

Effect of Climate Change on the Well-being of Primary School Children: A Case Study of Chattogram City

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Abstract This study investigates the profound impact of climate change on primary school-going children within the urban context of Chattogram City, aiming to comprehend the multifaceted dimensions of this critical issue. Climate change, characterized by rising temperatures, extreme weather events, sea-level rise, and altered precipitation patterns, poses significant challenges to vulnerable communities, especially children. This study employs a multidisciplinary approach, integrating environmental science, public health and educational research to assess the implications of climate change on the physical health, mental well-being, academic performance and overall quality of life of primary school children in Chattogram City. Through a comprehensive analysis of data collected from various sources, including surveys, interviews, and academic literature, this research aims to provide valuable insights into the nuanced and interrelated factors that influence children's experiences and vulnerabilities in the face of a changing climate. The findings of this study are crucial for formulating informed policies and interventions that prioritize the resilience and well-being of young learners in the midst of an evolving climate scenario.

Keywords Climate, Primary School, Children, Chattogram

1. Introduction

Climate is the average weather in a given area over a longer period of time. Climate change is the significant variation of average weather conditions becoming, for example, warmer, wetter or drier over several decades or longer. It is the longer-term trend that differentiates climate change from natural weather variability. In Chittagong, Bangladesh tidal surges are affecting the city as often as twice a day, frequently flooding homes and businesses. In a recent report the UN stressed that the interdependence of climate, ecosystems and biodiversity and human societies; the value of diverse forms of knowledge; and the close linkages between climate change adaptation, mitigation, ecosystem health, human well-being and sustainable development, and reflects the increasing diversity of actors involved in climate action [1]. Emphasizing on the impact of climate change a group of researchers argue, although the role of education in addressing the challenges of climate change is increasingly recognized, the education sector remains underutilized as a strategic resource to mitigate and adapt to climate change. Education stakeholders in many countries have yet to develop a coherent framework for climate change education (CCE)

[8]. According to Filho et al., (2010) the problems caused by climate change do not differentiate between young and older people. However, bearing in mind that the consequences of climate change will be felt for years to come, it seems sensible to try to actively engage young people who will be most affected and for the longest period of time [7]. The issue of climate change affects all along its way, to combat the crisis there is no alternative to recognizing, educating and preparing the young ones how to tackle it in best possible way [11].

Climate change is complex and there is a need to educate our future generations so that they are able to deal with the plethora of information and views that they come into contact with in their live [2]. Climate, as Heidegger would put it, has been 'hidden' since it has allowed us to survive without conscious thought. According to, [3] at present, the phenomenon of climate change has already exerted a tangible influence on the human population. A study of this kind suggests, Climate change affects children's health through increased air pollution, more weather-related disasters, more frequent and intense heat waves, decreased water quality and quantity, food shortage and greater exposure to toxicants. A study by [6] focusing on students and teachers at primary level in India claims, children in developing countries such as India will experience severe consequences of climate change. Primary school students, in particular, are the most vulnerable to extreme weather

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conditions, such as heat waves intensifying due to climate change. This will adversely impair their development, well-being, and learning outcomes [6]. Generally, the students perceived that human beings' interference with the natural settings through their development actions is the main reason for climate change. Another paper, based on the US students, aims to enhance students' understanding of the impacts of climate change through an educational intervention. It discusses the importance of equipping students with knowledge about climate change effects to promote environmental awareness and action. It also claims that knowledge regarding the issues can considerably improve their understanding and decision making process [13]. Apart from these staggering findings by various researchers from different regions of the world, there are also many studies regarding the knowledge, perception and attitude of students concerning climate change [4]. Another study on Tanzania and Finland found similarities as well as differences in the students' views. Most of the students realized the seriousness of the climate change dilemma. In both countries, the students also mixed concepts and had misconceptions related to the causes as well as the consequences of climate change—even if they were mixed in different ways [12]. On the other hand another study concerning the perception of university students found that majority portion of the students think that it is difficult to combat against climate change problem because it has already been too late to take action. Besides this study also found that government is crucially responsible for combating against climate change problem [5].

2. Research Questions

What are the observed changes in the climate of Chattogram City during the past few years?

What are the principal vulnerabilities and dangers associated with climate change that affect primary school kids in the Chattogram city area?

How does climate change manifest itself in the Chattogram City Area, and what are the immediate and anticipated environmental impacts that directly affect primary school children?

What are the physical health implications of climate change on primary school children in the Chattogram City Area, including potential exposure to heat-related illnesses, vector-borne diseases, and other climate-induced health risks?

3. Objectives of the Study

The study was intended to evaluate the level of awareness and understanding of climate change among primary school children in the Chattogram City Area.

To identify the perceived impacts of climate change as experienced or understood by primary school children in terms of their daily lives, environment, and community.

To analyze the physical health implications of climate

change on primary school children, focusing on potential health risks and ailments associated with changing climate patterns.

To examine the psychological impact of climate change on primary school children, including stress levels, anxieties, and emotional responses related to climate-induced events.

To assess the adequacy and effectiveness of educational programs within primary schools aimed at educating children about climate change and its potential consequences.

4. Methodology

In research, the selection of methodology plays a critical role in ensuring the rigor and validity of the study's findings. Depending on the research question and objectives, it is often necessary to combine both empirical data and descriptive analysis to provide a comprehensive understanding of the subject under investigation. For the current study we have adopted both empirical data and descriptive analysis, as there still lack of structured way of doing this kind of research. In addition, this methodological explanation outlines how empirical data and descriptive analysis have been effectively integrated in this study. Research objectives and questions have been clearly defined and to achieve the objectives and answer the questions relevant data are assembled. The aim was to reach at the heart of the subject matter of the study with the minimum of questions put strategically. A short overview of the major studies that have been conducted in this area of research. it has been tried to present a comprehensive and holistic overview of the major and influential studies that have been conducted so far. Also try to gather insight from different researchers from different parts of the world. For the empirical portion of the study, collect data through primary sources (surveys & observations) and secondary sources (existing datasets, literature reviews). For collecting data physically visited ten primary schools in Chattogram City Area and interviewed 250 students along with 15 teachers from these schools. It had to process the collected empirical data to remove errors, outliers, and inconsistencies. This step was crucial for maintaining data integrity while not compromising with any possible error. By adopting this methodological approach, we attempted to effectively leverage both empirical data and descriptive analysis to provide a holistic understanding of their research subject while ensuring the rigor and validity of their findings. This approach promotes a comprehensive and nuanced exploration of complex research questions. Based on these collected empirical and descriptive data in depth discussions have been presented in Discussions. Demographic information of the sample has been discussed first, which is followed by the issues related to the research topics.

5. Discussion

To begin with, the awareness about climate change among

the primary school students is a bit complex. Due to the setting curriculum or teaching approach or any other reason, there have been seen misunderstanding, even ignorance

about climate change, though it is not rampant.

The demographic data of these schools are presented in the following table in the following page.

Table 1. List of School along with Number of Class Attendants

Name of School	Total Students	Regular Attendance	Attendance During Calamitous Day
Kapasgola Govt. Primary Boys School	464	400	10%-20%
Poschim Bakolia Govt. primary School	673	600	10%-20%
Abdul Bari Govt. Primary School	1200	800	10%-30%
Agrabad Govt. Colony Primary School	700	500	5%-10%
Sultan Al Nahiyen Govt. Primary School	650	500	5%-10%
Chorlokkha Govt. Primary School	1200	900	10%-20%
Bondor Debar Par Govt. Primary School	500	450	10%-15%
Kapasgola Govt. Primary Girls School	500	400	10%-20%
Muradpur Govt. Primary School	700	600	10%20%
Hamzarbag Govt. Primary School	550	450	20%-30%
Total	7137	5600	
Average	713.7	560	

For survey it has been selected those kinds of school, which are affected most by climate change. The list of schools presented above is some affected and direct sufferer school in the city in last few years.

In these schools, there are roughly 7137 students. On an average a school has 713.7 students among which on average 560 students attends in each school each normal day. Among them Abdul Bari Govt. Primary School and Chorlokkha Govt. Primary School have the highest number of students, each having 1200 students grossly, whereas Kapasgola Govt. Primary Boys School has the lowest number of students consisting 464 students.

It has also been observed that the absence rate of the students ranges from 10%-30% of the total students on normal day of the week or month. It indicates that the parents of the city area are concerned to a large extent about their children's school going.

But staggering fall in the rate of attendance occurs when any kind of natural calamities take place. Excessive rain, flood water, water logging, unbearable dust in air and drought are observed to be the main obstacle which deter students from coming to school.

With the rise of sea level and excessive rain this year coupled with dysfunctional drainage system, around 200 schools of the city had been inundated by water. Schools were shut down for almost two weeks. These occurrences have dire consequence on the overall condition of the students in primary school. The responses from the respondents indicate that they have been affected both physically and mentally due to these occurrences.

In recent years a number of natural occurrences disrupted the normal flow of education process in the city. Due to excessive rain, water loggings have been witnessed there, which deterred the students from coming to school. The

attendance rate in the above table clearly shows that there is a positive correlation between natural occurrence and attendance fall.

Most Frequently Encountered Problems by the Students

- i. Tidal Water
- ii. Water Logging
- iii. Fever
- iv. Lack of Safe Drinking Water
- v. Bad Odor
- vi. Stuck at Home
- vii. Diarrhea

While talking with the students, it has been observed that they lack the knowledge of climate change or they have vague idea about the issue. But, when directed clearly and the relevant issues were clarified they seemed responsive and showed genuine interest, which we have mentioned earlier. When asked about the issue, by clarifying some basic issues, of the problems they face almost three-fourth of the respondents replied that the issue of water logging was the most irritating issue for them.

They say when water gets logged these becomes breeding ground for mosquitoes, bad odor comes out of and it creates health concern for the parents of the students. As the sewerage system is often dysfunctional and the water flowing through they are contaminated at most it also contaminates the air around causing air pollution.

Tidal water, water logging and home staying prevents student from coming to school, thereby hampering their normal flow of life which is also responsible for mental health problem, while fever, diarrhea and typhoid cause serious health problems to the students. Lack of safe drinking water and bad odor around the school and other places cause serious health and mental problem.

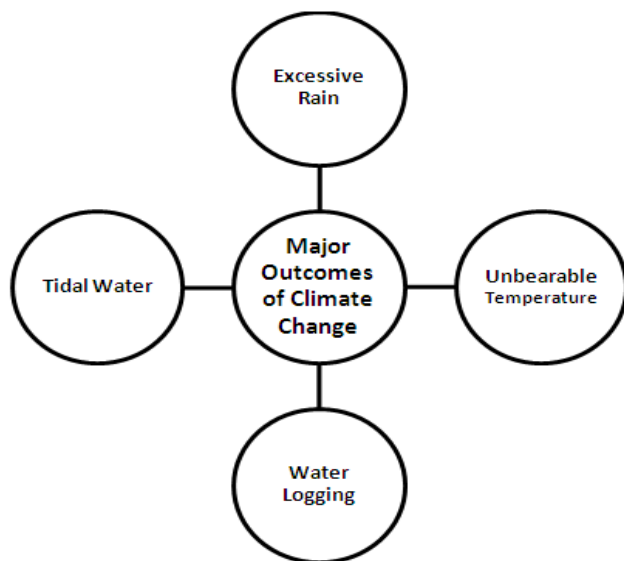


Figure 1. Major Consequences of Climate Change

To combat the climate crisis, the government of Bangladesh has taken some comprehensive plans earnestly working toward implementing these plans such as Mujib Climate Prosperity Plan 2030, Bangladesh Climate Change Strategy and Action Plan (BCCSAP), 2009, National Disaster Management Policy, 2015, National Plan for Disaster Management 2021-2025, Bangladesh Energy Efficiency and Conservation Master Plan up to 2030, Standing Orders on Disaster 2019. Though there is no plan particularly concerning about the city, there are holistic plans regarding the whole country. The concerned authority in the city, as reported in various media, hopes that some master plan will be taken within shortest period of time to deal with the issue in the city.

6. Findings

There are significant changes in the climate of the city in recent years, which is evident in excessive rain, water logging at unprecedented level and unbearable heat wave and temperature, increase in the level of dust in the water etc.

The changes in climate clearly adversely affecting the students of primary school of the city. Their regular classes getting hampered, their flow of the study is being disrupted and consequences of which are clearly negative. Moreover, the consequences of these changes are not limited in school, they also affect the life style of the students, sometimes against their distaste and abhorrence.

Climate change manifesting itself in different forms and to different extent in different sub-area of the city. The lower areas are the worst suffer, while the highland areas of the city are seemed to be less affected. Tidal water inundated number of roads and streets which sometimes reached the school area of the city, while some of the areas have been under water for quite few days.

In case of the students' knowledge about the issue of climate change, they have vague or no idea, which clearly indicates

inadequacy in their awareness level. Another point which deserves to be mentioned is that though they have topics related to climate change in their curriculum at least to some extent, yet they lack clear idea about the issue, which again puts the adequacy of the content and the teaching provided by the teachers in question.

The change in climate is clearly having significant adverse effect on the physical and mental health of the students of primary schools in the city. The interview with students clearly indicated the issue of mental health, which is yet to be fully recognized in this country, is gravely attached with climate change. Due to air and water pollution the rise of different kinds of water-borne diseases have been observed among the students. The issue of bad odor around the school and house surroundings has reached the height of extreme.

The govt. has expressed its commitment towards the issue of climate change as mentioned in the earlier chapter, but any specific action plan focusing on the city solely yet to be taken. The importance of the holistic and comprehensive plan for whole country and world is undeniable. Nonetheless, particular plans must be developed regarding the situation of the city, as there is no such attempt from the part of the government or the city corporation. It is also worth mentioning that the repercussions of climate change and suffering induced by it reached its extreme this year, which cannot but need to be taken seriously and with utmost attention.

7. Limitation of This Study

The first limitation of the study is the limitations of the sample size. There are number of schools which are direct victim of climate change in the city. Language and cultural barriers has the potential to affect the accuracy of responses, especially because the primary school children have difficulty in expressing their experiences or thoughts in the language, which is a bit unfamiliar to them, used for data collection. It should also be noted that the schools selected for the survey in this research had different kinds of impact of climate change differing also in intensity, which are grossly generalized here for the purpose of making some common conclusions for all of them, which, if taken seriously, would benefit all of them.

8. Conclusions

In a recent report Education Week mentioned that half of the educators of the US believe that climate change is affecting students immensely. So, it is no surprise that there is also impact of climate change in this country. As we have shown earlier in this country, even though affected by the issue students still lacks clear knowledge about climate change and its impact on their lives, which clearly needs to be rectified. As a result of climate change, there are many repercussions on the primary school students. Calamities like, flood, tidal water, water logging, excessive temperature, heat

wave, excessive rain have been negatively affecting the students of primary school. Both their physical and mental health is being negatively affected by climate change. Climate change also affecting their surroundings and way of life, which is creating disruption in the process of their normal growth. Consequently, it has been seen that they are losing concentration and focus from their study, while excessive heat creating stress and dehydration among the student along with the shortage of safe drinking water.

Despite governments' commitment to reduce the impact of climate change, the steps taken by the concerned authority is less than adequate. Because of lack of adequate knowledge, students, who are a major stakeholder in this respect, are left behind in combating climate change. They need to be educated properly, if the challenge is to be faced on all the fronts. If it needs be, the teachers should be given special training in this regard.

In conclusion, climate change is a global issue. Country like Bangladesh alone can do little about this global issue, hence all of the world community should come forward and make comprehensive plan and take necessary steps to face this current global crisis. At the same time, the govt. of Bangladesh should take the issue of Chattogram City seriously and take immediate and necessary measures, as the city is being submerged every year mainly during monsoon affecting thousands of lives including students and children.

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