

Water Partners International

**IMPACT EVALUATION OF URBAN AND
RURAL WATER AND SANITATION PROJECTS,
BANGLADESH**

FINAL REPORT

August 2008



Bureau of Research, Testing and Consultation
Bangladesh University of Engineering and Technology
(BUET), Dhaka-1000, Bangladesh

**IMPACT EVALUATION OF URBAN AND
RURAL WATER AND SANITATION PROJECTS,
BANGLADESH**

FINAL REPORT

Bureau of Research, Testing and Consultation
Bangladesh University of Engineering and Technology
(BUET), Dhaka-1000, Bangladesh

Executive Summary

Introduction

Water Partner International (WPI), a U.S. based non-profit organization, has recently funded two WSS projects, implemented by two local NGOs named Village Education Resource Centre (VERC) and Dustha Shasthya Kendra (DSK). VERC carried out its project in a rural area in Manikganj District, whereas DSK carried out its project in slums at three locations of Dhaka city. As per desire of WPI the Bureau of Research and Testing Consultation (BRTC), BUET has undertaken this study to evaluate the impacts of those water and sanitation projects implemented by those two NGOs. This report is the outcome of the evaluation study.

Study Objectives

The main objective of the study was to assess whether the projects funded by WPI and implemented through DSK and VERC have been effective in achieving the desired goals in the respective project areas. The specific objectives of the study were as follows:

- To determine whether the water and sanitation facilities continue to work effectively and whether beneficiaries continue to use these facilities as primary sources for potable water and improved sanitation;
- To understand the level of satisfaction which exist among project beneficiaries and what factors are associated with increased or decreased satisfaction;
- To evaluate the post-project impacts (health, temporal, economic, etc) as a result of the projects, how well these have meshed with the anticipated impacts from the proposals, and what factors (project and non-project) will affect the achievement of long-term benefits from the projects.

Approach and Methodology

At the very outset of the study, the study team had a series of meetings with DSK and VERC officials and visited the DSK and VERC project locations to have an overview of the situation in the field. Necessary relevant documents including project proposals, grant/loan agreements, reports and other deliverables, planned implementation schedule and actual achievements and financial reports generated by the projects were collected, compiled and reviewed by the study team.

A questionnaire sample survey was conducted during the month of March, 2008 in randomly selected VERC and DSK project locations. Five rural communities were selected from the VERC project areas in Savar, Dhaka and 15 urban slums located within Pallabi, Demra and Kamrangir Char areas of Dhaka from the DSK project areas were randomly selected for survey. Apart from that a total of 20 Focus Group Discussions (FGDs) in the selected 20 areas were carried out to get views of the people of those areas including the project beneficiaries on different aspects of the project.

Findings in VERC Project Areas

Water Supply

There was acute crisis of safe water in the VERC project area at Fordnagar Mollapara because of arsenic problem. People had to collect drinking water from distant places and people used to spend a significant amount of time for collecting water. To alleviate water crisis and create accessible safe water supplies in the five communities of Fordnagar Mollapara village, a total of six water points (Deep Tube wells) were installed by the villagers through cost sharing among themselves and with the assistance of VERC WATSAN project supported by Water Partners International (WPI). A total of 25160/= (BDT) were collected as participatory cost from the community on “ability to pay” basis apart from the project assistance.

The water of the community water points were tested under the project. Arsenic concentrations of these 6 tube wells were also tested as a part of the present study (using an Atomic Absorption Spectrophotometer attached with a graphite furnace). All Arsenic concentrations were found well below the Bangladesh standard of 50 µg/L and also lower than the WHO guideline value of 10 µg/L.

Arsenic concentrations found in the present study were somewhat lower than those reported by VERC. However, the tubewells currently being used within the project area (excluding those installed and tested as a part the project) may not be free from arsenic contamination. For example, before implementation of the project, VERC tested existing 141 water points (shallow tubewells), out of which 62 were found contaminated with arsenic above the limit of Bangladesh standard of 50 ppb.

Results obtained from the questionnaire survey and the FGDs indicate that the types of water sources for fetching drinking water changed significantly after implementation of the project. At present around 20% households of that village are using the water points installed under the project for collecting safe drinking water. 67.2% households collect drinking water from their own tubewells and rest of the households (12.8%) collects water from tubewells installed by the neighbors or from other sources. This represents a significant shift from unsafe sources (e.g., ponds, dug well) to a safer source (i.e., tubewells). However, as noted earlier, there is concern about the Arsenic concentrations of many of these wells. Physical condition of many of the water points is also not good. Presently around 37.5% households use water from tubewells having no platforms. About 30.6% households spent more than half an hour for collecting water.

Results obtained from the questionnaire survey and the FGDs revealed that majority of people in the project area are in general satisfied with the water supply situation. While most households expressed satisfaction over the present state of water supply following the project intervention, there were differences in perceptions regarding the most important area of improvement. For example, about 43.2% of households observed improvement in quality of water and about 40.8% of households reported sufficient availability of water after installation of water points under the project.

Sanitation

Use of unhygienic open hanging latrines by the villagers of Fordnagar Mollapara village was a common scenario before implementation of the project. Under the project VERC did not provide any financial or direct hardware support to the households for installing latrines. However, they motivated people to install hygienic latrines by describing the ill effects of open defecation and open or hanging latrines and benefits of hygienic latrines. The introduction of Village Engineering Committee (VEC) appears to be an innovative and effective approach for transferring latrine

manufacture and installation technology and tubewell O&M protocols to the communities. Members of the VEC, who received training on hardware installation and O&M from VERC, provided voluntary services in the community for construction and O&M of water points and hygienic latrines.

In all the FGDs carried out in the VERC project areas, the participants were very proud of their achievements in the sanitation sector. After completion of the project, the villagers put up sign boards mentioning that this is an 'Open Defecation Free Village'. However, the questionnaire survey revealed that at present 3.2% households are still practicing defecation in open places and 18.4% are using unhygienic latrines. In addition, about 27% households are not using any fixed place for disposing children's feces. While this marks a significant improvement over the situation that existed before the implementation of the project, 100% sanitation coverage is yet to be achieved. It is interesting to note that in all the 5 FGDs carried out in the VERC project area, the participants claimed they have completely eradicated open defecation from their respective communities. However, the questionnaire survey revealed that a small percentage of the population still practice open defecation and the community at large are probably not aware of this fact.

Opinions expressed during the FGDs as well as information gathered during the questionnaire survey clearly suggest that the project has brought about significant improvement in the overall environment of the village. After installation of the hygienic latrines about 57.6% of households perceived odor free surroundings and about 38.4% of households noticed improvement in the overall environment of the village.

Hygiene Practice

The baseline survey carried out by VERC before implementation of the project revealed that the surrounding environment of the village is not hygienic and level of hygiene practice by the villagers is also very poor. Suffering of the men, women and children of the village from various waterborne diseases like diarrhea, dysentery, worm infection and skin diseases were very regular. To improve the situation, VERC carried out varieties of software activities like courtyard meeting, health campaign, film show, building up of institution, child to child learning session, project orientation and trainings that had great impact on changing the condition of the village.

According to the VERC pre-project survey, the hand washing practice by households' before taking meals was only 10% and after defecation was only 8%. Most of the household members disposed their waste beside house and bushes near house. Only 5% household members used to cover their food, 25% used to cut their nails regularly and 10% used to clean their house and courtyard regularly. Only 3% household members used to wear slipper before going to latrine.

After completion of the project, VERC conducted another survey which showed that 98% household members wash their hands with soap before taking meals and 100% household members wash their hands with ash or soap after defecation. The questionnaire survey show that currently about 85.5% households practice hand washing before taking meals, while about 96% practice hand washing with soap or ash after defecation.

Findings in DSK Project Areas

Water Supply

Before implementation of the project, the baseline survey conducted by DSK reveals that most of the households were using water from private sources (43.8%) or collecting rain water (29.1%) or

fetching water from Government tubewells or public water points (18.9%). During the questionnaire survey carried out as a part of the present study, different water supply related problems were reported by the respondents. More physical work and irregular availability of water were the main problems according to 33.1% and 28.8% of households, respectively. Among other problems long time needed for fetching water and functional problems of the water options were significant. In the FGDs carried out with Beneficiary Groups in Pallabi, Kamrangir Char and Demra, the participants also mentioned significant time and effort in collecting water, uncertain supply, and poor quality of water (especially those from surface water sources) as the major water supply related problems before the project intervention.

To resolve the water supply problems and create accessible safe water supplies in the selected areas of Pallabi, Demra and Kamrangir Char, DSK with assistance from the community installed different types of water supply options namely (i) Water points (connection in piped water supply system); (ii) Stand posts; (iii) Deep set hand pumps and (iv) Hand tubewells. In Pallabi and Demra project areas, the inhabitants shared part of the capital cost based on their ability, and paying the remaining amount to DSK in 24 monthly installments. In the FGD with the Beneficiary Groups at Pallabi, some participants expressed their dissatisfaction over 10% extra charging by DSK. In Kamrangir Char project area, most of the beneficiaries are tenants and the water points are owned by landlords, who usually charge a fixed amount (usually Tk. 100 per month) from the tenants for water use. In the FGDs at Kamrangir Char, some of the beneficiaries expressed their dissatisfaction over lack of control on the water sources.

All the tubewells were tested for arsenic before and after installation by DSK. The water samples of the tubewells were found safe from arsenic contamination (i.e., arsenic concentration not more than the Bangladesh standard of 50 ppb) and were painted with green color. The survey carried out under the evaluation study showed that around 50.4% of households knew that testing of these water points were carried out and around 47.5% of households knew the test results. However, 33.9% of households responded that the water testing was not carried out regularly. Results from the questionnaire survey carried out as a part of the present study showed significant change in the water source use in the project areas. Unreliable rainwater harvesting, illegal water connection and unsafe pond/river are no longer used as water sources by the project communities. These have been largely replaced by community based tubewells (in Pallabi and Kamrangir Char), community based piped water supply (in Pallabi), and own tubewell (in Demra). At present around 38.4% households are using community based (Legal) piped water supply and around 37.6% households are using community based tubewell in Pallabi area of the project. In Kamrangir Char area of the project, most of the households (67.5%) are using community based tubewell and in Demra area of the project, most of the households (68.7%) are using their own tubewells. However, about 8% households are still using community based illegal piped water supply connection in Pallabi area of the project.

About 16% households spent more than half an hour for collecting water. According to the questionnaire survey, a large majority (around 90%) of the people in the project areas are satisfied with the present water supply situation. Some regional differences however surfaced in the FGDs. For example, while beneficiaries in Pallabi project area are quite satisfied with the level of water supply, those in Kamrangir Char complained about inadequate water. As noted earlier, this appears to be related to the fact that many of these beneficiaries are in fact tenants who pay a fixed amount for water use, and the landlords have control on the water source. In Demra project area, some of the beneficiaries complained about inadequate number of tubewells. Here, lowering of groundwater level and availability of less water from tubewells during the dry season is also an emerging problem.

Sanitation

The people of the DSK project areas of Pallabi, Demra and Kamrangir Char were hardly using any sanitary latrines before implementation of the project. Open defecation and use of unhygienic open hanging latrines were common. Solid waste management practice was very poor and people used to throw their garbage here and there. To improve the overall sanitation situation of these areas, the facilities like family latrine (pit/slab latrine), community latrine (twin pit latrine), improvement of drainage system and cleaning of garbage were provided or promoted under the project by DSK.

According to the results of the questionnaire survey, significant achievement has been made in the sanitation sector through the project. About 89% of the households surveyed are currently using hygienic latrines. However, the goal of 100% sanitation has not been achieved; about 8% of the households are still using unhygienic latrine and about 2.4% still practicing open defecation. Though majority of the household (about 80%) dispose children's feces in latrine, about 5.3% still use no fixed place for their disposal.

The beneficiaries expressed their satisfaction over the achievements made in the sanitation sector through the combined efforts of the implementing NGO and the communities themselves. After installation of the hygienic latrines about 48.3% of households surveyed perceived odor free surroundings and about 37.9% of households noticed improvement in the overall environment of the village. However, cessation of active functioning of Management Committees as well as other Committees formed as a part of this project have been identified as a major risk in sustaining the achievements of the project.

It should be noted that 43 Barrel Composting units were also installed as a part of this project for improving solid waste management in the Pallabi project areas, which also contributed to improvement of environmental conditions in the project areas.

Hygiene Practice

To learn about the health and hygiene situation in the selected areas of Pallabi, Demra and Kamrangir Char, DSK evaluated the awareness of community considering the Key Messages like using of safe water, knowledge about safe water, knowledge about safe water sources, sanitary latrine (odor free, having a water seal, excreta cannot be seen), using of sandals during latrine use, hand washing practice with soap before taking food and after defecation, keeping the food covered at all times. To improve the poor hygiene practice as revealed by the baseline survey, DSK carried out varieties of software activities that included hygiene promotion training of the community.

Data from questionnaire survey and information gathered during the FGDs suggest significant improvement in hygiene practices due to the project. After implementation of the project the hand washing practice by households before taking meal has increased by 35.9% and hand washing practice by households after defecation has increased by 44.7%. Also use of sandals by households while going to latrines has increased to 93.8% from a dismal figure of 37% before implementation of the project. About 93% households keep their food covered and 93.6% households observed less occurrence of water borne diseases at present.

Discussion on Findings

In general, the WPI funded WSS projects in rural and urban settings have been found to be successfully implemented by the two NGOs. The targets of ensuring access to safe drinking water

and hygienic sanitation facilities, and improving hygiene practices have been largely achieved in the two project areas. Formation of CBOs, management committees, women and children groups and their active participation in WSS activities are significant positive steps towards achieving sustainable health impacts through the provisions of water supply and environmental sanitation facilities. However, concerns remain regarding sustainability of the achievements made through these projects.

Involving the community people in the decision making process vis-à-vis in all activities of WSS improvements is a major strength of the project. While these could led to continual improvement and long term sustainable WSS development, the opportunity might be lost due to two important reasons. Firstly, the relatively short duration of the project might not have fully motivated the community and consequently, the community management of WSS services might not sustain longer. Inactivation of management committees as well as other committees/ groups, which were instrumental in bringing about the positive changes, is a cause of concern. Field experiences suggest that full community motivation may be achieved in two distinct phases-first, when the community and the NGO work closely with community still having some degree of dependency on the NGO, and second, when the community works relatively independently needing only occasional support from the NGO. Both VERC and DSK projects have perhaps completed the first phase.

Secondly, it would have been appropriate for the NGO to motivate both the community people and the Local Government Institutions (LGIs), e.g., the Union Parishad (Council), in order to ensure sustainable WSS provision in the community. It may be noted here, that the LGIs are mandated for provision of WSS services to the community. Motivating the LGIs and the community would ensure sustainable WSS development and management as the NGO gradually pulls out. This would also lead to the development of relationships between LGIs and the CBOs, important for sustainable management of WSS service provisions. This project could not adequately address this issue, perhaps due to shorter project duration.

While the projects introduced a wide range of low cost options for sanitation, medium cost improved options, e.g., twin-pit options with ceramic pan or commode, septic tank system, are not introduced. It is always advantageous to introduce the sanitation ladder consisting of low to medium to high cost solutions, so that as people become economically affluent they can opt for more sustainable, improved options. As most of the project areas are flood prone, it is also important that WSS options for flood emergencies are made available to the communities.

The project did not adequately focus on WSS related entrepreneurship development. The entrepreneurship would have ensured income generation among the community through employment. In addition, availability of hardware and spare parts within the community would also be ensured that would further assist sustainable WSS development. Adequate WSS entrepreneurship training and provision of resources or credit facilities for small businesses would assist in development of entrepreneurship within the community. Particularly women entrepreneurship should have been encouraged. Products for a variety of options should also be made available for successful WSS related entrepreneurship development and sustainable business.

Recommendations

The following recommendations are made based on the findings of the study:

- Motivating and involving the LGIs are needed who in turn would play an active role in motivating and empowering the communities.

- Wide range of WSS technologies to suit varying conditions should be considered, including technology training and coping with disaster situation.
- Developing small business within the communities through micro-credit facilities should be promoted.
- Phasing out of the NGO involvement in the project activities should be gradual, keeping in mind that the community needs occasional support after physical implementation of the project is completed.