

Reaching Wider Audiences Through Mobile Unit On Boats: Educating Rural Farmers On Water Quality

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ABSTRACTS

By introducing Mobile Unit on Boats to educate farmers on water quality and environmental-friendly agricultural practices, the project minimized the rate of fish kills, protected bio-diversity, improved river water quality, enhanced the overall health of aquatic system, maximized agricultural productivity and improved quality of life of thousands of landless-marginal farmers.

INTRODUCTION

Bangladesh is the land of rivers; the development, economic growth and environment of the country are highly influenced by water - the quality of surface and groundwater. Although the country is mainly a plain surface, but the very high density of river systems and its criss-crossed character gives the country a riverine nature. The three great rivers Ganga/Padma, Jamuna/Brahmaputra and the Meghna along with 7,000 rivers and streams covering 22,155 km in length, forms the delta of 4,395,966 hectares of inland waters, of which 2,832,792 hectares are flood plain, 146,890 hectares are ponds and tanks, and 610,000 hectares are estuaries and mangroves. The surface water sources not only provide sanctuary to the inland water fish species, but also to thousands of other plants and animals. This country has been very rich in fish and aquatic resources, and other biodiversity. Rivers and other inland water bodies provide the habitat of 266 species of indigenous fish, 13 exotic fish, 56 prawns, 26 freshwater mollusks, 24 turtles and tortoises, 10 frogs, 150 birds and several species of crabs. The demands for fresh water for different sectoral uses such as agriculture, fisheries, navigation, industry, domestic uses and for other livelihood activities have increased greatly in the recent years with the gradual increase of population and expansion of economic activities. But due to the non-point source pollution most of the water bodies and rivers have reached alarming levels, the aquatic ecosystems are being affected, and the chemicals entering the food chains creates public health implications.

Bangladesh has the highest rural population densities in the world, and most of the rural areas have densities around 1,000 people per km². But the people living in the remotest riverside areas of Bangladesh are often deprived of the availability of

electricity, telephone, television, video cassette player etc, as the areas are not in the focus of development initiatives. Mobile Internet-Educational Unit on Boats (MIEUB) reaches to these people via river ways, anchored at the riverside, the Unit arranges evening-night educational programs. The project was developed by Shidhulai Swanirvar Sangstha (SSS), Bangladesh with the support of The Commonwealth of Learning (COL) under the Poverty Reduction Outcomes through Education Innovations and Networks program (COL PROTEIN).

OBJECTIVES:

Broad objectives:

- To ensure the access of the poor community in the mainstream of development and concern them about the water quality of the rivers.
- To educate farmers on the crop production practices that can protect water quality and increase agricultural productivity through the introduction of recent agricultural development around the world.
- To reduce the non-point source pollution, soil & stream bank erosion and improve the overall health of the aquatic system.
- To document farming community's perception on river, soil, crops, and the environmental health of the watersheds in general, and disseminate the information's to wider audiences through the Mobile Internet-Educational Unit on Boats.
- To provide rural farmers with the basic and relevant agricultural information's like current market prices and village wise weather updates through the Mobile Unit on Boats.

Specific objective:

- To inform farmers about the impact of inappropriate use of pesticides on the overall health of the aquatic system.

THE PROBLEM

River plays an important role in the communication system of rural Bangladesh. Therefore, most of bazaars, public and religious places, and economic activities were expanded in the riverside areas during the earlier periods, but the planning of the road ways did not consider the existing river networks of the country, and thus people living in the riverside areas are still have to depend on the rivers for transportation. In fact the development initiatives of the country are concentrated around the roadways; on the other hand people living in the riverside remotest areas

are always deprived of the availability of electricity, telephone, television, video cassette player etc.

Basic Statistics on Communication of Bangladesh

Paved roads	15,603 km
Earthen roads	1,89,679 km
Length of inland rivers	22,155 km
Goods transported through rivers	50 % of the total goods
Passengers transported through rivers	21% of all passengers

These riverside areas are not in the focus of development initiatives of NGO's as well, as these areas are isolated by rivers, and do not have any connections with the mainland; Development workers usually work in the areas where there is regular road network and have comparatively easy access from other places. Therefore the development initiatives of the country are concentrated in the Upazila or Union Council Headquarters, people living in the distant parts of the Union Council or riverside areas do not get any facilities offered by the development projects. There is a river network across the country, which is easily accessed by boats, but development initiatives using the river ways have not yet started in Bangladesh.

The project areas of Shidhulai Swanirvar Sangstha cover the distant parts of different northern districts besides the different rivers, i.e. the Atrai, Baral, Gumanin Rivers and Greater Chalan Beel (the largest wetland of the country). People of these areas usually do not have any access to the information society. Therefore the amount of fertilizer and pesticide, farmers had to use went up a hundred times over thirty years due to their knowledge gap on the proper use of fertilizer and pesticides. During this period, the price of fertilizers and pesticides went up ten times, as a result farmers all over the rural areas started to go bankrupt. The total amount of fertilizers used annually is about 2 million tons. The excessive use of fertilizers and pesticides not only affect the soil but also impact every aspect of the ecosystem. Compaction, salinization, loss of biological activity, excessive oxidation of organic matter, and soil erosion are a few of the soil degrading processes that are threatening the sustainability of the local cropland resource. Water quality is often negatively impacted through movement of sediment and sediment-associated nutrients or as a result of runoff in riverside areas.

There are hundred kilometers of severely eroded stream banks, and 6 to 12 inches of the bank are lost each year. Therefore one percent of the river's storage capacity is lost in every five years. Each year river erosion grabs nearly 25,000 acres of land resulting thousands of homeless people in Bangladesh. To date more than 2.5 million people were rendered homeless as the rivers destroyed their homesteads and the other sources of livelihood.

Several decades ago there was an abundance of fish in this country, but recently fish production has declined to about 50 per cent, with a negative trend of 1.24 per cent per year as the overall fish health is poor and succumbs to protozoan and bacterial infections. The fish kill is due to the cropland runoff contaminants, result of using the pesticides more than the needed application rates. The overall health of the aquatic system is degrading day by day as well. According to the Red List of IUCN, there are 54 species of inland fishes, 8 amphibians, 58 reptiles, 41 resident birds, and 40 mammals, which are threatened throughout the country. Though Bangladesh itself is the largest watershed, but initiatives on saving the rivers have not yet started.

Latrine usage is very poor across the country, averaging only 16 percent in the rural areas. In the riverside areas the lack of awareness on latrine usage results a serious threat to the quality of surface water sources. The open latrines are located beside the rivers or very close to the water sources causing the fecal contamination and Diarrheal diseases, killing over 100,000 children each year. Thousands episodes of diarrhea occur in children and adults each day in rural Bangladesh. Diarrhea diseases have close biological and socio-economic links to the other problems like malnutrition, poor maternal health, high fertility, and certainly to child survival.

SPECIFIC TARGET GROUP:

The target groups of the project areas are mostly the poorest of the poor and most disadvantaged segments of the population living in villages along the rivers of northern districts of the country. The beneficiaries are classified under the three different categories: Landless with no homestead land, Marginal Farmers with only 0.2 to 0.4 ha land and Small Farmer with 0.4 to 0.8 ha land. Medium & large farmers are also considered as target groups but not in the main focus group. Most of the target groups are comprised of women, who are engaged in farming activity in their locality, with low training or training that does not meet the requests of the local market. Statistics show that these women are most often poorly trained, and as a result unemployed or underpaid. This makes them one of the most vulnerable groups in the society, being women, minors, mothers and head of families.

THE INNOVATION:

A large part of the country remains seasonally submerged for 3-4 months during monsoon and in this season the earthen roads can not be used even for bicycle. During the period of the year rural people have to rely only on boats for transportation. In Bangladesh most of the bazaars, mosques, temples, educational institutions and play-fields etc were developed near the river ways in earlier periods.

About 16,867 villages are located besides the rivers and 2,02,32,039 people are still living in the riverside remotest areas which is only accessed by boats. Therefore Boats with Internet-Educational Unit on the board can easily reach to these target people via river ways, anchored at the riverside, the Units can arrange evening-night educational programs at the public places and courtyards. The MIEUB is able to involve people in open distance education program with a wide variety of information's available on the World Wide Web. One of the updated features of the Mobile Unit on Boats is the regular information delivery on market price and village wise weather updates to water user association's and village people living in the distant places. The MIEUB is able to be fitted and actuated at any local country boat, anywhere and at any riverside remotest areas. If the equipments are accommodated in a smaller country boat, and then another country boat will be needed to accommodate the display screen.

ODL AND ICT OUTPUTS:

Informative websites with Bengali Voices have been introduced to the farmers along with other developed multimedia educational materials. There are also informative articles with voices, web casts, interviews of the scientists etc on environmental friendly agricultural practices and water quality issues, which were developed with the collaboration of research institutes. Farmers are now familiar with websites, e-mails, and the overall benefits of technology to humanity.

Market information's are now available to the remotest growers and farmers so that they can decide the most profitable market in the district, as well as the other markets of the country. The program particularly helps the growers to earn more.

The MIEUB provides information's on the agricultural non-point source pollution, soil & stream bank erosion and health of the aquatic system concerning water quality of rivers with the display of recorded dramas, folks songs, web based tutorials, animated drawings etc. Now the rural people are conscious about the water quality of the river and practicing the knowledge they received.

The changes of river occurring during each season, data's at the different stations of monitoring, and relevant field experiences are gathered and summarized for the display during the programs of the MIEUB and will also be published in website in order to disseminate the projects learning to the wider audiences across the world.

The MIEUB provides village wise weather updates to the villagers, and will also introduce online agricultural advisory service to ensure the access of rural people to latest information and developments in agricultural arena. Due to the audio-text-

drawing feature of the educational materials, the participation of rural farmers specially the women groups are increasing day by day.

DESIGN AND METHODOLOGY

Mobile Internet-Educational Unit on Boats reaches to the target people via river ways, anchored at the riverside, the Units arranges evening-night educational programs at the courtyards and public places. Having four people on the board, the boat is equipped with a Laptop Computer, Multimedia Projector, Display Screen (12'x12'), Sound System, Generator, Uninterruptible Power Supply (UPS), Wireless Telular System, printer and developed multimedia educational materials. One volunteer teacher acts as the main facilitator, is assisted by the group of four people who organizes the show. The extension and training officers of SSS trains the groups and, help them to develop the educational lessons such as web based tutorials, animated drawings, presentations and recorded documentary on jari songs, interviews, farmer's success stories etc on water quality for the distance education programs. The other project activities i.e. street dramas, water user association's meetings, grassroots innovations etc are recorded with the digital camera, and then it is displayed on the large screen along with the other information's available on the World Wide Web. The Mobile Data feature of the boats allows the rural farmers to get information's on the village wise weather updates, and commodity and farm input prices. With this features, the rural people are able to send and receive mails, and get relevant information's from the internet. The beneficiaries of the project area also get the facility to use the mobile phone feature of the Boat.

The MIEUB reaches at each of the neighborhoods throughout the school year on the need basis. The school year is divided in to different environmental themes i.e. Non Pesticidal Pest Management program, Non Fertilizer Based Nutrient Management program, Water Quality Monitoring program, Filter Strip Establishment and stream bank erosion control, Integrated Crop Management etc. Farmers of each neighborhood gets access to the online and offline web based resources twice a month. During the next year, they will also be able to send information's about their learning's, local innovations and practices on sustainable development to the website of the project.

BENEFITS TO GIRLS AND WOMEN

Due to the socio-cultural and religious superstitious, the rural women can not participate in the development initiatives side by side with men in rural Bangladesh. Therefore the women's participation are not satisfactory in the public meetings and

street dramas, as these programs are organized at the public places like hats, bazars etc. It is also found that cultural programs like street dramas can not be organized close to the dwellings of farmers. On the other hand, the Mobile Internet-Educational Unit on Boats anchors at the courtyard of the neighborhood during the evening when the women groups do not have any household works, and easily spend two to three hours on the open distance education sitting at their own courtyards. During the MIEUB program the girl and women's participation was always satisfactory (73% of total participants) as the programs are organized close to their dwellings. And rural people's keen interest in new the technology also influenced women groups to participate in the programs.

BENEFICIARIES' RESPONSE TOWARDS THE PROJECT

The active participation and enthusiasm of the villagers concerning the mobile unit program is increasing day by day. The regularity of farmers in the MIEUB program at each of the neighborhoods is steadily increasing along with the wide range of participation of villagers including youth, children, male and female of all castes etc. There are also visitors coming from nearby villages.

In fact the quality of the environmental health of the river is improving, as the farmers are practicing environmental friendly agricultural practices, engaged in improving the surface water courses, started using the paddle pumps for the utilization of river water for agricultural purposes, engaged in removing riverside open latrines etc.

The project has provided a new reason for rural people to be interested in the preservation of natural resources and also attracted the non-farming groups to come forward to save the rivers.

THE SUCCESS OF THE PROJECT

The villagers, from all walks of life and age groups, have taken the project with much enthusiasm, and they attended the weekly training sessions regularly. It is heartening to see girls and female farmers curiously standing at their own courtyards, exploring the contents and learning new things. Indeed, the villagers have learned to live with the technology and started to customize it to suit their unique needs.

Due to the knowledge gap of farmers on the proper use of fertilizer and pesticides, the usages went up a hundred times over last thirty years with the prices, but with

the education of the Mobile Internet-Educational Unit on Boats, 15000 farmers were trained on proper use of fertilizer and pesticides, the usage is reduced and agricultural productivity is increased to 15 percent, and thousands of landless farmers did not have to leave their villages in search of work.

The Mobile Units trained thousands of people on the tree & grass filter strip establishment, and as a result the riverbank residents have established hundred acres of trees and grasses in the river banks of their neighborhoods, which has controlled the soil erosion and polluted runoff.

Thousands of the farmers were trained on the identification and preservation of beneficial bugs-insects, mechanical means of controlling pests and insects, and reduced use of pesticides. The usages of pesticides are reduced to 25 percent in the watershed and the fish kills is controlled in this year. Also farmers have been successful in saving a good amount of money due to the reduced usage of pesticides, which has changed the quality of their livelihood.

About 65 percent of the trained farmers have been liberated from the extra time spent in the agricultural fields, and also saving money due to the reduced use of fertilizer and pesticide. The saved time and money are now used for better family care, education and food production. In fact the income of landless and marginal farmers has been increased up to 15 percent during the last season.

The stream health of the river is improved. The number of macro-invertebrate found in a unit area has been increased to 17 percent and a good number of the water quality monitoring stations is free from coliform contamination.

The villagers are beginning to self-organize themselves to address other village issues such as sanitary latrine usages, clean drinking water and control over local water sources. The landless-marginal farmers have started speaking on the language of development, as well as gaining their knowledge and believe on the importance of the river and its water quality in the local economy. About 65 percent of the community members are practicing the knowledge they received from MIEUB. People now know about the top pollution problems affecting the rivers. They now can identify the problems like polluted runoff from cropland, potential source of pollution and soil erosion. About 87 percent of the watershed farmers are now concerned about the need for preserving the bio-diversity and developing Water User Association's in their localities.

DEVELOPMENT IMPACTS

The Mobile Unit on Boats has established relationships among the different sectors of development, such as the rural farmers are getting access to the innovations of the research institutes like paddle pumps, the field experiences of agricultural extension officials of Government and other NGO's are now documented and made available to the farmers through MIEUB, farmers innovations and success stories are now under the considerations of the scientists for further developments etc. The MIEUB gives an opportunity of exchanging views and opinions that have an impact on the local development.

The informative price-lists of the Mobile Units activity have brought changes in the activities of landless-marginal farmers, as it has helped them to sell their products to the market in better prices.

The field experiences of the Mobile Units activity have revealed a new feature of development, which is "the importance of the river in the rural development". It has cast light on the importance of local country boat in the rural development as well; it is true that these elements are able to catalyze the processes of local development and to put new life into rural economy. The experience has proved that it is possible to carry out more developments based on the Mobile Unit on boats activity like mobile telecentre on boats to support landless and marginal farmers, who are always neglected by local governments and organizations as these areas are the remotest and only accessed by boats.

PROJECT'S SUSTAINABILITY

Under the Mobile Internet-Educational Unit on Boats program, rural communities are paying monthly contributions to carry out the expenses like boat for the day, fuel of boat and organize the program at their neighborhoods. This is the first time poor farmers have been paying for their own training in Bangladesh. The amount raised from the mobile phone services of the boats are accumulated as the Watershed Fund. The Watershed Steering Committee and Water User Association would also contribute to the sustainability of the project.

TRANSFERABILITY

It has a good potential for replication. As the multimedia educational materials on water quality are already developed under the Mobile Internet-Educational Unit on Boats program, now only some equipment will be needed for others who want to replicate the program in other parts of Bangladesh. MIEUB would also contribute to the other sectors of development like open distance education for children and adult, media education on human rights, mobile telecentre, mobile healthcare units etc. The

project is developed in association with the Commonwealth of Learning (COL), Canada as a new media or method for open-distance education, it is expected that this type of technology equipped educational boats will move through the river ways of the Commonwealth countries in near future. The project is already replicated by other NGO's in the country, and the Government has expressed keen interest in developing such boats for the education of the riverside areas of the country. In next three years over twenty thousands of farmers will be educated and a good number of rivers will be saved from pollution.

CONCLUSION

Rural life of the country evolves around the river, and the use of technology on boats is definitely responding to the needs of rural Bangladesh. It also contributes to the democratization of information and offers assistance to the underprivileged people of the remotest areas. The project is helping the people who had no right to be accessed to information society. And with the Mobile Unit on Boats their voices are now disseminated to the distant areas and to other farming groups. They are able to think and decide the alternative ways for saving the surface water sources. Now they can look at the whole world, establish their relationships with it and build up a vision of development.

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