Developing Sustainable Models for Rural Communications the case of the MICTI FMFI Project

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Motivation, problem area

- Telecentres in Mozambique are located in rural areas. The self-sustainable operation of these public access centres represents the biggest challenge and the key-factor for the success of such initiatives;

- The level of connectivity and access to communication means are poor and the costs are very high;

- Around the Telecentres, there are some local public (government) institutions, NGOs, schools and business entities, and all require access to information in their daily activities; and

- Based on these facts there is a need to seek for innovative and low cost alternative means access to information.

Motivation, problem area

- In less density areas, transmitting using wireless signal can carry internet traffic, including data and voice, more cheaply, and often more reliably, than much of the existing traditional telecoms equipment.
- So it costs less and it can reach further, but is that enough to bring a meaningful result to a disempowered and disconnected community?
- The answer lies in the opening of wireless standards, and the way that the community can harness their wireless network.
- With wireless links, their connectivity is driven by an infrastructure that communities can build, own, maintain and develop themselves the network.

Vision, Mission

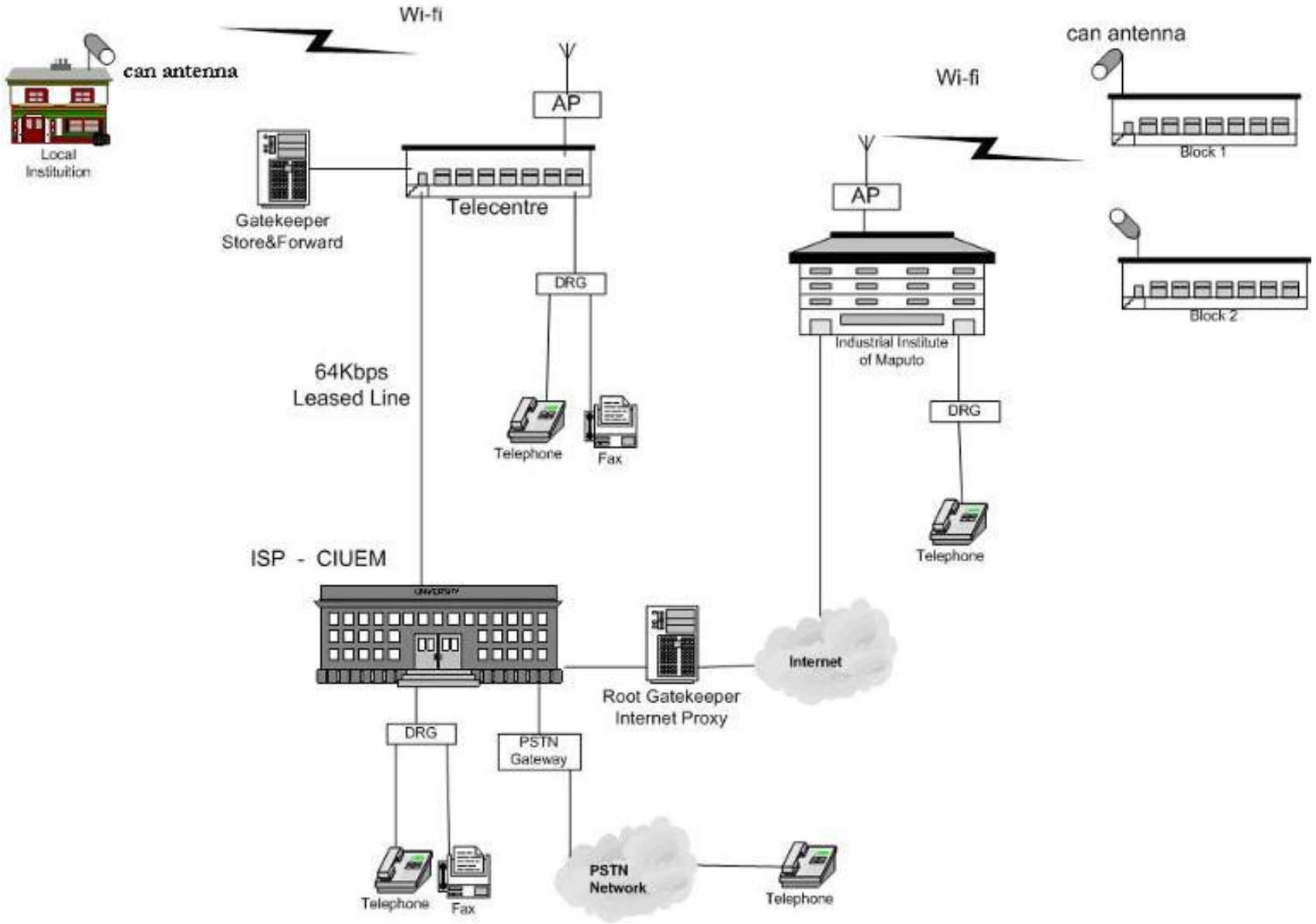
- **Vision**
  - To enhance communication means to allow interaction and networking between communities, which will contribute to achieve social and economic growth, and to improve the quality of life (wealth, health and education)

- **Mission**
  - The above will be achieved by using Telecentres as a small scale ISP providing Internet access and VoIP services to the communities in the neighborhoods, through innovative and low cost access technologies in a sustainable development model based on the creation of local human resources capacity

Project Objectives

- To implement technological solutions that contribute to a major involvement of the communities in the use and development of ICT resources;
- To facilitate and stimulate the development of local contents;
- To empower the local communities by the introduction of new ICT services and technologies; and
- To make use of the potential of innovative and low cost ICT technologies.

The Proposed Model Implementation Scheme



The Proposed Model Implementation Process

- The project implementation was divided into two phases:
  - Wireless links setup - putting the telecentre as small-scale ISP using can-antennas for wireless links made successfully possible to link local public institutions (in Manhiça) and NGOs (in Chóckwe).
  - Voice message services - implementing VoIP based solutions tested within the Eduardo Mondlane University Main Campus and between the telecentres and the University.

The Sustainable Business Case

- An assessment made to the telecentres identified that the bottleneck in their operations is the cost and quality of the connectivity. A solution was to bring a concept that could allow the enhancing of the quality of the link and the same time putting in place a mechanism to cover the costs of that link.

- The solution then proposes that the telecentres would implement wi-fi links to the surrounding organizations with capacity to pay for an internet link. The monthly fees collected from these organizations would be used to pay the telecentre ISP. As more organizations request to be linked more bandwidth the telecentre would request to the ISP as this will be on shared basis.

The Sustainable Business Case

- With the aim of building local entrepreneurs who then could technicaly assist after implemented the solution in the districts, a concept of homebrew antennas was used which includes lot of technology and skills transfer to the people involved in the project implementation and there is an opportunity for learn by doing and to run open courses on homebrew antennas. The replication of this initiative is present has during the implementation new people are trained and involves local organizations (the benefits), local entrepreneurs (the future service provides).

- The rural communities would benefit by having access to internet in a reasonable price from more places, local government workers are having access to internet for free in their jobs.

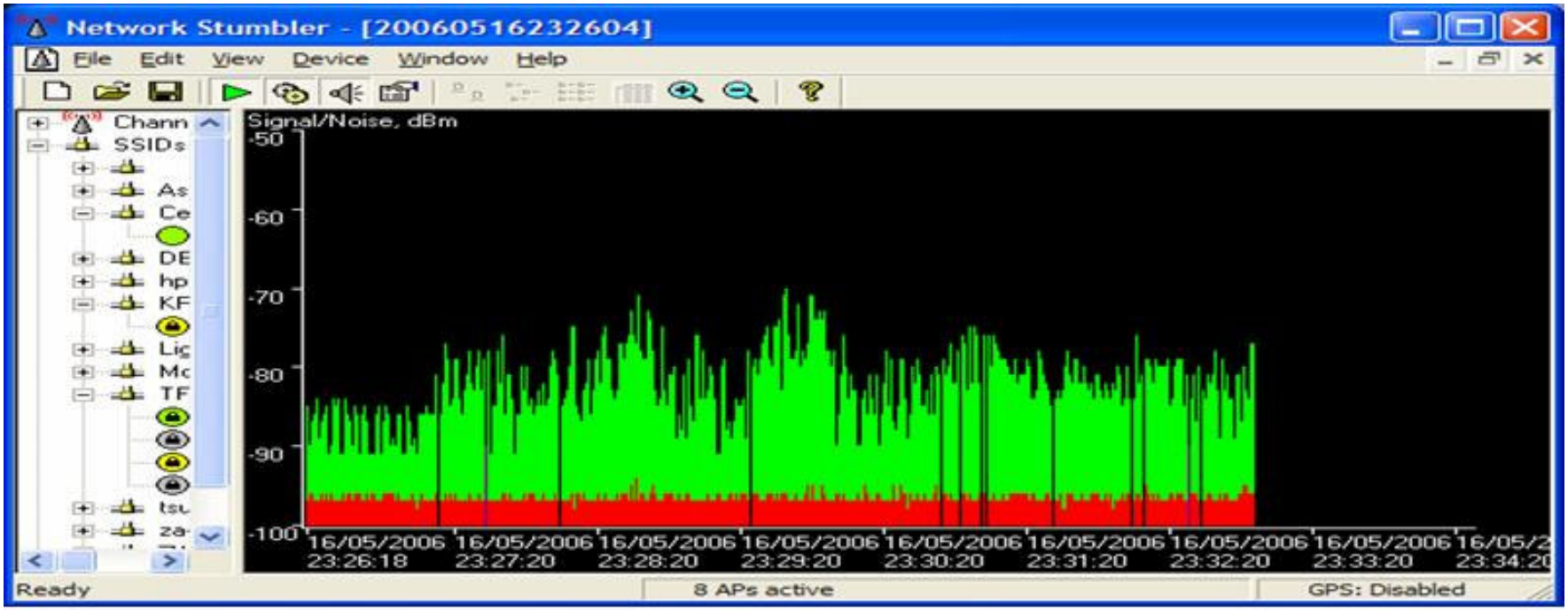
Project Development

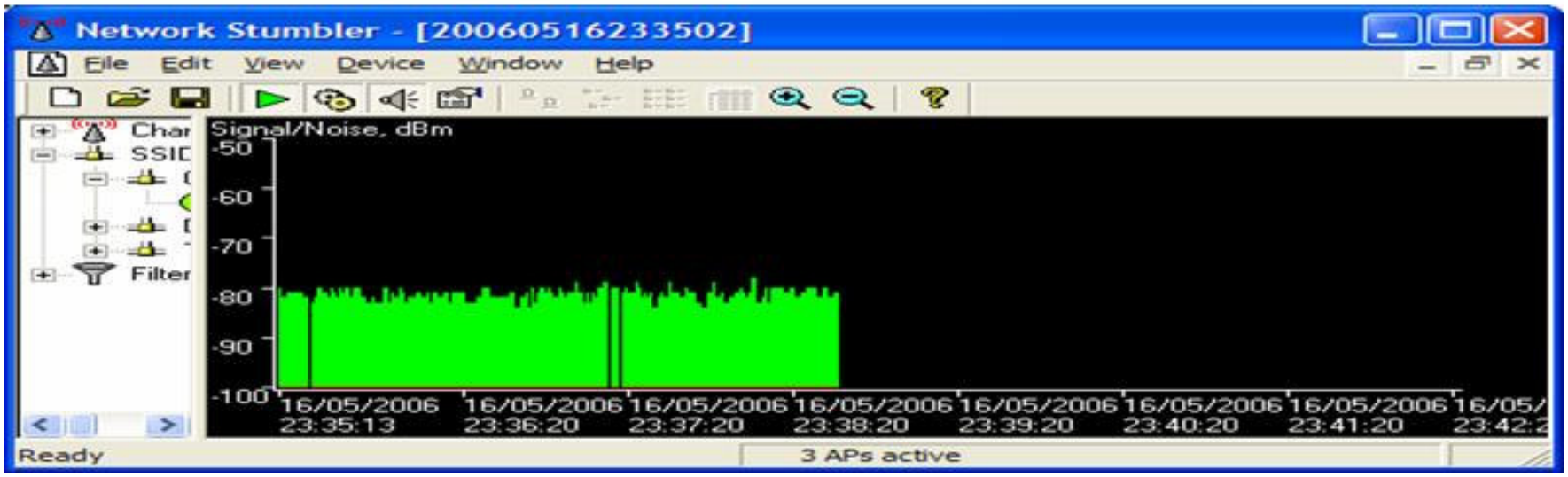
- **Phase 0**
  - Desktop research
  - Identification of pilot locations
  - Equipment specification

- **Phase 1**
  - Technology development and testing
  - Piloting
  - Monitoring and Evaluation

- **Phase 2+**
  - Dissemination and policy intervention
  - Replication

Technical Aspects (Local Tests)





Technical Aspects (Local Tests)

- VoIP messaging solution
  - Servers
    - Asterisk
      - Voice mails boxes
      - Audio Stream
      - PSTN Gateway
    - SER – Sip Express Router
    - Handling VoIP Calls
    - Combination with RTP Proxies
  - Clients
    - Softphones (X-Lite, SJphone)
    - Analog handsets connected to terminal adapters

Major Outcomes/Results

- The District Government Administration is open to provide personnel to be trained to work at the telecentres and the technical officers. This would contribute to retain the staff at the district after trained as they would have a permanent employee contract.
- In Manhiça District Government Administration there used internet to research on how to write strategic plans and got remote assistance from experts living in Brazil and Portugal on writing and revise the document.
- The Municipality which used the e-mail for to do the procurement (requesting and reception of quotations), then reducing costs on the sending faxes or travel to collect the quotations. They are considering on developing a web site to publish activities undertaken and business opportunities within the municipality.

Major Outcomes/Results

- Appling this solution helped the district government administration and the municipally having access at a reasonable price at the same time contributing to the sustainability of the community centre which would then continue providing internet access to the public in the district. This approach used by the project members brought a challenge to the policy makers in terms of thinking on which framework would be used to regulate the use of communication means in disadvantage areas were the business market still infant.

Major Outcomes/Results

- The Communications Regulator invited MICTI to attend some working meeting for the development of the Universal Access Policy and its implementation strategy and the MICTI project was identified as innovative idea that could be used by local entrepreneurs to provide access in remote areas.

- It was established an interaction channel between the regulator and MICTI to develop and implement innovative communication solutions for communities, frequent meeting held between parties

Challenges

- **Human capacity:** The staff required for the project implementation had to be initially trained to acquire the needed knowledge to implement and monitor the project. This process resulted in a somehow endless cycle due to the fact that the trained people often get better job opportunities with the acquired skills and end up leaving the project.
- **Procurement of equipment:** Equipment procurement in Mozambique observes delays, due to the fact that some key components needed to build the antennas (e.g. N-type connectors, pigtail, some coaxial cable) are not available in the local stores.
- **Connectivity at the Telecentres:** the existing bandwidth in the telecentres is not sufficient to provide communication using VoIP based solutions, there were many cuts during the communication.
- **Policy and legal framework:** The VoIP telephony is not allowed in the country, the fixed telephony still monopoly of TDM and can only be used in the areas were TDM is not operating. The small scale ISP being implemented in the telecentres faces to constrains being the one related to the use of radio frequency that needs to be authorised by the communications regulatory authority and the second related being a service provider that needs also a licence from the communications regulatory authority. This is an impediment and increases the costs of operations and affects the sustainability of the project.

Conclusion

- Al the local level the equipment acquisition and frequent changes in the research team affected the accomplishment of the project objectives

- The low bandwidth allocated to the telecentre is one of the barriers to implement some of the services proposed. In this regard some modifications had to be done in regard to the VoIP based services and reduce the number of sites to be linked to the telecentre.

- Regulatory obstacles have long been the major barrier to progress in many areas of ICT development. Ownership and Partnership are keys to sustaining ICT-enabled development activities.

- Locally-owned networks sometimes enjoy some financial advantages due to their small size and not-for-profit objectives, e.g. in-kind contributions from community members to traditional operations.

Outlook

- For a sustainable business model for the telecentre operation, the project has to take into account the following:
  - Number of sites connected to internet through the telecentres and the bandwidth allocated to the telecentre and to each site;
  - VoIP based services that not require high bandwidth;
  - Most of the people living in the neighborhood of the telecentre are not technology literated, then it is recommend the implementation of user-friendly technologies; and
  - Piloting using also state departments to reduce the possibilities of blocking behavior, while waiting for the fixed telecom liberalization.

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