Progressive Agriculture 31 (1): 1-9, 2020 ISSN: 1017 - 8139

Progressive Agriculture
Journal homepage:http://www.banglajol.info/index.php/PA

Impact of *Kapotaksha* river water pollution on human health and environment

MA Hanif[1], R Miah[2], MA Islam[1*], S Marzia[1]

[1]Department of Environmental Science, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh; [2]Department of Agribusiness and Marketing, Faculty of Agricultural Economics and Rural Sociology, Bangladesh Agricultural University, Mymensingh 2202, Bangladesh.

Abstract

This study was conducted to evaluate the Kapotaksha River water pollution status and its impacts on Human health and Environment. This study conducted a case study on four selected areas (Barakpur, Srirampur, Prbazar, and Gouranandapur) on the Kapotaksha river bank at Jhikargas Upazila. This river water pollution occurs by some natural process such as flood, storm, and natural biodegraded. But human activities are major reasons for the river water pollution. Industrialization, urbanization, domestic waste, sewage system, agrochemicals, etc are major causes for river water pollution. This more polluted water has an impact on human health and environment. This study was conducted to find out the polluted water due to various types of diseases such as scabies, asthma, dysentery and respiratory disease. Most of the people (49%) are affected by Scabies, 4% are affected by diarrhea, 5% are affected by dysentery, 25% of people are suffering from respiratory diseases and 4% are suffering from asthma and the polluted water pollutes soil by using the water in agriculture purpose answered by 20% respondents which is 100% of farmer respondents. If someone does not use this water can not affect soil answered by 80% of respondents. This river water becomes more polluted and harmful for human health and environment because this water hampered by the local colony, local trader, lack of proper management of sewage system, miss-use on the riverbank area for the dumping various solid waste on the river bank, chemical fertilizers, industries etc. At present now we cannot fulfill control this continuous river water pollution but we can minimize this problem and it would be positive for human health, others living organisms and Environment.

Key words: Water pollution, , farmer's perception, human health, environmental pollution, Bangladesh

 ***Corresponding Author:** maislam@bau.edu.bd

Introduction

Bangladesh is riverine country. There are many rivers in Bangladesh. The number of rivers in Bangladesh is often 700 (Secondary Geography), Often 310 and it also has 58 trans-boundary rivers (BBS, 2019; Wikipedia, 2019). It has total Length 24140 kilometers. The rivers contain water body huge amount, most of them used for agricultural land for irrigation to produce food products. A protected environment is needed to our comfortable and safe life. At present now, Environmental degradation, river bank erosion is a common factor in Bangladesh, and it's increasing in day by day (Islam *et al.*, 2017). Water is the most important part of our life. Because we use water every day, and it's needed for human being or all plans, animals and aquatic life, etc. It is a natural renewable source any cultural or civilization depends on the

availability of water. This water fallen on the earth in the river, lakes, Oceans etc. A little amount of water infiltration in the ground of the earth, soil contains a little water, and it is used to growing plants, for drinking water etc. (Hennigan, 1969).

Water is important part of our life yet it has poorly managed resources in the world. Now, industrialization, urbanization and agrochemicals etc. are responsible for the poor quality of water (Rahman *et al.*, 2016; Tinni *et al.*, 2014; Islam *et al.*, 2020). Industrial, agrochemicals etc are contribute to toxic in the environmental issue that is threat to human and others life, and it's to be a cause to die for any life. Due to industrialization the water quality of the river water deteriorated day by day in different countries as well as Bangladesh (Ashraf *et al.*, 2010; Islam *et al.*, 2020; Rahman *et al.*, 2016; Tinni *et al.*, 2014).

Water pollution occurs chemically or biologically, and then the water quality becomes poor and polluted. This water has negative impact on living organisms and users. And its effects not only impact on people, but they also can kill other living organisms, such as- animals, fish etc. (Wikipedia, 2019).

Most of the people of Bangladesh depend on the river for catching fishes, washing daily bathing, transported system etc. But most of the rivers in Bangladesh has been polluted from industrial waste, growth urbanization and used agrochemicals such as chemical fertilizers, pesticides etc. The Kapotaksha River is one of the most important River in Jashore district. This river holds area on the Chougasa, Jhikargacha, and Keshobpur Upazila. It is one of the most important rivers in the Jashore district. This river bank area sometime depends on it, because it used to irrigation system, for fishing etc. But the water of the Kapotaksha river water quality is changed and it's become hampered in day by day. The water quality of this river water is degraded and alarming for the living organisms and environment as well as human health. Because of the increasing urbanization, more amounts used of chemicals fertilizers, pesticides in agricultural fields, ponds and in different forms in soils. Dumping solid waste on the river bank area hold these waste and to hinder the water flow of the river. Sewage system, domestic or households wastes are also fallen into the river.

The unplanned urbanization, agrochemicals, domestic waste, sewage system, coal and ash from brick field has affected all living organism in the river water and to die and destroy the food chain in the river. It becomes critical disease for human health, and hampered environmental condition (Wikipedia, 2019). In Bangladesh, Padma, Meghna, Jamuna, Buriganga, Bangshi, Balu, Brahmaputra, Tista, Balu, Karnofuli etc. river's water qualities were reported as polluted due to urbanization, unplanned disposal of industrial effluents, sewage systems and agrochemical deposition (Tinni *et al.*, 2014; Ashraf *et al.*, 2010; Mukti, 2009; Rahman *et al.*, 2016; Islam *et al.*, 2015; Islam *et al.*, 2017; Islam *et al.*, 2020).

Polluted water is threatened for human health and environment. Polluted water destroys the quality of human life, aquatic life, and every environmental condition in the World. There are many of the rivers nearest the big cities in our country. It has been polluted in the last few years due to various reasons as river communication, irrigation system, natural sources of a groundwater reservoir, fishes, maintaining the environmental temperature maintaining, control of ecosystem, to provide water for birds or animals, etc. Kapotaksha River is one of the rivers which consists a set of importance for *Chougasa*, *Jhikargasa*, *Keshobpur* (*Jashore* district). But this river water is not suitable for regular use because it is much polluted.

So, it is important to explore the major causes of river pollution and human health problems and the environmental problems. There are many of the peoples affected by this river water pollution who lives in the nearest on the riverbank of Kapotaksha river. The objectives of the study are to assess the causes of Kapotaksha River water pollution and to assess the

impacts of water pollution of Kapotaksha River on human health and the environment.

Materials and Methods

***Study area*:** There are four villages (*Barakpur*, *Srirampur*, *Prbazar* and *Gouranandapur*) on the riverbank area of the Kapotaksha River at *Jhikargasa* Upazila in *Jashore* district (Figure 1). The *Jikargasa* pourashova is located within 89º04′ North latitude to 22º57′ North latitude and 89º07′ East longitude to 89º22′ East longitudes. The four selection area is on the Riverbank of the western side (BBS, 2019).

***Local trade area*:** Most of the local market still is side of this river and *Parbazar, Barakpur, Srirampur* and *Gouranandapur* etc. are the major trade areas.

***Agricultural land use for food products*:** Most of the land of Bangladesh is being used as agricultural land. But agricultural lands are decreasing while increasing of the land in urban use. Kapatakkha river system area is very fertile. So the area was used as agricultural land massively. Now the patterns are being changed even in southern part of Kapatakkha River.

***Selection of the research area*:** The Kapotaksha river of Jashore is about 180 km in length in length (Wikipedia, 2019). It is not possible to study all areas about the river. So, about 2-3 km area surrounding Jhikargasa regarding river pollution has covered by the study because this area is severely affected by mostly various waste and hazards than other areas. Around Jhikargsa most of the area is occupied by different types of business. The area, suitable for various business activities, is not very far from Jhikargasa. Once, the land of the area was not very high value in rate. Due to recent Urbanization, most of the rivers of the adjacent area of the high way surrounding urban zone is being affected a lot. The Kapotaksha River is the river that has been severely affected by various waste and hazards. So, the selection of the study area deserves a strong justification for the research.

***Primary data collection*:** The primary data collection was the initial stage of this study. The primary data were collected using semi-structured questionnaire. A questionnaire survey was carried out to investigate the major causes of water pollution of the river, impact on human health, common illness, and impact on the environment etc. Data collected from randomly selected 200 respondents in four selected areas.

Figure 1. Maps showing the study sites of Jessore district in Bangladesh.

***Secondary data*:** Secondary data were mainly used to have information about the degree of water pollution of the river, understand the studied area history, culture, livelihood, economic condition, etc by analyzing different research works. The basic sources of secondary data for this study were previous studies, journals, books, reports and websites.

***Data collection method*:** The present study was done on the basis of data collection through survey, observation, discussion, face-to-face interviews with respondents. A simple and appropriate semi-structured questionnaire was used to convey the message of the issue intelligible to the respondents. Respondents were selected from the affected community randomly both

male and female, and they were interviewed by the researchers directly. It has been assumed that the issue of water pollution in the river has started about 20-25 years back. The generations those who are young in age could not see the pollution-free water of the river. The aged people passed present and past history of the river water. So, most of the respondent has been selected with an aged group of minimum 25-65 years.

***Data tabulation and data analysis*:** The collected primary data were analyzed by using Statistical Software SPSS. Microsoft Excel was used also for checking data properly. Appropriate analytical model and statistical techniques were used to analyze the data. To achieve the above objectives this study was considered on some socio-economic and demographic characteristics of the respondents such as age, education, gender, occupation and environmental issues related to study river like- usage of river water, perception about river water pollution, odor and color of river water, existence of flora and fauna in the river, impact of water pollution on human health, distribution of respondents based on suffering from different diseases, impact of polluted water in soil, actions taken by the government against river water pollution etc. Appropriate graphs (Histogram, Bar diagram and Pie chart), tables and descriptive statistics (ratio, percentage, average) were used to present and summarize data.

Results and Discussion

***Age of the respondents*:** The age of the respondents are categorized into five groups (20-30, 31-40, 41-50, 51-60, 61yrs+) for easily interpret the information. It is shown in the Figure 2. The field data revealed that 10% of the respondents belong to the group of 20-30 years, 32% belong to the group of 31-40 yrs, 21% belong to the group of 41-50 yrs, and 34% belong to the group of 51-60 yrs, 3% belong to the group of group of 61yrs+. The highest number of the respondent belongs to 51-60yrs group that is 34%.

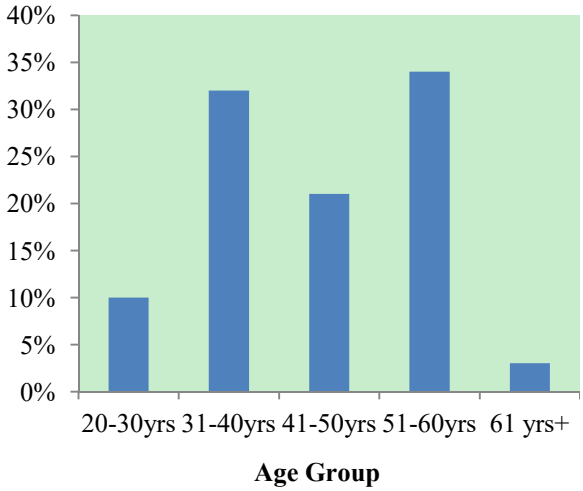

Figure 2. Distribution of age group of the respondents.

***Gender of the respondents*:** Both male and female respondents have been interviewed for the better result of the study. 65% of the respondents are male and 35% of the respondents are female in this study.

***Education status of the respondents*:** The education status of the respondents has been categorized in four groups of no education, below S.S.C, S.S.C, and above S.S.C. It is shown in the Figure 3. It is observed that 55% of the respondents belong to the no education group, 70% belongs to the group of below S.S.C, 53% belongs to the S.S.C group, and rest of the 22% belongs to the group of above S.S.C. The higher percentage of the respondents belongs to the group of no education and below S.S.C which is 62.5%. Lowest number of respondents belongs to the group of above S.S.C. (11%).

***Occupation of the respondents*:** From the data in the Figure 4, it is observed that the higher percentage (42%) belongs to the farmer group because this study area is very useful for agricultural work or others cultivation, 7% to fish monger group, 10% to laborer group, 28% to house wife group, 0% to boatman group because the river does not navigate, and 13% belongs to other group. The businessmen, unemployed, and servicemen are included in the other group. It is seen in the collected data that the education level of other

group occupation is S.S.C and above S.S.C. The education level of fisherman, farmer, laborer, house wife, and boat-man group is no education, below S.S.C, and S.S.C. It is noted that some of the fisherman education level is S.S.C.

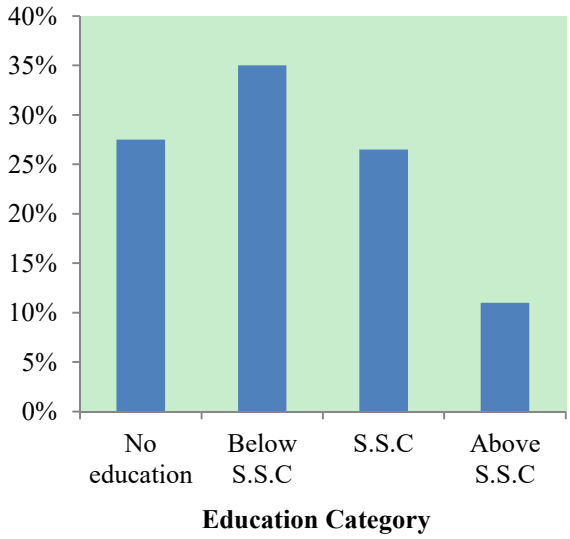

Figure 3. Education status of the respondents.

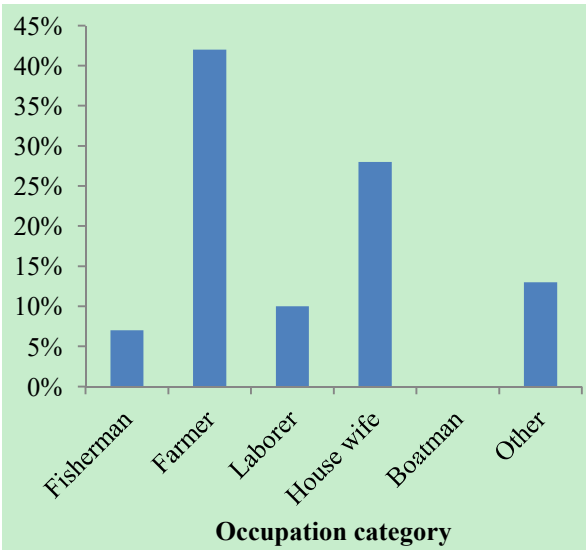

Figure 4. Distribution of occupation of the respondents.

***Usage of Kapotaksha river water*:** In this part, the number of users of water from the Kapotaksha river are focused. The most of the people use the river water for different purposes and that frequencies are 94%. The highest numbers of people use river water for bathing (44%), then 28% use for agricultural purposes, for household 22% respondents are use (Figure 5).

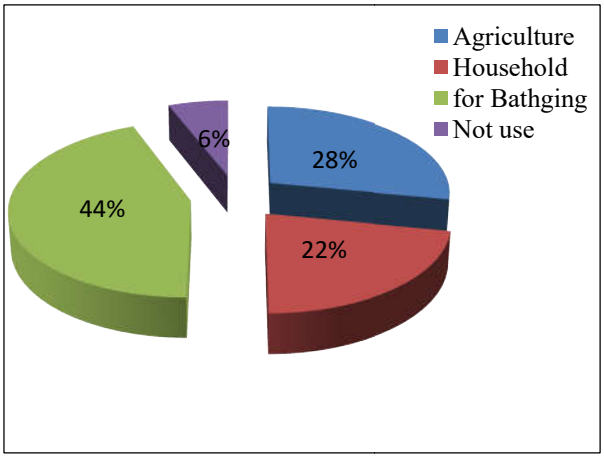

Figure 5. Usage of *Kapotaksha* river water

***Major causes of water pollution*:** The probable causes of the water pollution of the Kapotaksha River are shown in Table 1. Most of the respondents think about 90% for the discharge of domestic waste, growth-centre related waste, chemical pesticides, and land fill leakages are the major causes of the river water pollution. The kapotaksha River water in this study area are become more polluted by the chemical fertilizers and pesticides (opined by 44% respondents) because most of the riverbank area is used for agro-based cultivation and farmers use various types of agrochemicals. Secondly, respondents are opined about the other causes of water pollution in the river are drainage/sewage system (33%) and household wastes 13%. Kabir (2014) reported that the major causes of the Banshi river water in the study area at Savar is Industrial waste (92% respondents opined), but agrochemicals/fertilizers and household wastes only 2%. Industrial and domestic waste disposal, pesticide

deposition are the major causes of water pollution in Balu and Buriganga rivers (Rahman *et al.*, 2016; Chakraborty *et al.,* 2013). Islam *et al.* (2020) also observed the metals in Brahmaputra river water samples caused by domestic waste disposal and agrochemical deposition in water bodies. The mixing of insecticides, industrial effluents in water bodies from the runoff of water into the river cause of water pollution (Schulz, 2004, Tinni *et al.*, 2014). Saifullah *et al.* (2012) also reported different causes of water pollution in Buriganga river like- regular dumping of wastes, industrial wastes, household waste etc.

Table 1. Distribution on the causes of water pollution in the Kapotaksha River.

Causes	Frequency	Percent	Cumulative Percent
Drainage / Sewage system	66	33.0	33.0
Household and growth centre related wastes	26	13.0	46.0
Chemical fertilizer and pesticide	88	44.0	90.0
Land fill leakages,	16	8.0	98.0
Others	4	2.0	100.0
Total	200	100	

***Odor of the water*:** Total 98% of the respondents answered that the odor of the water in the study river is unpleasant. Rest of the respondents opined the odor is pleasant. Most of the respondent shared that the major causes for bad odor of the water is pesticides which directly mixed into the river water, the dead body/body parts of the various animals are thrown directly into the river, and sewage system fall into the river without treatment etc. Rahman *et al.* (2016) also reported about the bad odor of the water samples in Balu river than Brahmaputra river which is identical as this finding. In another study, much bad/unpleasant odor reported in water sample of Brahmaputra river due to more dilution of metal contained wastes (industrial disposal). In few samples of river water, the odor of insecticides reported (Schulz, 2004). Unpleasant odor of the water samples of Buriganga and Bangshi rivers were found by different research groups in Bangladesh (Saifullah *et al.*, 2012; Mukti, 2009).

***Existence of flora and fauna in the river*:** It is reported that only 18% of the respondents have opined for existence of flora and fauna in the river water and 82% of the respondents pointed out about no existence of flora and fauna in the river water. Kabir (2014) found that only 12% of the respondents have answered for existence of flora and fauna in the river and 88% of the respondents pointed out of no existence of flora and fauna in the river. In Buriganga and Balu rivers, relatively smaller amount of flora and fauna were reported by Chakraborty *et al.* (2013) and Rahman *et al.* (2016). Previous findings related to the existence of flora and fauna relative less than the Kapotaksha river water. The flora and fauna of Jamuna River are badly affected due to direct discharge of different industrial effluents (Tinni *et al.*, 2014). Excessive metals reported in water of Brahmaputra river due to addition of waste from different agricultural lands, cause for creation of unsuitable environment of flora and fauna in the river (Islam *et al.*, 2020).

***Present color-status of the water*:** It is observed that the color of the water is blackish green which is pointed out by 64% of the respondents. Another 30% respondent's told that the color of the water is black and 52 rests of the 6% respondents opined that the color of the water is dark black (Table 2). Blackish green, black and dark black are not the normal color of the water. It may be clear and light green in color. The change of the water has been occurred here due to pollution. Blackish and Brown colored water samples of Bangshi and Buriganga rivers were noticed respectively by Mukti (2009) and Saifullah *et al.* (2012).

Table 2. Distribution patterns on the color status of the water samples.

Parameters	Frequency	Percent	Cumulative Percent
Black	60	30	30.0
Dark black	12	6.0	54.0
Blackish green	128	64.0	64.0
Total	200	100.0	100.0

***Impact of water pollution on human health*:** Human health directly related to the status of water pollution, where 94% peoples are use river water regularly for their livelihood. The disease pattern of the study areas was shown in Table 3. Most of the people (45%) are affected by Scabies, 4% are affected by diarrhoea, 6% are affected by dysentery, 20% of people are suffering from respiratory diseases and 4% are suffering from asthma.

Table 3. Distribution of respondents based on suffering from different diseases.

Types of diseases	Frequency	Percent	Cumulative Percent
Scabies	98	49.0	49.0
Diarrhea	8	4.0	53.0
Dysentery	10	5.0	58.0
Respiratory disease	50	25.0	83.0
Asthma	8	4.0	87.0
Others	10	13.0	100.0
Total	200	100.0	

Kabir (2014) reported that the disease pattern of the area. Most of the people (54%) are affected by skin disease, 6% are affected by diarrhoea, 8% are affected by dysentery, 30 of people are suffering from respiratory diseases and 4% are suffering from asthma. Halder *et al.,* (2013) reported that the disease pattern of the area (on the Turag river of Tongi bridge in Dhaka). Most of the people (80%) are affected by skin disease, 75% are affected by the Gastric ulcer and diarrhoea and 45% are affected by the Cold caught. From both research it was found that all types of diseases have more impacts on human health than the selected study area. Because their research areas (Banshi River and Turag River) become more polluted than the Kapotaksha River. Different types of industrial and others pollutants are available in the Buriganga river (Chakraborty *et al.*, 2013) and Banshi River at Savar (Mukti, 2009) This reason most of the people (54%) are affected by Skin diseases, 6% are affected by diarrhoea, 4% are affected by dysentery, 30 of people are suffering from respiratory diseases and 4% are suffering from asthma and others 2%. Also the study area of the Turag river become more polluted and most of the people (80%) are affected by the Skin disease, 75% are affected by the diarrhoea and gastric ulcer and 45% are affected by the cold cough. Whereas from my research it was found that (49%) people are affected by Scabies, 4% are affected by diarrhoea, 5% are affected by dysentery, 25% of people are suffering from respiratory diseases and 4% are suffering from asthma because Kopotaksha river water (study area) is free from various types of industrial and other pollution than those study area. The major rivers of Bangladesh also polluted by different industrial effluents which directly affect on fish species and human health adversely (Tinni *et al.*, 2014, Mukti, 2009). Human health adversely affected by water pollution caused by insecticide mixed in river water (Schulz, 2004). The deteriorated water samples were found in Buriganga water which is also adversely affect on human health (Saifullah *et al.*, 2012).

***Impact of polluted water in soil*:** Results exhibit that the polluted water pollutes soil caused by using the water in agriculture purpose answered by 20% respondents where all are farmer respondents. If

someone does not use this water can not affect soil answered by 80% respondents. Kabir (2014) reported that the polluted water pollutes soil by using the water in agriculture purpose answered by 10% respondents which is 100% of farmer respondents. If someone does not use this water can not affect soil answered by 90% respondents. Almost 50% respondents were answered positively about the water pollution due to industrialization which directly affect on soil (Chakraborty *et al.*, 2013). This study was also find out that the 20% farmers are used this river water for irrigation. This polluted water causes to pollute soil by using the water in agricultural land. Industrial waste also mixed directly to the different water sources, mostly in river water which is much harmful for river water quality (Tinni *et al.*, 2014). Impact of air pollution and its awareness in Bangladesh also reported that no such significant awareness reported in rural and urban areas (Sarker *et al.*, 2018). Insecticide residues were reported in water of different river which also deposited in soil (Schulz, 2004).

Action taken by the government: The most of the respondents (98%) answered that no action taken by the government against the river water pollution where only 2% respondents opined that action taken by the government. Kabir (2014) reported that the most of the respondents (98%) answered that no action taken by the government against this water pollution in Bangladesh. For saving the Buriganga river water different strategies were taken by GOs and NGOs in Bangladesh (Saifullah *et al.,* 2012). Now-a-days, there are few NGOs aware about the river water pollution in Bangladesh.

Conclusion

Kapotaksha River water turned into toxic and poisonous under the huge agrochemicals and sewage system discharging into it, most of the wastes coming from the agricultural land field and domestic waste from the sewage system factories at Parbazar, Srirampur, Barakpur and Gourinondapur area in Jhikargasa pourashova. The river with blackish green and black water is constantly receiving tons of sewage system wastes and other toxicants and poisonous solid and liquid wastes without any measures and treatment from surrounding this Domestic area, growth-centre and settlements. The chemical pesticides, domestic waste, land fill leakages and other human garbage mixed with the river water by the forces of rain water, drain, canals, lake and flood etc. Its water is no longer clean and transparent which is almost impossible to use.

By using of river water for washing clothing and bath many water-borne diseases spread man to man. For the polluted situation of the river maternal and child health of nearby riverbank slum are in a dangerous position. The effect of water pollution was studied carefully and found out that a lot of people are suffering from various types of diseases; especially Scabies and respiratory diseases. The water pollution caused for unplanned agrochemical use, unplanned urbanization has affected all fishes and most of the aquatic animals to death, disruption of food-chains, and critical diseases to humans, destruction of ecosystems and environment, and socio- cultural habits of the people in the area. Lack of proper management of wastage release and lack of proper implementation of policy are the main reasons for it. If we take care of these sections we can make the river water condition and state very good which can have positive changes to the human and aquatic life, environment and ecosystem of the river area.

The findings have identified the areas where further improvements are required for having the way of preventing the water pollution of the Kapotaksha River. Therefore, it is recommended for in–depth research on the area can be conducted. Future research may also be carried out to explore some of the important issues like the impact of water pollution on human habits and cultural changes.

References

Ashraf MA, Miah MJ, Yusoff I, Mehmood V (2010). Effects of Polluted Water irrigation on Environment and Health of People in Jamber, District Kasur, Pakistan. *International Journal of Basic & Applied Sciences,* 10(3): 37-57.

BBS (Bangladesh Bureau of Statistics) (2019). Encyclopedia of children has data available from 20 May 2019.

Chakraborty C, Huq MM, Ahmed S, Tabassum T, Miah M (2013). Analysis of the causes and impacts of water pollution of Buriganga River: A critical study. *International Journal of Scientific and Technology Research,* 2(9): 245-252.

Halder JN, Islam MN (2015). *Journal of Environment and Human*, 2(1): 2373-8332. DOI: 10.15764/ EH.2015.01005.

Hennigan RD (1969). Water Pollution. *Bio-Science*, 19 (11). Retrieved 23 February 2019 from http://www.jstor.org/stable/10.2307/1294973.

Islam MA, Nuruzzaman M, Das RR, Afrin N (2020). Contamination of heavy metals in water, sediments and fish is a consequence of paddy cultivation: focusing river pollution in Bangladesh. *Ministry of Science and Technology Journal*, 1 (1): 48-59.

Islam MA, Parvin S, Farukh MA (2017). Impacts of riverbank erosion hazards in the Brahmaputra floodplain areas of Mymensingh in Bangladesh. *Progressive Agriculture*, 28(2): 73.

Islam MA, Fatima K, Hossen MK (2015). Seasonal variation and characterization of effluents of fertilizer factory. *Progressive Agriculture*, 26: 136-146.

Kabir MR (2014). Social Impact Assessment of Water Pollution: A Case Study on Bangshi River, Savar. *MS Thesis*, Institute of Governance Studies (Igs) BRAC University, Dhaka, Bangladesh, November 2014.

Mukti KNK (2009). Point and Non-point sourced of pollution along the River Bangshi: Its impact on water quality and human habitats. *M. Sc. Thesis*, Department of Geography and Environment, Jahangirnagar University, Savar.

Rahman MM, Islam MA, Khan MB (2016). Status of heavy metal pollution of water and fishes in Balu and Brahmaputra rivers. *Progressive Agriculture*, 27(4): 444-452.

Saifullah SM, Kabir MH, Khatun A, Roy S, Sheikh M S (2012). Investigation of Some Water Quality Parameters of the Buriganga River, *J. Environ. Sci. & Natural Resources,* 5(2): 47-52.

Sarker R, Yeasmin M, Rahman MA, Islam MA (2018). Peoples perception and awareness of air pollution in rural and urban areas of Mymensingh sadar upazila. Progressive Agriculture, 29(1): 22-32.

Schulz R (2004). Field study on exposure, effects, and risk mitigation of aquatic non point –source insecticide pollution: a review. *Journal of Environmental Quality*, 33: 419-448.

Tinni SH, Islam MA, Fatima K, Ali MA (2014). Impact of Tanneries Waste Disposal on Environment in Some Selected Areas of Dhaka City Corporation. *J. Environ. Sci. & Natural Resources*, 7(1): 149–156.

Wikipedia (2019). Wikipedia. Water is essential not only for survival of human beings, but also for animals, plants, and all other livings being. Data retrieved on 20, may 2019.