



## **Canada**

### **BRIDGING THE DIGITAL DIVIDE IN RURAL AND REMOTE COMMUNITIES: THE CANADIAN EXPERIENCE**

#### **I- PREAMBLE**

With each passing day there are more and more reports and studies on the opportunities and challenges associated with the global extension of both traditional telephone service and the related information and communications technologies (ICT's). Many aspects of the linkages between ICT and the resulting improvements in the commonwealth of citizens, country by country, are explored in these reports and studies. But, while ICT applications in rural and remote areas of both developed and developing countries are acknowledged in such reports and studies, it is usually only in a cursory fashion. With that in mind, this contribution to the WTDC-02 Conference focuses on matters relating to the bridging of the digital divide in countries' rural and remote areas. Throughout the discussion, the term "digital divide" connotes the disparity in the availability of both traditional telephone service and ICT particularly as between densely populated urban areas and the more sparsely populated rural and remote areas.

Canada is already associated with a variety of initiatives aimed at bridging the digital divide including the Digital Opportunities Task Force (DOT Force) ([www.dotforce.org](http://www.dotforce.org)) under G-8 leadership, the ICT task force of the United Nations (<http://www.un.org/esa/coordination/ecosoc/itforum/icttaskforce.htm>), and the Institute for Connectivity in the Americas (<http://www.idrc.ca/pan/institute>). In addition, Canada plays an active role in ITU-D activities and initiatives. This was evident in the work of Study Group 4/2, Communications for Rural and Remote Areas as reported at Valletta, Malta in 1998. More recently, Canadian companies (Nortel and AMEC) have supported the development of the Centres of Excellence in Nairobi, Kenya and Dakar, Senegal. In other words, this contribution, consistent with other Canadian initiatives, past and present, is rooted in a homespun desire to see many others around the world experience the advantages and opportunities that come from having reliable access to telephone and ICT services.

The Telecommunications Executive Management Institute of Canada (TEMIC, <http://www.temic.ca/>) has prepared a related Canadian contribution to the WTDC-02 Conference entitled “Universal Access and Sustainability”. The characteristics of a sustainable universal access policy and program are discussed and it is proposed that the unfolding issues associated with fostering sustainable universal access be made part of the new Action Plan adopted by the Conference.

## II- THE TWO FACETS OF THIS CONTRIBUTION

This contribution is written from the Canadian side of the global digital divide. Virtually all Canadians have reliable access to ordinary telephone service and at the end of 2000, among the OECD countries, Canada ranked second in Internet access (OECD, The Development of Broadband Access in OECD Countries, October 2001). But, even in Canada with its vast and often forbidding climate and terrain and the sparse population in the rural and remote areas have limited or in many cases no ready access to ICT related capabilities. This contribution has two facets.

First, it sets out in Section IV a summary of the lessons and observations being drawn from the expansion of Internet access in Canada during the 1990's with a particular focus on rural and remote areas of the country. These lessons and observations are intended to provide practical and specific encouragement to the multitude of worldwide initiatives seeking to bridge the digital divide.

Secondly, a number of Canadian consultants were contacted because of their involvement in international projects directed towards making access to both telephone and broadband services a practical reality in developing countries. These consultants were asked to identify the key lessons and observations drawn from these specific international projects. Section V of this contribution sets out a summary of these lessons and observations.

## III- WORKING DEFINITIONS

However, before proceeding with these discussions, a word about some working definitions for five terms: connectivity, digital divide, broadband, universal access and community. The following definitions are not set out to constrain wider notions of such terms but rather to indicate how these terms were understood in the preparation of this particular contribution.

**Connectivity:** Recently, a group of experts met in Quito, Ecuador to prepare a draft Agenda and Action Plan for Connectivity in the Americas. The definition for connectivity reads as follows:

“Connectivity is a society’s internal capacity for communication and with its global environment through the use of telecommunications, information technologies, and what is produced by content industries, whose purpose is to evolve towards the information and knowledge based society. Connectivity is the solution to the digital divide—or gap.”

**Digital Divide:** A recent OECD publication ([www.oecd.org](http://www.oecd.org)) entitled “Understanding the Digital Divide begins by asking: What is the digital divide?” The answer provides the definition for this contribution:

“As used here, the term “digital divide” refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to their opportunities to access information and communication technologies (ICT’s) and to their use of the internet for a wide variety of activities. The digital divide reflects various differences among and within countries.”

**Broadband:** The National Broadband Task Force report to the Canadian government entitled *The New National Dream: Networking the Nation for Broadband Access* (<http://broadband.gc.ca>) began by asking the question: “What is broadband?” The report acknowledges that broadband originated as an engineering term relating to a network facility capable of carrying a large amount of information; however, the report found that there is a wide range of views as to what network capability, (i.e., transmission of bits of information every second) constitutes a broadband capability. Therefore, the Task Force concluded that it would define broadband “as a high capacity two-way link between an end user and access network suppliers capable of supporting full-motion, interactive video applications.” It was noted that a minimum two-way or symmetrical transmission speed of 1.5 Mbps is required to meet this defined broadband requirement but that much higher speeds will be required for emerging applications.

For purposes of this contribution, this Canadian Task Force definition of broadband seemed appropriate because capability would, if available, meet the requirements of most users in most countries both now and in the foreseeable future. Furthermore, in this contribution this broadband capability is often referred to as Internet access as that reflects common parlance and experience.

**Universal Access:** Module 6 of the *Telecommunications Regulation Handbook* (<http://www.infodev.org/projects/314regulationhandbook>) begins with a discussion of the concepts of universal service and universal access. The Handbook’s description for universal access is the working definition used in this contribution. It reads:

“Universal Access (UA) generally refers to a situation where every person has a reasonable means of access to a publicly available telephone. UA may be provided through pay telephones, community telephone centres, teleboutiques, community Internet access terminals and similar means.”

**Community:** The description of universal access just noted refers to the concept of community. Canada’s Broadband Task Force found it necessary to define that term as follows: “... a community can be defined as a locality which, among other things, has the following activities: a name, a distinct physical location and territory, and a population.”

The Task Force report notes that a geographic definition of community allows for the identification of gaps in infrastructure development although it was acknowledged that the application and benefits of broadband capability often come about through communities of interest that cut across such geographic boundaries. Indeed, the reality of community and particularly the maturation of a rural community have many facets beyond the geographic definition noted above. In Section IV of this contribution there is some indication of the strands of rural community existence that are critical in the sustainable and productive use of ICT applications.

#### **IV- EXPANDING INTERNET AND BROADBAND ACCESS IN CANADA: LESSONS FOR OTHER COUNTRIES?**

As noted, this contribution intends to focus first on recent initiatives to improve access to the Internet in rural and remote communities in Canada. It is noteworthy, however, that the story of how Canadians have come to enjoy both universal telephone service and widespread access to the Internet and broadband services has actually unfolded over many years. For those who wish to explore that story two sources are suggested. One, an article entitled *Universal Telephone Service: A Canadian Perspective* published in the *Telecommunications & Space Journal*, Volume 5, 1998 and second, a January 2001 ITU publication *IP Telephony and the Internet: Canada Case Study*, one of a series of country case studies available at <http://www.itu.int/wtpf/casestudies/>.

The decade of the 1990's was marked by the liberalization of all segments of the Canadian telecommunications sector. Three key elements in this evolving liberalization are noteworthy. First, Canada has actually had an independent agency regulating telecommunications since 1906. The Canadian Radio-television and Telecommunications Commission (CRTC) merged the broadcasting and telecommunications regulatory responsibilities in 1976.

Second, beginning in the late 1970's the first seeds of competition took root through CRTC Decisions that opened the private line and data and then, the terminal equipment markets. The Government licensed the first wireless carriers in 1984 with further entry in 1994. Then, in 1993, consistent with jurisdictional decisions taken by the Supreme Court, a comprehensive Telecommunications Act was passed enabling CRTC to regulate all Canadian telecommunications carriers. That set the stage for a market-by-market liberalization with domestic long distance and local calling, payphones and international calling all opened to competition by 1998. (See the Landmark Decisions of the CRTC at <http://www.crtc.gc.ca>.)

Third, this liberalization was paralleled by retail price deregulation. A recently published CRTC Report, Status of Competition in Canadian Telecommunications Markets; Deployment / Accessibility of Advanced Telecommunications Infrastructure and Services, provides an up to date summary of the outcome of this intensive period of telecommunications market liberalization and associated deregulation (<http://www.crtc.gc.ca>).

Side by side with these legislative and regulatory activities Industry Canada designed and implemented its Connecting Canadians strategy. This strategy was designed to promote and enable a more widespread availability of Internet access than would have been the case if developments had been shaped only by the market. The many facets of this strategy can be found at <http://www.connect.gc.ca>. For instance, along with provincial, territorial and private sector partners, Industry Canada by March 1999 had connected all of Canada's schools and public libraries to the Internet (<http://www.schoolnet.ca>). Related initiatives have connected over 5000 volunteer organizations, established over 5000 community access sites, and selected through a Canada-wide competition twelve "Smart Communities" to demonstrate and test how to make effective use of information and communications technologies (<http://smartcommunities.ic.gc.ca>).

Building on such initiatives, the Minister of Industry in January 2001 established the National Broadband Task Force. Its mandate was to map out a strategy to ensure that broadband services are available to businesses and residents in every Canadian community by 2004. The Task Force Report, The New National Dream: Networking the Nation for Broadband Access was issued in June 2001 (<http://www.broadband.gc.ca>).

The lessons and observations regarding the expansion of access in Canada set out in the Task Force Report are summarized below along with those in two other publications. One is the recent CRTC report entitled Status of Competition in Canadian Telecommunications Markets and the Deployment / Accessibility of Advanced Telecommunications Infrastructures and Services (<http://www.crtc.gc.ca>) The other is a recent article by Ricardo Ramirez entitled A Model for Rural and Remote Information and Communication Technologies: a Canadian Exploration, Telecommunications Policy 25 (2001) pages 315-330 (<http://www.elsevier.com/locate/telpol>).

Numerous case studies are referenced in these three publications. The Task Force Report lists all the public submissions from various organizations and individuals at pages 90-92. The Report notes that electronic versions of these submissions are posted online at <http://broadband.gc.ca>. The CRTC Report lists a number of case studies in Section 6 and the Ramirez article examines in some depth

three case studies which will be discussed later in this contribution: K-Net Services in the remote northwest of the province of Ontario (<http://www.knet.on.ca>); the County of Oxford Integrated Network (COIN) in the southwest of Ontario (<http://www.county.oxford.on.ca>); and the Lanark Communications Network (LCN) in the eastern portion of Ontario (<http://www.thelcn.on.ca>).

A summary of the lessons and observations regarding Canadian broadband access initiatives as documented in each of these three reports is now set out.

## **1. Broadband Task Force Report**

The Task Force estimated that about three quarters of Canadian communities, representing about 25% of the national population, do not have access to broadband services available from cable and telephone companies throughout the more densely populated regions of Canada. Moreover, it was acknowledged that market forces alone were unlikely to provide broadband access to these unserved communities by 2004. (Indeed, a recent Federal Budget announced on December 10, 2001, may delay the completion of Canada's broadband program by 2004.)

The Task Force suggested that the broadband program priorities should include the provision of 1.5 Mbps symmetrical access to each end user with higher bandwidths for institutions; access for First Nation, Inuit, rural and remote communities at comparable prices to more densely populated areas; and the extension of the broadband infrastructure to each community's public centres, (i.e., public health care centres and libraries).

The Task Force encouraged all levels of government and other stakeholders to push forward with the extension of broadband services and concluded that government funded broadband building efforts should be shaped by the following objectives:

- Ensure third-party open access
- Ensure competitive and technological neutrality
- Ensure sustainability and scalability
- Ensure transparency in all aspects of program funding
- Maximize the role and risk taking of the private sector
- Leverage the financial capability of the private sector
- Minimize deployment costs
- Encourage public and private sector partnerships
- Response to community needs and
- Build community capacity (Task Force Report at pp.5-6)

The Task Force concluded that there were two main ways to bridge the digital divide. One was the infrastructure support model. It focuses on incentives to encourage infrastructure construction with the support of government funding. As a result, transport networks between communities and access networks that link homes and businesses to the community point of presence for the transport network come to be built. The second approach is the community aggregator model. It focuses on the stimulation of demand through an accumulation of potential users gathered by a community champion. Once a community-based business case has been confirmed, funding is provided. Indeed, the Task Force suggested the most practical course of action is likely a combination of these two basic approaches.

Background studies undertaken for the Task Force note that there are already many examples of the successful deployment and utilization of broadband applications in rural and remote Canadian communities. Increasingly, asymmetric satellite-based connectivity allows for dialup and upstream

connection via telephone with downstream transmission via the satellite connection enabling the transfer of images and large files. As already noted Appendix C of the Task Force report is available on-line and it includes references to a wide variety of such case studies.

An illustrative example is the self-governing Territory of Nunavut. In the eastern and central portion of the Arctic, Nunavut makes up one-fifth of Canada's land mass and 70% of the 27,000 residents speak a dialect of Inuktitut. With no roads or land-based communications facilities, satellite based systems have provided reliable telephone service for many years and the Digital Communication Network (DCN) provides the backbone for broadband throughout Nunavut. The DCN was constructed by ARDICOM Digital Communications, a partnership of Northern Aboriginal Services Company, Artic Co-operatives Limited and NorthwesTel Incorporated ([www.ardicom.ca](http://www.ardicom.ca)). The Government of Nunavut provides ARDICOM with a minimum use commitment and that has allowed for the creation a successful pooled network services to government, businesses and individuals. Use of bandwidth is limited by the cost of operations as opposed to the technology capabilities and capital costs.

There have been significant accomplishments using the DCN. The Government has operated a successful Tele-health service in three Arctic communities with patient care being provided. Otherwise, these patients would have waited for the infrequent visits of doctors or have been evacuated by air. In addition, the DCN allows community health centres to hold conferences, training sessions and discuss health care issues with specialists.

Although not available in all communities, Nunavut is a leader in distance and internet-based education. In a related initiative, the Living Dictionary is nurturing the evolution and growth of the Inuit language and has attracted attention from linguists around the world ([www.livingdictionary.com](http://www.livingdictionary.com)). These initiatives are building bridges to information-based communities from the current oral culture with low levels of literacy.

Isuma Igloolik Productions may be the leading producer of Aboriginal language feature films and the prospect of affordable broadband will enable a web-based distribution to the Nunavut communities and the global marketplace ([www.isuma.ca](http://www.isuma.ca); [www.atanarjuat.com](http://www.atanarjuat.com)). Other web-based initiatives include several commercial newspapers in Inuktitut and English, business directories, tourism and commercial sites. Also, the DCN is allowing the Government to decentralize its functions creating local work and opportunities for private sector initiatives.

Nunavut's objective is to have affordable broadband access operating in all its communities by 2004. It is a continuing challenge to make digital communications operational in some of the most difficult physical conditions in the world.

## **2. CRTC Report: Status of Competition in Canadian Telecommunications Markets; Deployment/Accessibility of Advanced Telecommunications Infrastructure and Services**

The CRTC Report noted that the geography of Canada results in many communities being distant from major urban areas and network transport facilities using fibre, cable or fixed wireless technologies. Thus, while a small community network to serve local needs may be within economic reach the cost of linking that community network to the backbone transport network is often daunting.

In this context, the CRTC Report suggested that funding broadband access projects from the general body of subscribers is constrained by the need to maintain affordable rates for basic telephone service and the marketplace pressures to eliminate the longstanding distortions built into the pricing structures through explicit and implicit subsidies.

That being said, the CRTC Report noted there were many initiatives underway in Canada to provide improved broadband access in rural and remote communities. First, there are publicly funded projects including a regional government initiative (Region of Peel west of Toronto) to build more than 200 kms of fibre; a Saskatchewan government initiative to extend a high-speed network to over 350 rural communities; and the Federal Government's support of the Smart Communities Project with up to \$5 million over the period 2001-2003.

Second, there are privately funded projects that either construct broadband networks or aggregate demand to support such construction including a municipal hydro company which used its budgetary surplus to provide a small fibre network; a small Ontario town which created both a consortium of users to aggregate demand requirements and then a non-profit corporation to carry out feasibility studies and negotiate broadband access arrangements with Bell Canada; and Quebec School Boards which combined their communications needs and partnered with other "anchor" users to help fund a local fibre network linking schools and other community-based locations. Third, the CRTC Report sets out a number of public and private sector partnerships including two private sector operators in the province of Alberta committed to building a transport network to 27 core communities supplemented with provincial government funding of just under \$200 million which will allow these private sector partners to connect an additional 395 communities and the Manitoba Telephone System's commitment to invest \$300 million over a three year period to bring high-speed Internet services to more than 85% of the provincial population.

### **3. A Model for Rural and Remote Information and Communication Technologies: A Canadian Exploration (Telecommunications Policy 25 (2001) pp. 315-330)**

This recent article by Ricardo Ramirez examines three community-based networks designed for broadband services. They were selected on the basis of four criteria:

- Each exhibited accomplishments that could be observed and analyzed;
- Each had been an organizational entity for more than five years;
- Each represented three distinct geographical areas, two rural areas in southwest and another in the eastern part of Ontario and then one remote network in the northwest area of the province;
- Each constituted a distinct model of infrastructure development (p. 318).

The primary research interest was to identify what Canadian experiences with broadband network development in rural and remote areas might be transferable. Ramirez argues that complete models cannot be transferred although "principles, major steps and the essential characteristics of the process" may be transferable. Ramirez notes that persons taking the lead in these community-based network projects demonstrated skills and confidence in three areas: negotiating in respect to grant providers, identifying community needs and selecting the appropriate technology. Ramirez suggests there are five basic principles that may be transferable:

- Available policy incentive programs need to be diverse to meet the communities' capacities and needs as they evolve;
- There needs to be a "team of champions" rooted in the community but capable of effective and visionary management and facilitation;
- There needs to be workable informal relationships between the community champions and the outside policy workers allowing each to both learn from the other and make adaptations;

- There needs to be community-based electronic network organizations that are responsive, flexible and willing to review service offerings regularly;
- There needs to be community trust in a local organization so that both the benefits and the limitations of these advanced communications services can be explored (pp. 324-325).

But then, Ramirez points out an important paradox. These five potentially transferable principles “cannot be imported; they have to be ‘grown’ locally”.

Ramirez suggests there is a common sequence of events as communities plan and build broadband networks. The five-step sequence appears to be:

- Make access possible through public places;
- Let community members experiment with technology;
- Allow community members to learn how to use the technology;
- Plan around those aspirations, aggregate demand, develop a business and development case for infrastructure upgrades; and
- Organize to make the aspirations a reality in terms of infrastructure, applications and skill (p. 325).

Indeed, Ramirez suggests that if a needs assessment is conducted in a community before people have had a chance to “play” with the technology and brainstorm on how it might meet community needs the outcome may be simply “confusion and anxiety”. That leads Ramirez to emphasize that for communities who are stepping towards broadband communications “the key” is to find the right champions to stimulate local ingenuity and community-level planning, and to exploit government funding only as the organizational capacity evolves.

Surely, that is a message not only for rural and remote communities but also for all officials in national governments and international agencies who are involved in the assessment and the recommendations regarding the funding of broadband communications projects.

That concludes the summary of lessons and observations drawn from Canadian sources and experience. There is, of course, a growing body of evidence and experience from many other countries around the world as well. Attachment A to this report identifies a wide variety of such sources that can be explored.

## **V- CANADIAN CONSULTANTS: LESSONS DRAWN FROM INTERNATIONAL EXPERIENCE**

For many reading this contribution it will come as no surprise that one of the strengths of the Internet, the capacity to search for and identify extensive information on any given subject matter is, at the same time, one of its inherent weaknesses. Converting information into knowledge requires human beings to filter, interpret and apply it to issues and needs at hand. In a very real sense, that exercise is as old as time.

The task at hand is bridging the digital divide particularly in rural and remote communities in countries throughout the world. Information that addresses this task abounds and this submission adds to that with a snapshot of Canadian experience with extending ICT access in rural and remote communities. It is to be hoped that this summary of Canadian experience and the associated source documents will become, with country-specific analysis and application, much more than mere information.



But, that leads into the second aspect of this contribution. As rural and remote communities throughout the world are assisted to sift, sort and initiate ICT capabilities, one can expect that people in those communities will be able to testify to the resulting advantages and opportunities and one can daresay resulting failures and dead ends. Presumably, such testimonials will be stories of how communications technology is meeting everyday human needs.

As noted earlier, a number of Canadian consultants have been involved in projects to help countries and communities within those countries to translate communications technology into community stories worth telling. These Canadian companies and consultants were contacted and invited to “tell their story” arising from their direct experience in consultancies that were intended to assist directly or indirectly in building bridges over the digital divide in specific countries. Several responses were received and a compilation of the key lessons and observations is set out in what follows.

The consultants’ responses noted that mapping the road to successful and sustainable telecommunications programs in rural and remote communities in any country requires prior attention be paid to a number of matters. These include:

- An effective regulatory arrangements to manage and monitor the use of the radio spectrum;
- The creation of a regulatory authority to establish and execute interconnection arrangements among competing wireline and wireless providers usually in the context of market-driven pressures for cost-based rate rebalancing and policy-driven pressures for a comprehensive universal access program;
- The implementation of adequate quality of service measurements along with effective compliance incentives; and,
- The articulation of policy objectives and frameworks in agricultural, educational, health and other government services that take into account the integration of telecommunications and ICT capabilities.

More specifically Kayani and Dymond (World Bank Technical Paper, Number 359, “Options for Rural Telecommunications Development”) argued that neither liberalization nor privatization would act to stimulate increases in rural teledensity. Clearly an enunciated policy supported with financial subsidies is required. The specific recommended policy measures included price flexibility for operators to allow tariffs to match the markets; asymmetric interconnection and revenue sharing arrangements in favour of the rural operators; maintenance of some direct cross-subsidies in support of rural service targets; and, rural development funds through annual levies on national and urban-based operators.

Such “pre-conditions” can be daunting when listed on a page but it is a reminder that the efforts to bridge the digital divide in any country in rural and remote communities are only one portion of the inherently complex puzzle of effective and sustainable improvements in the commonwealth of a country’s citizens. That being said, the Canadian consultants identified certain common elements in successful community-driven initiatives to bridge the digital divide in rural and remote settings as gleaned from their consultancies in recent years. These common elements are:

### **1. Conducting up-front needs assessments with intended users**

Any successful ICT project requires an initial assessment of the communication and information needs of the intended users. This affords an opportunity to engage community members in a participatory planning process and will help to identify key stakeholders and community leaders, as well as existing organizations and information systems, upon which any ICT project must be based.

## **2. Measuring the Demand for Services**

Demand-informed projects stand a much greater chance of success. Unless ICT initiatives satisfy the information and communication needs that intended users are willing to pay for, the infrastructure will remain underutilized. Simply put, initiatives that do not address the needs of the communities they purport to serve will not survive and will not contribute to sustainable development.

## **3. Building and Maintaining Awareness**

Awareness building at all stages of ICT planning is critical for success. Community decision-makers with financial resources must be made aware of the possible uses of telecommunication and ICT services. Also, cultivating the support of local politicians who understand the potential of the technology is vital to the spread and success of ICTs. Finally, successful marketing is vital to ensure that a payphone, telecentre, or other ICT service becomes an integral part of the community.

## **4. Organizing Projects in Concert with Local Champions**

To facilitate the introduction of ICTs local champions who believe in the project objectives and methodology need to be incorporated into the process from the start. This includes the use of intermediary organizations such as NGOs, church groups and decentralized government agencies that often can act as the link between the promoters of the technologies and rural people.

## **5. Forming Collaborative Partnerships**

Rural ICT project proponents should explore multi-sector partnership possibilities to generate strong collaborative effort. Through such locally based collaborations, projects can be better equipped with the human, technical and financial resources needed to produce sustainable results. Partnerships may include project proponents, donors, private sector representatives, government, NGOs and community groups.

## **6. Sustaining the Operation and Management of Rural ICT Services**

The sustainable implementation and operation of payphones, telecentres and other local applications of ICT is dependent on a number of inter-related factors. These include the promotion of both inward calls and arrangements for prepayment of calls such as “callMe” cards, the deployment and ongoing maintenance of the telephone lines, electricity supply and servers; taking into account cultural factors such as the communities social and historical characteristics, levels of education and literacy and gender matters and economic and political factors such as income levels and people’s ability to pay, political networking and local power and participatory decision-making approaches.

## **7. Training the Users**

Both the staff and users of Rural ICT Centres must be trained to utilize the technology and the associated services. This includes basic hardware and software computer awareness and assistance to know how to look for the information they need which can be extended to contacting information providers to make requested content available.

## **8. Providing Technology and Technical Support**

In order for the proposed technologies to be easily understood and implemented, the applications should be as user-friendly as possible and appropriate to the expressed needs and context of the region where it is to be utilized. Technical support must be available through either shared community resources or through a sufficiently responsive private service.

## **9. Being Alert to Patterns that make for Sustainability**

Well-developed business plans, built on demand studies, and measurement of ongoing costs and revenues, are fundamental to ICT project sustainability. In the case of a telecentre, there must be a critical mass of community members keen to pay for Internet access, a local ISP connection and conscientious local coordinators who operate their telecentre as a revenue-generating business. Community access facilities built into existing community centres ideally sharing lines, technical support and costs are more likely to succeed.

An interesting example of such an arrangement was noted in Cotahuasi in a remote region in Peru. La Asociacion para el Desarrollo Sostenible (AEDES) has been working there supporting local efforts to export high-value organically produced local products. In 1997, when the first satellite phone was installed, AEDES personnel began to use email and the Internet to communicate and gather information. Soon, rural leaders and public officials, especially those working in health and education, began to request use of the ICT available ICT services. AEDES complied but soon found that as the demands for use of the computers grew the financial burden became excessive. In response, AEDES opened up the Cabina de Internet Cotahuasi, which offered use of its computer for the general public. Now farmers, women's groups, local schools, and community leaders are using the Cabina. Rates vary from US \$0.43 per hour for students, to \$0.86 for professionals, and \$0.58 for farmers. Leaders pay nothing when engaged in community work thanks to a subsidy from a Canadian project. Special rates are charged when the equipment is used for courses run by the school.

## **10. Paying Attention to Variations within Communities**

Rural communities are often strikingly diverse and ICT initiatives need to be sensitive to such diversity to insure that all potential users who are willing and able to pay for services are adequately served. For example, the Grameen Telecom VillagePhone Program in Bangladesh uses primarily female entrepreneurs as VillagePhone Operators. Rural women in Bangladesh, particularly in villages that are distant from the influence of urban centres, are limited by traditional patriarchal society in many ways, including the extent to which they are able to move around and beyond the village without a male escort. This is often the case with the large number of husbands involved as foreign workers

When a woman operates the VillagePhone, other women will use the phone accounting for more than 50% of the phone use and often more than 50% of the revenue; however, when a man operates the VillagePhone, very few women will make use of the phone, thus substantially hindering the potential revenue available to the VillagePhone operator and the overall program. Thus, Grameen Telecom continues to target women as the main operators of its VillagePhones.  
(<http://www.telecommons.com/villagephone/index.html>)

## VI- A CONCLUDING COMMENTARY

There could be much honest debate among us regarding how best to deploy communications technologies to bridge the profound divide between the communications “rich” and the communications “poor” within and between countries around the world. Indeed, some would argue that this communications infrastructure disparity will entrench other social and economic divides between communities and countries. A statement of principles set out by Nelson Mandela at ITU Telecom 95 is well worth recalling as we continue to seek ways and means to bridge the divides among us. That statement read:

- The world should strive towards global universal service and global access to the information superhighway;
- Development of the information infrastructure should be based on partnership and rules of fair competition and regulation, at both the national and international levels;
- The information revolution should be geared towards enhancing global citizenship and economic prosperity;
- A diversity of paths towards the achievement of national information societies should be respected;
- Policy for the development of an equitable global information society should be co-ordinated internationally so as to ensure the sharing of information and resources; and,
- The education of young people with regard to the skills needed for living in an information society should be prioritized.

With these guideposts in mind and in the context of this review of bridging the digital divide in rural and remote communities what proposals and open questions may warrant inclusion in the Action Plan arising from this WTDC-02 Conference? The following suggestions are put up for discussion:

1. Given the complex interrelationship between the many aspects of rural development and the availability of telecommunications and ICT services what specific steps could be taken to forge partnerships between the ITU-D and other organizations such as Food and Agricultural Organization of the United Nations that has a mandate to foster rural development?
2. How might the ITU-D effectively contact in a given country the rural stakeholders such as agricultural and farmers’ organizations and rural governing entities either to assess existing rural communications facilities or to ascertain what communications facilities might best fit the expressed needs of specific rural communities?
3. How might the ITU-D foster more effective mechanisms whereby both international and national organizations could be learning directly from rural stakeholders rather than through the “filter” of end-of-project reports and then adapting their rural development policy and associated funding frameworks?
4. How might the ITU-D foster the “twinning” of rural communities, one with viable ICT services and one without, to discuss and identify what communications arrangements best fit the candidate community?

These four suggestions warrant debate and discussion but they are shaped by the conviction that the residents of rural communities must be afforded every opportunity to decide how to weave the capabilities of ICT services into the mosaic of their community life. It sounds somewhat trite but in the final analysis communications technologies must be our servants and not our masters.

## Attachment A

In addition to the references and web sites noted throughout the contribution the following reports, studies and web sites may be of interest and value.

### Studies and Reports

1. Accenture has joined forces with the UNDP and the Markle Foundation in a public/private partnership – the Digital Opportunity Initiative (DOI). This initiative was launched at the G8 meeting in Japan in July 2000 and is intended to support the activities and strategic objectives of the G8 Digital Opportunities Task Force (DotForce). The first step in this effort has been the completion of Creating a Development Dynamic, a study that aims to formulate a high-level approach to harness ICT for development purposes (July 2001) <http://www.accenture.com>
2. Brookings Institute, Who pays for universal service? When telephone policies become transparent Robert W. Crandall and Leonard Waverman (Eds.), Washington D.C., 2000, ISBN 0-8157-1611-7
3. Center for International Development at Harvard University, Readiness for the Networked World – A Guide for Developing Countries <http://www.readinessguide.org>
4. FAO, ITU and IADB, Telecenters for Socioeconomic and Rural Economic Development in Latin America and the Caribbean – Investment Opportunities and Design Recommendations with special reference to Central America, by Francisco J. Proenza, Roberto Bastidas-Buch, Guillermo Montero, Washington D.C., May 2001 <http://www.iadb.org/regions/telecenters/index.htm>
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  4. Digital Divide Network – Knowledge to help everyone succeed in the digital age <http://www.digitaldividenetwork.org>
  5. Global Information Infrastructure Commission <http://www.giic.org/>
  6. Hewlett-Packard Company, World e-inclusion <http://www.hp.com/e-inclusion/en/index.html>
  7. IDRC Telecentre Research – This site serves as a meeting place for people interested in telecentre practice and research. Information on the International Development Research Centre's PAN Networking and Acacia telecentre initiatives is included, along with links to resources produced by others working in the field  
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