



AMERICAN  
ASSOCIATION FOR THE  
ADVANCEMENT OF  
SCIENCE

150 YEARS • 1848-1998

# ALLEVIATING POVERTY THROUGH TECHNOLOGY



**MUHAMMAD YUNUS** is founder and managing director of the Grameen Bank of Bangladesh, where he has created innovative entrepreneurial programs to benefit the rural poor. He was appointed to the International Advisory Group for the Fourth World Conference on Women in Beijing (1993 to 1995) by the UN Secretary General, and has served on the Global Commission of Women's Health, the Advisory Council on Sustainable Development, and the UN Expert Group on Women and Finance.

In 1974 I began work as Chair of the Economics Department at Chittagong University in the newly independent country of Bangladesh. I was a young and idealistic economist, and my head was filled with all of the elegant models and theories of development very much in vogue at the time. I was caught up in the euphoria of a hard-won liberation struggle and supremely optimistic about our young nation's ability to transcend its poverty-ridden past.

The 1974 famine violently shattered this naïve confidence. While I lectured my students on optimal strategies for economic development, just outside the classroom I could witness poor villagers dying of hunger. The great distance that exists between the lives of the poor and the abstract world of economic theory had never before been so clearly illustrated for me. I was devastated.

I left my textbooks and went to the villages to learn about poverty from the people. There, in Jobra, a village just adjacent to Chittagong University, I came to realize the gaping deficiencies in assumptions about the poor. One assumption is that the poor lack skills. The reality is that they possess extraordinary survival skills. A poor person must work hard just to stay alive in a country that provides no safety net. Unfortunately, these survival skills are often undercapitalized, with the consequence that the poor do not receive the full fruits of their labor. A survey of 42 villagers revealed that \$27 was the total amount necessary to release them from the clutches of the moneylender. The need of the poor was clear: credit. Grameen Bank (Grameen means village, or of the village) originated then and there, in Jobra, where I loaned \$27 to the 42 villagers.

Since then, more than 2.3 million Bangladeshis, spread over 37,000 villages, have borrowed from Grameen Bank. Cumulatively, the bank, a financially sustainable, profit-making venture with 12,000 employees, has loaned \$2 billion, and virtually every cent has been repaid. It is not a charity, not a program based on good will or political favors. It does not subsidize the poor; they are its borrowers and its shareholders. The bank makes small loans that average about \$60 each, thereby proving microcredit to be an effective tool. By any criterion, Grameen is a successful bank.

What is even more exciting is Grameen's success as a poverty-alleviation project. Bangladesh remains one of the world's poorest, most densely populated, and least developed nations, despite sustained domestic and international efforts to improve its economic and demographic prospects. Grameen Bank deals with the poorest

of the poor, people who are often ignored, or simply forgotten altogether, when major development projects are planned. Ninety-four percent of Grameen Bank borrowers are landless rural women who have made great strides as a consequence of these loans. Studies have cited improvements in nutritional status, sanitation, access to food, health, pure drinking water, and housing. In fact, a recent World Bank study estimates that more than one-third of all Grameen Bank borrowers have risen above the poverty line, and another third are close to doing so.\*

What has all of this to do with science and society, the subject of this series of essays? Grameen has begun to provide opportunities for its borrowers to take advantage of scientific and technological innovations, particularly in energy, communications, and information technology. By building on its extensive network of borrowers, the organization has a unique opportunity to empower the poor and contribute to broad-based economic development in Bangladesh. In addition, there are Grameen programs replicated in 58 different countries on 4 continents. In all there are 241 international programs in countries as diverse as Nigeria, Tanzania, Kenya, China, Nepal, Indonesia, Sri Lanka, Papua New Guinea, France, Norway, Jamaica, Mexico, Colombia, Canada, and the United States. Thus there now exists the potential to empower the poor to attain sustenance through credit and self-employment in nearly all parts of the globe, and to link this global network of microcredit borrowers, we have found no better tool than the Internet. The superhigh-

way that conducts information and services across the globe can, if properly used, solve many problems that a small start-up business might have when dealing with logistics and communications. To begin to fully realize the potential help that information technology may provide to solve global poverty, Grameen has begun to seek international partnerships with companies such as Hewlett-Packard, which has discussed donating thousands of computers to Grameen programs around the world so as to link these microcredit programs through the Internet.

What is surprising is the ease with which this shift to technology can be accomplished. Usually one only needs to create a program and then find a testing ground for it. With only minor modifications for local conditions, programs can be replicated in almost any of the villages with Grameen branches. With this extensive network, any project that benefits the poor and is self-sustainable can readily be piggy-backed onto the Grameen system and replicated across Bangladesh and around the world.

For instance in March 1997, Grameen Telecom, a nonprofit company, was established to launch cellular telephone operations in rural areas. Telephones are greatly needed in Bangladesh,

The author is at Grameen Bank, Mirpur Two, Dhaka 1216, Bangladesh.

\*R. Khandker, B. Khalily, Z. Khan, *Grameen Bank: Performance and Sustainability* (World Bank Discussion Papers, #306, 1995).

ILLUSTRATION: ALLAN M. BURCH



where the telephone density is one of the lowest in the world. Telephones provide the kind of access to information—whether it be the market price for a farmer's crop or news that a relative is ill—that most readers of *Science* might take for granted. Twenty-eight Grameen Bank borrowers became pioneers as providers of telephone service for their villages. These women, chosen by their fellow Grameen borrowers, were given loans of approximately \$350 each, which covered the cost of the telephone, the hook-up, training, and repair services. As the “wireless women” of their villages, they purchase air time at wholesale prices from Grameen Telecom and sell the telephone service to their neighbors at the market rate. Basically, they act as human pay phones in places where there are no land lines and no one has even seen a telephone or made a phone call.

The telephone operators have thus far been earning net profits of approximately \$2 a day, more than \$700 a year. This is significantly more than the \$250 average annual per capita income in Bangladesh. One important lesson to come out of the Grameen programs is that helping the poor involves more than simply providing technology. They must be owners of that technology, not just its passive consumers, and ownership of technology is catching on, as more and more borrowers become telephone vendors. In just a few months the original 28 pioneers have more than doubled to become 60, and with additional funding for the program, the quality and quantity of services in rural areas will rapidly increase.

The cellular phone company Grameen Phone, in joint venture with TeleNor of Norway and Marubeni of Japan—and GonoPhone of the United States as a non-Grameen partner—is selling wholesale air time to Grameen Telecom, which then provides the same rate to the borrowers, who in turn charge the retail rate to their customers. Grameen Phone is also providing services in urban areas with 20,000 subscribers at present. This impressive number was achieved in only 8 months. Over the next 6 years, Grameen Telecom anticipates 1 million Grameen Phone subscribers and 50,000 village pay phones owned and operated by Grameen Bank borrowers.

Another technological venture being designed by Grameen Communications and Grameen Foundation USA is the Village Internet Program, a pilot project in which borrowers will take loans to purchase and operate “Cyber Kiosks” for profit. These village computer centers will make it possible for Grameen borrowers to access the Internet in search of income-generating activities and to provide education and computer-based employment. This exciting project, still at an early stage of development, has drawn together a team of professionals from around the world to finalize design plans.

A major benefit of this Internet service will be increased access to agricultural and market information. Farmers will be able to learn the current market price of their produce through the Internet, resulting in increased economic efficiency. More importantly, accurate and timely information will reduce exploitation of poor rural producers by allowing them to access the market directly rather than go through middlemen who can control prices at both ends when they control information and transport.

Cyber Kiosks will also bring employment opportunities to the

community at large. With training, young people will be able to perform data entry and provide transcription services for any company in the world, a better alternative than migration to urban slums in search of employment. This educated youth can, at the same time, become a resource for teaching others, providing educational opportunities beginning with the most basic primary education, then moving to distance learning and to remote classroom facilities in villages that until now had not even a schoolteacher.

The Village Internet Program will be supported by established infrastructures and technologies within the Grameen family of companies. Grameen Shakti (Energy), which has been developing solar energy for village households, will assist in integrating technology into villages by providing inexpensive power through the Solar Household System, already introduced into selected villages in Bangladesh.

Initially, several villages will be linked to a VSAT (very small aperture terminal) that will be connected via a satellite uplink. In addition, several backup systems will be installed with the use of store-and-forward satellite technology. Eventually, Grameen Communications plans to have Cyber Kiosks that run on solar power and connect to the Internet by a variety of methods, such as spread spectrum radio, microwave, and laser connections. As with Grameen Bank, Grameen Communications will ultimately be a borrower-owned company. Each Cyber Kiosk will be run as an independently owned and operated franchise of Grameen Communications in which the borrower will earn money from selling Internet and computer services at the Cyber Kiosks. Grameen Foundation USA will develop standardized testing and training of data entry personnel in Bangladesh, and success with the pilot project in a small number of villages will set the stage for replicating the prototype in hundreds, and later thousands, of kiosks. Grameen Foundation USA is also working with Grameen Communications to identify North American and European corporations to outsource

their data entry needs to Cyber Kiosk users. In addition, there are plans to equip bank workers with specially modified palmtop computers that will upload banking data directly into the main bank computers from the field by means of wireless technology. Hence, in addition to benefiting the rural poor, Grameen Bank borrowers will also indirectly benefit because the new technology will allow Grameen Bank employees to greatly reduce their paper work, allowing them to use their time more effectively.

Having arrived at an age dominated by science and technology, many of us are finding that we still more or less pursue the same careers, with science and technology as aids to perform them more efficiently. For the more affluent among us, science and technology have improved, but not revolutionized, our lives, providing us, perhaps, more time to return to a simpler way of life and to restore the human touch. For the poor, however, science and technology are likely to have a far greater impact as they promise to provide new, important, even life-saving economic opportunities. I foresee the day, not far off, when there will be only one world—when a student sitting in a Bangladesh village can take a course at Harvard University through the Internet—a world in which everyone can have a voice that resonates through the great global village.

“CYBER KIOSKS WILL ALSO BRING EMPLOYMENT OPPORTUNITIES TO THE COMMUNITY AT LARGE. WITH TRAINING, YOUNG PEOPLE WILL BE ABLE TO PERFORM DATA ENTRY AND PROVIDE TRANSCRIPTION SERVICES FOR ANY COMPANY IN THE WORLD, A BETTER ALTERNATIVE THAN MIGRATION TO URBAN SLUMS IN SEARCH OF EMPLOYMENT.”