



Shidhulai Swanirvar Sangstha:

*Bringing Information Technology
to Rural Bangladesh by Boat*

ARSHAD MAHMUD

February 2006

Council on Library
and Information Resources

The Bill & Melinda Gates Foundation Access to Learning Award is given annually to a public library or similar organization outside the United States that has an innovative program offering the public free access to information technology. The award, which includes a grant of up to US \$1 million, is administered by the Council on Library and Information Resources (CLIR). An international advisory committee of librarians and information technology experts reviews applications.

**Bill & Melinda Gates Foundation
Access to Learning Award Recipients**

2005

SHIDHULAI SWANIRVAR SANGSTHA, Bangladesh

2004

AARHUS PUBLIC LIBRARIES, Denmark

CHINA EVERGREEN RURAL LIBRARY SERVICE, China

2003

SMART CAPE ACCESS PROJECT, South Africa

2002

BIBLORED, Colombia

2001

BIBLIOTECA DEL CONGRESO, Argentina

PROYECTO BIBLIOTECAS GUATEMALA (PROBIGUA),
Guatemala

2000

HELSINKI CITY LIBRARY, Finland

Shidhulai Swanirvar Sangstha

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Technology to Rural
Bangladesh by Boat*

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ACCESS TO LEARNING AWARD RECIPIENT 2005

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More information about Shidhulai Swanirvar Sangstha (Shidhulai) is available at <http://sss.interconnection.org>.

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ABOUT THE AUTHOR

Reporter and editor Arshad Mahmud has worked for leading news outlets in Bangladesh, the United States, and abroad. Born in Bangladesh, he graduated from Dhaka University before going to work for *The New Nation* and the weekly *Holiday*. Mahmud has served as Bangladesh correspondent for *The New York Times*, *The Guardian*, and *South China Morning Post*, among others. Currently, he is a freelance writer and editor based in Washington, DC.

“With this award, we will bring libraries to thousands of underprivileged children and youth and educate thousands of farmers on sustainable farming through the use of basic technology training.”

ABUL HASANET MOHAMMED REZWAN
Executive Director
Shidhulai Swanirvar Sangstha



Credit: BILL & MELINDA GATES FOUNDATION/PHOTOGRAPHS: BO MATHISEN

AHM Rezwan with the award statue presented to him in Oslo, Norway at the annual meeting of the International Federation of Library Associations and Institutions (IFLA).

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PREFACE

The 2005 recipient of the Bill & Melinda Gates Foundation Access to Learning Award overcame the challenge that the ecosystem of Bangladesh poses and found a way to deliver information technology to residents of some of that country's flood-prone areas. With specially designed, indigenous boats, Shidhulai Swanirvar Sangstha is using cellular technology and solar power to provide Internet access and online training to thousands of rural residents. Shidhulai is the name of a village in the Natore district of Bangladesh, and the term *swanirvar sangstha* means "self-reliant organization." Rarely has a project been more aptly named.

Shidhulai's approach embodies the kind of innovation that the Access to Learning Award recognizes and celebrates. As this case study documents, Shidhulai, a non-profit organization, confronted formidable obstacles. Bangladesh has the highest population density of any developing country in the world: nearly half of its population lives below the poverty line. Shidhulai's solution was to float—literally—information technology and to bring it to some of the country's most disadvantaged residents. Shidhulai has succeeded because of the strong partnerships it created with villagers, particularly women and children, and a vital network of volunteers. Founded in 2002, the project has become an integral part of everyday life in the 240-kilometer area that it serves.

Shidhulai joins the list of previous Access to Learning Award recipients that span the globe from Colombia and Finland to South Africa and China. In each case, the recipients have used information technology to reach beyond their natural constituents and to give residents of underserved communities the tools they need to improve their lives. Each award recipient offers a different model, but each has applicability elsewhere in the world.

It is CLIR's good fortune, through the generosity of the Bill & Melinda Gates Foundation, to witness firsthand these inspiring models that place information technology in the hands of those who need it most.

ALICE ANDERSON BISHOP
Special Projects Associate
CLIR

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Bangladesh, the Nation

Bangladesh, meaning “Bengal nation,” is a low-lying country formed by the alluvial plain of the Ganges-Brahmaputra-Meghna river system, the largest delta in the world. Over 92 percent of the annual runoff from these rivers flows through Bangladesh. This runoff is the third highest in the world after the Amazon and the Congo river systems.



INTRODUCTION

Ever since its tumultuous birth in a bloody civil war in 1971, Bangladesh has faced enormous challenges in meeting the needs of its exploding population.

Despite advances in family planning, the country's population has nearly doubled in just 34 years—from 75 million since the country's founding to more than 144 million in 2005.

Bangladesh is one of the world's ten most populated countries, with 1,000 people per square kilometer (2,600 per square mile). By comparison, the world's two most populous countries, China and India, have 115 and 274 people per square kilometer, respectively.

The situation is made worse by the fact that one-fifth of the country is water, and much of the land is barely above sea level. During the monsoon, large parts of Bangladesh are submerged for three to four months. Overcrowding on the fertile, easily accessible land drives the poor and landless into remote regions of the country, where they battle for survival against nature and each other.

The scarcity of habitable land is aggravated by widespread deforestation. River erosion claims nearly 25,000 acres of land annually, leaving thousands homeless. Erosion can eat away more than a kilometer of riverbank in a year, sometimes imperiling entire towns. The Serajanj district in northwest Bangladesh, for



example, is fighting off the encroachment of the Jamuna River. Vast areas of the town, including its main marketplace and railway station, have already disappeared into the river.

The shifting landscape of Bangladesh increases the hardship on an already-impo- verished population. At least 30 percent of the country's citizens cannot find work or are underemployed, mostly as agricultural laborers. More than 40 percent are considered landless by the government. At least 50 percent live below the poverty line, subsisting on less than US \$1 a day. Some 20 million people who live in villages along the rivers have no access to basic facilities such as electricity, telephones, health care, and education.

These grim statistics have presented an ever-growing challenge to successive governments, development practitioners, nongovernmental organizations (NGOs), and donors, whose combined efforts have brought modest but encouraging improvements over the past 15 years. The country, which suffered from a perennial food shortage, is now almost self-sufficient in food production. Its primary school enrollment has reached nearly 90 percent, and its microcredit system, pioneered by the Grameen Bank, is a model for fighting poverty around the world.

Although numerous NGOs operate across Bangladesh, few do so in the remote, economically depressed northwestern region. The districts of Natore, Pabna, and Sirajganj, about 190 kilometers northwest of Dhaka, have no industry or significant service sector to support a population that exceeds 5.85 million. Agriculture and fishing, the main economic activities, are in dire straits because of river pollution caused by open latrines and pesticide runoff from farmlands during the monsoon. Poor roads and lack of communication contribute to the isolation of this area.

One local NGO, however, found a novel way to circumvent the absence of infrastructure and to bring information technology to communities in this remote region.

The Boat Project: Shidhulai Swanirvar Sangstha

Shidhulai is the name of a village in the Natore district, and the term *swanirvar sangstha* means “self-reliant organization.” Founded in 1982, Shidhulai Swanirvar Sangstha (Shidhulai) is devoted to improving the lives of people in remote areas of Bangladesh by empowering them through information sharing and education.

In 2002, Shidhulai introduced a program that has brought hope to the residents of Natore district and surrounding areas. Using custom-built, indigenous boats, Shidhulai

The Critical Role of NGOs

Since independence, the state has struggled to assist the poor and reduce poverty. NGOs play a vital role in this effort. NGOs have sprung up across the country: according to the Association of Development Agencies in Bangladesh, they now number more than 1,000. These groups have been successful in promoting small-scale, home-based income-generating activities, such as cattle and poultry farming, food processing, social forestry, apiculture, and rural handicrafts. Nevertheless, the country's infrastructure problems and a lack of coordination between the government and NGOs have hampered their effectiveness in alleviating poverty.

established libraries, schools, and mobile Internet education units (MIEUBs) that navigate the Bangladeshi river network, reaching the most-remote areas, even during the monsoon season.

The boats use solar energy and light-weight generators to power computers, projectors, and other technical equipment. They are equipped with cellular modems and antennae and use several Internet Service Providers (ISPs) to provide Internet connections in different areas. Project staff members teach children and adults how to use the technology to retrieve information. They also offer education on a range of practical topics, such as environmentally friendly agricultural practices, microenterprise development, food security, and health care.

Shidhulai's activities are concentrated in the Nandakuja-Atrai-Boral watershed region in northwestern Bangladesh. The project area covers 240 kilometers of rivers, streams, and wetlands. As of 2004, it was home to about 86,500 families. The watersheds are part of the greater Chalan Beel, the largest wetland in Bangladesh.

The Project in Action

On a hot, humid day in July, the boat library, boat school, and MIEUB dock at Krishna Nagar, a farming-and-fishing village in Singra, a subdistrict of Natore. Anchored side by side, the three boats hum with activity. The boats usually travel separately, but today they are working together to maximize their training and information-sharing capacity. The users, mostly young girls wearing *hejab*, a head scarf worn by conservative Muslim females, take advantage of the facilities with deep interest and enthusiasm.

“It’s a great opportunity for us. We’ve never seen anything like this in our village,” says Shabnur Parveen, age 17. A college sophomore on summer vacation, she comes to the library whenever she has free time. She mostly reads literature. Shakespeare is her favorite writer, and she has already read *Hamlet* and *Romeo and Juliet* in Bengali translation. The library contains books on literature, economics, religion, and family law, among other topics.

Each boat library has four computers with Internet access and one printer. MIEUBs carry digital projectors, screens, and laptop computers for online training sessions that are offered on board as well as on shore, where they reach even larger audiences. Three girls and one boy, all in their midteens, are learning computer skills. They hope to gain an edge in the region’s highly competitive job market.

“For me, this is a dream come true,” says Hafiza Khatun, a shy tenth grader. Asked to write her name and address, Hafiza trembles as she fiddles with the keyboard. Alope Kundu, a volunteer computer instructor who has worked for several technology firms, comes to Hafiza’s rescue. “Don’t be afraid. Take it easy,” he counsels. Virtually all the users are new. “After five months, you’ll see how proficient you are,” he assures them. “Seeing a computer, let alone touching it, was beyond our wildest imagination,” says Abdul Azad, a farmer.



The boats are designed to adjust to any equipment configuration as well as to protect the electronic equipment from inclement weather, even during the height of the monsoon. Flat-plank floors allow the boats to glide in very shallow water. The boats are also outfitted with waterproof roofs and side windows that open in good weather.

Project Genesis

A native of Natore, Abul Hasanat Mohammed Rezwan, executive director of Shidhulai, saw firsthand the hardship of people who have no access to information and the opportunities it affords. With roads impassable during the monsoon, students cannot make the trek to school. It is common to see school dropouts in this region, even though primary schooling is free.

“How can you accept this situation?” Rezwan says. “I’ve seen many of my friends and relatives just fall by the wayside, forced to embrace a wretched, miserable life simply because they were denied access to education.”

Rezwan studied architecture at the prestigious Bangladesh University of Engineering and Technology (BUET) in Dhaka. Even before graduating in 1998, he began toying with the idea of doing something in his village that would alleviate people’s wants and needs. “I thought that if the students cannot come to the school for lack of proper transportation, then the school should come to them,” he says.

During his university days, Rezwan made frequent trips to his village. The more he visited, the bolder his determination to take action. In Bangladesh, it is almost unheard of for a bright BUET graduate to abandon the assured path of success and prosperity for an ill-defined career in rural development.

“I’m immensely pleased with what we’re doing,” he says. “With determination and commitment, you can do wonders.” Rezwan appreciates the dedication and commitment of his staff, including Program Manager Suprakash Paul, Education and Training Officer Abdul Manan, Administrative Officer Tarikul Hossain, and others, who implement the Shidhulai mission. He also applies his own expertise in developing distance-learning tutorials and hand-outs to make the curriculum simple and easily understandable.



AHM Rezwan with a class.

A Model for Others

The program has already been replicated by local NGOs in two areas in Bangladesh—Daridra Bimochon Sangstha at Baraigram in Natore and Panchshisha Bahumukhi Somobay Somity at Chalanbeel in Sirajganj. In addition, the Impact Foundation of Bangladesh is organizing an MIEUB on health education as part of a campaign to educate rural residents. Sustainability Partnerships, an NGO based in Stockholm, Sweden, established a similar program in Mali in 2004. Shidhulai provided technological advice and educational materials that facilitated replication of the program in Mali.

Awards

Shidhulai has won several awards for its innovative boat program. In addition to the Access to Learning Award, it received the Global Junior Challenge Award of the Municipality of Rome in 2004, second prize in the Stockholm Challenge Award of 2003, the Citizen-Based Initiative Award in 2002 from Ashoka, and the Intel Environment Award from the Tech Museum of Innovation.

Shapla Rani Pal, 25, is in charge of the boat library. Around 8 a.m., the library's three-member staff, including Pal's assistant and a boatman, set off from their regional headquarters in Natore in their specially fitted boat. The boat makes its first stop in Krishna Nagar.

On a typical day, the boat libraries make four stops and stay two to three hours at each stop. Unlike the MIEUBs, which offer evening programs, the boat libraries are supposed to finish by 5 p.m. On most days, however, they're out much longer. "How can you shut the door when they want to stay a bit longer?" Pal says. "It's truly exhilarating to see so many people coming to our boat. We're overwhelmed," she adds.

Shidhulai's two major objectives are to promote literacy, especially among girls and women, and to educate villagers about environmental issues so that they can reverse the damage to the waterways on which they depend for their livelihoods.

CHANGING THE LIVES OF GIRLS

In a country where most of the population is illiterate, Shidhulai is making significant strides in educating young people, particularly girls.

Women make up almost 50 percent of the population of Bangladesh. "There's no way the country can move forward without empowering them," says Rezwan. As men spend considerable time outside their villages searching for better opportunities, women, increasingly, are forced to augment the family income. Many women have turned to farming, but a female farmer receives only about half the wages of her male counterpart.

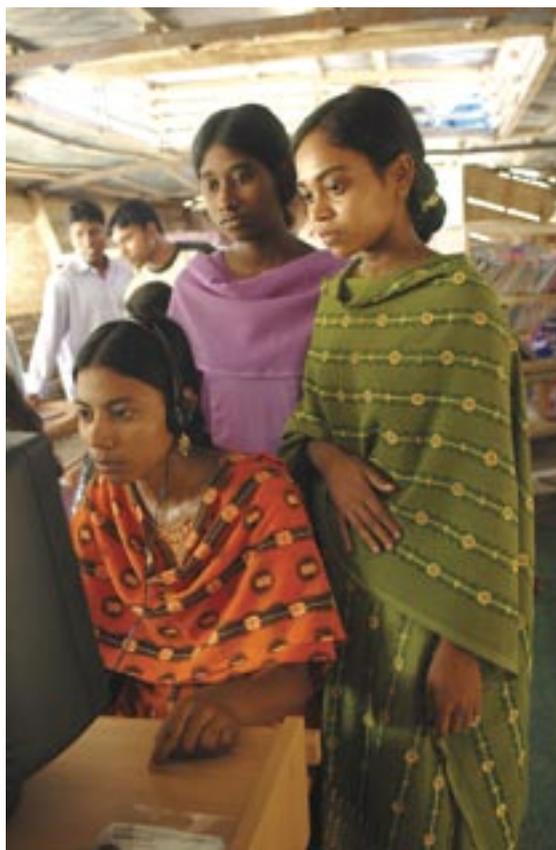
In a deeply conservative society such as Bangladesh, religious and cultural mores restrict women's mobility. This means that women are often relegated to jobs with low

economic returns. The unique approach of the boat project addresses the religious and cultural barriers that have prevented women from achieving social equality. Women now take full advantage of the boat school, library, and Internet facilities delivered right to their doorsteps. The proximity of the facilities allays the concerns of their parents and guardians.

On the boats, villagers, including students, school dropouts, unemployed youth, and particularly women, receive training.

When their schedules permit, users often spend two to three hours learning about the computers.

Shidhulai's two major objectives are to promote literacy, especially among girls and women, and to educate villagers about environmental issues.



A group of students at a computer terminal in Natore.

SAVING DYING RIVERS

Like Krishna Nagar, most villages in the project area lack running water and proper sanitation. Open latrines dot the riverbanks. Men, women, and children bathe and wash their clothes and cooking pots in the contaminated water. Adding to the pollution from untreated waste is pesticide runoff from farmland during the monsoon. Studies have documented the effect of these pollutants on public health, and especially on the health of newborns. The pollutants are known to cause stunted growth, stomach ailments, and skin diseases.

Water contamination also affects the fish population. The production of fish, Bangladesh's main source of protein, has declined about 50 percent since 1970. The fish kill is largely attributed to cropland runoff contaminants, the result of using too many pesticides. The situation has hurt the livelihoods of people who rely on fishing for their survival.

"We decided we must do something to save these people from the slow, creeping disaster that not only threatens human health but the whole environment," says Rezwan. So, he introduced the first river-based environmental curriculum in the country. The curriculum teaches villagers how to protect the environment and conserve water. For example, Shidhulai launched a "Save the Rivers" education campaign to raise awareness of the critical role of rivers in everyday life. The program educated farmers about environmentally friendly crop-production practices and methods of maintaining the ecological balance in the natural environment. The program also facilitated a conversation between scientists and farmers about effective agricultural practices. Technology, through email and video, has allowed these conversations to occur and to continue over time and distances. As more farmers practiced sustainable agriculture, word of the program's success made the national news, and other rural communities started similar campaigns.



Trainer Aulak Kumar Kundu (r) teaches the computer to Shilpi Khatun (l).

Shidhulai Technology and Content

About 35 boats are now delivering services across the project area. Of them, 12 are for libraries, 10 for MIEUBs, and 13 for schools. Local communities provide the organization with 13 additional boats that are used for other project activities, such as mobile health care units, offices, and waste-exchange facilities.

The project has 135 computers for the boats and field offices. Of these, 98 are used to provide access to library materials and locally developed content. Most of the com-

puters have cellular modems and application software. Each boat library and school has four desktop computers and one printer, 500 books, 50 periodicals, 5 newspapers, and materials on children's rights, health care, and family law. Each MIEUB has one desktop computer and one laptop, a multimedia projector, a display screen, sound systems, cellular mobile systems, and printers. Thirty-seven computers are used for staff development, testing, and office support.

Shidhulai runs its programs six days a week, from Saturday to Thursday (Friday is the weekly holiday in Bangladesh). The facilities are used by adult men and women who are interested in learning computer skills, including how to access electronic information about farm prices and commodities, job opportunities, health care (HIV/AIDS), and human rights, as well as by students.

In the evenings, MIEUB offers informal education programs on human rights, technology, water-quality-measurement techniques, and environmentally friendly agriculture. With the help of volunteers, staff members show locally developed Web tutorials, animated drawings, documentaries, and

dramas. Between 250 and 300 people typically attend a MIEUB program.

Shidhulai has created local content in cooperation with the villagers and volunteers. These locally developed tutorials, training materials, online presentations, and schoolbooks support education in technology, literacy, human rights, women's rights, child trafficking, domestic violence, organic farming, and the benefits of biodiversity, among other topics. The content is tailored to the needs of different audiences—literate and illiterate men, women, and children.

Overcoming Technological Challenges

Introducing computers and the Internet to the boat program was a challenge. Shidhulai began using the telephone lines of its project office to connect to the ISP in the city; a wireless network was then used to distribute the signals to the MIEUB and libraries. But the poor condition of the phone lines and limited coverage of the wireless network compelled Shidhulai to switch to tellular mobile systems (cellular phones with data transfer capabilities), along with high antennae, to transmit signals from the boats.

Under this system, only dial-up connections are available, and they can be very slow. That limits Internet users to sending and receiving small files, conducting database searches, and simple browsing of the Web. Shidhulai hopes to remedy the problem in the near future. Cellular services in Bangladesh are expected to improve with the availability of high-speed Internet connections.

Staff and Volunteer Training

One hundred-fifty full-time staff and 1,500 volunteers run the organization. Most work in the field, operating boats, providing training, and facilitating daily operations. Staff are recruited from the villages where Shidhulai runs programs. Volunteers come from universities, government agencies, and research institutes. Shidhulai headquarters is located





Iman Ali (front) uses the computer in the mobile Internet educational unit.

in a small office in Dhaka. A regional office in Natore is also used as a training center. There are eight field offices across the districts.

The success of Shidhulai is in large measure a result of the field-oriented training that it provides staff and volunteers. Various kinds of training are offered, according to the needs of any given job. Technology courses are offered regularly. These last for eight months, with twelve weeks spent at the MIEUB.

Shidhulai periodically organizes workshops for staff. These sessions feature invited specialists and experts who discuss ideas on recent developments in information and communication technology, libraries abroad, the environment, and agriculture. There are also exchange programs for staff members who visit other libraries, NGOs, government agencies, and universities. These programs are normally offered during vacation time.

Creating Community Networks

To sustain the program and bring long-term benefits to the river communities, Shidhulai helped establish community networks in the project villages. The idea is to involve local residents in the project so that they consider it their own and have a desire to help sustain it. The networks also raise awareness about specific issues of importance to the village. The following are some examples of the networks.

The Water User Association (WUA) helps farmers identify their agrarian needs and understand related environmental issues. In cooperation with Shidhulai extension workers, WUA members, who are mainly farmers, discuss ideas and identify the best-possible techniques and practices for specific problems.

Once WUA members have completed a series of instructional sessions on a particular topic (for example, water quality), they are required to donate a certain amount of time to monitor the water quality in their areas. Members collect water samples as well as data on water transparency, color, temperature, depth, rainfall, and river levels. Shidhulai experts then analyze the data and propose solutions to identified problems.

WUA members are also trained in agricultural-production practices. The trained farmers are then divided into groups of extension-delivery teams that help improve existing farming methods. So far, 45 such teams have been formed in the project area. WUA members use the computers and Internet services available on the boat libraries to obtain commodity and farm-input prices. The information helps them get better prices for their products.

Girl Children's Rights Association

(GCRA) is a distance-education program.

Through discussions, meetings, and formal training sessions, girls and young women between 13 and 29 years of age learn about domestic abuse, early marriages, child trafficking, prostitution, and the importance of independent media, among other issues. Some GCRA members provide information on child trafficking and prostitution to a cen-



Fishermen on the river, Bildohar, Natore.

tral database that helps Shidhulai track trends in the project area.

Microenterprise Groups (MGroups) provide a monthly forum where villagers, particularly women, receive instruction on microenterprise development and explore ideas for small-scale income-generating activities. After careful scrutiny of proposed activities by peers, members receive credit and ongoing education in enterprise management.

Before the boat program began, riverside communities had no way of coordinating their work on development issues. With the MIEUB and mobile phones, the WUA, GCRA, and MGroups can interact with each other to address problems more effectively. Shidhulai staff members regularly meet with members of these groups to monitor their progress, identify problems, and solve those problems using boat library resources.

Funding and Donations

To meet its annual operating costs of approximately US \$825,997, Shidhulai receives financial support from nonprofit organizations and income-generating projects. Sixty percent of Shidhulai's operating costs are supported through grants from Ashoka, the Commonwealth of Learning, Direct Relief International, the Global Fund for Children, and the Levi Strauss Foundation.

Shidhulai generates income from its waste-recycling program. Waste pickers from across the project area buy plastic, iron, tin, batteries, and glass from villagers. The waste pickers sell this solid waste to Shidhulai, which then sells it in bulk in Dhaka and other districts for recycling. Shidhulai started providing low-interest credit to the waste pickers so that they can collect larger quantities of trash. Under this program, waste collection has doubled.

The mobile phone service is another income-generating project. Rural residents are charged a fee for using the boats' mobile phones for personal reasons. This service generates about US \$40 every month for each of the boats. The revenue helps cover the costs of printer cartridges, paper, and other supplies. Shidhulai also raises funds through special events and individual contributions.

Lessons and Benefits

Over the years, Shidhulai has learned many lessons that have enabled it to improve its services. Those lessons have also helped to highlight the project's benefits.

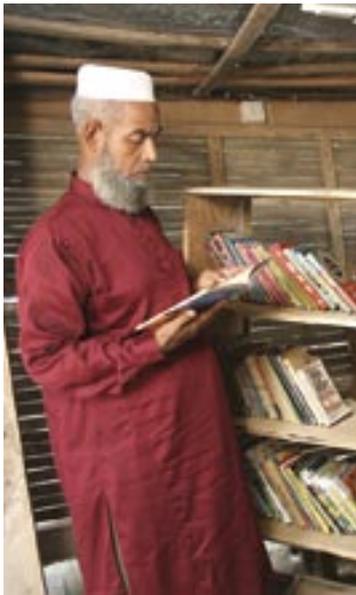
LESSONS

- The boats are designed to accommodate users' needs and protect the electronic equipment in all kinds of weather. Nonetheless, during the monsoon season, or even during heavy rain, it is often difficult for the MIEUB to stage educational programs. In such instances, boats are

docked at sites between large trees so that plastic sheeting can be suspended from them to protect the users from the rain.

— Since one phone line is used to activate the modem, each library has been given additional phone lines to ensure that telephone services are not disrupted.

— ISPs do not have enough modems to meet subscribers' demands, and users often get busy signals when they try to log on. To address the



Mohammed Nasir Uddin using the book library.

problem, Shidhulai opted to use Internet connections from different ISPs.

- Initially, Shidhulai had difficulty recruiting volunteers because riverside communities are isolated and residents could not understand why it was in their interest to donate their time. But after arranging sessions at local educational organizations and highlighting its boat-based, hands-on approach, Shidhulai succeeded in recruiting a diverse group of volunteers. To keep them motivated, Shidhulai offers ongoing training sessions and arranges study tours to libraries, historical sites, research institutes, and universities.

BENEFITS

- Shidhulai has adapted the timing and content of courses to meet villagers' needs. For example, literacy programs are offered both during the day and in the evenings in order to accommodate the schedules of working children. Children who cannot get to school during the monsoon receive remedial training on the boats. Shidhulai constantly surveys villagers to find out what kinds of course content they believe is most useful, and it adapts the courses accordingly.
- By establishing grassroots networks, Shidhulai gives villagers a stake in the project and facilitates communication on fundamental development issues. For example, WUA farmers get better prices for their products now that they can find pricing information on the Internet.
- The operational costs of the boat library and MIEUB are substantially lower than those of a standing library. In addition, the boats provide maximum flexibility. They can reach villagers who, for logistical, social, or cultural reasons, cannot access a standing library.

— Using multimedia programs shown on projectors, Shidhulai is even reaching women in their own homes. Given the boats' proximity to villages, some programs can be seen and heard by residents sitting in their own courtyards. In some cases, villagers on both sides of small rivers and canals have taken advantage of Shidhulai programs.

Evaluation Methods

Shidhulai has spent considerable time measuring the impact of its programs. It conducts needs analyses both before and after implementing a project. Surveys of staff, volunteers, villagers, teachers, and parents are done at the beginning and end of each year. Shidhulai also commissions consultants' reports that document the improvements in daily lives and users' opinions of training programs. The consultants analyze the exam results of boat school users. To measure the boat library's impact on school enrollment, for example, Shidhulai analyzed enrollment and dropout rates at the end of each year, interviewed parents and teachers, examined attendance records and exam results, and surveyed children about their specific interests in the library program.

Shidhulai periodically reviews its libraries' holdings to determine the utility of their content. Staff and user comments are sought on the level of project cooperation within the community as well.

One segment of the rural population that Shidhulai targets is homeless children. Their parents are either flood victims or marginal farmers and day laborers. The children are invited on a regular basis to share their views and opinions about their needs and interests. The children's comments are used to improve facilities and services.

Project Impact

The impact of the integrated boat program has been phenomenal. Since the program was launched in 2002, school enrollment in greater Chalan Beel has increased 25 percent, and the dropout rate has fallen by 30 percent. One of the most successful programs has been basic education for those who have never enrolled in school or do not have any chance to enter mainstream education because they are considered too old to be enrolled in primary school.

Nasreen Khatun, a slight woman in her late teens, drills nearly 35 girls in the Bengali alphabet. Her charges are packed tightly in the 40-by-15-foot boat. "Tell me from the picture what the first letter denotes," Ms. Khatun asks while holding up a book. Several hands shoot up. "I can, Apa," they shout in unison. (*Apa*, which means "elder sister," is an honorific for female teachers.)

Ten-year-old Hosne Ara then volunteers to come forward and demonstrate what she has learned that morning. The picture that accompanies the first letter in the book, she



Nasreen Khatun teaches the Bengali alphabet.



Even when roads are impassable during the monsoon, students can still attend school in the boats.

says, tells about the river. In fact, the entire book, conceived and designed by Shidhulai and titled *Going to School*, is about rivers and the importance of environmentally friendly farm practices, the pernicious effects of pesticide use, and water conservation.

Nazma Begum, a mother of two, proudly explains how she has benefited from the program. "I've been able to almost double my yield of eggplants and leafy vegetables," she says, by using the techniques she learned from Dr. Samajit Pal, an agricultural scientist. Dr. Pal, who works for the government, is one of the project's 1,500 volunteers. Because his office is 70 kilometers from the project

site, Dr. Pal often addresses many of the users' problems and questions through e-mail, which he receives from the MIEUB.

According to a recent Shidhulai survey, the MIEUB is providing education to farmers from 263 riverside villages on such subjects as biodiversity; the benefits of insects, parasites, and microorganisms; monitoring water quality; integrated crop management; and land-water rights.

Over the past 30 years, as farmers have used more pesticides and the prices of fertilizer and pesticides have skyrocketed, more farmers have gone bankrupt. With the MIEUB educational materials and database, farmers now receive training on op-

Since the program was launched in 2002, school enrollment in greater Chalan Beel has increased 25 percent, and the dropout rate has fallen by 30 percent.

timum fertilizer use and sustainable farming. The database contains interviews with scientists on environmentally friendly agricultural practices and water-quality issues, information on soil- and water-sample collection, technical advice, market information, and a question-and-answer section. As a result, there has been a 30 percent rise in agricultural productivity and a 40 percent reduction in the use of pesticides. At the same time, there have been improvements in the health of frogs, snails, tortoises, and other species that are beneficial to farmers.

The survey also shows that about 19,500 people are directly benefiting from the project. Of them, 15,000 farmers have been trained on proper fertilizer and pesticide use, and 4,500 received training on a program to plant trees and grasses along the riverbanks to help halt soil erosion.

About 65 percent of the farmers who received training have cut the amount of time that they spend farming. Farmers' incomes have increased by 35 percent. Because they have reduced their production costs and increased their earnings, thousands of landless farmers no longer need to leave their villages in search of work. Through the micro-credit program, they have opened small- and medium-size businesses, including paddy husking; lime making, pottery, weaving, and garment production; and transport services. At the same time, tree and grass planting has slowed erosion. Water quality has improved as villagers remove open latrines from the banks of the river.

Looking Ahead

As the recipient of the Bill & Melinda Gates Foundation's 2005 Access to Learning Award, Shidhulai plans to use its award funds to expand the boat program to other rural communities. The organization will also replace its Windows 95 computers with newer ones, secure additional computers, and buy more efficient solar panels and generators to ensure

a reliable power supply. Shidhulai also wants to open a new training center and central library facility in Natore that will increase the number of staff and volunteers.

Other uses for award funds include plans to develop newer, larger boats, develop additional training materials, increase the number of electronic resources available in Bengali, and create an endowment for long-term sustainability. Interest from the endowment will be used to support existing programs.

Conclusion

By bringing information resources to rural villagers in their own communities, Shidhulai is addressing fundamental issues that have hampered rural development in Bangladesh for decades. The project provides practical advice and education that help villagers learn to help themselves. The proximity of the resources has motivated parents to send their children, particularly girls, to learn. It has generated considerable enthusiasm, interest, and local involvement. This replicable model demonstrates that information technology and ingenuity, when aligned and developed with community needs and expertise, can help meet some of the most basic human needs and improve people's lives.



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Bill & Melinda Gates Foundation
Access to Learning Award 2005**

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Wellesley, Massachusetts



**Council on Library
and Information Resources**
1755 Massachusetts Avenue NW
Suite 500
Washington, DC 20036-2124
USA

www.clir.org