

The Coverage of Climate Change Awareness in Textbooks of Bangladesh and its Impact on the Students at Secondary Level: An Analysis

Dr. Md. Abdul Quaium¹
Ashraful Islam Goldar²
Md. Al-Amin³

Abstract

Climate change poses significant challenges globally, affecting environmental sustainability, economic stability, and social well-being. In Bangladesh, a low-lying and densely populated country, these challenges are particularly acute due to its vulnerability to sea-level rise, extreme weather events, and shifting precipitation patterns. Despite these risks, the secondary-level education system in Bangladesh lacks comprehensive coverage of climate change in its textbooks. The study used three kinds of Tools e.g. Book Review Checklist for 16 NCTB textbooks, Semi-Structured Interview Schedule for Secondary level Teachers and Focus Group Discussion for Students. This study examined the representation of climate change awareness across subjects in secondary school textbooks of Class Six to Nine, aiming to fill the research gap in understanding how this critical topic is taught and perceived. Through a quantitative content analysis of 16 selected textbooks and qualitative insights from teacher interviews and student focus groups across coastal and non-coastal regions, the study assessed the accuracy, depth, and educational effectiveness of current textbook content on climate change. The number of school was 12. That was covered from coastal and non-coastal area. The students of coastal areas disclosed that they trained up through NGOs in critical situation. They mainly depends on announcement of Radio and TV. There was no training on Climate change. Findings revealed varying degrees of coverage and suggest the need for enhanced integration of climate change education into the curriculum to foster greater awareness and preparedness among future generations facing environmental challenges.

Keywords: Climate Change, NCTB, Textbooks, Secondary School

Introduction

Climate change is one of the most critical challenges faced by humanity today and it poses significant threats to the Global environment, Economy and social fabric. Being a low-lying and densely populated country, Bangladesh is particularly vulnerable to the adverse impacts of climate change, such as sea-level rise, extreme weather events, and changes in precipitation patterns. In this context, it is crucial to assess how climate change is taught and understood in the textbooks of Bangladesh's secondary level education system, as textbooks play a vital role in shaping students' perceptions and attitudes towards environmental issues.

¹ Associate Professor, Islamic History & Culture , Govt. Rajendra College, Faridpur

² Assistant Professor, Geography and Environment , Eden Mohila College, Dhaka

³ Lecturer, Department of Bangla, Prime University, Mirpur, Dhaka

Statement of the Problem

Despite the severity of climate change in Bangladesh, there is a lack of research on how climate change is presented in the textbooks of the country's secondary level education system. This study aims to address this research gap by examining how climate change awareness is presented in textbooks used in secondary schools in Bangladesh. The study seeks to explore the definition and description of climate change in these textbooks, the topics related to climate change covered and how they are presented. Additionally, the study aims to investigate how the presentation of climate change in textbooks varies across different subjects and assess the accuracy and comprehensiveness of the textbooks' representation of the causes, consequences and mitigation and adaptation strategies of climate change.

Rationale of the Study

The study found no mention of climate refugees in NCTB textbooks, highlighting a significant gap in the curriculum. Respondents emphasized the importance of addressing this issue due to the increasing impact of climate change on Bangladesh. They concluded that the most effective way to educate students on climate change is by integrating these topics into their textbooks. This approach would ensure that future generations are better prepared to face the challenges posed by changing weather patterns. Additionally, they suggested that proper introductory workshops or training and the inclusion of environmental consciousness in textbooks would benefit students and enable them to educate their families.

Objectives of the Study

The objectives of the study were to:

- a. examine how climate change is defined and described in textbooks used in secondary schools in Bangladesh.
- b. assess how the presentation of climate change in textbooks varies across different subjects, such as Bangla, English, Science, History and Social Science.
- c. explore how students and teachers perceive and understand climate change and the effectiveness of the current teaching methods.

Review of Related Literature

The study delved into Bangladesh's vulnerability to climate change, emphasizing its profound impacts stemming from erratic weather patterns. It stressed the urgent need to educate youth about these changes to help them adapt to extreme temperatures. Researchers analyzed NCTB textbooks, conducted interviews with teachers, and held focus groups with 48 respondents, predominantly male with a notable female minority. Respondents lamented the lack of climate change education in formal schooling, often supplemented inadequately by NGOs in coastal regions through leaflets and community outreach. They criticized governmental efforts as insufficient and pointed to teachers' heavy workloads hindering climate discussions in classrooms.

All respondents unanimously recognized climate change as a critical issue, highlighting the sparse coverage in NCTB textbooks. They advocated for robust, grade-appropriate climate change chapters in both Bangla and English subjects from grades six to nine. Teachers, sensitive to their coastal students' experiences, stressed the immediate need for comprehensive climate education and proposed integrating environmental awareness throughout the curriculum. They recommended workshops and seminars within educational institutions to heighten student and family awareness. The absence of content on climate refugees in textbooks underscored the necessity for broader curriculum inclusion.

In conclusion, the study underscored a significant gap in climate education within Bangladesh's educational system. It called for systematic integration of climate change topics across all educational levels to empower students and communities in effectively addressing and adapting to climate challenges. This integration, researchers argued, would prepare future generations to be proactive agents in environmental stewardship and resilience building.

Methodology of the Study

The research methodology for analyzing the coverage of climate change awareness in textbooks of Bangladesh at the secondary level involved a descriptive research design. The study adopted a quantitative content analysis approach to analyze the coverage of climate change in the secondary school textbooks of Bangladesh.

Sampling

Textbooks Sampling

There are 84 Subject in NCTB for Six to Nine Classes. The study covered purposive sampling to select 16 Textbooks from Six to Ten because the study was on secondary level.

Table 1: Textbooks Sampling of the Study

Name of Subject	Subject Sampling					NCTB
	Six	Seven	Eight	Nine-Ten	Total	
Bangla	1	1	1	1	4	14
English	1	1	1	1	4	14
Science	1	1	1	1	4	14
History & Social Science	1	1	1	1	4	14
Total=	4	4	4	4	16	84

School Sampling

The study covered 12 Secondary level schools from Six districts. Three were 3 from coastal area and 3 from non-coastal area. There were;

Table 2: School Sampling of the Study

Type of Area	District	Upazila
Coastal Area	Satkhira	Samnagar
		Asashuni
	Patuakhali	Patuakhali Sadar
		Kalatoli
	Bagenhat	Mogla
		Sharonkhola
Non Coastal	Magura	Magura Sadar
		Sreepur
	Faridpur	Faridpur Sadar
		Vanga
	Rajbari	Pangsha
		Kalukhali
2	6	12

Source of Data and Methods of Data Collection

The sources of data for the research was on climate change awareness in textbooks of Bangladesh at the secondary level will be the secondary school textbooks themselves. The study focused on selected textbooks from Bangla, English, Science, History and Social Science, Geography and Environment, Agriculture Studies, Bangladesh and Global Studies subjects of the secondary level in Bangladesh.

Tools of Data Collection

Besides documents review, the following tools used for primary data collection:

- Book Review Checklist for Six to Ten Class.
- Semi-Structured Interview for the Teachers of Secondary Level School.
- Focus Group Discussion Guideline developed for Students of Class Six to Ten for its impact.

Methods of Data Analysis and Presentation

The research on climate change awareness in Bangladeshi secondary-level textbooks involved:

- **Descriptive Analysis:** Calculating frequencies, percentages, and mean scores to assess the frequency, accuracy, depth, and relevance of climate change content.
- **Content Analysis:** Identifying patterns and themes in climate change coverage.

- **Presentation of Findings:** Using tables, charts, and graphs to present descriptive and inferential analysis results, highlighting key themes and patterns from the content analysis.

Data Analysis and Findings

Three data collection tools were used. One was a Book Review Checklist for NCTB textbooks for class's six to ten, covering all analysis and findings. It had 17 statements and three response options: A. Presence in Detail, B. Partially Present, and C. Totally Absent. It were;

Table 3: Book Review Checklist

SL	Statements
1	The textbook contains topics about different types of pollutants which cause pollution.
2	The textbook contains topics about air pollution.
3	The textbook contains topics about water pollution.
4	The topics related to radioactive pollution.
5	There is a separate chapter about environmental facts and effects in the science
6	The textbook describes global warming and its effects.
7	The textbook describes the greenhouse effect.
8	The textbook describes acid gases, acid rain, and its effects.
9	There is a proper description about ozone layer depletion in the science textbook.
10	The science textbook is appropriate to know about environmental pollution and its awareness measures.
11	There is a proper description about the importance of protecting the environment in the textbook.
12	The textbook contains topics about environmental degradation.
13	There is a proper description about the social significance of environmental awareness.
14	The textbook covers sea level rising due to global warming.
15	The textbook covers vulnerable areas (coastal areas) due to climate change.
16	The textbook describes the desertification process in Bangladesh.
17	The textbook contains coping mechanisms for climate change.

Class Six: Bangla

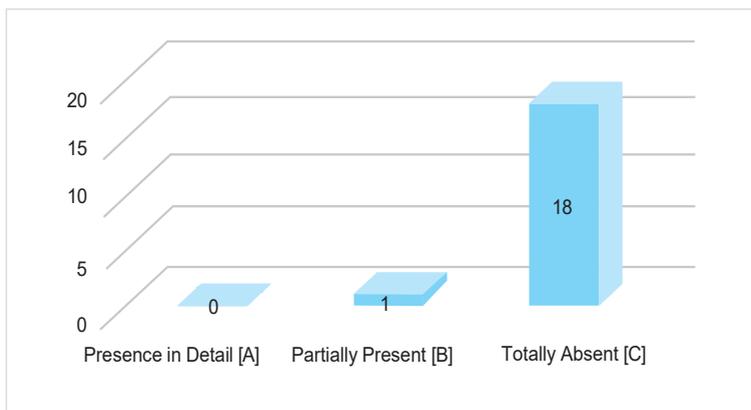


Figure-1: Class Six: Bangla

The Bangla textbook contained 7 chapters, 19 sections, and 138 pages, with only 5.25% covering environmental and climate change topics. Chapter 5, Section 4 discussed pollution and the impact of pesticides but lacked information on radioactive pollution, greenhouse gases, and acid rain. While the textbook addressed environmental pollution and its social significance, 94.75% of sections did not mention climate change. Teachers opined that, given its importance, more sections on climate change should be included in the Bangla textbook, as it is a compulsory subject.

Class Six: English

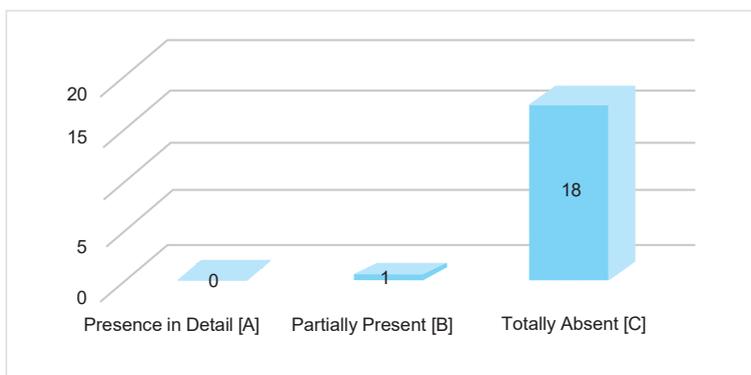


Figure-2: Class Six: English

The English textbook contained 19 chapters and 167 pages, with only 5.25% addressing environmental and climate change topics, specifically in a chapter named “Save our Home.” This chapter featured photos of environmental issues, such as flood damage, and discussed water and air pollution but omitted topics like radioactive pollution, greenhouse gases, and acid rain. While it provided descriptions of environmental protection and degradation, 94.75%

of the chapters did not cover climate change. Teachers suggested that, given the global significance of climate change, the English textbook should include more detailed discussions and specific terminology on the topic, to be elaborated in future classes.

Class Six: Science

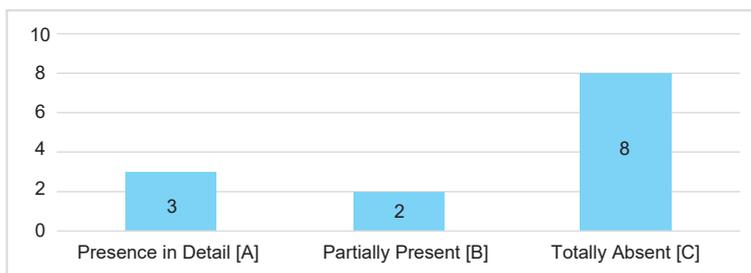


Figure-3: Class Six: Science

The English textbook for secondary students in Bangladesh consists of 19 chapters spanning 167 pages, yet only 5.25% of its content addresses environmental and climate change topics. This meager

coverage is confined to a single chapter titled “Save our Home,” featuring photos illustrating issues like flood damage, alongside discussions on water and air pollution. However, critical subjects such as radioactive pollution, greenhouse gases, and acid rain are notably absent.

While the textbook touches on environmental protection, degradation, and the social importance of environmental awareness, it fails to provide comprehensive climate change education. Remarkably, 94.75% of the chapters completely ignore climate change, despite its global significance.

Teachers have recognized this gap and advocate for integrating more detailed discussions and specific climate change terminology into the English curriculum. They argued that expanding these topics in future editions would enhance students’ understanding and prepare them better to confront environmental challenges. The current chapter, while a step forward, falls short of meeting educational needs amidst the urgent global climate crisis. Educators recommend revising the textbook to include comprehensive sections covering various facets of climate change. This adaptation would align with global educational priorities and empower students with the knowledge needed to promote environmental stewardship effectively.

Class Six: History and Social Science

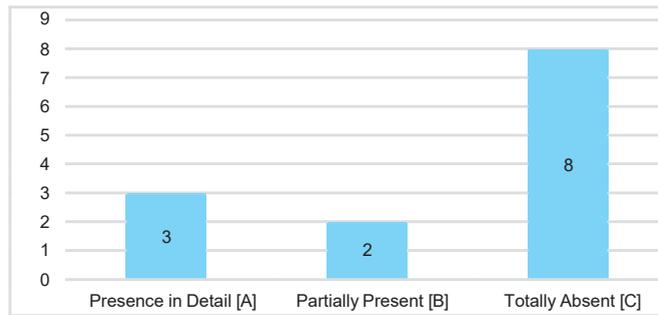
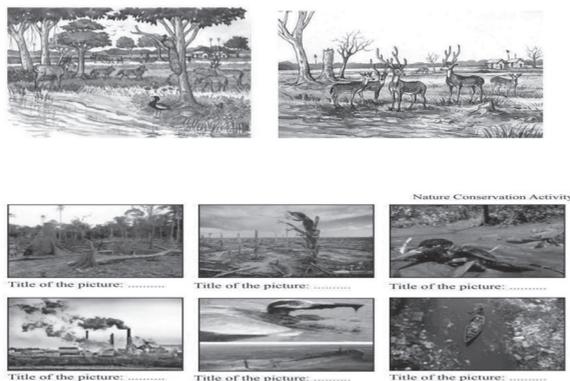


Figure-4: Class Six: History and Social Science

There were total 13 Chapters with 184 pages in History and Social Science Books. Almost one fourth (23.07%) chapters presented in details with Environment with Climate Change. Those were Nature Conservation. Nature and Social Structure and The interrelation between natural and social structures, and our responsibilities. Almost kinds of indicators were addressed in text e.g. water and air pollution, radioactive, green house, acid rain. The books was covered by various activities in text on it. e.g *I/We have taken at least one initiative in protecting animals/ wildlife/environment. I am strongly committed to protecting wildlife and the environment in future. I have realized why wildlife and the environment are important to us. Now I can explain at least 3 reasons for the extinction of wildlife and the environment. There was a sub-section on The Earth Getting Green.* The books illustrated various kind of natural picture to represent the climate change. There were 15.38% chapter (N-2) addressed partially and 61.53% chapter (N-8) were totally absent about climate change. As a

History and Social Science subject there was enough discussed on climate change. There was a lot of picture about climate change. The following picture presented on History and Social Science.



There was enough discussion on it. 100% (N-24) teachers was agreed in effects on climate. In this regard the study expressed that 95.65% (N-22) section were totally absent about climate change.

Class Seven: English

There were total 12 Chapter and 21 Sections with 179 pages in English Book of class Seven. 100% chapter and section was totally absent on climate change discussion. One of the teacher expressed:

First of all we should make a master plan for total secondary contexts what, how and where that will be presented. How much we will introduce students to certain subjects in secondary school and teach it through certain subjects in which classes. How much of it will be discussed in a book in class six and how much will be taught to the students in seven, eight and nine class. Then the outcome will be good. The topic of climate change will come up sporadically in different categories. But if it has a master plan, there is an opportunity to present it more beautifully. There was no discussion on climate change in English subject of Class seven.

Class Seven: Science

There were total 17 Chapters with 113 pages in Science. There were sufficient discussion on climate change e.g. Heat and Temperature, Changes around Us, Work, Energy and Power, Environment and Topography, Disasters Caused by Geo-natural Causes and Their Remedies, Mixture and Separation of the Components of Mixture, Earth Surface and Plate Tectonics Theory, Earthquake and Bangladesh, Different Types of Rocks and The Earth and the Universe. The book discussed on *Interrelationships of organisms. That was; The ecosystem of an area is made based on the interdependence of all the living and non-living things (such as soil, water, air, etc.). The environment remains balanced only when these elements are present in their normal quantities. When an element of the environment, such as a specific species of organism becomes extinct, it poses a threat to the balance of the environment. Similarly, a sudden rise in the population of a particular species also disrupts the balance of the environment.*

This subject incorporated respective terminology on climate change. People disrupted the environment that was highly linked with climate change. Science subject of class seven covered it sufficiently.

Class Seven: History and Social Science

There were total 10 Chapters with 184 pages in History and Social Science. There was no chapter presented in details about climate change. Only 20% chapters partially presented; they were e.g. *Individual's Stand and Role in a Changing Context and Sustainable Development and Our Role*. But that was somewhat relevant to climate change. Mainly goals SGD were presented here. The conversion of class six was sufficient but there was no continuation in class seven. 80% chapter was out of climate change`s issue.

Class Eight: Bangla

There were total 7 Chapters and 21 sections with 189 pages in Bangla. 100% chapter and section were totally absent on climate change.

Class Eight: English

The composition of English was 12 Chapters with 199 pages. There was no chapter on presented in details but 8.33% chapter named Life in the woods partially presented about climate change. The chapter addressed somewhat environment about rain, summer etc. Direct climate change were totally absent in the whole book. There are some natural picture but that was not relate to climate change issues.

Class Eight: Science

There were total 16 Chapters with 186 pages in Science. There was no chapter on presented in details but 6.25% chapter named *Natural Resources* of Bangladesh partially presented about climate change. sub-section named *Impact on the Environment due to Extraction of Natural Resources*. This section addressed causes of climate change that was *'These extraction processes can result in greenhouse gas emissions as well as air and water pollution. Burning fossil fuels contributes to changes in the climate, which have extensive effects on the environment and human society. The process of extracting natural resources from mines can have adverse effects on the environment. For mining, it requires the removal of large amount of soil and rock which results in the loss of green grass cover, and causes soil erosion on the Earth's surface. Besides, mining can release toxic chemicals and heavy metals into the air and water, which can have long- term impacts on the environment and human health.'* The last sentence of the book was: *Everyone must participate in efforts to protect natural resources and ecosystems for future generations.* There was no continuation in class eight. 93.75% of the chapter was totally absent on climate change.

Class Eight: History and Social Science

History and Social Science of class eight was complied with 10 Chapters with 179 pages. There was 10% chapter named *Let us protect nature and human bonds* presented in details on climate change. The chapter addressed random use of natural resources and its impact on human being. Without protection of nature everything destroyed in human civilization. Natural disaster and its effects addressed in details. Specially forest, wildlife, sea resources, tourism, blue tourism, water resources in this chapter. There was a specific description on climate change, That was *Climate Change: Climate change is having a major impact on the oceans. These include rising ocean temperatures, increasing acidity, and rising sea levels. These changes are harming marine biodiversity. Species distribution and numbers are changing. It can disrupt the normal processes of the environment. Mitigating the effects of climate change requires taking and implementing measures to reduce greenhouse gas emissions and protect the balance of marine ecosystems.*

There was a lot discussion about disaster management and sustainable development and management. The issues of climate changes and effects also discussed in the whole chapter. The subject had mentionable discussion on climate change. 90 % chapter were totally absent on climate change.

Class Nine to Ten: Bangla

There were total 7 Chapter and 16 Sections with 213 pages in Bangla Book of class nine. There was no chapter and section presented in details about climate change but partially presented on environment. Season, Trees, Flood, Nature are presented here somewhat but these did not highly link to climate change but there were some picture those are highly linked with climate change.



Figure 4.6: Class Nine: Picture of Bangla

Class Nine to Ten: English

There were total 7 Chapter section 19 with 187 pages in English. All of the chapter was totally absent about climate change. There are some natural picture and discussion but those are not relate to climate change.

Class Nine to Ten: Science

There were total 13 Chapter with 221 pages in English. All of the chapter was totally absent about climate change. There are some natural picture and discussion but those are not relate to climate change.

Class Nine to Ten: History and Social Science

There were total 10 Chapter with 183 pages. 8 chapters were totally absent about climate change. 10% chapter named Exploring Nature and Society. There was somewhat discussion about natural resources those were no relate to climate change. Those were highly relate to society. There were another chapter named Living Safely Together in Harmony. There were a lot of discussion about Land use. In this chapter named Bangladesh Delta Plan 2100. There were 6 Goals. Every goal were somehow related to climate change. Goals were

Goal 1: Ensure safety from floods and climate change related disasters;

Goal 2: Enhance water security and efficiency of water usage;

Goal 3: Ensure sustainable and integrated river systems and estuaries management;

Goal 4: Conserve and preserve wetlands and ecosystems and promote their wise use;

Goal 5: Develop effective institutions and equitable governance for in-country and trans boundary water resources management; and

Goal 6: Achieve optimal and integrated use of land and water resource

No chapter presented in details on climate change.

Over all Findings

Table 4: Over all Findings

Subject	Chapter	Section	Pages	Presence in details	Partially Present	Totally Absent
Class Six						
Bangla	7	19	138	-	One Section	-
English	19	-	167	-	One Chapter	-
Science	12	-	141	One Chapter	Two Chapters	-
History and Social Science	13	-	184	Three Chapters	-	-
Class Seven						
Bangla	7	23	186	-	One Section	-
English	12	21	179	-	One Section	-
Science	17	-	113	One Chapter	Two Chapter	-
History and Social Science	10	-	184	-	Two Chapter	-
Class Eight						
Bangla	7	21	189	-	-	-
English	12	-	199	-	-	-
Science	16	-	186	-	One Chapter	-
History and Social Science	10	-	179	-	One Chapter	-
Class Nine						
Bangla	7	16	213	-	One Section	-
English	7	19	187	-	-	-
Science	13	-	221	-	-	-
History and Social Science	10	-	183	-	Two Chapter	-

Table-4 showed it was observed that in Class Six, among the four subjects, Bangla has only one section in a chapter where detailed analysis is not present. Similarly, English has one chapter where detailed analysis is lacking. In the Science subject, out of two chapters, one provides detailed descriptions. For History and Social Science, there are three chapters where detailed analysis is present without any partial absence.

In Class Seven, Bangla and English each have one section without detailed analysis. In Science, one chapter has detailed analysis, while two have partial analysis. In History and Social Science, no chapters or sections have detailed analysis, but two chapters have partial analysis.

In Class Eight, Bangla and English have no chapters or sections analyzing climate change. However, in Science and History and Social Science, there is one chapter in each subject with partial analysis of climate change matters, but not in detail.

In Class Nine to Ten, Bangla has only one chapter with partial coverage of the topic but not in detail. English and Science have no chapters or sections analyzing climate change. In History and Social Science, there are two chapters with partial coverage but not detailed analysis.

Gender of Teachers

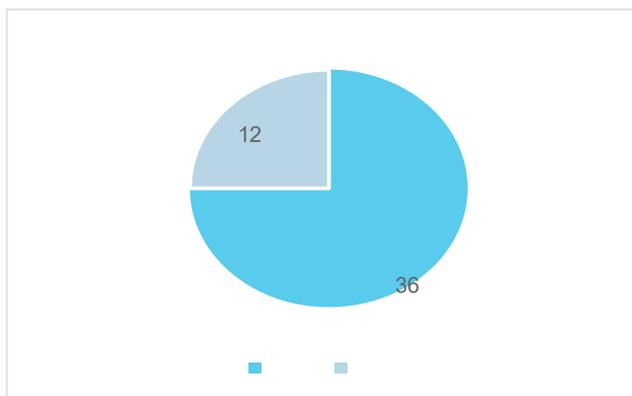


Figure-5: Gender of Teachers

The study covered total 48 teachers from 6 districts. One fourth (N-12) respondents was Female and three fourth (N-36) was Male.

Training on Climate Change

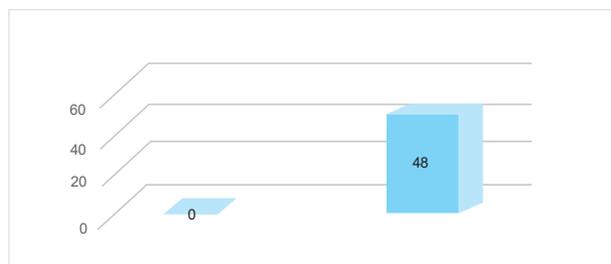


Figure-6: Training on Climate Change

There were total 48 respondents in the study. None of them were not received any training on climate change. One of the respondents expressed on training

As a result of current climate change, it is becoming imperative for us to protect the world from the rate of extreme rainfall and non-rainfall in different regions of the world. And heat and heat are making human life miserable. We have no choice but to train to avoid it. Only when we are trained will the human society become conscious along with the student society.

Discussion, Conclusion and Recommendations

The study focused on the profound impact of climate change in Bangladesh, noting its severe consequences due to frequent weather fluctuations. It stressed the urgency of educating youth about these changes to prepare them for extreme temperatures. The research examined NCTB textbooks, conducted interviews with teachers, and held focus groups with students, involving 48 respondents, mostly male and a quarter female. Respondents highlighted their lack of climate change education, often supplemented by NGOs through leaflets and community outreach, especially in coastal areas. Governmental efforts were deemed inadequate, and teachers felt burdened with professional duties, limiting climate discussions in classrooms.

Respondents unanimously recognized climate change as a critical issue, criticizing the insufficient coverage in NCTB textbooks. They advocated for comprehensive climate change chapters from grades six to nine in Bangla and English subjects. Teachers, aware of their coastal students' experiences, emphasized the need for urgent climate education and proposed integrating environmental awareness across all subjects. They suggested workshops and seminars in educational institutions to enhance student and family awareness. The absence of content on climate refugees in textbooks highlighted the need for broader curriculum inclusion. Overall, the study underscored a critical gap in climate education in Bangladesh, calling for systematic integration into educational frameworks to empower students and communities in addressing climate challenges.

The study incorporated the FGD discussion here. That was;

Question1: *Have you learned about climate change from sources other than textbooks? If so, what are the details?*

Discussion: Many students learned about climate change from sources beyond textbooks, including newspapers, TV, mobile phones, and other media outlets. These platforms were crucial in raising awareness about climate change, providing a continuous flow of information that keeps people updated and engaged beyond formal education.

Question2: *Do you think the ideas about climate change in textbooks are enough to handle the types of climate-related disasters (natural disasters) the world is currently facing? If not, what topics do you think should be added to the curriculum? Please explain.*

Discussion: Respondents find climate change mitigation concepts in textbooks inadequate, stressing the need for detailed, current descriptions of natural calamities. They seek deeper insights into real-world impacts to better understand the urgency and complexity of mitigation efforts.

Question3: *What kind of instructions do teachers give you to deal with various natural disasters? Please explain in detail.*

Discussion: Teachers often provide students with various theoretical directions for coping with different natural calamities. However, many students find these directions lacking in practical application. They suggest that engaging in practical sessions would be more beneficial. By incorporating hands-on activities and simulations, students can better understand how to respond effectively to natural disasters. Practical sessions would not only enhance their knowledge but also equip them with valuable skills that can be applied in real-life situations.

Question4: *How much have you learned about climate change from your textbooks? Please explain in detail.*

Discussion: Here's what they gather from the textbook regarding climate change:

1. Understanding climate change and strategies for coping with calamities.
2. Recognizing various changes in nature caused by climate change.
3. Noticing shifts in temperature and rainfall patterns.
4. Learning about the increase in the number of diseases associated with climate change.
5. Understanding the decline in the population of rare species due to environmental changes.

These topics provide a comprehensive overview of the impacts and manifestations of climate change as outlined in the textbook.

Question5: *Does your textbook discuss the roles of governments and international organizations in addressing climate change? If so, please provide details?*

Discussion: Most respondents did not provide accurate answers, indicating a lack of awareness about the subject matter.

Question6: *Does your textbook discuss climate refugees? If so, please provide details.*

Discussion: They expressed that there was no discussion about climate refugees.

Question7: *Do you face any difficulties in learning about climate-related topics from your textbooks? If yes, please explain the type of difficulties you encounter.*

Discussion: Respondents struggle to grasp climate change topics due to limited equipment and physical demonstrations in their curriculum. They stressed the need for hands-on learning experiences and access to tools to enhance understanding effectively

Conclusion

In conclusion, secondary-level NCTB textbooks in Bangladesh (grades six to nine) inadequately address climate change. Both students and teachers emphasized the need for more practical education on this pressing issue, advocating for additional chapters and teacher training. Bangladesh suffers annual losses due to climate impacts, highlighting the urgency of

educating future generations. It is recommended that climate change education be integrated comprehensively into the curriculum, potentially as a compulsory subject alongside existing ones like ICT and the History of Emergence of Bangladesh, to ensure holistic learning and preparedness for the challenges ahead.

Recommendations

- Climate change topics should be gradually introduced in the National Curriculum and Textbook Board (NCTB) textbooks from class six to ten, ensuring that students develop an age-appropriate and progressive understanding of the issue.
- At least one dedicated chapter on climate change should be incorporated into compulsory subjects such as Bangla and English, so that every student, regardless of their stream, gains exposure to this critical global challenge.
- Educational institutions should regularly organize seminars and workshops on climate change to raise awareness among students, teachers, and communities, creating an informed generation capable of addressing environmental concerns specially in coastal area.
- Comprehensive training programs on climate change should be provided to teachers and education officials, equipping them with the necessary knowledge, teaching strategies, and resources to effectively integrate climate-related content into classroom instruction

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