COMMUNITY-CENTERED CONNECTIVITY

FOSU STEPHEN

STEP NETWORK

ABOUT US

- Step Network, a technology-based company which specializes in building Community Networks.
- Promoting digital accessibility and literacy in rural areas.
- It was established in 2012







Why Community Networks



Lack of Internet Access

- No service or poor coverage from telecom providers.
- Expensive internet that local people cannot afford.

Need for Communication

Families want to stay in touch with relatives.

Economic Empowerment

- People want to use the internet for jobs, farming, business, and mobile money.
- To boost local income and opportunities.

For Education

Nurses, Students and Teachers need internet for learning.



Samreboi Community Network



It was established in 2021 at Samreboi Western Region of Ghana.



Kuntu Community Network



It was established in 2022 at Kuntu in the Central Region of Ghana.



Bruben Community Network



It was established in 2024 at Bruben in the Kwahu Afram Plains North which an island in the Eastern Region of Ghana.





Technical Model

Topology: Point-to-Multipoint (tower to communities)

Backbone: Satellite(Starlink)

Infrastructure: Ubiquiti Omini APs

Security: firewall

Monitoring: Uptime-Kuma, Zabbix & Nagios



By Stephen Fosu Step Network 03-01-2024

Challenge

Limited Infrastructure

• Challenges include unreliable electricity and bad roads

Funding

• Challenges in covering both initial setup and ongoing maintenance.

Language and Literacy

- Most online content and applications are in English or non-local languages.
- Low digital literacy

High Cost of Internet and Devices

- Devices like antennas, and even smartphones can be unaffordable.
- Backhaul costs are often too high for rural or low-income communities.



Way Forward

Community ownership training

• Educate residents on managing and sustaining their own network, including basic finance, governance, and decision-making.

Train-the-Trainer programs

 Build local skills by training community members who can teach others digital literacy and basic IT skills.

Technical training

• Offer workshops on network management, cybersecurity, and troubleshooting for local technicians.

Affordable licensing

• Introduce low-cost or free spectrum licenses for community use.

Scaling Up

- Replication of Successful Models
- Partnership Expansion





THANK YOU & YOUR QUESTIONS





Meaningful Connectivity and Community-Driven Connectivity Solutions





Meaningful Connectivity Indicators



- 4G-like speeds a fast and reliable internet connection that allows for smooth browsing, streaming, and using online applications
- Smartphone ownership allows for greater mobility and the ability to stay connected on the go
- Daily use- allows people to integrate the internet into their lives for tasks like communication, education, work, and entertainment
- Unlimited access point -provides a reliable environment for online activities without worrying about data caps or limited access
- Digital skills These are crucial for people to navigate the online world effectively and reap the full benefits of connectivity
- Safety and security Protecting privacy, ensuring cybersecurity, and safeguarding children online
- Sustainability Promoting environmental sustainability and economic viability of connectivity initiatives

Offline and Falling Behind: Barriers to Internet Adoption

Limited/No Coverage

This includes cellular towers, fiber optic cables, and reliable electricity grids, making it difficult or expensive to establish a stable internet connection.

Limited Digital Literacy Skills

To effectively use digital tools and make entrepreneurs more susceptible to online scams or cyberattacks, creating a fear of using online financial services or platforms.

High Costs

The cost of internet access, data plans, and devices can significantly burden low-income entrepreneurs, limiting their ability to participate fully in the digital economy.

Social Norms & Cultural Practices

In some communities, traditional gender roles or cultural norms may limit women's access to technology or participation in online business activities.

Fundamentals of Community Networks



SCOPE

- Market context that necessitated the network
- Impact of not intervening digital divide and communities left behind
- The initiating energy for the project
- The community champions
- Area of coverage identified
- Technical skills and expertise required
- Equipment and infrastructure needs
- Roles and responsibilities
- Governance mechanism
- Navigating the principal agent relationship
- Financial (costs, revenue, and funding)
- Non-financial sustainability (community participation, organizational, legal)

Community Centred Connectivity Initiatives

COMMUNITY CONNECTIVITY PROVIDER



- Socially focused & purpose-driven
- Community-led
- Open and carrier-neutral networks
- Decentralised nature
- Localised locally owned or operated
- Not for profit / cost-recovery model
- Grassroots / bottom-up
- Collective ownership
- Self-deterministic

VS.

TRADITIONAL OPERATOR

- Profit-driven
- Commercially-minded
- Centralized infrastructure
- Privately or state-owned
- Profit-extraction
- Professional and top-down
- Knowledge concentration / specialization
- Investment from traditional sources
- No / minimal user participation in network governance (design, deployment, operation)

HOW: Community Approaches to Self Provisioning of Locally



PamojaNET Community Network





Battery Operated Systems for Community Outreach Uganda



- BOSCO started by addressing the lack of electricity in the area by providing access to solar electricity systems to help school-based education and create job opportunities for youth. This also involved deploying five "mini grid" solar power systems (of up to 30 kW) supported by a grant from the Accenture Foundation
- The mini grid solar power systems are placed in schools and in a commercial centre, and costs are recovered through purchases of energy by the schools and small businesses, and by BOSCO for their ICT centres.
- Conducts PV solar system training for our community members to enable them easily to maintain and manage the ICT Centres.

Enabling Local Businesses



- More than 5,000 people have now benefited from free access to Pamoja Net
- Research by La Difference revealed that 98% of users felt that Pamoja Net had contributed to a positive change in their lives, whether it was a new ability to connect with family and friends, to conduct educational research, job applications, or to save money
- For example, the Cooperative Society of Coffee Planters and Traders of Kivu has reported that internet connection has improved their business operations by streamlining communication with buyers and supporting the sales contract culture
 As a result, the cooperative was able to partner with international buyers, including Starbucks and Blanchard

Developing Community Digital Skills



The organization has a total of 54 centers in the districts of (Gulu, Amuru, Nyoya, Pader, Argago, Kitgum, Lamwo, Oyam, Omoro, Lira, Adjumani, Yumbe, Arua districts. There are centers in refugee settlements Pagirinya, Maaji, Bidibidi, RhinoCamp, Nvempi, Omugoll in partnership with UNICEF. Build the capacity of community members through training in ICT skills that seek to relate to the lives of community members irrespective of what they do

Barriers for Emergence and Growth for Community Networks

| Regulatory Environment | Technical and Organizational Expertise | Operational Difficulties | Demand-side issues |
|--|--|---|--|
| Restrictive license issuances High licensing costs Taxes, customs, and import fees Low availability / access to spectrum for smaller networks to use or share Government bureaucracy, delays and long waiting periods to obtain permissions & licenses | Lack of initiative, leadership & skills to set up broadband projects in rural areas Limited managerial experience Lack of awareness of benefits of creating own network Perpetual cycle of training and retraining because of talent drain to other opportunities | Lack of affordable or reliable energy supply High costs for backhaul connectivity Low availability of international bandwidth of transit Lack of coordinated activity between MNOs and infrastructure providers Lack of mapping of existing infrastructure Theft of equipment Political risk and currency volatility risk | Limited availability of information on demand Low affordability of services Prohibitive cost of devices Lack of digital literacy and awareness Low perceived relevance and attractiveness of content for end-users |
| licenses | | | Demand volatility |

Financial Resources

- Very limited availability of financial resources
- High cost of credit
- Heavy reliance on philanthropy (limited pool of grant funders) and contributions from governments, USFs
- Limited options for monetizing services
- General lack of land or other marketable assets
- Choosing between other vital necessities such as food or healthcare

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