Sierranet: Linking Sierra Leone to the World

by Jennifer Pepall

Classroom in Sierra Leone

(Photo: N. McKee, IDRC)

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Freetown don empty. [Adrian Labor](#), currently an intern at the International Development Research Centre (IDRC), received this e-mail message from a colleague in the capital of Sierra Leone following the military coup there in May 1997.

"Man heavy gun sound yesterday night. A lot of panic in freetown today. People start packing their belongings finding their way out of freetown. Man I lost my uncle yesterday when a stray bullet meet him and collaps... Every day so many die body in the street of freetown," wrote Abdul Kargbo in the Krio language to Labor.

Origins

Kargbo and Labor are two of the eight founders of Sierranet, a telephone-based computer network created to support research by university students in Sierra Leone. The project, funded in 1994 by IDRC, was a success. It resulted in the establishment of two functional e-mail networks — one for the university community and another for health professionals — and paved the way for the introduction of the Internet to Sierra Leone.

But the health professionals and students who used Sierranet have fled the country. Kargbo is the only remaining member of the Sierranet team. Rebels have occupied the university where parts of the network is based. Development research has all but stopped in the violent aftermath of the coup.

Gains still intact

Labor insists, however, that Sierranet's gains are still intact. "We didn't lose an ounce of what the project established. We built the environment. The physical infrastructure is still there," he says. "What we learned, we still know."

Such optimism in the face of adversity is a hallmark of Sierranet's development. Labor, age 25, was an undergraduate at McGill University in Montreal when he and other like-minded students began exploring how Sierra Leoneans studying at North American universities could help their colleagues at home. Their idea was to give users an easy and cost-effective way to communicate and transmit information, no matter where they were in the world. The network they envisioned would connect students at the University of Sierra Leone to a broader research community, speeding the exchange of ideas that are vital to the life of a university.

Simple requirements

The simplicity of Sierranet's requirements — a phone line, a software disk, a modem, a personal computer, and a trained student operator — masks the complexity of the organization required to set it up. For one year, while also pursuing his engineering studies, Labor lobbied extensively: "I knocked on all doors. I had to convince people of influence that there were tangible applications to this rather than just a noble idea," he says.

In 1994, he received $32,000 from IDRC to develop and test the network in Sierra Leone. By 1995, two e-mail systems were in operation: one for users at the University of Sierra Leone and the other for the medical community, students, and staff at the College of Medicine and Allied Health Sciences. The latter is part of a broader international initiative called HealthNet, a telecommunications system partially funded by IDRC that uses low-earth-orbit satellites and telephone-based computer networks for the exchange and transfer of health-related information in the developing world.

Sierranet facilities

Components of the networks are based at the Sierranet Resources Centre and at the University of Sierra Leone. The Centre also houses a documentation facility, which plays a supporting role in creating awareness and promoting the application of information technology in Sierra Leone. At the time of the coup, the local telephone company was close to establishing full Internet connectivity in Sierra Leone. A week before the coup, it had successfully engineered a live Internet dial-up and was busy setting pricing schemes for Internet access. Meanwhile, Sierranet was exploring the feasibility of creating a new network for the agricultural community.

Labor heard about the coup as he was about to deliver a paper on Sierranet at a conference on information technologies. He had planned to describe how a new generation of Africans were embracing the Internet and developing sustainable networks with the resources available. But on hearing the news, "I could no

longer pitch it from that point of view," he says.

Transmitting news reports

Labor rallied, however, by using Sierranet to send reports describing international condemnation of the coup into the country, which were then passed to local journalists. Prior to these messages, "everybody had to wait for the BBC broadcasts," he says. He was also able to provide vital information to colleagues such as the fact that The Gambia — the destination of choice for people fleeing the country — had closed its border to Sierra Leoneans.

"The coup has killed Sierranet's potential for growth," says Labor. Today, the priority is to keep the equipment safe. Gun-toting rebels have already taken money from the compound where Sierranet is based. Once the fear and mayhem have passed, Labor hopes that Sierranet will play a role in the reconstruction of Sierra Leone and the restoration of democracy.

"Please who na keep on praying for us. The Land we love our Sierra Leone." Abdul Kargbo.

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Connecting the North: Telecommunications links for Canadian aboriginal communities

by Keane Shore

Walruses outnumber people in some areas of the Canadian Arctic

(Photo: Tourism Canada)

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The northern regions of Canada account for more than 40% of its total land mass, yet fewer than one-third of one percent of Canada's 30 million inhabitants live there. How to connect northern residents — many of whom are indigenous peoples — with the world and with each other was the focus of a 1994 electronic conference, *Connecting the North*, which explored the daunting challenge of extending the "information highway" to areas mainly travelled by migratory caribou and polar bears.

The conference — which was funded by more than 60 government, cultural, communications, educational and technical institutions, including the International Development Research Centre (IDRC) — experimentally linked 27 communities in the Northwest and Yukon Territories and Labrador with Ottawa, Canada's capital. The official host, [Inuit Communication Systems](#), used television, telephone, teleconferencing, videoconferencing and fax equipment to create a vast "virtual meeting" in which participants brainstormed future applications for a more permanent communications network.

Connecting the North was the first northern Canadian test of new technologies such as ATM

(Asynchronous Transfer Mode) and digital direct satellite services. Moreover, it was the first pan-Arctic forum to examine how northerners want to use the information highway. "We looked at distance education, telemedicine and business applications," says Katherine Fry, managing director of Inuit Communications Systems.

Potential for global applications

According to Gisèle Morin-Labatut, a senior program officer at IDRC, the conference was also of interest because of the potential for global applications. "These technologies are not just for *Canadians. Connecting the North* showed what might be done by other indigenous peoples using the technologies that are becoming available," she says.

Participants were quick to see that for many remote communities now equipped with only one or two radio telephones, accessing the information highway remains a long and expensive way off — but is well worth the trip. "Internet access is an essential tool for their participation in the Northern economy, the Canadian economy and, potentially, the global economy," says Fry.

Since the *Connecting the North* event, the Government of the Northwest Territories has taken steps to upgrade the region's existing infrastructure through the launch of a high-speed digital service that will connect 15 major communities by the end of this year. Some conference participants have also started forming the partnerships needed to help achieve universal access to telecommunications service, a goal which no single entity can afford to provide. For example, Television Northern Canada and Canadian Satellite Communications have teamed up to form Drumco, an aboriginal-owned company that aims to bring the information age to remote communities near the Arctic Circle, using satellite technology.

Community telecentres

Meanwhile, in the communities of Iqualuit, Iglulik and Cambridge Bay, Inuit Communications Systems has built pilot "community telecentres", which provide free access to northern-based arts and cultural exchanges; distance education; aboriginal communication, health and social services; and economic development assistance. According to Fry, the company is also trying to develop a way for elders and other community members to access computers using syllabics — unique written symbols that represent the traditionally oral languages of the North.

Keane Shore is an Ottawa-based writer and editor.

Sidebar:

Inuit Communications Systems

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MOVING ASIA FROM GRASSROOTS TO CYBERSPACE

by Catherine Wheeler

Some of Asia's least developed nations are acquiring the means to tap into the abundant information resources residing on the Internet through an IDRC program that allows better access to electronic communications technology. More importantly, the program helps Asian countries share their information resources with each other and the world.

For 25 years, IDRC has supported hundreds of initiatives to collect a wide variety of valuable development information. The Centre is associated with a remarkable network of information resources on development subjects, housed in the databanks and databases of information centres and libraries in Asia. Recently, IDRC decided to systematically promote the dissemination of these Asian information resources over the Internet. Currently, about 30 million users hold an Internet account, although most of them are in Northern countries.

As a preliminary step, IDRC conducted a study of computer conditions in several Asian countries to determine the ability of developing countries to share their research and development information and to access the North's information resources via the Internet.

The survey found that many of the countries that most needed access to the Centre's accumulated research were least likely to have the equipment and technical abilities required to connect to the Internet. So IDRC established the Pan Asia Networking Program (PAN), enabling some Asian countries to communicate electronically for the first time.

For instance, in 1994, IDRC connected Mongolia to electronic mail, the first step toward Internet access. In Vietnam, where only electronic mail (e-mail) and local bulletin boards are currently available to users, IDRC will help secure a leased line for full Internet access.

With local and other partners, IDRC will help Sri Lanka develop an all Sri-Lanka R&D information website for the benefit of researchers and development workers in the country and the world. Plans to help other developing countries network over the Internet are under way.

"All systems will have business plans for generating revenues to sustain operations," says Maria Ng Lee Hoon, the PAN Team Leader who helped conceive and develop the program along with Asia Regional Director Randy Spence and other colleagues.

The PAN Program will carry several content-based subnetworks. Initially, these will address biodiversity, natural resource management, social and economic policy, environmental technology, human health, and information and communication technology.

The broad range of development-related information provided by PAN will benefit many types of users, including researchers, development workers, academics, teachers, students, decision and policy makers,

and individuals interested in Asian development.

Communities that may have previously lacked printed materials and other forms of access to development research information will now be able to use the Internet to access information and communicate with experts internationally, because of the networking infrastructure that PAN is developing. Employment opportunities will emerge as new skills are needed to run the new technology. A new service provider -- in a country such as Sri Lanka, for example -- has the potential to become a large enterprise. Continually growing and upgrading, it will need increasing numbers of trained workers.

The Pan Asia Networking program has started a web site located at http://web.idrc.ca/en/ev-4509-201-1-DO_TOPIC.html. As PAN grows and matures, many more people in Asia's developing nations will have the opportunity to tap into the Internet's accumulated wisdom.

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The Acacia Initiative: Connecting African Communities

by Michael Smith

University of Nairobi microbiology lab:
Unlike medical centres in capital cities, most rural health facilities
in Africa lack access to telecommunications networks

(Photo: Gerry Toomey, IDRC)

[Encouraging local content](#)
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A major problem in Africa today is the lack of access to information technology — including basic telephone service. Although most countries have established Internet access, it is generally restricted to the capital cities, said South African communications consultant Michael Jensen, during a workshop at the recent [Global Knowledge '97 conference](#), sponsored by the World Bank and the Canadian Government. In other words, the 70% of the continent's population who live in rural areas remain electronically isolated.

Even where access is possible, it is often extremely expensive. Local telephone calls cost up to CA$6 an hour and an Internet account costs CA$65 per month, on average. In contrast, Internet accounts in North American can cost as little as CA$10 per month. Because of the limited connections between African countries, even messages between neighbouring nations generally must travel to the United States or to Europe before they reach their destination, Jensen said.

Although Africa is poorly served both by telephone systems and the Internet, there is more to using information technology than just providing links to the Internet, stressed Robert Valantin, director of the Acacia Initiative, a new program of the International Development Research Centre (IDRC).

Encouraging local content

"Connectivity is all very fine," Valantin told the workshop participants. "But you have to have something to travel down the pipes." The Acacia Initiative, which aims to support the use of information and communication technologies for community development in sub-Saharan Africa, will encourage the development of local content and South-South information exchanges, he said.

Another key issue is sustainability. "There is no use putting in a satellite link if you have to pull the plug when the donor leaves," Valantin stressed. "So, we have been investing in low-cost solutions where the users pay in some form or another for the service from the very beginning."

The total cost of this program is an estimated $100 million over the first five years. "We see this as a tremendous opportunity to help Africa harness information technology for its social and economic development," IDRC President Maureen O'Neil said during a press conference at Global Knowledge '97.

Three main goals

The Acacia Initiative is named after the Acacia tree, which is widespread throughout Africa. The Initiative has three main goals: to demonstrate that information and communication technologies (ICTs) can aid in community development; to build local knowledge and experience with ICTs; and to foster international interest and involvement in using ICTs for community development.

Kate Wild, senior advisor for information and communications at IDRC, said that in the Acacia Initiative, "communities" include not just geographical entities, but also communities of interest, such as farmers. "The Acacia Initiative aims to help these communities influence planning and decision-making in a much more powerful way than they have in the past," by supporting democratization and decentralization.

The Project will focus on four areas, she added: (i) policies that encourage ICT access in rural and small-town areas; (ii) human and innovative technological infrastructure for those areas; (iii) tools and technologies that facilitate ICT use by marginalized groups,, such as touch-screens and multilingual interfaces; and (iv) applications and services that meet community needs.

Technological impetus

Some of the technological impetus for this project will come from the Information Technology Association of Canada, which represents more than 1,200 computing and telecommunications firms. ITAC will encourage the Canadian high technology companies to get involved in the "wiring" of Africa. Similarly, the governments of South Africa and Mozambique will encourage the participation of their private sectors.

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The PAN Mongolia Experience

by Geoff Long

A changing Mongolia joins the global Internet community
(Photo: Geoff Long)

If you were to pick a country least likely to join the global communications network a few years ago, Mongolia would have been an easy choice. With deteriorating or non-existent infrastructure, a tightly controlled media, and a one-party state political system, the country was isolated from much of the world. Yet today Mongolia is embracing the Internet and its free-flow of information as quickly as its fragile economy will allow. This despite a severe lack of finances and an outdated telecommunications system.

Mongolia's first Internet host was born when local software and networking company Datacom was assisted through IDRC's Pan Asia Networking program. The PAN program aims to fund communications infrastructure and research projects in developing countries across Asia. In turn, this infrastructure can enable content-based subnetworks in line with the centre's research priorities and allow individuals, development institutions, and other organizations to share information.

From that first partnership, which resulted in a low-cost dial-up Internet connection in 1994, has evolved a dedicated satellite connection providing full Internet access. More importantly, it has provided the technical infrastructure necessary for other technical and content programs. Today, users include the Prime Minister through to people in remote areas, development agencies, universities, and the new businesses of a fledgling market economy.

Changing Priorities

Mongolia's transition to a market system has not been easy. When the Soviet Union collapsed in 1991, so too did many of the subsidies and trade that had been underpinning its economy. According to Surenguin Badral, the foreign policy adviser to the Prime Minister, one of the central tasks of the new government is to reduce its spending and at the same time improve infrastructure. However, with limited funds and many priorities, including the provision of basic services such as electricity to remote areas, the task is long-term. Says Badral, "In this way the Internet network that the country is starting to build up is most important in terms of first of all reducing costs and secondly communicating with the country people and getting information from remote places."

When Datacom, a former state-owned enterprise, first had the idea to start an Internet service, lack of funds was the major stumbling block. Datacom's director-general, Dr Dangaasuren Enkhbat, says that without IDRC's offer of technical and financial assistance, the project would not have been possible. Just as important, he says, is that it provided an example to other organizations of what was possible and a technical base for developing other projects.

Desperate for Information

Mongolia was the first site chosen in the PAN program. In this regard, the PAN-Mongolia project can be seen as a pilot to assess how assistance might also be offered to other developing countries in the region. The country was chosen for a number of reasons. Having only recently made the transition to a market economy, it is in desperate need of information from the rest of the world and ready to re-forge links with neighbouring countries. Datacom, the only domestic provider of data communications services, also had a team that could undertake the demanding technical requirements needed to become an Internet provider. And as a remote country without Internet access, it offered a chance to study the technical challenges that would be applicable to other countries in the region.

Paul Wilson, a consultant from Australian-based networking company Pegasus Networks, was involved in the project as a technical advisor in the preliminary stages. He was impressed by the technical capabilities at Datacom at the time and, as a result, the likelihood of success. As he notes, "they were clearly out there and ready."

Homegrown Solutions

However, he also points out that the conditions that they had to work with were poor, although similar to many other developing countries in Asia. Problems included unreliable telephone lines, telephone exchanges based on non-standard and outdated Russian technology, erratic power, and few computers. However, even at this early stage, Datacom had built up its own messaging system, adapted from Russian software, which was robust enough to cope with the conditions. According to Wilson, the system, called PC-Mail, was based on a file transfer model and seemed very reliable as well as accommodating Mongolia's Cyrillic-based script. "It was quite an achievement that the PC-Mail system was all local development. They also had a clear awareness that they could adapt it to UUCP protocols," he says, referring to the Unix-based program that can be used for transferring files on the Internet.

This occurred in late 1994, when Datacom installed a dial-up gateway system based on UUCP protocols that allowed for the connection of its domestic system to the Internet. The system was compatible with Internet email and newsgroups, and initially these were transferred twice weekly by connecting to the Institute of Global Communications (IGC) in the US. As the system gained new users, the dial-up frequency was increased. However, Datacom's goal was to have a permanent Internet connection.

Satellite Link

The most economical and feasible connection turned out to be via satellite. A meeting with Sprint concluded in an agreement to cooperate on a 128k leased line satellite link via PanAmSat 2. Funding for

the link came from a government loan and the US National Science Foundation (NSF), which agreed to pay the leasing costs if Datacom would give Mongolia's educational institutions free Internet access during 1996/7. Satellite communications equipment from Comstream was installed in late 1995, along with a Sun Netra server and Sun workstation to host Web, FTP, and Gopher servers, culminating in the opening ceremony for the country's first permanent Internet connection in January and a Mongolian web site in March of 1996.

Local Initiatives

Its Internet infrastructure is far from perfect, but nevertheless Mongolia has improved its communications capability dramatically in just two years. So much so that it has attracted the attention of other developing countries facing similar problems. However, Datacom head Dr Enkhbat is realistic about the task ahead, likening the current situation to having only one foot on the ground. Two feet, he claims, will be when local content begins to appear from various sectors of the community. Already, though, he is thinking of how to start some sort of multimedia centre capable of developing such material.

Even with its first Internet node in place, Mongolia still has a lot of work ahead of it. As Dr Enkhbat comments, perhaps the hardest task is now to create a local infrastructure to spread the benefits of Internet to the wider community. However, the early signs are encouraging and there are a number of projects in progress aiming to build on the PAN Mongolian groundwork.

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