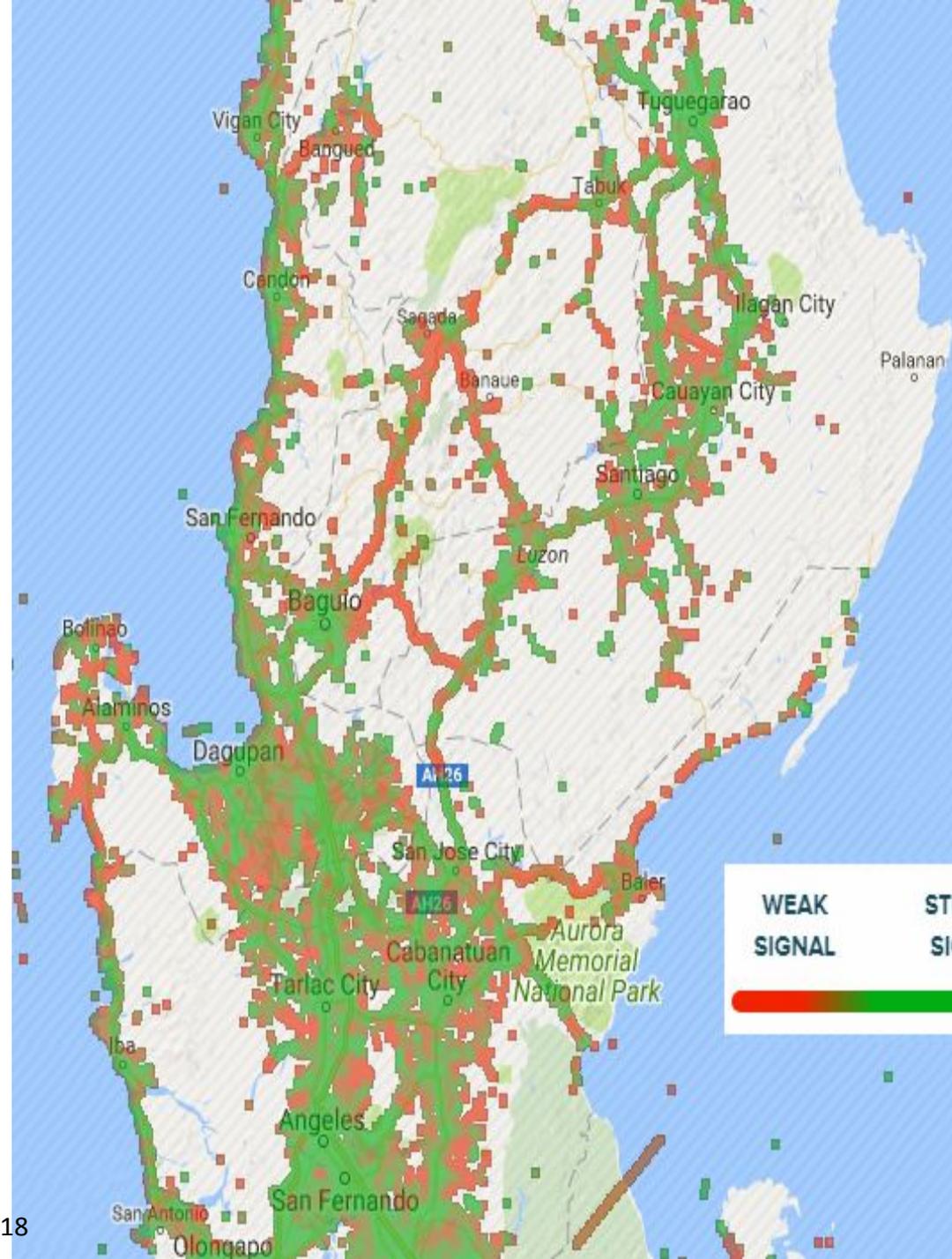


As of 2018, the Philippines' **subscriber penetration is only at 64%** of the population.*

*GSMA. The Mobile Economy Asia Pacific 2019.
<https://www.gsma.com/r/mobileeconomy/asiapacific/>

Many communities still lack cellular connectivity, especially in remote, rural areas

- Most barangays lack grid power, power supply intermittent for others
- High installation and operating costs of traditional base station (BTS) deployments
- Unprofitable for telcos due to small potential subscriber populations

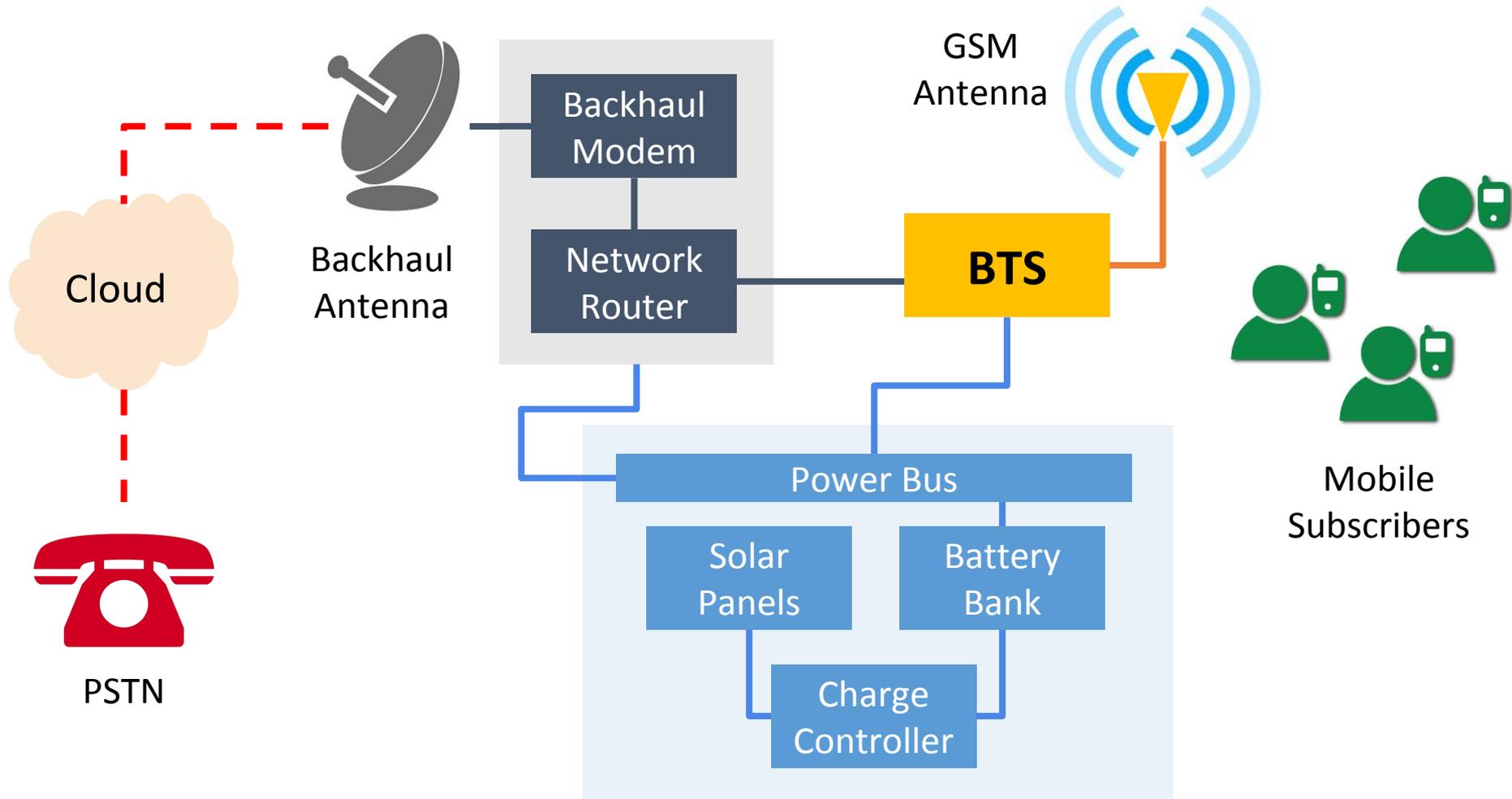


VBTS

Community Cellular Networks

- Low cost, low power, compact GSM (2G) base stations
- Uses alternative sources of power (solar)
- Customized network for small communities
 - Managed locally: cooperatives, LGU, barangay
 - Community-owned model

VBTS System Diagram



Pre- Deployment Challenges

■ Telco Partner

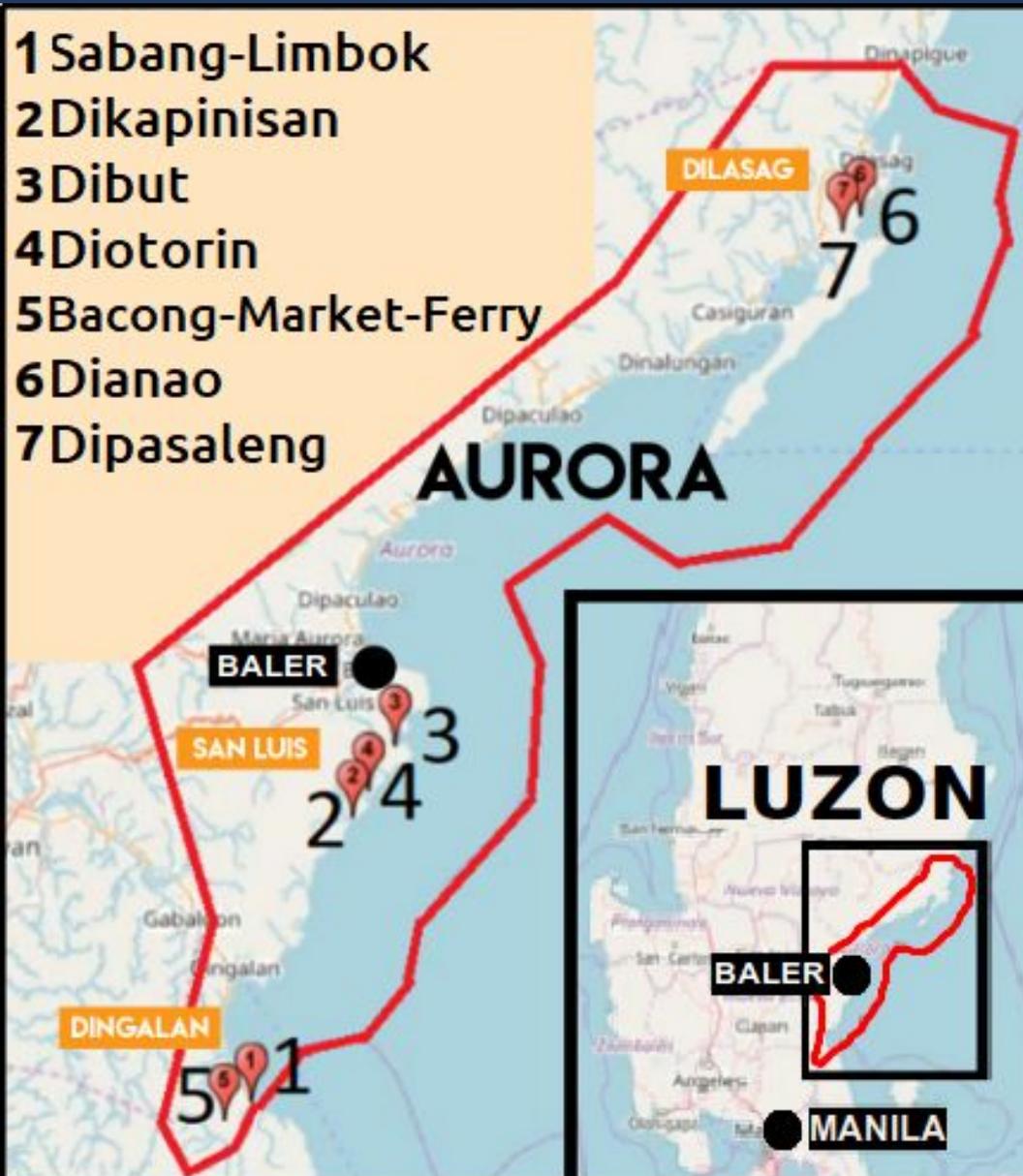
- 2G frequency bands in the Philippines are assigned to incumbents
- Two-year negotiations
- 80-20 revenue sharing
- Handles regulatory permits, SIM cards, and interconnect.



■ Regulatory Requirement

- type-certification
- Initially set to use experimental network-in-a-box solutions

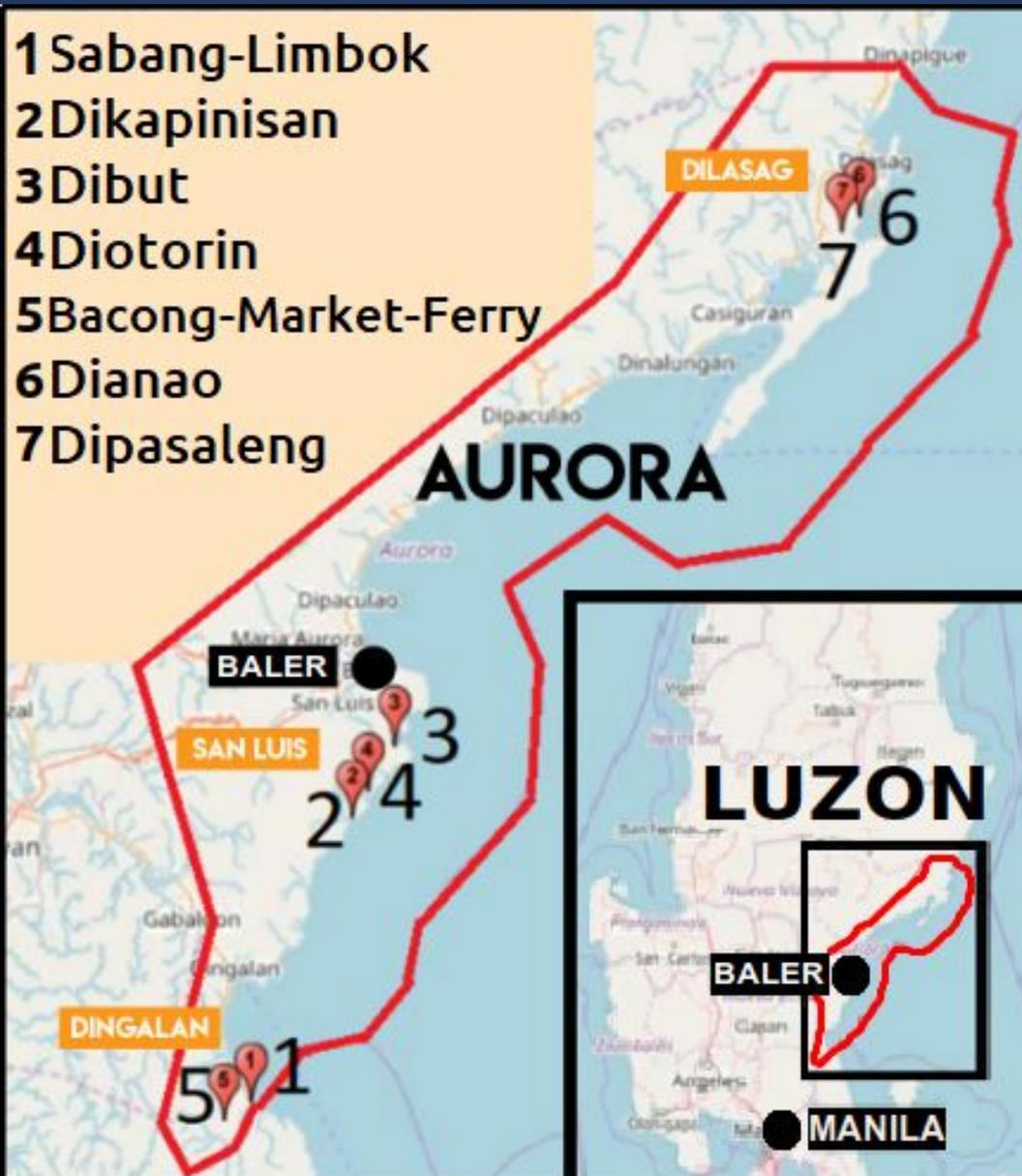
VBTS Deployment Sites



Randomized Control Trial

- Impact study of first-time access to mobile communication in rural areas
- To determine 7 pilot communities

Site Profile



Location

Remote and isolated coastal communities



Travel

2 - 3 hours boat ride from the nearest mobile phone tower

Site Profile



Community

Fishing, farming, retail of goods



Connectivity

Locals travel several hours to use mobile phone services
LGU has HF radio links



Timeline



UP-Globe MOA



Site3
Dibut



Site4
Diatorin

04/17

09/17

10/17

02/18

05/18

08/18

10/18

01/19



Site1
Sabang-Limbok



Site2
Dikapinisan

Site 5
Bacong-Market

Site 6
Dianao

Site7
Dipasaleng



VBTS Typical Installation



Status

- 7 community sites
- 2K++ subscribers
- 2 years of operation
- 10k+ voice mins
- 20k+ SMS ave monthly traffic



User Observations



SMS is the predominant traffic

- Equal volume in both directions



“Call me” behavior

- Inbound call traffic is almost x6 outbound call traffic
- Subscribers are aware that they could save by letting their contacts call them instead.



Peak usage in the evening

- Subscribers prefer to call/text after work hours (6PM+)
- Operational hours during rainy season may adapt to this trend

User Observations



Demand for promos and data access

- Frequent inquiries on future availability of promos and internet access, notably Facebook



Changing attitudes on service availability

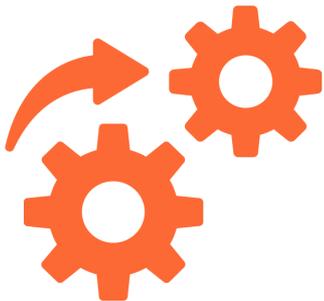
- Demands on service availability changes as time goes on; becomes accustomed to the presence of the service
- Increased sensitivity on service disruptions

Challenges for Sustainability



Regulatory

- Current structure is highly dependent on telcos, their expansion plans, and priorities. End of agreement
- Spectrum license for LGU end-users
- Equipment type certification
- Permits to purchase, possess, operate



Operation

- Backhaul availability. Currently VSAT is the only feasible soln for true “drop and operate” deployment.
- Phone numbers and interconnection to core of existing mobile phone networks.

Challenges for Sustainability



Service Perceptions and Expectations

- Higher expectations on operational hours and reliability.
- Service comparison to incumbent MNOs



Social Infrastructure

- Personnel retention is a challenge as designated maintenance officers venture to more rewarding livelihoods

Future of Community Network in PH

We see the internet as a way to move forward.

Cellular Data or LTE

- High dependency in telco partner and high cost of bandwidth
- To eliminate dependency in the telco partner:
 - Legal framework for CCNs as a mode of community-based social entrepreneurship
 - Reform of system for spectrum allocation and licensing towards designation of 'social use' frequency for CCNs

Internet Only Network

- the eventual phase-out of 2G and the proliferation of internet-capable phones points us to an internet-only network
- But internet in last mile areas are not cheap so efficient bandwidth utilization strategies should be explored



By sharing our experiences, we hope to open more opportunities for these communities, expand coverage and connect more people to the rest of the world.



Thank you!

<https://vbts.pcari.edu.ph>

