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Perception and Knowledge on Climate Change: A Case Study of University Students in Bangladesh

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ABSTRACT

This paper mainly investigates the perception and knowledge on climate change of the university students in Bangladesh. To carry out this study, primary data collected from 370 students and several statistical methods are used. Perception and knowledge on the causes, effects and mitigation ways of climate change problems, and perceived duties to combat against climate change are analyzed with descriptive statistics. This paper finds that deforestation is the main cause of global warming and climate change and, the effects of climate change is very serious on people's health. 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 finds that government is crucially responsible for combating against climate change problem. The study calls for government mainly besides industry and youths to aware people about the causes, effects, mitigation ways of climate change so that they can contribute to the sustainable development by mitigating climate change problem.

1. Introduction

The earth is threatened due to the climate change and environmental degradation. In addition, the world is again induced by the rapid growth of economy, urbanization and population. In the case of climatic change concerns, Bangladesh is one of the most vulnerable countries in the world^[1]. There have been several reasons for Bangladesh to remain standing such a susceptible situation regarding climate change, for example, geographical location, flat and low-lying landscape, high density of population, poverty and malnutrition, unsafe agro-food production, lack of proper education, poor institutional set up and so on^[2]. These problems trigger serious consequences when the phys-

ical, socio-cultural and economic condition set in motion of below average^[3]. As a result, it is the responsibility for all walks of life to come forward to tackle the climate change problem and it requires introducing a basic understanding of public perception on vulnerabilities, risks, uncertainties and adaptations in relation to climate change^[1]. Although the 13th goal of Sustainable Development Goals (SDGs) has strongly expressed about "climate actions", it can only be successfully achieved when community based strategies are designed and implemented. To tackle environmental degradation as well as implementation to SDGs, it is intuitively required to the involvement of the youth. As soon as they are understood about the differential features of the atmosphere, they can employ their efforts not only to face immediate challenges

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but even they partake preparing against the long term effects.

In the flowchart, adapted from Harding, et al. [4], stated below, the youth's (students) perception regarding the climate change as well as sustainable environment is very straight forward. It is the present youths will build to the next generation where their choices and activities are really inevitable for the society. That means the students' performance of choosing either their career or consumption level depends how much amiable would be the climate for people in the near future. Firstly, whenever students motive to welfare the community as well as surrounding, there would not any outcome from them which further degrades the environment. The outcome from economic activities, such as agro-productions, investments, manufacturing products, services and others will accommodate the market demand. While the youth try to consume bio or organic products, it would much more closer to achieve the way of environmental sustainability. On the other hand, there is no commitment to a safe climate at all.

The climate will take revenges in terms of climatic disasters and it will stimulate world's suffering and vulnerability. Secondly, the students' consumption behavior will affect the atmosphere to a large context. Either they choose the basket of goods is associated with high mass carbon emissions or they can choose environment friendly bio or organic products. Indeed, the choices are going to stimulate activities which either damage the survivals or not. That means rapid carbon emission to the environment triggers the climatic vulnerabilities, like floods, river erosions, thunder storms, droughts, typhoons and cyclical storms. In addition, the number of pollutants will increase further and it will be treated hardly a better place for human being. Nevertheless, people particularly the young generation may raise voices against the detrimental effects what humans already have done and endangered the upcoming generations. To support the polluted and impaired world, they may come forward with a unique slogan, "To help the environment is to save the human being from extinction". That is the moral attitude, indeed individuals are far away from it. In such way, perhaps people can be able to survive in the world. If the effects are spread very rapidly, people will reach for sustained environmental development.

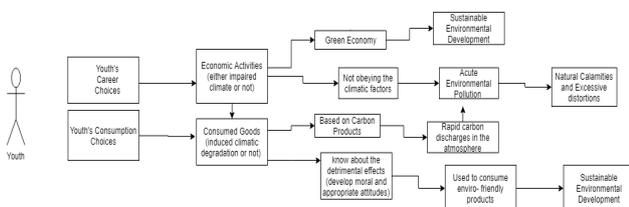


Figure 1. Youth's perception in sustainable environmental development

Source: Adapted from Harding, et al. [4]

Moreover, according to Harding, et al. [4] the involvement of students as well as young generation to the environmental accountabilities has tremendous effect in the long-run, such as, accountability behaviors and attitudes of youth may contribute to the low environmental degradation; utilizing the technological devices, young people can know how and where carbon pollution is eliminated and can help to communicate the vulnerable peasant society to the prosperous nation; gathering the technological knowledge from school, youths can expand green technologies. Throughout the world, many researchers investigated the farmers' and agricultural professionals' perceptions, attitudes and adaptation strategies on climate change [5-9]. In addition, studies on indigenous people's perception [10] and public's perception about climate change [11-13] are also investigated.

However, very scant attention has been drawn to the students' perception on climate change. From the deliberate review of literature, it is found that [14-18] investigated on the students' perception. The focal point of these studies implies that climate change awareness creates major influence on its adaptation and mitigation strategies. On the other hand, very few studies investigated the connection between students' perception and climatic issues. In this regard, a study by Zhao [19] suggests that the ongoing curriculum among college students is insufficient regarding students' responsibility towards climate change cure. On the other hand, Hoffman [20] demonstrates that students can adopt a better solution through the updated technologies in the world although there are very limited beneficiary groups for thinking about the future environment. Both the perception on climate change and the role of forests played crucial contributions among students about the climatic development [14]. In this regard, urban students are far better than rural students as urban students have better understanding than rural students on global warming and climate change [21].

Authors of this paper find some limitations in the previous studies. Moreover, proper investigation has not been carried out on this issue in the context of Bangladesh which pushes authors to investigate deeply. Thus, this paper specifically explores students' perception and knowledge on: (i) the causes of climate change, (ii) the effects of climate change, (iii) the mitigation ways of climate change and (iv) the duties to climate actions.

It is definitely undeniable that the importance of climatic study among the youth is inevitable, particularly the university students who are going to rule the society very soon. They will understand about the relevance of such discipline in the practical arena. In this study, the researchers try to find out the aspect to possess a better

living place in the world.

2. Data and Methods

This paper is mainly based on primary data. To carry out this paper, Rajshahi district among 64 districts of Bangladesh is selected randomly as the study area as it is known as education city of the country. In this district, hundreds of educational institutions are currently providing education services to the students. As this study focuses on the university level students, only the universities of this district are considered here. Rajshahi district belongs four universities of which two are public university and the rest two are private. Among these four universities, one university is randomly selected and Varendra University was selected. The university is running with 5000 students at 3 faculties such as Arts and Social Sciences, Business and, Science and Engineering faculties. From the university registrar office, the list of faculty wise students is collected. These faculties are assigned as stratum. Using the stratified sampling method, sample is selected and the number of sample size is determined by the following formula stated by Taro Yamane.

$$n = \frac{N}{1 + Ne^2} = \frac{5000}{1 + 5000(0.05^2)} = 370$$

where, n = sample size, N= population size and e = rate of precision (0.05). Data are collected from 370 students from the faculties randomly with a well-structured questionnaire during January to June 2019 through face to face interview.

After sorting, coding and finalizing, data were analyzed through SPSS 23 by descriptive statistics such as frequency distribution and presented in tabular form. More specifically, students' perception about the causes of climate change is measured with three points likert scale such as true, false and don't know while the seriousness of the effects of climate change is measured with five point likert scale such as very unserious, unserious, moderate, serious and very serious. The ways to mitigate the adverse effects of climate change is measured with five point likert scale such as strongly disagree, disagree, neutral, agree and strongly agree besides duties to climate action is also measured with five point likert scale such as not at all, small portion, half, major portion and almost.

3. Results and Discussion

3.1 Students' Perception about the Causes of Climate Change

This paper intends to examine the students' perception

about the causes of climate change. Perceptions on the causes of climate change are divided into three categories: true, false and don't know. The perceptions of the students' perception about the causes of climate change are presented in Table 1.

Table 1. Students' perception about the causes of climate change

Factors	Frequency		
	True	False	Don't know
Carbon dioxide emission causes global warming and climate change	352	7	11
Unplanned human settlements causes climate change	334	3	33
High consumption and production causes climate change	314	7	48
Deforestation cause climate change	364	4	2
Methane is a greenhouse gas causes climate change	241	55	74
Unsustainable development causes climate change problem	362	3	5
Burning fossil fuels causes climate change	358	3	9
Rising livestock farming causes climate change	222	73	75
Violation of the commitment of "Kyoto Protocol" causes climate change	7	49	314
Source: Field survey, 2019			

Table 1 represents that 364 students out of 370 students stated that deforestation is the prime cause of climate change. In addition, the second highest portion answered the causes of climate change is true in case of unsustainable development causes climate change. Besides, 352 students responded that the carbon dioxide emission causes global warming potential and this gas is stronger than all other greenhouse gases while 7 students perceived wrong and the rest 11 is don't know. Moreover, among the 370 students, 352 confirmed that unplanned human settlement causes climate change. Contrarily, the large portion of students answered don't know about the violation of the commitment of "Kyoto Protocol" causes climate change. From this analysis, it is found that deforestation is the main cause climate change.

3.2 Seriousness of the Effects of Climate Change on Different Sectors

The effects of climate change is quite diversified and multi-folds. The intensity of these effects in different sectors is not same. In this study, the researchers try to identify the intensity of different climate related effects in different sectors. Based on the responses of students, the effects of climate change in different sectors is shown in Table 2.

Table 2. Seriousness of the effects of climate change in different sectors

Sectors	Frequency				
	Not very serious	Not serious	Mod-erate	Seri-ous	Very serious
Ecological environment and wildlife	-	-	11	26	333
Industrial and commercial activities	-	30	155	167	18
Physical assets/infrastructure	3	26	26	56	259
Energy use and supply	-	11	26	92	241
Food supply	-	7	11	74	278
People's health	-	-	3	8	359

Source: Field survey, 2019

Table 2 reveals that the highest portion of the students (359 students) responded that the effects of climate change are very serious on people's health while the second highest portion of the students perceived that the effects is very serious in case of the ecological environment and wildlife (333). In addition, the effect was very serious on physical assets/infrastructure (259), energy use and supply (241) and food supply (278). On the other hand, the majority portion of the students responded that the effects of climate change are serious in case of the industrial and commercial activities (167). This analysis reveals that the effect of climate change is very serious on people's health.

3.3 Students' Perception about the Ways Mitigating the Climate Change Problem

To make different sectors of the countries like Bangladesh free from the adverse effects of climate change, it is inevitable to find out the ways mitigating the problems of climate change. Table 3 shows the students' perception about the ways to mitigate the climate change problem.

Table 3. Students' perception about ways to mitigate the climate change problem

Ways to mitigate climate change problem	Frequency				
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
An individual's actions can help in mitigating the climate change problem	-	7	241	49	74
Influencing people to adopt low-carbon lifestyle can combat against the climate change problem	-	-	59	34	277
Technology can help to mitigate the climate change problem	167	55	111	92	19
The governments and businesses is more influential to mitigate the climate change problem seriously	-	11	248	48	63

The awareness about climate change can help significantly to decrease the effects of climate change	-	-	59	44	267
It is difficult to combat against climate change as it is too serious and our actions are already too late	-	-	11	22	337

Source: Field survey, 2019

Table 3 represents that as the ways of mitigating climate change problem, majority portion of the students are strongly agree with 'influencing others to adopt low-carbon life-style can combat climate change (277)' and 'the awareness about climate change can help significantly to decrease the effects of climate change (267)'. More than this, the highest portion of the students are strongly agree with 'it is difficult to combat climate change problem as it is too serious and our actions are already too late (337)'. Besides, a significant portion of the students are neutral for mitigating the climate problem of the following ways such as 'an individual student actions can help mitigate the climate change problem (241)' and 'the governments and businesses is more influential to mitigate the issue of climate change seriously (248). On the other hand, the major portion of the students are strongly disagree with 'Technology can help to mitigate the climate change problem (167)' as a way to mitigate of the climate change problem. Although there were some ways mitigating the effects of climate change to a great extent, it is difficult to combat climate change problem as it is too serious and our actions are already too late has been highly perceived by the highest portion of the students.

3.4 Perceived Duties to Climate Action

Although climate change is a global concerning issue, especially it is more pressing in the developing countries. Over last few decades, not only natural environment but also all the physical assets, wildlife and human being are badly affected by the adverse effects of climate change. Therefore, it stresses to take responsibilities for reducing climate change problem. Table 4 represents the distribution of different agents who can take responsibilities to work for mitigating the climate change problem and sustainable environment.

Table 4. Perceived duties to climate action

Agents	Level of responsibility (Frequency)				
	Not at all	Small portion	Half	Major portion	Almost
Government	-	8	11	37	314
Producers	-	18	30	26	296
Consumers	259	74	19	18	-
Individuals	333	17	20	-	-

Source: Field survey, 2019

Table 4 indicates maximum portion of the students responded that the individuals (333) and consumers (259) are not responsible for reducing climate change problem. On the other hand, according to the perception of the students, government (314) and producers (296) are almost responsible for reducing climate change problem. From the above table, it is found that besides others, government has the crucial responsibility to combat against climate change problem.

4. Conclusion

This paper explores four distinct research questions on students' perception about climate change. First, what are the causes of climate change? Second, what are the effects of climate change? Third, what are the ways to mitigate the climate change problem? Finally, who are responsible for climate action? Using primary data collected from 370 students and several statistical methods, the study finds four interesting findings. First, the paper finds that 364 students out of 370 students perceived "deforestation" as the top most cause of climate change. Second, majority of the students (359 students) think that very serious effect of climate change falls on people's health. Third, 337 students out of 370 students reported "it is difficult to combat against climate change problem because it is too serious issue and it has already been too late to take actions" as a response to the ways to mitigate climate change problem. Four, this study also finds majority of the students (314 students) reported that government has the major duty to combat against climate change problem.

The findings of the study justifies the need for awareness and enlightenment of knowledge on climate change of the students. Therefore, the study calls for government mainly besides industry and youths to aware people about the causes and effects of climate change along with the ways to mitigate the effects of climate change. In doing so, this study suggests to arrange seminar, symposium, workshop, group discussion and enroll a course in the academic curriculum for enhancing students' knowledge on climate change and ensuring the participation to the mitigation of climate change problem and achieving SDGs. Since this study is carried out within short budget and time, sample size is henceforth small. Thus, authors of this paper recommend deep further investigation to bring to light the real scenario on this issue.

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