INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 4, Issue 3, (2014) E-ISSN: 2222-6990

An Analysis of Knowledge on Sources of Environmental Pollution of Students' at Secondary Level in Bangladesh

Mirza Md. Moyen Uddin
Fellow, Institute of Education and Research, Rajshahi University
Rajshahi 6205, Bangladesh
Email: mirzamoyen76@gmail.com

DOI Link: http://dx.doi.org/10.6007/IJARBSS/v4-i3/731

Published Date: 29 March 2014

Abstract
The article examined mainly the knowledge on sources of environmental pollution of the students of secondary level formal education. Data were collected from 220 students of secondary level formal education of Dhaka and Rajshahi division of Bangladesh purposively through questionnaire between March to June 2013. Results show that in several cases the students have the misconception of environmental knowledge on sources of pollution. But most of cases, they have the rational and positive thinking regarding the issues. Finally the article concluded that there was a need to intensify students' awareness regarding environmental knowledge on sources of environmental pollution for the better management, protect from pollution and gain expected sustainable development of present and future Bangladesh.

Key ward: Sources of Environmental Pollution, Environmental education, Formal education, Bangladesh.

1. Introduction

Bangladesh faces unique challenges to the search for ecological sustainable development with a very high density of population, natural disaster and limited resources. Negative change of environmental condition has become a growing concern and threat for world ecosystem. Depletion of ozone layer, warming of the earth's surface, air pollution, desertification, water pollution, deterioration of the soil productivity etc. are the results of human capricious activities. Irresponsible human activities are mainly responsible for creating all these threats to life support system both locally and globally (Meenakshi, 2009). The environmental condition of the world is deteriorating at an alarming rate due to changes in human activities triggered by inappropriate economic activities and rapidly changing demographics and socio-economic patterns. The problems are the outcome of dynamic interaction of poverty, population growth and its changing distribution and the misuse of

resources, wasteful production and human greed. Paradoxically, underdevelopment as well as haphazard development processes are also responsible for its precarious situation (Chowdhury, 2004). For the geographical location, Bangladesh suffers from frequencies of hazards arising from drought, flood, soil erosion and other natural calamities. Air pollution is one of manmade environmental disasters that pollutes mainly from two sources namely, vehicular and industrial emissions. There are also numerous brick-making kilns working in dry season all over Bangladesh. These kilns are another vital source of air pollution. An emerging issue of great concern in the cities and towns is the high concentration of lead in the air from vehicular exhausts. The high level of concentration of lead is very harmful for human health especially for child health. The surface water of the country is being polluted through capricious disposal of untreated industrial effluents and municipal waste water, runoff pollution from chemical fertilizers and pesticides and oil and lubes spillage in the coastal area from the operation of sea and river ports and ship wreckages and high level arsenic contamination in ground water is a national problem. The quality of soil has deteriorated due to reckless use of agrochemicals, unplanned use of land, undesirable encroachment on forest areas for agriculture and settlements and indiscriminate disposal of hazardous industrial wastes. The depletion of biodiversity is the result of various kinds of human interventions that impinge on it through destruction and degradation of land, forest and aquatic habitats. These activities encompass the sectors of agriculture, forestry, fisheries, urbanization, industry, transport, tourism, energy, chemicals, and minerals (GOB, 2010).

In Bangladesh, environmental education is a recent phenomenon particularly in the formal higher education sector where few universities teach environmental studies. Recently popular environmental movements have heightened awareness of environmental issues as well as the need for education and skilled environmental management in Bangladesh (Salequzzaman and J.K. Davis, 2003). To face the environmental challenges it is important to acquaint our younger generation with appropriate knowledge, skills and attitudes relating to environment, because this generation will affect and be affected by the environment management policy undertaken today (Sarkar, 2011). A significant program of environmental education and development of local expertise is needed for massive changes in behavior with respect to the environment. Bangladesh is now in a vulnerable situation due to greenhouse effect. If the sea level rises for the negative climate change, then one third portion of Bangladesh will submerged by sea water and salinity problem will be a great problem for agricultural production. Already 830,000 hectare cultivable land of south-west part of Bangladesh has unable to cultivate due to salinity problem from Ayla and Sidor. Information is that the average temperature of the world may increase 1.1-6.4˚C by 2100 and the sea level may increase up to 34 c. m. by 2080. In this circumstances many countries like Bangladesh will totally submersed by sea water (Tapon et al., Secondary Science Textbook, NCTB, 2012).In this respect, the formal education system provides a ready framework for reaching a large part of the existing population and can help make future generations conscious of the importance of environmental conservation. Students are receptive and curious, making them appealing to motivate. Practical approaches that involve the students in solving local environmental problems have more influence, develop skills and give reinforcement to the idea that people can make a difference. Improvement of environmental quality by education is critically important for the sake of human health as well as for the economic growth.

2. State of Environmental Education at Secondary Level in Bangladesh

Some researchers argue that formal environmental education system helps students to develop more favorable towards environment (Lee, 2008).Therefore, it is reasonable to look at the environmental education in respect of Bangladesh within this study. The environmental education (EE) in Bangladesh is in its very initial stages. Environmental education policy is not well-organized in Bangladesh. It is important to note that in Bangladesh, EE is not taught students as a separate subject at secondary level. However various themes like fossil fuel, energy and its conservation, ecosystem, population and environment, greenhouse effects have been incorporated in the General Science curriculum of the secondary classes. In the Science text book, climate change, environmental hazard, global warming, carbon pollution presented as a part of content. In Geography and Environment text book, there presents various themes related to atmosphere, hydrosphere, environmental balance, natural disaster of Bangladesh etc. Moreover, textbooks of Biology, Social Science, Agriculture Study, and English at secondary levels also carry some environmental education concepts, which are presented as part of content in various chapters. Furthermore, the textbooks lack guidelines for teachers to teach these concepts not only to create knowledge and develop attitudes, interests and skills among students but also to equip students with strategies to take action in order to preserve the earth's natural resources and to deal with environmental issues.
Above discussion indicate that although there is no separate environmental education course in the secondary education in Bangladesh, environment related themes are intended to provide to all students from both the science and non-science groups through different subjects areas. Environmental education should be given proper attention and it is important to relate EE with daily life as this strategy would help to develop positive attitude towards environmental issues.

3. Objectives

The objective of the study is to find out knowledge on sources of environmental pollution at secondary level formal education students' in Bangladesh.

4. Research Question

What is the knowledge on sources of environmental pollution of the secondary level formal education students' in Bangladesh?

5. Materials and Methods

The research for this study includes exploratory type. Exploratory in the sense that the awareness of the students who are educated in formal education at secondary level regarding environmental pollution (especially air, water, soil and sound), their opinion relating to the sources of environmental pollution has explored and described in this study.

5.1 Study area

Two divisions in Bangladesh, Dhaka and Rajshahi have been selected purposively for this study. From Dhaka division two districts, Dhaka and Gazipur have been selected. From another Rajshahi division, there also two districts Rajshahi and Sirajgonj have been selected for this research purposively. Dhaka is the capital city of Bangladesh. A lot of peoples and vehicles gather here. Many factories and industries also grown up improperly in this city and now Dhaka is called one of the most polluted city of the world. Gazipur is mainly factory and industry oriented district and from where Industrial garbage, chemicals, smoke, transport etc. also important in this respect. Rajshahi is often referred to as Education city and is situated in the north-west of the country and on the northern banks of the river Padma. Another district

Sirajgonj is the transit route to the northern area of the country with the south-east side and most of the part of the country. Sirajgonj also situated on the western banks of the river Jamuna.

Figure 1: Map of Study areas

5.2 Sample Techniques and Selection of Respondents

In order to participant selection, two districts of Dhaka division named Dhaka and Gazipur district and two districts of Rajshahi division named Rajshahi and Sirajgonj district in Bangladesh were purposively selected due to researcher's proximity and convenience. The secondary schools in these districts were divided into urban and rural category according to their geographical location. Three secondary schools from each district of Dhaka and Rajshahi and two schools from each district of Gazipur and Sirajgonj (three of the each urban division sadar and two of the rural areas in each district) were selected and twenty two students from each of these schools were then randomly selected. In this manner, 220 participants were included altogether with equal number of boys (n = 110) and girls (n = 110). Mittelstaedt et al., (1999) found that there is significant sex difference in students' environmental knowledge and attitudes, that is why both boys and girls students were included.

5.3 Data Processing and Analysis Procedure

The collected data is reviewed, scrutinized and edited to avoid inconsistency and error in the light of objectives. At the same time edited data is classified and coded. Quantitative data is analyzed by using Tables and appropriate statistical technique. However, qualitative data and comments which are collected through open and close ended questionnaire is also considered to enhance legitimacy and validity of the findings.

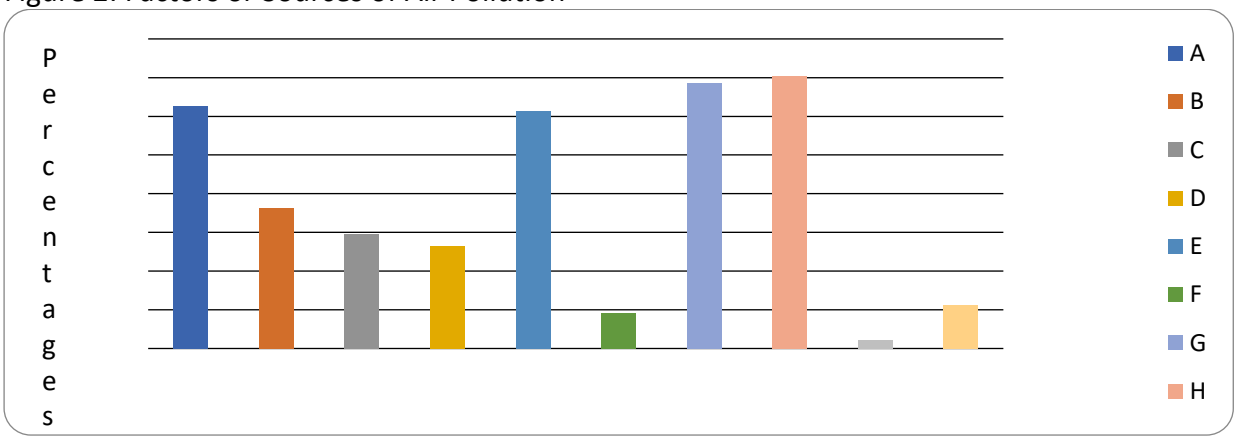
6. Understanding

Students are receptive and curious, making them appealing to motivate. Practical approaches that involve the students in solving local environmental problems have more influence, develop skills and give reinforcement to the idea that people can make a difference. In this respect formal education system provides a ready framework for reaching a large part of the existing population and can help make future generations conscious of the importance of environmental conservation. Improvement of environmental quality by education is critically important for the sake of human health as well as for the economic growth. Data on primary survey collected from the students of secondary level formal education regarding their knowledge on sources of environmental pollution. Following Tables reveal their knowledge on sources concerning environmental pollution.

Table 1
Factor responsible for air pollution

Factors or sources of air pollution	Number of Respondents	%
A) Industrial and urban wastes	138	62.73 %
B) Radioactive pollutants	80	36.36 %
C) Agricultural pesticides	65	29.55 %
D) Domestic sewage and turn off	58	26.36 %
E) Burning of fossil fuel	135	61.36 %
F) Industrial plants	20	9.09 %
G) Brick kilns	151	68.64 %
H) Vehicles	155	70.45 %
I) Construction sites	5	2.27 %
J) Industrial effluents and sewage	25	11.36 %

Figure 2: Factors or Sources of Air Pollution



Note: A, B, C, D, E, F, G, H, I and J are defined in Table 1

Students were asked about the sources or factors of air pollution. Among them 62.73 % respondents viewed industrial and urban wastes as a source of air pollution, 36.36 % respondents mentioned radioactive pollutants, 61.36 % respondents said that burning of

fossil fuel, 68.64 % respondents mentioned brick kilns and 70.45 % respondents mentioned that vehicles are the most responsible factors of air pollution. From the Table 1, and Figure 2, it is shown that Industrial and urban wastes, burning of fossil fuel, brick kilns and vehicles are the most responsible factors of air pollution.

Table 2
Students were asked to identify the air pollutants from vehicles

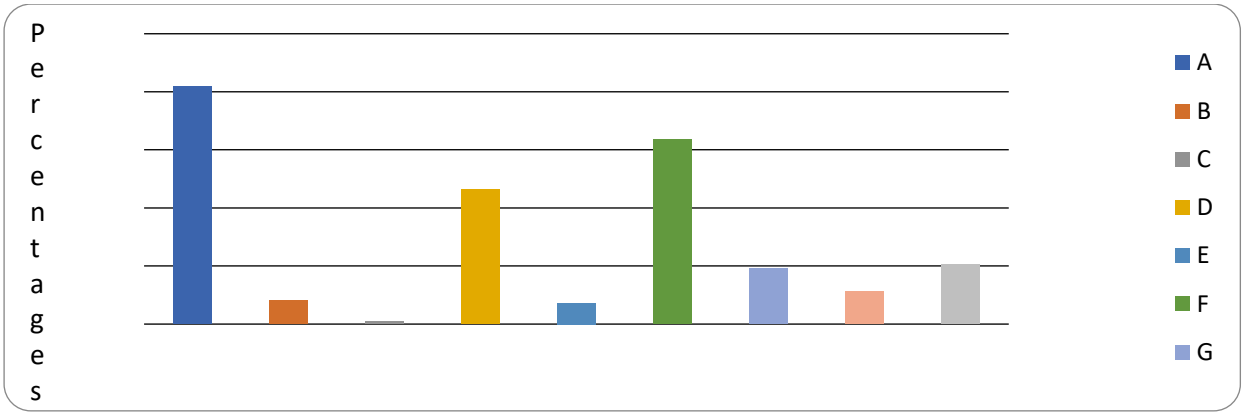
Pollutants from vehicles	Number of Respondents	%
A) Particulate matter(PM)	9	3.64%
B) Volatile Organic Compounds(VOCx)	55	25.00%
C) Carbon monoxide(CO)	151	67.27%
D) Oxides of Nitrogen (NOx)	10	4.09 %

Respondents were asked to identify the air pollutants from vehicles and their opinions are given in Table 2. Among the respondents 3.64 % viewed particulate matter (PM), 25% respondents mentioned volatile organic compounds (VOC_x), 67.27 % respondents mentioned that carbon monoxide (CO), and 4.09% said that the oxides of nitrogen (NO_x) are the source of air pollutant from vehicles. So it shows that carbon monoxide is the most responsible pollutants from vehicles.

Table 3
Students were asked which are the green house gases and responsible for heating atmosphere

Green House Gases	Number of Respondents	%
A) Carbon dioxide (CO_2)	180	81.82 %
B) Water Vapor	18	8.18 %
C) Oxygen(O_2)	2	0.91 %
D) Methane (CH_4)	102	46.36 %
E) Hydrogen (H_2)	16	7.27 %
F) C. F. C (Chloroflouro carbon)	140	63.64 %
G) Nitrous Oxide (Nox)	42	19.09 %
H) Particulate matter (PM)	25	11.36 %
I) Ozone (O_3)	45	20.45 %

Figure 3: Factors responsible for heating atmosphere



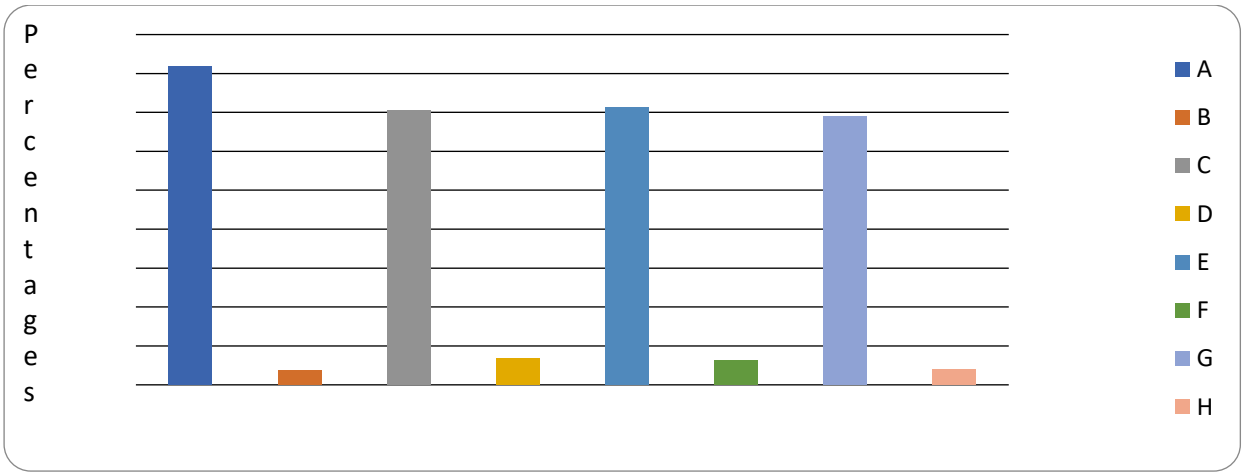
Note: A, B, C, D, E, F, G, H and I are defined in Table 3

Students were asked which are green house gases and responsible for heating atmosphere. Table 3 shows that 81.82 % respondents mentioned Carbon Dioxide (CO_2), 46.36% students said that Methane (CH_4), 63.64% respondents mentioned C. F. C (Chloroflouro carbon), 19.09 % said that Nitrous Oxide (NO_x), 11.36% mentioned Particulate Matter (PM), and 20.45 % respondents mentioned that Ozone (O_3) are responsible for heating atmosphere. According to the perception of respondents; A, D and F represent the most responsible factors for green house effect that is mentioned in figure 3.

Table 4
Students were asked for mention the sources of water pollution

Factors or Sources	Number of Respondents	%
A) Industrial garbage	180	81.82 %
B)Vehicles and suspended particulate matter	8	3.64 %
C) Unsanitary latrines	155	70.45 %
D) Burning of fossil fuels	15	6.82 %
E) Littering and dumping of rubbish in water	157	71.36 %
F) Brick kilns	14	6.36 %
G) Agricultural Chemical and Pesticides	152	69.09 %
H) Volatile Organic Compounds (VOCx)	9	4.09 %

Figure 4: Sources of Water Pollution



Note: A, B, C, D, E, F, G and H are defined in Table 4

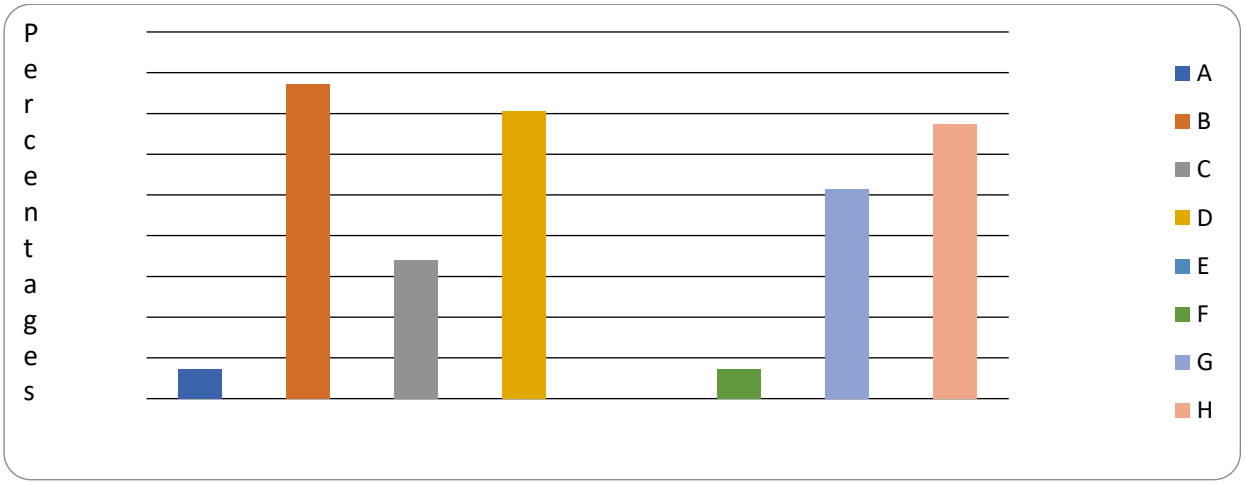
Table 4 shows that 81.82 % students mentioned industrial garbage as a sources of water pollution, 70.45 % respondents said unsanitary latrines are responsible for water pollution. Among them 71.36 % mentioned littering and dumping of rubbish in water and 69.09 % of them mentioned agricultural chemical are the cause of water pollution. They mentioned correctly in Table and Figure 4 that in A, C, E and G are most responsible elements for water pollution.

Table 5
Students were asked to identify the sources of soil pollution

Sources	Number of Respondents	%
A) Burning of fossil fuel	16	7.27 %
B) Polythene bags	170	77.27 %
C) Domestic sewages	75	34.09 %
D) Agricultural pesticides	155	70.45 %
E) Road traffic congestion	00	00 %
F) Vehicular emissions	16	7.27 %
G) Industrial and house hold garbage	113	51.36 %

H) Chemical fertilizers	148	67.27 %

Figure 5: Sources of Soil Pollution



Note: A, B, C, D, E, F, G and H are defined in Table 5

Table 5 shows that 77.27 % students identified the polythene bags are responsible sources of soil pollution, 34.09 % respondents mentioned domestic sewages, 70.45 % respondents mentioned agricultural pesticides, and 51.36% respondents said that industrial and house hold garbage and 67.27% students mentioned chemical fertilizers as the sources of soil pollution. So the most responsible sources are identified B, D, G and H in Table and Figure 5 by the respondents.

Table 6
Roles of Forest to keep the balance of environment

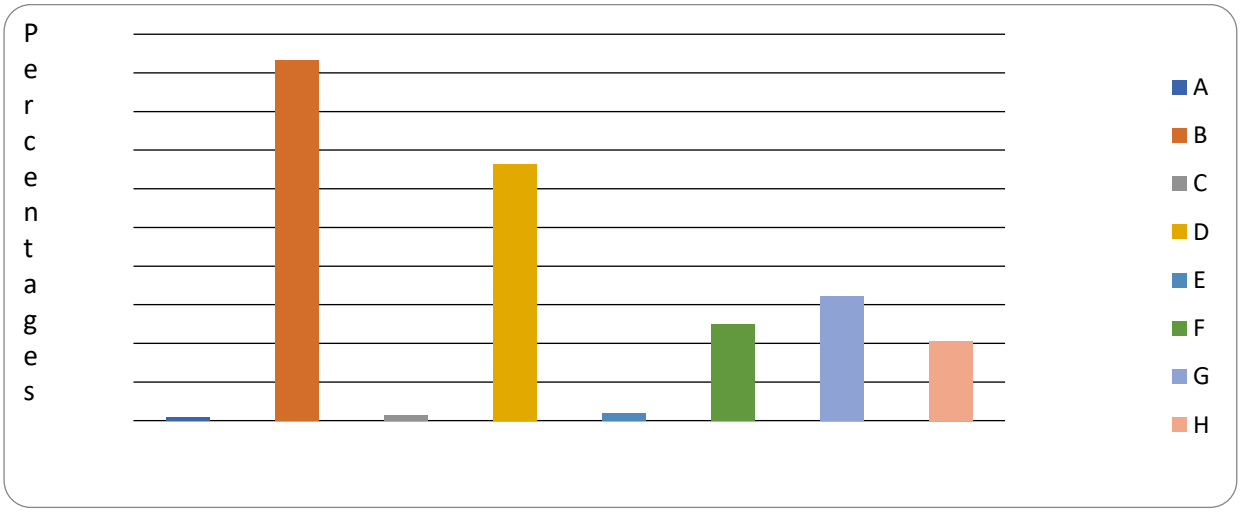
Roles	Number of Respondents	%
A) Forest controls the direction of wind	20	9.09 %
B) Forest protects from green house effects	15	6.82 %
C) Forest helps to keep environment cool	13	5.91 %
D) All the above	180	81.82 %

In Table 6, respondents viewed about the role of forest for keeping the balance of environment as 9.09% respondents think that forest controls the direction of wind; 6.82% respondents think forest protects from green house effects, 5.91% says forest helps to keep environment cool and rest of 81.82% respondents think that forest plays all the role mentioned in Table 6 for keeping the balance of environment.

Table 7
Elements which are responsible for noise pollution

Responsible elements	Number of Respondents	%
A) Sound of cyclone	2	0.91 %
B) High volume music	205	93.18 %
C) Sound of birds and animals	3	1.36 %
D) Hydraulic motor horn	146	66.36 %
E) Sound of tidal and tornado	4	1.82 %
F) Sound of air craft	55	25.0 %
G) Sound of brick kilns	71	32.27 %
H) Sound of rocket engine	45	20.45 %

Figure 6: Sources of Noise Pollution



Note: A, B, C, D, E, F, G and H are defined in Table 6

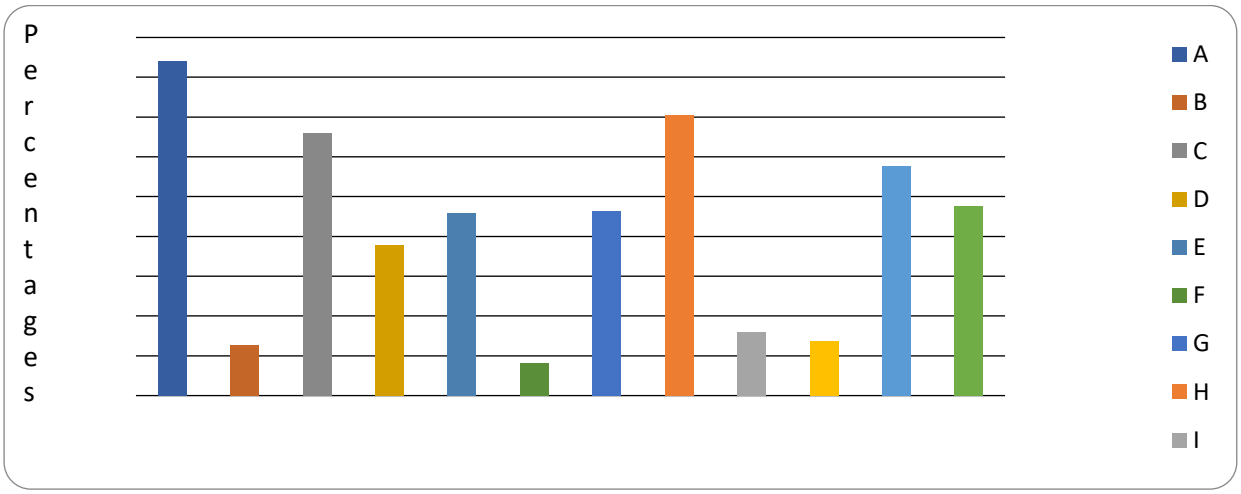
In Table 7 and Figure 6, respondents were asked to mention the sources of noise pollution. Among them 93.18% mentioned high volume music, 66.36% respondents mentioned hydraulic motor horn, 25% respondents think sound of air craft, 32.27% respondents mentioned sound of brick kilns and 20.45% students said sound of rocket engine as a sources of noise pollution.. So, according to them high volume music and hydraulic motor horn are more responsible for creating noise pollution.

Table 8
Some natural hazards in our environment

Hazards	Number of Respondents	%
A) Flood	185	84.09 %
B) Fire in forest	28	12.73 %

C) Drought	145	65.91 %
D) Tsunami	83	37.73 %
E) Deforestation	101	45.91 %
F) Ice falling	18	8.18 %
G) Tornado	102	46.36 %
H) River erosion	155	70.45 %
I) Salinity	35	15.91 %
J) Acid rain	30	13.64 %
K) Earthquake	127	57.73 %
L) Cyclone	105	47.73 %

Figure 7: Related natural Hazards in our Environment.



Note: A, B, C, D, E, F, G, H, I, J, K and L are defined in Table 8

Respondents were asked to mention the natural hazards related to our environments. Table 8 show that 84.09% respondents mentioned flood, 12.73% mentioned fire in forest, 65.91% said drought, 37.73% mentioned tsunami, 45.91% respondents said deforestation, 8.18% said ice falling, 46.36% told the tornado, 70.45% mentioned river erosion, 15.91% said salinity, 13.64% said acid rain, 57.73% told earthquake and 47.73 % respondents mentioned cyclone that are related to our environment. In some context, fire in forest, ice falling, mentioned the remarkable portion of respondents, although these hazards are not active in our country. But flood, drought, river erosion, deforestation, tornado and cyclone are common hazards in our environment mentioned in Figure 7.

Table 9
Celebration of World Environment Day

Date of world environment day	Number of Respondents	%
A) 5, April	21	9.55 %
B) 5, June	145	65.91 %

C) 5, May	42	19.09 %
D) 5, July	12	5.45 %

They were asked to identify the celebration of World Environment Day. Table 9 show that 9.55 % mentioned 5, April; 65.91 % respondents mentioned 5, June; 19.09 % said 5, May and 5.45 % told 5, July, the world environment day. So, about 65.91% respondents mentioned the 'World Environment Day' correctly.

7. Discussion

It is found that many of the students at secondary level have not the clear concept about the sources of air pollution. Most of the students have the better concepts and the factors which are responsible for causing green house effects. They have also the idea to identify the air pollutants from vehicles**.** In respect of water pollution most of the respondents have the better concept about the sources of water pollution. In respect of soil pollution the students have also the better understanding about the sources of soil pollution. They have also mentioned the factors of causing noise pollution properly. Respondents were asked to mention the natural hazards that are related to our environment. In several cases they have the misconceptions but overall they answered it appropriately.

8. Recommendations

In the light of the results of this study this section presents the following recommendations.

Intended for Policy

In view of the results of this study, it is recommended that teacher-training institutes should include environmental issues in their curriculum. It is important to train teachers in pedagogical strategies to orient them as how to teach environmental education to students for critical thinking, problem solving, action oriented and need for the modifications are required to bring out the environmental implications in the existing subjects or what new subjects are needed.

Proposed Practice

The study suggest that teachers need to use variety of innovative teaching strategies such as cooperative learning strategies, problem solving teaching methods, so that critical thinking in students could be developed. Student should be encouraged to take positive actions in daily life so that they could be able to act positively in their practical life in future. In this way, they can gain confidence, which would improve their knowledge, towards environmental preservation. Teacher must create such a platform for interactions for students with the aim that useful learning will take place in the classroom which is important for sustainable future (Yousuf and Bhutta, 2012).

9. Conclusion

It can be concluded that Bangladesh has many environmental problems such as frequent disasters, industrial and house hold garbage pollution, health and sanitation problem, deforestation and desertification, salinity, soil erosion, noise pollution, green house effect, negative change in climate condition etc. (Ministry of Finance, GOB, 2010). Bangladesh faces a lot of challenges for gaining sustainable development such as ecological imbalance, a very high density of population, continuous high population growth rate and scarce of natural resources. In this respect, a significant and efficient program of environmental education with

the local expertise is needed for massive changes in behavior with respect to environment. The high level of awareness and knowledge plus positive attitude of the students may come from the family situation, teachers, media, private reading and school curriculums regarding to the environment which increases the environmental perspective among students and in overall in the society (Aminrad, 2013) With a view to the formal education system formulates and provides a ready framework for reaching a large part of the existing population and that can help to make the future generations conscious of the necessity of environmental preservation because the students are receptive and curious, making them appealing to motivate. But in our formal education system there has the lack of supplementary reading materials for the pupils as well as of appropriate audio-visual support to teaching. The existing curriculum is knowledge based and examination oriented and the secondary level school students do not have the opportunity to develop skills to analyze and evaluate local or national environmental problems or issues. There also a lot of lack of coordination amongst respective organization is a very common problem in Bangladesh. Though the existing environmental education programs do not seem to be good enough, but the future looks promising.

10. Acknowledgements

I would like to express my sincere gratitude to Professor Dr. Abdul Wadud, Department of Economics, University of Rajshahi, for his support valuable suggestions and encouragement. I would like to acknowledge Professor Dr. Elias Hossain, Department of Economics, University of Rajshahi, for his support valuable suggestions in research activities. Many thanks to Goutam Ray, SESDP, National Text Book Board (NCTB), government of Bangladesh, Dhaka and to Ziaul Haque, Deputi Director, Department of Environment, Bangladesh, Dhaka for their valuable speeches and help in this regard. I also thank all the students, teachers and principals of concern various schools for their kind cooperation.

References

Aminrad, Z., Zakariya, S.Z.B.S., Hadi, A.S. and M. Sakari, 2013, Relationship Between Awareness, Knowledge and Attitudes Towards Environmental Education Among Secondary School Students in Malaysia. World Applied Sciences Journal, 22(9), 1326-1333.

Ashrafujaman, M., Bhuiyan, M.H., Beg, A. H., Habib, K.A., Khanam, A., Hossain, J., and M. Rahman, 2012, Secondary Agriculture Study, For class ix-x, Dhaka : National Curriculum and Textbook Board.

Begum, R. A., Shikder, A. H., and K. M. Das, 2011, Secondary Social Science, For class ix-x, Dhaka National Curriculum and Textbook Board.

Bradley, J. C., Waliczer, T. M., and J. M. Zajicek, 1999, Relationship between environmental knowledge and environmental attitude of high school students, The journal of Environmental Education, 30, 3, 17-21.

Chowdhury, M. H., 2004, Environmental Education for Sustainability in Bangladesh, UNESCO/ Japan, Asia Pacific Environmental Education Research Seminar

GOB, 2010, Bangladesh Economic Review-2010, Ministry of Finance, Economic Adviser's Wing, Government of Bangladesh, 239-247.

GOB, 2010, National Education Policy-2010, Ministry of Education, Government of Bangladesh

Hider, S.M., Naser, M. N., Ahmed, G. A. and E. Haulader, 2012, Secondary Biology, For Class ix-x, Dhaka: National Curriculum and Textbook Board.

E. B., Lee, 2008, Environmental attitude and information sources among African American college students. The Journal of Environmental Education, 40(1), 29-42.
Meenakshi, P., 2009, Elements of Environmental Science and Engineering, PH-1 Learning Private Limited, New Delhi, 1-7.
Muttaqui, I. A., 1983, Environmental knowledge and attitude of the post primary rural and urban students and their implication for curriculum planning in Bangladesh, Teacher's World, 13, 4, 38-42.
Mittelstaedt, R., Sanker, L., and B. Vander veer, 1999, Impact of a week-long experiential education program on environmental attitude and awareness, The journal of experiential education, 22, 3, 138-148.
National Curriculum and Textbook Board [NCTB], 2012, Curriculum and Syllabus: secondary level (grades ix-x), [in Geography and Environment], Dhaka: Ministry of Education, Government of Bangladesh.
National Curriculum and Textbook Board [NCTB], 2012, Curriculum and Syllabus: secondary level (grades ix-x), [in General Science], Dhaka: Ministry of Education, Government of Bangladesh.
National Curriculum and Textbook Board [NCTB], 2012, Curriculum and Syllabus: secondary level (grades ix-x), [in Social Science], Dhaka: Ministry of Education, Government of Bangladesh.
National Curriculum and Textbook Board [NCTB], 2012, Curriculum and Syllabus: secondary level (grades ix-x), [in Agriculture Study], Dhaka: Ministry of Education, Government of Bangladesh.
National Curriculum and Textbook Board [NCTB], (2012), Curriculum and Syllabus: secondary level (grades ix-x), [in Biology], Dhaka: Ministry of Education, Government of Bangladesh.
Salequzzaman, M. and J.K. Davis, 2003, Environmental Education and Environmental Management in Bangladesh and their Sustainability, Environmental Informatics Archives, 1, 70-82.
Sarker, M., 2011, Secondary Students' Environmental Attitudes: The case of Environmental Education in Bangladesh, International Journal of Academic Research in Business and Social Sciences, 1, Special issue, wwwhrmars.com/journals.
Shahjahan, S., Karim, R., and J. Shahin, 2012, Secondary Geography and Environment, for class ix-x, Dhaka: National Curriculum and Textbook Board.
Shams, R., Haider, Z., Ray, G., Majumder, S.R., Razzaque, A., and N. Shahzadi, 2012, Secondary English for Today, for class ix-x, Dhaka: National Curriculum and Textbook Board.
Tapon, S., Rahman, S., Rahman, H. and A. Khalique, 2012, Secondary Science:For class ix-x, Dhaka: National Curriculum and Textbook Board.
Yousuf, A. and S. Bhutta, 2012, Secondary school student's attitude towards environmental issues in Karachi, Pakistan, International Journal of Scientific and Engineering Research, 3, 10, ISSN 2229-5518.