

Scalable Models for Establishment of Sustainable Broadband Services in Rural Areas of developing regions

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Outline of case studies

This session was focused on connectivity and presented experiences based on available communication infrastructure, to an increasing extent optical fibre, to provide broadband services, as well as experiences using infrastructure-less communication systems using self-configuring ad-hoc network technologies to establish sensor networks for environment monitoring. Cases were presented from Rural Tanzania, Kenya and Malawi.

Challenges

The challenge is to develop “markets” where demand, provided by consumers and their ability to pay, and supply, provided by technical solutions and entrepreneurs provisioning affordable services sustainably, can meet in areas where both are small but not negligible. We regard Usage, Technical Solutions and Entrepreneurship as the three enabling pillars of our approach and add Impact Analysis as a validation mechanism.

Usage

To attract infrastructure investments the usage initially targeted is focused on basic public services, education, health and local government services, including environment monitoring and support to rural entrepreneurs. In the operation phase, no stone should be left unturned in the search for customers willing and able to contribute to covering the operational costs. The trick is to find value for users by reviewing traditional work procedures to produce more for less.

In the education sector, tertiary, secondary and primary education have different needs and impact. Universities are in many ways self-sufficient and prime motors in the establishment of the knowledge society in most countries. Most have private campus networks that are becoming interconnected via national research and education networks and regional backbones between continents to share global resources for research and education. Tertiary level ICT education is, however, a severe bottleneck in the development process in all sectors of society. Secondary and primary level education need teacher training in ICT usage, both pre-service and in-service, connectivity and learning material taking advantage of the medium.

In the health sector, the obvious targets include acute logistics (ambulance), sentinel surveillance, remote consultations, patient records, hospital information systems and continuing education of health workers.

Local government can benefit from ICT usage in most their responsibilities, including budgeting and accounting, education and health, a wide spectrum of environment issues, services to the citizens,

utility services such as water supply, support local entrepreneurs, both as users of ICT and as service providers, etc.

Technical Solutions

The potential technical solutions in a specific area, depends on what infrastructure is available or can be deployed, be it radio spectrum or optical fibre cables, the most powerful communication infrastructure. It is our strong recommendation to include deployment of fibre in all infrastructure projects, such as power networks, pipelines, railways, roads, etc. The marginal cost is marginal.

Network equipment with reasonable availability is inexpensive and straight forward to use. Servers and clients are also becoming inexpensive but require more competence to configure, maintain and use. Competence in the areas of network design implementation and administration, computer system configuration and administration, and information systems design and implementation is in short supply, as well as education in these areas. Universities have a role to play in this field, by encouraging and stepping up the exchange, production and dissemination of educational information.

Where fibre is missing, inexpensive wireless broadband technologies can be used to extend network coverage up to 100 Mbps. A mixture of point-to-point and point-to-multipoint technologies can form backbones providing connectivity to remote villages over distances up to tens of kilometers. Beyond the horizon, the resort is broadband VSAT or narrowband shortwave radio links up to a few kbps.

Entrepreneurship

The availability of end-user applications and of technical solutions are necessary but not sufficient for services to be provisioned. Entrepreneurs are necessary spanning the value chain for providing communication services, from passive infrastructure, cable deployment, equipment distribution and repair, to systems and network administration, software support, help-desks and business development to take advantage of ICT. Missing links in the value chain may define business opportunities or may call for special arrangements, such as the entrepreneurial cooperative efforts or community intervention.

Impact analysis

There are no generic methods for benchmarking the development of sustainable broadband communication markets in rural areas. Such methods would support the structuring of the development process and track progress, stimulate discussion and cooperation and facilitate for donors and funding agencies to monitor, document and communicate progress in its development programmes. Attempts have been made to outline such a generic benchmarking method based on the development strategy outlined above. The benchmarking parameters suggested include:

- Relevant policies and regulations, in particular in the areas of communication and competition, including law and law enforcement
- Stakeholder analysis describing value chains, actors and business models
- Maturity of the usage of ICT and business development activities in the public and private sectors and in the civil society, with a focus on the most important areas for the progress towards the Millennium Development Goals: healthcare (eHealth), education (eSchools), support to local entrepreneurs, and

local administration (eGovernment)

- A generalized teledensity parameter including the penetration of terminals for data communication, broadband access and backbone capacity.

Recommendations

The adoption of open policies regarding access to communication infrastructure, both wired and wireless, is an efficient way of making broadband connectivity more available. Infrastructure like optical fibre should be regarded a utility like roads, water supply and sanitation systems, power supply, etc. Return on public investments will be indirect, in terms of lower communication costs for public sector and increasing tax revenues from new commercial activities made possible by access to this infrastructure.

Since the availability of human resources is a major bottleneck in making broadband access ubiquitous, integration of development and capacity building is an efficient way to build capacity. Problem-oriented development projects have been successfully used to drive individual learning towards diplomas and degrees, organizational learning towards certificates and consortial learning refining the understanding of the roles of different actors on the market being developed.

Way forward

The pavement of the way forward is open policies and regulatory frameworks, The first step is deployment of open access infrastructure. Mass movement requires stakeholder analyses and formation of local multi-stakeholder partnerships interested in ICT use, development of human resources, organizational certification and a deeper understanding of the market to be developed.