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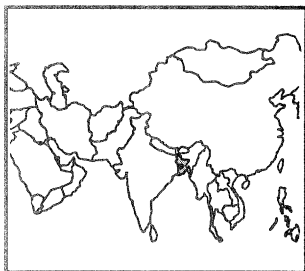
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# Sanitation in a poor settlement in Bangladesh: a challenge for the 1990s

Bilqis A. Hoque, M.M. Hoque, N. Ali and Sarah E. Coghlan

**SUMMARY:** *The primary purpose of a water supply and sanitation project is to achieve an effective and sustainable improvement of the community environment. This paper presents the experiences gained in the evaluation of a water supply and sanitation project in a settlement in Dhaka where improved water supply, sanitary latrines and hygiene education were provided by a reputed international non-governmental organization. Water and latrine use practices by adults improved but latrines were maintained so poorly that concentrated pollution created a problem within the community. The people from the community were not provided with appropriate knowledge or a system of maintenance. Even though water supply and sanitation were given priority status, since they were not planned with a view to being sustainable, they failed to interrupt the environmental contamination process.*

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## I. INTRODUCTION

**PROVIDING WATER SUPPLY** and sanitation facilities in cities is recognized as one of the most important goals of the 1990s. It is obvious that to maintain reasonable health standards within rapidly growing cities, governmental and non-governmental organizations must undertake more activities in this area. Too often, however, after successfully implementing such projects, the instigators fail to follow up or continuously monitor real use and maintenance or to promote hygiene messages. Current literature<sup>(1)</sup> points out that water supply and sanitation variables have important roles in effectiveness and sustainability and strongly impact upon such programmes. Improved provision for water and sanitation does not prove useful if not used properly.

In this paper we present our experiences whilst evaluating the performance of a water supply and sanitation project implemented in Mirpur slum, Dhaka by a highly reputable interna-

**Saudi Arabia, Sweden, Switzerland, the United Kingdom and the United States; international organizations including the Arab Gulf Fund, Asian Development Bank, International Atomic Energy Centre, the United Nations Children's Fund (UNICEF), the United Nations Development Programme (UNDP), the United Nations Population Fund (UNFPA) and the World Health Organization (WHO); private foundations including the Ford Foundation, Population Council, Rockefeller Foundation and the Sasakawa Foundation; and private organizations including American Express Bank, Bayer A.G. and CARE, Helen Keller International, the Johns Hopkins University, Swiss Red Cross and the University of California, Davis. The NGO provided all the support in conducting the study, which in itself indicates that they are eager to improve their programme.**

1. Cairncross, Sandy (1989), "Water supply and sanitation: an agenda for research", *Journal of Tropical Medicine and Hygiene*, No.92, pages 301-314.

2. Background paper (1990), "Global consultation on safe water and sanitation for the 1990s", New Delhi, India, September 10-14, 1990.

3. Stalker, Peter (1994), "A fork in the path; Human development choices for Bangladesh".

tional non-governmental organization (NGO). The capability of NGOs to test innovative water and sanitation activities and to make water and sanitation programmes effective through their close relationships with the community has been well recognized.<sup>(2)</sup> It is important that these experiences be shared. We present here only the technological aspects of the water supply and sanitation programme, which we were requested to evaluate.

## II. THE PROJECT

**IN BANGLADESH** IN 1991, there were 23 million urban dwellers, comprising 20 per cent of the country's total population.<sup>(3)</sup> By the year 2001, the population is expected to have grown 25 per cent or more. In Dhaka slums there are only about 2.8 square metres (or 30 square feet) of land per person, and these people rarely have access to safe water or sanitation. Although the government has expressed some reluctance to improve services for slum residents in order to discourage further migration from the rural areas, the need for some basic services continues to exist. These people are likely to remain for some time, despite such appalling conditions. The government has been trying to assign specific areas to poor people and this project was part of one such programme. It was implemented under an agreement between the government of Bangladesh and the United Nations Capital Development Fund. The project aimed at resettling 2,600 squatter families in a Mirpur Resettlement, an 89 acre site in Kulsiteck, Mirpur, a section of Dhaka, the capital city of Bangladesh. They were mostly slum dwellers from Bhasantek, another section of the town, and moved because development activities had been initiated there. Here, each family was allotted an area of about 9.1 by 2.4 by 3.7 metres (30 by 8 by 12 feet) and a latrine. The allottees received contracts for the site with specific installments to be paid over an agreed period after which they would own the premises. The resettlement is still not completed and there is unused land. The NGO was mainly involved in two activities: community development and sanitation activities, which this paper addresses.

The sanitation programme included the provision of a double alternating pit latrine for each house, a Tara handpump to be shared by each grouping of twelve families, and a large container (dustbin) for the solid wastes of 24 families. This infrastructure was designed by the authorities (it was not clear by whom), and the NGO field workers reported that they had no say in the design or the construction of the structures. Tara handpumps are deep-set tubewells that extract groundwater through direct manual action. The latrines were built next to the dwelling units; each consisted of a platform with a squatting pan and water-seal structure, two separate adjacent pits and a cover slab. The platform with the squatting pan was to be placed on the pit that was in current use. When that pit was filled, the squatting pan was to be moved to the second pit. It was expected that this alternating provision (changing pits as

they filled up) would allow adequate time for the pit contents to decompose and allow safe handling of the sludge.

### a. Sanitation Programme

The sanitation programme included a short intensive training course in sanitation/latrine use and tubewell operation and maintenance, and ensured that project beneficiaries were aware of their rights in relation to the project. A sanitation group was formed with members (women) from about 14 households. The members of each group were given water and sanitation related health education and motivated to use the water supply (water from Tara pumps) and sanitary defecation facilities (the pit-latrines). Health education was given by water and sanitation or health workers or both, mainly by using specially designed flip charts that covered the following topics:

- \* sanitation: latrine maintenance and general hygiene
- \* worms: prevention and treatment
- \* diarrhoea: prevention and oral rehydration salts for treatment
- \* environmental and personal hygiene
- \* sore eyes: treatment
- \* scabies: prevention and treatment
- \* tubewells: proper use and maintenance

Health education involved a series of 16 visits to each group, over an average 12-13 week period.

### b. Study Method

This study was conducted three years after completing the installation of the water supply and sanitation provision but the health education activities were on-going. A cross-sectional survey was conducted in the project area to collect data from about 10 per cent of the families who were living there. Accordingly, each tenth household became a sample. If the woman of the household was absent, that house was bypassed and the next household selected. Data were collected from every cluster. In small clusters, at least three households were sampled, even if this required visiting every third household.

Both open-ended and closed-ended questionnaires were administered. The questionnaires were developed based on objectives and health education messages documented in the project proposal and then modified according to the pre-testing results. Specific indicators for technology design and its use and personal hygiene practices were spot-checked. All data were collected by female workers. One evaluator randomly supervised their work and repeated 10 per cent of the sampling.

## III. RESULTS

**TWO HUNDRED AND** fourteen households were studied. About 65 per cent of household members were illiterate. The average

family size was five, and the average family income 1,200 taka (US \$30) per month.

### **a. Water Supply and Sanitation Situations**

One hundred per cent of the people claimed that they drank water from tubewells (Tara pump). Seventy-seven per cent of the respondents said that they used tubewell water for bathing. More than 90 per cent said that they found tubewells more accessible for use but sometimes found them hard work and too demanding when they needed to wash family clothes. Then, they bathed and washed in nearby ponds or rivers. Although 100 per cent of respondents reported that the pumps were maintained through their community savings, about 46 per cent of the pumps were observed to have leakage problems. Women depended fully on their community leaders to manage the maintenance of the pumps.

The alternating pit latrines were found to be present and used by all adults in all 214 of the families that were visited. Forty-four per cent of the children's feces was disposed in them and the rest was disposed of indiscriminately. Only 38 per cent of the latrines in use, however, were in good working order.

Only 18 per cent of the latrine platforms were seen to be clean. About 45 per cent of the pits were found to be full, leaking or broken, with fecal matter running out into the surrounding area. Seventy-four per cent of the families (158 families) reported that they had been using the same pit instead of alternating use since the installation of their latrines. They emptied the used pit 1-4 times per year, 69 per cent carrying the contents in a bucket and dumping it in the drains or a canal about 100 metres from their settlement. The remaining 26 per cent said that they buried the contents. Therefore, the original idea of alternating the use of pits was not acceptable or convenient to the majority of the people and was not being practiced.

In 28 per cent of the houses, the kitchen area was extended to include the unused alternate pits inside the kitchen area (60 pits). The space on the cover slabs of unused pits was used inside the kitchen for various household activities. As the people experienced space constraints they used the next available space, irrespective of its suitability. When the pit covers of those pits inside the kitchens were removed, most were full of foul effluent (probably leaking from the adjacent pits), smelt bad, and were full of cockroaches and ants.

In spite of providing dustbins at convenient locations (at the end of each block), many of the dustbins were empty, with washed clothes spread on their walls for drying in the sun. These dustbins were intended as collection points from which the wastes would be taken away for final disposal. Only 20 per cent reported that they disposed of all of their kitchen and domestic wastes in these dustbins. There was an irregular mechanism for waste collection and those dustbins which were in use were overflowing.

## b. Environmental Health Knowledge and Practices

The people acknowledged that they knew that flies were a means of disease transmission. The roles of water and fecal matter in the spread of diarrhoeal diseases were mentioned by a small percentage of women. Overall, however, they lacked adequate fundamental environmental health knowledge.

**Table 1: Responses to How Diarrhoea Spreads: Data from Mirpur**

Responses	% Respondents
Flies	43
Rotten/contaminated food	44
Contact with faecal matter	22
Drinking of surface water	12
Dirty hands and finger nails	7

Sixty-eight per cent of the respondents could not properly explain the flip chart on sanitary latrines used by health workers during their health education sessions with the community.

## IV. DISCUSSION

**WE HAVE PRESENTED** the performance of the water supply and sanitation component of the Kulsiteck settlement project, which is one of the biggest settlements in the city. The experiences gained in studying these activities clearly reconfirm the need for appropriate planning, with an emphasis on operation and maintenance of the provisions, strong hygiene education components, and monitoring of the activities.

The target people were approached, motivated into adopting improved water and sanitation practices and given improved provision. The overall NGO activities were remarkable, as has been reported elsewhere.<sup>(4)</sup> They have, on the whole, successfully provided health services, literacy, safe water and sanitary provision to several slums in the country. Their schools in other slums added special classes on environmental health to the regular curriculum. These students were more knowledgeable about basic environmental health issues and practices than the students in other schools. Here, we have presented the practices and problems with regard to the water supply and sanitation activities in Kulsiteck settlement only. We believe that sharing our experiences in the settlement has policy and development implications as this settlement has been legally developed. Legal ownership of land in poor, crowded areas is often an important issue in development and health activities, and it does not exist here.

Water and sanitary latrine use by adults was high and more or less similar to that reported in other slums.<sup>(5)</sup> We have compared our findings with reports on slum dwellers because we could not locate another similar area. As water supply and

4. Hoque, Bilqis A., Nahid A. Ali and M. Mozzammel Hoque (1992), "Sanitation in slums: an evaluation of CONCERN experiences", Bangladesh.

5. Baqui, Abdullah H., N. Paljor and Diana R. Silimperi (1993), "The prevention and treatment of diarrhoea in Dhaka urban slums", *Urban FP/MCH Working Paper No.4*, May, International Centre for Diarrhoeal Disease Research, Bangladesh.

sanitation provision was available, people used it but the impact of the project intervention on effective use of these provisions was doubtful since they used surface water sources for bathing, and pumps and latrines were not maintained properly.

The suitability of alternating pit latrine technology, however, is in doubt as the routine of alternating pits was seldom used. Either the users did not understand the principle or purpose behind the design and functioning conditions of these latrines or space constraints discouraged the setting aside of alternating pit areas for defecation purposes. The existing sanitary conditions of the majority of sanitary latrines were unacceptable.

De-sludging (emptying the contents of the pit as it fills up) was a common problem in all areas. Most of the users de-sludged indiscriminately, contaminating the environment. As space constraints are always severe in poor areas, the burying of fecal matter is highly impractical. Although the local project staff told us that it was the local public authority's responsibility to desludge the latrines since they (the project) were not responsible for housing, it was difficult to understand how community health welfare could neglect such an obviously acute environmental health hazard. The communities disliked the unclean conditions of their latrines and the problems associated with de-sludging their pits. They expressed dissatisfaction with being given latrines that required such frequent de-sludging. This community reaction has serious implications for the effectiveness of the sanitation coverage.

The fact that a high proportion of sanitary latrines were in an unacceptable condition, that is, broken or with leaking pits, was indeed related to a lack of knowledge of the principles of latrine functioning but more so, or equally, related to the problems associated with de-sludging the pits. The users need to have explained to them the basic principles of constructing (and using) latrines to confine the feces and let it biodegrade under anaerobic conditions. Other options for latrines or communal latrines could be considered.

In selecting latrine technology, the appropriateness of the type of latrine for the local people should be given the highest priority. This means that latrine owners must be involved in the planning and must be educated to undertake or manage the required maintenance effectively. Although all the adults used the latrines, the general pollution level was high and unacceptable. The improper disposal of children's feces is a common problem in Bangladesh. More importance must be given to addressing this problem, and conducting pilot tests is essential to avoid putting the effectiveness of the whole programme at risk.

Tara pumps have been successfully maintained by rural volunteer women elsewhere.<sup>(6)</sup> Similar systems could be tried in slums by training the women as caretakers and assigning them responsibility for their own pumps. This would also have implications for women's empowerment.

Hygiene education should be redesigned to make it more understandable to the people. The level of knowledge among the people in relation to the role of water and feces in the spread of diarrhoeal diseases was low, as in other slums, but they were

6. Hoque, Bilqis A., K.M.A. Aziz, Z. Hasan and M.M. Patwary (1991), "Maintaining village water pumps by women volunteers in Bangladesh", *Health Policy and Planning* Vol.6, No.2, pages 176-80.

given health education every month. Attention should be given to producing more understandable information. The skills of the health educators need to be improved through proper training. In general, it appears that the performance of the project was not monitored from a technical point of view. An appropriate monitoring system should be developed and implemented. We would like to re-emphasize the fact that sanitation should not be viewed simply as latrines but rather as a gradual improvement in safe excreta disposal according to what communities can afford.