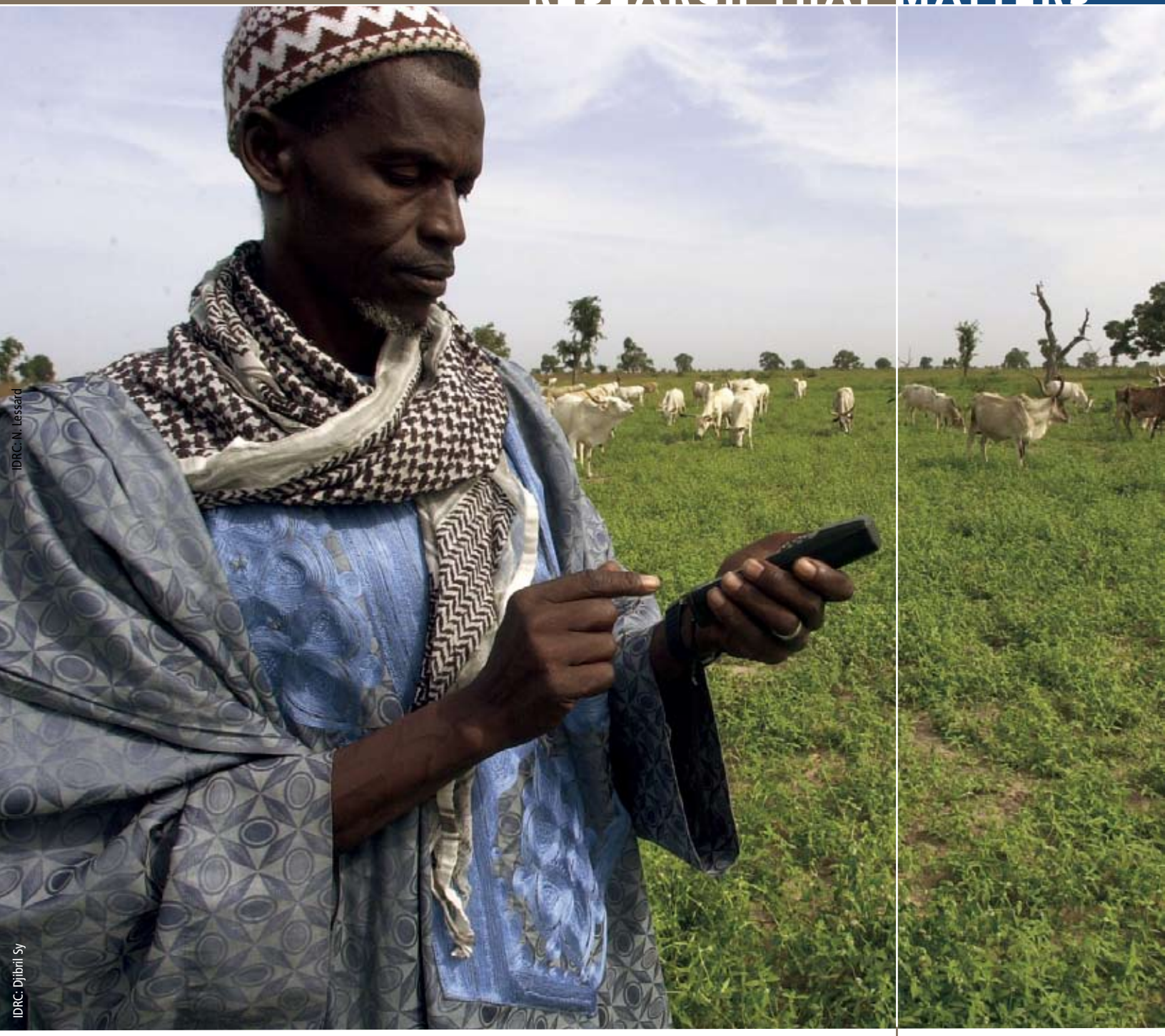

IDRC: N. Lessard

IDRC: Djibril Sy

The Future of Africa is Mobile

Personal digital assistants (PDAs) are often used as scheduling tools in developed countries, but IDRC-supported researchers are showing how wireless PDAs can improve healthcare delivery in Africa.

IDRC CRDI

Canada

"Just start thinking about the PDA as a computer. It's got more computing power than the spaceship that first went to the moon."

Holly Ladd, Executive Director, SATELLIFE

The Development Challenge: Improve access to medical information

In Uganda, as in other African countries, doctors and healthcare workers often don't have access to the current health and medical information they need to effectively treat patients. This has been particularly true for heath professionals working in remote rural locations without electricity or access to fixed-line telephones. It can be challenging for them to gain access to updated treatment guidelines for diseases such as HIV/AIDS, or country-specific essential drug lists. It can also take months before epidemiological surveys, done on paper, are input into a computer in the capital city of Kampala. This limits how quickly the healthcare system can respond to disease outbreaks. The nongovernmental organization SATELLIFE thought that PDAs could bring the power of a computer into areas without electricity — particularly if the PDAs had wireless connectivity.

"We took immediate action [when we learned of a typhoid outbreak reported via PDAs] – typhoid education about cleaning the water, asking people to boil water."

Gulabla Katumba,
Medical Officer in Charge, Kalisizo Hospital, Rakai District

The Idea: Harness wireless technology

Local Global System for Mobile Communications (GSM) cellular networks have become well-established in Uganda. In fact, national teledensity has increased by 350% since the first network went live in early 1995. So, while many rural villages lack power, they do have cellular coverage. SATELLIFE and Uganda Chartered HealthNet (UCH) wanted to capitalize on this dramatic new development by piloting an affordable, durable approach to two-way electronic communication that would make use of the GSM telephone network.

IDRC: R. Fuchs

Midwife Veronica Ndagire Herman is one of 206 healthcare workers in Rakai District to receive a PDA.

The Research: Testing a new health network

PDAs were used to send and receive information and data via "Jacks," relay devices created by WideRay, Inc. of California. The Jacks are battery-operated units that contain a GSM cellular transceiver and a data cache; each Jack can support up to 1 000 handheld units. The Jack communicates with a server located at UCH headquarters in Kampala by making

cellular phone calls, and with the handheld units via their infrared beam. When users "beam" to the Jack, information is uploaded and downloaded. Twenty Jacks were installed at strategic locations in two pilot districts, Mbale and Rakai. Healthcare workers used the Jacks to download information, such as medication alerts or guidelines, as well as to upload information, such as survey results or email consultations with other healthcare workers.

PDAs were also loaded with information that is usually found only in medical reference libraries so that physicians in remote areas could diagnose illnesses, determine treatment, and prescribe medication. SATELLIFE and UCH deployed 200 Palm m130 handheld computers with the necessary accessories and ancillary equipment. Canada's International Development Research Centre (IDRC) supported the pilot project, which ran from 2003 to 2004, with a contribution of CA$962 731. A second phase of research, also supported by IDRC, is ongoing and some 150 additional PDAs have since been dispatched.

On the Ground: Trial and error point to improved approaches

Jacks were installed in healthcare facilities in the Rakai and Mbale health districts. Research revealed several problems with the original model, including dropped calls and unnecessarily long connection times. This led to the development of an improved model, the WideRay SP320 Jack, which eliminated most of the problems associated with the previous model.

The lack of electricity to charge PDAs proved a major challenge in several healthcare facilities. This problem was solved by introducing solar chargers.

Training in how to use PDAs was provided to 206 health workers in Rakai, 140 in Mbale, and 40 from Marie Stope Uganda (MSU) and the Joint Clinical Research Centre.

The Impact: A new wireless network for Uganda's healthcare workers

The technology has proven to be robust and easily adoptable by both UCH and end users, and has yielded measurable cost savings and improvements in data quality and availability. Rakai and Mbale Districts and PDA users reported that they have seen an improvement in both the timeliness and accuracy of data reporting as a result of the project and users have increased their demands for additional content and services (email and power supply). A team of experts from Makerere University found that the network was less expensive by about 25% than the traditional paper-and-pen approach for data collection. The Uganda Ministry of Health has said it is now interested in providing PDAs throughout the health sector.

SATELLIFE: B. Gebru

UHIN: P. Okello

Training in how to use a PDA was provided to more than 300 health workers in Rakai and Mbale Districts.

SATELLIFE: B. Gebru

Future Challenges: Making PDAs widely available and expanding the network

Africa has proved to be a profitable market for mobile phones, yet the market for PDAs remains untested. Although many healthcare workers have become convinced of the usefulness of PDAs, the technology is difficult to purchase in Africa at reasonable prices. Setting up a retail outlet in Uganda could test the market. Researchers are discussing this option with manufacturers. Researchers are also undertaking to build an alternative to the Jack to reduce equipment costs and make it more affordable to expand the network.

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