Sanitation and Environmental Status of Near By Village around the Industrial Activities of Dhaka Export Processing Zone (DEPZ), Bangladesh

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Abstract

The study was conducted at Dhamsona, Savar, Dhaka to assess the basic sanitation and environmental condition. This study was divided into two section. Firstly, we will see the environmental condition, secondly, the sanitation scenario. The area was selected conveniently and most of the family of this area was included in the sample. A questionnaire was used to collect data from the respondents, who were selected according to selection criteria. Toxic effluents coming out from various industries of DEPZ first go to the Dhalai Beel, and the cumulative impact of these effluents affects the waterways and then the environment. A lot of wastes from DEPZ are poured into the Dhalai Beel, which then finds its way into the Bansi River. Here, in most of the respondent's families insanitary latrines were used. Water seal hand flushed, but rings broken and/or no slab /broken slab types of insanitary latrines were used by families, and open or hanging latrines connected to water bodies are also used. In many of the families there were no latrines. Use of sanitary latrines in the families with literate family heads was more than that used in the families with illiterate family heads. About 30% of the people are affected by various types of skin diseases and many other water borne diseases. Health education should be provided to the slum dwellers to create awareness about sanitation and personal hygiene.

Keywords: Sanitation, health, DEPZ, Bangladesh.

Introduction

Bangladesh is a developing country with a population of about 158.1 million and land area of 147570 sq. km. Population density of Bangladesh is about 834/sq. km. Over population, poverty and illiteracy are major problems of Bangladesh. As a consequence, development in all sectors is very slow and not sustainable. A major challenge faced by the developing countries is that of industrial and human waste management and disposal. Human waste or excreta are the term used to mean human faces and urine, excluding other types of domestic waste. The potential dangers of industrial and human waste have been realized for many years in industrialized countries through experiences from the spreading of infectious diseases at uncontrollable rate. Human faeces are dangerous to health and detrimental to the environment if they are untreated before being disposed of into the environment. The awareness of environmental degradation is not very prevalent in developing countries. Sanitation was rarely considered as an important issue to the policy makers of developing countries even to the aid donors.

Industrial effluents coming from different industrial and commercial establishments posing serious threats to environment it becomes the source of pollution for surface and subsurface water, soil and air. Shortage of water supply and sanitation is the basic cause why diseases transmitted via faeces are so common in developing countries. The health hazards of improper excreta disposal are soil pollution, water pollution, contamination of foods, and propagation of flies. The diseases that result from improper disposal of human excreta are typhoid and paratyphoid fever, dysenteries, diarrhoeas, viral hepatitis A and E and geohelminthiasis (ascariasis, hookworm, strongylodiasis, trichoriasis)[1]. Proper disposal of human excreta therefore, is a fundamental environmental health service. In Johannesburg, need for improvement in sanitation as acrucial priority WSSD[2] by 2015 reduce by half the number of people, currently 2.4 billion, who do not have access to basic sanitation facilities. Bangladesh government has declared the target of achieving a state whereby every household in the nation will have sanitary latrine by 2010. The target will be fulfilled in three phages by 2005, 2008 and 2010[3].

Department of Public Health Engineering (DPHE), and Local Government Engineering Department (LGED) in collaboration with UNICEF, DANIDA, DFID, and WHO conducted a baseline nationwide sanitation survey. This survey was conducted during August-September 2003. It was found that 33% of the population of Bangladesh use sanitary latrine, of these 70% in the city corporation area 60% in the pourosava area and 29% in the rural area. The use of insanitary latrine in city corporation area, pourosava, and rural area was 27%, 28%, 24% and no latrine was 3%, 12%, 47%.In December 2004, nationwide household use of sanitary latrine was 43.57%, and in city corporation area 73.80%, pourosava 64.26% and in rural area 39.41%[4]. People in general have a poor understanding of

the relationship between health and sanitation. In most cases latrines are used for reasons of convenience and privacy rather than health reasons mainly in the rural areas of Bangladesh. In the households having no latrines people use other's latrine, open fields, bushes, jungles, river, and water bodies (ponds, cannels, and open ditches). In the rural areas reasons for not having latrines were lack of awareness, lack of space, lack of money, preference to defecate in open space, and lack of material[5]. Under the leadership of local government and rural development and cooperation (LGED and C) ministry a nationwide sanitation campaign has been launched to create awareness about health, motivation about use of sanitary latrine and providing sanitary latrine in partnership with development partners, NGOs, local government institutions and local administration etc.

Government of the People's Republic of Bangladesh, UNICEF and other national and international NGOs are working for basic sanitation and safe water supply throughout the country. More than one hundred NGOs are working in the slums for the improvement of the living conditions of the slums. In the rural areas and urban slums hand flushed water seal type of latrines are distributed at a low cost and in some cases free of cost. This sample survey has been planned to assess the basic sanitation status of a selected slum of Faridpur town. This survey has been designed to conduct mainly for academic purpose. Students will participate in all stages of this survey including planning, data collection, analyses, and report writing.

Study Area: The study area Dhalai Beel is located in Dhamsona, Savar, Dhaka. The area of Dhalai Beel is bounded by four moiza, Dehama in the north, Bansh Bari in the south, Ganakbari in the east and Kamalsi in the west. It is 2.65 km (app.) in length and 0.55 km in width[6]. DEPZ is situated on the bank of the Dhalai Beel. Daily toxic effluents coming out from various industries of DEPZ first go to the Beel and the cumulative impact of these effluents affects the waterways and then the environment. A lot of wastes from DEPZ are poured into the Dhalai Beel, which then finds its way into the Bansi River. Dhalai Beel is interconnected with Bansi River, which is 1.5 km away from the Beel. The study area is illustrated in the following map (figure-1).
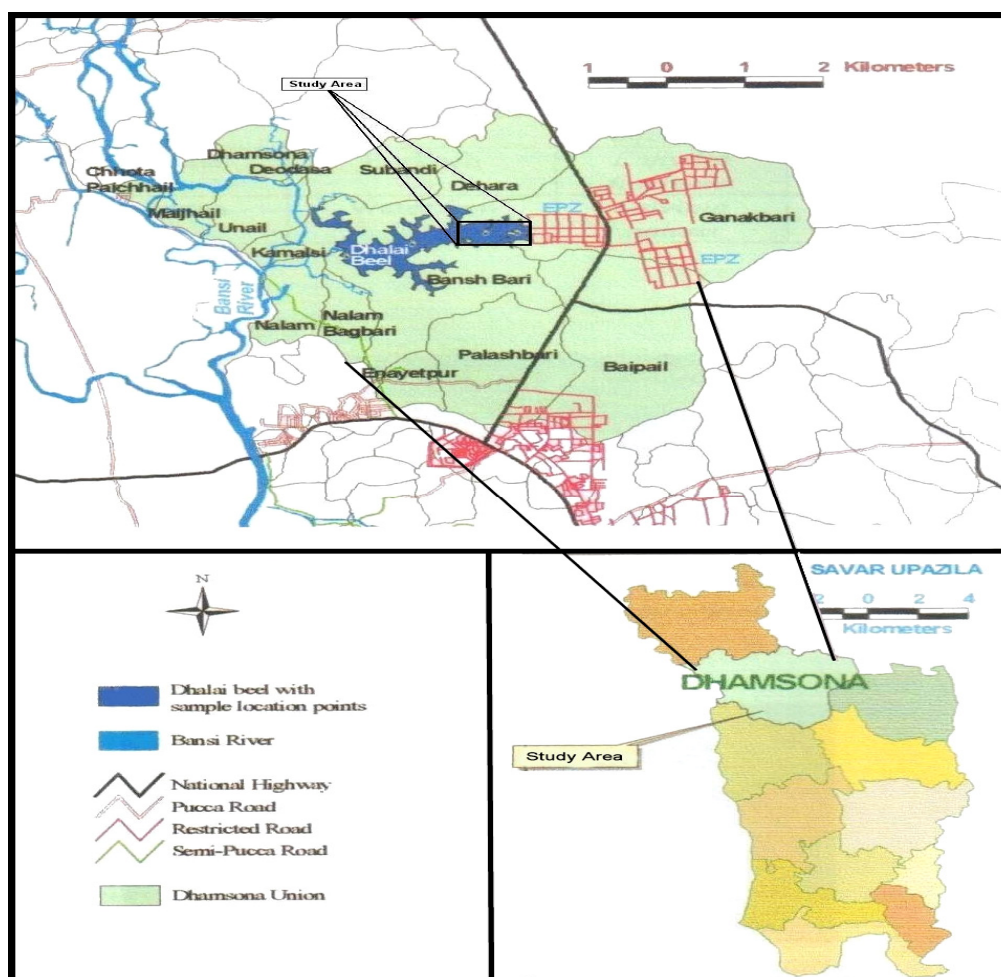

Figure-1
The study area

Methodology

Collection and Preservation of Water sample: Effluent receiving water samples were collected from four different points of Dhalai Beef in plastic containers. Plastic containers of 1500 ml capacity prior to sampling were washed with 20% (V/V) HNO_3 solution and then rinsed thoroughly with de ionized water. Water samples were quickly brought into the laboratory and 500 ml were filtered with WhatMan-41 ash less filter paper and then acidified by concentrated HNO_3 acid (4ml/liter sample) to prevent adsorption of metal ions on the sides of the containers.

Determination of Physicochemical parameters of water: The temperature was taken from by a mercury thermometer graduated 0ºC to 100ºC. The electric conductivity of the sample water was measured by using an EC meter. (Bonnet 1, HI 3291, ATC- Conductivity probe). Quantitative analysis was done for Total Dissolved Solid (TDS) determination. The pH of water was examined by using a glass electrode pH meter (Jenway pH meter, Model no.3305). Dissolved oxygen content of sample water was determined by using DO meter (HANNA INSTRUMENTS: H19143, Microprocessor, Auto Cal, DO meter, Portugal).

Health and Sanitation Scenario: *Study population:* Most of families of the area were the study population.

Sampling unit: Each family of the slums was sampling unit.

Sample size: In this study sample size was 56. Sample size was not predetermined. It was taken on the basis of total number of families from which data were collected.

Sampling technique: Non-probability sampling technique was followed. All families of this house were included in the sample.

Research instrument: A questionnaire was developed which was almost structured with a very few unstructured questions.

Data collection procedure: The whole house was surveyed and every family of this house was included in the survey. An adult family member aged more than 18 years of each family was respondent of this survey, who was present at house at the time of data collection. The respondents were selected according to these selection criteria. Each respondent was interviewed face to face by interviewer and responses were noted on the questionnaire. Each interviewer inspected the condition of the latrine used in the family of the each respondent. Several families used the same latrine, in these cases for each family findings were same. The findings were noted on the questionnaire. After data collection data were checked and sorted.

Results and Discussion

This cross sectional descriptive study was showed in a particular slum with the objectives to assess the basic sanitation status of the selected slum and the socioeconomic condition of the families of this slum.

Table-1 shows the percentages of respondents in different age group. Among the respondents 66(26.4%) were in 25-34 years age group, 69(2/.6%) in 35-45 years age group. Only 11(4.4%) were in more than 64 years age group and 45(18.0%) less than 25 years age group. Mean age of the respondents was 36.88 years and SD 13.25 years. Respondent's minimum age was 19 years and maximum 80 years. Table-2 presents the frequency distribution of the head of the family. Most of the family heads 183(73.0%) were father and a remarkable number was mother as family head. Grandfather as family head were only 5(2.0%) and in others category 7(2.8%).

Table-1
Distribution of the respondents by age

Age of the respondents in years	Frequency	Percentage
<25	45	18.0
25-34	66	26.4
33- 44	69	27.6
45-54	41	16.4
55-64	18	7.2
>64	11	4.4
Total	250	100

Table-2
Head of the family

Head of the family	Frequency	Percentage
Father	183	73.0
Grand father	5	2.2
Son	22	8.8
Mother	33	13.2
Others	7	2.8
Total	250	100

Table-3 shows the frequency distribution of types of latrines used in the families of the respondents. Sanitary latrines were used in 68(27.2%) of the respondent's families and in 37(14.8%) families these were water seal hand flushed ring slab type, and in 31 (12.4%) families dug well type. In most of the respondent's families insanitary latrines 173(69.2%) were used. Water seal hand flushed, but rings broken and/or no slab /broken slab types of insanitary latrines were used in 71 (28.4%) families, and open or hanging latrines connected to water bodies in 102(40.4,%,) families, and 9(3.6%) of the families there were no latrines.

Table 4 shows the distribution of the types of latrine, used in the family by the monthly income of the family. Of the 164(100%) families with monthly family income of taka 3000 or less, sanitary latrines were used in 35(21.3%) families and in remaining 129(78.7%) families insanitary latrines were used.

Out of 86 (100%) families with monthly family income of taka more than 3000, sanitary latrines were used in 33 (38.4%) families and in remaining 53(61.6%) families insanitary latrines were used. Use of sanitary latrines in the families with monthly family income of taka >3000 was more than that used in the families with monthly family income of taka 3000 or less.

Table-3
Types of latrines used in the family

Types of latrine used in the family	Frequency	Percentage
Sanitary (water seal, hand flushed, ring slab)	37	14.8
Sanitary (dug well)	31	12.4
Insanitary (water seal hand flushed, but rings broken, and/or no slab/broken slab)	71	28.4
Insanitary (open or hanging latrines connected to water bodies)	102	40.8
No latrine (use open space or drain)	9	3.6
Total	250	100

Table-4
Distribution of the types of latrine used in the family by the educational level of the family head

Educational level of the head of the family	Types of latrine used in the family		Total
	Sanitary	Insanitary	
Illiterate	29(21.3%)	107(78.7%)	136(100%)
Literate	39(34.2%)	75(65.8%)	114(100%)
Total	68(27.2%)	182(72.8%)	250(100%)

Here, Of the 136(100%) families with illiterate family heads, sanitary latrines were used in 29(21.3%) families and in remaining 107(78.7%) families insanitary latrines were used. Out of 114 (100%) families with literate family heads, sanitary latrines were used in 39 (34.2%) families and in remaining 75(65.8%) families insanitary latrines were used. Use of sanitary latrines in the families with literate family heads was more than that used in the families with illiterate family heads. There was a statistically significant association between types of latrines used in the families and level of education of the family heads.

Sanitation Issue: It was found in this survey that the most of the respondents 176 (70.4%) were in 25-54 years age group. Only 11(4.4%) were more than 65 years of age. Respondent's mean age was 36.88 years and SD 13.35 years. It was found in the present study that a good number of family heads 85(34.0%) were Garment worker. In a survey of Urban Research Centre, it was observed that large number of Garment worker came from these slums. Small business was the occupation of 63 (25.2%) of the head of the families. Of the family heads 43 (17.2%) were labourer. Occupational statuses indicate their low socioeconomic condition. It was also revealed from this study

that most of the family heads 136(54.4%) were illiterate and only 14(5.6%) had SSC or above level of education. They are the least educated segment of the country. As they had the least level of education they were the underprivileged group of a country. Their quality of life is likely to be very poor. Regarding types of latrines used in the respondent's family, it was found that in only 68(27.2%) of the families sanitary latrines were used and in rest of the families 173(69.2%) insanitary latrines. Though there were latrines in most of the families but most of these were insanitary types. There were 108 (43.2%), water sealed, hand flushed ring slab type of latrines but most of these were not in sanitary conditions. The most likely reasons were lack of awareness about health and lack of maintenances of the water sealed hand flushed, ring slab types of latrines. In the families where monthly family income was above poverty line, and level of education of family heads was literate, there was more use of sanitary latrines. Those who were living below poverty line and illiterate were likely to use insanitary latrine or have no latrines.

Table-5
Some common diseases are found from the individuals, they are

Necrotizing Fasciitis	Necrotizing soft tissue infection is a rare but very severe type of bacterial infection that can destroy the muscles, skin, and underlying tissue.
Cutaneous Candidiasis	Cutaneous candidiasis is infection of the skin with candida fungus.
Fungal Nail Infection	Fungal nail infection is an infection of the nails by a fungus.
Dry Skin	Symptoms and signs of dry skin include itching and red, cracked, or flaky skin. Read about causes, diagnosis, treatment, home remedies, prevention, and the best moisturizers for dry skin.

Conclusion

From the observation it is found that, most of the respondents, 135(54.0%) were in 25-44 years age group. Respondent's average age was 36.88 years and SD 13.25 years. Most of the family heads were father 183 (73.0%) and a remarkable number was mother 33(13.2%). Almost all 244(97.6%) families were Muslim. Most of the family heads were small businessman 63(25.2%), rickshaw puller 85(34.0%) and labourer 43 (17.2%). Out of 250 family heads most of family heads were illiterate 136(54.4%). only 14(5.6%) had SSC or above level of education. Of the families, 164(65.6%) had monthly family income of taka 3000 or less. Only 7(2.8%) of the families had monthly family income of taka more than 6000. Average monthly income in these families was 3091 taka, and SD of taka 1501. Sanitary latrines were used in 68(27.2%) of the respondent's families and in 37(14.8%) families these were water seal hand flushed ring slab type, and in 31 (12.4%) families dug well type. In most of the respondent's families

173(69.2%) insanitary latrines were used. Water seal hand flushed, but rings broken and/or no slab /broken slab types of insanitary latrines were used in 71 (28.4%) families, and open or hanging latrines connected to water bodies in 102(40.4%) families. In 9(3.6%) of the families there were no latrines. Out of 68(100%) sanitary latrines only 12(17.6%) were found unclean. All members above five years of age used sanitary latrines in most of the families 66(97.1%) in which sanitary latrines were used. There was a statistically importantlink between types of latrines used in the families and monthly family income.

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