

Connecting Rural Communities

Multimedia Services for Rural Areas using Wireless IP Technologies

Presentation for the Digital Opportunity Forum-Asian Diversity and the Role of Japan

Yasuhiko Kawasumi (Japan Telecom),

Rapporteur for Focus Group7 of ITU-D

ITU Headquarters



Outline of this Presentation

1. Introduction of FG7: Collection of case reports via web site and analysis of the collected reports
2. Findings: Applications
3. Findings: Technologies
4. Follow up of Recommendations
5. Task Force Activities
6. Implementation of Pilot Projects

Focus Group 7 Background

- Topic of study formulated at ITU's WTDC98 (Valleta, Malta)
- Terms of Reference approved by Telecom Development Advisory Group Meeting in April 1999
- Funded by a Voluntary Contribution from the Government of Japan
- After one year period of activities, FG7 presented a final report, "New Technologies for Rural Applications" to SG2 (Sep.) and TDAG (Oct.) in 2000.

Focus Group 7 Activities and Output for 1999-2000

- 81 members from private sector, public sector, and academia
- Case Library: Approximately 60 case studies collected
- Web site: During its first year of operations, over 1000 visitors from more than 60 countries visited the site
- Discussions groups were conducted via email and archived on-line
- Report published in 3 languages, CD-ROM in 3 languages and including case studies

Focus Group 7 Background (continued)

- The report addressed the access network, including the local loop, and end-user terminals, as well as off-grid or renewal energy solutions.
- The report identified a need for low-cost, wireless access technologies with packet-based networks for the possible delivery of multimedia applications.
- Based on the report's findings, six recommendations are addressed to the BDT.

FG7 Recommendations

1. Promote the development of low-cost information appliances for rural use.
2. Create a renewable energy handbook on small-scale power systems for rural ICTs.
3. Increase collaboration with micro-finance organizations to develop communication-based rural businesses and applications.
4. Conduct pilot projects of packet-based wireless access infrastructure for multimedia applications.
5. Maintain and expand FG7 Web site.
6. Hold a symposium on new technologies for rural applications.

2. FG7 Findings: Applications

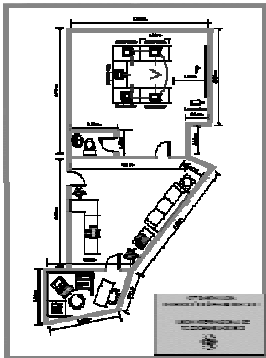
Women in Mozambique listening to broadcasts on a clockwork-powered radio



Source: Freeplay Foundation

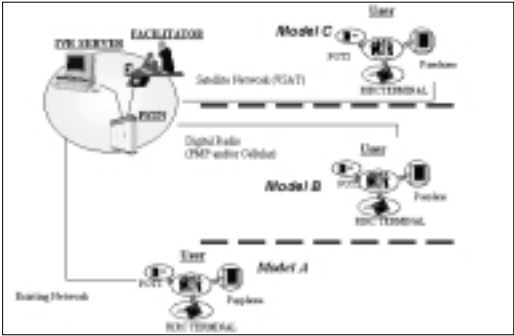
Community and Business Development Applications

Multipurpose Community Telecenters (MCTs)



Equipment layout at the Valle de Angeles MCT

Telephone-based Interactive Voice Response (IVR)



Three access options for delivering relevant information to rural communities over the PSTN (Source: RISTI - Telkom Indonesia)

Telemedicine



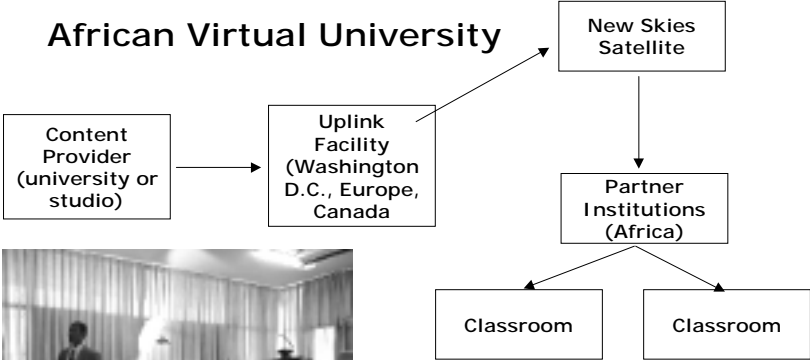
Videophone Telemedicine in Indonesia



Electrocardiogram monitor that transmits patient data over a regular telephone line

Tele-education

African Virtual University



AVU classroom at the Ethiopian Civil Service College (left)

Trends in rural applications

- Specialized expertise used to design applications in education, health care, administration, etc.
- Widespread adoption of Internet platform and multimedia content
- Presence of multiple actors: PTOs, Governments, NGOs, UN Agencies
- Lack of telecom connectivity still #1 barrier in rural areas

3. FG7 Findings: Technologies

Wireless Access Technologies

EXISTING

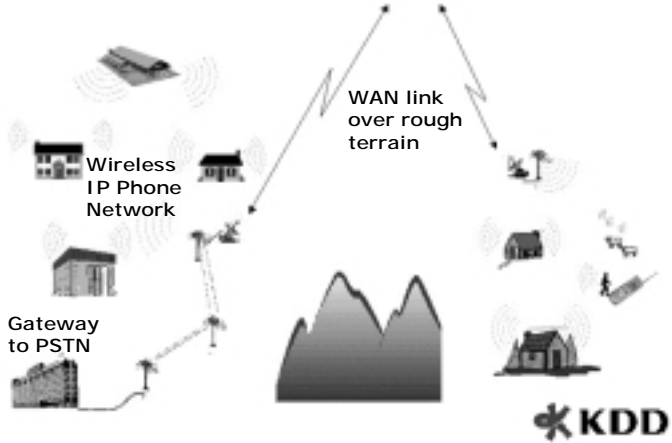
- VHF radio
- PMP/Cordless WLL
- VSAT
- Digital satellite radio
- PHS-WLL

EMERGING

- GSM 400
- CDMA450
- IMT-2000
- Wireless routers(VoIP)
- Two-way satellite Internet access

Wireless IP-Based Networks at PSTN Edge

Recommended technology for rural applications



**Packet-Based Wireless Technology combined
with Internet Protocol(IP) Routers**

- Advantages over circuit-switched networks becoming the platform of choice for new telecommunication network
- Data-path(channel) to be shared simultaneously among users in the network(low cost services)
- It can be multi-media platform including voice services(VoIP)
- Flat rate can be applied (simple billing)
- Automatic rerouting capability(protection for facility failure)

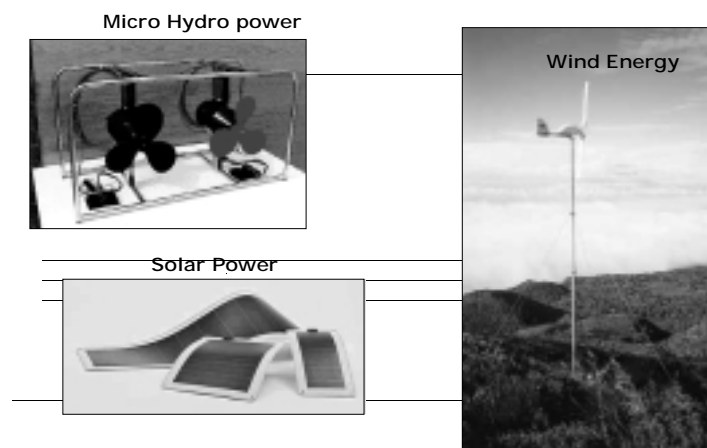
Wireless has advantage over copper wire

- Important tool for reducing the digital divide
- Provide fast roll-out time
- Lower maintenance cost and greater network flexibilities

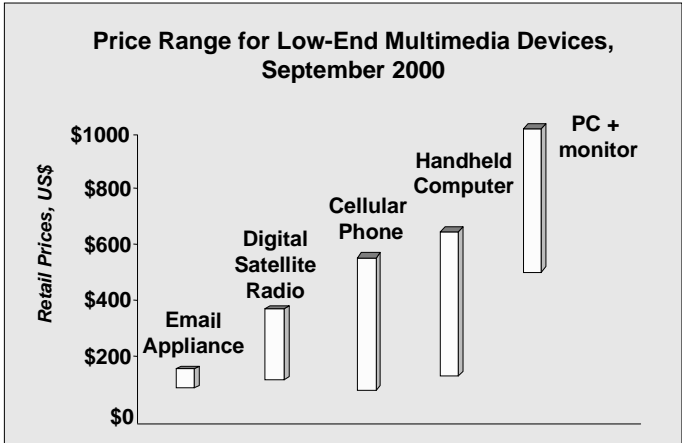
Wireless Routers

- Determines the next network point through which a packet should be forwarded to its destination
- Router is connected at least two network, decides which way to send each information packet based on the current understanding of the state of the networks to which it is connected

Powering rural and remote telecom installations



Taking advantage of low-cost multimedia devices



Lowering the technical skills barrier using information appliances

- To install a pre-configured email appliance:
- insert batteries
 - plug in telephone line
 - turn on machine

- To install PC-based email:
- connect hard disk drive, monitor, keyboard and mouse
 - plug computer & monitor into 110/220 AC outlet
 - boot up the hard drive
 - navigate the file management system
 - install email software
 - configure dial-up access number, modem rate, SMTP server, etc.



Guidelines for Rural ICTs

- Modularity and scalability
- Use of wireless technologies
- Low frequency bands
- Remote network management
- Simple configuration & operation

Guidelines for Rural ICTs (con't.)

- Accessible user interface
- Long life cycle
- Multi-user terminals
- Standards compliance
- Low power requirements

4 Follow up FG7 Recommendations

Proposed FG7 Task Force

- Small group of volunteers among the ITU-D Study Group members offering to advise the BDT Director on the implementation of FG7 recommendations. Tasks include:
 - Monitor implementation progress of all FG7 recommendations
 - Formulate suggested criteria for the establishment and location of pilot projects
 - Contribute to cross-communication and coordination efforts among all parties

5 FG7 Task Force

Task Force Activities and Output for 2000-2002

- Task Force created in 4th TDAG meeting, October 2000. A group of interested volunteers, led by Mr. Kawasumi, to help the BDT in implementing FG7 final report recommendations.
- 27 members
- The Terms of Reference of the Task Force:
 - Advise and assist the BDT in implementing all Focus Group 7 recommendations;
 - Assist the BDT in identification and implementation of pilot projects involving new technologies for rural applications. To this end the Task Force might develop criteria for the establishment and location of pilot projects;
 - Assist the BDT in identifying potential sponsors for the pilot projects and in the mobilization of resources - technological, human and monetary resources for the implementation of the Focus Group 7 recommendations in general;
 - Contribute to effective communication and coordination efforts among all parties in the application and utilization of new technologies for the provision of telecommunication services in rural and remote areas.
- The Task Force is expected to be active until March 2002

First Task Force Meeting: 20th February 2001

- Discussion and prioritisation of the 6 recommendations made by FG7 final report
- Priority was set to conduct pilot projects of packet-based wireless access infrastructure for multimedia applications to be provided in an affordable and sustainable manner
- Objective and Criteria for the launch of pilot projects were created
- Total budget for the year's activities estimated at \$570,000
- Discussion regarding ways in which the BDT could identify potential sponsors for the pilot projects and in the mobilization of resources - technological, human, and monetary for FG7 activities in general.

Objective of Pilot Projects

- **1) To create exemplary practical example of the introduction of new technologies; to set-up modern telecommunication applications to facilitate the understanding of the possibilities and benefits of ICT for rural areas in developing countries**
- **2) To test the suitability of packet-based wireless access infrastructure for delivering multimedia applications such as long distance education, telemedicine, local business development, and so forth, cost effectively in rural areas**

Selection Criteria for Pilot Projects

Location

(Natural Environment)

- **Rural or remote areas, preferably in a LDC countries**
- **The presence of a mass of needy users**
- **Presence of telecom-related infrastructure elements needed**
- **Appropriate geographical and meteorological conditions for the equipment to be installed**

Selection Criteria for Pilot Projects (Continued)

(General context)

- **A favorable regulatory environment**
- **An identified demand(existing or potential) for telephone service, as well as multimedia applications such as long-distance education, telemedicine, environmental monitoring, and so forth**
- **Socioeconomic impact of the pilot project on the rural community(the pilot projects should be developed to have the widest developmental impact, including support for education, health, small business development, governance and poverty reduction**
- **The level of commitment from the government, local authority etc.**

Selection Criteria for Pilot Projects (Continued)

B. Equipment

- As described in the FG7 recommendations, the technology to be installed is expected to be packet based and wireless

C. Shared use concept

- The pilot projects will most likely to take place within a shared-facility such as a university extension center, hospital, post office, etc. The exact configuration of such telecenters has yet to be worked out and will vary according to the local environment. However, most telecenter are expected to offer phone, fax, e-mail, and Internet services

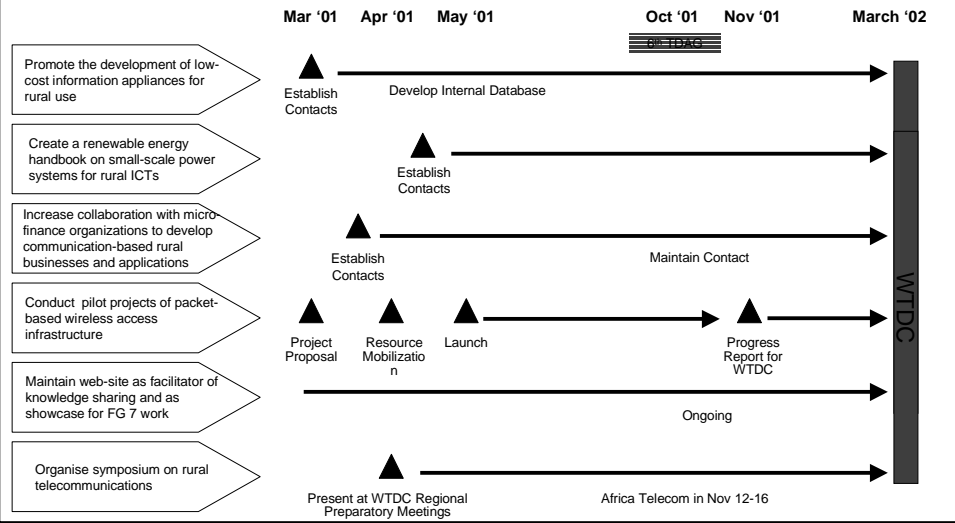
5th TDAG Meeting: 22-23 February 2001

- The FG7 final report was distributed to TDAG delegates and highly praised.
- TDAG members endorsed the proposition to include Task Force activities into the BDT's operational plan for 2001.
- Resource allocation is required for the proposed pilot projects.
- Fund raising is launched by BDT Director, letters being addressed to Administrations, Sector members, etc.
- Collaboration with other agencies and institutes recommended

Recommendations in Detail: Pilot Projects

- Five pilot projects are planned for implementation in different regions (Arab countries, Africa, Asia, CIS, and Latin America)
- Technology will be packet-based and wireless
- Projects will be developed to have the widest socioeconomic impact possible, enabling rural communities to access multimedia applications such as tele-medicine, long distance education, local business development tools, and so forth
- Projects will be implemented in conjunction with the BDT's telecenters.
- Total budget for the pilot projects estimated at \$500,000.

Timeframe



Three Project Proposals received so far

- Brazilian Proposal
The community center in a fishing village in the outskirts of Rio de Janeiro to be covered by the wireless IP network and to be connected via satellite internet to Brazilian national project of multimedia digital library. The service may be expandable to Portuguese speaking countries in Africa (Angola, Mozambique)
- Bulgarian Proposal
Septemvri telecenter is selected for providing multimedia services in the surrounding villages with the support of local CATV operator. It will be supported by the Bulgarian Association of Telecenters and extended after tested to other tens of telecenters outside and inside the countries
- Sri Lankan Proposal
Basically it is an open university project to provide youth in villages of Sri Lanka who can not afford to attend the Mumbai University. Multimedia service platform can also provide telemedicine and information services to cover the rural areas in the outskirts of Mumbai

Thank you for your attention !