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Present Environmental Condition and Its Impact on Livelihood – A Case Study of Two Villages around the University of Barisal

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Abstract

The study was focused mainly on the level of knowledge and current situation on environmental pollution and degradation in the male, female and school going children living in Char Aicha and West Karnakathi villages in Barisal district. Data were collected randomly from 200 families (most of them consist of 6/7 members) by personal observation, focal group discussion and personal interviews during the period from January to June, 2016. The study revealed that majority of the people knew the basics of environmental pollution and degradation through television but they do not apply this in their way of living. On the other hand, about 30% of the people do not know what it is. The data showed that most of the women were not conscious about the devastation of pollution. As household wastes were not managed properly, the open area especially the ponds filled with waste. Pond is one of the prime sources of water for cooking and washing. Tree plantation program, hand washing program, school based awareness program, introduction of cheap water filtration process and discussion program on sustainable agricultural production revealed a positive attitude to manage environment. After these awareness programs, results showed that almost 90% of people follow the prescribed methods. In addition, primary school going children showed keen interest about the program and they play an important role in controlling pollution in the study area by sharing with their parents about the harmful effect of pollution in their regular life. The study will provide baseline information for controlling environmental pollution and degradation in the area.

Key Words: Environmental Pollution, Degradation, Awareness program, Kirtonkhola River.

1. Introduction

Environmental degradation would remain an important global issue for the 21st century because of its adverse impact on agronomic productivity, food security and quality of life (Yiran et al., 2012). Over the last three decades there has been increasing global concern over the public health impacts attributed to environmental pollution (Kimani, 2007), Human exposure to pollution is believed to be more intense now than at any other time in human existence (Schell et al., 2006).

Pollution can be made by human activity and by natural forces as well (Fereidoun et al, 2007). Getachew and Demele (2000) holds that the most pressing environmental problems in the least developed countries are prevalent in rural areas, where the bulk of the populations live and whose livelihood depends on agriculture and related activities. Izibili (2005) stated that no doubt, damage to the environment is no respecter of frontiers, and damage done to one generation has the consequence of affecting the future generation. Based on this and many salient issues within the context of environmental degradation, Reynolds Stafford-Smith and Lambin (2007) stated that a major environmental challenge of the 21st century is environmental degradation; it adversely affects the sustainable relationship between ecosystems and the livelihoods of people worldwide.

The United Nations, UN (1997) refers to environmental degradation as the deterioration of the natural environment through human activities and natural disasters. Kan (2009) originated the fact about China that, it has environmental problems, including outdoor and indoor air pollution, water shortages and pollution, desertification, and soil pollution, have become more pronounced and are subjecting Chinese residents to significant health risks. Reed (2007) noted that environmental degradation is the reduction in value of the environment to meet its ecological and socio-economic needs. It includes issues such as land degradation,

deforestation, desertification, loss of biodiversity, land, water and air pollution, climate change, sea level rise and ozone depletion. Environmental degradation is leading to more severe natural disasters which have already cost the world over $608 billion in the last decade, killed and displaced over 8 million people, mainly poor people in most developing countries in 1998-1999 alone (World watch, 2001).

Environmental pollution is tangled with the unsustainable anthropogenic activities, resulting in substantial public health problems (Khan, 2004). The water we drink is essential ingredients for our wellbeing and a healthy life. Unfortunately polluted water and air are common throughout the world. The WHO states that one sixth of the world's population; approximately 1.1 billion people do not have access to safe water and 2.4 billion lack basic sanitation (European Public Health Alliance, 2009). Polluted water consists of Industrial discharged effluents, sewage water, rain water pollution (Ashraf *et al*., 2010) and polluted by agriculture or households cause damage to human health or the environment. (European Public Health Alliance, 2009). In fact, the effects of water pollution are said to be the leading cause of death for humans across the globe. Moreover, water pollution affects our oceans, lakes, rivers, and drinking water, making it a widespread and global concern (Scipeeps, 2009). With the dangers of further deterioration before us, assessment of environmental degradation has therefore, become a global issue for the long-term management of the earth bountiful natural resources and the sustenance of livelihood that depend on them (William, 1998).

Sustainable development invokes intra- and intergenerational equity, i.e. equity among and within nations at the present time and the management of natural and other resources such that while the present generation meets its needs, the future generations can meet theirs too. Rapid economic growth coupled with a rising population is putting a high toll on the environment, ecology and natural resources in Bangladesh. In order to ensure the best possible opportunities for a productive and healthy life for the people while maintaining the balance in nature and ensuring sustainability for future generation, The key priorities for Bangladesh for sustainable development are agriculture and food security, water, energy, climate change and disaster risk reduction and disaster management. Environment being one of the three pillars of sustainable development along with social and economic pillars, must achieve appropriate attention in relation to environmental protection and response to the climate change (MoEF, 2012).

At present, several steps have been taken by the government to improve the environmental degradation and pollution control but it is a matter of fact that how the mass people responded on this death causing issue is still not known appropriately. The present case study will evaluate the different types of environmental pollution and associated health hazards existing in Char Aicha and West Karnakathi villages near Barisal University, Barisal. It will also help to take proper steps about how nationwide environmental monitoring program should run as well as some suggested steps to improve the pollution control measures.

2. Materials and Methods

The present study was conducted to assess the condition of pollution and impacts faced by a community around Barisal University adjacent to the Kirtonkhola River. The study was conducted from January to June, 2016. The study was done in Char Aicha and West Karnakathi villages. The geo-location of the villages are 22°39´ 44.3´´ N to 90°22´10.2´´ E and 22°39´33.7´´ N to 90°21´40.1´´ E respectively. Total households of the villages are 1877 and 1347 with a total population of 8582 and 6321 respectively (BBS, 2011).The study was done in three parts. Firstly, a field study was done to observe the condition of the environment for preparing questionnaire. Then, questionnaire was set for collecting information. The questionnaire included the questions on family size, drinking and cooking water sources, waste disposal system, sanitation facilities and diseases etc. Related advice was given also in this time for public awareness. Lastly, another field study was done to observe the improvement of the villagers after the awareness program. The data were collected through personal interview supplemented by multiple methodological Participatory Rural Appraisal tools such as Focus Group Discussion (FGD) and Crosscheck Interviews (CI) with key informants. Necessary relevant information was collected from regional offices.

All the collected information were accumulated and analyzed by MS- Excel and then presented in textual, tabular and graphical forms to understand the present environmental condition and its impacts on the villagers.

3. Result and Discussions

A total of 200 families were interviewed on various aspects of environmental conditions and health impacts in their villages. Detailed analyses were done on the following parameters and are presented in three sections.

3.1 Present Environmental Conditions of the studied area

Environmental condition of the villages was not satisfactory. Different types of pollution make the condition worse than it was before. First of all the initiation of urbanization is responsible for accelerated deforestation. Farm land and crop productivity also reduced as a result of urbanization.

Due to the construction of Dobdobia Bridge, the course of river has been changed. It reduces the depth of river and causes river bank erosion. Almost 9 to 10 brick kilns were observed along the course of the river nearby the studied area. The unplanned building of brick kiln causes pollution of air; diseases like respiratory problem may be the effect of this pollution. It may decrease soil fertility, fruit and crop production too (Sikder *et al.,* 2016). The organic matter status of the soil was low to medium (0.288%) and pH was neutral to slightly alkaline. The condition of usable water was not satisfactory. Some difference was observed in water quality of Kirtonkhola River with the inland water as presumed.

Table 1: Water quality of the studied area

Water Quality Parameters	**Kirtonkhola River**	**Inland water**	**Standard Limit for Drinking**
Temperature (lab)	29°C	-	25°C
pH	7.57	7.45	6.5-8.5
EC	407 µS/cm	287 µS/cm	300 µS/cm
DO	5.86 ppm	3.2ppm	4-6ppm
TS	300 ppm	340 ppm	505 ppm
TDS	100 ppm	180 ppm	500 ppm
TSS	200 ppm	160 ppm	5 ppm

From table 1 it is observed that the temperature was higher (29°C) than the limit. Electrical conductivity (EC) was high (407 µS/cm) for Kirtonkhola River but low for inland water (287 µS/cm). Dissolve Oxygen (DO) was higher (5.86 ppm) for Kirtonkhola River but low for inland water (3.2 ppm). pH, TS, TDS limits were satisfactory but TSS was much higher than standard limit (Imam and Didar, 2005).

3.2 Family size

The family size of villagers was divided into three classes as small, medium and large. From this study it was found that most of the families were composed of 3 to 4 members (30%), marked as small family. Medium family contains 5 to 6 members (50%) and large family (7-10) as 20% (Figure 1). Most of the family in Barisal belonged to the medium size (4.49) (BBS, 2011).

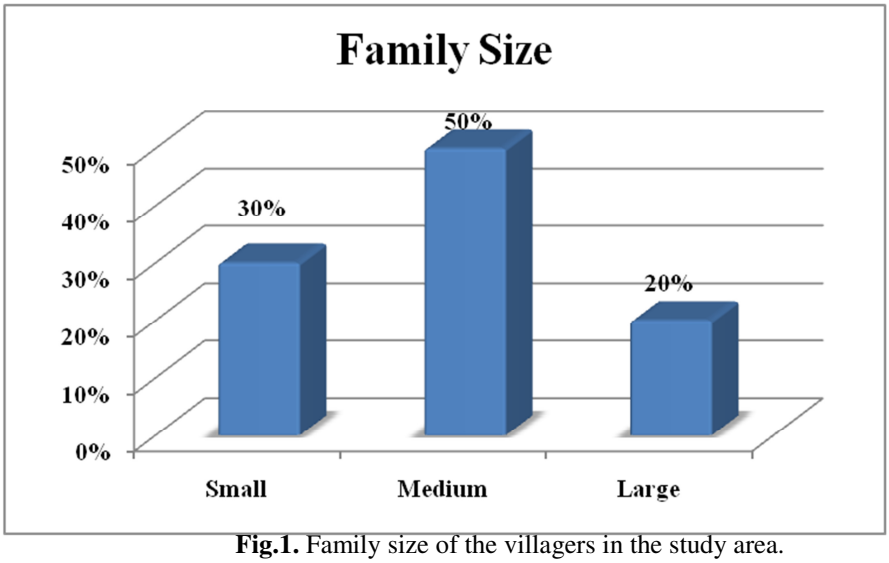

Fig.1. Family size of the villagers in the study area.

3.3 Sources of Income

From the survey, it was found that the villagers earned from mainly four types of occupation such as agriculture, fisheries, day laboring, and trawler driving etc. Agriculture was the prime source of their income (55%) follwed by fisheries 20%, day laboring (10%) and trawler driving (10%). Another 5% was for other types of occupations (Figure 2).

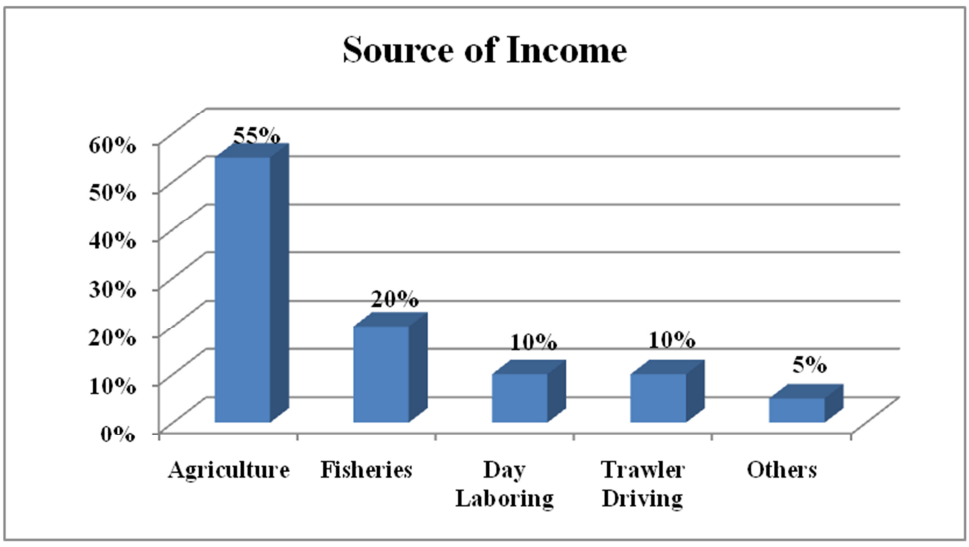

Fig. 2. Sources of income in the studied area.

3.4 Consciousness about pollution and health

A significant portion of the villagers have no knowledge about pollution and their health impacts (30%) and at the same time 30% is aware about it. Most of the villagers (40%) know about pollution but are unaware about it (Table 2). The study also shows that only 30% of women know about pollution.

Table 2: Consciousness about pollution and health in the studied area

Knowledge level	Percentage
No knowledge	30
Have knowledge but unaware	40
Aware	30

3.5 Water resources for drinking and cooking

A notable practice is seen among the villagers that most of them use deep tube-well water (80%) for their drinking purpose but in case of cooking purpose the uses of pond water is the highest (60%) then canal water (30%) and at the least is deep tube-well water that is only 10%. It is a scenario that reflects to their lack of consciousness (Table 3).

Table 3: Water resources for drinking and cooking of the studied area

Drinking water source		Cooking water source	
Sources	**Percentage**	**Sources**	**Percentage**
Deep Tube-well	80	Deep Tube-well	10
Shallow Tube-well	20	Shallow Tube-well	-
Pond	-	Pond	60
Canal	-	Canal	30

3.6 Waste disposal system

In case of waste disposal system different types of dumping location were found but none of them are desired. Maximum percentage (40%) of people throws their waste hither and thither nearby their place of residence. 30% of wastes are being disposed to nearby ponds, 20% in canals. This water is used for cooking purpose. Only 10% is disposed in a specific area (Figure 3).

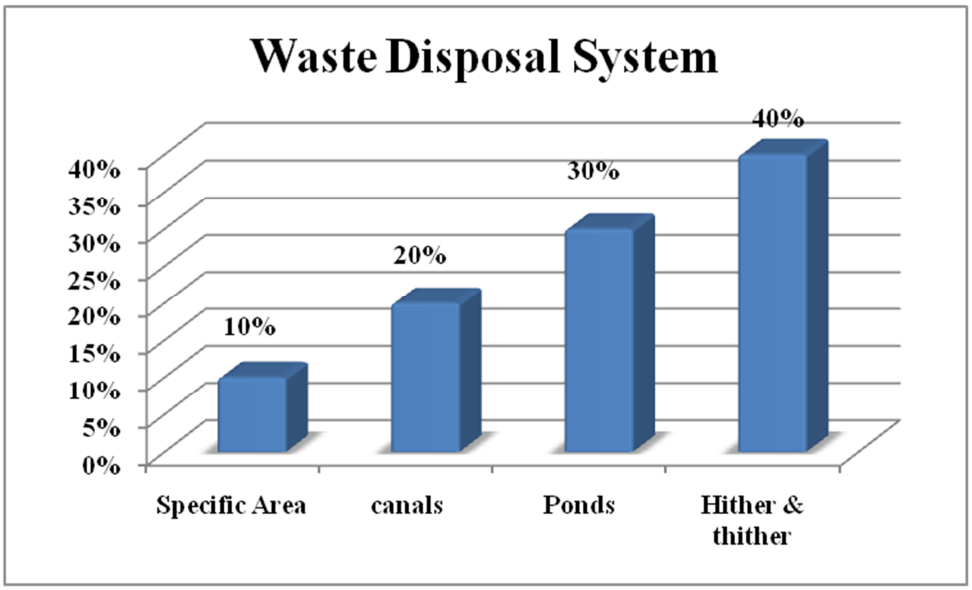

Fig.3. Waste disposal system of the studied area.

3.7 Sanitation

Sanitation facilities are considered as hygienic that promotes health through prevention of human contact with the hazards of wastes as well as the treatment and proper disposal of sewage or wastewater; Unhygienic like hanging latrines, open latrines, broken pit latrines, etc. with improper waste disposal systems (Minnatullah and Orsola-Vidal, 2006.) and combination of these two often described as moderate.

The overall sanitation facility of these areas is moderate. Almost 60% of families have moderate sanitation facilities and 40% have unhygienic facilities (Table 4). None of them has hygienic sanitation facilities. Most of their septic tank is river or ditch. Functional conditions of the latrines were all right as none of them were leaked or overflowed.

Table 4: Sanitation facilities of the studied area.

Sanitation Facilities	Percentage
Hygienic	0
Moderate	60
Unhygienic	40

3.8 Diseases

Disease sufferings of the villagers have been divided into two categories based on age difference. People aged below 15 years suffered mostly with fever (54%), 15% of peoples suffered with cold diseases, 7% with typhoid. In case of skin disease, respiratory problem and headache the proportion is 6% for each. 6% of people suffered with more than one disease (Table 5).

Table 5: Disease sufferings of the villagers having <15 years old.

Name of the Disease	Percentage
Fever	54
Cold Disease	15
Typhoid	7
Skin Disease	6
Respiratory Problem	6
Headache	6
More than one	6

People aged above 15 years suffered mostly with more than one (70%) or two diseases (30%). The sufferings of diarrhoea along with skin diseases are 31%. The percentage is 31% for skin diseases along with worm diseases. 23% is for worm diseases and respiratory problem, 8% for respiratory problem and headache, 7% for skin diseases and headache. Among the 30% of people who suffered with more than two diseases- 33.33% suffered with diarrhoea along with skin diseases and worm diseases; 33.33% for Skin disease along with worm disease and headache; 33.33% for worm disease along with respiratory problem and headache (Figure 4).

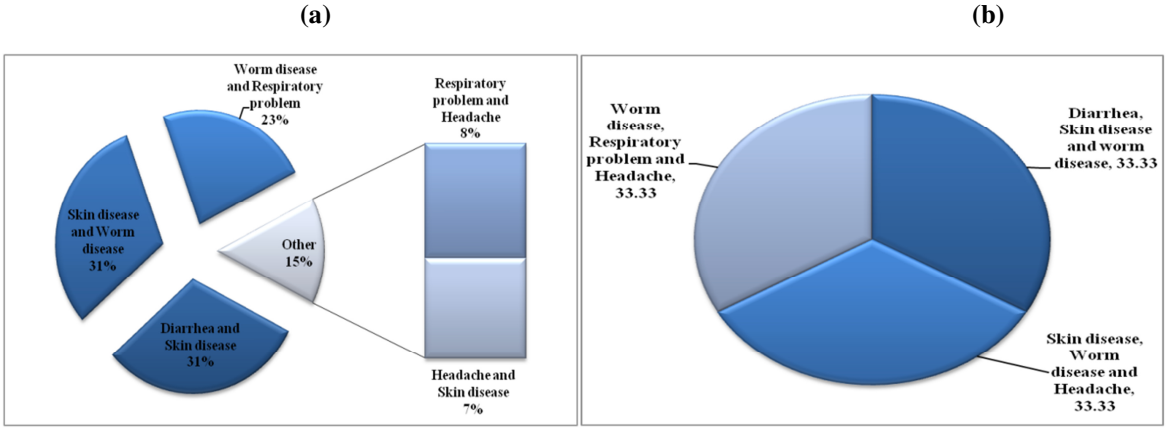

Fig.4. Percentage of different diseases suffered by the villagers (a) People suffered with more than one disease and (b) People suffered with more than two diseases.

3.9 Changes observed after survey

At the time of survey some public awareness program were done like communication program with the respondent about current problems, hand washing and sanitation campaign, tree plantation program, awareness program in school etc. This program also included the raise of awareness for drinking and cooking with safe water. The procedure for making cost effective water filter (With pitcher) was shown.

After the survey another field study was done on the respondents to observe the changes or effect of the program. The study creates a positive attitude on the respondents result an increase in using hygienic latrines (40% increased to 95%). The percentage of hand washing has been improved from 57% to 75%. Only 6% of the latrines were without soap and sandals. The fallow land besides most of the houses was cultivated with vegetables.

4. Conclusion

The present study showed the level of knowledge among the people lives in a peri-urban area. The findings showed that most of the people have knowledge about environmental pollution and degradation but they are not aware of its devastation. They use deep tube-well water for drinking purpose but use surface water for cooking and washing. The waste disposal system is very poor and most of them throw their waste anywhere which might cause degradation of the environment. While raining washed out wastes and ended up in the nearby pond. The sanitation system is moderate in most of the family but still now a major portion has no hygienic sanitation system. The young generation aged below 15 years are suffering from various diseases like Fever, Cold disease, Typhoid, Skin disease etc. The people aged above 15 years are affected by two or three diseases at a time where Diarrhoea, Skin disease and worm disease are most prominent. The management steps such as tree plantation, rally, seminars, school based awareness program about environmental pollution, hand washing program, introduction of water treatment methods at lowest cost, leaflet and poster causes a revolution on environmental consciousness. The research findings showed that the women have less knowledge about environmental deterioration which has great impact on the environment. Finally this research recommend some important steps based on the findings that if we want a sustainable environment then we have to teach mass people about environment and have to create a educated force who will understand its severity and will try to control it by strong hand. In this case women should not be neglected because they are half of the total population and most of the household related pollution is caused by them. It is inevitable that every school and collage must teach about environmental pollution and degradation. Further study is needed to identify the actual causes of diseases and the effect of natural hazards on environmental degradation.

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