



ICT for Development Contributing to the Millennium Development Goals

Lessons Learned from
Seventeen *infoDev* Projects

The logo for infoDev, featuring the word 'infoDev' in a stylized font with a series of dots above the 'i'.

Information for Development Program

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ISBN

ICT for Development

Contributing to the Millennium Development Goals: Lessons Learned from Seventeen *infoDev* Projects

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Information for Development Program

Preface

When *infoDev* was created, in 1995, few regarded information technologies as a valid tool for development. Barely five years later, the international community had adopted a set of Millennium Development Goals, within which this role was explicitly recognized. The development community is now readying itself to meet in Geneva and Tunis for a “World Summit on the Information Society.”

Yet, analysts and decision makers are still struggling to make sense of the mixed experience of information technologies in developing countries. Very often, such experiences seem to amount to little more than a heterogeneous and unrelated set of anecdotes. However spectacular, successful, moving, or important some of those anecdotes may be, they remain a precarious basis for justifying major policy or investment decisions.

The possibility to replicate and scale up successful projects will not fully materialize until the knowledge accumulated from IT-for-development projects (successful and unsuccessful) is widely documented and shared. This “knowledge dissemination imperative” is at the core of *infoDev*’s new strategy.

The aim of this paper is to create a publicly available resource that provides concise descriptions of selected *infoDev* ICT-for-development projects and their impact on poverty. The paper first presents case studies of a cross-section of projects funded by the *infoDev* Core Program, followed by an in-depth analysis of the impact and limits of those projects.

The main criterion for selecting projects for case study analysis was to be as representative as possible of the various environments (political, economic, social, geographic) in which *infoDev* has been operating since its inception. An attempt was also made to provide a balanced sample relative to the success rate of the projects. Rather than selecting the “best projects,” the authors, in consultation with the task managers of the projects, gave priority to those initiatives likely to offer the best lessons and knowledge about how to use ICT for development purposes.

This paper also makes an attempt to include the experience gathered by other programs involved in ICT-for-development. And it makes a specific effort to link the ICT projects to the Millennium Development Goals. It is *infoDev*’s hope that by sharing such practical experience in an open and candid fashion, it can stimulate the use of ICT as a tool to reach the MDGs in a timely, cost-effective, and imaginative fashion.

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infoDev Case Studies

“TO PROMOTE INNOVATIVE PROJECTS THAT USE INFORMATION AND COMMUNICATION TECHNOLOGIES FOR ECONOMIC AND SOCIAL DEVELOPMENT, WITH A SPECIAL EMPHASIS ON THE NEEDS OF THE POOR IN DEVELOPING ECONOMIES.”



Abantu (Kenya) www.abantu.org

Strengthening the Electronic Communications Capacities of Women's Organizations in Africa

Abstract

Abantu for Development was established in 1991. In 1999, it began an Information and Communication Technology (ICT) component of its work, funded in part by *infoDev*. This work has concentrated on Kenya and has included 1) training various women's groups in basic software and Internet skills, and 2) bringing together different sectors of the business community to produce gender-sensitive ICT policy recommendations. *infoDev* funding also supported ICT conferences in Ghana and Tanzania.

While the ICT component was started as a distinct project ("Gender and ICT") Abantu found that it needed to incorporate ICT work into all of its program areas. Abantu believes this strategy will have a greater impact on its other gender-related projects: Poverty, Governance, and Conflict. By integrating ICT into its mainstream work, Abantu strengthened its partners and their communication of key gender issues. Abantu will soon expand its ICT advocacy work to Uganda, Tanzania, and Zambia.

Background

Abantu for Development is an international non-governmental organization. It focuses on training and providing information and advice on how to mobilize resources for sustainable development in Africa. The

organization's East African office is based in Kenya and currently has four programs: Gender and Poverty, Gender and Governance, Gender and Conflict, and Gender and Information and Communication Technologies. The specific ICT project, funded mainly by *infoDev*, began in 1999 in collaboration with a number of other African organizations. Its first efforts were concentrated on Kenya.

The aim of the Gender and ICT project was to improve African women's access to and use of the Internet. In addition, Abantu has been working with policy makers to try to ensure that gender perspectives are incorporated into all new ICT policies. To accomplish these goals, the project developed a strong, focused core group of women across Africa to:

- define and guide African priorities on the development and use of electronic communications
- establish a cross-sectoral, interdisciplinary African women's information network
- set up and maintain African list serves (electronic discussion groups) and information networks to build information and databases on Africa *in Africa*
- stimulate dialogue and cross-fertilize ideas among women in Africa
- enable women to use the Internet as an advocacy and information-sharing tool on international issues
- develop strategies for influencing information and communication policies from a gender perspective

As part of its work, Abantu has strengthened the presence of African women in cyberspace by developing the Abantu web site.

The idea for this project arose from a survey on the needs of women's groups carried out in 1995. The proj-

ect also responded to demand generated by existing Abantu ICT training workshops. In 1999, Abantu embarked on a number of ICT training workshops for women's groups, held seminars to raise awareness among policy makers, and developed a project web site. Today, the ICT project work falls into four categories: Training and Capacity Building; Advocacy, Public Awareness, and Networking; Research, Publications, and Information; and the Institutional Development of Abantu itself. Electronic information is regularly exchanged between Abantu's regional offices and their network of NGOs, particularly with respect to work plan follow-up and requests for information on NGO activism in Africa.

Under the Training and Capacity Building component, Abantu has trained organizations in one farming region (Nyeri), one pastoral region (Kajiado), and two informal settlements of Nairobi. Nyeri is one of the major coffee-producing regions of Kenya. The training there focused on both the Internet and software programs for use in the factory. The results of the various trainings included increased use of the Internet and e-mail (particularly for personal use), although such use was often constrained by poor infrastructure (power and telecommunications). Abantu is currently proposing a small telecenter project for each of the four groups.

Under the Publication, Research, and Information arm of the project, Abantu produced gender-sensitive ICT guides for use by African women's organizations. These guides covered such topics as "Making the Most of the World Wide Web" and "Advocacy and the Internet." In addition, each quarterly issue of Abantu's *GAP Matters* magazine now carries a section on technology that informs people about emerging ICT issues.

Finally, under the Advocacy, Public Awareness, and Networking component, Abantu held a number of public seminars. These included a 1999 seminar on forthcoming telecommunication reforms in Kenya. People from all social and economic sectors of Kenyan society attended the seminar to express what they wanted in the new legislation. Abantu then looked at the role played by gender in the discussion. The results of the seminar were sent as recommendations to the government. A more recent seminar produced a framework for critiquing future government ICT policies.

An internal evaluation of the Gender and ICT program was carried out in June and July 2002. At the time, the ICT component had already been increasingly integrated into the other gender projects of Abantu. The evaluation highlighted that ICT was the key to the efficiency and effectiveness of all Abantu programs and recommended that ICT not be retained as a standalone project, but become part of all of Abantu's gender work.

Impact/Results

- a certain number of financially independent women's groups (some groups trained by Abantu no longer require support, as they have used their newly acquired IT skills to increase their incomes)
- gender-sensitive ICT guides for African women's organizations
- critical framework for evaluating government ICT policies
- women's groups in farming, pastoral, and slum communities were trained in how to use the Internet and basic software programs
- lesson learned: ICT supports all gender-related advocacy and program activities, prompting Abantu to integrate ICT into its poverty, governance, and conflict projects

Key Issues

Target groups

Abantu principally targets poor women and policy makers. It works with existing women's organizations in various communities to improve the ability of women to use and access ICT. Abantu encourages and facilitates opportunities for people from various sectors of society and business to attend workshops and seminars. The results of these seminars are distilled into policy recommendations for government.

Capacity building

Abantu training helped community groups improve their management and organization, as well as their income-generating activities. To date, Abantu has trained groups from pastoral, farming, and slum communities in Kenya.

Abantu found that it was important for its own staff to develop a basic working knowledge of ICT. Within Abantu, staff have the opportunity to teach themselves various software packages using CD-ROMs.

This instruction constituted the institutional development component of the program. Abantu found self-teaching CD-ROMs to be more cost-effective than sending people to courses. This type of learning created no work disruptions, enabled learning at a self-taught pace, and allowed everyone to learn at different levels.

Technology

Standard laptops and desktop personal computers (PCs). Abantu staff bring three PCs to community trainings because participants are more familiar and relaxed with desktop computers than they are with laptops.

Finance

Total Project Cost:	US\$ 500,000
<i>infoDev</i> funding:	US\$ 250,000

The remainder of project funding was covered by other Abantu programs. The *infoDev* funding has now finished. However, the aims of the project continue, as this project now forms an integral part of all Abantu activities. With respect to the telecenters project (for increasing community income), external funding is currently being sought.

Beneficiary Stories

In Kajiado, a largely illiterate Masai women's group used the Internet and their software skills to successfully secure USAID funding for a bee project. The funding enabled the project to expand from honey collection to other income-generating activities using both wax and honey.

Near Kisumu, a poor semi-literate woman used her training to enable her to personally communicate bimonthly with her son in America. Previous e-mails to the woman had been collected by a friend who, it was later discovered, kept the money sent to her through Western Union. Today, the woman has the confidence and ability to communicate with her son directly, freeing her from the need for an intermediary. She compares e-mail to a phone call.

Issues and Lessons

- The main lesson learned was that best practice calls for incorporating ICT into existing programs, rather than maintaining it as a separate program. Much of the project was, therefore, carried out in coordina-

tion with Abantu's other three programs.

- Seminars and workshops were the most effective tools for advocacy. Kenya is largely an oral society, so written work is seen as less accessible.

Challenges

- There is a need to collaborate and partner with like-minded organizations in order to increase the impact of the program. The results of a recent evaluation show that overall, the project achieved its objectives, and that its impact was appreciated by target beneficiaries.
- The national policy development seminar, "Making Policies Gender-Sensitive" (December 2001), made Abantu aware of the need to publicize gender and ICT issues if ICT policies in Kenya were to become gender-sensitive.
- A major project challenge was the current state of technology infrastructure in Kenya. Poor telephone communications and unreliable electricity made it very difficult for people to access computers. In response to this problem, Abantu hopes to create four telecenters in the areas in which it has been working. A recent reduction of the computer tax in Kenya should also help expand the reach of ICT.
- There was a significant difference between rural and urban project areas. The rural areas had a stable community and the same people continued through several different training sessions. In the urban areas, however, there was often participant discontinuity between one training session and the next; it was also difficult to engage the community as a whole.
- The previous government ICT policy document was based on a system similar to the national education system. That system places ICT among the sciences, an area in which female education is not promoted. As the school curriculum is changed, it is hoped that the ideas surrounding the "pedagogical location" of ICT will also change.

Key factors/issues which led to poverty reduction outcomes

- Evaluations from participants at policy seminars in Ghana and Kenya demonstrate that the work of Abantu in making ICT policies gender-sensitive is both timely and relevant. In addition, some organizations that received reports on these activities

have requested to be included in future Abantu activities.

- The integration of ICT into all aspects of Abantu's work increased the impact of these activities on poverty, while fulfilling the aims of this particular project.
- The mix of seminars, trainings, and booklets broadened the reach and impact of the project with respect to publicizing gender issues.
- Lesson learned: an individual does not have to be fully literate to utilize ICT. This discovery increased the impact of Abantu's work with low-income women.

Future outlook

- Continued integration of ICT in all areas of Abantu's work is needed. This objective will be achieved through coordinated improvement of ICT infrastructure and capacity building for Abantu staff in all regions. ICT training will be offered to all Abantu staff and the Abantu Directorate will provide

guidance on how to implement this training in the regions.

- Abantu hopes to set up four telecenters in Kenya. At present, they are looking to locate these centers in areas that are culturally appropriate for women to visit, such as shopping centers.
- Abantu is just beginning to mainstream ICT into their gender and advocacy work in Tanzania, Uganda, and Zambia.

Stakeholder consultation

- Abantu Grant Agreement with *infoDev*, June 1999
- Abantu Third Quarter Report 2002 for *infoDev*
- Abantu web site: www.abantu.org
- Interview conducted by Dr. Batchelor with Waithera Ndung'u, Information and Communication Program Officer, Abantu, Kenya, July 2003
- Additional information received from Peter Kahara, July–September 2003
- *infoDev* Task Manager, Pamela Street



B2BPriceNow.com (Philippines) www.b2bpricenow.com

E-commerce for Farmers: Hands-on Training Program

Abstract

B2Bpricenow.com is an e-marketplace in the Philippines that enables farmers, fishermen, and small and medium enterprises to access market prices and trade products. The marketplace can be accessed via web site or cell phone. The first phase of the project involved obtaining content for the B2B web site from a variety of agricultural and fishery cooperatives and training them to access and post products on the site. Because Unisys provides free technical support and hosting, B2Bpricenow.com is able to offer its services for free. The second phase of the project will focus on getting target groups connected to the Internet and conducting actual transactions online.

Background

This project is the brainchild of Mr. Edgardo Herbosa. The idea was to set up an e-commerce web site through which Filipino cooperatives and groups could trade their produce. Mr. Herbosa created the site in 2001 with some of his own funds and received technical support from Unisys in exchange for company shares. The project was adopted by a number of government agencies, as well as the Land Bank of the Philippines and the NGO Philippine Rural Reconstruction Movement (PRRM). Both of the latter organizations were then planning similar systems.

Funding for training was obtained from *infoDev*. These partnerships enabled B2Bpricenow.com to provide free access to the site for cooperatives and other groups.

The project objective is to “enable farmers to harness the benefits of information and communications technologies to promote economic development and social well-being.” It is hoped that by providing transparent and timely market information to both buyers and sellers, the project will enhance efficiencies in the agricultural market. In addition, the ability of farmers to tap buyers and sellers directly and to obtain competitive prices for inputs and outputs should result in higher incomes—a direct poverty alleviation impact.

The rationale behind the project is that farmers in the Philippines, particularly those in rural areas, have long suffered from lack of market price information and poor access to buyers and sellers. Consequently, they have been unable to get the best value for their produce and have usually relied on traders to serve as intermediaries. The interests of the traders, however, often conflict with those of the farmers—putting into question the reliability of the market price information provided by traders and the fairness of the purchase and sale prices negotiated by them with the farmers.

In the past, this problem was addressed by cooperatives and government agencies, which collected samples of prevailing market prices two to three times a week. These prices were then disseminated on demand a day or two later. By that time, however, the prices were out of date. The system was also unable to provide comprehensive price information throughout the 7,100 islands of the Philippines. Moreover, no mechanism existed to allow farmers and cooperatives to market their products and trade directly with distant buyers and sellers.

To address these marketing deficiencies, B2Bpricenow.com provides a free electronic bulletin board and marketplace designed to bring relevant market information directly to farmers, primarily through their cooperatives. As an electronic bulletin board, the web site enables users to gain greater negotiating leverage from awareness of prevailing market prices for their products. As an electronic marketplace, the web site aims to minimize intermediation (middlemen's fees), thereby enabling farmers to reap the gains of lower costs and broader market reach.

Project activities to date include establishment of the web site, creation of web site content, and a training/information road show presented in over 30 cities. In addition, five two-day workshops were carried out in conjunction with PRRM. The training program included computer training and online basics. Future trainings will address, among other topics, how to negotiate online, how to canvass prices, and how to contact buyers. Currently, project activities are focused on getting cooperatives connected to the Internet in 1,500 municipalities through the establishment of b2bcenters (business centers) on cooperative premises. The Land Bank attempted to conduct an initial evaluation of project usage by cooperatives via questionnaire. Unfortunately, none of the questionnaires were returned. However, B2Bpricenow is still in the formative stage and monitoring of actual transactions should be easier once the online transaction gateway is launched in Fall 2003.

Impact/Results

- Target groups gained access to additional marketing windows for their commodities. B2Bpricenow.com believes that the Internet is the ultimate playing field where farmers and fishermen can sell their commodities at prices that are not controlled by middlemen.
- Figures from August 2003 show that B2Bpricenow.com has 1,967 businesses connected to its web site. These businesses cover numerous sectors, including agriculture, manufacturing, civil society organizations, and government agencies. There were 1,344 agricultural postings, 92 consumer manufacturing postings, and 104 industrial manufacturing postings. No figures are available on the number of transactions made to date.

- The initial number of trainees registered to attend the five PRRM workshops was 248. However, the workshops attracted more than 2.5 times this number of participants. Of the people who originally registered, 42 percent were small entrepreneurs and 20 percent were farmers or fishermen.
- An estimated 1,550 people attended the 31 trainings associated with the road show.
- Seventy percent of the cooperatives of the Land Bank have been informed of B2Bpricenow, and 42 percent (1,600) have been trained to use it.

Key Issues

Partnership

- The primary partner institutions are the PRRM and the Land Bank of the Philippines. Founded in 1952, PRRM is the country's oldest non-governmental organization. PRRM has 14 field offices nationwide, a workforce of 300 men and women, and programs dedicated to sustainable local development. PRRM and B2bpricenow.com have been working together for a year, having forged an agreement in 2000 (see the project web site) whereby PRRM committed to inform, educate, and, where available, provide Internet access to cooperatives from their field offices.
- The Land Bank is a government-owned universal bank with a mandate to promote growth and development in the countryside. In addition to its financial assistance mandate, the Land Bank also provides cooperatives with technical assistance on matters such as marketing, trading, and provision of information on new technologies.
- Through a partnership with the American-based technology company, Unisys, B2Bpricenow.com has been able to reduce its high-cost technical expenditures, including programming, purchase of e-marketplace software, administration, maintenance, and hosting, which are covered by Unisys. As a consequence of this arrangement, B2Bpricenow.com can provide the marketplace for free.

Target groups

B2B mainly targets farmers, but also fishermen and small entrepreneurs. Users from these groups tend to belong to cooperatives or people's organizations, including advocacy groups. The PRRM partner groups are mostly rice farmers, rice-based food processors, and

farm workers who are also micro-entrepreneurs. Land Bank-assisted cooperatives are also mostly agriculture-based, but include some small manufacturers and processors. One cooperative in Cavite is fishing-based.

The Land Bank and PRRM have no statistics on the age and gender of their cooperative members. However, they report that most members are between the ages of 35 and 60. Regarding gender, farmer cooperative members are usually men, whereas women usually outnumber men in small entrepreneur cooperatives.

Capacity building

By accessing information on prices, volumes, and the identities of buyers and sellers, farmers are able to negotiate and attain competitive prices for their products and purchases. B2Bpricenow.com intends to train farmers to use information and communications technologies in their day-to-day transactions by the end of the project.

Technology

Desktop computers and telephone connections for 14 cooperative groups. In addition, Internet cafes are currently being set up with the Land Bank that will use wireless technology to link to the Internet. The web site and server have been developed and hosted by Unisys. Cell phones can be used to access information via the Short Messaging Service (SMS) application.

Finance

Founder's initial capital (pre-operating expenses)	US\$	40,000
Unisys site design, programming, and maintenance		\$360,000
Ating Alamin Advertising - broadcasting		\$40,000
Land Bank promotion and training (technical assistance)		\$132,000
<i>infoDev</i> training grant		\$118,000
Total Project Funding	US\$	690,000

For the training events, the Land Bank paid for accommodations, the Philippine Department for Trade and Industry paid for food and venues, the Philippine Department for Agriculture lent the LCD projector, and the Philippine Department of Science and Technology covered the airfares. Ongoing costs are met through commissions paid to B2Bprice when people access the

site via cell phone or conduct an online transaction. Other sources of income include funding from local congressmen, cooperative web sites, and online advertisements.

Beneficiary Stories

- Ricardo Buenaventura, a rice farmer from Talavera, Nueva Ecija, describes how access to B2Bpricenow.com helped him and his cooperative, Nagkakaisang Magsasaka: "This trading venue enables us to monitor prices. We no longer have to travel far, going to a marketplace or trading center to do that." (From "Electronic Market For Farmers," by Lala Rimando, www.b2bpricenow.com/pr/WhatIsB2B.htm.)
- Orientation training on B2Bpricenow.com led Maggie Monge of PRRM-CamSur to encourage fellow co-op members to participate in the road show training. In addition, she noticed that the web site showed demand for virgin coconut oil, but no producer. This has prompted her to introduce the production of virgin coconut oil to the cooperatives.
- Nine young people from El Gancho Cooperative families received B2Bpricenow.com computer training and are now able to use the computer provided to the cooperative. In addition to helping their families monitor prices, they use the computers for their school work.

Issues and Lessons

Challenges

- The main challenge was locating funds to cover education and technology costs. However, Unisys and *infoDev* eventually provided these funds.
- The main technical challenge has been poor-quality or non-existent telephone connections. For areas far from any telephone service, B2Bpricenow is currently in talks with satellite and wireless technology companies. In contrast to most developing countries, electricity connection rates are also fairly expensive in the Philippines. At present, B2Bpricenow plans to expand its work only to areas with both electricity and telephone connections, which will limit it to municipal centers and large settlement areas.
- Another major challenge is to ensure that cooperative members who attend the trainings keep up their skills.

- While B2B has focused on the Internet, it has become obvious that mobile phones offer a greater opportunity for relevant and useable service. Mobile or cell phones are now common in the Philippines and text messaging (SMS) is particularly popular. Co-ops already get price data from local traders by phoning them. B2B offers part of its service through SMS and is likely to expand this service to match demand from user cooperatives.

Key factors/issues which led to poverty reduction outcomes

- This project contributes to poverty reduction in four ways: 1) it helps farmers increase their revenues by getting competitive prices for their produce, 2) it helps farmers lower costs by enabling them to communicate electronically with other cooperatives that have similar purchasing and marketing requirements, 3) price and supply volume information aids farmers to make better crop and other investment choices, and 4) the site enables farmers to broaden their customer base and to trade with one another.
- When conducting training, three participants per computer proved more effective than one participant per computer. This is due to the fact that three participants complement one another in the learning process, while one participant tends to get lost during the lecture and has no one with whom to share his or her experience. The ability of participants to access the system themselves following the trainings strengthened the long-term benefit of the training modules.
- Lesson learned: It is better to invite younger members from the cooperatives, as they are more inclined to continue to use the computer than older members.
- Project timing and price (free) were key factors in project success. The e-marketplace came into being at a time when both PRRM and the Land Bank were thinking of creating similar projects, to which they had already assigned budgets. By linking with the Land Bank, B2Bpricenow is able to use an existing banking system for transactions. In return, the Land Bank increases its client base because all transacting parties must open an account with the bank.

- b2bpricenow.com is now endorsed as the “Official e-marketplace of the Philippines for the Agriculture and Fisheries Sector” by COCAFM, a bicameral committee composed of the Philippine Senate and House of Representatives. It is also endorsed as the “Official e-marketplace of APRACA” (Asia Pacific Rural and Agricultural Association, which includes the 18 largest agriculture banks in Asia).
- b2bpricenow.com was even mentioned as a deliverable in the 2003 State of the Nation Address of Philippine President Gloria Macapagal Arroyo on “Modernized Agriculture to Ensure Food Security.”

Future outlook

B2Bpricenow.com is currently setting up partnerships with computer hardware companies, cell phone operators, and other service providers to expand the project to more farmer cooperatives. In exchange, the companies will advertise their products on the B2B web site. Other plans include partnerships with the Philippine Trade and Industry Department to market the latter’s services to small enterprises, and with the National Food Authority (NFA) to harness the NFA’s warehousing, trucking, and logistical services.

Stakeholder consultation

- Development Marketplace 2001, Full Proposal Form for B2Bpricenow.com, www.worldbank.org
- Third Quarter Report 2002 for *infoDev*
- *infoDev* Project Details web page, www.infodev.org
- B2Bpricenow.com Statistics Report, 7 August 2003
- E. Herbosa, Final Project Report, 2003
- Interviews conducted by Soc Evangelista in August 2003 with:
 - Edgardo Herbosa, founder of B2Bpricenow.com
 - Ryk Ramos, Land Bank (Development Assistance Department)
 - Conrado Navarro, PRRM
 - Irene Fernandez, PRRM
 - Gemma Martin, PRRM
 - Members of the El Gancho Cooperative, Naic, Cavite
 - Members of the Kooperatibang Likas ng Neuva Ecija
- *infoDev* Task Manager, Jacqueline Dubow



CDI: Committee for Democracy in Information Technology (Brazil)

www.cdi.org.br

Information Technology and Citizens' Rights Schools for Low-income Communities

Abstract

The Committee for Democracy in Information Technology (CDI), is a non-profit, non-governmental organization. Since 1995, it has pioneered an initiative to promote the social inclusion of disadvantaged communities by using information and communication technology as a tool for citizens' rights and development. CDI facilitates the operation of Information Technology and Citizens' Rights schools by providing equipment (hardware and software), training of local educators, and local administrative and technical support. The schools are self-managed and self-sustaining, but supported and monitored by regional CDI offices. The regional offices were initially set up by volunteers interested in the mission of CDI. Today, they are also self-sustaining and self-managed, with offices located in 20 Brazilian states, as well as Colombia, Uruguay, Chile, Mexico, Guatemala, Honduras, Japan, Angola, South Africa, and Argentina.

Background

CDI began as the personal vision of Rodrigo Baggio. Rodrigo worked as a community volunteer, but success

and work pressure in the IT business forced him to give up volunteer work. In 1993, he realized that he could use his IT knowledge and skills to help community development and formed CDI. The aim of CDI is to use the Internet to create a communication channel between young people from different social groups. The following year saw the first computer donation campaign, and in 1995, the first Information Technology and Citizens Rights School (ITCRS) was established. The school was seen as a chance to bring technology to underprivileged and socially excluded communities while simultaneously using the technology to promote active citizenship.

CDI has grown at a phenomenal rate since 1995. In 2003, more than 200,000 young people will receive training in 830 schools. As more schools were established around the world, more regional CDI offices were created to maintain them. The final objective of each school and regional office is to stand on its own, enabling CDI to move into a supervisory and ongoing training role.

CDI regional offices and ITCRSs are, in effect, social franchises. CDI uses local community centers, churches, and other available institutions to create new schools. Local staff are then trained to run them, with CDI providing hardware, software, and technical support until such support is no longer necessary. Educators receive a five-month initial training; their first class is supervised before they are deemed qualified. School staff are also trained in network support. CDI headquarters in Rio, which supervises regional offices across Brazil and abroad, is responsible for program monitoring and evaluation. Each regional office sends detailed monthly reports to headquarters based on information they receive from individual ITCRSs.

CDI does not expand by seeking partners, but by awaiting invitations. It then uses an evaluation committee to decide whether an invitee is a suitable partner. Due to its rapid growth and success, CDI is presently in the process of consolidating its work and is not seeking to expand further until it can assure the quality of its current activities.

In June 2002, *infoDev* gave CDI a grant in order to increase the number of ITCRSs in Latin America, specifically, Uruguay, Colombia, Chile, and Mexico. The grant was also used to strengthen the operations of CDI regional offices in the region.

Impact/Results

- CDI has successfully adapted its methodology to reach a diverse range of disadvantaged individuals, including socially excluded street children, visually impaired youth, indigenous peoples, maximum-security prisoners, the physically and mentally disabled, and psychiatric patients.
- As a result of the organization's work, more than 483,000 students have attended over 830 schools, learning to use ICT in community development projects designed to promote active citizenship. In a recent evaluation carried out by an external consulting group, 87 percent of children attendees said that the schools had a positive effect on their lives. Among the benefits of the schools are education, new friends, keeping children off drugs, and helping children return to normal schools. The information technology training provided by the schools allows youth from low-income communities to learn to use the Internet as a basis for professional development, thus increasing their chances on the job market.

Key Issues

Partnership

In the CDI model, the major partner is the local community. Volunteers, with help from CDI, set up the regional offices, which in turn create the schools in partnership with local community centers, neighborhood associations, and religious groups, among others. Regional CDI offices use

existing buildings to establish the ITCRSs and train community organizations, as well as members of the community itself. This approach eliminates many overhead costs. Partnership with the local community is the key to the model's success. CDI provides the methodology, equipment, and training, and the community uses these tools to address its specific needs.

CDI has received funding from an enormous variety of sponsors. Usually, each sponsor contributes a specifically defined element or funds a new initiative. Sponsors include BNDES, Microsoft, Fundação Avina, Fundação W.K. Kellogg, BID, AMCHAM-SP, Fundação Vale do Rio Doce, Phillips, Accenture, Fundação Telefonica, UBS Financial Services Group, World Bank Group, UNICEF, YMCA, ESSO, Xerox do Brasil, Terra Network, and Fundação EDS.

Target groups

The majority of CDI target groups are children, but target groups also include visually impaired youth, indigenous peoples, prisoners, the physically and mentally disabled, and other disadvantaged groups.

In order to gather more detailed information about the individuals attending its schools, CDI requested the Institute of Social and Economic Research (ISER)—a consultancy institute with proven expertise in evaluating social programs—to prepare an impact evaluation study. The study was conducted in 2000 to determine the profile of CDI students, as well as to measure the impact of the courses offered. It showed that:

- 65 percent of the students were 10 to 18 years old
- 56 percent were women
- 65 percent were black or mulattoes
- 77 percent had families of at least four members
- 63 percent had no income
- 29 percent received an income of between one or two minimum salaries
- 87 percent considered that the courses contributed to a positive change in their lives
- 90 percent believed that the courses fulfilled their expectations

Capacity building

CDI builds capacity in local communities in a number of ways. First, the regional CDI office provides the local communities with technical expertise, educational methodology, educator training, and curriculum development for the different social groups involved. Second, the non-didactic curricula of the schools foster community building through debates on topics considered important to local groups. These topics are then researched and discussed by the groups within the wider socio-political context. The schools teach common computer programs, such as Microsoft and open source software, and offer Internet and hardware maintenance training. It is the replication of the model, from CDI headquarters to regional offices to local educators, that enables the model to grow and impact local communities.

Technology

One of the responsibilities of the CDI regional offices is to organize computer donation campaigns. These offices are able to recycle machines as old as Pentium 486s. In Rio de Janeiro, for instance, they have a large, loaned warehouse in which large numbers of old computers, monitors, printers, etc., are stored. A team of locally recruited and trained people then strip and rebuild the machines for distribution to ITCRSs.

CDI has developed a Linux-based system which uses one high-spec machine to service 15 to 20 slave units. The latter units have no hard drives, just a floppy disc, 16 megabytes of RAM, and video and network cards. A bootable floppy disc in each drive runs software directly from the server, providing a remarkably fast user interface. Open source software is used alongside a limited number of packages donated by Microsoft.

The goal is to train one person from each ITCRS to maintain and repair their own machines, although due to the simplicity of the system, the reliability rate is good. All computers are donated to the schools and most are second-hand, unless funding has been received for new computers in a specific case.

Finance

The schools are self-sustainable, funded by monthly student fees and donations by partner institutions.

These funds help pay for maintenance costs and educator salaries (although some educators are volunteers). Students that cannot pay fees help by contributing to school chores and taking part in local fundraising activities. Part of the responsibilities of each regional office is to coordinate partnerships with local organizations to set up new schools, as well as to run fundraising and computer-donation campaigns.

Total Project Cost:* **US\$ 350,000**
infoDev funding: US\$ 150,000

*Additional funding provided by CDI and other partners.

Beneficiary Stories

Leandro Farias is a former student who is now an “educator” at an ITCRS. He was the first student to register for the IT course when it was originally created. Another former student, Luis Claudio, is now responsible for the computer network within the Morro dos Macacos ITCRS. In fact, they were both trained in the *favela* (Brazilian slum). Leandro went on to become degree-qualified and then returned to work at the school because of his love for the work. He is seen as a leader by the students. In other cases, educators leave to find better jobs and opportunities, which CDI also considers a success.

Issues and Lessons

Challenges

- With so many offices, duplication of work has resulted and the communication of ideas has not been maintained.
- Drug gangs control local areas and can prevent young people from crossing over a boundary to attend a school.
- Keeping up with technology is an ongoing problem, since it is a moving target.
- The Brazilian government is beginning to recognize the importance of access to ICT for education (digital inclusion). However, funds to promote this type of work are not yet readily available.

Key factors/issues which led to poverty reduction outcomes

- CDI commissioned an external agency with expertise in evaluating social programs to prepare an impact study. This ensured that the program was targeting

the people that it intended to benefit. The study confirmed that the CDI schools were reaching the poor and the marginalized and had appropriate gender inclusion.

- It was important to link a practical skill that potentially enhanced employment prospects with citizenship training. ICT opened an opportunity for group work and peer-to-peer education. The schools undertake a project that encompasses local issues as well as technical learning. The project is created using a process of reflection and action. The non-didactic content fosters community building through debates on topics such as human rights, sex education, non-violence, and ecology, using digital technology. The evaluation noted that the benefits included keeping children off drugs.
- One of the keys to the success of the CDI model is the network of relationships between CDI headquarters, regional offices, and the schools. CDI trains the future educators of the schools who, in turn, train others in their communities. The fact that local staff are heavily involved in the process means that the courses offered by the schools are tailor-made and relevant to community needs. The driving factor is the desire to see underprivileged people given the tools (i.e., technology and education) by which

they can help themselves and improve the conditions in which they live.

Future outlook

- CDI is currently in a period of consolidation. Rather than increasing the number of schools it works with, CDI is currently trying to increase the standard of activities in existing schools.
- The self-sustainability of each school very much depends on the community organization responsible for its administration. CDI encourages each school to develop activities that will make self-sustainability possible.

Stakeholder consultation

- CDI institutional profile
- CDI Grant Proposal to *infoDev*
- CDI Grant Agreement with *infoDev*
- Interviews conducted in August 2003 by Malcom Peirce with:
 - Ricardo Schneider, CDI
 - Leandro Farias, CDI Educator
 - Luis Claudio, CDI Network Manager
 - Dona Ana, Community Center Founder
 - Fernandes Linia Denilson, CDI Maintenance Coordinator
- E-mail communication with CDI, July–Sept 03
- *infoDev* Task Manager, Rafael Hernandez



CEMINA (Brazil) www.cemina.org.br

*Strengthening Women's Leadership in
Community Development through Internet
Radio in Brazil*

Abstract

Communication, Education, and Information on Gender (CEMINA) is dedicated to strengthening women's leadership in community development through Internet radio in Brazil. The CEMINA project was the first initiative in Brazil to focus on promoting gender education by connecting communities to the Internet via the radio. Radio program content is produced locally and shared with other radio stations via broadband Internet links (for uploads and downloads). Today, 11 community radio stations are successfully using information and communication technology (ICT) to produce radio content and 1,500 women from all over Brazil have been trained in radio production.

Background

CEMINA is a Brazilian NGO founded in 1988. Its mission is to promote communication and information on gender issues through radio broadcasting. Today, CEMINA broadcasts to a network of over 400 women's radio programs stations throughout Brazil and is nationally and regionally (in Latin America) recognized as a media focal point for women's radio networks.

The rationale behind the ICT community radio project (Network Cyberella) was to use ICT to exchange audio material and thus improve radio content. The end

result would be increased capacity of Brazilian community radio, a media that operates on scarce resources and relies predominantly on volunteers. The main aim of CEMINA was to improve education on gender by strengthening the use of community radio by low-income women in Brazil. Cyberella set out to integrate existing local radio stations across Brazil into a network that would share content by downloading content via broadband Internet links. They would transmit the programs over the Internet as well as on normal radio.

The CEMINA project offers an alternative telecenter model. The long-term sustainability and limited outreach of telecenters have put the latter model into question. Obstacles to the success of dedicated telecenters include cost, language, local relevance of content, distance, and limited access for poorer residents—especially those in remote, rural communities. Community radio, however, can be used to improve the efficiency of telecenter investments by expanding outreach and increasing participation and value.

One of the objectives of CEMINA is to break the isolation of women and facilitate their social integration via new communication technologies. By connecting the Internet to a media that people are familiar with (radio broadcasts), CEMINA expects to overcome some of the resistance that new technologies tend to create, especially among women.

The main objectives of the project were to:

- create a radio web site that featured profiles of many Women Radio Network (WRN) stations
- provide hardware and train ten WRN stations located in sites with good Internet connectivity (essential for the exchange of audio material on the Internet)

- provide access, hardware, and training for three WRN stations located in remote areas with no connectivity (these areas depend on satellite Internet connections)

The first 13 WRN stations were selected through a public contest called “Cyberella.” The selection criteria required stations to:

- be a member of the WRN
- have access to a broadband Internet connection
- provide a staff member to be the permanent link with CEMINA
- once a week, to broadcast a radio program downloaded from the radiofalamulher.com web site
- provide content to www.radiofalamulher.com

Thirty radio stations submitted proposals. The final selection took into consideration each station’s regional coverage and outreach. One such radio station was based in a community center that featured a telecenter supported by the NGO SAMPA.org. Many of the CEMINA projects feature similar partnerships with other development initiatives.

Launching the Internet radio project in the first 13 WRN stations constituted a pilot phase that allowed necessary adjustments to be made to the project. The three stations without an Internet connection became the basis for future installations of “Radio-Internet-Telecenters” in communities where no Internet connectivity exists. Historically, the major towns and cities of Brazil—and thus, the communications infrastructure—developed along the coast, leaving the interior of the country underdeveloped. CEMINA plans to expand its initiative to the poorest municipalities of Brazil, especially in the North-Eastern region of the country.

Interestingly, CEMINA originally viewed community radio as an alternative to telecenters. However, since the project supplied radio stations with broadband Internet connections, the stations themselves are becoming telecenters.

CEMINA monitors its projects internally through monthly reports. These reports are linked to a series of commitments set out in individual project partnership agreements. The articulation of project goals in partnership agreements was crucial to the pilot phase of the project.

Impact/Results

- A radio web site has been produced (www.radiofalamulher.com). Thirteen community radio stations have been enabled to contribute content and download audio files that are broadcast locally. The present content of the site includes a daily program that is streamed live from 3:00 p.m. to 4:00 p.m. daily. The program is then replicated five times over the next 24 hours. In between, music and selected programs are provided by Radio Viva Favela, with which CEMINA has a partnership for the exchange of audio content.
- Two telecenters have been established. CEMINA is also working with one community radio station located in an area known for child labor. In response to the needs of this area, a telecenter was developed to provide ICT training to local youth.

Key Issues

Partnership

One of CEMINA’s strategies is to partner with other organizations and networks that can contribute content to the web site. In return, CEMINA helps its partners to disseminate digital radio content and create a sustainable network upon conclusion of *infoDev* funding. At present, a partnership with Radio Viva Favela and a link with two digital radio stations have been created.

Two other major partnerships are currently being put in place. The first is a partnership with a large network of health organizations on tobacco prevention. The network will provide a weekly program to be streamed from Radiofalamulher, which in turn will provide coverage of any events held by the health organizations in Brazil. This exchange will cover the costs of production services and hosting the program. CEMINA hopes to develop this partnership into a model that can be used to cover the fixed operating costs of the radio stations.

The second major partnership is with “Hip Hop” music youth groups. These groups tend to be independent music producers in search of new channels for the dissemination of their products. Most are very familiar with ICT and could potentially bring a large audience to the web site. This partnership could also lead to interesting radio programs that CEMINA could promote in the area of youth education.

Other CEMINA partners fund the project through financial or in-kind contributions and include the software company Sound Foundry, the Kellogg Foundation, and the United Nations Educational, Scientific, and Cultural Organization (UNESCO).

Target groups

The main target group of the project is the rural population of low-income women in Brazil. These women reside in the communities served by the 13 women's radio stations chosen to host the content made available through Network Cyberella.

Capacity building

It is estimated that the 400 existing community radio stations are listened to by millions of Brazilian citizens. In theory, all of these stations could, in time, become part of one network. Theoretically, the Internet makes it possible to extend the network to any Portuguese-speaking country in the world.

At the start of the project, CEMINA identified four key areas which needed to be addressed:

- hardware
- capacity building
- broadband Internet connection
- content

With respect to hardware, each of the original 13 participating radio stations was provided with a computer, the software necessary to process digital radio programs, and staff training. Capacity building was addressed through CEMINA training programs. The availability of a broadband Internet connection was a prerequisite for joining the network. With respect to content, CEMINA had been producing the Fala Mulher (Women Speak Up) radio program for several years. It thus created the project web site, www.radiofalamulher.com, based on existing program scheduling.

Technology

The thirteen radio stations were each equipped with a Pentium IV-class computer with sufficient memory and CD-ROM drives to enable editing of sound files. Sound Foundry provided licenses for professional sound editing software. The open source software Open Office was

installed on each computer. To cover the costs of broadband connectivity, CEMINA will be signing six-month contracts with local providers selected by each of the 10 stations with landline connections. The three radio stations with no landline Internet connectivity will be connected via satellite.

In conjunction with the installation of this equipment, a training program is planned to improve the ICT skill level and management capacity of the project manager of each radio station. Radio station staff come to CEMINA's office in Rio for a ten-day training program at their computer suite, which consists of a dozen high-specification AMD Athlon computers.

Finance

Total Project Cost:	US\$ 425,593
<i>infoDev</i> funding:	US\$ 245,593

The Kellogg Foundation and UNESCO recently concluded funding partnerships with CEMINA that allowed the NGO to expand the project.

Two major factors will contribute to the eventual financial sustainability of the project:

- commercial advertising (will generate revenue)
- shared content (will minimize production costs of original content)

Future funding is also potentially available from a Brazilian government tax on IT companies (one percent of profits). However, NGOs are presently finding it difficult to access these funds.

Issues and Lessons

Challenges

- Project implementation presented few technical difficulties. Madalena Guilhon, one of the producers of Fala Mulher, explained that after the first programs were produced and distributed, CEMINA discovered that the format needed to be changed to a number of short segments instead of one, 60-minute program. The shorter format allows local radio stations to use segments of the entire program in different time slots.
- A major challenge has been the lack of broadband connectivity in many areas. This reality required a

number of satellite digital connections, which are very expensive.

- Another challenge is how to provide technical support to partners. For example, working out the best way to support partners when equipment fails or starts to have problems due to viruses. To date, such problems have been dealt via e-mail, phone, and sometimes by arranging for local assistance. Indeed, a key project need is to build local assistance partnerships.
- In the near future, CEMINA and other ICT-based programs in Brazil may face a funding problem brought about by the cessation of government support.

Key factors/issues which led to poverty reduction outcomes

- Radiofalamulher shares content and presenters with a number of local radio stations, notably Viva Rio and Radio Favela. There has also been a great deal of crossover between a number of other radio development projects, where each has had something to offer the others.
- In two cases, partners were able to set up their own telecenters and are now making the Internet accessible to their respective communities. In the specific case of Retirolandia (in the interior of the state of Bahia), the telecenter “Cybersolidario” is offering ICT training to young people aged 15–21 years old. (This area is known for child labor.)
- With respect to the policy environment, CEMINA has been able to determine its own constitution and working practices. Community radio is an accepted part of Brazilian culture that is encouraged by the government.

Future outlook

- The experience of Radio Viva Favela has been helpful in enabling CEMINA to identify the technology

configuration needed for the project (i.e., number of computers and software needed). A technical meeting at Radio Favela’s studio was held to help the CEMINA team learn about Radio Favela’s experience in implementing streaming radio. Among the issues discussed were the lowest possible bandwidth required to obtain a good quality stream; streaming compatibility with media players running on all operating platforms; and obtaining open-source workstations (Linux, etc.).

- As a result of this meeting, CEMINA decided to use the same server platform as Radio Viva Favela, after ensuring that the resulting media stream could be listened to on any user platform. The technical compatibility between the two projects will help both teams to exchange experience and technical expertise, leading to greater coverage.
- Funding from the Kellogg Foundation and UNESCO enabled the project to expand the radio-telecenter model. CEMINA has begun selecting 16 new “Cyberellas” (community radio stations) and will organize training sessions in August 2004.
- It is hoped that CEMINA will be able to expand its partnerships and connectivity in the near future. For example, there is a possibility of installing a pilot project using the SatMex network, which would eliminate connectivity costs for some local partners.

Stakeholder consultation

- CEMINA Grant Agreement with *infoDev*
- *infoDev* Project information sheet, www.infoDev.org
- CEMINA Second Quarter Report 2003 for *infoDev*
- CEMINA homepage, www.cemina.org.br
- Interview of Thais Corral by Malcom Peirce, August 2003
- Communication with Thais Corral, July–September 2003
- *infoDev* Task Manager, John Garrison



El Proyecto Conexiones (Colombia)

www.conexiones.eafit.edu.co

Integrating ICT into the School Curriculum

Abstract

Conexiones began in 1993 as a research project of EAFIT University and the Pontificia Bolivariana University in Medellín, Colombia. The project intended to develop new information and communication technology (ICT)-supported learning environments to improve the quality and equity of education in Colombia. Since its initial research phase, Conexiones has targeted schools in both rural and urban areas, without prejudice to their socioeconomic level. To date, 75 primary and secondary schools in the provinces of Antioquia, Santander, Bolívar, and Valle del Cauca belong to the Conexiones network, which encompasses more than 1,000 educators and over 6,000 students between 7 and 16 years of age.

Background

El Proyecto Conexiones sought to create a model by which schools could use information technology to enhance the learning environment, as well as to improve the quality and accessibility of Colombian education. To achieve these goals, Conexiones initially created a dial-up computer network that linked schools across Medellín to a central node/information center at the EAFIT University. This network is now integrated with the national academic network (CETCOL) and provides Internet access to schools.

In addition, Conexiones has developed a multi-media graphical interface called La PachaMama, which integrates productivity tools, information technology utilities, and educational components. La PachaMama is used in the classroom by groups of students to help them solve specific problems. As part of the pedagogical and technical support provided to the schools by Conexiones, one final-year university student is attached to each school. The project has provided teachers greater resources to use when planning classes, including the means to create interactive programs for children. Opportunities for children to learn about technology outside of school are provided through technology clubs set up with the support of participating schools and their respective local communities.

In order to facilitate the use of ICT in Colombian schools, Conexiones began a preliminary program in five elementary schools, based on the work of 15 researchers from different fields. On the basis of their research, a model was created to help schools utilize ICT within the existing school curriculum. Today, Conexiones introduces its program into schools over an 18-month period. During this time, the schools follow a four-step process of preparation, initiation, appropriation, and institutionalization. This process includes raising awareness of the program among the educational community, training school principals to manage the project within their schools, training teachers in the Conexiones model, and assigning a university student to the school as an “educational agent.” Once the training is complete, each school determines the implementation strategy that it will continue to use for the project in its school. This strategy may include working out which students to involve, defining achievement indicators, and creating an information technology club.

Since the project began, follow-up evaluations have been carried out at each participating institution. These evaluations were then used to design an evaluation model for the project as a whole. This model, designed by researchers from the Educational Computer Science Area at EAFIT University, examines the achievements of the educational population (both students and teachers), together with impacts at the institutional level.

The most important results of the Conexiones project to date have been an improved institutional climate within participating schools, changed roles and attitudes of both teachers and students, the participation and recognition of all students, and the consequent improved self-esteem of students and teachers. As the project team declares in its summary report, “the children are very sensitive to their cultural surroundings—in [Colombia’s] case, the conditions of poverty, intolerance, violence, insecurity, and corruption affect them very deeply. The conviction that collaborative construction and sharing of knowledge...are means to face such problems turns ICT into an important opportunity to integrate school, community, and life.”

One of the most successful collaborative projects undertaken by Conexiones is “Constructing an Integrated Ecological Farm.” This project seeks to strengthen the ecological, ethical, and cultural values of students. As the project develops, students discover the importance of land and small farmers in a country whose economy has been fundamentally agricultural, as well as the importance of living harmoniously with nature. As students investigate the workings of an integrated ecological farm, they develop proposals for the design and maintenance of different parts of the farm. At the end of the project, the students use dialogue and consensus to integrate their proposals to design a complete virtual (electronic) farm.

Impact/Results

- Applying school curricula to everyday life with ICT has improved the institutional climate within Colombian schools and the self-esteem of teachers and students alike.
- The integrated ecological farm project has given students a deep understanding of the importance of farming and the land.

- To date, the “educational agent” component of the project has involved about 150 university students, who provide voluntary service to the educational community for one calendar year. The educational agent component has now been extended to 30 municipalities of Colombia, 80 percent of which are rural. In addition, this initiative has prompted the creation of several other programs in Colombia that support other national and regional projects.

Key Issues

Partnership

EAFIT University directs the project and hosts the central network node. The Science and Technology Center provides financial support for the educational agent component. In 1999, some 55 university students were placed in schools. In addition, the Antioquia Secretariat of Education facilitated the participation of four teachers to provide project support. Other partnerships include financial help from the Colombian Institute for the Development of Science and Technology (COLCIENCIAS, a government organization) and Centro de Ciencia y Tecnología de Antioquia (a private sector organization). A partnership has also been formed with Fundación Corona COMFAMA.

Target groups

School children under 15 years old and their school-teachers in the provinces of Antioquia, Santander, Bolívar, and Valle del Cauca in Colombia are the target groups of the project. In designing the project, Conexiones tried to involve all members of the community, including children and teachers.

The activities initially proposed by Conexiones were modified during implementation to respond to the needs of user groups. For example, communities expressed interest in combining cultural and recreational activities with technological training activities. This ensures that the community takes ownership of the technology clubs, participates in the entire process, and generates high levels of motivation and interest.

Capacity building

Conexiones offers 180 hours of training for teachers in participating schools. Training is offered in four installments over an 18-month period, with each installment

followed by a period of application in the classroom. Topics include using ICT tools, working with Conexiones learning materials, and teaching in a dynamic, participatory manner.

Technology

Conexiones provides participating schools with a connection to its inter-school network and software interfaces that require minimal computer training to use. At the center of the technology package is LaPacha-Mama, a graphical interface that integrates Conexiones communication and collaboration tools with educational software. This interface can be installed on intranets, which are established at low cost using Windows and Linux operating systems. The Conexiones project does not provide hardware; on the contrary, it takes advantage of existing technology in each educational institution and promotes the management of hardware and connectivity resources.

Finance

Staff	US\$	142,708
Travel		19,372
Contractual services		23,338
Equipment (for management center and schools)		635,490
Training		77,843
Miscellaneous		126,820

Total Project Cost: US\$ 1,025,571
infoDev Funding US\$ 250,000

Quotes from Users

- “There has been a revolution: we have better facilities to engage in dialogue and to solve problems that emerge in the classroom, and also to create projects to address our local needs.” —Student
- “The classes were tedious, full of books and notebooks, working individually without integration of materials. Now we work in groups, everyone values the work of all members of the class, there is communication with companions in other schools, and the teachers are more dynamic. Now the learning activities challenge your own creativity and it is more fun to work in the classroom.” —Student
- “There was a barrier between my central role and the passive participation of students in the classroom, and I never thought of an effective way to

change this situation. It was imperative for me to change my attitude. Now I spend less time delivering static lessons while I am more helpful, allowing them to develop many more concepts and knowledge by themselves, which they apply immediately to collaborative projects.” —Teacher

Issues and Lessons

Challenges

- Introducing technology into the classroom affects the current organization of the school (schedules, class location, furniture, etc.) and can initially increase the workload of teachers. Therefore, it was imperative that the project gain the support, commitment, and involvement of school managers and teachers from the start.
- One challenge has been to design a system that can cater to the different needs of various schools. Schools involved in the project include those located in small isolated towns and rural areas, those in middle-class urban areas, as well as schools in the poorest neighborhoods of the city of Medellín. An important lesson has been that quality education requires the participation of all members of the community: students, parents, teachers, and administrators.

Key factors/issues which led to poverty reduction outcomes

- By improving the quality of education in primary and secondary schools in Colombia, the project enhanced opportunities for poverty reduction.
- The realization among project participants that improving educational standards requires the involvement of all members of the local community.
- Conexiones spent a lot of time and effort making the project applicable to the skills, needs, and expectations of the target group. By meeting a direct need, the project has been able to grow and head towards becoming sustainable.
- Raising awareness of the program and training administrators and teachers began early. The result has been a high level of commitment to the project on the part of participating schools.
- Long-term backup and follow-up was included in the project framework. Over a two-year period, each school is given access to one project staff person and (after 120 hours of training) one university

student for support and training. Most support services are delivered via e-mail, a system that has proven flexible and effective.

- Leadership has been the key to implementing the model. Conexiones promotes leadership within the schools by encouraging the most dedicated and interested students to form “ICT Friends’ Clubs” or CATICIs, as they are known in Spanish. CATICIs receive guidance and special tutoring from Conexiones support staff, and work informally to promote the program within the school.

Future outlook

- Based on the experience of the Conexiones project, a pilot center (Conexiones II) and school network have been set up. The main goal of Conexiones II/ Escuela Global is to demonstrate that shared low-tech ICT facilities can provide a successful model for sustainable community development if they incorporate strong community participation and customized educational modules that fulfill assessed community needs. The project will establish Technology Centers for community development within participating schools for use by both schools and local communities.
- The new project has four axes: local productivity enhancement, governance, the relation between culture and education, and life-long education. The

Centers and the capacity-building programs will be designed to catalyze a firm integration between the communities and their schools. Training and services will be tailored to fulfill local needs and to enhance the social and economic profile of the community—a key component of broader community development.

- The Autonomía Bucaramanga University began a similar project in eight schools in the Santander Region. This project reaches approximately 250 regular users, who receive training and advice on technical and pedagogical issues for use in schools.
- In 2002, Conexiones began implementing additional centers in Antioquia and, in the medium term, anticipates implementing an ICT center in each school that has successfully incorporated the Conexiones model.

Stakeholder consultation

- Proyecto Conexiones Grant Agreement with *infoDev*
- Project Abstracts, Rafael Hernandez, *infoDev*, August 1998
- Final project report for *infoDev*, www.infodev.org
- Conexiones: Ambiente Tecnológico Escolar, Digital Dividend, www.digitaldividend.org
- Communication with Claudia Zea, July–September 2003
- *infoDev* Task Manager, Rafael Hernandez



Fantsuam Foundation (Nigeria) www.fantsuam.com

*Improving Healthcare and Education through
Shared ICT Resources*

Abstract

The Fantsuam Foundation in Kafanchan, Nigeria, is working to give local rural communities in Nigeria access to health and educational resources via the Internet. In the first phase of the project, Fantsuam worked with local committees to establish three Community Learning Centers (telecenters). One of these centers, at the Fantsuam office in Bayan Loco, is already financially self-supporting. Plans to set up a mobile community telecenter, which would visit different communities and offer e-mail access via satellite, were abandoned due to prohibitive cost.

There is strong local demand for basic computer skills training, which has generated revenue for the Bayan Loco center. However, because the telecenters do not have working landline telephones, they have been unable to date to offer e-mail or Internet access, as was originally hoped.

The project, which began in January 2001 and ends in December 2003, arranged for over 225 refurbished multimedia personal computers to be shipped to Kafanchan from the United Kingdom by the charity ComputerAid. These computers were sold at cost to local NGOs and community groups and have been widely appreciated. The low cost of these machines was a

major factor in establishing a financially sustainable telecenter. Fantsuam hopes to become Nigeria's first rural ISP and is in the process of establishing a VSAT connection with support from the United States.

Background

Fantsuam Foundation is a Nigerian NGO located about 600 miles from Lagos. The foundation was formed in 1996 by a group of Nigerian professionals who saw that rural community development through the empowerment of women was largely unrealized in Nigeria. Fantsuam Foundation was established to facilitate this process.

The goal of the project is to increase access, particularly for women, to information and communication technology (ICT) facilities in southern Nigeria. To achieve this goal, Fantsuam facilitated ICT training and equipment upgrades in three Community Learning Centers (CLCs) and intended to create one Mobile Community Telecenter, all in rural communities in the southern Kaduna area of Nigeria. These facilities were primarily used by community health workers and nurses (most of whom are women), students and staff of health-training institutions, and local colleges.

As part of the project, Fantsuam provided refurbished computers and basic computer training. The project hoped to develop culturally relevant health content using a variety of media: the Internet, community radio, and reference textbooks in libraries. Alternative power sources (such as solar energy) have been piloted, and rural communities are supported to set up their own Community Learning Centers.

Specific activities undertaken include:

- Basic IT training for frontline health workers, students, and health trainers. This training has been

designed to enable these different groups to adapt and/or translate health information from the Internet into information that is appropriate for local communities.

- Training health workers and rural populations in the development of health education programs for radio broadcasts (in process).
- Development of a pilot database to record births and deaths.
- Purchasing 225 refurbished Pentium II personal computers (PCs) through the U.K. charity ComputerAid, which were provided at cost (25,000 naira/US\$190 each) to local NGOs and community groups.
- Provision of reference textbooks, computers, computer spares, and IT training to CLCs.
- Production, distribution, and screening of videotapes.
- Upgrading of old computers with Linux to create an intranet through which students can learn Internet skills before being connected to the Internet.

Impact/Results

- The Bayan Loco CLC has trained 155 local men and women in basic computer skills (May 2001–July 2003). Fifty percent of trainees were women. Training fees were charged at local commercial rates: 3,800 naira (US\$30) tuition for three months of training, two hours a day. The Kagora CLC has trained 60 people, charging 5,000 naira (US\$38) per course. The CLC at Kagoma has suffered political difficulties and has not trained anyone to date.
- The Bayan Loco CLC is now financially self-sustaining, able to support a full-time trainer and to purchase and maintain equipment.
- Scholarships were provided to 20 women and 10 youths for IT training at the Bayan Loco CLC.
- As part of the project, Fantsuam purchased a Thuraya satellite phone, which is made available to local people at a cost of 250 naira (US\$2) per minute. Although this cost seems high for a rural community, the satellite phone is one of the only reliable telephones in the area. Fantsuam covers the costs of the phone by charging for its use. The foundation estimates that 15 calls are made a week (an average of 30 total minutes). Calls are usually of an emergency nature (e.g., family bereavement or sickness), with families wishing to contact relatives elsewhere in Nigeria, or in the United Kingdom or United States.

Key Issues

Partnership

- Fantsuam's principal partners are the communities which implement the CLCs. Partnerships are based on previously established relationships between Fantsuam and clan women involved in a Fantsuam microcredit project. Other partnerships include:
 - Fantsuam U.K.*: link to schools in Manchester that donated text books and PCs
 - U.K. charity ComputerAid*: provided 225 refurbished computers
 - Galilee College Israel*: gave a scholarship for one staff member to attend a course on NGO development and management
 - Gamos Ltd. and Big World*: provided advice on using video and Video Compact Discs (VCDs) for training
 - Open Society Initiatives for West Africa, OSIWA*: support for setting up a community radio station
 - African Development Foundation*: grant to expand the Fantsuam microcredit project
 - West African Open Source Association*

Target groups

The immediate target groups are members of the local community (both men and women), community health workers, nurses, students, and staff of health training institutions and colleges.

Capacity building

Fantsuam developed new partnerships to train rural-based community health extension workers and to help produce health education video content in local languages. In addition, Fantsuam provided health workers with a three-day workshop (January 17–20, 2002) to update their computer skills and knowledge.

To increase the capacity of Fantsuam staff, Galilee College in Israel provided a full-tuition scholarship for one staff member to attend a course on NGO development and management.

Technology

- Van for the mobile community telecenter (abandoned due to the very high cost of satellite access: US\$10 per megabyte of data transferred)
- Inmarsat BGAN satellite modem for e-mail access
- Thuraya satellite phone (1), used by local

community members for local emergency calls on fee-paying basis

- 2 laptop computers
- Each CLC was provided with:
 - 2 refurbished desktop PCs with CD-ROM
 - deep discharge batteries
 - WorldSpace satellite radio (The aim was to make use of the WorldSpace data back channel to download useful development content. However, this requires the computer to be running over a prolonged period, i.e., overnight, which has not been possible due to unreliable power supplies. The CLC PCs are powered by generator and/or solar power.)
 - Microsoft Word 2000
 - Linux Mandrake 7.0
 - Printer

The project hoped to use a ground terminal for low-cost e-mail by satellite, as developed by VITA (Volunteers in Technical Assistance: www.vita.org) of the United States. However, this service has been withdrawn by VITA due to the high cost of calls.

Finance

Personnel	US\$	33,735
Equipment		65,530
Consumable materials and supplies		10,590
Services and contracts		19,800
Administration		14,500

Total Project Cost	US\$	144,155
<i>infoDev</i> funding	US\$	97,500

Other funding and donations: fees charged to CLC users; Fantsuam Foundation; Friends of Fantsuam Foundation; Galilee College, Israel.

Issues and Lessons

- Fantsuam reports that it overlooked the need to offer financial incentives to rural health workers to undertake the additional tasks of health education, including video and community radio program production. Mechanisms are now being considered to introduce these incentives.
- Satellite connectivity was prohibitively expensive and forced Fantsuam to abandon plans for a mobile

telecenter that would have provided e-mail access to local rural communities. Fantsuam also hoped to use VITA's low-cost e-mail satellite service via a ground station terminal, but this service has been withdrawn. Attempts to use WorldSpace satellite radios for receiving selected Web content were unsuccessful due to unreliable power supplies (some areas have power for only two hours a day).

Challenges

- The region suffered from outbreaks of sectarian violence that led to the loss of lives and property. Respected community leaders of all interested community groups have undertaken to make their facilities as inclusive as practicable and to provide protection for the CLC facility, which is communal property.
- Theft: Initial experiments with copper telephone cables did not succeed because they were stolen. The satellite phone and laptop computers are kept in secure custody, except when they are in active field service. CLC premises have 24-hour security, which is the responsibility of the management committee constituted by the recipient community.
- Fantsuam first offered small loans from their existing microcredit initiative to women who wished to use the loans to pay for IT training. However, the number of women willing to use the loans for this specific purpose was very few; those who were initially offered loans had difficulty repaying them. Fantsuam is developing alternative strategies to encourage local entrepreneurs to set up and manage CLCs.
- A computer crash meant that the database of local health information was lost. It was re-created from scratch and is now used to record the details of births and deaths in one pilot community.
- Political rivalries in the area of the Kagoma CLC have left the center unable to function. Although a trainer was trained by the Bayan Loco CLC, no trainees have been trained to date at Kagoma.

Key factors/issues which led to poverty reduction outcomes

- Although the project is still ongoing, it has been unable to provide e-mail or Internet access to rural

users, so there has been a limited impact on poverty reduction.

- PC skills training has enabled rural youth and adults to find jobs in urban areas.

Future outlook

- Fantsuam is in discussion with a U.S. donor regarding the provision of VSAT Internet access. This would enable Fantsuam to become the first rural ISP in Nigeria, offering both voice and data services to local communities, and to provide a backbone for CLCs operated by local entrepreneurs.
- Fantsuam is hoping to establish a second wave of CLCs run by local entrepreneurs. The PC trainer at the Bayan Loco CLC, Julius Madaki, has already set up his own private training facility, using a small

loan provided by Fantsuam's existing microfinance initiative.

Stakeholder consultation

- Fantsuam Grant Proposal to *infoDev*
- Fantsuam Grant Agreement with *infoDev*
- *infoDev* project information sheet, www.infodev.org
- Final report to *infoDev*, February 2003
- Interviews carried out by Mike Webb with:
 - John Dada, Director, Fantsuam Foundation
 - Ivy Audu, trainee, Bayan Loco CLC
 - Norman Didam, trainee, Bayan Loco CLC
 - Julius Madaki, Training Instructor, Bayan Loco CLC
 - Ahmodu Fujuno, Luka Ajiji, and Markus Ahmadu: members, Bayan Loco CLC Committee
 - Samuel Maichibi, Chairman, CLC, Kagoma
- *infoDev* Task Manager, Jacqueline Dubow



Foundation of Occupational Development (FOOD), India www.xlweb.com/food

Inter-city Marketing Network for Women Micro-entrepreneurs

Abstract

FOOD, based in Chennai, India, began the Inter-City Marketing Network project in April 2001 to help poor women in urban areas increase their incomes. FOOD worked initially with some 100 existing women's self-help groups representing between 1,000–2,000 women and their families. An initial survey of these groups indicated that while many women derived a small income from producing goods at home (food products, soap, repackaged food items), they were generally weak at marketing their products and finding customers. Typically, they sold their products to visiting middlemen and made little profit from their work.

FOOD provided training in marketing and the use of "social capital," encouraging the groups to focus on production, or marketing, or both. It also provided each group with a cell phone to facilitate contact between production and marketing groups, and between groups and customers. While the cell phones were initially provided by the project, today all groups buy their own phones and pay for all calling charges.

Background

The Foundation of Occupational Development (FOOD)

is a 20-year-old non-profit organization based in Chennai, India, that conducts research on social development and implements welfare programs in the following areas: employment-generation, poverty-alleviation, cost-effective housing, education, health, water and sanitation, energy conservation, information and communication technology (ICT), electronic NGO networking, e-commerce, and capacity building for women's networks.

The Inter-City Marketing Network for women micro-entrepreneurs was initiated by FOOD after its staff observed that there was often a surplus of products produced by women micro-entrepreneurs in their home neighborhoods, while in other areas there was a shortage of such products. The network also responded to the problem of many low-income women who made food and household products at home, but were not effective at marketing these items. In most cases, the products were sold at relatively low prices to middlemen.

The goals of the network were to link women micro-entrepreneurs from different urban areas in order to exchange goods and develop new markets for their products. The groups trade in over 100 basic products, including soap, cooking oil, washing powder, rice, pickles, spices, and candles. Communication between the groups is maintained through mobile phones, which are used to receive and place orders for goods with other groups in the network, and to compare prices across the region. Each group is responsible for choosing their own mobile network providers, tariffs, etc. In the period of one year, the project linked 300 women's groups across Tamil Nadu.

The project used the existing staff of FOOD, who first conducted a survey of locally marketed products to identify 26 core products that could be sold in different areas of Chennai. FOOD then worked directly with

existing women's self-help groups to build their capacity to market and network (with one another) to increase their household incomes. Groups identified themselves as production or marketing groups (or both), and received training in neighborhood marketing, basic bookkeeping, and self-evaluation.

Marketing in the network is based on the concept of social capital, whereby individual women are encouraged to foster good relationships with their friends, family, and neighbors by extending practical support (e.g., offering childcare, sharing household duties, etc.) in order to build a strong personal network of loyal customers. Products are distributed via small and large trading meetings or shanties, with distribution of larger quantities being handled by scooter or motorized pushcart, paid for by the groups themselves.

The project was monitored and evaluated through secondary data collected from group leaders, who were trained to record the marketing and production process. The project was also evaluated by comparing participant stories at the beginning, middle, and end of *infoDev* funding. Finally, *infoDev* carried out a project evaluation in March 2002.

Impact/Results

- Active network members today typically earn a profit of between 500–2,000 rupees (US\$10–40) per month from their part-time work. This income represents 10–15 percent of total family income and enables many members to pay school fees.
- Today, over 300 groups are involved in the growing network and other organizations are considering applying its approach to other areas.
- The network enabled women in the groups to increase their profit margins (commissions paid to middlemen decreased from 18–30 percent at the

start of the project to 0 percent after 12 months), increase their volume of sales, and extend their marketing reach into new urban areas.

- The project learned that there was a need for face-to-face meetings, as well as mobile phone communication.

Key Issues

Partnership

By establishing links with the government of Tamil Nadu, FOOD gained government support for the project. The local government now includes information on the project in their training programs for government and community organizers, in the hope that it can be replicated elsewhere.

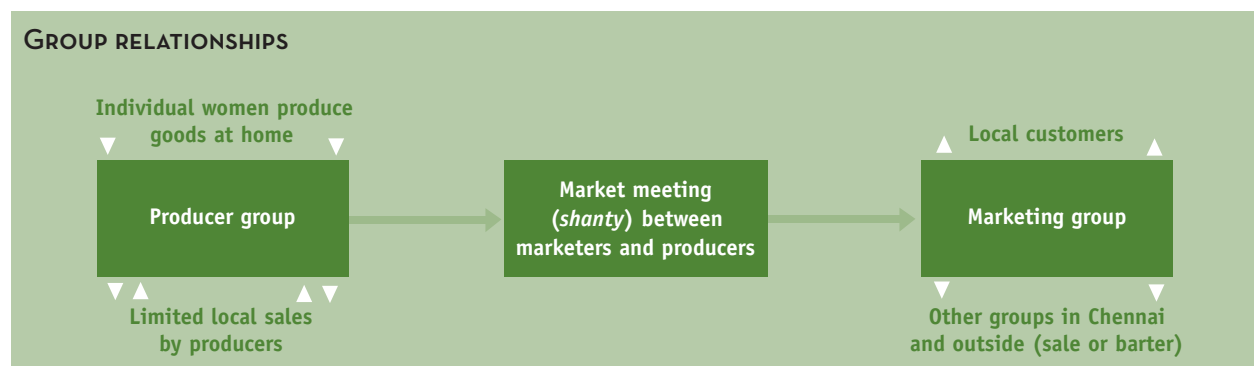
One key to the project lies in the way community groups partner with each other across areas of Chennai to open up new markets and develop new products. The result of this networking is higher individual incomes for active group members, as well as increased social mobilization. By facilitating increased contact between groups (by mobile phone, market trading meetings, and training sessions), the women have been able to share ideas and learn from one another's experiences.

Target groups

Local female artisans and semi-skilled workers who are currently living below the poverty line within Chennai and its outskirts are the target group. Since the *infoDev*-funded project ended, 100 additional inter-city groups have been established through FOOD's water and sanitation program.

Capacity building

FOOD has run a number of training sessions for the women's groups. The training sessions cover such issues as self-evaluation, marketing through the use of social



capital, and practical implementation of setting up a group. In addition, FOOD organizes two monthly meetings for the groups. The face-to-face contact between groups has encouraged better networking and enabled an environment whereby the women can exchange experiences and lessons learned. For example, the marketing groups were able to communicate to the producer groups that “toilet soap” needed to be re-branded as “bath soap” because, due to local culture, “toilet soap” was assumed to mean soap for cleaning the toilet.

During the course of the project, women in the groups learned to identify and manage costs (e.g., production costs, distribution costs, cell phone bills, etc.), a task many were unable to perform at the beginning of the project. FOOD’s concept of social capital encouraged the women both to ask for and give credit terms in order to manage the cash-flow needed to sustain their small businesses. Thus, for example, some women were encouraged to buy rice in bulk (10 kg sacks) as a first step towards a business, rather than buying a 1-kilogram bag. By repackaging the rice into ten 1-kilogram bags and taking a 10 percent margin, the women could “earn” one bag of rice for their labor. Because they know the women, local traders have provided small amounts of credit, which in turn is extended to the women’s end customers when necessary.

As FOOD Director Loyola Joseph says, “If you have social capital, you don’t need money.” The active members of the marketing network also learned that it was possible to start and run a small business without depending on banks or moneylenders for loans. (In fact, the project once wrote to local banks to ask them not to give loans to the marketing and production groups, since they often spent the loans unwisely and had difficulty repaying them.)

Technology

100 mobile phones, office computers, and peripherals.

Use of mobile phones enabled the groups to stay in contact with both customers and other groups. Many of the artisans are involved in activities that keep them away from home all day. For others, cultural reasons or specific disabilities prohibit them from leaving their neighborhoods. In both situations, access to mobile phones appears to have been invaluable in expanding their marketing efforts and keeping them within the

SUMMARY OF GROUP EARNINGS (IN RUPEES)

	Before	After 1 month	After 12 months	After 24 months
Production groups	Rs 500	Rs 1,100	Rs 14,000	Rs 18,700
Marketing groups	Rs 0	Rs 605	Rs 10,300	Rs 13,050

reach of customers and other groups. While the project covered the initial cost of the phones, all new groups now pay for their own phones and ongoing operating costs. By using pre-paid phone cards, groups easily manage their calls without the danger of overspending (many groups use their phones to receive incoming calls only, which are free). Groups typically spend 300–400 rupees (US\$6–8) a month on phone charges.

Finance

The total cost of the twelve-month project was US\$159,600. The majority of funding came from an *infoDev* grant (US\$147,900), with the remainder provided by FOOD. The following items were identified from the proposal:

Cost of 100 mobile phones	US\$ 25,000
Salaries of the project team	24,600
Travel costs	5,000
Training costs	25,000
Survey costs	5,000
Publicity for community-based organizations	25,000
Administration	50,000

Anecdotes

- *Kalaichelvi from VOC Nagar.* Kalaichelvi has 5 children. Her husband works at the race course for a daily wage. Before joining the inter-city network, Kalaichelvi produced a few cleaning items, like soap, oil, and phenol, to sell to nearby homes. Since joining the inter-city network, she has developed a production group of women in her area and divided the workload.
- *Pushparaniammal from KK Nagar.* Before joining the inter-city network, Pushparaniammal worked from home, supplementing her family’s income by sewing clothes for people in her area. After joining the inter-city network, she was able to find new markets for her tailoring skills outside of her neighborhood. She also began to procure products from production groups outside her area to sell to her local tailoring

customers. She now earns an average of 3000–3500 rupees per month.

Issues and Lessons

Challenges

- A number of groups have been approached by financial institutions interested in providing them micro-credit. In a number of groups, this money gave rise to corruption rather than the intended expansion of activities. To address this problem, FOOD wrote to the financial institutions to encourage them not to lend to the groups.
- Initially, mobile phones were handed out without considering whether the groups could afford the subsequent phone bills. This resulted in a small percentage (3 percent) dropping out of the network due to debt. In response, FOOD now only provides a group with a phone once they can prove that they are able to pay the phone bills. “Now the women tell me the cheapest way to run my phone,” says FOOD Director Loyola Joseph.
- At first, the concept of social capital was not understood by many FOOD staff members, who found it difficult to understand how they could help women set up their own businesses without grants or loans.
- Some groups—typically in the early stages—had problems with quality control and/or charging too much for their goods. These issues were addressed in regular discussions between the producer and marketing groups.

Key factors/issues which led to poverty reduction outcomes

- While the rich have financial capital to promote their enterprises, this project demonstrated that the poor can use social capital. One of the best ways to develop this kind of capital is community networking. Building social capital allowed the groups to eliminate the need for cash credit.
- Due to the low level of literacy required to operate and maintain a mobile phone, the community groups have not needed to undergo extensive training or learn a new language to take advantage of this networking tool.
- Use of the mobile phones enabled the producer and marketing groups to expand their reach into new areas.
- By building a good communication network, the inter-city network helped women who were con-

strained by cultural barriers (such as resistance to operating outside of their neighborhoods), or who had physical disabilities, to utilize their free time to market products, thereby increasing the income levels of their families.

- An additional positive outcome was the rise in women’s self-confidence and motivation after joining the community groups. This self-confidence is best illustrated by three women from the inter-city network who stood for and won local council elections.

Future outlook

- Existing groups are currently self-supporting and new groups must buy and run their own phones.
- New groups must also provide a corpus of 5,000 rupees (US\$100) with which to buy products or raw materials. Marketing groups give producers 15 days of credit.
- The women’s groups have agreed to contribute one percent of turnover to a common fund. The fund will be used to meet the administrative costs of the inter-city network and fund future development.
- Groups are planning to introduce common branding for food products under the name of “Nala,” which is a name associated with high-quality food.

Stakeholder consultation

- FOOD Project Proposal for *infoDev*, March 2000
- FOOD Project Proposal in Brief, March 2000
- FOOD Grant Agreement with *infoDev*, April 2001
- Project web site, www.xlweb.com/intercity
- Inter-city Marketing Network for Women Micro-entrepreneurs using the Cell Phone, End of Project Report, FOOD, May 2002
- Deepa Narayan, (*infoDev*) Evaluation of Inter-City Marketing Network of Women Entrepreneurs, March 2002
- Interviews conducted with:
 - Loyola Joseph, Director, FOOD
 - Santosh Narayanan, Technical Director, FOOD
 - Shiva Kumar, Inter-city Marketing Network team leader
 - Tamilshelvi Udyakumar, group leader, Korattur production group, North Chennai
 - Hemalatha Elumalai, member, Korattur marketing group, North Chennai
- *infoDev* Task Manager, Brian Kurey



Future Stations (Brazil) www.vivario.org.br

Stimulating the Economic Integration of Low-income Populations through the Internet

Abstract

The Future Stations project began in March 2002 as part of a Rio de Janeiro shanty-town initiative called Viva Rio. Viva Rio is a large and highly respected grassroots non-governmental organization that has been working for over ten years in the *favelas* (slums) of Rio. The main mission of Viva Rio is to provide economic alternatives and empowerment to youths (both men and women) between the ages of 14 and 29. These young people live in a high-risk social situation; the work of Viva Rio helps decrease poverty and violence within the *favelas* where they live.

Future Stations are multifunctional Internet cafes that offer training in Internet use and major computer software packages. They also act as advice centers for employment and offer many other community services, including evening classes for young people who have dropped out of school. Viva Rio has a large web site that features locally generated information and links aimed at young people in the *favelas*. InfoDev directly financed the implementation of several Future Stations.

Background

A Future Station is a telecenter with Internet access that uses a state-of-the-art wireless radio system to provide reliable Internet connections. Each center has

up to 25 computers and a staff of attendants and instructors, who are mainly recruited from the local *favelas*. Access is either free or affordably priced (around US\$0.50 per hour), depending on the time of day, age of the user, and other factors. The vision for the centers emerged gradually in response to circumstances in the *favelas*, including violence, public health issues, and teenage delinquency.

As of September 2003, 13 Future Stations had been established to promote local economic development among low-income communities. Their services include access to information technology and low-interest credit (Viva Cred).

Through the creation of an Internet portal (www.vivafavela.com.br), it has been possible for the Future Stations to introduce other support services to community entrepreneurs, such as electronic transaction sales using online catalogues. A development agent for this purpose creates purchasing groups and enables them to access credit, insurance, and other services.

Current services offered by the telecenters include:

- Internet access
- computer courses (e.g., Windows, Word, Excel, Power Point, web site creation, Internet use, typing, and PC assembly and maintenance)
- job-market orientation (the telecenters run business management courses and provide access to the labor market through an online employment database and a mobile interview system)
- typing, formatting, and printing of documents and resumes
- dissemination of information (including enrollment details) on computer classes

Under the Viva Rio “My First Job” program, Future Stations are directly linked to employment agencies and employers. The stations also act as sales outlets for “Fair Trade” clothes produced by local seamstresses and provide news items for community newspaper articles as part of other Viva Rio projects.

Process

The following ten steps are used to set up each Future Station:

1. Contact associations and community institutions to present the project proposal.
2. Select the location of Future Station facilities, using criteria such as street location, number of people passing through the vicinity, and accessibility.
3. Construct the Future Station. This activity can range from adapting existing facilities to installing computers.
4. Alongside step 3, carry out field research in the community to identify local demand for products and services.
5. Develop a business plan, taking into account existing community activities and projects to avoid replication.
6. Hire staff: generally one manager, two assistants, and one trainee.
7. Train new staff.
8. Share the project proposal with the community for its approval.
9. Print and distribute invitations to the opening of the Future Station.
10. Open the Future Station for business.

Impact/Results

- The Future Station monitoring system enables managers to make historic comparisons of results in order to identify best practices.
- Future Stations average 170 Internet users per day and 200 computer students per month. As of September 2003, Viva Rio has been responsible for local youth completing over 60,000 elementary and high school diplomas.
- The project has generated employment, promoted the inclusion of low-income communities in ICT education, trained business managers, and opened up the employment market to community members.
- Viva Rio now has a full-time team of around 20 reporters who write articles aimed at changing the

image of favelas. They use the Future Stations as both a source of material and an outlet for their articles, which are published through the Internet portal. Local professional newspapers are already using these articles as a resource.

Key Issues

Partnership

Each Future Station is owned and operated by the local community in partnership with Viva Rio. The idea behind this partnership is to increase the potential sustainability of each telecenter by placing it in the hands of the communities they are intended to serve.

External partners learn from the project and help integrate its activities into various social and economic sectors in Rio de Janeiro. Funding partners include the Higher Institute of Religion Studies (ISER), Productive Restructuring and Local Economic Development Laboratory, Federal University Fluminense, Brazilian Support Service to Small and Medium Enterprises (SEBRAE), Globo.com, Microsoft, Cisco, Worker’s Support Center (CAT), Petropolis Tecnopolis, and the Electronic Computer Core (UFRJ).

The Committee for Democracy in Technology (CDI, another ICT-based NGO in Brazil), Viva Rio, and Cisco Academy work together to produce software for the Future Stations. Cisco also offers scholarships to young people from the favelas, as well as courses for paying students.

Viva Rio administers the Future Stations project. It is supported by the National Bank for Economic and Social Development (BNDES), the Inter-American Development Bank, FININVEST, and the Rio de Janeiro Municipal Labor Secretariat.

Target groups

Approximately 28 percent of Future Station users are teenagers between 13 and 20 years of age. Another 42 percent are young adults between 21 and 30 years of age. Both groups reside in the shanty towns of Rio de Janeiro. A good gender balance exists among users (52 percent are male). The largest social group targeted by the Future Stations is, however, young females. All these groups recognize that Future Stations work as “development centers” inside a

community. This recognition not only encourages those who directly participate in the stations, but has a multiplier effect in Brazilian society—similar projects are being developed in other regions and are even being designed at the national level.

Capacity building

Future Stations train local people for the staff positions of manager, educator, and computer support technician. The stations are therefore capable of self-sustainability and replication, a particularly relevant fact, given that there is a potential need for hundreds of telecenters in Rio de Janeiro. As mentioned above, each Future Station is owned and operated by the local community in partnership with Viva Rio.

Viva Rio notes that ICT courses are proving to be the most important income-generating activity of the Future Stations. Based on demand for ICT courses that equip students with professional skills, future course programs will focus more on this type of course than those geared towards using computers for personal interest (e.g., games).

Technology

Each Future Station has a satellite uplink rather than a broadband landline connection and uses wireless networking to connect the computers. The latter are either Celeron 500 MHz with 64 MB of RAM or Pentium MMX 233 with 32 MB tower units.

Finance

Maintenance	US\$	118,000
Personnel		171,000
Miscellaneous		12,000
Administration		92,600
Internet content		625,000
Auditing		10,000

Total Project Cost	US\$	1,028,600
<i>infoDev</i> funding	US\$	246,500
Viva Rio funding	US\$	782,100

Beneficiary Stories

One student who attended the business manager course obtained a microcredit loan to start and develop his own business.

Recently, two young men in their early twenties conceived of an idea to develop an integrated Internet, radio, TV, and newspaper for their favela. They brought their idea to Viva Rio not as a vague notion, but as a detailed Power Point presentation outlining the entire concept. The presentation cited financial institutions that the two men had already approached, a business plan, budget predictions, and predicted community usage. These young men had both learned their skills at a Future Station.

Issues and Lessons

Challenges

The main challenge of the Future Stations is sustainability. Telecenters must run as businesses and be self-funding. Viva Rio considers the telecenters to be self-financing. The radio aspect of Viva Rio is indeed self-financing due to commercial advertising. However, selling advertising requires management, which makes staff training a vital element of telecenter development. Given training requirements, it is hoped that each Future Station can become self-sustaining in three years.

Violence within the communities has also been a major challenge. Future Stations have helped diminish violence by providing alternatives to young people who are at social risk. These young people have avoided confrontations, refusing to negotiate with or be influenced by local gangs in any way.

Each Future Station has a computerized information system to monitor its activities and progress. However, there have been problems in ensuring that monitoring forms are filled out correctly. Generally, this is because the Future Stations are run as businesses and staff view serving clients as their first priority.

Key factors/issues which led to poverty reduction outcomes

Statistical analysis is impossible in the absence of baseline data and in light of the difficulty of separating the impact of the Future Stations from other factors. Feedback is therefore primarily anecdotal. The Campo Grande Future Station is being developed on the concept of e-learning, or a virtual university, in partnership with a cluster of public institutions. These partners include the Society Center for Superior Tele-

Education (CEDERJ Society), the main goal of which is to expand high-quality free education by the state.

The experience of the project to date highlights the importance of working with local communities. It was discovered that the stations have become an integrating core in their respective communities. Indeed, the role of the stations as advice centers has exceeded expectations. One of their strengths is that they make Internet access and computer skills development part of a larger package of community services.

Future outlook

The Future Stations are just one component of Viva Rio activities. The work of Viva Rio involves an immense number of people and has numerous expressions. There is a constant stream of new ideas coming online at Viva Rio, built on previous experience and success. As one aspect of a project becomes established and effective, new possibilities open up and new challenges emerge.

The Future Stations provide a sustainable model, assuming that: 1) premises continue to be provided at

low or no rent from local authorities or benefactors, and 2) the flexible fee regime continues to cover costs. Current donated satellite technology is unlikely to be replicated beyond the existing centers, as these centers were business-funded promotional offers. Alternative land-based broadband Internet connections and funding will thus be necessary in the future.

Stakeholder Consultation

- Future Stations Grant Agreement with *infoDev*, March 2002
- Second and Third Quarter Reports 2002 for *infoDev*
- *infoDev* Future Stations project details, *infoDev* web page, www.infoDev.org
- Final Project Report for *infoDev*, "Future Station—Uniting the Point of Exclusion with That of Innovation"
- Communication with Marta Ramos, July–August 2003
- Interviews carried out by Malcom Peirce with:
Ruben Cesar Fernandes, Viva Rio
Maria Helena Alves, Viva Rio
Marta Ramos, Viva Rio
- *infoDev* Task Manager, John Garrison



MANOBI (Sénégal) www.manobi.net

Innovative Internet and Wireless E-services for Strengthening the Livelihoods of Senégalese Fishermen

Abstract

This project started in early 2003. It uses Wireless Access Protocol (WAP) and short messaging service (SMS) technology via cell phones to provide fishermen with up-to-date weather and market price information. In addition, fishermen are able to use interactive technology to input fish stock information for marketing purposes and to log their departures and estimated times of return. The latter information enables local fishing unions to be alerted if fishing boats fail to return on time. At the time this case study was written, some 57 individual users had registered for the service (41 buyers and 16 fishermen).

Background

This project was initiated in January 2003 by MANOBI, a private telecommunications company, in partnership with three local fishing unions, two telecommunications companies (Alcatel and Sonatel), and the Canadian International Development Research Center (IDRC). Consultations were carried out with stakeholders, including representatives of local fishing unions, at the beginning of 2003, to determine the information needs of local fishermen. These fishermen typically earn between 50,000 CFA (US\$80) and 100,000 CFA (US\$160) per month. At the end of 2003, the project will be evaluated by a national steering committee,

which is interested in scaling up the project to provide nationwide service.

The MANOBI project aims to support the livelihoods and improve the safety of Senégalese fishermen by giving them access to up-to-date market prices, weather reports, and other information services via cell phones using WAP and SMS. The fishing sector presently represents 10 percent of Senégál's GDP and employs approximately 17 percent of its working population. Previous information projects in the fishing sector tended to address the collection of information, rather than its dissemination to users.

MANOBI previously developed a similar scheme for small Senégalese farmers growing fruit and vegetables. This service now has over 300 subscribers and has enabled farmers to secure higher prices for their crops. The positive experience of this first project, coupled with the needs of fishermen and the interest expressed by the national government, encouraged MANOBI to look at a similar project for Senégál's fishing community.

The project began with an analysis of the needs of the fishing sector, as well as a financial and technical study for project design and implementation. On this basis, the project proceeded, beginning with the extension of the cellular telephone network to fishing regions. Through the MANOBI multi-channel gateway, the project was able to produce weather, catch, and price information in a form readily understandable to fishermen. WAP was chosen as the main technology because it allowed some interactivity and enabled fisherman and others to access a central database in real time. Finally, the fishermen were trained to use the WAP network to retrieve information.

The project employs two data collectors, who record market prices for fish in three locations in Dakar and Kayar. The information is collected using a ruggedized Psion computer and is transmitted by cell phone to a central database and web site. Market prices are updated in real time, enabling fishermen to find out the latest prices immediately upon their return from sea. In some cases, this has enabled them to land on a different beach in order to secure a higher price from middlemen. By the end of July 2003, some 57 individual users had registered for the service (41 buyers and 16 fishermen).

The service requires users to buy a WAP-enabled cell phone (available locally for US\$90 plus a US\$30 SIM card). Many fishermen, however, already had cell phones, which they used to contact regular buyers. MANOBI estimates it takes about two minutes to access the data services, at an average cost of 180 CFA (US\$0.29) a minute.

One major success of the project to date was persuading Sonatel to install a cellular base station near the beach at Kayar in March 2003, which now provides cell phone coverage up to 14 kilometers from the shore (allowing fishermen to access the MANOBI data services while at sea). In addition, pilot services have enabled fishermen with cell phones to log their departures and estimated times of return, so that local fishing unions can be alerted via SMS and the extranet web site if fishing boats fail to return on time. Combined with access to real-time weather reports, this service has improved the safety of fishermen operating from Dakar and the nearby town of Kayar. By recording detailed information about daily catches, moreover, the database will provide a useful resource for monitoring fish stocks in the immediate area, which are being over-fished.

When implementing the project, MANOBI experienced a number of delays. The project first had to persuade the government meteorological office to publicly share weather data. (Previously, weather reports were made available only to people within the administration and to industrial fishing ships). It also took time for Sonatel to install the base station at Kayar, without which the pilot would have been unable to function in that area.

When collecting data about local species of fish, it was discovered that the same species was called different names by different ethnic groups. Finally, it took time to develop simple, recognizable graphic icons for the different fish so that fishermen with low levels of literacy could use the service via a cell phone screen display.

Impact/Results

Although the pilot is still in its early days, the project has demonstrated that it can provide fishermen real-time access to market data for their products. It has also demonstrated its utility to fishermen safety. One of the fishing unions reported that the service enabled them to detect and rescue one of their members and his eight-man crew, who had not returned on time. Finally, the service will potentially enable fishermen to improve the quality of their products—by alerting all potential buyers (middlemen) as soon as they have landed their catch, fish can be sold while still very fresh. Typically, up to 30 percent of the catch is wasted while fishermen wait to find a buyer.

The project has also directly contributed to the extension of the mobile network in Kayar, a fishing town of 20,000 people during high season.

Key Issues

Partnership

The project has partnered with a number of organizations from both the corporate and civil sectors. In the initial phase, close dialogue was maintained with the fishing communities and unions in order to design the most appropriate information service. This dialogue also enabled MANOBI to investigate the willingness of future users to pay for the services being developed. The investigation helped MANOBI design a tariff structure in line with fishermen's ability to pay.

The fishing unions and telecommunication organizations involved in the project will be responsible for monitoring the project through a steering committee.

Target groups

The project target groups are fishing communities within rural poor areas who use five identified landing sites. These groups include both the fishermen and the women involved in fish processing and wholesaling.

Capacity building

The project has strengthened the capacity of local fishermen and their unions by giving them access to weather reports, market data, and other services. The project has also helped them present their needs to the government and to share information on fish catches on a transparent basis.

Technology

The MANOBI service is accessible via the web and SMS (using WAP-enabled cell phones). While many fishermen already owned cell phones to contact their buyers, some had to upgrade these phones for WAP capability. ALCATEL has agreed to sell suitable cell phones to fishermen at a discounted rate and Sonatel has discounted the price of data calls to US\$0.29/minute from the US\$0.37 cents/minute rate charged for voice calls.

Finance

MANOBI	US \$139,920
Sonatel	105,580
Alcatel	88,420
IDRC	31,800

Total Project Funding	US\$ 565,720
<i>infoDev</i> funding	US\$ 200,000

Beneficiary Quotes

- Fisherman Adama Diop has used MANOBI data services to support his own small business. "It is a very powerful tool, which is changing the way we are working," he says. The service allows local professional organizations to monitor the different boats at sea: "If we are one or two hours late returning, they can send an alert and try to help us."
- Pape Mbaye, who leads a professional federation of fishermen, believes the data services have brought significant benefits to fishermen, improving both safety and sales revenue. "It provides real-time data about prices on the beach and volumes. It will help us increase our efficiency and the revenue from this sector."

Issues and Lessons

Challenges

The project faced a number of challenges at the beginning, which delayed the data services pilot until June 2003. These included delays on the part of the local

administration (e.g., convincing the meteorological office to share weather reports and developing a procedure to do so); initial shortages of pre-paid SIM cards (supplied by Sonatel); and language barriers among different ethnic groups (this was addressed by creating graphic icons for different species of fish suitable for use on WAP cell phones).

Key factors/issues which led to poverty reduction outcomes

The project took the time to involve a range of stakeholders, including government officers, fishing unions, and telecommunications companies. The fishing unions (who can access data via a personal computer and dial-up modem from their office in Kayar) own the project and want to use the fishing catch data to lobby for government policies to prevent over-fishing in the region.

MANOBI Director Daniel Annerose comments that the comprehensive collection of data will help fishermen in the future, especially as fish stocks come under increasing pressure from both local fisherman and large commercial fishing vessels from Europe and other developed countries. The project provides the only detailed, publicly available information on fish catches, which can be used to help fishermen and their representatives present a strong case for protecting the natural resources on which the fishermen depend. "Our platform can make this data available to government and the professional organizations that are managing this sector," says Annerose.

Future outlook

The pilot project is currently preparing the way for a national program through the use of a steering committee. The committee will evaluate the experience of the pilot study in order to develop recommendations for a nationwide program. Their evaluation will focus on 1) the economic impact of access to market-price information (i.e., the impact on the incomes of fishermen and wholesale fish merchants), 2) the degree of diffusion and acceptability of ICT equipment among the local population, and 3) an assessment of the potential of other services based on the same technology (e.g., health services, e-government, etc.). The evaluation will also identify if there is sufficient fee-based demand to cover most of the investment cost and all

operating costs of content development. MANOBI hopes to persuade Sonatel to boost the coverage of the Kayar base station to an expected 70-kilometer radius using Alcatel equipment, significantly widening the area of coverage.

Stakeholder consultation

- Manobi web site, www.manobi.net
- Manobi Proposal for *infoDev*, January 2002
- Manobi Grant Agreement with *infoDev*, August 2002
- Interviews carried out by Mike Webb in August 2003 with:

Daniel Annerose, CEO MANOBI

David Boggio, Business Development, MANOBI
Adama Diop, Iba Diouf, and Mar Mbaye:
fishermen

Diene Ndiaye, Fisheries Technician, Ministry of Fisheries

Abdel Kader Mboub, local consultant who trains the fishermen

Pape Mbaye, Bassirou Mbaye, Abdoulaye Diouf, Abdoulaye Diop: representatives of fishing unions

- *infoDev* Task Manager, Paul Numbaum



Trust for the Americas, Organization of American States (El Salvador, Guatemala, Honduras, and Nicaragua) www.trustfortheamericas.org

IT: Employment for People with Disabilities

Abstract

This project was conducted in Central America over a 14-month period, starting in June 2000. It used professional volunteers to train people with disabilities in computer programs and work-related information and technology skills. The project also trained organizations that work with the disabled. A total of 13 volunteers trained 338 people representing 44 organizations in El Salvador, Guatemala, Honduras, and Nicaragua. A typical impact was that one of the organizations, Transiciones, a print shop in Guatemala, was able to expand its operations as a result of the training. ICT training gave people with disabilities a new opportunity to enter the workforce and to raise their income levels.

Background

The Trust for the Americas is a non-governmental organization affiliated with the Organization of American States (OAS). The Trust decided to embark on a project to train people with disabilities in Central America in response to several factors: 1) the recent adoption by the OAS of an Inter-American Convention on people with disabilities, 2) recent laws in El Salvador and other Central American countries that promote employment for people with disabilities; and

3) the large number of people with disabilities in Central America, a result of internal conflicts in the 1970s and 1980s. Utilizing the Trust's volunteer initiative, Net Corps Americas, the OAS was able to combat poverty by using information technology training to reduce the obstacles to employment faced by people with disabilities.

The *infoDev*-funded project, "IT: Employment for People with Disabilities," was implemented for a period of 14 months between June 2000 and August 2001 in four Central American countries: El Salvador, Guatemala, Honduras, and Nicaragua. Two interrelated projects sent volunteers with and without disabilities to conduct ICT training. First, people with physical disabilities from selected organizations were trained in computer programs adapted to specific disabilities, as well as in work-related information technology skills. Second, an existing network of groups working with people with disabilities was connected across countries, regions, and internationally via the Internet. As a result of this training, OAS believes that its trainees are able to fight more effectively for access to education and for changes to laws and physical barriers.

To implement the project, the Trust deployed high-tech volunteers through its Net Corps Americas program (a proven model) to previously selected host organizations in the field. Each organization was chosen on the basis of its desire to use technology, its willingness to share this resource, and its capacity to continue training programs after volunteers left. Volunteers were identified as the most cost-effective mechanism to deliver high-quality, customized, needs-based training. The majority of volunteers were international consultants who donated their time. In many cases, they brought knowledge that was new to the region, particularly in the case of adaptive technologies, and were able to customize training to the needs of specific organizations.

Prior to deployment, volunteers and hosts met via e-mail to develop a needs assessment and tentative work plan, which was finalized when they met in person. This approach meant that volunteers did not deliver a uniform training curriculum to all organizations, but were able to tailor training to the different educational levels of participants, types of disability, and activities of the host organization. The volunteers sponsored by the project came from Argentina, Venezuela, Holland, Spain, and the United States. One-third of the volunteers were women.

The project gave particular emphasis to monitoring and evaluation. For this purpose, two members of the OAS team made site visits and held meetings with local organizations and the people they had trained, who were asked to fill out evaluation questionnaires and surveys with general information. The survey used a baseline approach in order to measure the impact of the project. In addition to the project evaluation, regular reporting was made to both *infoDev* and the Development Marketplace.

Impact/Results

- A total of 13 volunteers were sent to work directly with 10 organizations in Honduras, El Salvador, Guatemala, and Nicaragua. They trained more than 300 people who represented 44 organizations in the region. The principal skills taught by the volunteers included software training (Microsoft Office [Word, Excel, Power Point], Internet navigators, Microsoft Front Page, Netscape Composer, e-mail applications, database design) and adaptive technologies (among them JAWS, "Scan and Read" for the blind, and adaptive devices for people with impaired mobility).
- Adaptive technologies were introduced in four countries of Central America. At the beginning of the project, almost none of this technology was available in these countries.
- The project had a direct impact at three different levels: 1) introducing adaptive hardware and software, 2) training people with disabilities, and 3) training disability organizations as trainers.
- During the project evaluation, many organizations confirmed that they had improved their ICT skills and the quality of their work as a consequence of the training. They also reported that their use of e-mail had increased.
- A portal has been created to increase the flow of information about disabilities in the region (<http://www.reddiscapacidad.org/>)

Key Issues

Partnership

Throughout this project, the Trust relied on a variety of partner organizations with specific expertise to assist it in such areas as volunteer training and advice on adaptive technologies. Interaction with local partners was one of the key elements in the success of the project, which allowed for the implementation of well thought-out work plans.

Target groups

"Approximately five million Central Americans are disabled...Half are of working age, but most can't find jobs. They are the poorest of the poor." (*New Look at the Disabled: Call for Ways to Tap Productive Potential*, IDB America, from Inter-American Development Bank)

Unemployed people with disabilities were the target group. These people had been unable to find a job for a variety of reasons, including:

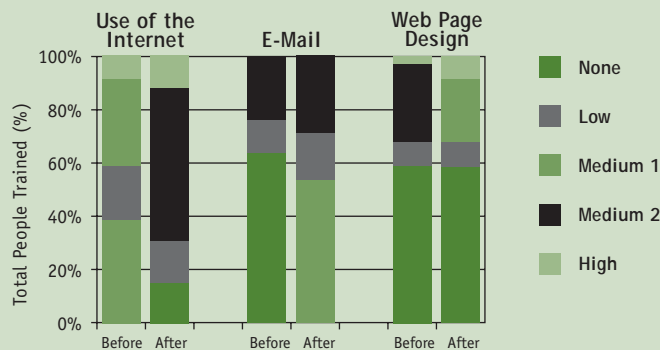
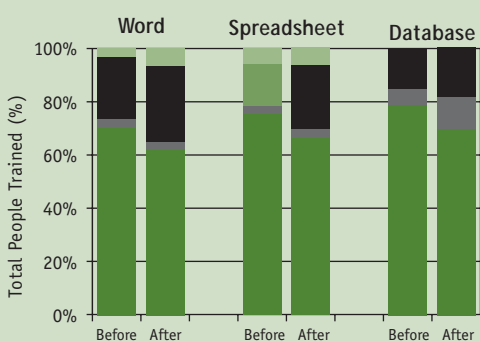
- limited access to education: "Special education services in the region are provided to 3 percent of school-age children with a disability." (*Integration of Persons with Disabilities into the Productive Workforce*, The Canadian Association for Community Living, for the Inter-American Development Bank, September 1997)
- inaccessible physical structures: many public buildings and roads are not modified for people in wheelchairs. Access to public transportation barely exists for the disabled, thereby limiting people's ability to get to work.
- negative societal perceptions and discrimination: even when people endeavor to circumvent architectural barriers and have the necessary job-related skills, societal attitudes often keep them from being hired.

Capacity building

Project strategy was based on training of trainers. The strategy aimed to facilitate the direct transfer of knowledge and to lend sustainability to the project. Most of the trainers who were trained were permanent staff of local organizations. It was observed that these local groups increased their efficiency significantly after project implementation.

In essence, the project focused on capacity building and training for local organizations and their beneficiaries. By the end of the project, its impact—in terms of

Graph 1 Level of Knowledge Before and After Training—Office Tools and After Training—Internet Tools



numbers of people trained—far exceeded expectations: 13 volunteers trained 338 people from 44 organizations. The graphs below demonstrate the increased capacity of trainees to use Microsoft Office and the Internet.

Technology

At the heart of the project was the conviction that the Trust, as an external actor, could provide technology training as a tool that organizations could appropriate and use for their own development.

In general, the Trust selected organizations to participate in the project which already had some computers. Computer ownership was evidence that the organizations already had an interest in ICT and had made an effort to avail themselves of this technology. The Trust also donated some equipment—primarily adaptive technology—to organizations accepted into the program. This equipment would have been almost impossible for the organizations to acquire by themselves.

Finance

Staffing	US	\$116,100
Computer equipment		47,000
Volunteer supervision		7,000
Accommodation for volunteers		40,000
Administration and communications		37,045

Total Project Cost US\$ 297,145

infoDev funding US\$ 50,000

Development Marketplace funding US\$ 89,500

Other funding sources US\$ 157,645

Host organizations for this project included Consejo Nacional de Atención Integral a la Persona con Discapacidad (CONAIPD), El Salvador; Fundación Hondureña de Rehabilitación e Integración del Limitado (FUHRIL), Honduras; INFRACNOVI, Honduras; and Transiciones of Antigua, Guatemala, which runs a graphics print shop.

Beneficiary Stories

- Jenny is a lady from El Salvador who is in a wheelchair. Prior to attending training with OAS, she was unemployed with no training or technical education. Upon entering the OAS program, she was provided with training and eventually became the OAS secretary in El Salvador. In the last year, she also became an OAS advisor on disabilities issues.
- Transiciones in El Salvador received two volunteers through the OAS/Trust program. The volunteers arrived at the launch of Transiciones' graphic design and offset print shop and provided training in small print production. One volunteer provided training in the Internet and computer programs; the other, a retired print shop manager, provided technical training. Transiciones still rely on the training materials left by the volunteers. Since the training, the print shop has grown a great deal and has been able to add additional equipment and provide a wider range of services to their clients.

Issues and Lessons

- Local counterparts should be involved as far as possible in the project from the beginning.
- A clear understanding of the goals of the project

and the role of the different partners is crucial for good implementation.

- There is a need for a wide range of partner organizations. The Trust had support from numerous international and local partner organizations in the implementation of the project. This reduced the costs of the project and leveraged over US\$500,000 of in-kind donations.
- The provision of highly educated trainers who were able to provide customized, needs-based, cost-effective training for people with disabilities and their organizations was crucial to project success.
- In order to promote employment for people with disabilities, factors beyond ICT training need to be considered, including a legal framework to support employment of people with disabilities, an awareness campaign to promote the disabled, and providing job-readiness training and a job placement program for the disabled.

Challenges

- One challenge faced by the project was the February 2001 earthquake in El Salvador. This natural disaster greatly affected the country, altering project work plans. However, the Trust managed to honor its commitments to local organizations by sending volunteers at a later date.
- Ironically, volunteers—one of the greatest strengths of the project—also posed a challenge. Although almost all volunteers successfully completed their assignments, organizations working with volunteers should be prepared to deal with their varying abilities to adapt to new environments.
- The educational level of the people trained posed a challenge. Many people with disabilities have not had any access to education, nor are they familiar with computers. For many, computers are something completely new and they needed time to adjust to them. These factors need to be taken into account when designing future training and selecting the software applications to be used.

Key factors/issues which led to poverty reduction outcomes

- Overall, the project improved the conditions of the target population because it gave them an additional tool to gain employment. In addition, the skills of the organizations increased significantly, which directly improved their services to the target population.

The number of people trained was 11 times greater than the target number in the original proposal. In addition, the program recruited higher-quality volunteers than anticipated.

- A framework already existed for the project and several relationships strengthened that framework. For example, the Trust for the Americas already had an initiative called ICTD (Information Communication Technology for Development), which was running many different projects in Central and South America. It was under this umbrella that the Technology and Disabilities Training project was started. The personnel, policies, and vision were already present—giving the project a head start. Also the previous establishment of Net Corps Americas provided a ready link between skilled volunteers and the disadvantaged.
- Established links with organizations like the Inter-American Institute on Disability and the Georgetown University Center for Intercultural Education and Development allowed the project to draw on specialized advisory support.
- The volunteers were a key element of project success. They were properly trained and served as channels for direct transfer of knowledge and skills.

Future outlook

- The model developed by this pilot project has been validated and consolidated by an end-of-project evaluation. The recommendations made by the evaluation, such as the addition of job-readiness and job placement components, have been included in a revised model, which is currently being tested on a larger scale in El Salvador with great success. The new project includes these additional components. Requests have already been received from the governments of three countries in the region to implement similar projects based on this model.

Stakeholder consultation

- OAS Grant Proposal for *infoDev*
- OAS Grant Agreement with *infoDev*, May 2000
- Trust for the Americas web site, www.trustfortheamericas.org
- Final Project Report for *infoDev*, December 2001
- Project Evaluation Report, January 2002
- Communication with Susan Benson and Dario Soto, July–August 2003
- *infoDev* Task Manager, Rafael Hernandez



PEOPLink (worldwide) www.catgen.com

*Implementing a Global E-commerce Network
of Grassroots Producers*

Abstract

This project supported the development of the first version of “Catalogue Generator” (CatGen) software, as well as the regional training of some 165 artisan producer groups. The training enabled the artisans to build, maintain, and update their own web catalogues of craft products for use in business-to-business (B2B) marketing. While e-commerce is no panacea for artisan producers, the CatGen system allows users to create online catalogues with minimal web and computer skills, and has brought significant benefits to producers, especially in the areas of collaborative product development, liaison with buyers, and simple web- and e-mail-based marketing.

Although the project is still in its early days, initial sales data is encouraging. Artisan producers who take the time to maintain and update their sites, and who actively integrate web marketing with off-line promotion, are generating B2B sales and finding new buyers. The most popular CatGen artisan web sites are regularly attracting between 2,000 and 3,000 visitors a month, generating sales of tens of thousands of dollars. Since the majority of collaborating craft partners are fair trade businesses that employ low-income artisans at “fair” rates of pay, sales revenues directly support the livelihoods of poor artisans, especially women and their families.

Background

PEOPLink is a U.S.-based non-profit organization that trains and equips grassroots artisan organizations all over the world to market handmade craft items using the Internet. From 1996 to 2000, PEOPLink developed training modules for on-site workshops and provided online support to 55 trading partners in 22 countries, representing up to 100,000 handicraft artisans. This training allowed the organizations to develop their own web catalogues of craft products.

The current project, funded by *infoDev*, created a system to enable any producer group to create and maintain their own web catalogue (see www.catgen.com) using only basic computer skills. The project lasted two years and created three regional support centers in Asia, Africa, and Latin America. Fifty-five producer groups were trained and equipped to publish digital images and maintain simple web pages to promote their products. As a result, some 5,000 craft items were made available to buyers online.

The software used to generate the web catalogues was developed by a multinational team of programmers working from Ukraine, Siberia, Albania, India, Ecuador, and Ireland, coordinated by PEOPLink in the USA. The software continues to be developed. It is currently being enhanced with such features as online tools to handle marketing and promotion, payment, shipping, distribution, and other services.

Most current users of the CatGen web catalogues are craft organizations with established B2B operations, primarily within the fair trade sector. PEOPLink has thus been able to create a fully searchable “catalogue of catalogues” to enable buyers (importers, whole-

salers, retail buyers, etc.) to find products and producer groups. This facility (see www.catgen.com/ifat) was completed for the International Federation for Alternative Trade (www.ifat.org), a worldwide network of 142 members in 42 countries benefiting 400,000 artisans. The “catalogue of catalogues” was the culmination of PEOPLink’s efforts to meet the primary goal of the project described in this case study: “to implement a global e-commerce network of artisan groups.”

PEOPLink has also launched a mechanism for web-based review of prototype products by design experts. This is critical for producers who, due to their isolation, have little or no knowledge of trends and preferences in their target markets (e.g., Europe and the USA). Designer Karen Brown, a craft design expert who works with the U.S. Smithsonian Folklife Festival, has conducted 15 reviews covering color, price, size, shape, materials, overall appearance, packing/shipping, salability, use, text, markets, improvements, diversification, and new products. The system is still being fine-tuned with both e-mail and free message board services for interactive discussion of design issues.

Impact/Results

PEOPLink reports that it is difficult to obtain detailed sales figures from its trading partners, or to determine what sales have been specifically generated by online activities. “However, users who have understood that CatGen is a tool, not a magic wand, have achieved impressive results,” says PEOPLink founder and CEO Dan Salcedo. Specific results include:

- A number of PEOPLink producers report that the CatGen system helped them to find new buyers and generated significant actual sales.
- Ten trading partners in Nepal have set up a small artisan portal (www.catgen.com/nepalcraft) that achieved online sales of \$6,528 in its first six months of operation. These partners have also experimented with direct sales to U.S. consumers, using a system of aggregated distribution that PEOPLink calls LIBIBO (“little box inside big one”). Each individual order is packed by the producer with the U.S. customer’s name and address and then shipped in a larger box to the United States for distribution by PEOPLink. Using this method, the

Nepalese artisans made ten such shipments by September 2003.

- Another set of Nepalese producers, who belong to Third World Craft (www.thirdworldcraft.com), used their CatGen web site to generate \$16,609 of sales in 2002.
- According to CEO Dan Salcedo, the project’s most dramatic success has come from tourism portals in Cambodia, Vietnam, and Laos (see, for example, www.angkorhotels.org). By the end of 2003, these portals will represent close to 600 hotels and generate 800 online bookings a month. “In round numbers, that translates to one million dollars per year of online booking, without counting walk-in bookings (typically four times of those online) attributable to research that tourists performed on the sites before embarking on their trips,” says Dan Salcedo.

Key Issues

Partnership

The main partnerships in this project are between PEOPLink and artisan trading organizations. Most of these groups are members of the International Federation for Alternative Trade (IFAT), which comprises 142 members from 45 countries. PEOPLink has also developed partnerships with other local bodies to provide shipping, payment transfers, and logistical services (e.g., the consolidator Esewa in Nepal, www.esewanepal.org). PEOPLink has also used the online payment provider PayPal to facilitate the payment of small sums generated by pilot business-to-consumer sales.

Target groups

PEOPLink’s main target group is grassroots artisan organizations who need help to access overseas markets, such as Europe and the USA, for their products. Many of these fair trade producers target low-income artisans (e.g., women), and pay “fair” rates of pay. Thus PEOPLink’s strategy to enhance B2B sales potentially has a direct impact on the livelihoods of tens of thousands of low-income artisans and their families in the developing world.

Capacity building

In the past, PEOPLink offered online training modules to trading organizations. However, development of the CatGen system has made it much easier for minimally

trained staff to manage online catalogues with long-distance support. In fact, over the course of the project, PEOPLink was able to train more than twice as many producer groups than originally proposed, and to maintain their online catalogues using CatGen.

This project also included the development of three regional support centers in Africa, Asia, and Latin America. Each center had a full-time local expert trained and supported by PEOPLink, offering both face-to-face and remote support and consultation.

Technology

Each trading organization that participated in the project was given a basic Sony Mavica (floppy-disc-based) digital still camera to photograph their products for use on the Web, plus basic training in using digital photography to create online catalogues. The organizations were also given copies of CatGen software developed by PEOPLink, together with training in how to create and maintain their own, updateable product catalogues. These catalogues are hosted on PEOPLink's CatGen site (www.catgen.com).

The CatGen system is flexible enough to allow individual producers to choose their own "look and feel," provide key data and background information on artisans and products, and even run their own domains independent of the CatGen site. Catalogues are fully searchable by visitor-buyers and can be combined by PEOPLink into generic "catalogue of catalogues."

Finance

Equipment for partner organizations	US\$ 12,000
Equipment for Regional Support Centers (RCSs)	9,000
Office rent, utilities, and salaries for RCSs	43,200
Regional travel for RSC staff (3 x US\$6,000)	18,000
PEOPLink training of selected organizations and RSC staff with two trips, plus Internet follow-up	66,000
Purchase of initial stock to "prime the pump"	15,000
Equipment for PEOPLink	48,000
Development of an integrated web system for promotion	52,000
Implementing Designers Studio for product feedback	55,000

Promotion in North America, Europe, and Japan by contacting retail and wholesale buyers through traditional means (press, trade shows, etc.) and the Internet	60,000
Overhead	41,640

Total Project Cost	US\$ 419,840
<i>infoDev</i> funding	US\$ 125,000

Beneficiary stories

- The Chennai-based trading partner IFFAD (International Foundation for Fair Trade and Development, see www.iffad.org), which markets craft products from 49 producers in Southern India, reports that their CatGen-based web site enabled them to find a new professional buyer in Australia, directly generating sales of US\$2,200 in May 2003. Their CatGen site now attracts around 2,000 visitors a month, mostly from Northern countries. According to Marketing Manager Mr. G. Ramesh, the site has enabled IFFAD to strengthen relations with existing business buyers, making it quicker, easier, and cheaper to showcase new products and designs, and is a worthwhile enhancement to their business overall.
- IFFAD has also found that using digital photography has significantly sped up product development, especially when liaising with Northern buyers on particular designs and trends. Marketing catalogues created with digital images not only save money (compared to conventional photography), they can be promoted by e-mail to known contacts at minimal cost.
- The Nepalese producer group Mahaguthi (www.mahaguthi.org) saw their annual sales increase by 8–10 percent a year in the late 1990s. After promoting their products online, however, they experienced sales growth of 30–40 percent for four years running. They are drawing several thousand visitors to their web site each month, which is one of the most popular of the CatGen artisan web sites.
- ESEWA provides technical assistance to Nepalcraft. With help from PEOPLink, they have been listing items on e-Bay and have sold over US\$7,000 of products, including two US\$800 thanka paintings from www.catgen.com/thanka. These paintings were delivered to buyers using Peoplink's LBIBO consolidated distribution system.

Issues and Lessons

Challenges

- The main challenge of the project is the financial sustainability/profitability of CatGen and the broader operations of PEOPLink as a whole. Many groups find the CatGen catalogues a valuable tool for enhancing existing B2B relationships and even for finding new business customers. However, the potential for producers to sell their products directly to consumers is limited, mainly due to the nature of handicraft products (which most consumers wish to handle before purchasing) and the high cost of shipping small quantities internationally. Given this reality, business-to-business (B2B) and not business-to-consumer (B2C) sales are the likely focus of any push towards sustainability.
- While larger producer groups and craft exporters in urban areas have the necessary infrastructure to support CatGen (i.e., reliable power, telephone connectivity, and a suitable PC), smaller groups in rural areas still face the considerable barriers of unreliable power and poor or non-existent telecommunications infrastructure. However, it is possible to operate CatGen from a telecenter or cyber cafe.

Key factors/issues which led to poverty reduction outcomes

- Increased sales of craft products directly support the livelihoods of low-income artisans, especially women.
- Single point of access to multiple online and offline wholesale and retail “first world” channels, including wholesalers, e-tailers, retailers, and gift/trade shows.
- Easy-to-use software platform that facilitates market access while remaining under the control the artisans themselves.
- Regional training and support to develop essential online, marketing, and entrepreneurial skills.

- Regional groupings (portals) aggregate products and reduce distribution costs (e.g., Nepalcraft).

Future outlook

- Strong potential for enhancing B2B sales; less opportunity for B2C sales. However, if the trading partners select their products carefully, B2C can be highly profitable. High-value, low-weight items are more appealing to the B2C market, such as Thangka paintings, contemporary paintings, idols, statues, carving, and jewelry.
- To address the problem of high shipping costs, PEOPLink has experimented successfully with low-level B2C sales from Nepal using their LIBIBO distribution system. They continue to explore this sector and, once the shipping/logistics model is in place in each country, it may help promote the B2C market.
- Potential for growth, especially in tourism (the promotion of hotels in Southeast Asia has been one of the most dramatic successes of CatGen).

Stakeholder consultation

- PEOPLink Proposal for *infoDev*, September 1997
- Final Project Report for *infoDev*, February 2000
- *E-commerce Options for Third World Craft Producers*, Batchelor and Webb, March 2002, www.big-world.org
- Stockholm Challenge Award Application, February 2001
- Communication with Dan Salcedo, Executive Director, PEOPLink
- Interviews carried out by Mike Webb in August 2003 with:
 - Surendra Shahi, Trading Partner Liaison, PEOPLink
 - Dr. V. Purushothaman, Director, IFFAD, Chennai
 - G. Ramesh, Marketing Manager, IFFAD
 - Panneer Selvam, Managing Trustee, Chitrayalam Trust (producer group), Pondicherry
 - Leyoni Adolf, artisan producer, Chitrayalam Trust
- *infoDev* Task Manager, Daniel Crisafulli



RITS/ Sampa.org (Brazil) www.rits.org.br

Internet Access and Effective Use by Third-Sector Organizations in Brazil

Abstract

This project involves using digital information and communication technologies to promote Internet access and use by civil society organizations and their networks in Brazil. Rather than trying to build experimental centers from the ground up, the Information Network for the Third Sector (Rits) chose to work with the Sampa.org network of telecenters, which are located in low-income communities of São Paulo. Rits provided the centers with technical help, evaluations, and financial support. Currently, Sampa has ten telecenters with about 2,500 users in São Paulo shantytowns. Most users tend to be women (70 percent), with 60 percent of users between 13 and 17 years of age.

Background

The Information Network for the Third Sector (Rits) is a non-profit organization founded in 1997. It is dedicated to empowering third-sector (civil society) organizations by disseminating digital information and communication technologies (DICTs). In addition to hosting NGO web sites and servers, Rits provides web mail, electronic conferencing, and knowledge management services. Rits also provides a newsletter management system that disseminates information on the Telecommunications Services Universalization Fund

(FUST) in Brazil, as well as on local initiatives to develop community ICT access. Nearly 6,500 individuals subscribe to the information services of Rits and the nearly 200 members of the organization are fairly distributed across the third sector throughout Brazil. Rits works closely with several other networks of third sector organizations that are active in all regions of Brazil.

The *infoDev*-funded project, “Internet Access and Effective Use by Third-Sector Organizations in Brazil,” officially began in January 2001. Its goal was to formulate and carry out solutions to democratize access to information and communication technology (ICT) in Brazil among NGOs, civil society organizations, their networks, and their constituencies. Rits conducted a survey of 2,500 third-sector organizations which showed that Brazil currently does not have sufficient infrastructure in place for third-sector organizations to create and promote telecenters. The results of the survey led to a plan to connect 13,000 public high schools; 50,000 public health units, hospitals, and clinics; plus the majority of public libraries within Brazil, to the Internet.

Initially, Rits tested some of the well-known e-learning packages (both those developed abroad and in Brazil) to determine the costs and benefits of deploying these systems in low-cost (preferably open source) e-learning environments. They also developed training programs for two Internet services: a system of electronic conferencing and an intranet system. At the same time, agreements were concluded with Brazilian NGOs to develop and/or adapt content that could be converted to useful online learning tools for third-sector organizations.

Rits held a number of conferences and seminars in order to ensure that, rather than duplicating efforts already underway in Brazil, it would support and work with current projects. One key workshop was the First Digital Inclusion Workshop (Brasilia, May 14–17, 2001), which was cosponsored by the Brazilian government. (Rits has also been involved in the implementation of the Information Society Program, which is coordinated by the Ministry of Science and Technology of Brazil.)

The Rits project is helping Sampa.org extend its network of community-based telecenters to most neighborhoods in the city of São Paulo. (Sampa.org has telecenters in the districts of Clean Field, Capon Redondo, and Ângela Garden, which offer free access to the Internet, as well as courses on computer science and communication technology.) The expansion of the Sampa.org network has the full support of the municipal authorities of São Paulo.

Sampa.org will use its accumulated expertise to deploy 150 new community-based telecenters throughout the city by the end of 2003. Although Rits is based in Rio de Janeiro, the project is intended to be national in scope and should have a regional multiplier effect over the long term, given the relationships that Rits has cultivated with regional initiatives in Latin America and the Caribbean such as TELELAC and Red Científica Peruana.

Finally, Rits has developed a web portal called Portal da Cidadania that uses technology developed by a local software company. The portal is intended to be a large reference center that will provide space for networks and individual non-profit organizations to disseminate information.

Impact/Results

- Publication of a set of guidelines for including the poor in ICT policies (digital inclusion) at the federal level.
- Circulation of a number of model solutions and information components of digital inclusion programs using the Web and other forms of dissemination. It is hoped that these information dissemination efforts will encourage replication of the initiative.

- The effectiveness of Sampa.org telecenters in São Paulo has influenced local public policy.

Key Issues

Partnership

The major partner in the project is Sampa.org in São Paulo. Of note, the original chairperson of Sampa.org is now the mayor of the city. She has had a dramatic effect on public policy with respect to the need for and perceived effectiveness of telecenters. Sampa.org now works in partnership with the São Paulo municipal authorities, providing the expertise needed to create new telecenters.

Apart from *infoDev* and Sampa.org, Rits has formed partnerships with institutional funders, sponsors, and logistical/institutional support agencies. These partners include Conselho da Comunidade Solidária; United Nations Educational, Scientific, and Educational Organization (UNESCO) Brazil; the International Development Research Center (IDRC); and the Ford Foundation. Private sector partners include a software and computer components company, Open Text Corporation, and organizations specializing in technical development (the National Research Network; Net-Open Ltd.; and Ecoliving Institute, a non-profit telecenter operator).

Target groups

Third sector organizations in Brazil, which include NGOs and community organizations, are the primary target group of the project. Through the institutional link with Sampa.org, the project specifically targets the local favela (slum) population, with particular emphasis on teenagers and youth in their early twenties.

Capacity building

Rits adopted the Teleduc open source e-learning platform developed at the University of Campinas (Unicamp). In addition, it chose to develop free source distribution packages for NGOs. Rits has also developed training programs for two of its Internet services: the electronic conferencing system (Civil Cyberforum) and the intranet system (based on an advanced content management system donated by Open Text Corporation). Training is conducted in person and online.

Technology

Each Sampa.org telecenter uses one high-specification server and a network of between 10 and 20 made-to-order basic computers without hard drives. The machines run Open Source software from the server (the Teleduc open source e-learning system is based on Linux-compatible tools and software). The application server system is operated by a small company at the University of Rio. Internet connections are provided by dedicated leased lines or dial-up connections.

The Rits web portal (Portal da Cidadania) uses a technology developed by a local software company and is hosted by a highly secure data center in Rio.

Finance

Coordination	US\$	65,000
Field research		91,000
Experimentation		117,000
Dissemination		68,000
Training		66,000
Conferences and workshops		77,000
Administration		48,000

Total Project Cost	US\$	532,000
Total from <i>infoDev</i>	US\$	250,000

The continued cost of the project will be covered through a fund created by the Brazilian government. The fund is created by the donation of one percent of the telephone service bills of every telecommunications company in the country.

Issues and Lessons

Challenges

- Violence and crime are major challenges in the favelas.
- Sampa.org learned a key lesson about sustainability during the experimentation phase. Sampa.org has gone a long way towards ensuring the sustainability of its telecenters by using existing community buildings and installing efficient, low-maintenance computer systems at minimal cost. Staff training then builds both institutional capacity and sustainability.
- However, maintenance of the project at its present scale costs a minimum of US\$400,000 per year, not including the initial investments in equipment, training, planning, materials, etc. If it were to be

entirely supported by the community of users, the project would cost approximately US\$160 per user per year, or the equivalent of more than two minimum wages. If digital inclusion projects are to become permanent, therefore, they must count on funding from the state to maintain basic infrastructure and associated personnel.

- It is estimated that São Paulo alone needs 1,000 telecenters to ensure that the entire population is “digitally included.”

Key factors/issues which led to poverty reduction outcomes

- Locating telecenters in existing local community centers and placing their control in the hands of center managers integrates the work of the telecenters into broader community work in the favelas. Although it is impossible to evaluate the specific benefits of the telecenters, it is clear from individual stories that the centers bring benefits to individuals and thus, families, within the favelas.
- Rits believes that telecenters can and should be the basic community hub for a number of digital inclusion projects, which could extend the benefits of the centers far beyond basic computer training and access to the Internet. The work of Sampa.org already positively impacts economic solidarity projects (such as a services clearinghouse), cultural initiatives, professional training, and many other community initiatives.
- Sampa.org has protected its centers from theft by explaining their purposes to local gang bosses prior to opening. Other local telecenters have not been so fortunate.

Future outlook

- While assessing the most effective ways to implement the program, Rits discovered that a number of decisive initiatives had been launched by the federal and state governments of Brazil. These initiatives seek to ensure that all favelas have some means of public access to the Internet. These initiatives should have a tremendous impact on the program.
- As a result of the field research component of the project, Rits is seeking to create a “Digital Inclusion and Universal Access” project. This project would monitor the state of universal access in Brazil.

- Sampa.org continues to partner with the São Paulo municipal government to create new telecenters throughout the city. The political will to push the program forward is now present.

Stakeholder consultation

- Project Proposal for *infoDev*, July 2000
- Rits Grant Agreement with *infoDev*, January 2001
- Final Report for *infoDev*, January 2002
- *infoDev* web site, www.infoDev.org
- Rits web site, www.rits.org.br
- R. Lefort, "Striking Media Giants with News on the Web," *The Courier* (UNESCO), May 2001
- Communication with Rits, July–August 2003
- Interviews with members of Sampa.org by Malcom Peirce, August 2003
- *infoDev* Task Manager, John Garrison



Vishnevskaya-Rostropovich Foundation (Russia) www.rostropovich.org

Tele-healthcare Network for Child Cancer Care

Abstract

The Vishnevskaya-Rostropovich Foundation created a telemedicine healthcare network in the First Municipal Hospital of St. Petersburg in 1999 to meet the needs of pediatric medical staff. Using the power of digital technology and the Internet, the Foundation linked child cancer specialists in St. Petersburg with colleagues in the USA and Europe. The network has enabled Russian staff to send MRI scans and records of their patients to other specialists in order to improve the care management of children living with cancer. The network has also improved communication between primary care physicians and medical specialists within the St. Petersburg area.

Background

The Vishnevskaya-Rostropovich Foundation (VRF) is a publicly supported, non-profit organization whose aim is to improve the health and future of children in Russia. The Foundation's telemedicine healthcare network, partially funded by *infoDev*, provided Russian pediatric medical personnel in St. Petersburg with technology that allowed them to improve the care of children with cancer, especially leukemia. Based at the First Municipal Children's Hospital in St. Petersburg, the network links hospital staff to the Georgetown

University Children's Medical Center and the Lombardi Cancer Center in Washington, D.C. It has since expanded its links to medical colleagues in Europe. By creating an international professional network, the project contributes to the ongoing educational and consultative needs of Russian cancer specialists.

Other project aims included:

- Creating a model system that would define the technical requirements for cross-cultural transmission of medical knowledge.
- Building the foundation for marked improvement in the survival rate of Russian children with leukemia.
- Improving the care of Russian children with cancer, who are currently poorly served by the Russian health care system.

The incidence of children with cancer in the St. Petersburg area is considered among the highest in Russia. (This finding is, however, based on incomplete data.) St. Petersburg is the second-largest city in Russia with a population of 5 million, of which approximately 800,000 are children. At present, there is no effective program for screening children with cancer in the area. As a consequence, most children are not diagnosed until the disease is at an advanced stage, which results in long hospitalizations and poor prognoses. Leukemia and lymphoma constitute well over 50 percent of the cancers, for which the survival rate in the USA is about 80 percent. In Russia, however, most children with these diseases die after lengthy and painful illnesses.

The oncology unit of First Municipal Children's Hospital in St. Petersburg Children's Hospital is the center for treating leukemia in the northwest region of the Russian Federation. Prior to the installation of the

Internet network provided by the project, hospital physicians were isolated from the medical community beyond the city limits of St. Petersburg. Yet there was a real need on the part of hospital doctors for contact with their colleagues in other parts of Russia and the West. Moreover, patients outside of St. Petersburg had no access to hospital specialists except by traveling to the hospital in person. Nor did physicians outside the city have a way of consulting the highly trained specialists at the hospital.

The project initially began as a high-tech initiative using a browser-based electronic medical record (EMR) system as a vehicle for standardizing medical records for international and local medical consultations. Over time, it evolved into a low-tech system consisting of desktop computers, a server, Internet access, a digital microscope and monitor, and digital imaging and scanning equipment. This technology provides the basis for medical consultations via e-mail, with digitized medical images used as attachments. In addition, the project is creating a universal information system appropriate to the Russian context that can be used in partner countries.

Impact/Results

- Today, consultations between physicians at the St. Petersburg hospital and their counterparts in Russia, the USA, and Europe, take place on a regular basis.
- The system is heavily used by a variety of staff at the hospital. A number of staff have even purchased their own equipment to access the network—testimony to its popularity and usefulness.
- Medical staff not only use the new equipment to access the cancer network, but also to surf the Internet for the latest medical research. This has enabled them to stay up-to-date in a research-reliant medical specialty.
- Consultant references to research available on the Internet attest to the importance of the Internet as a source of vital information previously unavailable to the Russian specialists.

Key Issues

Partnership

This project is based on a partnership between physicians at the St. Petersburg hospital and their counterparts in Europe and America. It also links them to primary care workers within Russia. These partnerships

have enabled the transfer of knowledge and experience to improve the quality of care and speed of diagnosis among cancer professionals in Russia.

Target groups

The main target group is medical staff who treat children living with cancer in Russia. By improving the care that these children receive, the program hopes to reduce child mortality rates attributable to cancer in Russia.

Capacity building

Once the network was established, the ability of consultants to treat patients rapidly increased. Consultations between physicians at the St. Petersburg hospital and their counterparts in Moscow and the West, particularly in the UK and Germany, now take place on a regular basis. Physicians in St. Petersburg also use the network to provide consultations to Russian physicians in other areas of Russia. Finally, physicians at the St. Petersburg hospital rely heavily on the Internet for information on the latest medical research, which is particularly important in the cancer field.

Technology

Technology provided to the hospital and primary care centers included a primary server, computers, a network hub and wiring, printers, a digital microscope and specific software for its use. By linking primary care centers to the St. Petersburg hospital, direct contact has been established between specialists and primary care physicians who currently have limited knowledge of diagnostic and treatment protocols.

It is important to note that, owing to the low-tech nature of the project, maintenance expenses are relatively low. Total *infoDev* project funds expended in 2001 amounted to US\$9,745, almost all of which went to cover the cost of an additional workstation and software (US\$4,406), plus Internet access.

Finance

Personnel and administration	US\$	166,350
Technical equipment		34,000
Travel and communication		49,650

Total Project Cost		US\$ 3.7 million
Total <i>infoDev</i> funding	US\$	250,000

Recently, the project obtained a digital microscope from a private donor and a number of staff have themselves paid to extend the network to their workstations.

The project hopes to become self-sustainable by providing consultations and distance learning.

Beneficiary Stories

- Owing to a consultation with a specialist in the UK, a 16-year-old boy with ALL (Acute Lymphocytic Leukemia) avoided having painful and dangerous blood transfusions.
- In the case of a 12-year-old girl named Maria Trokhalyova, the network enabled a German specialist to confirm the diagnosis made by the Russian physicians, based on medical data sent by e-mail. This case is ongoing and the treating Russian physicians have sent MRIs and X-rays for further consultations.
- Being able to access the Internet enabled Dr. Pavel Korenev to browse a web site on brain tumors. Information on the site enabled him to contact a doctor in the UK to discuss the case of a 6-year-old girl with brain tumors, including sending MRI scans in electronic form.

Issues and Lessons

Challenges

Rostropovich faced a number of logistical difficulties in setting up the project, including obtaining a reliable landline provider, proper utilization of the technology, and a good-quality, high-speed Internet connection. To address these needs, local authorities are looking into providing an optic cable connection to the hospital.

An ongoing challenge is how to make a tele-healthcare network generate enough income to become financially sustainable.

The concept of using electronic browser-based medical records (EMRs) as the basis for the project was recognized as overly ambitious and, ultimately, unnecessary to achieve project goals. It appeared to have been unrealistic to expect Russian physicians to accept EMRs that did not mirror paper medical records currently in use in Russia. Developing an EMR is an ambitious undertaking in any setting, and Rostropovich now believes that such an undertaking should be a separate project.

Another challenge was the recognition that exchanging medical information by e-mail requires standardization. Even though EMRs intended to become the standard means of exchanging medical information, a simplified electronic form that contained essential data with a section for comments would make the process of medical consultations more efficient and professional.

Key factors/issues which led to poverty reduction outcomes

As a dedicated health project, Rostropovich did not have a direct impact on poverty reduction. However, by improving the care of child cancer patients and enhancing the professional development of cancer specialists, the project made undeniable contributions to the quality of health care in Russia.

The project discovered that international patient consultations can work well using e-mails with attached medical images, a finding that could make such consultations a possibility for doctors in many developing countries. However, the efficiency of such consultations relies on an agreement as to the level of data provided and on adequate-quality images for diagnostic purposes.

The low-tech nature of the project not only makes it replicable, it contributes to the potential long-term sustainability and user-friendliness of the resulting system. The majority of medical staff in the St. Petersburg hospital are now accessing the Internet and making use of the system to help improve standards of patient care.

Future outlook

Local sustainability and expansion of the project are well underway. The Health Committee of the City of St. Petersburg is providing funding for daily maintenance and is investing in fiber optic cables for improved Internet connectivity. More importantly, the committee has decided to create a consultative diagnostic center for pediatrics at the First Municipal Hospital to serve the entire northwest region of Russia, based on the tele-healthcare network. The fact that the proposed diagnostic center would cover all pediatric care, and not be restricted to cancer cases, is evidence that the tele-healthcare network has broad applicability across medical specialties. Ultimately, local sustainability

depends on general recognition of the usefulness of the tele-healthcare network. To date, there appears to be broad agreement on this score.

Stakeholder consultation

- Project Grant Agreement with *infoDev*, January 1999
- Final Project Report for *infoDev*, December 2002
- Vishnevskaya-Rostropovich Foundation (VRF) web site, www.rostropovich.org
- Interview by Susan Batchelor of Dr. Pavel Korenev, Physician and Head of VRF Russia, August 2003
- Communication with Billy Amoss and Dr. Elena Frolova of VRF, July–September 2003
- *infoDev* Task Manager, M. Vanari



Satellife & HealthNet Kenya (Kenya) www.healthnet.org

*Regional Information Technology
Training Center*

Abstract

The Regional Information Technology Training Center was established in Nairobi, Kenya, in 1999 by Satellife, a non-governmental organization, and HealthNet Kenya, a registered Kenyan company. The aim of the center was twofold: first, to train medical staff from across East Africa in basic IT skills and technical support, and second, to sensitize policy makers to the potential value of information and communication technology (ICT) in the workplace.

One hundred people were trained at the center over a one-year period. While the foundations of a sustainable business were created, institutional factors have led to an uncertain future of the project in Kenya. Nevertheless, trainees from Uganda, Tanzania, Ethiopia, and Eritrea were able to return home and organize ICT training in their countries, resulting in the ongoing training of health professionals throughout East Africa.

Background

infoDev funding assisted Satellife, a not-for-profit health organization, and HealthNet Kenya, a private company, to establish a pilot East African Regional Information Technology Training Center (RITTC) in Nairobi, Kenya. The center offers health professionals

in Eritrea, Ethiopia, Kenya, Tanzania, and Uganda the opportunity to attend courses in information technology (IT) basics and IT training-of-trainers instruction. Participants were selected on the basis of their ability to use the training to assist others in their home institutions. During the funding period, a total of 87 people completed the IT Basics course and 24 people completed the IT Trainers course. Training has continued since *infoDev* funding concluded.

In addition to training, the project also aimed to sensitize policy makers to the potential value of information and communication technology (ICT), thereby promoting investment in ICT equipment and training. To this end, officials were invited to open training sessions, with the first session opened by the Permanent Secretary of Health of Kenya.

Two three-day courses were run repeatedly by the center throughout 1999–2000: Information Technology Basics and Information Technology Trainers. The IT Basics course was an introduction to information technology and its health applications. The course offered training in the use of various information technology tools, such as electronic mail, electronic discussion groups, CD-ROMs, the World Wide Web, and GetWeb, a tool designed by Satellife that enables users to extract text from web sites via e-mail messages in ASCII text. Participants were also trained in evaluating the cost-effectiveness and relevance of IT tools. The second course mainly focused on preparing participants to train colleagues and serve as IT resource personnel in their home institutions. Participants were introduced to a variety of adult learning styles, instructed in the use of multiple facilitation techniques, and given the opportunity to create

personal action plans (strategies for creating training opportunities within their own institutions).

Training modules used in the workshops are now published on the Satellife web page (www.healthnet.org/training.php). Tutorials are available on how to use e-mail (Eudora software), CD-ROMs (the Cochrane Library CD-ROM), GetWeb (the Satellife web-to-e-mail tool), Satellife electronic discussion groups, and the World Wide Web (using Netscape).

The RITTC is administered by Satellife with assistance of the network management team of HealthNet Kenya (HNK), which helped plan and implement the project. Although HNK was intended to be registered as an NGO, it was founded as a limited company in Nairobi—an institutional aspect that has created barriers to the long-term stability of the project. HNK offices were originally located in the Kenyatta National Hospital Training Center, but have now moved offsite.

Monitoring and evaluation of the project has included student evaluations of training sessions, which have been consistently highly enthusiastic.

Impact/Results

- There is considerable evidence that the IT courses have had a multiplier effect. Recent reports from RITTC participants indicate that they have been able to significantly increase computer literacy, for example, in the Ministry of Health of Eritrea and the Makerere University Medical School in Kampala, Uganda.
- The link between training courses and policy cannot be accurately determined. However, the head office of the Kenyan Ministry of Health had virtually no computers at the start of the project, and only the Director of Medical Services had access to e-mail. After the training, it was observed by former RITTC project manager Eliazer Karan that the “building [was] full of computers.”
- Following training and sensitization, an ICT center was established at the Kenya Medical Training College.
- At some hospitals, training resulted in an ever-growing list of staff wanting to be trained, indicating growing awareness of the potential of ICT.
- Electronic discussion groups provided by Satellife,

such as *afroNet* and *edrug*, have been expanded with growing numbers of Kenyan participants.

- The experience of Satellife and the various East African HealthNet organizations in implementing the project expanded their ability to provide mission-related services.
- The project enabled Satellife and HealthNet to increase their visibility within the international development community, reach new audiences for their services (including, but not limited to, training), and consolidate their roles as key players in expanding the use of IT for better health in Africa.

Key Issues

Partnership

Principal partners included NEC, which provided equipment, and Kenyatta National Hospital in Nairobi, which provided free space for the RITTC in return for partially subsidized training. Sabre Foundation of the United States designed the curriculum and materials for IT trainers for a nominal fee. It also provided an instructor for the IT Trainers course at no cost. The Cochrane Collaboration of Cape Town, South Africa, donated the Cochrane Library on CD-ROM. Silver Platter Information, Ltd., of the United Kingdom donated the MedLine CD-ROMs used in the IT Basics course.

HealthNet offices in Kenya, Uganda, Eritrea, and Ethiopia subsequently integrated training components into their ongoing operations. The Sabre Foundation has expressed a strong interest in using the RITTC for future training activities in East Africa.

Target groups

Health professionals from organizations in Eritrea, Ethiopia, Kenya, Tanzania, and Uganda were the target group. Course representation according to country is shown in the table below:

First course	Second course
Kenya: 42 (48.3%)	Kenya: 11 (45.8%)
Tanzania: 17 (19.5%)	Tanzania: 4 (16.7%)
Eritrea: 6 (6.9%)	Eritrea: 2 (8.3%)
Uganda: 8 (9.2%)	Uganda: 2 (8.3%)
Ethiopia: 14 (16.1%)	Ethiopia: 5 (20.8%)

Participants included physicians, nurses, medical students, and health program managers from various disciplines. The project was committed to gender equity and HealthNet Kenya worked very hard to provide training opportunities to women.

Capacity building

The institutional capabilities of Satellife and the HealthNet organizations in the five target countries grew through staff acquisition and/or enhancement of the following skills: design and production of instructional materials, project management, training, marketing, and entrepreneurship.

At the conclusion of the project, the basis of a sustainable business had been established through training fees (KSh 7,000 for basic training, KSh 12,000 for advanced training, and, in some cases, KSh 2,000 per software application class).

Technology

- 14 Pentium workstations
- NEC POWERMATE server
- network hub
- printer
- liquid crystal display (LCD) projector
- projector screen
- whiteboard
- scanner
- 3.5 KVA power generator

The computers were provided at a discounted price by NEC, which also donated the LCD projector free of charge.

Finance

Project staff	US\$	69,477
RITTC maintenance/supplies		40,800
Equipment and supplies		51,836
Travel and lodging		82,890
Administrative expenses		5,000
Administration		37,501

Total Project Cost	US\$	287,504
<i>infoDev</i> grant	US\$	287,504

Beneficiary Story

Shortly after participating in the RITTC Training of Trainers program, Ceasar Scott of HealthNet Uganda wrote to Satellife about the new training program at the University Medical School of Uganda. As a result of his work, HealthNet Uganda has trained nearly 100 medical personnel in basic Internet tools. The training program was created along the lines of the RITTC model in Nairobi and uses the Satellife training manuals.

Issues and Lessons

- There is tremendous demand for basic IT training among health professionals in Africa.
- With very few exceptions, applicants to the RITTC indicated that they would be unable to participate without full tuition and travel scholarships. While this remained true for the duration of the *infoDev* grant, awareness of the need for ICT training has grown to the point where health personnel will fund their own personal development privately if subsidies are not available.
- Having established the RITTC facility, curricula, and training materials, the project partners believe that similar centers can be established by organizations whose existing infrastructure, skills, and experience are comparable to those of Satellife, provided that these organizations are adequately funded to sustain the program until full cost-recovery is achieved.
- When launching such a project, it is imperative to hold back reserves from the original grant, or to raise funds prior to grant termination, to cover ongoing operating expenses, business planning costs (i.e., consultants), and the acquisition cost of entrepreneurial skills. Without planning this support in advance, the financial viability of the project can only be guaranteed by launching revenue-generating activities well in advance of grant termination.

Challenges

Relatively few operational obstacles arose during the course of the project. The following factors required the original project plan to be adjusted:

- The departure or relocation of several staff members

resulted in a delay in project implementation.

- The timeframe for renovating the space in which the RITTC would be housed was longer than anticipated, resulting in a delay in project implementation.
- Overall, project implementation required greater levels of staff effort than the project partners had projected.
- The cost and complex logistics of bringing computer equipment through Kenyan customs greatly exceeded expectations. The assistance of the World Bank office in Kenya was instrumental in overcoming this problem. It should be noted that Kenya has since instituted a policy change and computer equipment is now exempt from customs. This change should ease such problems for future such projects.
- As a result of power rationing in Nairobi, it was necessary to purchase a power generator.
- A variety of factors, including war and the cost and complexity of travel arrangements, made it difficult to recruit participants from Eritrea and Ethiopia. An in-person visit to each country by a HealthNet Kenya staff member was necessary to increase participation from these target countries.
- After overcoming the majority of the challenges over the life of the project, the future sustainability of the project was severely undermined by institutional factors. HealthNet Kenya's status as an NGO came into question after it became apparent that the organization had been registered as a private company. This institutional problem has affected future planning. As a result, the organization had to leave the hospital and its current viability is unclear. Other HealthNet organizations in East Africa have continued to offer training to health professionals.

Key factors/issues which led to poverty reduction outcomes

- A commitment to the strategic recruitment of participants throughout the five targeted countries to ensure the greatest possible regional impact.
- The strategic placement of participants in the IT Trainers course to ensure maximum regional

impact of their new training abilities and personal action plans.

- In the IT Basics course, a focus on a basic skill set appropriate to the current level of IT access available to most health professionals in the region. This basic skill set provides a foundation on which participants can build as their access to higher-bandwidth IT increases.
- Highly qualified staff of Satellife and HealthNet, as well as the long-standing presence and reputations of both organizations in the target region.
- The ability of project partners to leverage previous work and existing relationships with other institutions and organizations.

Future outlook

- Following the success of the RITTC in Kenya, a similar center was set up in Nepal. See www.healthnet.org/hnnepal.php.
- The future of HealthNet training in Uganda and Ethiopia is assured by strong local organizations grounded in appropriate institutions. While an appropriate business model was established in Kenya, institutional factors have led to an internal reorganization of HealthNet Kenya.

Stakeholder consultation

- Satellife/HealthNet Grant Agreement with *infoDev*, May 1998
- Satellife/HealthNet Final Project Report for *infoDev*, July 2000
- Satellife web site, www.healthnet.org
- Information Technology Training Course: message posted to HELINA-L, Health Informatics, Africa Mailing List
- Message posted to DIGOPP mailing list by Rebecca Riccio, Director of Programs, Satellife
- Interviews carried out by Dr. Batchelor in July 2003 with:
 - Eliazer Karan, former project manager, RITTC
 - Silas Owiti Mudekhere, former project manager, RITTC
- *infoDev* Task Manager, Jacqueline Dubow



Siberian Development Net (SibDev)/ Russia www.sibdev.net

Attracting Growth and Investment to Siberian SMEs through the Internet

Abstract

The overall goal of this project is to increase the capability of small and medium enterprises (SME) in poor areas of Siberia, Russia, to attract investments. The project increased the capacity of local SME support organizations to attract private investments via the Internet and developed a web site dedicated to the marketing of Siberian SMEs. To date, the project has run a number of training workshops, produced a toolkit to promote business marketing via the Internet, and developed a project web site.

Background

Started in June 2002 with one year's funding from *infoDev*, this project is coordinated by a private company, Cryptos Ltd., through a specially formed entity, SibDev. Cryptos specializes in providing business information services in Siberia and worldwide. It has partnerships with Lexis-Nexis and Internet Securities Ltd., a Euromoney Institutional Investor company. The experience of Cryptos in the investment sector enabled it to support a marketing web site for Siberian SMEs. In addition to Cryptos, the project also involves a number of private sector organizations at both the regional and national levels in Russia. These organizations have been supporting the project in kind.

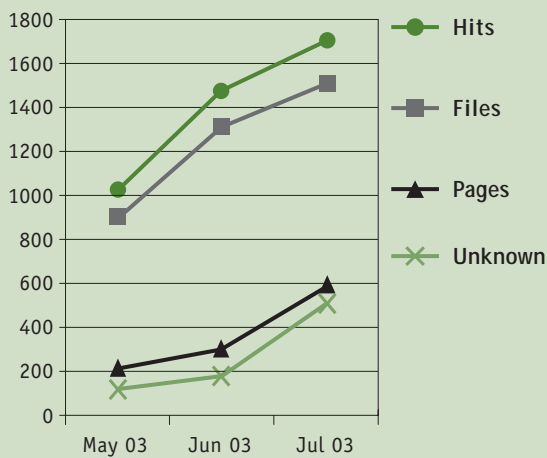
Small, remote urban centers within Siberia currently face economic and social problems due to an erratic economic structure. These problems include high unemployment, salary payment delays, and gaps in employment legislation. As a result, many people have created their own, independent SMEs. Using the Internet, the SibDev project aims to increase awareness of opportunities to invest in these SMEs among national and international investors.

SibDev accordingly developed a web site (www.sibdev.net) that includes basic regional investment information, plus marketing sites in English and Russian. The latter sites serve as a forum where SMEs can post investment proposals and investors can make known their interest in the proposals. To ease content administration and management, the web site contains more than 20 databases, including dedicated databases for investment proposals (SIPE), marketing web sites, and exporters (Siberia Direct). In addition to web site design and maintenance support, SibDev also helps SMEs develop marketing and export strategies for the Internet.

The marketing web sites are produced and maintained by the SMEs themselves. The success of this scheme is currently demonstrated by the steady rise in the number of investment proposals and investment companies added to the Russian-language databases. Several investment proposals have already been sent to registered investors through the "active system" and, as table one shows, there has been a steady increase in visitors to the SibDev site. Exact figures regarding the number of resulting successful partnerships are not yet available.

In addition to direct support of SMEs, SibDev also supports municipal Local Business Centers (LBCs) by build-

Table 1 Monthly Statistics for the Russian Language SibDev Website



ing their capacity to use the Internet, as well as providing them knowledge and a technical platform to conduct Internet marketing. These activities are intended to enable the LBCs to become more active in supporting Siberian SMEs, thereby attracting investment and promoting economic growth in the region.

Specific project activities included:

- web site design and development
- two workshops for representatives of LBCs and other SME support service organizations
- registration of the SibDev web site on search engines
- an international workshop, "Information and Communication Technologies for Small and Medium Enterprises in Siberia," for Siberian regional governments, NGOs, and private companies. The workshop was organized in partnership with the Global Development Learning Network (www.gdln.org), the Kemerovo regional administration, and the private company Sibirtelecom.
- specific support to potential investors in identifying suitable partners and liaising with government agencies and regional authorities

The project has been monitored using a number of methods, including questionnaires, interviews, onsite visits, and web site statistics.

Impact/Results

- Twenty (20) databases have been created, including databases for investment proposals, local business centers, and marketing web sites
- 88 people representing local business centers, SMEs, banks, and ICT companies across Siberia attended the international workshop
- Two video conference sessions connected sites in Kemerovo, Moscow, St. Petersburg, and Washington, DC, during the workshop, enabling participants to discuss issues related to small business development with specialists from the World Bank, the IFC, *infoDev*, and several Russian business support agencies
- A project toolkit, "Attracting Investments and Promoting Products by Using the Internet," was produced and disseminated via project events and the web site
- Training workshops were provided to LBCs in 13 regional cities, three more than originally planned.
- More than 30 people responsible for small and medium enterprises (SME) were trained to provide ICT support in their areas.
- The project contributed to policy decisions that are important for SMEs and ICT development in Siberia. One regional government, for example, has adopted a regional ICT development strategy with particular emphasis on SMEs; it also decided to conduct an e-readiness assessment.

Key Issues

Partnership

SibDev has close relations with local governments, state institutions, non-governmental organizations, and businesses that enable it to attract specialist support for various SMEs. Partnership relations with key regional stakeholders helped SibDev to organize the workshops with fewer resources and achieve workshop goals more efficiently.

In addition, by working with local organizations involved in SME development, SibDev has developed communication channels, a series of databases, and the opportunity to obtain local economic and investment information. SibDev makes sure that prospective investors can access up-to-date information on site and/or building availability, potential partners, and labor market conditions.

Target groups

Small- and medium-scale entrepreneurs in Siberia are the main beneficiary group. It is hoped that by promoting investment and enabling marketing opportunities, beneficiaries will be able to reach the national and international investment community.

Capacity building

Established contacts with regional universities (Kemerovo State University and the Russian State Trade and Economic University) helped SibDev attract new, young staff to provide ICT expertise. The workshops, toolkit, and web site support have increased the ability of SMEs within Siberia to promote new investment opportunities and develop their markets.

Technology

The SibDev web site was programmed using a wide range of software. MySQL server software was used for data management and processing because of its fast and flexible database management system. Linux was chosen as the basic operating system. Web interface development was developed using an Apache web server, PHP programming, and HTML document mark-up languages. The usage of Linux, Apache, and PHP was effective in developing the web site because all three are powerful, flexible software products with wide-spread availability. Two ISDN connections were provided for videoconferences during the international workshop.

Finance

The cost of supporting and developing the SibDev web site is comparable to that of any similar web site. It was estimated that the cost would be approximately US\$9,000 per year (including advertising and promotion, hosting, personnel, and communications costs). To become sustainable, it is proposed to generate revenue by charging for services, particularly for the placement of investment proposals, creation of marketing web sites, and advertising on the SibDev web site.

Beneficiary Story

Eugene Anikin, Director of KRK Ltd., a furniture production company, highlights the impact of working with SibDev:

“In 1994, we began to work in the Kemerovo regional market. However, we faced a major problem finding the

TABLE 2: ACTUAL BUDGET (US\$)

	Total	infoDev	In kind
Business plan	5,800	4,300	1,500
Web site development	21,410	18,210	3,200
Database	7,130	6,100	1,030
Training workshops and toolkit	18,850	14,330	4,520
Promotion activities, incl. workshop	18,447	16,300	2,147
Miscellaneous (incl. audit)	10,600	8,400	2,200
Total	82,237	67,640	14,597

financial resources necessary to buy equipment. In Russia, all banks have different loan terms and they are very suspicious of SMEs, with which they have never worked. Our company then applied to the State Business Support Fund. Unfortunately, at that moment, the Fund had a lack of financial resources. . .[s]o our business project document ‘got dusty in the corner.’ After taking part in the training workshop conducted by SibDev, our company decided to promote the project over the Internet. With help from the State Business Support Fund, we prepared our business project document in accordance with the SIPE system requirements. A week later it was entered into the SIPE system. The system, in turn, simultaneously transferred our project to all regional banks. As a result, we have received several concrete proposals from regional banks and are in the process of loan negotiations.”

Issues and Lessons

Challenges

- One of the main problems of the project has been the need to rapidly enter investment proposals into the SME database in order to make the database attractive to potential investors. Although SibDev created a special content management system to enable SMEs to independently upload investment proposals, the pace of gathering proposals through the system remains insufficient.
- Regional workshops in Novokuznetsk and Kemerovo, as well as consultations with key stakeholders in small business development, made SibDev aware that a great number of investment proposals submitted to Local Business Centers were not being actively

promoted. SibDev reprogrammed its databases and developed a content management system to enable LBCs to upload information as well. This “active” system increased the volume of investment proposals on the site and enabled LBCs to send investment proposals directly to investors via e-mail.

- The international promotion of the web site has been slow due to insufficient development of the English-language databases (fewer high-quality investment proposals are developed in English than in Russian). A database of investment companies is also being developed in English.

Key factors/issues which led to poverty

reduction outcomes

- The development of a unified investment proposals database (SIPE) allowed the SibDev team to digitize and classify regional SME investment proposals. This capability is expected to increase SME chances of finding investors and, in turn, create jobs.
- The creation of SME and LBC web sites on the SibDev server are expected to increase revenues and stimulate economic activity in the region.

Future outlook

- The SibDev project has primarily focused on the 13 regions that make up the Siberian Federal District. However, the distribution of SMEs across Siberia is

very uneven and SibDev decided that, upon conclusion of the *infoDev* grant, it will focus on the large regions that have a significant number of SMEs. SibDev believes this strategy will allow it to rapidly generate a number of investment proposals and SME marketing web sites. The SibDev web site should then become sustainable, enabling the project to expand once again to other regions of Siberia.

- To increase the number of registered users (LBCs, SMEs, investors, etc.), the web site needs to become more effective in achieving its goals, i.e., SibDev needs to increase commercial exploitation of the site.
- The experience gained at regional workshops showed that many NGOs could effectively reach local SMEs and promote the project through their own channels. In the future, SibDev will target these kinds of organizations.

Stakeholder consultation

- SibDev Proposal for *infoDev*, May 2001
- SibDev Grant Agreement with *infoDev*, June 2002
- Third Quarter Report 2002 for *infoDev*
- Final Project Report for *infoDev*, July 2003
- SibDev web site, www.sibdev.net
- Communication with Denis Bagaev, August 2003
- *infoDev* Task Manager, Mikhail Bunchuk



SITA (India) www.kcetv.org/sitaa/sitaa.html

*Computer and Information Technology
Training for Low-income Women in India*

Abstract

During 1991–2001, Project SITA (Studies in Information Technology Applications) trained over 500 low-income women from north Delhi in basic computing with the aim of finding them work in local businesses. SITA estimates that as of July 2003, some 70 trainees were directly using their computer skills in paid employment. However, the project underestimated the significant gender barriers faced by low-income women on the job market. This shortcoming was partially addressed by modifying the project to include work placements, thus giving trainees direct experience in local businesses. Although Project SITA has now ended, a number of staff are involved in a new women's e-cooperative, MitraMandal, which continues to train local low-income women and hopes to sell their services to local businesses on a cooperative basis.

Background

Studies in Information Technology Applications (SITA) first approached *infoDev* for funding in 1996. The core project idea was to enable low-income women to take advantage of the then current information technology (IT) boom in India. The funding contract was finalized in November 1999 and the project was implemented from July 1999 through December 2000 in three six-month phases.

SITA first partnered with an international NGO, the Committee of Science and Technology for Developing Countries (COSTED), based in Chennai. In late 2000, logistical considerations prompted SITA to seek a one-year extension from *infoDev* and permission to replace COSTED with Khalsa College of Delhi University. Khalsa College enabled the project to focus on sustainability by conducting field trials, trainee surveys, and identifying venues for internships.

The aim of the 18-month project (with an additional 12-month extension) was to empower low-income women from Delhi and Haryana by providing them computer training customized to local business needs. The average cost of a basic computer course, offered mostly by private companies within India, often makes such courses inaccessible to women, especially those with low incomes.

The Indian Department of Electronics had predicted that there would be more than 745,000 vacancies available for computer-trained women by the end of 2000, and estimated an employee shortfall of 700,000. SITA responded to this need for IT workers. Using up to 13 local trainers, the project trained a total of 589 women in two centers (Delhi and Haryana), with 507 completing courses in basic computing, keyboard and mouse skills, and MS Word. At the end of its first year, SITA was chosen as a finalist at the Stockholm Challenge Award 2000 ICT competition. After the pilot project ended, SITA intended to train large numbers of women in IT applications across India.

Training was provided to women free of charge. The criterion for participation was total household income of less than 2,500 rupees (US\$60) a month. Approxi-

mately half of the women selected for training were widowed or divorced, and half were unmarried single women. Some 100 participants were selected by the Delhi Police Family Welfare Society.

SITA developed its own interactive software modules for basic keyboard and mouse skills training, together with other course content, including a basic introduction to computers and to MS Word, Excel, and Power Point. Each trainee was offered four 12-hour modules of training (a total of 48 hours over two months). The project emphasized hands-on training, with each trainee having access to her own dedicated personal computer (PC) during the training. SITA purchased 20 personal computers (both new and second-hand) and used different machines for different stages of the training. This proved to be very cost-effective. The project determined that it required only a small number (5) of higher-specification (Pentium 2) machines, enabling it to buy a greater number of cheaper machines (286, 386, and 486 PCs).

After each course, students were evaluated, given a certificate, and, where possible, placed within an organization. A resource package of print, audio, video, and multimedia materials was also produced and given to each student. For a variety of reasons, including a sharp downturn in the India IT market in 2000, women trainees found it difficult to find or retain local work which used their new skills. The project underestimated the considerable barriers facing low-income women on the local business market, trusting that job-oriented IT training alone would be enough to open the doors to employment. This proved untrue and had a progressive demoralizing impact on the project, which came close to collapse in December 2000. In the end, SITA began to set up internships that provided trainees work experience with local organizations.

As of July 2003, informal estimates indicate that of the 400 trainees currently known to SITA, approximately 200 are currently tutoring secondary school students and have included some of their computer training in these tutorials. About 100 former trainees are doing more advanced courses in Web usage, graphic design, and desktop publishing. An end-of-project evaluation was carried out by Professor Alfonso Molina of Edinburgh University.

Impact/Results

- 507 women completed the training course.
- Approximately 70 women are currently employed in jobs where they use some of their computer skills (e.g., in publishing and design agencies).
- At the end of the project, a small group of four women (including Head Instructor Kiran Arora) set up their own e-cooperative venture, MitraMandal.
- An estimated 200 women trainees now provide IT tutoring to students.

Key Issues

Partnership

Partnerships played a key role in the project, both in the crisis it faced and the success it managed to achieve. The project proposal was a combination of the ideas of Prita Chathoth and the late Dr. Kamalni Sane. Dr. Sane had previous personal experience training women in basic computer and desktop publishing skills. It was his intention to bring this experience to the project, but, unfortunately, he retired from his university post and moved to Delhi before the project contract was finalized.

SITA first partnered with COSTED to ensure technical capacity. However, the lack of a sufficiently detailed Memorandum of Agreement between COSTED and SITA almost closed the project due to a misunderstanding over finances and the resulting low morale of SITA staff. By contrast, the positive partnership forged between SITA, Khasal College, and the UN Pacific Center for Technology Transfer (UN APCTT, which collaborated on the internship program) enabled the project to continue and build the foundations of a future e-cooperative project.

Target groups

Low-income, socially disadvantaged poor women in the vicinity of Kingsway Camp, north Delhi, were the target group. Over 80 percent of the women trained (411) held a university degree; 96 had no university degree; 54 had completed O Levels and 42 had completed A Levels at secondary school. These levels of education appeared rather high when compared with the women's low income level (US\$2 per day). In his final evaluation, Professor Molina noted that most of the women's degrees were the result of correspondence courses, which did not have much value on the local labor

market. “The social background of the women did not help either, as most of them do not possess good... English and face difficult circumstances at home,” noted Molina.

Capacity building

Project SITA enhanced the capacity of low-income women in Delhi to find paid work in a number of ways: by giving them basic training in PC use and a number of locally marketable software products, and by giving them office experience via internships. As a result, a number of the women trained grew in self-confidence, enabling them to apply for jobs they would not have previously considered.

Technology

- 20 PCs (five Pentium 2s, four Pentium 1s, six 486s, three 386s, two 286s)
- 2 dot matrix printers
- 3 inkjet printers
- 1 b/w laser printer
- 1 Epson 1520 printer

Finance

Staffing (15 staff for 78 weeks)	US\$ 40,000
Travel	4,000
Technical equipment	25,000
Professional services	13,000
Miscellaneous	38,000

Total Project Cost	US\$ 220,000
<i>infoDev</i> funding	US\$ 120,000

Issues and Lessons

Challenges

- Lack of a written financial agreement and procedures between COSTED and SITA resulted in a misunderstanding that almost closed the project. This development forced SITA to find a new partner with which it concluded a clearer understanding at the very beginning.
- The disruption and disappointment caused by the financial difficulties in July–December 2000, in addition to the inability of women trainees to find jobs quickly, resulted in the gradual disintegration of the program. The initial lack of support from an institutional umbrella organization and the reloca-

tion of the project from India’s “Silicon Valley” to Delhi also contributed to this outcome. New partnerships with Khalsa College and friendly organizations such as UN APCTT, which provided internships, allowed the project to survive.

- Effective IT training alone did not enable women from disadvantaged backgrounds to find jobs. Indeed, SITA’s experience showed that providing IT training alone may do more harm than good because it generates frustration when expectations are not fulfilled. Any future such program needs to include some kind of training in small business skills, income-generating schemes, and English.
- Gender and traditional values often prevent women from finding immediate employment. The women in this project were generally from the lower economic strata of India and from different castes and faiths (e.g., Hindu, Muslim, Sikh, and Christian). Social expectations resulted in a number of women being unable to take jobs due to household needs and an unwillingness to accept jobs outside of their neighborhoods.

Key factors/issues which led to poverty reduction outcomes

- The realization that the training program needed to facilitate an internship program, thus providing women the experience needed to find permanent jobs.
- In the second half of the project, a key success factor was the support received by the partner organizations, which increased SITA’s capacity to meet its goal.
- “The large majority of SITA trainees clearly had no difficulty to complete the training course and obtained their certificates. This was the result of a good combination between the quality of the course and the quality of the trainees.”—Dr. Molina

Future outlook

- As a result of the SITA project, the e-cooperative MitraMandal is proposing to address the issue of income-generating schemes in partnership with UN APCTT. As soon as women reach a minimum skill level, they will be able to join MitraMandal. The cooperative will have three parts: a management wing, a training wing, and an earning wing.

Stakeholder consultation

- Grant Agreement with *infoDev*, June 1999
- SITA, Final Report for *infoDev*, 2002
- A. Molina, "Assessment of Project SITA" (Scotland: School of Management, University of Edinburgh, June 2002)
- Stockholm Challenge Award Description, 2000, www.challenge.stockholm.se
- U. Emtrevall and M. Lingefelt, *SITA: Women empowerment through information technology* (Sweden: School of Education and Communication, Jonkoping University, 2001)
- Interviews carried out by Mike Webb with:
 - Dr. Krishna Sane, Director of SITA, July 2003
 - Brajesh Verma, IT Consultant and SITA Technical Supervisor, July 2003
 - Kiran Arora, SITA Head Instructor, July 2003
 - Anjali Puri, former trainee, now employed in a Delhi design agency, July 2003
- *infoDev* Task Manager, Prita Chathoth



Voxiva (Peru) www.voxiva.net

A Voice Portal for Health

Abstract

Voxiva, a private social venture, is committed to extending the benefits of information technology beyond the digital divide. At the request of local health officials in Latin America, the company explored ways to use existing telecommunications infrastructure to strengthen disease and disaster surveillance and response. Their product, ALERTA, is a disease surveillance application that enables health professionals in rural areas to use a telephone or the Web to submit reports to health care authorities. This information is then entered into a computer system that allows national health authorities to keep track of disease outbreaks nationwide in a timely manner and, based on this data, generate automatic alerts to health staff.

In addition, the ALERTA system also enables rural health professionals to receive information and help through voice mail, again via a local telephone. To date, the product has been piloted in 76 health facilities in two localities of Peru: the Cañete-Yauyos zone (approximately 140 kilometers south of Lima) and the Chilca-Mala zone (approximately 80 kilometers south of Lima).

Background

Voxiva is an international for-profit organization set up in 2001 to provide voice and data solutions to the public health sector. Its shared application platform, ALERTA, enables both the collection of data from

health workers on the ground and interaction between health workers across countries. Its functions include accessing reports, current health trends, and emergency notifications either by telephone or through the Internet. Peru was chosen to pilot the system due to its rural telecom expansion and commitment to public health. The Peruvian Ministry of Health also wanted to update its present disease surveillance system.

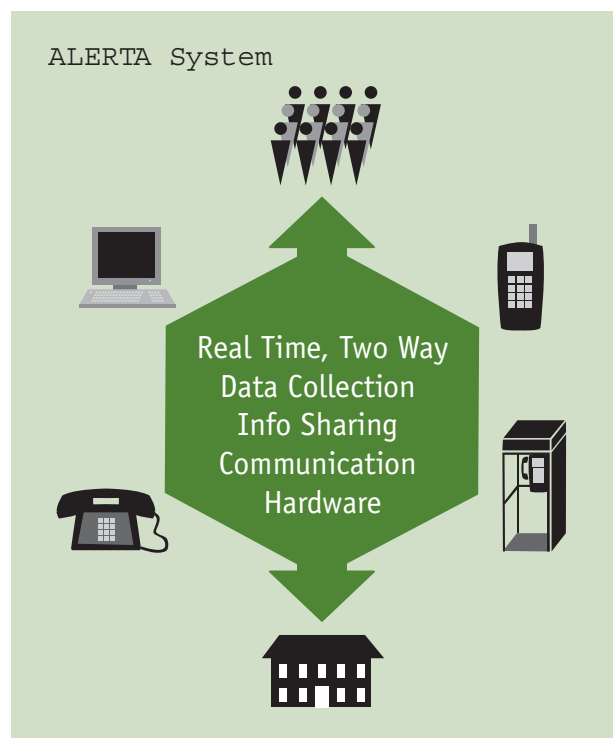
At present, there are 6,000 health centers across Peru, each of which is required to report cases of certain diseases (e.g. cholera, dengue, malaria, polio) to the Ministry of Health, so that the latter may investigate and take necessary action. However, the country's current system is mainly paper-based, with computers at the top end of the health service. It can take up to three weeks before information is received by the Ministry. Beyond the challenges of reporting disease, the health system also faces the problem of providing feedback to remote health workers. More than 90 percent of users of the paper system reported that they receive health reports "never," "rarely," or "less than once a month."

Voxiva started work in Peru in March 2002 with the objective of improving the speed and reach of communications between health professionals and health organizations, thereby enabling the country to respond faster to health emergencies. There was to be no investment in new hardware and the reporting and communication process would be designed to strengthen maternal health, immunization, and other health programs. Voxiva created the ALERTA platform on the basis of existing telephone lines and Internet servers. The use of the existing telephone network makes the system far more accessible than one solely reliant on the Internet.

Voxiva trained a number of health personnel to use the system, including how to administer user and group accounts, submit reports, and retrieve voice mail. These health workers are now able to make free phone calls to report disease and share health information. To date, the project has trained 149 users and counterparts in 76 health facilities across the regions of Canete-Yauyos and Chilca-Mala. Local systems administrators in three health offices and one regional office of the Ministry of Health have also been trained. Voxiva and the Ministry have been monitoring the project by collecting suggestions for improving the system. A team from the Economics Faculty of San Marcos University is now carrying out an external project evaluation.

Impact/Results

- Currently, 76 health facilities have been connected to the voice portal. These facilities have collectively submitted 4,269 reports and 28,296 cases.
- Results to date indicate that real-time electronic disease and disaster reporting is feasible even in communities with access only to a community pay phone.
- During a recent Green Alert after flooding, health workers were able to submit reports on a daily basis to the Ministry of Health.



- Designated health authorities have received immediate notifications of suspected cholera, Bartonellosis (a vector-borne disease of the Andean region), other diseases, and local disasters. Health officials have been able to quickly learn about cases of disease and can respond in a matter of hours and days instead of weeks. They have also been able to easily send feedback and guidance to health workers in remote areas.
- Voxiva Peru has now extended its services to aid crime reporting by citizens in Lima and to help bank customers access balances and check bill payments by phone.

Key Issues

Partnership

A key requirement of this project was the partnership between the Peruvian Ministry of Health and local health officials. The project worked with them to help strengthen the service they provide to rural areas through improved information flows, thus gaining their support and cooperation.

Target groups

The main target group was comprised of the health facilities (76) and health workers (204 doctors, nurses, technicians, and other health personnel) of two geographic zones south of Lima. These zones comprise over 200,000 habitants and 49 districts.

Capacity building

The service is designed to increase the capacity of health staff across Peru by providing a speedier procedure to report to and obtain information from the national health service. Technology training proved necessary even for applications where previous knowledge was often taken for granted. Few users, for example, had used the Internet or voice mail at the start of the project.

Technology

At present, Internet access is very limited outside of large urban areas in Peru. The cost of connecting to the Internet is, moreover, a significant barrier in a country with current per capita GDP of US\$2,130. Therefore, the project principally used telephone access to the ALERTA platform. To use the service, health workers either dial a free phone number connected to a secure server, or

enter information over the Internet. After entering a personal account number and password by phone; they can choose from the following service options: collect voice mail, send reports and data collection results, make simple transactions, retrieve data and reports from a database, access pre-recorded information from a library, or connect to an operator.

Reports are submitted in real time, allowing health authorities to monitor the national health situation through workstations connected to the system. This facility hosts the ALERTA shared application platform. Technology at the offices of Voxiva Peru includes computers with Internet access and a telephone. The web, database, and telephony servers are housed at a secure hosting center of Telefonica del Peru.

Finance

Voxiva began with a general start-up grant of US\$500,000 from the Markle Foundation of the USA. Grants specifically for the Peruvian project included US\$250,000 from *infoDev* and in-kind support from the Peruvian government and Voxiva. User groups do not pay to access Voxiva services, as these services are considered part of the resources available to health workers.

ALERTA in Action

On August 24, 2002, the first suspected case of measles in 2002 was reported in San Vicente (Cañete-Yauyos), via ALERTA as well as the paper-based system of the Peruvian Ministry of Health. The ALERTA notification instantly reached the Cañete-Yauyos health office and a number of health officials' cell phones. The paper-based notification reached only one Cañete-Yauyos office. In addition, the electronic message reached the Program Director in the neighboring Chilca-Mala health center.

The ALERTA messages were received on cell phones around 3:30 pm, a time when administrative health offices are closed. The message allowed officials to coordinate actions and encourage personnel to complete an investigation into the suspected case according to national procedures of the Ministry of Health, which include blood sampling. In addition, the Program Director of the Chilca-Mala health center coordi-

nated actions to verify the report to prevent any possible dissemination of the disease along the highway that connects San Vicente to Chilca-Mala.

Quotes from users

- "The benefit of Voxiva for our healthcare institutions has been, principally, the possibility to communicate serious cases in a rapid and timely manner." —Leonor Raman Cuya, Health Technician, Mala Health Post
- "The Voxiva system is saving me lots of time for improving quality and decreasing the hours spent on process...time, which for me, is valuable." —Cesar Falconi, ALERTA Administrator, Chilca Mala District
- "We can see the information instantaneously. Now everyone is informed about a case and the disease and the appropriate measures can be taken. It is truly an important benefit. It could help eradicate diseases." —Dr. Jaime Levano, Cañete, Peru

Issues and Lessons

Challenges

- The lack of telephones in some communities remains a major constraint to the ALERTA system. In a few of these areas, health facilities are using radios to transmit data. However, the major telecom carrier in the country now recognizes that this non-conventional health "traffic" could become a sustainable way to support the rural telephony network.
- Rather than introduce new technology, the major challenge has been to design a system that works with the current organizational structure and work flows of the health system. This proved especially difficult in light of the high personnel turnover at all levels of government, which required the project to seek new "champions" and orient new participants even during the very short project period.

Key factors/issues which led to poverty reduction outcomes

- The project demonstrated the significance of rural telecommunications for strengthening disease and disaster surveillance and response, even in remote areas such as the Andes. For example, telephone

access resulted in 4,269 reports, with 28,296 cases being submitted electronically from just one general area. Using the telephone to both give and obtain information could also prove beneficial to other sectors, such as education, justice, and agriculture.

- The recognition that it is possible to achieve access to accurate, real-time information by combining the Internet and the telephone in a unified application. The system also increased accountability and transparency within the health service.
- The project revealed the need for training and a flexible time frame, even for extremely simple ICT applications. Initial users were, for example, slow to make use of voice mail, in part because people were not used to the application. Some users were also concerned about the security of messages.
- Another key factor for success was the role of a strong champion who could guide the project and help articulate its benefits to people who could not immediately understand the benefits of ICT.
- Policy obstacles were avoided because the project partnered with the Ministry of Health of Peru.

Future outlook

- The project has been asked to expand its coverage from 76 to 188 additional health facilities in two areas: Lurin-Pachacamac-Pucusana and Barranco-Chorillos-Surco. The first of these areas is predominantly rural and the second, predominantly urban. The request is dependent on the results of the external evaluation currently underway, as well as the development of a sustainability plan acceptable to the Peruvian Ministry of Health. In addition, the same technology and approach is now being used by doctors in the Peruvian Navy in areas along the Amazon. The Navy is planning to expand its deployment to all Naval medical facilities in Peru.
- Voxiva is now looking to partner with development institutions to expand the deployment of ALERTA to other countries for purposes of both health and education. Potential countries include Brazil, Rwanda, South Africa, and India.
- In the USA, the Food and Drug Administration is now testing the same system used in Peru to monitor the U.S. blood supply, and the Defense

Department is using the system to monitor its small pox vaccination program for military personnel. The system developed in Peru is also being introduced in San Diego County and Washington, D.C., to link school nurses with local health departments.

Stakeholder consultation

- "A Voice Portal for Health," Voxiva Proposal to *infoDev*, January 2001
- VOXIVA Grant Agreement with *infoDev*, October 2001
- Voxiva Second and Third Quarter Reports 2002 for *infoDev*
- Dr. Pamela Johnson and Dr. Juan Rodriguez, *Extending the Reach of the Internet to Support Health and Emergency Services* (Washington, DC: Voxiva, Inc.)
- Paul Meyer, "VOXIVA Creates New Application for Technology Serving Public Health," *Humanitarian Information Network E-Newsletter*, no. 2 (March 2003), published online at www.reliefweb.int/hin/hin2_more.htm
- K. Kinetz, "Profit? So Much the Better," *The International Herald Tribune*, June 22, 2002
- "Voxiva: The Power of the Internet, the Reach of the Phone," video excerpt from University of Michigan Business School Case Study, "Innovation at the Bottom of the Pyramid," produced by C. Casas and W. Lajoie, Spring 2003
- E-mail communication with Pamela Johnson, July–August 2003
- *infoDev* Task Manager, D. Cotlear

Case Study Analysis

It is important to note that few of the case studies examined in this paper conducted initial baseline surveys, monitored progress, or evaluated impact. While the project implementers did record details and filed adequate reports with *infoDev*, there was an absence of systematic impact assessment. In many of the cases, therefore, it is difficult to determine whether a change in the target group's poverty level was attributable to the project or to external factors.

The lack of systematic monitoring and impact assessment was rectified in late 2002, when these activities were made standard elements of all *infoDev*-funded projects. However, the new requirements did not apply to the majority of the case studies. Another factor that complicated the analysis was that, at the time of writing, a number of projects had not been in operation for a long period of time—in one case (Manobi), pilot services had been provided for only three months.

For details on the projects discussed in this section, readers are invited to refer to the full summaries in the previous section or to consult a two-page synopsis of all 17 case studies found in annex 2.

Functional Use of ICT in *infoDev* Projects

The rationale behind the use of ICT in the *infoDev* case studies mainly arose out of a desire to increase the capacity of local communities to find work, improve educational standards, influence government policy, or extend the reach of an existing project. ICT components or standalone ICT projects were initiated either through existing structures (e.g., involving local communities and key stakeholders, word-of-mouth advertising, or training) or by working with local authorities, communication networks, or business services.

In most projects, the technology chosen to process information and/or enhance communication was selected as the most appropriate intervention for a given situation. Implementation either proved the technology choice appropriate (e.g., Voxiva, Future Stations, Food, Cemina), or caused a change or expansion in the types of technologies selected (e.g., B2Bpricenow.com, Fantsuam, Rostropovich, SITA).

The function fulfilled by ICT in the 17 projects under examination fell into the five general categories, with some projects qualifying for more than one category:

- **Information technology (IT) training and telecenters:** Projects that provided poor individuals the opportunity to learn various computer skills and to access the Internet.
- **Networks and partnerships:** Projects that used ICT to enhance and/or build networks and partnerships to improve health care, expand the market reach of small- and medium-size enterprises (SMEs), facilitate the exchange of experiences and information among organizations, or develop and share educational resources.
- **E-commerce:** Projects that enabled users to, among other functions, develop online catalogues, create websites, buy or sell produce, and/or solicit funding.
- **E-services:** Projects that enabled users to gain access to market information through ICT (e.g., weather reports, daily sale and purchase prices, financial forecasts, investment opportunities) or to use ICT to exchange information, reports, and messages.
- **Radio and education:** Projects that used ICT to distribute educational and news content to radio stations, broadening educational opportunities and community awareness among poor villages and/or urban neighborhoods.

Contribution to the Millennium Development Goals

This subsection considers the case studies in light of the Millennium Development Goals (MDGs) for reducing poverty and creating sustainable development that were adopted by the member states of the United Nations at the Millennium Summit in September 2000. Subsequently reaffirmed by the World Summit on Sustainable Development in Johannesburg, South Africa, in 2002, a growing number of multilateral and bilateral development agencies have subscribed to these goals.

Table 1 summarizes the contributions of the *infoDev* case studies to the individual MDGs. The apparent impacts and results of the specific case study projects as they relate to the MDGs are discussed below, bearing in mind that the analysis was not based on rigorous monitoring and evaluation data.

Goal 1. Eradicate extreme poverty and hunger.

Target 1. Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day.

Target 2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

infoDev-funded projects contributed to this MDG by enabling target groups to increase either their incomes or their access to work. These results were generally achieved through IT training (Fantsuam, CDI, Rits/Sampa.org, Abantu) or providing target groups access to ICT-based business development networks (B2Bpricenow.com, PEOPlink, Manobi).

On the whole, the target groups of the 17 surveyed case studies were poor. It can be assumed that most project clients began their participation in the projects with incomes of one dollar a day or less. Rits/Sampa.org, CDI, and Future Stations all focused on the urban poor, while Fantsuam and Manobi addressed the rural poor. Two projects that focused on female target groups—FOOD and Abantu—reached the very poor, but a third such project (SITA) served marginalized and excluded women without necessarily reaching individuals who subsisted on less than one dollar a day.

In the case of FOOD, the project shows evidence of improved incomes. The project works with

TABLE 1. CONTRIBUTIONS OF *INFODEV* CASE STUDY PROJECTS TO THE MDGs

	Goal 1		Goal 2	Goal 3	Goals 4,5,6	Target 12	Goal 8	Target 18
	Target 1	Target 2					Target 16	
Abantu								
B2Bpricenow.com								
CDI								
Cemina								
Conexiones								
Fantsuam								
FOOD								
Future Stations								
Manobi								
OAS								
PEOPlink								
Rits/ Sampa.org								
Rostropovich								
Satellife								
SibDev								
SITA								
Voxiva								

Key: – direct contribution
 – indirect or interpreted contribution (e.g., increased information access, change of educational system, social mobilization)

TABLE 2. MDG 1 – ERADICATE EXTREME POVERTY AND HUNGER

<i>infoDev</i> Project	Contribution to MDG
Abantu (Kenya)	<ul style="list-style-type: none"> ■ Increased the incomes of (some) women's groups
B2Bpricenow.com (Philippines)	<ul style="list-style-type: none"> ■ Increased the ability of farmers and fishermen to sell their goods at higher prices ■ Created new marketing channels for farmers and fishermen
CDI (Brazil)	<ul style="list-style-type: none"> ■ Increased marketable skills of teenagers and young adults ■ Provided ICT and citizen's rights training to slum populations
Cemina (Brazil)	<ul style="list-style-type: none"> ■ Indirect: distributed information on economic opportunities for women
Conexiones (Colombia)	<ul style="list-style-type: none"> ■ Increased ICT and collaborative learning skills of schoolchildren
Fantsuam (Nigeria)	<ul style="list-style-type: none"> ■ Provided training in marketable ICT skills
FOOD (India)	<ul style="list-style-type: none"> ■ Enabled women to earn monthly profits of 500–2,000 rupees (US\$10–US\$40) for part-time work ■ Increased profit margins and sales volumes of women's marketing and production groups
Future Stations (Brazil)	<ul style="list-style-type: none"> ■ Generated employment, trained business managers ■ Provided ICT training and community services to slum populations
Manobi (Sénégal)	<ul style="list-style-type: none"> ■ Enabled fishermen to improve their sales and profit margins ■ Created safer working environment for fishermen
OAS (Latin America)	<ul style="list-style-type: none"> ■ Increased marketable skills of over 300 people with disabilities ■ Improved efficiency and capacity of NGOs that work with the disabled ■ Introduced adaptive technologies to allow the disabled to use ICTs
PEOPlink (worldwide)	<ul style="list-style-type: none"> ■ Helped artisan producers increase sales and (in a few cases) find new buyers ■ Generated significant tourist hotel bookings
Rits/ Sampa.org (Brazil)	<ul style="list-style-type: none"> ■ Increased marketable skills of teenagers and young adults ■ Provided ICT and community services to slum populations
Rostropovich (Russia)	<ul style="list-style-type: none"> ■ Not applicable, specialized health care project
Satellife (Kenya)	<ul style="list-style-type: none"> ■ Indirect: improved knowledge of health care professionals
SibDev (Russia)	<ul style="list-style-type: none"> ■ Potential to generate employment and incomes
SITA (India)	<ul style="list-style-type: none"> ■ Provided low-income women with ICT skills training
Voxiva (Peru)	<ul style="list-style-type: none"> ■ Indirect: lowered the poor's vulnerability to income shock by improving disease surveillance and response

approximately 300 groups, representing approximately 3,000–6,000 households. The average active member of FOOD earned a profit of between US\$0.20 to US\$1.30 per day, a sum that represented 10–15 percent of their respective household incomes. In many cases, these monies enabled clients to pay school fees for their children, enhancing the income-earning ability of future generations.

Table 2 reviews the contribution of each *infoDev* case study to the poverty reduction MDG.

Goal 2. Achieve universal primary education.

Only one of the *infoDev* case studies, Conexiones, dealt directly with primary education, and it focused on strengthening the pedagogical system. However, the main challenge of universal education is not so much a shortage of schools, but the combined effect of poverty (reducing the financial ability of households to pay school expenses and the corresponding need for children to generate income), culture (gender bias regarding the sex of children sent to school, as well as situation-specific circumstances of exclusion from education and/or employment), and the quality and relevance of educational services.

With respect to specific *infoDev* projects, FOOD reported that clients spent the majority of extra income generated by the project on school fees. A number of projects targeted women in order to address gender-specific needs or, in the case of Abantu, to effect gender-related redistribution. In the case of SITA, IT training enabled only some of the targeted women clients to secure employment. It became clear, however, that several participants planned to teach their children their newly learned IT skills. One participant, lacking the resources to pay school fees, introduced her children to educational computer programs available at the training center. While there are no direct reports on the impact of the Cemina radio project, there is every reason to believe that this gender education project contributed to the broader education of its target audience (poor women in Brazil).

With respect to the quality of education, Conexiones and CDI both worked with teachers to upgrade their skills. These projects place particular emphasis on non-didactic learning methods, such as group projects and

problem-solving. Although CDI works only with children of secondary school age, it is possible that the new teaching style could gain momentum and spread to the primary sector via teacher workshops and professional networking. In a different vein, Abantu helped to improve the quality of education in Kenya by challenging the linkage of ICT with science, causing the authorities to reconsider a tradition which creates gender barriers to learning ICT.

One indicator of the second MDG is to improve the literacy rate of 15–24 year olds. While the MDG principally seeks to support the primary school system with the aim of improving literacy, the current generation of 15–24 year olds in many developing countries suffers high rates of illiteracy. Although none of the *infoDev* case studies address literacy as a stated objective, many of the projects created alternative adult learning opportunities, particularly the various telecenters (Future Stations, CDI, Fantsuam) and training projects (Abantu, Cemina, OAS).

Goal 3. Promote gender equality and empower women.

Target 4. Eliminate gender disparity in primary and secondary education, preferably by 2005, and at all levels of education no later than 2015.

Target 10. Ratio of literate females to males of 15- to 24-year-olds.

Target 11. Ratio of women to men in wage employment in the non-agricultural sector

A number of the *infoDev* projects specifically focused on empowering women through ICT. These projects ranged from IT training centers in India and Nigeria, to a women's group Internet network across Africa, to equipping women artisans with cell phones to increase their marketing capabilities.

Goal 4. Reduce child mortality.

Goal 5. Improve maternal health.

Goal 6. Combat HIV/AIDS, malaria, and other diseases.

The above goals have been consolidated because they all address issues of health. Lack of specific health-related data for the *infoDev* projects, however, makes it difficult to analyze their contribution to these MDGs.

TABLE 3. MDG 3 – PROMOTE GENDER EQUALITY AND EMPOWER WOMEN

<i>infoDev</i> project	Contribution to MDG
Abantu (Kenya)	<ul style="list-style-type: none"> Produced a critical framework for ICT education and its gender ramifications Specifically trained women's groups
B2Bpricenow.com (Philippines)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicator 11
CDI (Brazil)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicators 10 and 11
Cemina (Brazil)	<ul style="list-style-type: none"> In an area known for child labor, Cemina developed a telecenter for local youth, regardless of gender, to receive ICT training. Nevertheless, the program does have a particular focus on empowering women. To date, some 1,500 women throughout Brazil have been trained in radio production at the telecenters
Conexiones (Colombia)	<ul style="list-style-type: none"> Links university students to schools to increase the capacity of schools to develop the ICT skills of schoolchildren; potentially helpful to indicators 9, 10, and 11
Fantsuam (Nigeria)	<ul style="list-style-type: none"> 50% of all trainees were women
FOOD (India)	<ul style="list-style-type: none"> Enabled women to gain access to new markets through a mobile phone network that would have otherwise been closed to them due to social constraints
Future Stations (Brazil)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicator 11
Manobi (Sénégal)	<ul style="list-style-type: none"> Not applicable; fishing is primarily a male domain
OAS (Latin America)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicator 11
PEOPlink (worldwide)	<ul style="list-style-type: none"> Many trade producers target low-income artisans—predominantly women—and will pay “fair” rates of pay, directly affecting the livelihoods of women and that of their families
Rits/ Sampa.org (Brazil)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicator 11
Rostropovich (Russia)	<ul style="list-style-type: none"> not applicable
Satellife (Kenya)	<ul style="list-style-type: none"> not applicable
SibDev (Russia)	<ul style="list-style-type: none"> Gender neutral – services available to all; potentially helpful to indicator 11
SITA (India)	<ul style="list-style-type: none"> Focused on training women in ICT skills in order to increase their ability to find jobs in the commercial sector
Voxiva (Peru)	<ul style="list-style-type: none"> not applicable

Absence of health data can be attributed to a general lack of understanding of the fact that ICT-related projects require monitoring and evaluation, as well as the comparative newness of several projects and the abundance of external factors that affected their impact.

Nevertheless, several *infoDev* case studies that focused on health appeared to have positively contributed to the health-related MDGs. Voxiva, for example, strengthened the health system in two districts of Peru through an improved disease reporting system. The project offers a model that can be replicated in other countries, with the potential to reduce child mortality and improve maternal health. Voxiva specifically enabled a faster response to a measles outbreak in one Peruvian district, thus reducing the impact of the disease (indicator 15 of goal 4).

Although not directly related to the above MDGs, several other *infoDev* projects can be viewed as making indirect contributions to improved child mortality, maternal

health, and combating pandemics. Satellife HealthNet and Fantsuam focused on training health workers in ICT-related skills, which can be viewed as strengthening the capacity of the health care system as a whole. Rostropovich, on the other hand, enhanced the capacity of the Russian health system near St. Petersburg to deal with children's cancer cases, and is already being replicated for other caregivers in northwestern Russia.

Goal 7. Ensure environmental sustainability.

None of the *infoDev* case studies specifically addressed environmental concerns.

Goal 8. Develop a global partnership for development.

Target 12: Develop further an open, rule-based, predictable, non-discriminatory trading and financial system.
Target 16: In cooperation with developing countries,

develop and implement strategies for decent and productive work for youth.

Target 45: Unemployment rate of 15- to 24-year-olds.

Target 18: In cooperation with the private sector, make available the benefits of new technologies, especially information and communications.

Target 12: Although this target primarily addresses international trade, local and national discriminatory trade practices also need to be addressed. A number of *infoDev* projects worked to create a level playing field between producers and buyers by creating information networks on the basis of the Internet and mobile phones (B2Bpricenow.com, Manobi, PEOPlink). For B2Bpricenow and Manobi, the goal is to enable producers to ascertain the daily going market price, thereby increasing their bargaining powers with middlemen and other buyers. The PEOPlink project endeavored to link businesses and consumers around the world in order to increase the market reach of craft producers.

Targets 16 and 45: By targeting youth through ICT training in secondary schools and providing schools the resources needed to incorporate ICT into existing curricula, many *infoDev* projects (CDI, Conexiones, Future Stations, Fantsuam, Rits/ Sampa.org, OAS) equipped youth with the ICT skills in demand in the employment marketplace today. Projects that enhanced the supply chain (PEOPlink, B2Bpricenow.com, Manobi) can also be seen as “implementing strategies for decent and productive work.”

Target 18: This target includes specific goals for telephone lines and personal computers per 1,000 people. However, a mismatch appears to exist between the target and the indicators used to measure its achievement, given that the target aims to make available the **benefits** of new technologies to developing countries, not necessarily the technologies per se. While the indicators are easily measurable, they are limited to the technologies (in this case, telephone lines and personal computers), and therefore mask the way in which new technologies are appropriated in developing nations.

Fantsuam, for example, has been able to provide telephone and computer access, as well as IT training, to

the local populace in the southern Kaduna area of Nigeria on the basis of one satellite phone and computer in its telecenters. These services were previously unavailable in the area and, while one satellite phone would hardly count as **significant** progress towards the MDG target 18 of increased phone lines per 1,000 people, the single phone has clearly made available the **benefits** of the new technology to entire communities. In fact, Fantsuam found that local residents were willing to pay more than US\$2 per minute for a satellite phone call that would help their families, allowing its satellite phone setup to become a sustainable business.

A recent DFID study prepared by Gamos (McKemey et al 2003¹) shows that even where telephone density and frequency of use are low, the actual use of telephones on an infrequent basis is extraordinarily high in several countries of Africa. One impressive statistic cited by the paper was that 86 percent of people surveyed had used a telephone in the previous three months in Ghana, Uganda, and Botswana. This is a simple yet remarkable statistic because the survey sample was balanced between rural and urban areas and between good, medium, poor, and **no coverage** zones. Interviews confirmed that people were prepared to travel from zones with no telephone coverage to nearby covered zones in order to make telephone calls.

What is the principal purpose of such infrequent telephone use? The study distinguishes between calls to friends and family “to chat” and calls to discuss remittances. This first purpose constituted the single greatest reason for phone use, with calls to discuss remittances a close second. The use of phones for remittances is supported by anecdotal data from the Fantsuam project. Qualitative data from the study suggests that the majority of telephone calls made in the three countries concerned “cash flow,” that is, the timing of a remittance.

The results of the Fantsuam project suggest that, in general, people who make telephone calls receive more money than they would without the ability to place calls. Given the World Bank calculation that US\$71 billion is transferred annually in remittances worldwide—

1 K. McKemey, N. Scott, D. Souter, T. Afullo, R. Kibombo, and O. Sakyi Dawson, *Innovative Demand Models for Telecommunication Services, Final Technical Report* (London: U.K. Department for International Development, 2003). Available at www.teleafrica.org.

TABLE 4. MDG 8 – DEVELOP A GLOBAL PARTNERSHIP FOR DEVELOPMENT

infoDev Project	Contribution to MDG
Abantu (Kenya)	<ul style="list-style-type: none"> ■ Trained a group of coffee factory workers in software and Internet applications for use in the workplace ■ Engaged the government and private sector in dialogue about gender issues
B2Bpricenow.com (Philippines)	<ul style="list-style-type: none"> ■ Enabled farmers and fishermen to obtain access to real-time prices of produce via the Internet and mobile phones, increasing their bargaining and purchasing power ■ Project collaborated with the Philippine Rural Reconstruction Movement (an NGO), the Land Bank of the Philippines, and the technology company Unisys to make the e-service and e-commerce website available to fishermen and farmer cooperatives
CDI (Brazil)	<ul style="list-style-type: none"> ■ Received funding from a number of private sector trusts to make Information Technology and Citizens' Rights Schools available to low-income communities ■ Over 350,000 children have attended over 770 ICT schools since the project began, laying the foundation for professional skills
Cemina (Brazil)	<ul style="list-style-type: none"> ■ Received funding from a number of private sector trusts to increase the volume of radio programming available for distribution to rural community radio stations
Conexiones (Colombia)	<ul style="list-style-type: none"> ■ Worked with schools to increase their ability to integrate ICT into existing school curricula, raising the skill base of both teachers and students ■ Facilitated technical support to schools, as well as funding from universities and private sector organizations, to increase the reach and content of the project
Fantsuam (Nigeria)	<ul style="list-style-type: none"> ■ Received support from a number of institutions (both public and private) from around the world to increase the capacity of the project's health and education telecenters
FOOD (India)	<ul style="list-style-type: none"> ■ Partners within India have provided support for this project
Future Stations (Brazil)	<ul style="list-style-type: none"> ■ Over 60,000 elementary and high school diplomas have been generated through Viva Rio/Future Stations, increasing the marketable skills of the students ■ Received funding and support from a number of national and international organizations and institutions
Manobi (Sénégal)	<ul style="list-style-type: none"> ■ Provided fishermen and buyers with access to real-time data on market prices and catch levels, improving their bargaining power ■ Manobi, an international telecommunications company, worked with local fishing unions, international institutions, and local telecommunications companies to provide the e-service
OAS (Latin America)	<ul style="list-style-type: none"> ■ Worked across four countries in Central America to link mainly regional ICT consultants to local organizations that work with the disabled
PEOPlink (worldwide)	<ul style="list-style-type: none"> ■ Catgen System enabled local artisans to expand into overseas markets via the Internet; many artisans are members of the International Federation for Alternative Trade
Rits / Sampa.org (Brazil)	<ul style="list-style-type: none"> ■ Produced recommended guidelines for inclusion of the poor in ICT policies at the federal level ■ Extended the reach of ICTs to low-income communities in partnership with local organizations ■ Monetary support and support in kind provided by a number of national and international organizations and institutions, including the International Development Research Center and the Ford Foundation
Rostropovich (Russia)	<ul style="list-style-type: none"> ■ Increased the ability of Russian cancer specialists to access the Internet and other technologies to link them to other cancer treatment centers worldwide ■ Linked health professionals from around the world to national staff in order to improve the care of children living with cancer in St. Petersburg
Satellife (Kenya)	<ul style="list-style-type: none"> ■ Via one participant in the Satellife training course, a training program was begun at the Medical School of the University of Uganda which to date has trained over 100 medical personnel in basic Internet skills
SibDev (Russia)	<ul style="list-style-type: none"> ■ Contributed to policy decisions important for SMEs and the development of ICT in Siberia ■ Created 20 databases on business development and investment opportunities in Siberia, attempting to narrow the divide between regional and international investors and local SMEs
SITA (India)	<ul style="list-style-type: none"> ■ Partnered with a number of local, national, and international institutions to provide ICT training for low-income women
Voxiva (Peru)	<ul style="list-style-type: none"> ■ Partnered with the Peruvian Ministry of Health, a local telecommunications company (Fundacion Telefonica), and the Markle Foundation to provide a disease surveillance reporting service to local health professionals

more than the entire official development assistance budget of the North for the South—it is possible to infer that phones are used in developing countries with low telephone densities, even if infrequently, to secure significant financial **benefits** (remittances) for end users.

Another significant benefit provided by *infoDev* ICT projects that is not captured by telephone or computer density indicators is the way in which these projects broaden the reach and/or utility of existing ICT infrastructure. These enhancements are real, despite such difficulties as poor-quality networks, intermittent electricity, and old equipment. Voxiva, for example, worked with the national health service of Peru to provide healthcare staff with an information and e-service network, all on the basis of existing phone lines. Although the network has been in operation only one-and-a-half years, the Ministry of Health has already used it to avert a disaster following severe flooding. Health professionals have used the network to submit daily reports to the health service, enabling the government to respond quickly to any threat of widespread disease. The benefits of the telephone technology were thus significantly enhanced, even if the number of phone lines remained unchanged.

If the *infoDev* case studies are examined through the wider lens of the eighth MDG (“Develop a Global Partnership for Development”), it is evident that the ICT projects all formed partnerships that helped make available the benefits of new technologies, even if these benefits cannot be measured by the indicators prescribed by Target 18.

Projects by Sector

A sectoral breakdown offers another way to analyze the *infoDev* case studies, demonstrating the variety of ways in which ICT is applied to poverty reduction interventions. The projects examined here fall into several development sectors:

- **Education and training:** Projects in this area tended to focus either on IT training or on telecenters that offered Internet access and computer instruction. These projects can be further disaggregated among projects that targeted young people (Future

Stations, Conexiones), those that targeted adults (Fantsuam, Satellife), and those that focused on specific sectors or themes (Satellife, Abantu). Other projects challenged the status quo in existing educational systems by introducing a non-didactic pedagogy (CDI) or upgrading teaching skills in schools (Conexiones).

- **Social development:** In general, most *infoDev* projects shared a common thread of bringing poor residents of developing countries together and helping them to find new ways to identify and solve their problems. Social mobilization was at the heart of several case studies (Rits/ Sampa.org, FOOD, Cemina, CDI, Conexiones), with ICT forums offering opportunities for new kinds of dialogue. FOOD used women’s groups as a launching point for marketing training. CDI used ICT to create discussion groups on citizenship and problem solving. Abantu’s gender awareness project resulted in the empowerment of a Maasai women’s group, which successfully secured USAID funding for a beekeeping project.

- **Enabling environments – policy and regulatory frameworks:** Although none of the case studies specifically focused on creating enabling environments, a few have positively impacted local and national policies. Abantu, for example, held workshops and seminars to promote gender awareness and a gender-sensitive approach to ICT. Subsequent governmental policy reviews in Kenya revealed that ICT education suffered a gender bias because it was associated with science, a specialty in which education has a male bias. CDI’s citizenship training is expected to have an impact on local community participation in political decision making. And OAS made governments more aware of the potential disabled workforce.

- **Business development:** A number of *infoDev* projects focused on private sector development by building information networks to increase the market reach of SMEs. These networks, based either on telephone (FOOD) and/or Internet technology (B2BPricenow.com, SibDev), enhance the supply chain by facilitating the exchange of experience and information among producers, and encouraging them to develop and share resources. Certain

projects (SibDev, FOOD, B2Bpricenow.com) attempted to support SMEs at the investment stage, while others (FOOD, Manobi, PEOPlink, and B2Bpricenow.com) enabled producers to influence the sale price of their products by judicious use of market information.

- **Health care:** ICT was used in two case studies to improve health services by facilitating local (Voxiva) and international (Rostropovich) networks. In a third case study (Satellife), ICT was used to expand the access of health workers to relevant information. In Peru, Voxiva uses various technologies—primarily telephones and a computer database, with certain Internet and radio links—to enable local health professionals to access information, submit reports, and leave messages in a system designed to improve the ability of the Peruvian health system to respond quickly to natural disasters and disease pandemics.

In Russia, Rostropovich used the Internet to create an international cancer network, improving patient care in St. Petersburg by facilitating exchanges with cancer specialists worldwide. Rostropovich has gone on to build a local network to create a support structure for local health workers.

Satellife HealthNet trained health workers in Kenya, Uganda, Tanzania, Ethiopia, and Eritrea to use infor-

mation technology to access data, improving their ability to communicate both locally and internationally, and facilitating their professional development.

- **Agriculture and rural development:** A number of *infoDev* projects employed ICT as a way to make markets more transparent and effective. Networks were created to link producers to markets, exchange producers' experience and information, and develop and share educational resources. Similarly, the Manobi platform in Sénégal enabled fishermen to access market information, weather reports, financial forecasts, and investment opportunities.
- **Infrastructure development:** A number of case studies provided access to ICT (Future Stations, Fantsuam, CDI). In most cases, *infoDev* projects added value to established telecommunications infrastructure by enhancing it with additional technology. Voxiva added a back-office database, FOOD encouraged the use of mobile phones, Future Stations added new computers to an existing telecenter, and Fantsuam piloted satellite phones and computers. Manobi even encouraged the private sector and government to extend the telecommunications infrastructure by building new cellular base stations to connect to boats offshore. One unexpected benefit of this new infrastructure was the development of a brand-new security system for fisherman at sea.

Section 3: Lessons Learned and Recommendations

“GIVE A PERSON A FISH, YOU FEED HIM FOR A DAY. TEACH A PERSON TO FISH, YOU FEED THEM UNTIL SOMEONE COMES ALONG WITH A BETTER FISHING TECHNIQUE, OR UNTIL POLLUTION WIPES OUT ALL THE FISH, OR UNTIL THE GOVERNMENT CHANGES THE LAW OUTLAWING FISHING OR UNTIL WAR OVERTAKES THE FAMILY AND THEY BECOME REFUGEES. HELP A PERSON TO BECOME A CREATIVE THINKER AND YOU FEED THEM FOR LIFE.”²

² Simon Batchelor, *ABCD Programme Cambodia, Annual Report 1993* (Prey Veng, Cambodia: Christian Outreach Relief and Development, 1993).

Having examined the case studies through several analytical lenses, the following section attempts to identify some of the key lessons learned and elaborates recommended guidelines for future ICT-for-development projects. (See annex 3 for lessons learned by other ICT projects worldwide.)

Lessons Learned

Lesson 1: Involve target groups in project design and monitoring. The design of the FOOD project provides an example of effective interaction with a target group. In this case, the target group of poor women worked with NGO facilitators to articulate what they needed to make a small business successful before the project was designed. FOOD was then able to create a viable marketing system in response to their needs.

In the Future Stations project, it became clear that teenagers from the shanty towns of Rio de Janeiro required IT courses to meet professional rather than entertainment needs. As these courses generated much of the income of the telecenters, it was vital that instruction respond to client demand. Viva Rio is now studying their client base in order to develop courses more in line with client preferences.

Projects also meet the needs of different client groups more accurately if they involve these groups in the project design phase. The Conexiones education project, for example, works with both urban and rural residents, richer and poorer social groups. Educational content for the schools thus had to be designed in such a way that each school could access content most relevant to their students.

Finally, projects have found that client involvement in project design greatly enhances project sensitivity to the social environment, including gender roles and expectations, traditional values, cultural norms, etc.

- *ICT projects should empower local communities to create their own development content.* There appears to be a general development assumption that the **supply** of information available through ICT global networks is sufficient to enhance the livelihoods of the poor, provided that the poor can access these

networks. However, the *infoDev* case studies show that there is a strong need for content grounded in local realities.

One of the best ways to generate local content is to have members of local communities create it. Building capacity in this area would not only support the sustainability of telecenter and training projects, it would potentially promote local businesses and advocacy efforts in the South. If local content is to be generated, however, ICT projects must incorporate instruction in how to apply creative skills to content development.

- *Research the right partners for the project.* A number of implementing organizations realized that they needed to work with other groups to increase the impact of their projects only after they began operations. Finding organizations and projects that truly complement and/or enhance a project can be difficult. However, most of the case studies demonstrate that this kind of partnership increases the reach and impact of project activities. In all cases, the roles and responsibilities of project stakeholders should be outlined in a specific Memorandum of Understanding. Several case studies encountered institutional problems that derived from the lack of any Memorandum of Understanding, which in turn contributed to lack of transparency and accountability.
- *Incorporate ongoing monitoring into project operations.* The case studies demonstrate that monitoring enabled projects to adapt and tailor services to changing demand and circumstances. For SITA, this meant creating an internship program half-way through the life of the project. For the various telecenter projects, it often meant changing the types and frequency of computer courses.

Monitoring also requires staff training, as heavy workloads often prevent staff from giving this activity priority. In order to address this problem, Viva Rio is now providing Future Stations staff with one-day training on its monitoring system, emphasizing the importance of monitoring to the smooth operation of the project.

Lesson 2: When choosing the technology for a poverty intervention project, pay particular attention to infrastructure requirements, local availability, training requirements, and technical challenges. Simpler technology often produces better results. In many of the case studies, lack of reliable infrastructure meant that the technology used in a project (e.g., Internet-based discussion groups of Abantu) limited the number of participants. In other cases, technologies were not sufficiently disbursed in local areas for end-users to apply the skills they gained in training. B2Bpricenow.com, for example, reoriented its technology platform in the Philippines from an Internet website to include mobile phones after it became apparent that farmers did not have reliable access to the Internet, but could access mobile phones.

Technical challenges included unreliable electricity and communications infrastructure that rendered communications networks unreliable and/or inaccessible, as well as physical deterioration of infrastructure, the need for skilled IT support, and the necessity of instituting standard procedures. Theft of copper piping that encased the phone lines in Nigeria, for example, reduced the ability of people to access the Fantsuam health telecenters. In Peru, the remoteness of some health centers meant that Voxiva had to arrange for them to submit reports and access information via radio.

Technical problems experienced across the network of Future Stations telecenters forced the project to bring in permanent IT support, a cost not anticipated in the planning stages, while the Rostropovich project was compelled to quickly create a standard system for information exchange in order for the communications network to operate efficiently.

■ *Innovative technology solutions can be used to great advantage in development projects when they respond to user requirements.* Few infoDev projects used special technology, although a few piloted innovative system architecture. Rostropovich, for example, used cutting-edge technology to link health imaging equipment to the Internet. In Russia, however, the majority of computers are homemade, which can cause software compatibility and data transfer problems. Rits/ Sampa.org and CDI explored a Linux-based architecture based on

one high-end server and a network of between 10 to 20 made-to-order basic computers without hard drives. This system architecture has considerable potential to greatly reduce the cost per seat in telecenters and training institutes.

Open source and commercial software are used in many ICT projects. However, neither the comparative benefits of open source software, nor the cost of commercial software licenses, are well understood by implementers or end-users of ICT projects. End-users appear to prefer to learn Microsoft applications for employment purposes. Yet few of the projects that used such applications appear to have considered the lifetime cost of Microsoft licenses and the implications this cost would have for small businesses in the South.

Lesson 3: Existing technologies—particularly the telephone, radio, and television—can often convey information less expensively, in local languages, and to larger numbers of people than can newer technologies. In some cases, the former can enhance the capacity of the latter. Cemina is an excellent example of a project that used the Internet to support radio technology. By using Internet links to distribute digital radio content, the project expanded the supply and distribution of educational program content to local community radio stations.

■ *Telephones and voice mail systems can add considerable value to the communication systems of poor people in the developing world.* Most target groups of infoDev projects cannot afford to buy or even access the technology used in the projects, with the exception of phones. As noted previously in the discussion of Millennium Development Goal number 8, the poor are increasingly benefiting from the strategic use telephone communication. The cases of Voxiva, B2Bpricenow.com, FOOD, and Manobi clearly demonstrate that telephone technology (landline and mobile) can be used effectively to answer the communication, information, and business needs of poor people in developing nations.

Voxiva, for example, chose to establish a health-reporting network in Peru on the basis of standard phone lines, a choice that both increased the reach of the project and decreased its initial setup costs.

Because people were already familiar with using telephones, Voxiva had only to provide training on telephone menu systems to enable health workers to use the reporting system with confidence. An unexpected benefit of the technology was that the workers learned to write more concise reports to relay over the phone, enabling faster analysis of local health and disaster situations by the Ministry of Health. Here, simplicity of technology led to simplicity of the system.

- *Internet technology is not a cost-effective choice for many ICT for development projects. The geographic coverage of mobile phone systems is often broader and expanding more rapidly than Internet availability (particularly in Africa).* In addition to the cost of technology needed to access the Internet (e.g., computers, servers, modems, telephone lines, telephone usage charges), Internet-based projects often require considerable training in computer and Internet use. Such projects also often require literacy, despite high levels of illiteracy among the poor, as well as fluency in English (one of the principal languages of the Internet).

While the case studies suggest that the Internet has a role to play in providing the poor access to global information in Latin America, they also clearly demonstrate the problems associated with Internet use in Africa (Fantsuam, Satelife HealthNet, Abantu). Indeed, recent studies (McKemey et al., 2003) show that Internet access in Africa is not widely available outside capital cities.

- *ICT-for-development projects should consider using television and digital video technology.* None of the *infoDev* case studies used television or digital video technologies as the technical basis of an ICT project, although these technologies offer the potential to reach far greater numbers of the poor.

Although its development value is questioned, television is a known and accessible technology in

many developing nations. Nearly 500 million people in India already have access to television and this is growing rapidly. Of these, at least 150 million people may be considered early literate.³ And in nearby Cambodia (one of the poorest nations of Asia), a recent study has shown that 5 percent of households in certain rural areas have televisions (compared to less than 1 percent in 1993).⁴

With respect to video, recent changes in technology make it possible for digital video to be filmed by local communities and for local NGOs and government agencies to embed the editing process within their organizations. These changes in technology hold out the potential to develop local educational content on health, agriculture, and employment. In the past, video production has been expensive and video use was restricted by limited delivery channels. In the last two years, however, digital video has made video more accessible in terms of distribution (via computer, video player, or television) and cost. This has two key advantages—the cost of video production has fallen dramatically and the editorial process can be performed by development professionals. Video content could, for instance, be delivered through battery-operated cheap digital players carried by health or agricultural extension workers, as well as on personal players or village televisions.

Recent development projects have used digital video for formal training, adult education (particularly for the semi-literate and illiterate), and advocacy purposes. The Christian Industrial Training Institute, an NGO in Kenya, for example, is exploring the utility of digital video to teach such subjects as mechanics and machine-working.⁵ Kulika in Uganda is using the technology for agricultural training and the Health Foundation of Ghana (a local NGO) is training local agencies how to make videos that can be used by health clinics.

Lesson 4: ICT projects that reach out to rural areas might contribute more to the MDGs than projects

3 B. Kothari, "Same Language Subtitling: Watch TV and 'Read,'" *Information Technology in Developing Countries* (newsletter of the International Federation and Information Processing, Ahmedabad, India), 2001. See www.iimahd.ernet.in/egov/ifip/aug2001/article2.htm.

4 P. Sakhorn, *Survey Data for Prey Veng Cambodia* (Prey Veng, Cambodia: Ponleu Ney Kdey Sangkum, 2003).

5 Christian Industrial Training Centre, *Digital Bridges for Vocational and Education Training* (London: U.K. Department for International Development, 2003). Unpublished.

based in urban areas. Although the majority of *infoDev* projects targeted low-income communities, most of the 17 case studies were based in urban areas. Given that the majority of the world's poor live in rural areas (e.g., 70 percent of the population of India), a reorientation toward rural projects might reap greater benefits.

Lesson 5: Financial sustainability is a challenge for ICT-for-development initiatives. While many projects include mechanisms for cost-recovery, most find it difficult to generate sufficient income to become financially self-sustaining. The projects examined in this paper tended to rely on unproven business models and some form of subsidized start-up funding or operational support. Other projects provided "social goods," the costs of which would be difficult to recoup. In general, many ICT projects appear to generate positive externalities that must be carefully considered when evaluating the social return on donor investments in such initiatives.

Most e-commerce projects, for example, included potential cost-recovery mechanisms, but these mechanisms seemed unlikely to generate enough income to recover start-up costs. PEOPlink sells client subscriptions, B2Bpricenow.com could potentially generate returns through selling advertising space on its web site, and SibDev could generate income by successfully linking investors to SMEs. While each project reported some income, analysis indicates that significant lessons remain to be learned about these business models.

FOOD appears to have achieved greater cost recovery due to the relative cost and ease of use of the technology selected for the project: mobile phones. The added value of the phones prompted women's marketing groups to later purchase their own phones.

The telecenter (CDI, Fantsuam, Future Stations) and training (SITA, OAS) projects could potentially recover ongoing costs by charging fees. SITA, however, found that low-income trainees could not pay the full cost of training and needed to be directly linked to employment opportunities. Other projects—particularly those that were oriented towards social services—were simply not self-financing. Where ICT was used in schools or within a national health service, for example, it would be difficult to introduce viable payment or income-

generation schemes.

Even where projects appeared to have suitable mechanisms in place (CDI, Future Stations, Cemina), project reporting on sustainability did not necessarily include replacement costs for equipment.

- *Use existing physical facilities where possible.* Many of the case study projects used existing physical infrastructure to implement the ICT component. Abantu used its existing facilities, Satellife HealthNet used a hospital as a teaching base, and CDI used existing community centers for its schools. In general, existing facilities appear to be a more efficient choice than creating new buildings (Future Stations).
- *If a project will entail asset and/or loan repayments, avoid involving participants who do not have a sufficient financial base.* Consistent with the findings of microfinance, project activities that involve the very poor (those well below the poverty line) risk having participants use project assets (phones or community loans) for purposes of immediate survival.

Projects must be careful to screen participants to avoid indebting the most poor and placing project survival at risk. Certain small artisan groups in the FOOD project had problems paying for their mobile phone usage, while those with a stronger financial base were able to take better advantage of the new network. Similarly, some groups spent the initial Fantsuam community loans on items unrelated to the project, while others were able to pay back the loans in a timely manner.

- *Significant external funding is required to replicate most ICT projects.* New projects require startup funds both to cover the cost of community development work and subsidize initial operations. External funding is primarily needed not because ICT components are unique or particularly expensive, but because the projects as a whole are developmental interventions that change existing information and communication systems.

All of the case study projects were financed to some extent by *infoDev*. Other funding was often provided by organizations working in partnership with the implementing organization, with many

TABLE 5. FINANCIAL SUSTAINABILITY AND REPLICATION OF CASE STUDY PROJECTS

infoDev Project	Do current activities have the potential to become financially sustainable?	Is the project replicable without a large start-up grant?
Abantu (Kenya)	Yes. Main lesson learned was to integrate ICT into all gender awareness work. In theory, ICT project activities are sustainable without large grants.	Yes. Integrating ICT in day-to-day work is a “normal” institutional expenditure.
B2Bpricenow.com (Philippines)	Yes. Cost recovery could be achieved by delivering services that improve the profit margin of end-users.	Yes, if replicated in strategic partnership with private sector.
CDI (Brazil)	Yes. Schools are purportedly self-sustainable, based on student monthly fees.	No. Set-up costs require benevolent/ grant partnerships.
Cemina (Brazil)	Yes. Commercial advertising generates revenue and shared content minimizes costs.	No. Set-up costs require benevolent/ grant partnerships.
Conexiones (Colombia)	Yes. Program has support from government and educational institution budgets.	No. Set-up costs require benevolent/ grant partnerships.
Fantsuam (Nigeria)	Yes. Certain activities could become sustainable.	No. Set-up costs require benevolent/ grant partnerships.
FOOD (India)	Yes. User groups can sustain use of technology out of profits.	No. Community development workers needed to mobilize women’s groups.
Future Stations (Brazil)	Yes. Activities could become sustainable through fees for service.	No. Set-up costs require benevolent/ grant partnerships.
Manobi (Sénégal)	Yes. Activities could become sustainable on the basis of fees for service, <i>if</i> more subscribers are attracted.	Yes, if replicated in strategic partnership with private sector.
OAS (Latin America)	Yes. Activities could become sustainable through training fees.	No. Set-up costs require benevolent/ grant partnerships.
PEOPlink (worldwide)	Yes. Activities could become sustainable through fees for service (paid out of increased profits).	Yes, if replicated in strategic partnership with private sector.
Rits/ Sampa.org (Brazil)	Yes. Activities could become sustainable through fees for services.	No. Set-up costs require benevolent/ grant partnerships.
Rostropovich (Russia)	No. Public good: health service delivery efficiency gains supported by government budgets.	No. Set-up costs require benevolent/ grant partnerships.
Satellife (Kenya)	Yes. Activities sustainable through training fees, although in Kenya, institutional difficulties rendered this impossible.	Yes. Integrating ICT in day-to-day work is a “normal” institutional expenditure.
SibDev (Russia)	Yes. Potential cost recovery through delivery of services that improve users profit margin (unproven).	Yes, if replicated in strategic partnership with private sector.
SITA (India)	Yes. Activities could become sustainable through training fees and reduced scope of service.	No. Set-up costs require benevolent/ grant partnerships.
Voxiva (Peru)	No. Public good: efficiency gains in health service delivery supported by government budgets. However, the model can be adapted for commercial use—Voxiva sold a similar system to the American Red Cross to monitor blood supplies nationwide.	Yes, if replicated in strategic partnership with private sector, enabling start-up of key back office technology.

major contributions taking the form of in-kind contributions such as technical support, accommodations, software, hardware, volunteers, etc. In comparison to community initiatives around the world, however, the projects were all fairly large, with relatively high external financing.

Where developmental finance appears most needed is for the extension work that mobilizes community groups to implement a project. Although FOOD, with its use of mobile phone technology, appears to offer a solid model for replication, funding would still be required to facilitate similar women's marketing groups.

Similarly, CDI requires core funding to facilitate its telecenter training model. As with many other projects, the program's equipment costs are small in comparison to the overall cost of social mobilization and the initial organization of a telecenter. In fact, the models offered by CDI and Rits/Sampa.org may be more suitable for local and national governments than for self-sustaining private voluntary or community organizations.

Finally, some projects can reduce the need for substantial start-up grants by cementing strategic alliances with the private sector, as was the case with B2Bpricenow.com, Voxiva, and Manobi.

Lesson 6: Projects that focus on ICT training should include a job placement component. Any project that provides ICT training must 1) ensure that skills training responds to local job market needs, 2) help trainees with job placements, and 3) offer training in pro-active skills for finding jobs. Without such components, ICT training may raise false expectations among target groups.

Recommended Guidelines for ICT-for-Development Projects

On the basis of lessons learned from the *infoDev* case studies, the following guidelines are recommended for ICT-for-development projects. As will be apparent, these guidelines do not differ greatly from those examined in annex 3.

1. *View information and communication technology as a tool to enhance current projects, activities, and capacities, not as an end in itself.*
2. *At the outset of a project, involve the local commu-*

nity in deciding what information needs to be communicated and the most appropriate technology for doing so. Encourage the communities to make these decisions in light of local cultural and social norms.

3. *Have the local community discuss how the introduction of technology will affect current power balances in the community.* Such discussions should be held over the life of the project, not necessarily at the start, when the community does not understand the capabilities of the technology.
4. Involve the community in continuous discussions about how the project is progressing and what adaptations are required.
5. Develop appropriate and timely content for target groups.
6. Utilize locally available technology. Don't be afraid of keeping it simple.
7. Link ICT projects to public and private institutions. Assess potential partners in light of project objectives.
8. Be certain that the infrastructure required by project technology is in place, or in the process of being put in place.
9. Incorporate plans for monitoring, evaluation, and impact assessment into the project.

Conclusion

This study of *infoDev*'s experience identified the following practical tasks as potentially useful to project designers, executing agencies and organizations, and evaluators of ICT-for-development projects.

Project Design

- Consider how a proposed project will contribute to the Millennium Development Goals, with special consideration to the urban/rural bias of the project's location and services.
- Conduct a needs assessment with the participation of the local target community.
- Research appropriate partners for the project. Locate all stakeholders who would have a stake in the project's success.
- Where possible, locate partners with existing physical infrastructure to avoid extensive set-up costs.
- Draft a Memorandum of Understanding detailing the project goals, roles, and responsibilities of

all stakeholders.

- Develop a monitoring, evaluation, and impact assessment system with the participation of the target community. Train project staff and end-users in monitoring procedures.
- Determine if project growth and/or replication depends on new infrastructure, a supportive policy environment, or government policies. If yes, are advocacy efforts to achieve these goals incorporated into project activities?

Technology Selection

When developing a technical solution for the needs of the local target community, consider whether:

- adequate infrastructure exists to support the technology selected for the project, including, for example, the availability, accessibility, affordability, and reliability of landline telephones, local power supply, and mobile phone coverage areas
- extensive training would be needed for target community members to use the project technology
- the technology is both accessible and affordable to community members, once they have completed initial training (e.g., whether personal computers and phone lines are accessible for Internet access, a local telephone connection is accessible for a voice-based system)
- the technical solution will require skilled maintenance and troubleshooting. Is the solution technically sustainable? Are spare parts/software updates accessible and affordable? Does the project plan to build local technical capacity to maintain the technology? Are these costs included in the project budget?
- the implications of software selection (commercial or open source) are well understood by the implementer and end-users
- alternative existing technologies (e.g., radio, television, digital video) could, alone or in combination with newer technologies, reach greater numbers of end-users and achieve greater impact
- the technology can be used to build local capacity for content creation

Cost Recovery & Financial Sustainability

- Define and distinguish between startup and ongoing operational costs.

- Structure the project to include cost-recovery mechanisms, permitting eventual operational or full financial self-sufficiency.
- If a project involves a public good, such as education or healthcare services, define the actions and financial support needed on the part of local, municipal, and/or national government to ensure project success.
- Once cost-recovery measures have been determined, define criteria for client participation in the project. Would repayment requirements/loans place an undue burden on the very poor? Do clients need a minimum financial base for the project to be successful?
- Factor the cost of software licenses, software updates, and hardware maintenance and replacement into plans for sustainability.
- Define the extent, requirements, and cost of initial community development and facilitation work needed to replicate the project. Can staff or end-user training develop the institutional capacity to replicate the project in the same country? in other countries?

Training

If the project contains an ICT training component, or is solely dedicated to ICT training, ensure that the training program:

- responds to local job market needs and requirements
- responds to the demand of the target community
- has a well-developed job placement capability
- has considered gender, age, and subject matter biases present in the educational system and has developed activities to address these biases

Finally, it should be emphasized that ICT for development projects are subject to the same rules and guidelines that govern all development interventions. ICT is not a special case, it is simply a tool that can be used in the broader, complex process of poverty alleviation. Involving participants, creating partnerships, enhancing information and communication through appropriate content, focusing on the root causes of poverty—these are standard steps in the development process. In fact, these “rules” are the key to successful poverty alleviation. The case studies reinforce the view that if innovative use of ICT is to assist the development community achieve the MDGs, then ICT needs to be

Annexes

Annex 1: Case Study Methodology

The 17 case studies chosen for this study represent a cross-section of projects funded by the *infoDev* Core Program from 1995 through 2003, both in terms of geography and the dominant information and communications technology (ICT) used. Each case study was analyzed using a consistent framework based on the Millennium Development Goals. The framework was comprised of five basic components: an overview, impact review, impact analysis, lessons learned analysis, and beneficiary feedback. The objective of the case study analysis was to answer the question, "What can we learn from the case studies about what does and doesn't work in promoting ICT for development, and why?"

The general overview of each case study examines the development aims of the project and explores the "who," "what," "where," "when," and "how" of project activities. A second section provides a brief outline of the major impact/results of the project, followed by a third section which looks at five issues and how they contributed to these achievements: partnership, target groups, capacity building, technology, and finance. The fourth section analyzes the various issues and lessons learned over the course of each project. This section focuses in particular on the challenges faced during implementation, key factors and issues that helped to reduce poverty, and the future outlook of the project. In addition to these four sections, a "story box" encapsulates feedback received from case study beneficiaries on how the project impacted their lives.

Due to the nature of the case studies, research predominantly focused on secondary data provided by the *infoDev* task manager. Research began with a desk study involving an initial review of project documentation, including project proposals, monitoring and evaluation reports, and information found on project websites. In addition, Internet searches were conducted to locate additional available information on the projects, such as that posted on the Stockholm Challenge awards web site. The desk study of each case then produced a series of

questions which formed the basis for e-mail communication with the various project leaders.

In addition to electronic communication, field visits were carried out to 13 of the 17 projects: Abantu Kenya, B2Bpricenow.com, CDI, Cemina, Fantsuam, FOOD, Future Stations, HealthNet Kenya/Satellite, Manobi, PEOPLink, Rits/Sampa.org, SITA, and the Vishnevskaya-Rostropovich Foundation. Face-to-face semi-structured interviews were conducted with project staff and beneficiaries during the field visits, based on the information needed to complete the case studies. A series of still photographs and video film footage were taken in order to highlight various aspects of the projects (the video footage was later edited at the U.K. offices of Gamos and Big World.)

The four projects that did not host field visits (Conexiones, the Organization of American States, the Siberian Development Net, and Voxiva) were asked to share still photographs that they considered appropriate for the case studies. In addition to pictures, the authors also received a recent video snapshot of the Voxiva project in Peru.

Once all project data had been gathered, drafts of the case studies were sent to project leaders for review and comments. Amended drafts were then sent to *infoDev* task managers for final review and comment.

At the same time the authors were engaged in research on the case studies, they conducted a literature review on ICT-for-development issues. This review contributed both to the research framework for the present publication and to the analysis of the case studies in light of the Millennium Development Goals. The literature review focused predominantly on information available in print and on the Internet, as well as on various ICT e-mail forums (including Balancing Act, the Development Gateway, bytes for all, and DigAfrica), ICT case story sites (including www.digitalopportunity.org, www.sustainableicts.org, and www.iicd.org), and recent papers and/or research of major development agencies that addressed ICT and development, such as the Food and Agriculture Organization paper examined in annex 3 of this publication.

Annex 2: Summary of infoDev Case Studies

PROJECT	TECHNOLOGY	DESCRIPTION
Abantu (Kenya)	Laptops, personal computers (PCs), Internet	Abantu for Development was established to promote gender awareness. In 1999, it introduced an ICT component that concentrated on training various women's groups in Kenya in basic software and Internet skills. The project also brought together the business community to develop gender-sensitive ICT policy recommendations. While the ICT component began as an individual project ("Gender and ICT"), Abantu subsequently found it more effective to incorporate its ICT work into all of its programmatic areas—Gender and Conflict, Gender and Governance, Gender and Poverty—rather than treat it as a separate program.
B2Bpricenow.com (Philippines)	PCs, Internet, mobile phones	B2Bpricenow.com is an e-marketplace in the Philippines that allows farmers, fishermen, and small and medium enterprises to access current market prices and trade products. Access can be achieved via the Internet (the project web site) or cell phone.
CDI (Brazil)	PCs and Internet	CDI, the Committee for Democracy in Information Technology, is a non-profit, non-governmental organization that has used information technology since 1995 to promote social inclusion via Information Technology and Citizens Rights Schools. CDI provides equipment (hardware and software), instructor training, and administrative and technical support to the Schools, which are self-managed and self-sustainable, but monitored by regional CDI offices.
Cemina (Brazil)	PCs, software for digital editing, Internet	The primary aim of Cemina (Communication, Education, and Information on Gender) is to strengthen women's leadership in community development in Brazil. Cemina promotes gender education by connecting communities through a radio Internet link: radio program content is produced locally and then shared with other radio stations via Internet broadband links.
Conexiones (Colombia)	Inter-school network connection for existing PCs	Conexiones began in 1993 as a research project of EAFIT University and the Pontificia Bolivariana University in Medellín, Colombia, to develop ICT-supported learning environments. Its goal is to improve the quality and equity of education in Colombia. Since its initial research phase, the program has targeted schools in both rural and urban areas, without prejudice to their socio-economic level. To date, 75 schools in the provinces of Antioquia, Santander, Bolívar, and Valle del Cauca belong to the Conexiones network, which encompasses more than 1,000 educators and 6,000 students between 7 and 16 years of age.
Fantsuam (Nigeria)	PCs with CD-ROMs, satellite radio	The Fantsuam Foundation in Kafanchan, Nigeria, is working to give local rural communities access to health and educational resources through the Internet. In the first phase of the project, Fantsuam worked with local communities to establish three Community Learning Centers (telecenters). One of these centers, at the Fantsuam office in Bayan Loco, is already financially self-supporting. Plans to set up a mobile community telecenter, which would visit different communities and offer e-mail access via satellite, were abandoned due to prohibitive cost.

FOOD	Mobile phones	FOOD, based in Chennai, India, began the Inter-City Marketing Network project in April 2001 to help poor women in urban areas increase their incomes. Initially, FOOD worked with some 100 existing women's self-help groups representing between 1,000–2,000 women and their families. An initial survey of these groups indicated that while many women derived a small income from producing goods at home (food products, soap, repackaged food items), they were generally weak at marketing their products and finding customers. Typically, they sold their products to visiting middlemen and made little profit. FOOD provided them training in marketing and the use of “social capital,” encouraging the groups to focus on production, or marketing, or both. FOOD then provided each group with a cell phone to facilitate contact between production and marketing groups, and between groups and customers.
Future Stations (Brazil)	PCs & Internet	Future Stations began in March 2002 as part of the Rio de Janeiro shanty town project Viva Rio. Viva Rio is a large and highly respected grass-roots project that has been working in the <i>favelas</i> of Rio for over 10 years. Viva Rio works to empower women and decrease poverty and violence with in the favelas. Future Stations are multifunctional Internet Cafes offering training in the Internet and major computer software applications; they also function as advice centers for employment and offer many other community services. The Future Centers run interactive learning evening classes for young people who have dropped out of school.
Manobi (Sénégal)	Wireless Application Protocol (WAP) mobile phones, Manobi Server	Manobi initiated an Internet and wireless e-services project to strengthen the livelihood of Sénégalaise fisherman in early 2003. This project uses wireless access protocol (WAP) technology via cell phones to provide fishermen with up-to-date weather reports and market price information. In addition, the fishermen are able to use interactive technology to input fish stock information for marketing purposes, and to log departures and estimated times of return so that local fishing unions can be alerted if fishing boats fail to return on time. At the time of writing, some 57 individual users had registered for the service (41 buyers and 16 fishermen).
OAS (Latin America)	Adapted PCs and peripherals	OAS implemented an IT employment program for people with disabilities for 14 months, beginning in June 2000. The project used professional volunteers to train both people with disabilities and organizations working with people with disabilities in computer software and work-related information and technology skills. A total of 13 volunteers trained 338 people, representing 44 organizations in El Salvador, Guatemala, Honduras, and Nicaragua.
PEOPlink (worldwide)	PCs, digital camera, Catgen software	This project supported the development of the “Catalogue Generator” software (CatGen, first version) and regional training to enable some 55 artisan producer groups to build, maintain, and update their own web catalogues of craft products for use in business-to-business marketing. While e-commerce is not a panacea for artisan producers, the CatGen system allows users to create online catalogues with minimal computer and web skills. The project has brought significant benefits to producers, especially in the areas of collaborative product development, finding buyers, and simple web or email-based marketing.
Rits/ Sampa.org (Brazil)	High-spec server, secure data center, PCs and Internet	This project used digital information and communication technologies (DICTs) to increase Internet access and use by civil society organizations and their networks in Brazil. Rather than build an experimental center from

		<p>the ground up, Rits chose to work with the Sampa.org network of telecenters in low-income communities of São Paulo. Sampa currently has 10 telecenters with about 2,500 users in São Paulo shantytowns. Rits provides the centers with technical support, evaluations, and project sponsorship.</p>
Rostropovich (Russia)	Primary server, PCs and peripherals, digital microscope, Internet	<p>The Rostropovich Foundation telemedicine healthcare network began in 1999 with the goal of increasing the capacity of pediatric cancer specialists at the First Municipal Hospital of St. Petersburg, Russia. Through the use of the Internet and the power of digital technology, the Foundation has linked staff from St. Petersburg with colleagues from the USA and Europe, enabling Russian doctors to send MRI scans and records of their patients to other specialists to improve the care of children living with cancer. Within the St. Petersburg area, the network has also improved communication between primary care physicians and cancer specialists.</p>
Satellife (Kenya)	PCs, server, peripherals, generator	<p>The Regional Information Technology Training Center was set up in Nairobi, Kenya, in 1999. The aim of the center was twofold: to train medical staff from across East Africa in basic IT skills and technical support and to sensitize policy makers to the potential value of ICTs in the workplace. Over a one-year period, over 100 people were trained. In Kenya, the foundation for a sustainable business was laid, but institutional factors have led to an uncertain future. Trainees from Uganda, Tanzania, Ethiopia, and Eritrea have gone on to organize ICT training in their countries, contributing to the ongoing training of health professionals throughout East Africa.</p>
SibDev (Russia)	PCs and Internet	<p>The overall goal of this project is to increase the capabilities of small and medium enterprises (SMEs) in poor areas of Siberia to attract private investors through the Internet. To date, the project has run a number of training workshops, produced a toolkit to promote business marketing through the Internet, and developed a project web site that markets Siberian SMEs.</p>
SITA (India)	PCs and Peripherals	<p>SITA trained over 500 low-income women from north Delhi, India, in basic computing in 2000-2001, with the aim of assisting them to find work in local businesses. SITA estimated that in July 2003, some 70 trainees were directly using their PC skills in paid employment. Overall, however, the project underestimated the significant gender barriers faced by low-income women. This shortcoming was partially addressed by modifying the course to include work placements. Although the SITA project has been completed, several staff are involved in a new women's e-cooperative, Mitra Mandal, which continues to train local low-income women and hopes to sell services to local businesses on a cooperative basis.</p>
Voxiva (Peru)	Pay phone, mobile phones, PCs, Internet, local radio (occasionally)	<p>Voxiva is a private social venture committed to extending the benefits of information technology beyond the digital divide. At the request of local health officials in Peru, they looked for ways to use existing telecommunications infrastructure to strengthen disease and disaster surveillance and response. Their product, ALERTA, is a disease surveillance application that enables health professionals in rural areas to use local telephones to submit reports to healthcare authorities. The reports are then entered into a computer system, enabling the Ministry of Health to keep track of disease in a timely manner nationwide. The system also enables rural health professionals to receive information and help through voice mail, again via local telephones. The product has been piloted in 76 health facilities located in the Cañete-Yauyos and the Chilca-Mala zones.</p>

Annex 3: Lessons Learned from Other ICT-for-Development Efforts

This annex seeks to explore lessons learned from other ICT-for-development projects. While a number of ICT case studies have been written, relatively few in-depth evaluations have been published on what does and doesn't work in promoting ICT for development. Two recent papers prove the exception: the *Magic Box*, published by the Food and Agriculture Organization of the United Nations (FAO) in 2001, and *Sustainable Information and Communication Technology*, published by the U.K. Department of International Development (DFID) in 2003.

The sections below elucidate the guidelines developed in these two papers and apply them to the *infoDev* case studies.

The Magic Box (FAO)

Michiels, A.I., and L. Van Crowder. 2001. *The magic box: Local appropriation of information and communication technologies*. Rome, Italy: FAO.

This study looks at local appropriation of ICT in development projects around the world. Unfortunately, very little written information was available on such projects at the time the study was written, and only a limited number of community-driven, locally appropriated, ICT initiatives were then in operation. The projects surveyed by the FAO were, moreover, either in the pilot phase or, if they had concluded, had not conducted any type of monitoring, evaluation, or impact assessment. Nonetheless, the study developed some guiding principles for ICT projects, which are reviewed below using illustrations from the *infoDev* case studies.

FAO Guiding Principles

1. Enter into dialogue with the target group about what information they wish to communicate, the most appropriate technology for communicating this infor-

mation, and the impact an ICT project will have on the cultural and social norms of the community. Although none of the *infoDev* case study projects appears to have initiated specific discussions with the local community on the way in which a project would affect current social and cultural norms, several of the projects appear to have met the overall criteria of this guideline. Manobi, for example, developed the PDA interface for its project alongside the fishermen and buyers who would use it, seeking to create a tool that these target participants would feel confident using. CDI attributes the success of its IT and Citizens Rights Schools to the deep involvement of local communities in developing the model for the schools. The technology that is then chosen for CDI projects is tailor-made to meet community needs.

2. Leave the final decision on the type and location of the technology in the hands of the local community. In reaching their decision, make sure that local residents discuss how the project and technology could affect power dynamics within the community. Several *infoDev* case studies complied either in part or in full with this principle. Manobi, for example, worked with local fishing unions, government departments, and fishermen to choose the location for its project and the masts used as communications towers. B2Bpricenow.com adapted project technology to local needs and preferences after an initial Internet-based trial revealed that mobile phones had greater utility for the target community. CDI specifically uses the ICT component in its schools as the springboard for discussing citizenship and power dynamics within local communities. Whereas Abantu did not engage in this type of discussion with its women trainees, it did discuss power dynamics at the national level by advocating gender-sensitive government education policies on ICT.
3. Do not introduce technology for its own sake or for the sake of the project. Introduce technology solely to meet the information and communication needs of the target group. *infoDev* case studies reflected the reality of this

maxim in multiple ways. Abantu, for example, found that it needed to integrate ICT into its existing projects, rather than maintain an isolated ICT project. Manobi and B2Bpricenow.com both specifically created communications tools to empower producer groups, allowing them to obtain a fair price for their products. Voxiva developed its disease surveillance platform to answer the information and communication needs of the health care community of Peru.

Conexiones introduced its technology with the sole purpose of improving educational content and teaching techniques in local schools. Educational content developed for the project is designed to meet the requirements of school curricula and the needs of the teachers. The Rostropovich project became successful precisely because the technology solution was designed to meet the specific needs of cancer doctors (i.e., to send images to and communicate with other specialists worldwide).

4. *When designing an ICT program, it's necessary to understand the different ways in which people learn, communicate, and use information.*

This principle impacted the *infoDev* case studies in different ways. Abantu discovered that seminars and workshops, not written presentations, were more successful advocacy tools due to the oral nature of Kenyan society. Conexiones developed a system responsive to the learning patterns and needs of both rural and urban communities in Colombia. Continued expansion of its model points to its success in understanding how Colombian target communities learn and communicate. In the OAS program, trainers were required first to determine the needs of the disabled, then to adapt the technology they needed to learn in order for them to use it.

5. *Project design must incorporate monitoring, evaluation, and impact assessment components, and ensure that these components are implemented.*

A number of *infoDev* case studies gathered no baseline statistics, making it difficult to assess their true impact; the cases continue to display an over-

all weakness in monitoring and evaluation.

However, certain projects greatly benefited from monitoring and assessments conducted informally over the life of the projects. Hands-on learning, for example, in the B2Bpricenow.com project highlighted the need to integrate mobile phones into the technical design. Ongoing monitoring allowed Future Stations to determine that computer classes focusing on professional skills development were the most popular. The project subsequently modified its offerings to respond to client demand.

6. *Design holistic projects: incorporate the social, economic, and communication systems already in place in the target community.*

Certain *infoDev* case studies learned this principle the hard way, while others applied it in the design stage. SITA, for instance, realized that focusing solely on ICT training was not sustainable and subsequently adopted a more holistic approach that included training and internships, laying the groundwork for the employment of its trainees. Voxiva, on the other hand, chose the existing telephone network as its technology of choice, which has contributed to the continued success of the project and its forthcoming expansion to new regions of Peru.

7. *Create partnerships with public and private institutional infrastructures. Build on existing formal and non-formal local organizations and communication networks.*

All *infoDev* projects highlighted the need for partnership, whether to supply funding, provide technical support, or actually link the technology to projects on the ground (Rits/ Sampa.org). To cite but two examples, CDI utilized existing community centers to house their telecenters and trained local staff to run them; SibDev created a web site and databases in collaboration with both public and private institutions.

8. *Provide ICT skills training at all levels, according to community need. Pay particular attention to youth, women, and marginalized groups.*

All *infoDev* projects included a training element,

with many focusing on building the employable skills of young people. Certain projects, such as FOOD, targeted marginalized populations to enable them to increase household incomes and to promote empowerment.

Sustainable Information and Communication Technology Study (DFID)

Batchelor, S., and P. Norrish. 2003. *Sustainable information and communication technology*. London: DFID.

This study is part of a DFID research program on the sustainability of ICT projects. A more recent publication than the FAO paper, the paper looks at how organizations use ICT to enhance ongoing development activities that have some measure of sustainability. It concludes that **sustainability** “involves a combination of factors, including, among others, **clear objectives, institutional frameworks, local capacity, and development benefits.**”

Based on the distinct shared patterns of the 12 DFID case studies surveyed by the study, general guidelines have been distilled for ICT projects. Each guideline is tied to a standard project component (e.g., objectives, process, capacity) and applied to the experience of the *infoDev* case studies.

DFID Guiding Principles

1. *Objectives: Project objectives need to be clear and accepted by the majority of stakeholders.*
Interestingly, objectives were not explicitly highlighted by the *infoDev* case studies. However, the studies implicitly showed that a “champion” with a vision of success was often behind the project and kept it on track.
2. *Target Groups: Scant information is available about those target group features essential for sustainability.*
To have an increased impact on the MDGs, ICT projects need to focus on the majority of the poor. While *infoDev* case studies demonstrated that a wide variety of target groups can benefit from ICT (women’s groups, fishing and agricultural coopera-

tives, health workers), they also did not identify target group characteristics that would guarantee project success.

3. *Intermediaries: Many ICT projects appear to illustrate the need for re-intermediation rather than dis-intermediation, particularly with respect to technical facilitation.*
A number of *infoDev* case studies highlighted the need for incorporating middlemen into ICT projects, due to both social and cultural norms. Manobi didn’t disintermediate beach-based fish buyers, but it did give more power to the sellers to negotiate. Voxiva re-intermediated by allowing health workers to report directly to the database rather than through their local offices. FOOD, however, showed that removing middlemen (i.e., small businessmen who rent or sell mobile phone time) increased the incomes of the target group.
4. *Policy Environment: Government policies on ICT can affect the day-to-day operation of ICT projects.*
Among the *infoDev* case studies, only Abantu directly addressed the policy environment. Most of the projects benefited from a reasonable policy environment or from partnerships with local government agencies. Conexiones, for example, worked in cooperation with the educational system. CDI is presently in discussions with federal authorities in Brazil about expanding its IT-based schools, an expansion that could be enhanced by new government policies for social mobilization in the slums.
5. *Institutional Arrangements: Sustainability of an ICT project requires a clear link between the target group and the institutional arrangements made for the project.*
Finding the right partners for a project has been a theme throughout this paper. Certain *infoDev* projects, including SITA and Satellife, nearly terminated due to poor initial institutional arrangements with partners.
6. *Linkages: Development projects cannot operate in isolation, they must be linked to local authorities*

and other organizations working in relevant areas. Several of the *infoDev* case studies forged multiple links with local government agencies and NGOs. Conexiones, for example, established links with both local schools and educational authorities. Voxiva forged links with the Ministry of Health in Peru. FOOD demonstrated a slightly different lesson: that it can be important to avoid linkages with other development initiatives (in this case, credit programs) which could undermine project gains.

7. *Project Process: Sustainability is closely linked to planning and the involvement of the target group.* Feedback from target groups in the *infoDev* case studies often made the projects both more viable and more sustainable. As previously mentioned, Manobi involved fishermen and buyers in the technical design process, and CDI involved local communities in the development of the model for its schools.
8. *Capacity: Sustainability is affected by human capital and technical and organizational capacity. The latter capacity does not need to be present at the start of a project, but it must be either developed or found (by linking with other organizations or groups). An identifiable project "champion" is also crucial for building capacity.*
infoDev case studies show that the presence of a project champion enhances the success of a project (FOOD, Manobi, Voxiva, Fantsuam). The cases also demonstrate that technical and organization capacity can be built over the life of a project. For example, CDI currently employs a network manager and an educator who were both former students. Abantu, by contrast, enhanced its own capacity as an implementer by planning self-paced staff training using CD-ROMS.

9. *Technology: Use locally available equipment. Be ready to overcome technical difficulties. Match the style and quantity of equipment to its usage.* Several of the *infoDev* case studies provide good illustrations of this principle. Voxiva used the local telephone network. CDI and Rits/ Sampa.org overcame technical difficulties by pioneering the use of mini-networks using Linux. Both projects also matched equipment (second-hand computers and cheap workstations) to its intended use. Fantsuam, by contrast, overcame a lack of local connectivity by using leading-edge technology in an area without infrastructure.
10. *Finance: Despite the current emphasis on financial sustainability, it is too early to determine sustainability criteria for ICT projects. Although many such projects use cost-recovery mechanisms, most do not generate sufficient income for the project to operate independently or to purchase new equipment.* Many *infoDev* case studies use cost-recovery mechanisms, (CDI, Conexiones, Rits/ Sampa.org, Manobi), but only Future Stations explicitly stated that funding would be required to purchase or replace equipment. The Brazilian project concluded that cost-recovery from clients would not cover such costs.
11. *Development Benefits: ICT needs to be used in support of other development objectives, where it can have an immediate and identifiable benefit.* Illustrations of this principle can be seen in most *infoDev* case studies. Voxiva used ICT to build an early warning system for epidemics. FOOD provided income support for marginalized women. CDI promoted social mobilization and Cemina promoted gender awareness and empowerment.

