



IDRC: H. Hudson

Cape Town to Cairo: Connecting Africa

IDRC-supported research helps unleash the potential of Very Small Aperture Terminal networks, the new generation of satellite-based technologies.

"Bandwidth is the life-blood of the world's knowledge economy, but it is scarcest where it is most needed — in the developing nations of Africa."
— Mike Jensen, communications consultant

"ICTs, which are now universally pervasive, are no respecters of boundaries. Working on a regional basis is therefore no longer an option, but an imperative for development."

– Jan Mutai, former Secretary General, African Telecommunications Union

The Development Challenge: Kick-starting Africa's digital revolution

Few will deny that Africa remains the poorest continent. The 2006 report on the United Nation's Millennium Development Goals (MDGs) states that 44% of Africans live on less than US\$1 a day — by far the highest percentage of any world region.

But there is hope. That same MDG report details the dramatic advances achieved in other world regions during recent decades. In parts of Asia, for instance, the ambitious targets for poverty reduction that the United Nations sought to achieve by the year 2015 have already been exceeded.

One reason for this Asian success has been the rapid spread of low-cost telephone and Internet service. Improved access to these information and communication technologies (ICTs) clearly gives people a better chance of pulling themselves out of hunger and destitution. Modern networking tools supply farmers with market information, entrepreneurs with access to microcredit, doctors with disease surveillance or diagnostic advice, community groups with links to disaster relief, and students with a whole world of knowledge.

For many rural or poor Africans, however, using a computer or even a telephone remains a dream. Akossi Akossi, Secretary General of the African Telecommunications Union, describes the lack of ICT infrastructure throughout the continent as "cruel." Several factors are to blame.

High costs plus the shortage of investment capital have limited the construction of the right kind of infrastructure, whether it be the fibre optic and microwave "backbones" that link the country with national and international transmission capacity (bandwidth), or the fixed wire and wireless networks that link the end users — the so-called "last mile" of connectivity.

Part of the reason for this obstacle has been the burden of government oversight. Many of Africa's 54 countries still cling to a bewildering array of national policy regimes and restrictive telecom regulations. These often-incompatible systems also hinder the cross-border harmonization of licensing rules, thereby frustrating the economies of scale that are needed to make such large projects affordable. For example, the

non-profit African Virtual University offers satellite-based distance learning, but has faced huge hurdles in obtaining licences from more than two dozen governments.

A telling irony is that one of Africa's poorest territories, the unrecognized de facto state of Somaliland, hosts the continent's least expensive and most widely accessible telephone service. The country simply hasn't had the means to draft the straitjacket of licensing and levies that stifle the telecommunications sector elsewhere. In destitute Somaliland, ICTs thrive.

The Idea: Blue sky thinking

Somaliland can provide cheap and accessible ICT services for another reason: its small telecommunications sector relies heavily on satellites. Because these sky stations broadcast a wide footprint of low-cost and reliable signals, they offer a good model for linking a continent that suffers from insufficient terrestrial infrastructure. Satellites can connect "the last 1 000 miles."

The key to the affordability of these systems is higher powered satellites combined with the new generation of small but powerful ground stations. A Very Small Aperture Terminal (VSAT) typically measures less than 2.5 metres in diameter, and nowadays can be one-tenth the price of the more cumbersome receiving and transmitting equipment of the past.

A small sample of potential satellite applications for Africa:

- Internet
- Email
- Distance learning
- Rural telecommunications
- Telemedicine and medical data transfer
- Disaster relief
- Videoconferencing
- Intergovernmental communications
- Maritime services
- News gathering and distribution
- Video monitoring
- Bank transactions and ATM services
- Tourism reservation systems
- Point-of-sale electronic funds transfer
- Real-time market information
- Sales monitoring and stock control
- Information to highway drivers

Despite its small size, a VSAT can carry Internet, data, voice, fax, and video signals.

With VSAT, virtually any entrepreneur, small business, public institution, or individual (by way of a rural cyber café or telecentre) can immediately connect to the Internet or make a phone call — no matter how far they may be from fixed lines. VSAT can level the playing field by allowing everyone everywhere to benefit from similar levels of service.

VSAT offers one promising solution to the technical difficulties of reaching Africa's far-flung districts. But what is the answer to the administrative bottleneck caused by onerous regulation? How can this fragmented maze of rules and fees be minimized so that VSATs will be free to flourish?

The Research: Learning and advocacy

Between 2003 and 2006, Canada's International Development Research Centre (IDRC) joined forces with the British government's CATIA (Catalysing Access to ICTs in Africa) initiative to support research and advocacy on VSAT regulation by the industry association, the Global VSAT Forum (GVF).

The project set itself two tasks: to better understand the shortcomings of the current regulatory regime, then to press for reform of that regime.

The project's research team set out to clarify the current role of VSATs, particularly as they may help improve standards of health, education, and business in Africa, and their potential for improving these standards in future. It sent a detailed questionnaire to every African government, and quizzed global telecommunications organizations, regional industry associations in Africa, other non-governmental organizations, private sector consultants, and legal experts.

The team researched and analyzed a wealth of topics: the existing regulatory and policy frameworks, including licensing and taxation issues; currently accessible bandwidth and patterns of usage; ownership of VSAT technology; the technical and human resources available for deploying VSAT; the costs of VSAT to institutions and individual users; and complementary technologies.

The process gathered substantial information from fully two-thirds of Africa's countries, and



IDRC: Peter Bennett

partial information from the remainder. These facts and figures supported a series of meetings, workshops, and training events held with telecom regulators across the continent. The data also stocked an online "one-stop shop" of regulatory information and license applications — a handy service that reduced the administrative burden on governments and made it easier for private sector VSAT enterprises to access this vital information.

On the Ground: Getting a clear picture

Early in the project's lifespan, the team consolidated its rich findings in a detailed and persuasive 73-page report, *Open and Closed Skies: Satellite Access in Africa*. This book, available both in print form and online, filled important gaps in research and analysis, and included a practical blueprint for action by governments wishing to harmonize their satellite regulations.

An innovative by-product of the report is IDRC's online Africa Satellite Atlas. This interactive web page allows users to view, among other details, the coverage footprints over Africa of specific satellites. With a click of the mouse, the complexity of providing signal access across wide areas is clearly illustrated, and in brilliant colour. The atlas confirms that, technically, nearly all of Africa could be served by VSATs. Says IDRC's Heloise Emdon, "People with little ICT background could look at the maps and understand the issues."

CATIA's advocacy component drew upon all this material as it set out to persuade a wide African audience of the need for ICT reform. It focused on the private sector, civil society, consumer groups, and the mass media, and sought to show members of these bodies how they

With VSAT, any entrepreneur, small business, public institution, or individual (by way of a rural cyber café or telecentre) can immediately connect to the Internet

RESEARCH THAT MATTERS

themselves can push for better telecommunications. CATIA recognized the importance of personal leadership, and took care to boost the number of ICT “champions,” especially among women.

The Impact: Loosening up the regulators

The early release of the research report was key to the success of the advocacy. CATIA’s Clare Sibthorpe explains: “The research provided the information and data required, and then the CATIA project ensured that these results were

disseminated and used by policymakers and regulators. The two projects together were able to achieve greater impact than if they had stood alone.”

And what was this greater impact? “Basically what the report did,” says Emdon, “was to come up with model legislation which has subsequently been adopted by three regional regulatory associations which together cover three-quarters of Africa.”

In many of these countries, reform has already unleashed changes in licensing regimes and, as the GVF’s David Hartshorn puts it, “a rapid proliferation of VSATs.” For example:

- CATIA activities have led to policy and regulatory reform — followed by greater diffusion of VSATs — in Kenya, Uganda, Tanzania, Ghana, Côte D’Ivoire, and Nigeria;
- during 2005 the VSAT operator Afsat, serving Kenya, Uganda, Tanzania, Ghana, and Nigeria, grew by 67%;
- the number of authorized VSAT data networks in Ghana grew from 96 in 2003 to 162 in 2005;
- dramatic reductions in VSAT licensing fees have happened in at least 15 countries, leading to an increased number of service providers;
- better access to the Internet through VSAT boosts the opportunities for Voice Over Internet Protocol (VoIP) systems, thus reducing the cost of international phone services where VoIP is allowed.

These policy changes have helped Africans join the global “knowledge society” and so achieve real improvements in their lives. Many people

now have cheaper and easier access to markets, business opportunities, credit, medical information, and distance learning. These links stimulate new wealth at the bottom of the economic pyramid, and so likely will have an early and dramatic influence on development.

Future Challenges: Solutions in sight

Although much has been achieved, much remains to be done.

So far, the coordination of regulation has happened regionally in East, West, and Southern Africa. Central and North Africa will be addressed once regional regulatory bodies are established in these areas. African reformers are encouraged by the European experience, where some 46 different national regulators function in relative harmony — to the benefit of satellite operators and consumers, and without jeopardizing national sovereignty. By learning from other world regions, African regulators hope to leapfrog to modern solutions.

Other challenges to widespread deployment of VSAT services are the shortage of trained local technicians to install and maintain thousands of terminals, the need to power this equipment from alternative electricity sources in remote rural areas, and the problem of collecting service fees from people in those areas. For all these obstacles, however, feasible solutions are in sight, and the sky may well be the limit.

“The single most important obstacle slowing the provision of VSAT-based solutions is outdated regulation.”

– David Hartshorn, Global VSAT Forum, and Anina Selve, Gilat Satellite Networks Ltd.



IDRC: Peter Bennett

Canada’s International Development Research Centre (IDRC) is one of the world’s leading institutions in the generation and application of new knowledge to meet the challenges of international development. For more than 35 years, IDRC has worked in close collaboration with researchers from the developing world in their search for the means to build healthier, more equitable, and more prosperous societies.

International Development Research Centre
PO Box 8500
Ottawa, Ontario, Canada, K1G 3H9
Tel: 613-236-6163
Fax: 613-238-7230
Email: info@idrc.ca

www.idrc.ca