

Fiber optic networks to Rwanda's rescue

Josh Ruxin

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The same technology that has transformed the way Americans live and work during the past 50 years may soon propel the economies of the poorest countries from pre-industrial directly into the 21st century -- in a fraction of the time. And the potential of technology for enabling these countries to cope with famine, poverty and disease are enormous.

Rwanda, one of the poorest countries in Africa, had barely 3,000 landline telephones a decade ago -- that's 1 phone for every 3,000 people. Today, it's rapidly becoming one of the most wired nations in Africa.

One company, Terracom, is laying a fiber and high-speed wireless infrastructure throughout **Rwanda's** 11,000 square miles that will soon deliver a level of Internet connectivity only recently rolled out in the United States. Along with excellent mobile phone coverage, this project will not only transform communications, it could transform the economy and help the country lift itself out of poverty.

In Kigali, **Rwanda's** capital, where a good Internet connection five years ago cost \$1,500 per month, the price has plummeted to only \$70. Mobile broadband, the same technology offered by Verizon and Sprint in the United States, is also available, and, for an additional \$70 per month, you can get a card for a laptop delivering between 400 and 700 kbps.

Using the same technologies we have in the United States, development agencies, businesses and schools can finally get the tools to thrive. For example, the government is starting to link widely dispersed health clinics and hospitals to the Internet and to each other. These health centers and hospitals are now able to share information on treatment protocols, medication needs and disease prevalence.

Disease surveillance is an important topic. (Think of how much attention was given in the United States to the avian flu.) Communications could finally allow **Rwanda** to monitor any new outbreaks or changes in the rates of proliferation for AIDS and malaria.

A major challenge is to make technology accessible to most Rwandans. Up to now, a major obstacle to Internet access has been the price tag of computers. Even in **Rwanda**, where the price has dropped dramatically, PCs are still far out of reach of average citizens or entrepreneurs. Per-capita income is only about \$230 per year.

However, the planned delivery of high bandwidth to even the most far-flung villages and towns presents an extraordinary opportunity: rapid migration to low-power "thin clients." A "thin client" is essentially just a screen, a keyboard and an Internet connection. If the bandwidth is good enough, all the software runs on a computer remotely located where there is adequate power.

Thin clients cost around \$100, use far less electricity and don't have moving parts that break. They are the enabling feature of a real computer revolution -- and one to which even the poor can have access. It is, therefore, entirely conceivable that many Rwandans could have, before long, their own "virtual desktops" that could be accessed from any terminal anywhere on the planet.

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We're already starting pilot projects with this technology in one of the poorest places on Earth -- Mayange, **Rwanda**. Per-capita income there is about \$20 per year. Less than a year ago, the people of Mayange were enduring drought and famine; computers and Internet connectivity would have been the last things on their minds.

However, with the government of **Rwanda**, other partners and the Millennium Villages Project of Columbia University's Earth Institute, we're introducing basic low-tech interventions in agriculture, health and education that seek to end Mayange's poverty in fewer than five years. Now, with some of their most basic needs being met, the villagers are beginning to see how computer technology can transform their lives even more.

With improved seed and fertilizer, farmers have increased their productivity as much as tenfold, and some farmers have earned so much money from their crops that they have been able to buy cell phones and start small businesses. With computers, farmers would have access to valuable information on farming processes, and they can identify new customers and markets. The country's coffee has become so good that March was Rwandan coffee month at Starbuck's.

In health, the Millennium Villages Project's use of technology has helped solve basic staffing and supply problems. The Mayange Health Center now provides effective basic care -- everything from delivering babies to providing bed nets to prevent malaria. Soon the Mayange health center will introduce electronic medical records, computerized financial management and inventory controls for drug supplies. Telemedicine for remote diagnosis and specialist care will also be available.

Through the Millennium Villages Project, computers have been introduced in the school, allowing teachers, who have on average 60 students per class, to spend less time keeping track of grades, students and coursework, and more time teaching. Add Internet connectivity and thin clients, and the potential for learning will be as limitless as the World Wide Web.

All of this can happen -- almost immediately -- by introducing thin clients into these working environments. And other developments will energize change even further.

There are two separate initiatives, for instance, to bring fiber-optic cable to the 100 million people of Kenya, Tanzania, **Rwanda**, Burundi and Uganda. One is the East African Submarine Cable sponsored by many governments; the other is privately sponsored to bring a fiber cable across the sea from India.

This connectivity could transform even the poorest parts of Africa, just as India's economy is being transformed with growing business in call centers and back-office outsourcing. All it takes is English-speaking college and high school graduates eager for work -- of which Africa has many -- and the connectivity to link them to a global economy.

Given a chance, technology has the potential to power less developed countries into the 21st century. At a time when poverty is at the core of so much distrust, isolation and unjust suffering in the world, it is in America's interest to invest in and sponsor technology that can help poor countries give their people the same opportunities for entrepreneurship and prosperity that we have so long enjoyed.

Josh Ruxin, assistant clinical professor of public health at Columbia University, is director of the Access Project in Rwanda. Contact us at insight@sfchronicle.com.