

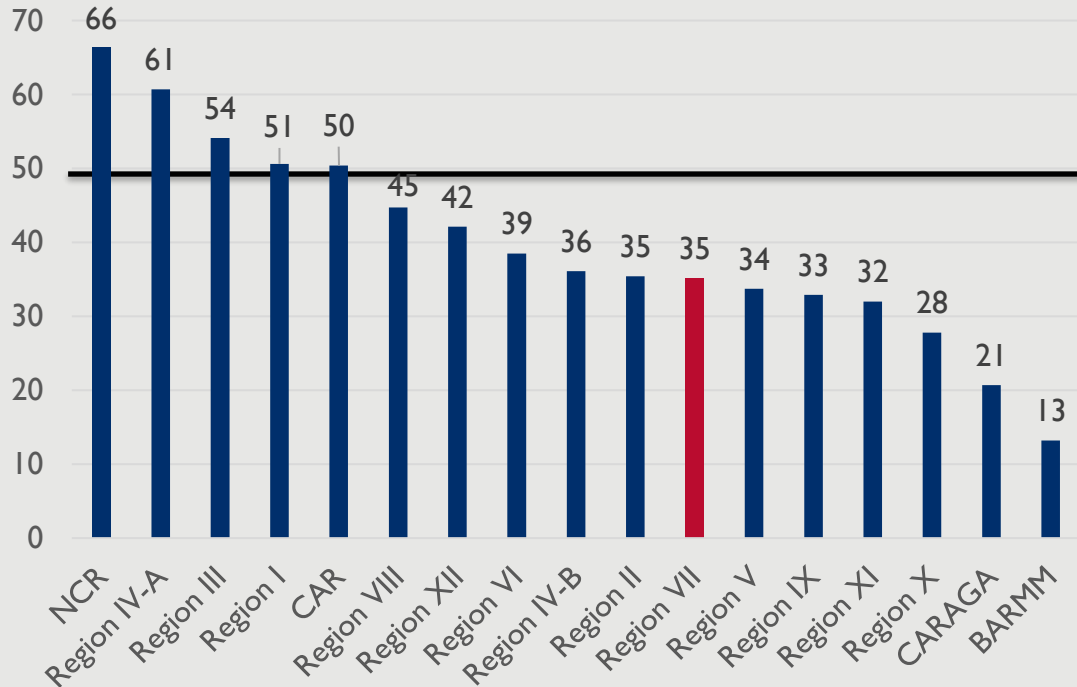


Community Networks: Small scale networking to bridge the digital divide

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PHILIPPINES' NATIONAL INTERNET USAGE BELOW 50%

Internet Adoption (% of population)



- **Region VII** trails national average with only **35%** of Region VII population using the internet; **Behind NCR (66%)** and national average (**47%**)

- Among households **without** access to the **internet**, main reasons are:

- Unaffordable prices

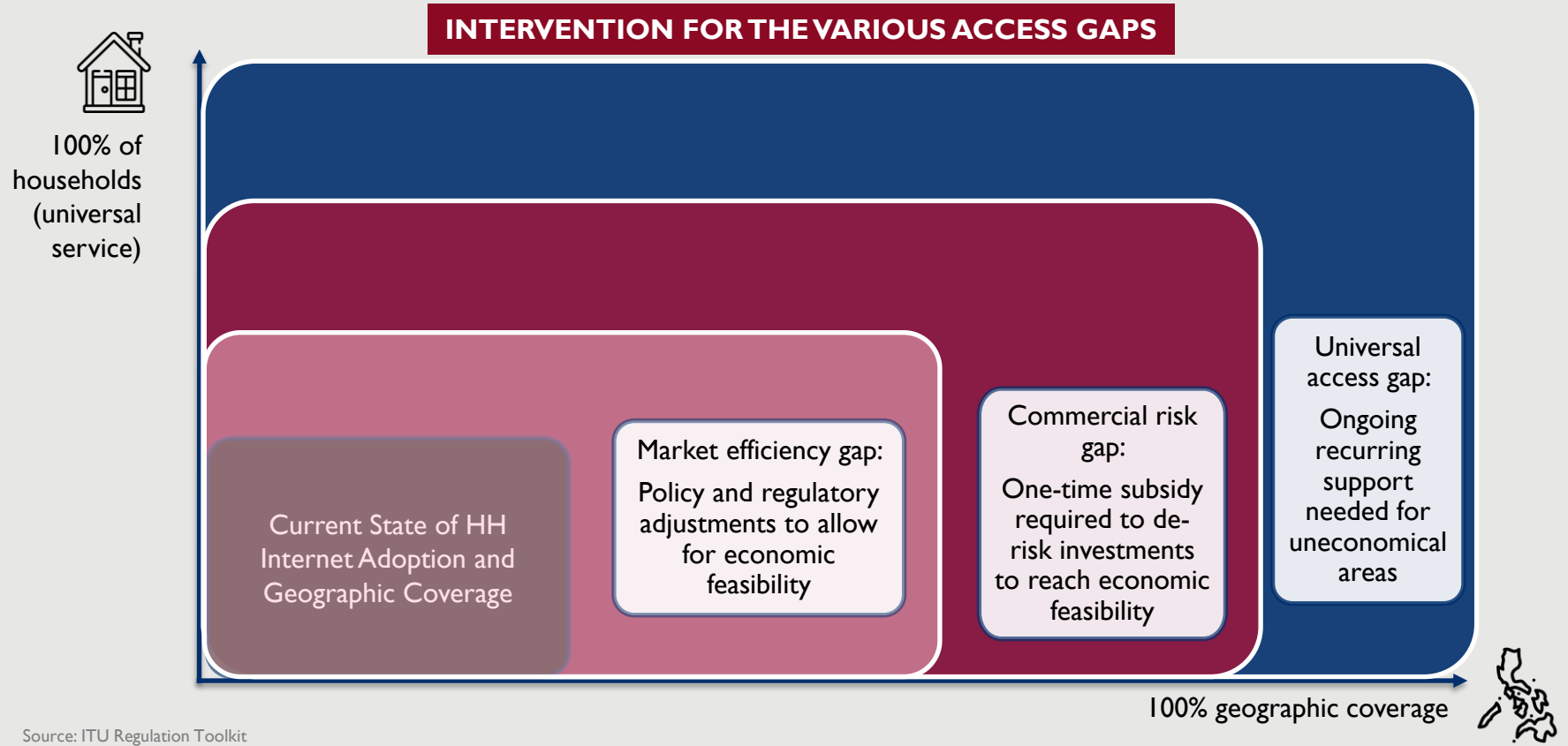


- Internet is not available



OPTIONS TO EXPAND INTERNET COVERAGE AND ADOPTION

There are three types of interventions to increase universal coverage and service for internet connectivity. This includes:



Community networks are designed and implemented through multi-stakeholder collaboration to bridge connectivity gap with focus on sustainability

Community Networks for expanding internet connectivity for unreached communities



Multi-stakeholder approach; communities involved in planning, deploying, and/or operations of the network



Directly addresses the communication and connectivity needs of a specific community

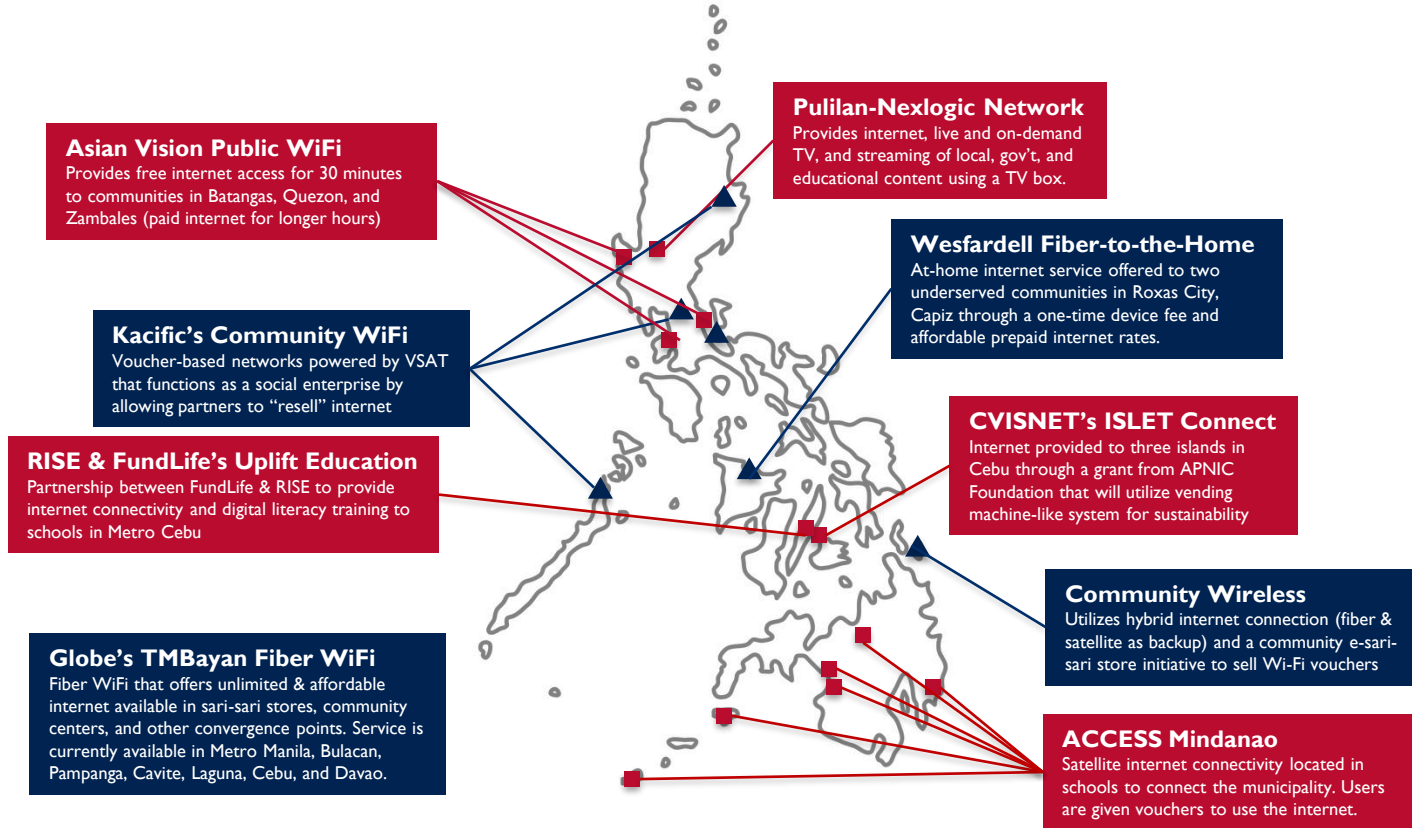
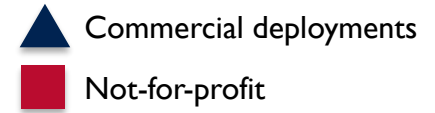


Involves assistance from external parties to provide technical/business support

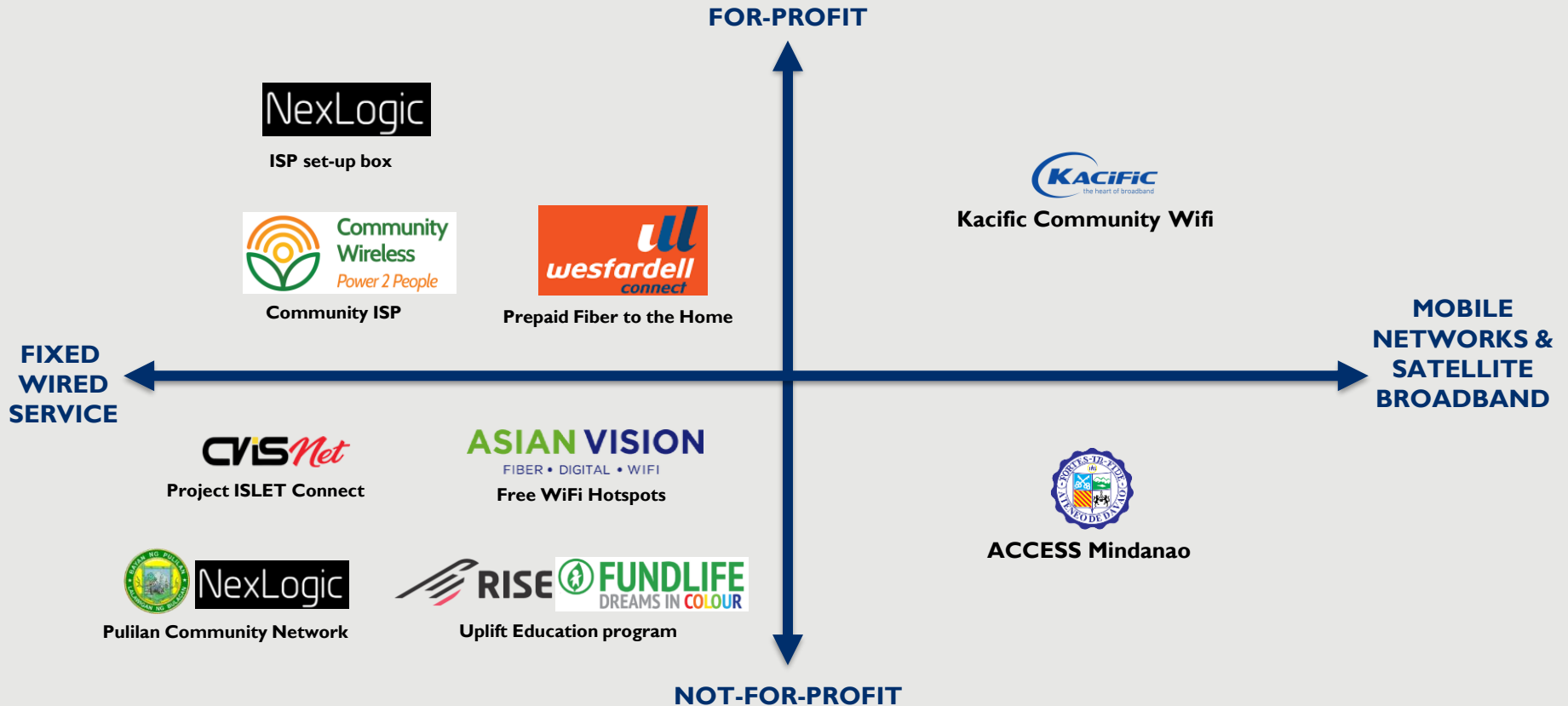


Has mechanism in place to ensure sustainability of the community network

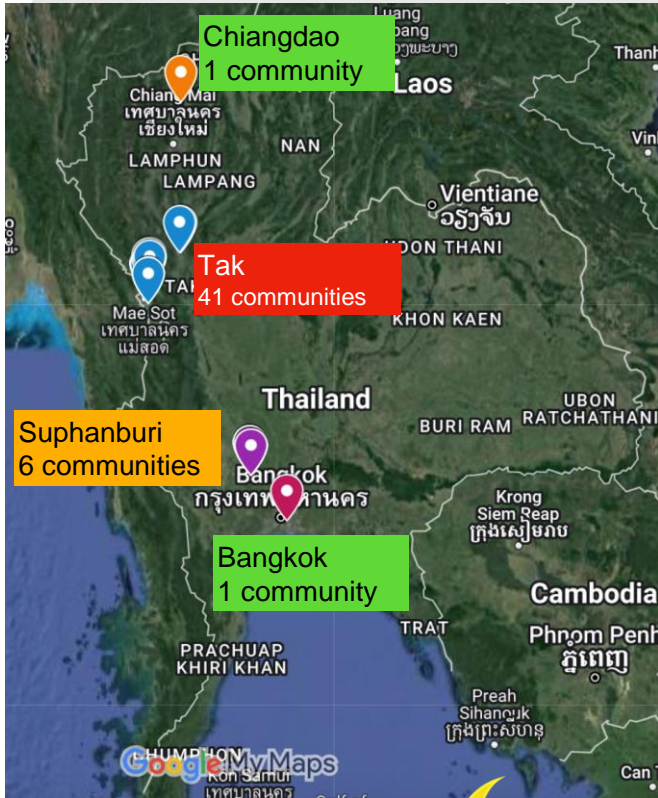
Community Network Models in the Philippines



Majority of community network models are skewed toward traditional wired broadband, but several players are now promoting alternative technologies



TakNet@Net2Home



By 2022
49 Active clusters/communities
500+ Households
100+ Moved to commercial ISPs



Bangkok Community



Tak Community

Suphanburi Community



Chiangdao Community

Breueh Island,
Aceh Besar regency



isif  asia

Ketemengungan Tae,
West Kalimantan

Polewali Mandar
West Sulawesi

Palu, Central
Sulawesi

Ambon, Central
Maluku

Sentani District,
Jayapura Regency

Ciptagelar
30 hamlets
700 daily users



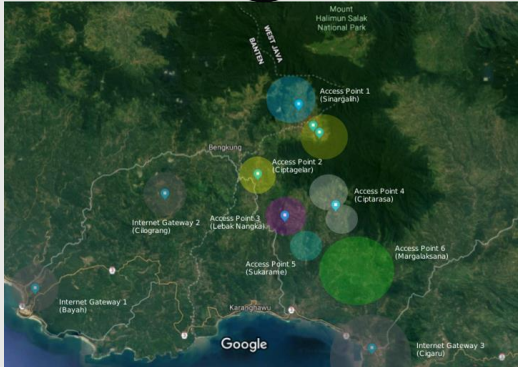
Ciptagelar Indigenous
Community Region,
West Java

Ciracap Sub-district
West Java

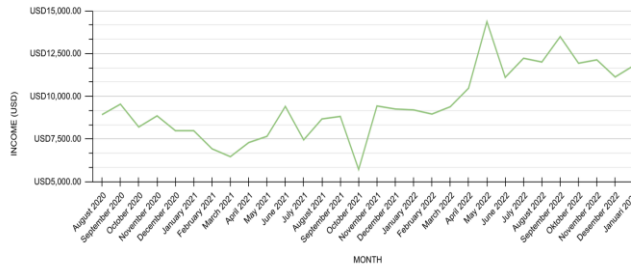
Sukadana Village,
North Lombok

Tembok Village
Buleleng Regency

Mata Redi Village,
Central Sumba



GROSS INCOME AUGUST 2020 - JANUARY 2023
Profit from the sale of Ciptagelar Internet Voucher before profit allocation



ISIF Asia funded projects (2022)

- Bluewave Wireless Company Ltd (Samoa) - Samoa District Connectivity Project
- Janata Wifi Ltd (Bangladesh) - Affordable Internet for the community, by the community.
- Institute for Social Entrepreneurship in Asia, Inc (ISEA) (Philippines) - Building a model for community networks linked to social enterprise and sustainable local economic development
- CVISNET Foundation, Inc. (Philippines) - ISLET Connect
- Lahore University of Management Sciences (Pakistan) - Early warning and communication system for flood risk reduction in Gilgit-Baltistan
- Similie Timor Lda (Timor Leste) - IoT data-driven water management for climate-resilient communities

ISIF Asia funded projects (2021)

- Distant Curve Remote Area Telecommunications (Australia) - Expand the Central Australian Desert Project to serve the Nitjpurru indigenous community in Pigeon Hole
- Papua New Guinea University of Technology (Papua New Guinea) - Sustainable smart villages in rural Papua New Guinea
- Universiti Kebangsaan Malaysia (Malaysia) - Hybrid LoRa Network for underserved community Internet
- Rural Broadband — AirJaldi (India) - Connectivity Bridges: Reaching remote locations with high-speed Internet services
- Common Room (Indonesia) - Local community-based Internet infrastructure development and Internet utilization in rural Indonesia

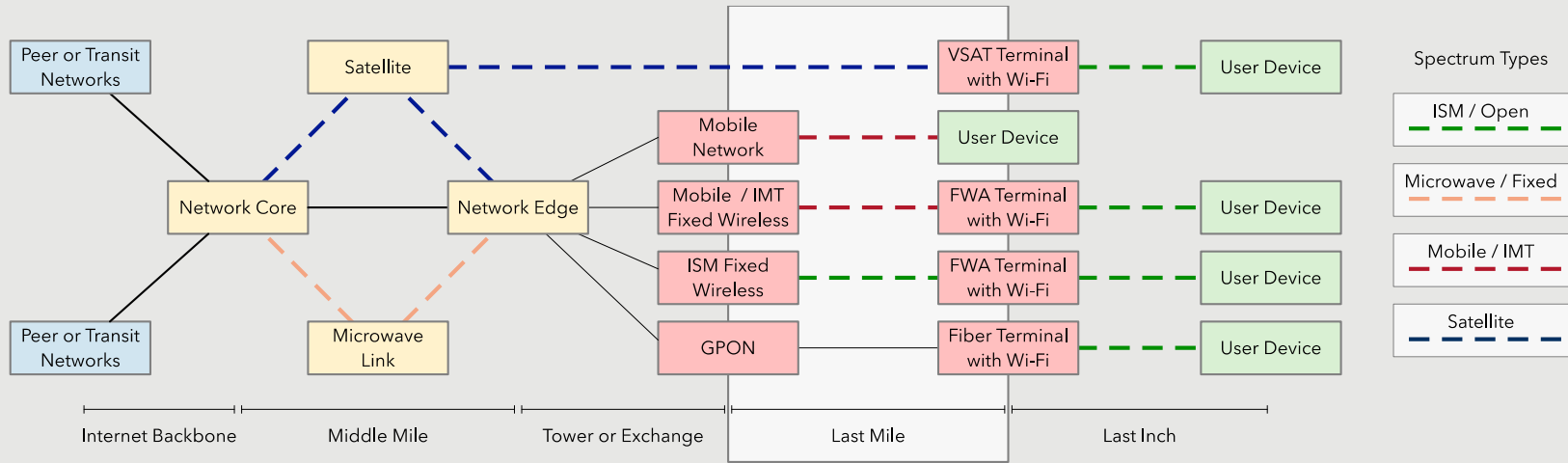
ISIF Asia funded projects (2021)

- Boom! Inc (Federated States of Micronesia) - Broadband for all in Yap
- National Institute of Technology Silchar (India) - Bamboo towers for low-cost and sustainable rural Internet connectivity
- SATSOL (Solomon Islands) - OASIS data garden project
- Davao Medical School Foundation (DMSF) (Philippines) - Internet connection to four villages in San Isidro
- Makerbox Lao (Lao PDR) - Empowering remote agricultural communities in Lao PDR through long-range wide area networks
- Servalots Infotech (India) - DIY COW — An inclusive community operated wireless kit for enabling local communications at remote locations

Enabling Community Networks: Essentials

- Access to Spectrum
- Access to Energy
- Access to Land, Towers, and Buildings
- Legal Permission to Operate

Enabling Community Networks: Access to Radio Spectrum



Four types of radio spectrum are commonly used in Internet access networks:

ISM/Open | Mobile/IMT | Microwave/Fixed | Satellite

Enabling Community Networks: Access to Radio Spectrum

- **ISM or Open Spectrum**
 - Originated with Industrial, Scientific, and Medical (ISM) requirements
 - Generally harmonized worldwide though restrictive and permissive regimes have less and more spectrum available for use
 - Used by Wi-Fi and inexpensive fixed wireless equipment (WISP)
- **IMT Spectrum**
 - Common mobile bands, harmonized by ITU region. In restrictive regimes, available only to carriers or government.
 - USA (CBRS), NZ (Managed Spectrum Park), Europe & UK (Local Private and Shared Networks) make it available to all
- **Fixed Linking (Microwave) Spectrum**
 - Used for small operator and CN backhaul in permissive regimes, only for carriers & govt in others.
- **Satellite Spectrum**
 - Assigned at a global level. Usable by satellite operators for free (without “landing fees”) in permissive regimes, only usable by license and often in partnership with a local carrier in restrictive regimes.

Enabling Community Networks: Access to Energy



Enabling Community Networks: Access to Energy

- **Grid Connectivity**
 - Networks in rural and remote locations with access to reliable grid connectivity are the exception. When they do have access, it's often a connection from a house, farm, or piece of government infrastructure.
 - Power is the biggest challenge for operators of wireless community networks, reliable grid connectivity can make everything else easy.
- **Solar Connectivity**
 - Depending on the location, networks might need will require 3–4 square meters of panels for every 100 watts of power load to provide adequate collection during winter or rainy months.
- **Batteries**
 - All rural and remote networks need batteries. Those on grid will have occasional interruptions, and those on solar rely on batteries so they can operate at night and on cloudy days.
 - An ecosystem of battery supply, service, and recycling is important to support community networks.

Enabling Community Networks: Access to Land, Towers, Buildings



Enabling Community Networks: Access to Land, Towers, Buildings

- **Public Land Access**

- Carriers often have access to land through existing legislation that enables them to build where they need to
- Community Networks would benefit from similar enabling legislation

- **Towers**

- Permits and fees for towers can be a significant barrier to small organizations
- Legislation enabling small infrastructure by default (national environmental standards for telecommunications) can eliminate barriers that often make small networks uneconomic.
- Legislation requiring tower sharing

- **Buildings**

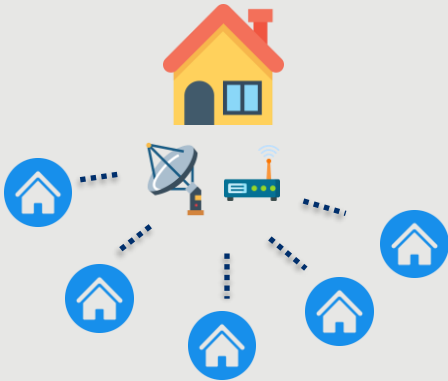
- Most community network infrastructure can exist on buildings and doesn't need dedicated towers.
- Community operators who partner with local governments or utilities can leverage their buildings.

Enabling Community Networks: Legal Permission to Operate

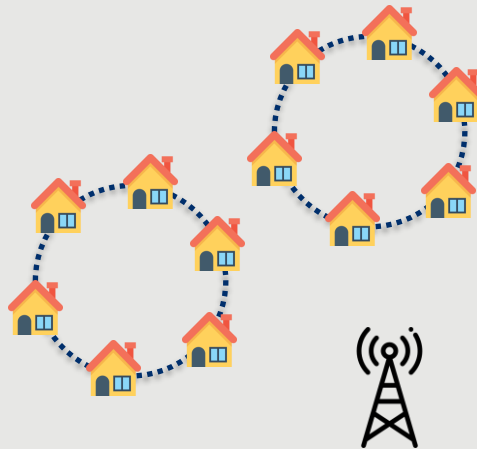
- **Telecommunications Operator License Classes**
 - **Facilities Based Examples**
 - Fixed-line network operator
 - Cable television provider
 - Satellite service provider
 - Wireless broadband provider
 - **Services Based Examples**
 - Internet Service Provider
 - Voice over IP Provider
 - **Where do Community Networks Fit?**
 - New license classes are needed to enable them!

Models of collaboration with public and private partners to support various models of community networks with focus on **sustainability**

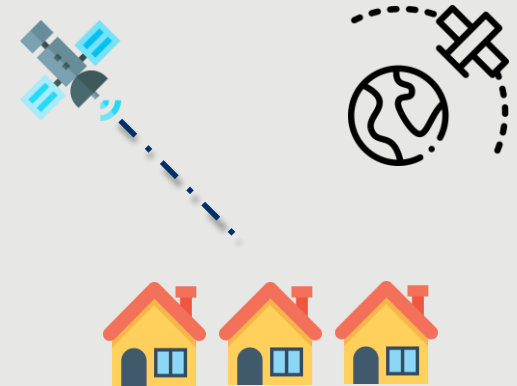
Facilitating partnerships to deploy community networks that double as social enterprises to **foster sustainability**



Providing technical assistance to **scale up or replicate innovative community network models**



Connecting unserved communities through **satellite broadband & other innovative technologies**



Priority to areas where internet connectivity will have a **multiplier effect** and in support of **economic development objectives**



Community centers in rural areas



Cooperatives and community business enterprise centers



Tourism spots & tourism jump-off points



Municipal Halls, Barangay Halls, & DRRM Office



Ports & transport terminals



Other priority areas of partners

PRIORITY AREAS FOR DEPLOYMENT OF COMMUNITY NETWORKS

- Geographically isolated and disadvantaged areas (GIDAs)
- BARMMM & other remote areas in Mindanao
- Collaboration areas with other development projects/initiatives
- Other priority areas identified by government and other development partners

Engagement with local & international partners to pursue its goals and support propagation of community networks

**National
Government
Agencies**

**Local
Government
Units**

**Private
Sector**

**Academe &
CSOs**

**Community
Network
Development
Partners**

**Local
Communities**



- Telecom companies
- Internet service providers
- Satellite Internet Operators
- Mobile network operators

- **Internet Society**
- **APNIC Foundation**
- **Asian Development Bank**
- **Connectivity Capital**
- Internet industry associations
- Other partners