Assessment of Water Supply and Sanitation Facilities for Korail Slum in Dhaka City

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Abstract— Slum population has been increasing in Bangladesh over the last three decades along with the growth and expansion of cities and towns. But slum facilities are very much unsatisfactory for them due to lack of proper water supply and sanitation system. Therefore, the major portion of excreta is deposited into water bodies and open places, as such polluting water sources, groundwater and the general environment. As a result, majority of population in Bangladesh suffer from different kinds of water and excreta-borne diseases that aggravate in their poverty situations. That’s why, essential goal of the study is to investigate of water supply and sanitation facilities for Korail slum in Dhaka city. During the study period, data and information were collected by questionnaire survey at Korail slum. However, the level of hygiene knowledge and practice has been found to be significantly low among the Korail slum dwellers. The study in Korail area of Dhaka city has found that the sanitary and water supply condition are improving very slowly. Majority slum people use tube well water for drinking while significant amount of open defecation is also found. Normally Korail slum have pit latrines, which are partially hygienic. These may cause ground water contamination depending on the soil characteristics and distance between the water sources and latrines. The drainage system is the most neglected sector in the slums. The open disposal of human excreta pollutes the nearby water bodies, canals and drains causing severe water pollution. Besides, solid waste management and drainage system are totally unsatisfactory in the slum area. Many motivational work and idea marketing from government and NGO side help to improve their awareness level.

Index Term— Slum, Sanitation, Hygienic, Contamination, Excreta-Borne Diseases

1. INTRODUCTION
Slum population has largely increased in Bangladesh over the last three decades along with the growth and expansion of cities and towns. Urban poverty is largely due to the transfer of the rural poor to urban areas [5]. But the urban facilities are quit unsatisfactory for urban dwellers in Dhaka city. However, Bangladesh produces 17 million metric tons of human faeces and 57 million metric tons of urine each year [3]. The major portion of these excreta is deposited into water bodies and open places, so polluting water sources, groundwater and the general environment. As a result, majority of population in Bangladesh suffer from different kinds of water and excreta-borne diseases that aggravate in their poverty situations. The global health burden associated with these conditions is staggering, with an estimated 4000–6000 children dying each day from diseases associated with lack of access to safe drinking water, inadequate sanitation and poor hygiene [4]. Therefore, considering the present context and sanitation situation of korail slum, hygienic, sustainable and eco-friendly sanitation system has been increasingly needed.

Currently, UNICEF and WHO estimate that 1.1 billion people lack access to improved water supplies and 2.6 billion people lack adequate sanitation [6]. But the UN Millennium Development Goals (MDG) aim to reduce by half the proportion of people without sustainable access to safe drinking water and basic sanitation by the year 2015. However, slum dwellers in Bangladesh are behind from the Millennium Development Goals [1].

Water supply and sanitation facilities in terms of quality and quantity are utmost necessary for assessing the living environment of the slum. In many areas the sanitation coverage is much below the national coverage figure, only 13.5% in metropolitan slums [7]. Moreover, the presence of thousands of slums and squatters within Dhaka city is an ever-present threat of public health. Many of these have been set up open water bodies or besides railways tracks. They have no proper arrangement of water supply and sanitation system that create an adverse effect on city’s environment. In this absence of sanitary latrines, inevitably human as well as general house hold waste is finding its ways in to the surface water bodies. It is believed that urban areas have received a disproportionate share of the investments in development expenditure in the country.

In slum area of Dhaka, the situation is very worse than in rural areas [2]. Only 18.9 percent households have access to sanitary latrine (Semi-Pucca) and 42 percent have access to pit or open pit latrine [2]. Some organizations are trying to improve the condition of water supply and sanitation facilities for urban poor in Dhaka city with different approaches. But the crisis of water supply and sanitation facilities is a common feature in daily life of urban poor. So, it is an immediate concern to study the approaches of different organization related to water and sanitation facilities for urban poor in this city. That’s why, essential goal of the study is to investigate of water supply and sanitation facilities for Korail slum in Dhaka city.

2. METHODOLOGY
The methodology of this survey consists of practical field observation and field based data collection of water supply, sanitation and solid waste management situation through structured and non-structured questionnaire and formal and non-formal interviews. The relevant secondary data for this study was collected from published and unpublished
sources. The survey was, therefore, undertaken to explore the nature and many other habitation problem and different reason of environmental hazardous situation of water supply, sanitation and solid waste management system in Korail slum.

2.1 Project Location
The total number of slums in the Dhaka city corporation area is approximately 4,500. For the study only 1 slum at Karoi was surveyed. Sites selected for habitation problem and environmental hazardous of low cost area of korail slum area in Dhaka city. It stands on beside Mohakhali near the BTCL office. Almost 50% inhabitants live in Korail slums and squatters with a very vulnerable condition of Dhaka city. Details of Korail slum area is as follows in table I:

<table>
<thead>
<tr>
<th>Location</th>
<th>Korail slum, Gulshan Thana, near BTCL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Permanency</td>
<td>49 years</td>
</tr>
<tr>
<td>Area</td>
<td>85 Acres</td>
</tr>
<tr>
<td>Number of Households</td>
<td>1100</td>
</tr>
<tr>
<td>Population</td>
<td>80,000</td>
</tr>
<tr>
<td>Water Facility</td>
<td>2 water points (1 DCC and 1 DWASA)</td>
</tr>
<tr>
<td>Sanitation Facility</td>
<td>350 water seal latrines, 250 bucket latrines, Hanging latrines 520</td>
</tr>
<tr>
<td>Drainage Facility</td>
<td>Discontinuous semi-pucca darain</td>
</tr>
<tr>
<td>Solid waste Facility</td>
<td>Open place</td>
</tr>
<tr>
<td>DCC</td>
<td>19 no. ward.</td>
</tr>
</tbody>
</table>

Moreover, some data and information were collected from website of DCC & Korail slum and interviews with different people of selected location.

3. RESULTS AND DISCUSSION
It is observed from the questionnaire surveys that water supply situation in the study areas are not satisfactory. Moreover, the other services like sanitation, drainage and waste disposal are not adequate and needs improvement in most of the low cost areas and slums.

3.1 Actual owner of the slum and average family size in the slum
It is observed that 7% of people say’s personal land, 11% of people say’s the owner is BTCL, 30% of people say’s land belongs to DCC and 52% of people say’s the slum owner is

2.2 Field Survey Design
A study was undertaken to assess the environmental conditions e.g. water supply, sanitation and solid waste management etc of the Korail slum of DCC area, and to identify the deficiencies for the improvement of existing situation. In order to achieve the objectives a comprehensive literature review, household surveys and field visits, and a questionnaire survey were conducted. ‘Household head’ means the person who plays the main role in the decision-making process of a family. In absence of the household head, the second-important adult member of the family was interviewed. A questionnaire survey was also conducted upon 70 respondents (selected randomly) of Korail Slum. Information was also collected through ‘non-participatory observation’ and ‘photographic observation’.

Photo. 1. Korail slum

Photo. 2. Another view of Korail slum
Bangladesh government (Figure 1). People living in the slum seem to be confused about the actual owner of the slum. On the other hand 7% of people have 3-5 member in their family, 24% have more than 8 person on their and 69% have 5-8 member in their family (Figure 2).

3.2 Residency of the slum
It is observed that 10% of people staying have been in this slum for 0-1 year’s, 47% people say they have been staying here 1-3 years, 22% people say that they have been staying in this slum 3-5 years and only 21% people say’s that they have been staying here more than 5 years (Figure 3). Observed that people don’t stay longer period of time in this slum because of the hazardous life in slum.

3.3 Occupation & monthly income of people
Doing questionnaire survey it is obtained that 4% of people are working in an industry, 17% of people are working as street hawker, 32% of people are working in garment and 47% of people are driving Rickshaw (Figure 4). Monthly income level of the people living in this slum is very low. Thought out the survey 49% of people say’s around TK. 3000-5000. And 51% of people are getting approximately TK.5000-8000 (Figure 5) per month. To this survey it is found out that people living this slum are generally poor, their occupation & monthly income can’t fulfils their fundamental needs.

3.4 Source of drinking water and other purposes
In most cases water supply facility in the slums is provided by the NGOs through water point from DWASA. Water...
point is basically water storage facility where water is stored from WASA main lines. In the slums where the above facilities are absent or inadequate, the inhabitants use maximum water sources of DWASA and very few numbers depend on adjacent water bodies like ponds. However, the main source of drinking water is the DWASA supply water. Around 57% respondents use DWASA supply water for their drinking water and other purposes while 43% respondents use shallow tube-well for their drinking and other purposes (Figure 6).

3.6 Problem in fetching water.
There are the problems in fetching water from the source we get for DWASA water source which is far away and crowded 51%. The surrounding environment is unsuitable for fetching water for women 49% in the Korail slum area. We observed that collecting water from far away is a major problem. Result in shown in Figure 7.

3.7 Water Supply
The peoples of Korail slum area are not satisfied for the lack of proper water supply. Approximately, 79% respondents are not satisfied while 21% are satisfied for the availability of water source in Korail slum (Figure 8).

3.8 Mode of defecation.
Sanitation situation is worse than water supply in the low cost areas. The commonly available sanitation facilities include pit latrines, bucket latrines and water seal latrines in slum area in DCC and bucket latrines and water seal latrines are low cost area in korail slum. Here result obtained about mode of defecation for Bucket latrine and water seal latrine are 17% and 0% respectively in the Korail slum area. Moreover, pit latrine of 29% and water hanging latrine of 54% in the slum areas. In Korail slum area has almost 80000 populations but the numbers of water seal latrines are 359, bucket latrines are 250, hanging latrines are 520 and all the latrines are not hygienic and environmental friendly. So it is observed that the sanitation process for this event is found comparatively unsatisfactory for the korail slum area. Collated Data is shown in the Figure 9. It is also observed that children are generally used the yard and the places near the tube-wells for defeating.

However, no proper hygienic latrines such as water sealed latrine exist in any of the slum observed as shown in (Photo 3). Considering the water use facility at or near the latrines and overall hygienic condition of the latrines, the situation is very disappointing. The situation analysis of slums has pit latrines or sanitation and it block given by different source. No slum has separate sanitation locks for male and female users. So, the sanitation facilities of korail slum are not sufficient.
3.9 Latrine facilities
In case of analyzing existing latrine facilities we get for common 86% and single 14% in the slum area. So it is observed that the type of common latrine is gathering for slums area’s i.e. unhygienic condition (Figure 10). Health and hygienic facilities of Korail slum area is in the worst condition. Therefore, different diseases frequently occur in that area. Besides safe distance between water point and latrine is not maintained in most cases that are very harmful for human health.

3.10 Paying for using latrine facilities:
The study also investigated that the mentality of paying for using latrine facilities in Korail slum area. Almost 79% respondents are not interest to pay money to get safe latrine while 21% respondents are interests to take safe latrine by the paying of money (Figure 11). After all, it is observed that most of the people have not to pay for using sanitation facilities due to lack to awareness on safe sanitation and their health as well as their poor economical status.

3.11 Solid waste disposal.
Food waste, paper, rubbish, ashes and residues, special wastes such as street sweeping, roadside litter and abandoned vehicles are the main solid wastes in the study area. Some municipal dustbins are found in Korail slum area for solid waste disposal, but not sufficient and the inhabitants have to dispose solid wastes in open spaces and road sides that is very vulnerable for the deterioration of environment. Almost 99% respondents are not satisfied for the solid waste management in Korail slum area while only 1% people is satisfied for the solid waste management in that area (Figure 12). Finally it is concluded that people are not satisfied with the existing solid waste disposing system. The groups of photos are shown the actual solid waste disposal system in Korail slum is (Photo 4). In this slum, the people can make some extra income by selling the compost at a lower cost. There is house-to-house waste collection system by which the waste is disposed off both at DCC communal bins and open spaces (at roadside). In BTCL area, solid wastes are collected by bans and the trucks waiting outside at the main road again collect the waste disposals from the vans. Some wastes are also put into the garbage bins of DCC. Solid waste disposing system of Korail slum area very low poor as a result the environmental is hazardous.
3.12 Water borne diseases.
There is almost universal knowledge among adult women, adult men and young generation from all contexts that contaminated water can cause diarrhea or Cholera. However, the data was collected from different sources and persons for common water borne diseases in korail slum. The diseases of Diarrhea, Dysentery and cholera were 50%, 24% and 26% respectively (Figure 13). Here we observed that major people affected diarrhea but suffering by cholera. The respondents seem to have fair knowledge on the mode of transmitting germs from human excreta. Hands and nails, flies were mentioned the most followed by breathe or air. More proportion of the young generation failed to respond. However, sickness during past three months from water borne diseases constituted maximum of all diseases reported. Maximum of the total medical expenses were spent on water related diseases. And on an average 10.2 working days were lost in last three months due to those diseases. Most of the households reporting to have at least one sick person in their households during last three months were asked about loss of working days.

4. CONCLUSIONS
The level of hygiene knowledge and practice has been found to be significantly low among the Korail slum dwellers. The study in Korail area of Dhaka city found that the sanitary and water supply condition are improving very slowly. Majority slum people use tube well water for drinking. Significant amount of open defecation is also found. Normally Korail slum have pit latrines which are no fully hygienic. These may cause ground-water contamination depending on the soil characteristics and distance between the water sources and latrines. The drainage system is the
most neglected sector in the slums. The open disposal of human excreta pollutes the nearby water bodies, canals and drains causing severe water pollution. Besides, Solid waste management and drainage system are totally unsatisfactory in the slum area. It is observed that houses, shops, drains, roads etc have been constructed unplanned and solid wastes are stored on open places in Korail slum area. Disposal of solid wastes and wastewater in open space and open drains also causes a severe hazardous condition. For lack of sufficient water sources, most people resort to unsafe water sources like ponds, rivers and even ditches which cause sufferings from diseases. Moreover, Garments and different hawker shops area opened in this area which create a gathering situation and made overall environment unsatisfied and hazardous. The deteriorated scenario causes severe environmental degradation affecting the environment of entire Dhaka city. Slum people are fighting against poverty and trying to improve their economic condition and standard of living. However, Government and in some cases, NGOs should be encouraged and offered the best facilities for taking more programs in slum areas on water supply, sanitation and solid waste management sectors. Moreover, specific rules and regulations need to be established to force the slum owners to provide the adequate water supply sanitary facilities in their slums. Future work will be collected information from all of slum resident to get the actual results that will be helped to facilities water supply and sanitation by the policy maker, Government, INGO and NGO etc.

REFERENCES