***Review Article***

**Understanding Climate Change Perception and Knowledge Outside of the Global North Context**

**ABSTRACT**

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| --- |
| Majority of the existing studies on public perception of scientific consensus on climate change have focused and experimented in the global north. This study aims to analyze public climate change perception and knowledge from developing countries context explicitly Bangladesh from existing literature and to grasp whether or not the gateway belief model could be applied to enhance public climate change perception in Bangladesh. Total number of articles abstract assessed (n=30) and full article reviewed were (n=17). Thereafter, 10 articles were selected based on the inclusion criteria for the analysis in this study. This study has synthesized the literature on two concepts to examine the public climate change perception and knowledge in Bangladesh. The first one is, examining the public perception of climate change that already have as well as acquiring formal education. The second aspect is, people that are living in highly climate risk communities and experiencing the impact of climate change. The overall findings from the literature showed that, universities students’ climate change perception and knowledge vary between educational institutions. Furthermore, people that are experiencing, and affected by climate change and living in the high climate risk communities, there are differences on the perception of climate change based on education level, cultural belief, economic situation, information gap, access to mass media and so forth. In order to increase public perception of climate change in Bangladesh, the gateway belief model could be tested adapting to the localized settings using social consensus, and in-group consensus messaging which will provide a notion whether or not the gateway belief model is applicable in the developing countries context namely Bangladesh. |

*Keywords: Climate Change, Climate Change Perception, Climate Change knowledge,* *Gateway Belief Model.*

1. **INTRODUCTION**

Climate scientists agree that climate change is happening (Aslany & Brincat, 2021; Cook et al., 2013; Doran & Zimmerman, 2009; Freudenburg & Muselli, 2010) and there is a strong scientific consensus that climate change is caused by humans which poses a serious threat to human civilization (Cook et al., 2016). However, public opinion on whether climate change is happening or not remains divided (Čábelková et al., 2021). Misconceptions about anthropogenic cause of climate change still exist, and support for climate-friendly behavior and policies remains low (Gellrich, 2021; Infratest, 2021). To fulfil Sustainable Development Goal (SDG) 13, “Climate Actions,” (United Nations, n.d.), needs ambitious collective action and requires to understand how people from different societies perceive, act, and respond to climate change. To understand the climate change perception of people, I will analyze public climate change perception and knowledge within the framework of the gateway belief model from the existing research.

* 1. **Background Of the Study**

Some experiments indicate that learning about the scientific consensus on climate change can increase belief in anthropogenic climate change, which is mediated by perception of scientific consensus (Brewer & McKnight, 2017; Kerr & Wilson, 2018; Lewandowsky et al., 2013; van der Linden et al., 2016). Consensus messaging has been demonstrated to improve attitudes towards climate change and public scientific consensus, despite debate in the literature (Brewer & McKnight, 2017; Cook & Lewandowsky, 2016; Deryugina & Shurchkov, 2016; Goldberg et al., 2019; Lewandowsky et al., 2013; van der Linden et al., 2015). Existing studies on consensus messaging mostly focus on the global north; many European nations already have high consensus among the public on climate change (Fagan & Huang, 2019). Several research studies suggests that interventions that increase perception of scientific consensus on climate change have no overall effect on personal belief (Dixon et al., 2017; van der Linden et al., 2014). Whereas, some studies found a strong link between public views of scientific consensus on climate change and policy support based on the core belief about the issue (Ding et al., 2010; McCright et al., 2013; Schuldt & Pearson, 2016). A meta-analysis explored 30 research studies on scientific agreement and found that perceived scientific consensus was the third most significant psychological predictor of belief in climate change (Hornsey et al., 2016). Also, few studies have explored low consensus messages, but other studies have found that disagreement, partisanship, and misinformation can reduce scientific consensus to support climate policies (van der Linden, 2021). The literature on consensus messaging mostly focused on the USA and Australian samples, with few studies focusing on New Zealand (Kerr & Wilson, 2018), Japan (Kobayashi, 2018), the UK (Hornsey et al., 2019), and Germany (Tschötschel, 2021). Climate change perceptions vary to a great extent between countries, so the results from one country cannot be applicable around the globe (Fagan & Huang, 2019). Academic literature commonly accepts that insufficient public responses cannot be entirely explained by uneven distribution of scientific literacy or a lack of knowledge (Denniss & Davison, 2015). Most of the research has focused on individual-level factors influencing people's attitudes and concerns about climate change (Poortinga et al., 2019). Even though the existing studies have expanded our knowledge on climate change and risk perception, that is country- and culture-specific, which makes it difficult to generalize with the other developing countries around the world (Lee et al., 2015). Some scholars indicate that confidence in climate scientists might moderate the consensus effect (Dixon, 2016; Hahn et al., 2015), and previous research suggests that faith in science may diminish the consensus effect, although there is no definitive evidence (Ding et al., 2011). Also, different mental models of science, for instance, “search for truth vs. science as debate,” might influence people’s way of thinking (Bertoldo et al., 2019).

Although the impact of climate change affects the whole world, it is commonly accepted that the poorest people in developing countries need the most support for adaptation (Adger et al., 2009; Ayers & Dodman, 2010; Burton, 2004; Huq & Ayers, IPCC, 2007; Schipper, 2007). Consensus messaging has focused and experimented mostly in the global north, which leads this study to assess existing literature to get insights of public climate change perception and knowledge in the developing countries context specifically Bangladesh. Bangladesh is a country with a population of over 170 million people that are facing great challenges due to the high vulnerability to climate change (Woroniecki et al., 2022). In this study, I am going to explore public climate change perception and knowledge in Bangladesh from the existing research which will help to comprehend public perception of climate change and whether the initiatives and intervention required to be approach within the framework of the gateway belief model and thus, figure out the scope to test the gateway belief model to enhance public perception of climate change in Bangladesh.

* + 1. **Gateway Belief Model**

The gateway belief model developed by van der Linden, Leiserowitz, Feinberg, & Maibach (2015), demonstrates the scientific consensus is indicating that human activities are the principal factor of global climate change and sees publics (mis)perception of the scientific consensus can influence “gateway” cognition (van der Linden et al., 2019). The gateway belief model suggests a two-stage mediational process in which perceptions of scientific consensus act as a “gateway cognition” to influence personal agreement with scientific statements that lead to support for related policies (van der Linden et al., 2019). It is purely a descriptive model which present a process of assessment and attitude change (van der Linden et al., 2015). The gateway belief model gains scientific consensus in climate science, can act as a “gateway” to other crucial cognitive and affective judgment for instance recognizing that global warming is happening that is caused by human beings and reflecting the level of concern people about it (van der Linden et al., 2015). The gateway belief model describes “de-biasing” by highlighting scientific consensus on an issue such as climate change to influence public perception of that consensus (van der Linden et al., 2019). Scientific consensus functions as a “gateway” for slight changes in personal beliefs and attitudes on climate change (van der Linden et al., 2015), and changes in the perceived scientific consensus has an indirect impact on public support for action (van der Linden et al., 2019).

Belief in  
Climate Change

Consensus Messaging

*Debiasing Process*

Support for Public Action

Worry about Climate Change

Perceived Scientific   
Consensus

Belief in Human Causation

**Fig. 1. Gateway Belief Model (van der Linden et al., 2019)**

**Source: van der Linden, S., Leiserowitz, A., Maibach, E., The gateway belief model:**

**A large-scale replication, Journal of Environmental Psychology (2019).**

1. **LITERATURE SEARCH, SCREENING AND SELECTION**

Before extracting the data from articles literature, a couple of keywords were used to sort the articles based on the objective of the study. In order to point out the articles that align with the objective of this study, the keywords and a prompt (see Fig.2) were applied in Google Scholar and Consensus (AI) tool. Afterwards, a draft table was prepared in a spreadsheet with categories such as author(s), title of the paper, method, objectives of the study, findings (focused on climate change knowledge, perception, and awareness) and relevance level. After assessing the full text of the articles (n=17), based on the inclusion criteria (see Fig.2) the articles were marked with high, medium, and low. The articles which closely aligned with objective, the theme and concept of this study were marked with high relevance, and finalized to analyse in this study. On the other hand, the articles that aligned with the theme but not with concept marked with medium relevance and the articles which did not match the theme and the concept of this study marked with low relevance and not selected for analysis.

**Literature search, screening and selection**

*Search Results*  
Google Scholar (n=234)  
Consensus AI (n= 45)

*Search tools used*  
Google Scholar & Consensus AI

*Google Scholar (Keywords used)*

"climate change perception” AND “climate change knowledge" Bangladesh

*Consensus AI (Prompt used)*

climate change perception and knowledge of people in Bangladesh

*Screening*

Total paper screened (n = 30) -title based on- climate change perception in Bangladesh, and climate change knowledge in Bangladesh and sorted by year: 2010-2025

Abstract assessed articles (n=30)  
  
Full text reviewed articles (n=17)

*Inclusion criteria*  
The articles which concept and theme concentrated on climate change perception and knowledge of people in Bangladesh were selected to analyse in this study

Total articles finalized for analysis (n=10)

**Fig. 2. Literature search, screening and selection**

**Table 1: Overview of the selected literature**

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| --- | --- | --- | --- | --- |
| Author (Year) | Title of the Paper | Method | Objective of the study | Findings (Focussed on Climate change knowledge, perception and awareness) |
| Haq & Ahmed, 2020 | Perceptions about climate change among university students in Bangladesh | A self-administrated questionnaire was used to collect data. | The aim of the study is to explore climate change perception among university students at Shahjalal University of Science and Technology (SUST) Bangladesh. | Majority of students believe that the primary reason of climate change is human caused which connects with: those that are mostly male respondents and have experienced the extreme weather, carry this perception of climate change.  Perception of climate change among student in tertiary education differ by academic discipline. Students in the social sciences more likely than other discipline, perceive climate change caused by human activities. |
| Rahman et al., 2020 | Climate change and dengue fever knowledge, attitudes and practices in Bangladesh: a social media–based cross-sectional survey | A social media based (Facebook) cross-sectional survey on knowledge, attitudes and practices and secondary data of dengue fever cases in 2019 | The objective of the study was to examine the knowledge, attitudes and practices of university students in Bangladesh as well as the variables that influences their climate change prevention practices and dengue fever. | A significant number of respondents reported that they heard about climate change and climate is changing. Moreover, the respondents have good knowledge of climate change attitudes and practices which leads to adequate knowledge of climate change mitigation and adaptation. However, male participants had lower probability of having strong climate change adaptation practices compared to female respondents. |
| Hasan & Akhter, 2011 | Determinants of public awareness and attitudes on climate change in urban Bangladesh: Dhaka as a case | A mixed method approach both qualitative and quantitative method used in this study. Also, stratified random sampling was employed to collect 172 samples from 4 various parts of Dhaka city. | The study aims to identify the aspects influencing public knowledge and responsiveness to climate change. | People with formal education, media access and personal experiences with environmental issues are more likely concerned about climate change and develop appropriate environmental attitudes compare to people with less formal education and less informed about environmental problem. |
| Ahmed et al., 2022 | Teachers’ Perceptions about Climate Change: A Comparative Study of Public and Private Schools and Colleges in Bangladesh | This study used a primary survey with a self-completed questionnaire to collect data from 95 teachers in Sylhet, Bangladesh from 3 schools and colleges. | To explore the perception of teachers in school and colleges in Sylhet, Bangladesh. | There is high level of awareness and perception about climate change among the teachers. Additionally, there is no statistically significant relationship the teacher’s education level and perception of climate change |
| Hasan & Nursey-Bray, 2017 | Artisan fishers’ perception of climate change and disasters in coastal Bangladesh | This paper adapted Johnson and Onwuegbuzie's (2004) eight -step framework to design and apply a mixed-method approach. A in-person survey was conducted applying a structured questionnaire and in-depth interviews and focus group discussions were deployed to collect primary data for this study. | This study explores the contextual causes and dimension of artisanal marine fishing communities’ views and understand, and respond to climate change in Bangladesh. | Despite the fishers are experiencing the impact of climate change however they do not perceive as the greatest risk or threat to their well-being. Furthermore, majority of the respondent believed that climate change is an "Act of God" or a natural process. In addition, the fishers do observe and worried about climate change but they do not consider or link it as a distinct phenomenon. |
| Huda, 2012 | Understanding indigenous people’s perception on climate change and climatic hazards: a case study of Chakma indigenous communities in Rangamati Sadar Upazila of Rangamati District, Bangladesh | A household survey was conducted to collect data from 384 households in Rangamati Sadar, Bangladesh. In order to collect data a semi-structed questionnaire was designed. | The primary objective of the project was to understand the relationship between the perception of climate change and climatic hazards and socio-demographic characteristics of Chakma indigenous community in Bangladesh. | A substantial number of respondents from Chakma community perceive that climate is changing and aware of the different climatic hazards. Moreover, male respondents are more likely to perceive climate change than female respondents. Also, younger respondents are likely perceiving climate changes than the older people in the Chakma community. Additionally, respondents that have formal education perceive climate change than people with less formal education which is a leading predictor. |
| Kumar et al., 2019 | Perception and Knowledge on Climate Change: A Case Study of University Students in Bangladesh | A well-structured questionnaire was used to collect primary data from the participants from four both public and private universities in Rajshahi city in Bangladesh and a stratified sampling method was used. | The purpose of this study is to investigate university students in Rajshahi on perception and knowledge of climate change specifically cause-effect, action and mitigation of climate change | A great number of the students participated in this study think deforestation as the primary cause of climate changes well as unsustainable development, unplanned settlement and burning of fossil fuel. In addition, most of the respondents strongly think that it is too difficult to tackle climate change as it is already too serious and late to act. Furthermore, the study found that majority of the students believe that government is mainly responsible to tackle climate change |
| Kabir et al., 2016 | Knowledge and perception about climate change and human health: findings from a baseline survey among vulnerable communities in Bangladesh | The main tool for this study was pre-tested, structured interviewer-administrated interview schedule. Also, as part of the questionnaire an observation checklist of household and community characteristics used by the interviewers. | The objective of the paper is to explore collect community data on people’s knowledge and perception about climate change | Around 54.2% of the participants has knowledge about climate change while 45.8% had not heard of it all. In addition, education was one of the most influential factors for understanding of climate change and its impact on health. The study has suggested school-based intervention should be explored to enhance people knowledge about climate change as well as public health sector needs to be engaged in primary health care. |
| Islam et al., 2024  Uddin & Akter, 2023 | Perception, problems, and risks to climate change adaptation: A study adjacent to Sundarbans mangrove forest, Bangladesh  The Knowledge, Awareness and Perception About Climate  Change And Its Hazardous Effects Among Students Of  Barishal University: An Environmental Survey | A reconnaissance survey was conducted to explore the existing condition of the study area. To collect the primary data and information on climate change adaptation were gathered through personal interview based on a questionnaire and household survey. Also, focus group discussions were also conducted as well as secondary data from different sources such as journals, books and so forth.  An online survey was conducted among the students at Barishal University, Bangladesh. 570 students participated in this study from 24 departments. A semi-structured interview guide and a self-administrated questionnaire was used to collect the data from the participating respondents. | The study goal is to explore the perception, problems and associated risks regarding climate change adaptation in the south-western coastal region of Bangladesh close to the Sundarbans mangrove forest.  The aim of the study was to evaluate the level of knowledge, awareness and perception about climate change and the impact on the students at Barishal University. | A substantial number of respondents around 77.15% were not concerned about climate change and 70% of the respondents were unaware of climate change adaptation. The potential reason for low perception level includes inadequate education, lack of training and insufficient financial support.  The students that participated in this study, around 97% were worried about climate change. However, among them 28% students were not aware of the causes of climate change, and 36% student lack knowledge about impact on economy of climate change. But, 84% students have experienced extreme natural events such as cyclone, floods, droughts and so on. In addition, 66% students believe that public awareness is important to reduce climate change impacts. |

1. **RESULTS AND DISCUSSION**

This study has synthesized the literature on two concepts to examine the public climate change perception and knowledge in Bangladesh. The first one is, examining the perception of climate change of people, that already have or acquiring formal education. The second aspect is, people that are living in the communities which are at high climate risk regions and experiencing the impact of climate change. The reason for synthesizing the literature in these two aspects is that, whether people with formal education have the knowledge of climate change and what is their perception of climate change as they already received or acquiring formal education. On the other hand, to examine the perception of the people that are living in the high climate risk communities and experiencing the impact of climate change in Bangladesh and find out the factors that influence their climate change perception.

* 1. **Perception Of People with Formal Education**

Looking into the public perception of climate change, the research conducted among the university students in Bangladesh to examine students’ perception and knowledge of climate change, a mixed observation from students have been discovered from the analysis of the selected literature for this study. Majority of university students at a public university in Sylhet in Bangladesh believe that the primary cause of climate change is human caused such as deforestation, extracting sand from rivers, dredging rivers, carbon emissions from vehicles and so forth (Haq & Ahmed, 2020). However, among all the students who’s participated in that study, around 25% perceive that climate change as the will of God or a punishment of humankinds wicked action such as not praying

regularly, women going out in public, committing immoral acts and so on (Haq & Ahmed, 2020). In addition, a substantial number of students from social science discipline perceive climate change as human driven than students from other disciplines (Haq & Ahmed, 2020). Furthermore, the study by Kumar et al. (2019), focusing on knowledge and perception climate change of public and private universities in Rajshahi city in Bangladesh, showed that most of students think combating climate change is challenging since it is already a too serious and late to act and the government have the primary responsibility to address this problem. Even though the students are aware of the causes and effect of climate change in Bangladesh (Kumar et al. 2019). Nonetheless, a significant number of students believe awareness of about climate change could help to a great extent to reduce the effect of climate change (Kumar et al. 2019).

In addition, Uddin & Akter (2023) conducted a study at a public university in Barishal and the results showed around 97% students were worried about climate change and about 66% students believe that personal awareness is important to reduce climate change effect. However, except from the bioscience faculty students, no other student has academic knowledge on climate change in their graduate and undergraduate studies (Uddin & Akter,2023). Moreover, the study by Hasan & Akhter (2011) conducted in 4 parts of Dhaka city examining public knowledge and responsiveness to climate change, the findings of the research illustrated, people that have formal education, access to media as well as personal experiences with environmental issues are more concerned about climate change and willing to develop appropriate environmental attitudes compare to people having less formal education and less informed about environmental problem.

* + 1. **Perception Of People at High Risk of Climate Change**

Looking into the research which have been conducted in the communities that are at high risk of climate change and people have been experiencing the impact of climate change provides a different overview about climate change perception than the studies conducted among the people that have or acquiring formal education and living in the urban or peri-urban areas of Bangaldesh.

Islam et al., (2024) conducted a study in the southern coastal region specifically in the communities of the Sundarbans mangrove forest. The findings reveal that majority of the respondents living the communities in the Sundarbans are not concerned about climate change which could be connected to the educational status of the people as the study shows 51% of the respondents have no formal education with only 25% respondents complemented primary education and 12% of respondents completed secondary or upper secondary education. The majority of the respondents in the Sundarbans communities experienced financial troubles, water logging, salinity and water-borne disease but only a small fraction of respondents were neutral and none were very concerned about climate change impact in the Sundarbans (Islam et al., 2024). Moreover, on the southeast coast in the villages of Chittagong and Chakaria which are at climate risk disaster zone, fishers are aware of climate change and can identify the visibility of the changes such as warmer winter, floods cyclones and so on (Hasan & Nursey-Bray, 2017), However, the understanding for climate change is opposite to scientific explanation as many of the fishers think climate change is a “Act of God” or divine punishment rather than human activity (Hasan & Nursey-Bray, 2017). Fishers have a long tradition adapting to environmental risks however they do not directly associate this adaptation with climate change which lead to a barrier for successful adaptation policy implementation in the villages (Hasan & Nursey-Bray, 2017). Their perception has relied mainly on direct experiences and observation of environmental changes and disaster which embedded in local knowledge, tradition, faith, and values rather than just formal scientific knowledge (Hasan & Nursey-Bray, 2017).

Furthermore, Chakma an indigenous community in Rangamati have inadequate approaches to tackle climate change impacts and climatic related hazard (Huda,2012). People with wealth, formal education and access to mass media such as teachers, NGO workers, male and young people far more likely to recognize climate change than people with lower-level education or no education such as farmers, small scale businessmen that are directly or indirectly involved in agricultural activities with an experience of visible impact of climate change (Huda,2012). Though, Chakma communities in Rangamati are aware of climate change but their strategies to combat climate change related problems are inadequate due to poverty, ignorance of different adaptation approach as well as knowledge and information gap on the effect of climate change (Huda,2012).

1. **LIMITATIONS OF THE STUDY**

The goal of this study was to get an overview of climate change perception and knowledge of people in Bangladesh and based on that, to understand whether or not there is a need to enhance public climate change perception and if so, to find out the scope to test the gateway belief model to enhance public perception of climate change in Bangladesh. However, this study has analysed a few selected literatures on climate change perception and knowledge of people in Bangladesh which does not provide a broader picture of general people climate change perception and knowledge. A meta-analysis literature review could provide a comprehensive output on public climate change perception and knowledge in Bangladesh.

1. **CONCLUSION**

This study has explored the public climate change perception and knowledge in Bangladesh based on the indicators such as, access to education, geographic location, experience with climate vulnerability. The overall findings of the literature showed that, students’ perception of climate change vary between educational institutions. Students from one university despite having the knowledge of climate change, some students lack of scientific consensus on climate change. Whereas, in another university majority of the students are seriously concerned about climate change and believe that personal awareness is crucial to tackle climate change. However, looking into some other university, the absence of morality has been noticed among students to take climate action which indicate lack of willingness to take action to mitigate climate change impact. In addition, people that are experiencing the impact the climate change and living in high climate risk communities in Bangladesh, among them there are differences on the climate change perception and knowledge due to several factors for instance cultural beliefs, education, economic situation, information gap, access to mass media, and so forth.

Although, people may not usually identify with scientist as a social group (Bayes et al.,2020), as. van der Linden (2021) brought up that, gateway belief model has yet to be investigated the benefit of using in-group messengers to convey consensus messages regardless of partisanship, or other factors. In the developing countries setting explicitly in Bangladesh application of the gateway belief model could be tested adapting to the localized settings using social consensus, and in-group consensus messaging to increase public perception of climate change. Future research could be focused on testing the gateway belief model adapting to the local settings using social consensus and in-group consensus messaging to enhance public perception of climate change, and examine the effectiveness of using social consensus and in-group consensus messaging in Bangladesh which will provide a notion whether or not the gateway belief model is relevant in the developing countries context namely Bangladesh.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author hereby declares that no generative AI tool such as Large Language Models (ChatGPT, COPILOT, etc) have been used. AI grammar and language checking tools have been used to check sentence error during the writing or editing process.

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