International Journal of Research and Review
[Indexed, Peer-Reviewed Journal]
Volume 12; Issue: 12; December 2025
Website: www.ijrrjournal.com
Research Paper *E-ISSN: 2349-9788; P-ISSN: 2454-2237*

The Future of Sustainability: Exploring College Students' Perception of Renewable Energy in Bangladesh

Md. Abdul Hai

Department of Humanities, Chittagong University of Engineering and Technology (CUET), Chattogram, Bangladesh.

Corresponding Author: Md. Abdul Hai, E-mail: hai@cuet.ac.bd

DOI: https://doi.org/10.52403/ijrr.20251224

ABSTRACT

This study was conducted to explore the perceptions of college students regarding renewable energy sources in Bangladesh. Considering college students' future roles as the leading force in energy production and consumption, along with a notable absence of comparable studies in this area among college students in Bangladesh, this study was carried out in three colleges among 242 students using a survey - based structured questionnaire. The study revealed that while most students expressed positive attitudes toward renewable energy sources, many remained skeptical. It also discovered that colleges are lacking in resources for seminars, talks, articles, and newsletters on renewable energy topics. This study suggests that colleges need to raise awareness about the dangers of fossil fuels, global warming, climate change, and environmental degradation, as well as the benefits and challenges of using renewable energy to support sustainable development. Furthermore, it indicates that colleges should modify their curricula to include the environmental, technical, economic, and social aspects of sustainable energy. Active involvement from students is crucial for a secure and sustainable energy future

Keywords: Perception, renewable energy, college students

INTRODUCTION

Fighting on-going and upcoming climate change and addressing an inexorable decarbonisation of energy systems to ensure the requisite phasing out of non-renewable fossil fuels have become major global priorities (Hai, 2021, Keramitsoglou, 2016). Therefore, particular emphasis placed on (i) altering energy use behaviour and (ii) developing and expanding renewable energy sources (RES). Traditionally, to meet energy demand, policymakers designed energy policies without considering the active concerns and participation of energy users. Society is a social construct that can be modified by people when and where needed, as seen in the energy industry from a sociological perspective (Robertson, 1987). The concept of "unquestionably accepting the social world" has been transformed by the effects of climate change into a reorganization of decision-making, energy production, and consumption through the active participation of energy users. The transition of energy systems, decentralisation of decision-making, and the implementation and use of renewable energy (RE) require everyday energy users to be involved and change their energy consumption behaviour (Hai, 2021; Steg,

Perlaviciute, & van der Werff, 2015). To achieve this, some studies emphasise on raising public awareness of energy issues (Keramitsoglou, 2016; Potter, 2010) and concurrently assess public perception of RES, as positive perception acts as a key factor in successfully accomplishing an energy transition (Sütterlin & Siegrist, 2017).

Citizens in Bangladesh continue to face challenges in achieving energy security security (Ahmed, Al Amin, Hasanuzzaman, & Saidur, 2013). Bangladesh has been experiencing energy crises due to limited production, transmission, and distribution of energy, making it an energy-poor and energy-hungry country Islam & Khan, 2017). The limited, exhaustible, and non-renewable energy sources (e.g., natural gas and coal) cannot satisfy 100% of energy demands (Hossain, 2008), hindering the country's development activities in many respects. Additionally, climate change poses threats to development as well. Bangladesh has consistently been recognized as one of the most severely affected countries by climate change among the Least Developed Countries (LDC) (Ahmed, Alam, & Rahman, 1999; Ayers & Huq, 2009; Nishat & Mukherjee, 2013). According to the Global Altitude Index Report 2020, Bangladesh was listed as the seventh most climate-vulnerable country (Eckstein, Künzel, Schäfer, & Winges, 2019). According to Debnath & Mourshed (2022), Bangladesh's GHG and CO2 emissions intensity was 0.46 tCO2e/capita in 2014 and is projected to reach two tCO2e/capita by 2050. RE can be utilized to address these circumstances by providing a potential solution to the rising energy demand and supporting sustainable development. The country benefits from a rich availability of RES such as solar, wind, hydro, biomass, biogas, tidal, and geothermal energy due to its geographical location (Akram, Arefin, & Nusrat, 2021). RE holds significant importance because it is considered "the key to cleaner and sustainable energy for daily human living and the natural environment, with non-pollutant gas emissions to mitigate climate change"(Trinh & Chung, 2023).

This study aims to delve into Bangladeshi college students' perceptions regarding RE, by exploring their opinions on the dangers of fossil fuels, their knowledge of RE benefits and challenges, their motivations for adopting RE, and their confidence and triggers for taking action towards sustainable energy solutions. In Bangladesh, as of 2022, the youth population in the 15-29 age group is 45.9 million Bangladesh Bureau of Statistics (BBS)'s population census-2022). Young people, including college students, are more aware of the significance of using RE over fossil fuels than older individuals Bangladesh Bureau of Statistics (BBS)'s population census-2022). In the coming years (e.g., 2030-2040), college students will be the driving force in energy production and consumption (Greenberg, 2009). Their perceptions, attitudes, and behaviour will have significant implications for sustainable energy development, impacting the positioning of energy producers and consumers' choices in the future. Their views on addressing decarbonisation and the sustainable energy transition will also guide policymakers and business leaders. For many young students, global warming resulting from the use of fossil fuels has become a pressing concern that directs their interest toward RE. This study intends to provide valuable insights into student perspectives on climate change, RE implementation, and sustainable energy solutions in Bangladesh.

The remainder of this article is structured as follows: Literature Review Section addresses existing literature on key issues related to perceptions of environmental degradation, the consequences of using fossil fuels, climate change, the awareness-building roles of educational institutions, self-efficacy, and general concerns. The methodology of this study is explained in Materials & Methods Section. Results & Discussion Section presents the results and discussion of the study. Conclusion Section

provides conclusions, including recommendations and directions for further research.

LITERATURE REVIEW

Perception, Intention, Plan & Attempt to Use, Try, or Adopt RE

Different studies indicate that perception acts as a vital indicator for consumers to adopt RE (e.g., Jabeen, Yan, Ahmed, & Qamar, 2019). One's actions towards both the environment and society are changed when one has a positive perception towards the environment that involves safeguarding it (Sultana et al., 2017). Bulent et al. (2009) identified a positive approach of individuals towards the environment; however, there is a disconnect between understanding the concept of the environment and the eagerness to engage in environmental preservation (Halder et al., 2013). Perception influences intention and intention acts as a blueprint to guide one's behaviour. Positive intention refers to actions taken by some people who believe they will benefit from them. In other words, intentions show a person's potential for acting in a certain way. It is well recognized that people's perceptions (Davis, 1989; Zahari & Esa, 2018) shape their lifestyle decisions and behavioural intentions, which in turn motivate them to embrace and use technology (Asadi et al., 2020).

When it comes to RET adoption, a lot of people's worries are related to their perception of the technology's capabilities and character. In this context perception refers to the methods by which people interpret technology (Shahin, Kennedy, & Stupans, 2019). These methods may centre on the technology's utility, safety, compatibility, and the costs or risks associated with adopting it (Zahari & Esa, 2018). Despite the fact that Scuotto et al. (2020) proposed a positive linear correlation between people's perceptions and their intentions to embrace a technology, the effects of such ideas can be beneficial or bad and far-reaching. A negatively perceived technology is likely to confront grater obstacles than one perceived positively.

Therefore, technology may be welcomed if it is thought to be beneficial and likely to enhance life, or it may be rejected if it is thought to be dangerous and likely to interfere with one's way of life. People's preferences vary, which influence their intentions toward or away from the technology (Spence, Demski, Butler, Parkhill, & Pidgeon, 2015).

In their investigation of the variables influencing the uptake of alternative energy in Indian households, Roy and Mohapatra (2021) found no evidence of a relationship between behavioural intentions to use these technologies and perceptions. While analysing behavioural intentions to use home energy management systems in the UK, Whittle, Jones, and While (2020) noted that people's perceptions of the technology's utility and ease of use were significant predictors of their intentions to use it. Likewise, Zulu, Chabala, and Zulu (2021) found that people's behavioural intentions to use solar energy technologies in Zimbabwe are influenced by their perceptions of the benefits, risks, and costs involved with adopting RE. Jansson (2011) and Qian and Yin (2017) in their studies also show the importance of perceptional beliefs in elucidating behavioural intentions.

Perception of Risks Associated with Using of Fossil Fuels

In addition to shaping their opinions on a new technology or service, users also evaluate risks and costs before deciding on whether to use it. If they perceive that the product is too risky or costly compared to the rewards, they might delay or refuse to purchase or adopt it. Perceived risk refers to how consumers view the uncertainty and potential negative outcomes of purchasing a product or service. It is the perceived mental dangers of being in a situation or to one's mental perception of the danger of a particular behaviour. Additionally, consumers frequently worry about the quick obsolescence and devaluation of high-tech

products. Sarin and colleagues (2003) claimed that consumers view the buying of new high-tech products as risky because of widespread technological and market uncertainties in products and industries. Because of this, perceived risks can be seen as a contributing factor that hinders consumer adoption.

Although nowadays, environmental pollution and energy crises are no longer beyond the understanding of most people (Wang & Guo, 2021), studies confirm that young people are more conscious about the use of RE over fossil fuels than older people (Greenberg, 2009). Akinwale (2022) in a study conducted in the eastern province of Saudi Arabia observed that at least three of every five university students thought that fossil fuels had an adverse effect on the environment. Keramitsoglou (2016) in a study among 234 high school students in eastern Greece observed that 88.9% respondents considered that climate change was related to fossil fuels consumption. Unlike Keramitsoglou (2016), Prasad and Mkumbachi (2021) in their study in south Pacific-Fiji islands observed that half of the university students (52%) believed that burning of fossil fuels causes climate change. While studying Indonesian middle school students' perception of climate change Dewi and Khoirunisa (2018) observed that students stressed on replacing fossil fuels to RE as one of the ways in reducing global warming.

Perception Regarding Severity of Environmental Degradation & Global Warming

One's perception of the gravity of a condition's repercussion is known as perceived severity. In another words, perceived severity refers to an individual's belief in the seriousness of the consequences of such behavior (Glanz et al., 2008). The consciousness among people about the seriousness of a problem determines perceived severity. It is a common tendency among people to prioritize a course of action when they feel a high gravity of a situation that directs them to do so.

Environmental concerns and the intention to buy green items were found to be significantly correlated by Paul et al. (2016), who looked into and forecasted the consumption of green products. Milfont and Thomson (2020) in a cross-cultural online study within 27 Brazilian states observed that environmental concerns were deemed to be more severe at the country level than at the state level. Using samples from Slovakia, England, Australia and Ireland Uzzell (2000) demonstrated how participants rated environmental problems as more important the farther they were from them. Furthermore, studies have identified gender disparities in views and beliefs towards the environment, RE, and science (for example, Wright, 2011; Boztepe, 2012; Karytsas and Theodoropoulou, 2014) with females showing lower levels of positivity towards science related to the environment and RE compared to males (Črne-Hladnik et al., 2009; Qin and Brown, 2007). Seriousness of environmental degradation is also impacted by gender. For instance, Shelds and Zeng (2011) observed "gender gap" by explaining that a greater concern about environmental crisis and the seriousness of environmental degradation were exposed by Chinese men than Chinese women.

Perception Regarding the Benefits of RE

Every time a consumer considers whether to adopt a new good or service, they assess its potential advantages against its potential costs. If the advantages are regarded as being greater than the costs, the product or service is more likely to be adopted (Wang, Dacko & Gad, 2008). When evaluating the potential adoption of a new product or service, feasibility factors should only be taken into account if such adoption is desired. Perceived advantages of adopting a new product or service influence customers' desirability, whereas feasibility is determined by the perceived costs

associated with such adoption (Zahari & Esa, 2018).

Individual perceptions of different positive and negative aspects of RES often influence willingness to accept the technology (Hai, 2021; Hai, 2019; Hegan & Pijawka, 2015). Likewise, Steg, Perlaviciute, & van der Werff (2015) stressed on the importance of understanding the extent and conditions under which "individuals are willing to accept and adopt renewable energy sources" (p. 2). In case of RE, an increased intention to adopt it is generally observed when the benefits are perceived as greater (Hai, Munjur & Seppälä, 2017; Ellabban & Abu-Rab, 2016; Yazdanpanah, Komendantova, Shirazi, & Linnerooth-Bayer, 2015). In their study Yazdanpanah, Komendantova, Shirazi, & Linnerooth-Bayer (2015) found that people's desire to use RE is significantly influenced by their perceptions of its benefits. Numerous studies have indicated that the use of RE can reduce environmental degradation (Adedoyin et al. 2021; Cevik et al. 2021; Mahalik et al. 2021). It is abundant in nature, safe, reliable, environmentally clean, local and increasingly cost effective solution to people's present and future energy demands (Hai, Munjur & Lahdelma, 2015). Several studies have confirmed a positive relationship between perceived benefits and adoption or use of RE (Hai, Munjur & Seppälä, 2017; Ellabban & Abu-Rab, 2016; Yazdanpanah, Komendantova, Shirazi, & Linnerooth-Bayer, 2015).

Perception Regarding the Barriers of RE

While planning to utilize RES, numerous energy users weigh the potential advantages and barriers, including cost and other adverse consequences. An energy user may discover a certain action to be bothersome or unenjoyable, even though he may view it effectively lowers threat. These unfavourable features are the perceived obstacles to action. Mondal, Kamp & Pachova (2010) have categorized the primary obstacles to the growth of RE in Bangladesh into three categories: (1) limited awareness and understanding of RES in society, (2) economic barriers (significant upfront investment) and (3) lack of clear policies hinders private sector encouragement (policy and regulatory issues).

At the time of implementation of RE plants in Bangladesh Masud, Nuruzzaman, Ahamed, Ananno & Tomal (2019) have identified a list of barriers for each potential RE that includes poor solar irradiation in winter and rainy season, carbon emission generated from biogas and biomass, poor wind speed in winter season, high cost associated with tidal, wave, and geothermal energy sources, environmental concerns arise from hydropower, and maintenance, environmental and sustainability concerns associated with nuclear energy. When it is a matter of individual adoption and use of RE, high-cost concern comes to the forefront since it is still costlier than conventional fossil fuels (Masud et al., 2019). Hai (2019) stressed that lack of time to focus on adopting RE (e.g., solar energy) could be a major barrier among would-be adopters (who are intended to adopt). Since energy users are habituated to conventional energy sources, their vested interest compels them to think that using RE would require a new and difficult habit for them (Child, Haukkala, & Breyer, 2017; Hai, 2019).

Perception Regarding Cue to Action

It is not sufficient only to perceive the dangers of using fossil fuels, environmental degradation, global warming and the need to adopt RE, individual desire and decision to use and adopt renewables should be activated and confirmed (Hai et al., 2018; Hai, 2019). Cue to action is necessary to initiate the decision-making process in order to agree to a suggested RE usage and adoption behaviour. The idea of 'cue to action' is not characterized as a standalone variable. Cues to action are the prompts that trigger the decision-making process to adopt change. Cues to action appear to stem from personal experiences, social dynamics, or essential shifts in the possibilities for

transformation. Stephens et al. (2009) and Yapici et al. (2017) stressed that the discipline and educational attainments of students influence their responses and views on initiating or backing environmentally friendly projects in society. Internal cues such as knowledge and awareness (Devine-Writh, 2008; Kardooni et al., 2016), innovativeness (Rogers, 2003), personal values and attitudes (e.g. Bollinger & Gillingham, 2012), etc., and external cues, such as college seminars and talks on the benefits of using RE, articles or newsletters available in the college that highlight the benefits of RE, peer effects, social networks, demonstration projects (Heiskanen et al., 2015) etc. can elicit students' desire to adopt or use RE (Yazdanpanah et al., 2015).

Self-Efficacy

In the adoption of RE, users need to know their perceived ability, termed as self-efficacy, to influence their own motivation, actions, and social surroundings to perform behaviours needed to overcome barriers in utilization. Ajzen (2002) indicates that self-efficacy is a major indicator of individuals' intentions to behave. Studies stress that self-efficacy positively and substantially influence the acceptance of RETs (Wojuola & Alant, 2017; Wall et al. 2021). Examining the intention to buy RE technologies in rural regions Masukujjaman et al. (2021) found that self-efficacy has a positive influence on the attitude toward consuming REs, affecting their acceptance. Likewise, some recent studies have validated and confirmed the significance of self-efficacy on attitude and indicated that individuals' attitudes towards REs are favourably impacted by their self-efficacy (Hussain et al., 2021; Zobeidi et al., 2022). People are inclined to use REs when they perceive them as feasible, convenient, and manageable (Hai, Munjur & Seppälä, 2017; Hai, Mekhilef & Hossain, 2018; Hai, 2019). Pondering such factors the perceived ability of a person enables him/her to take a decision and perform required behaviour that would determine his/her adoption status (Rogers, 2003). So, the decision to adopt RE rests with the person in question. Hai (2019) found that there are some customers who are unconditionally willing to adopt solar energy, but their weak desire attributed by lack of firm determination and action do not confirm their status as adopters. They could use or adopt RE with ease if they so desired. Depending on their perceived ability (e.g., access to information and are knowledge, required resources, etc.) some customers may view using RE is simple for them and they may become the adopters (Hai et al., 2018).

MATERIALS & METHODS

Study Location & Recruitment of Respondents

This study was conducted in three colleges situated in the Jashore district of Bangladesh (Figure 1). The city is located in the southwest area at 23°10′01″N 89°12′32″E coordinates of Bangladesh, in the Khulna administrative division. College-1 of the study was Akij Collegiate School, founded in 1991. It is a private college situated in Navaran, Jhikargachha Upazila, Jashore District. College-2 was Navaron Degree College, located in Sharsha, Jessore district. The third institution (College-3), Government Bir Shreatha Noor Mohammad Degree College, is found in Tabaria of Sharsha in Jashore district. It commenced functioning in 1995.

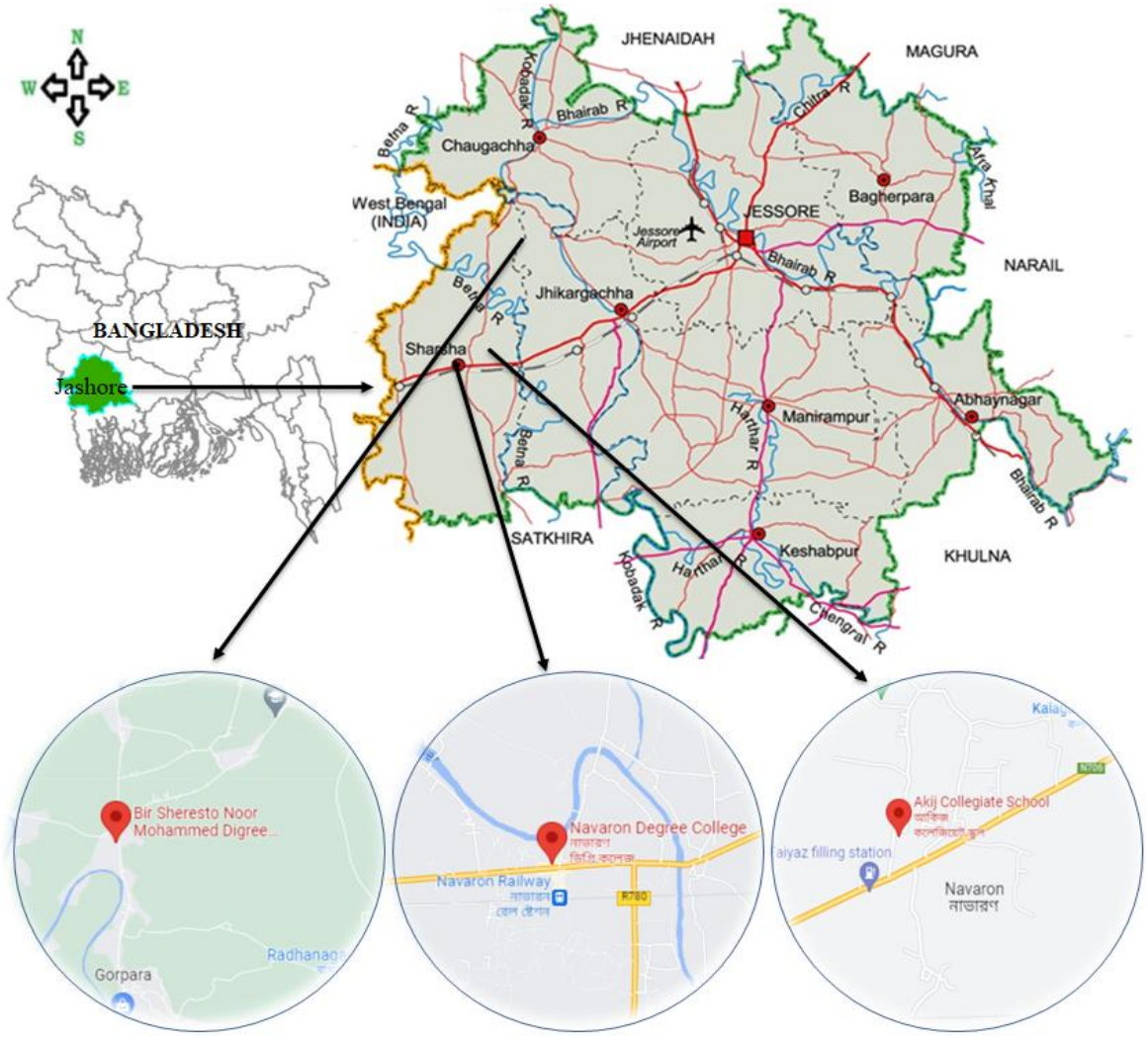

Figure 1. Three study locations in the Jashore district of Bangladesh.

The researcher knew one teacher from these colleges. With that teacher's assistance, using a link tracing strategy, two additional colleges were chosen for the study. During the investigation, there were 210, 315, and 297 students at the Higher Secondary Certificate (HSC) level in college-1, College-2, and College-3, respectively. A total of 242 students were selected based on their availability and willingness to participate, with 85 from college-1, 55 from college-2, and 102 from college-3.

In this study, the majority of participants (222 or 92%) belonged to the 17-19 age bracket, with only 2 respondents (1%) from the 20-22 age group across the three colleges (Table 1). Surprisingly, it was found that the combined number of students in these three colleges was evenly split between genders, with 121 males and 121 females. However, in individual colleges, there was an unequal gender distribution among participants.

Table 1. Demographic profile of the respondents

Age group (in years)	Number of male respondents			Number of female respondents			Total	Percentage
	College-1	College-2	College-3	College-1	College-2	College-3		
14-16	3	2	1	5	3	4	18	7
17-19	38	28	47	39	21	49	222	92
20-22	0	1	1	0	0	0	2	1
Total	41	31	49	44	24	53	242	100

Regarding the field of study, 69% of participants were enrolled in humanities, 22% in science, and 9% in commerce (Figure 2). Concerning their educational level, all the students who participated in the survey were in their first year of HSC studies, with 35% in College-1, 23% in college-2, and 42% in college-3 (Figure 2).

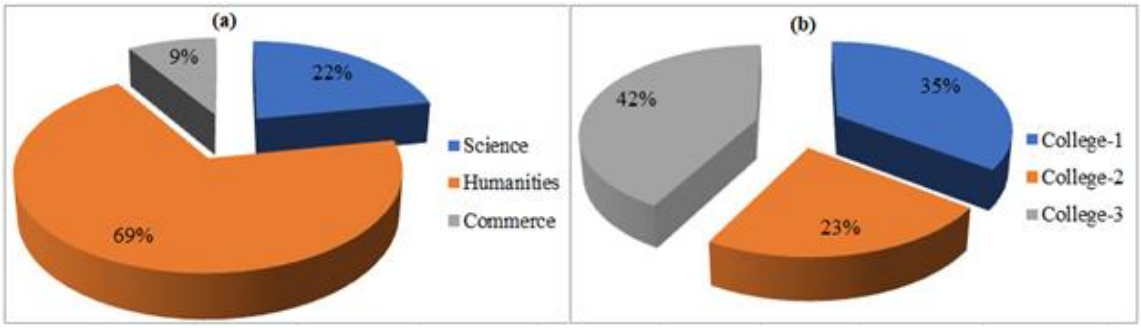

Figure 2. Percentages of participants by their (a) group and (b) level of study.

Survey Instrument – the Close-Ended Questionnaire

To conduct the survey, a close-ended questionnaire was prepared. To design the questionnaire, some previously studied questionnaires on RE perception were reviewed (Yazdanpanah et al., 2015). Considering those questionnaires and the literature review under various themes such as perception, intention, plans and attempts to use, try or adopt, perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, general concerns, and self-efficacy, specific question statements were developed that are mentioned and described in Results & Discussion Section. To achieve the study's desired goals, the statements were assigned a five-point Likert scale, which has been used in various studies reviewed in this paper (e.g., Halder, 2014)..

Data Collection & Analysis

To collect research data, the college principal was initially approached. The purpose of the research was explained, thereby obtaining consent from each college for the investigation. The college authority assisted the researcher by introducing him to the students in a large classroom, where the available students listened to the purpose of the research and the instructions provided in the questionnaire. All instructions were explained in Bengali. When the students seemed confident and ready, they were asked to provide the required responses to the questions mentioned in the questionnaire. It did not take more than 10-15 minutes to complete it. Data collection was conducted in August and September 2022, with college-1 and College-3 on 31/08/2022 and College-2 on 1/09/2022. Each sample question was assigned a consecutive serial number, and students were asked to remember it. The filled questionnaires were immediately checked to ensure they were completed correctly. If any information was left incomplete, it was corrected following the serial identification number, allowing the respondent to provide the missing information.

Descriptive statistics were used to analyse the collected data. To transfer data from the questionnaires to a computer - readable format for statistical analysis, Microsoft Excel was utilized.

Ethical Consideration

This study posed no risk to the participants regarding their rights and the confidentiality of their personal information. Participants willingly engaged in the study. Respondents' identification was not stored with the processed data, and their information was used only for the intended purpose of the study. Consent was obtained from the principals of three colleges, and after the initial data collection from each college, a

letter signed by the respective principal was collected. This letter confirmed consent, the total number of enrolled HSC - level students, and the number of participating students.

RESULTS & DISCUSSION

Intention, Plan & Attempt to Use, Try or Adopt RE

When addressing the first statement "I have the intention of using RE," 53% strongly agreed, and 38% agreed, indicating that the majority of respondents (91%) expressed a positive intention (Figure 3). This finding suggests that participants will do their best to adopt or use RE.

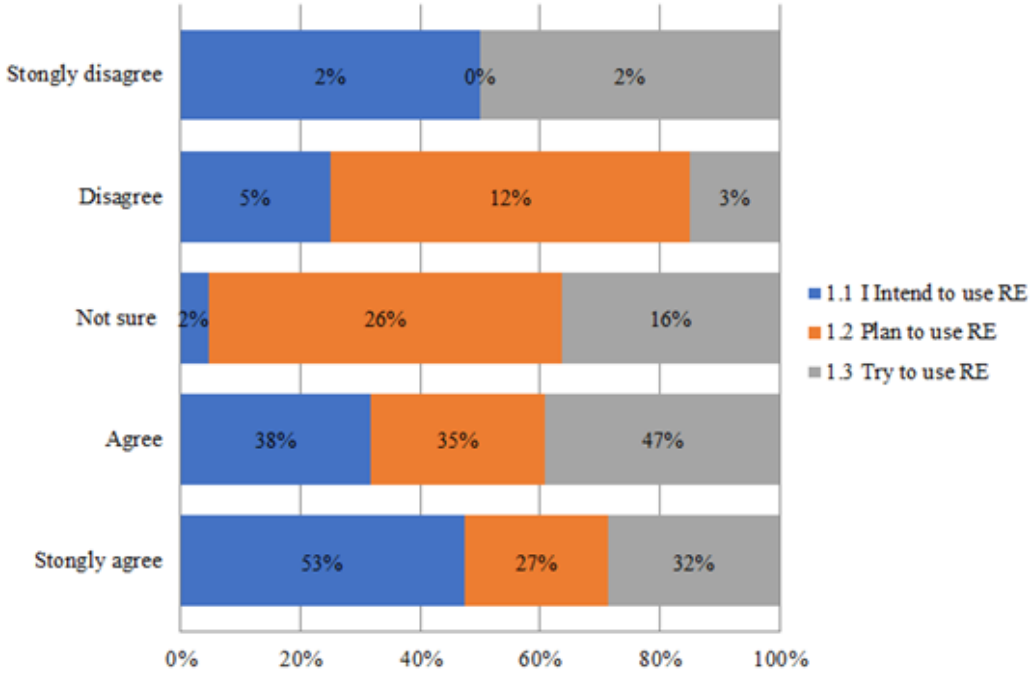

Figure 3. Respondents' intention, plan, and effort to use or adopt REs.

The second statement, "My plan is to utilize RE," was posed and, in this case, 27% of respondents strongly agreed and 35% agreed, indicating that most participants (62%) expressed a positive response toward having their own plans on how, when, and where to utilize RE. However, 26% of participants were uncertain about whether they had a plan to utilize RE. This situation may have led 12% of participants to disagree with the second statement, indicating that they did not plan to utilize RE.

In response to the third statement, "I will make an effort to utilize RE," the highest percentage of respondents (79%) expressed agreement, including 32% who "strongly agreed" and 47% who "agreed." Additionally, 26 g% of respondents were unsure about their decision regarding the third statement, leaving them in a state of flux. Considering their present conditions, 14% of respondents expressed disagreement.

Perception of Risks Associated with Use of Fossil Fuels

The fourth statement, "To me, the use of fossil fuels leads to climate change and global warming" was posed and in response, 66% of respondents showed agreement, with 41% strongly agreeing and 25% agreeing. Meanwhile, 11% of respondents were unsure about the statement, and 23% expressed disagreement.

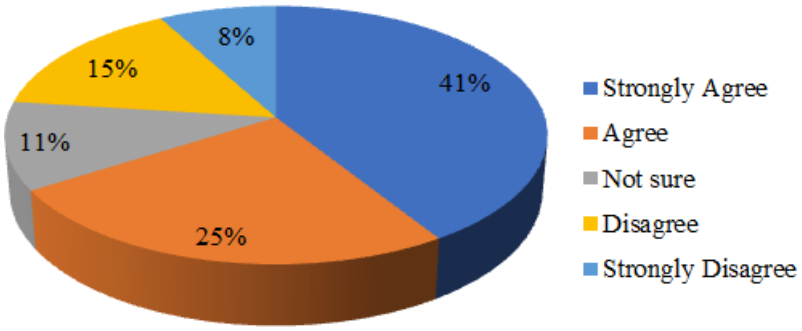

Figure 4. Respondents' perception to identify the use of fossil fuels as a cause of climate change and global warming.

In response to the fifth statement, "To me, the use of fossil fuels leads to environmental destruction and air pollution," an agreement from 64% of respondents was found, with 34% strongly agreeing and 30% agreeing (Figure 5). Uncertainty ("not sure") and disagreement were represented by 8% and 28% of respondents, respectively, indicating a significant lack of knowledge and understanding among students about the effects of fossil fuel use, which causes environmental destruction and air pollution.

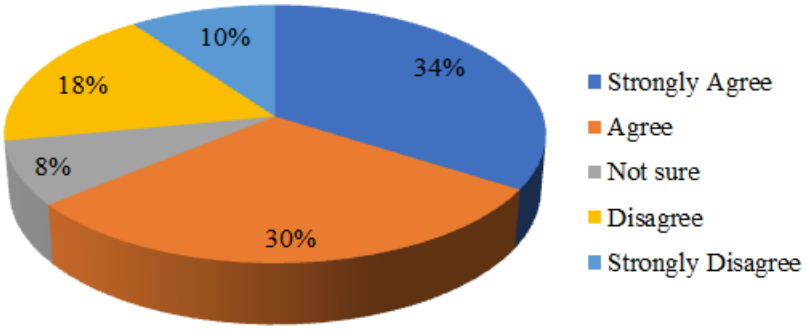

Figure 5. Respondents' perception of the use of fossil fuels as a cause of environmental destruction and pollution.

Perception Regarding the Severity of Environmental Degradation & Global Warming

In response to the sixth statement, "The use of fossil fuels is causing global warming, which I believe is a significant threat to the environment, nature, and animals," the maximum number of respondents (67%) expressed agreement (Figure 6). However, there were also 9% who were not sure and 24% who disagreed.

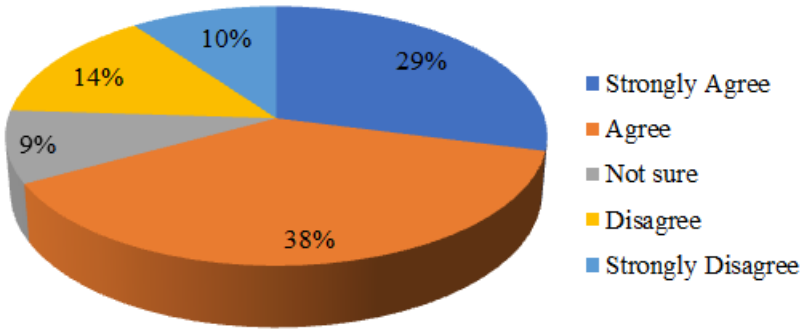

Figure 6. Respondents' perception of global warming caused by the use of fossil fuels as a serious threat to the environment, nature, and animals.

In response to the seventh statement, "In my opinion, the environmental destruction caused by global warming is a significant threat to humankind" 84% of respondents expressed agreement, with 48% strongly agreeing and 36% agreeing (Figure 7). While 8% of students expressed disagreement, another 8% of respondents were not sure about the statement presented to them.

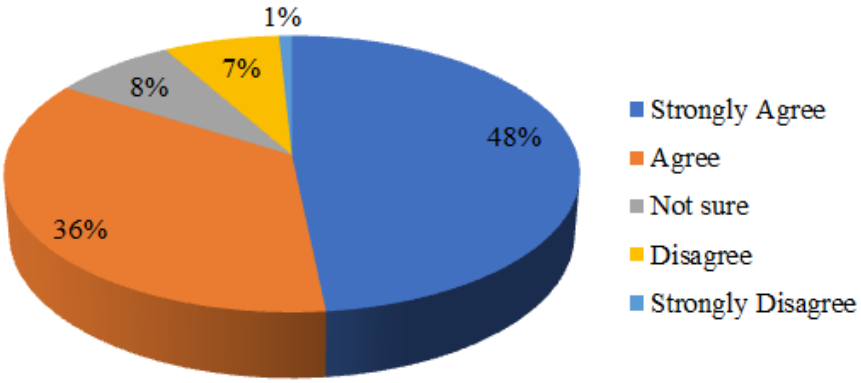

Figure 7. Respondents' perception of environmental destruction caused by global warming as a significant threat to humankind.

The eighth statement, "In my opinion, the serious threat to future generations is the environmental degradation caused by global warming," was probed and it was observed that 92% of respondents expressed agreement, with 51% strongly agreeing and 41% agreeing. There were only 4% unsure and 4% strongly disagreeing responses (Figure 8). This indicates a lack of knowledge regarding the consequences of global warming that could pose a serious threat to future generations.

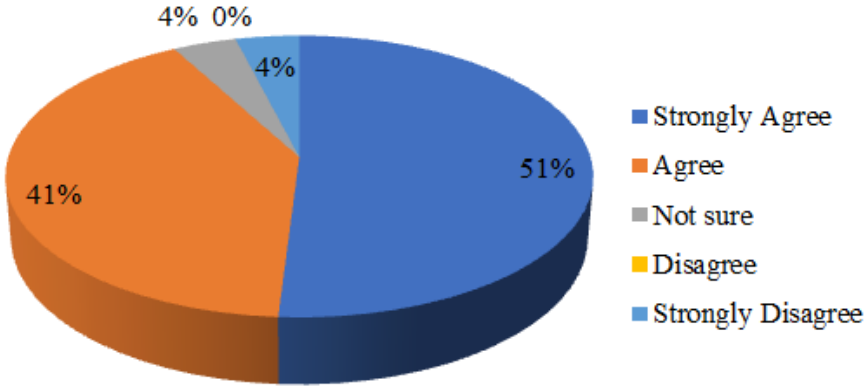

Figure 8. Respondents' perception of environmental destruction caused by global warming as a serious threat to future generations.

Cues to Action

To gauge students' knowledge regarding how to address global warming, the ninth statement, "I have read that one way to lower the risk of global warming is to use renewable energy," was probed. It was found that 93% of responses showed agreement, with 51% strongly agreeing and 42% agreeing (Figure 9). This indicates that most students were aware from their studies of the advantages of using RE to reduce the impacts of global warming.

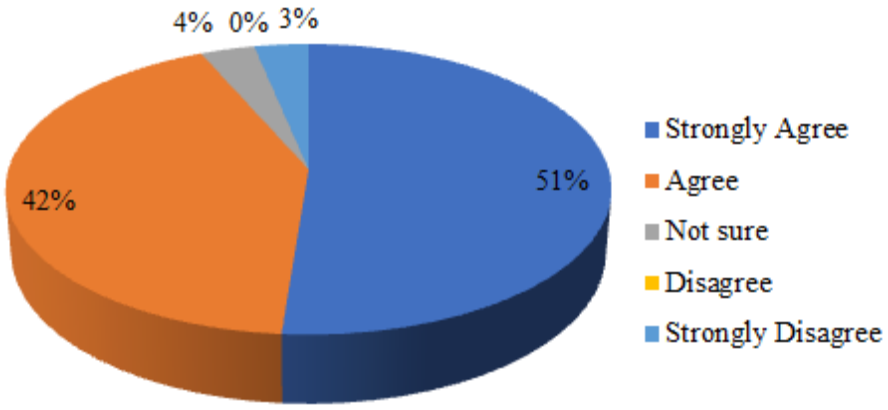

Figure 9. Respondents' perception of the use of RE as a way to lower the risk of global warming.

The tenth statement, "My college hosts talks on the benefits of using renewable energy," was posed. It was keenly observed that the highest percentage of respondents (66%) expressed disagreement, with 34% strongly disagreeing and 32% disagreeing (Figure 10). On the other hand, only 21% of respondents showed agreement, while 13% were not sure about the matter of hosting talks on the benefits of using RE.

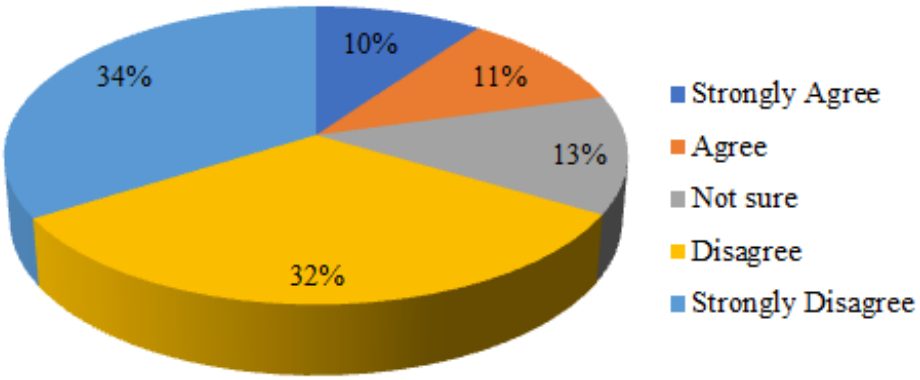

Figure 10. Respondents' response on whether their colleges host talks on the benefits of using RE.

The eleventh statement, "My college provides articles or newsletters that highlight the benefits of renewable energy," was posed and it was keenly observed that the highest percentage of respondents (67%) expressed disagreement, with 34% strongly disagreeing and 33% disagreeing (Figure 11). On the other hand, only 23% of respondents showed agreement, while 10% were not sure about the provision of articles or newsletters that highlight the benefits of RE in their colleges.

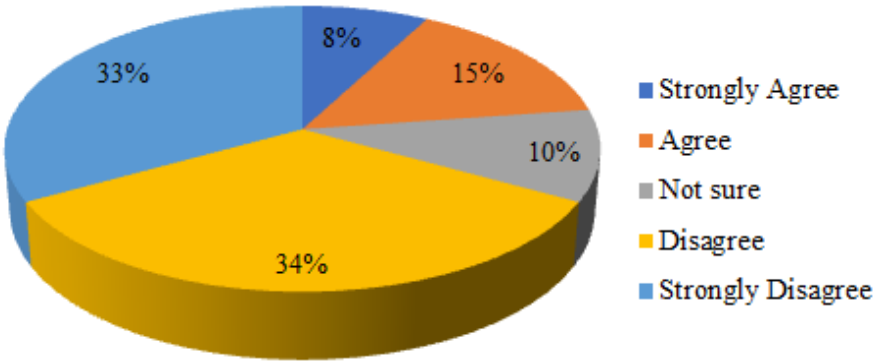

Figure 11. Respondents' response on whether their colleges provide articles or newsletters that highlight the benefits of RE.

Perceived Benefits

The twelfth statement, "Environmental deterioration will be lessened if I use renewable energy," was posed. It was observed that the highest percentage of respondents (78%) showed agreement, with 43% strongly agreeing and 35% agreeing (Figure 12). There were 18% of respondents who were unsure about the matter, while 4% of respondents showed disagreement.

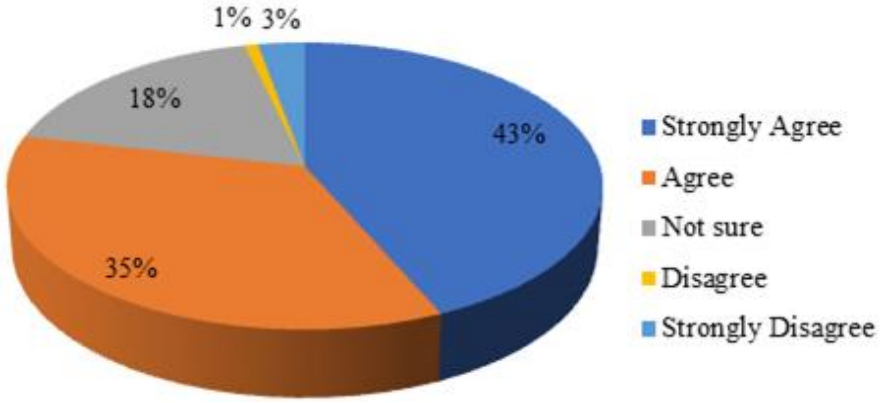

Figure 12. Respondents' response on whether the use of RE would reduce environmental degradation.

The thirteenth statement, "It will safeguard the environment if I utilize it," was addressed to understand respondents' perspectives. The highest percentage of respondents (88%) expressed agreement, with 47% strongly agreeing and 41% agreeing (Figure 13). An uncertainty about the twelfth statement was expressed by 10% of respondents, while only 2% of respondents showed disagreement.

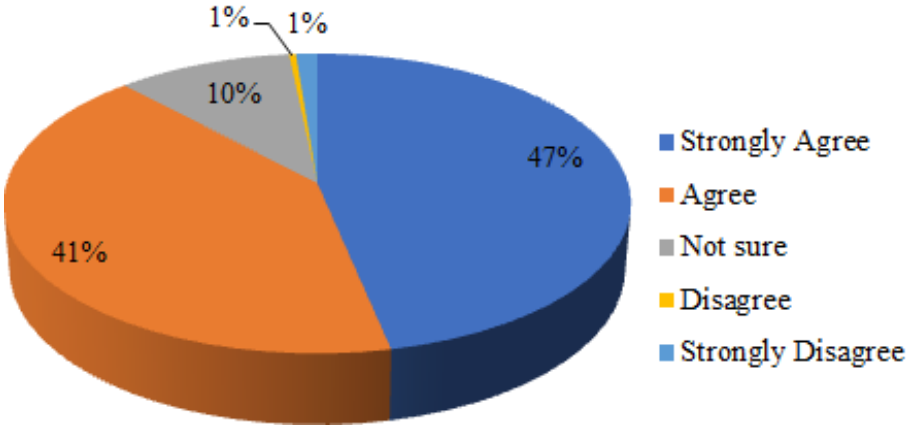

Figure 13. Respondents' view on their future use of RE to safeguard the environment.

The fourteenth statement, "The environment will be preserved for the next generation if I adopt renewable energy," was probed and it was keenly observed that 90% of respondents showed agreement, with 59% strongly agreeing and 31% agreeing (Figure 14). There were 10% of responses indicating uncertainty among respondents about the fourteenth statement, while only 4% of respondents showed disagreement.

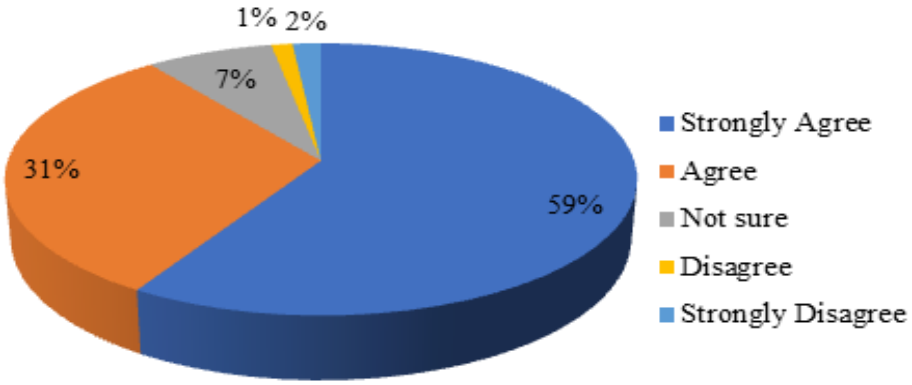

Figure 14. Respondents' view on their future use of RE to preserve the environment for the next generation.

Perceived Barriers

The fifteenth statement, "I find it expensive and time-consuming to use renewable energy," was posed to determine respondents' current situation. It was observed that 56% of respondents expressed agreement, with 20% strongly agreeing and 36% agreeing (Figure 15). This means that half of the students considered it would be expensive and time-consuming to use RE. It was noted that 31% of respondents were unsure about whether using RE would be expensive and time-consuming. Only 13% of respondents disagreed with the statement, which might indicate that monetary issues and time allocation in the adoption of RE were not major concerns for them.

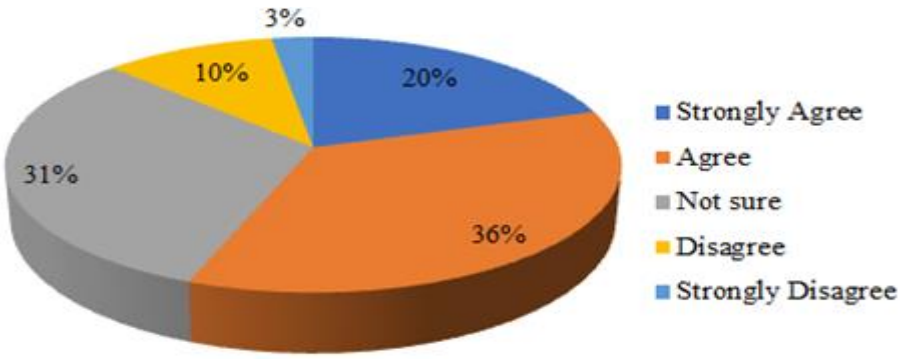

Figure 15. Respondents' view on whether the use of RE is expensive and time-consuming.

The sixteenth statement, "It would be challenging to form new habits in order to use renewable energy," was posed and it was found that 64% of respondents agreed, with 25% strongly agreeing and 39% agreeing (Figure 16). Additionally, there were 28% of respondents who expressed confusion regarding the matter, thus responding with "not sure." Only 8% of respondents expressed disagreement, suggesting that forming new habits to use RE would not be a challenging task for them.

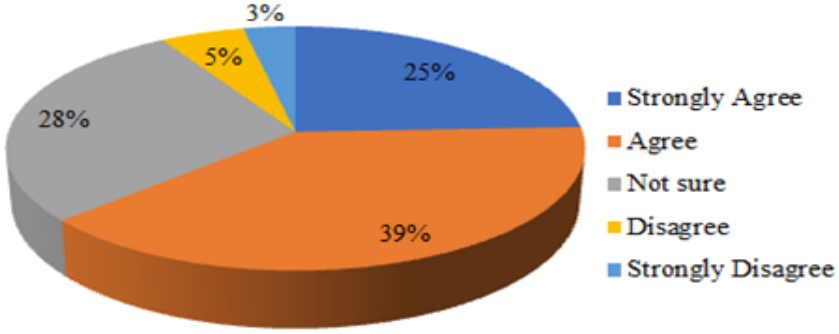

Figure 16. Respondents' view on whether it would be challenging to form new habits to use RE.

General Concerns

The seventeenth statement, "I consider global warming to be a constant concern," was probed to and the findings showed that 72% of respondents expressed agreement, with 33% strongly agreeing and 39% agreeing (Figure 17). There were 22% of respondents who were unsure about their concern for global warming as a constant event. Disagreement was expressed by 6% of respondents, meaning they honestly conveyed their stance regarding their reluctance toward global warming.

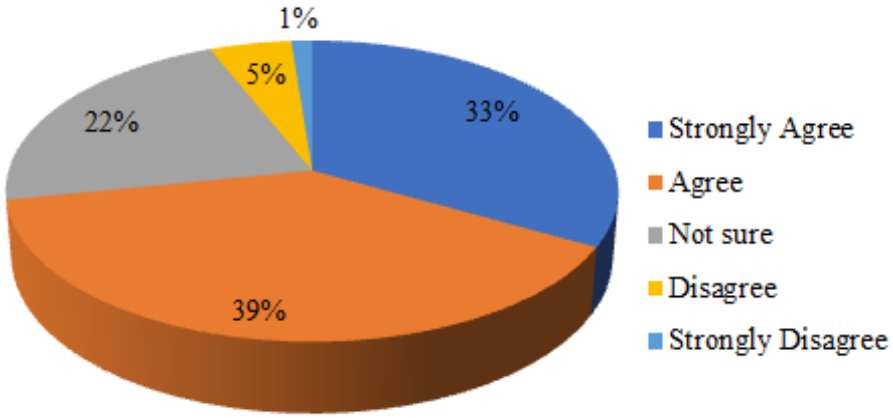

Figure 17. Respondents' view on whether global warming is to be a constant concern.

The eighteenth statement, "Details regarding renewable energy are of interest to me," was addressed and it was found that the highest percentage of respondents (75%) expressed agreement, with 41% strongly agreeing and 34% agreeing (Figure 18). There were 23% of respondents who were unsure about their tendency to seek details about RES. Only 2% of respondents expressed disagreement, indicating that details regarding RE were not a matter of interest to them.

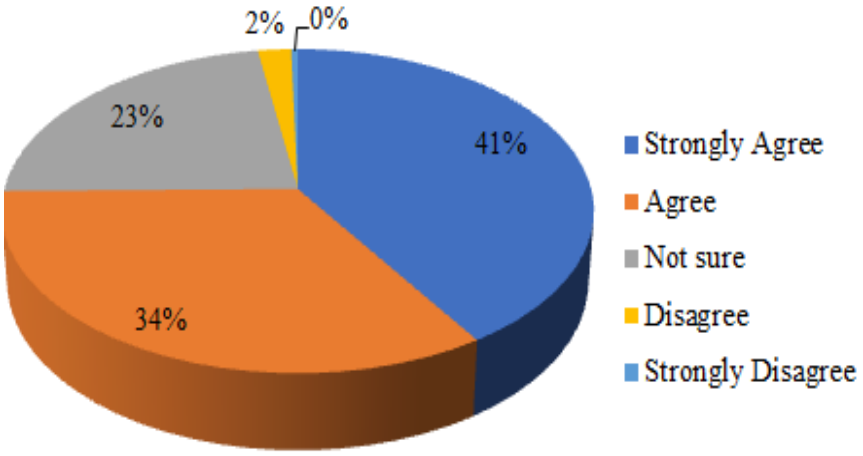

Figure 18. Respondents' view on their interest in knowing details about RE.

Perceived Self-Efficacy

In response to the nineteenth statement: "Ultimately, the decision to adopt renewable energy rests with me," most respondents (64%) expressed agreement, with 28% strongly agreeing and 36% agreeing (Figure 19). There were 23% of respondents who were uncertain about the issue, and 13% expressed disagreement with the statement.

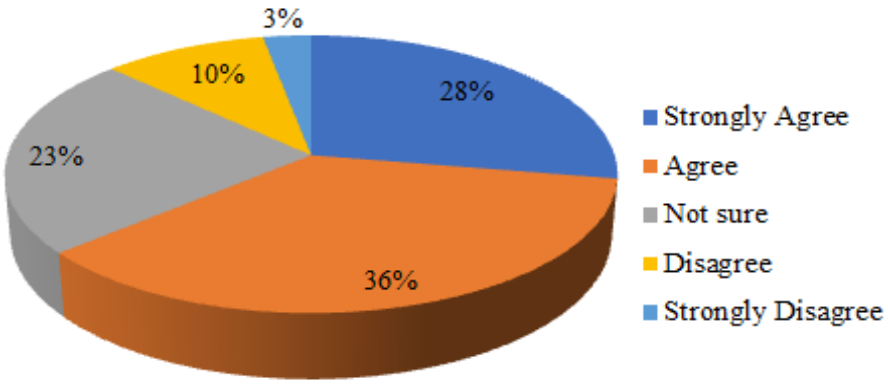

Figure 19. Respondents' view on whether the decision to adopt RE depends on them.

In order to gauge how easy the respondents felt about adopting or using RE, the twentieth statement, "Using renewable energy is simple for me," was presented. It was observed that most respondents (38%) were uncertain about the statement (Figure 20). While 39% (18% strongly agree and 21% agree) of respondents felt that using RE would be simple for them, 23% disagreed with this notion. This indicates that 23% of respondents did not believe using RE would be straightforward for them.

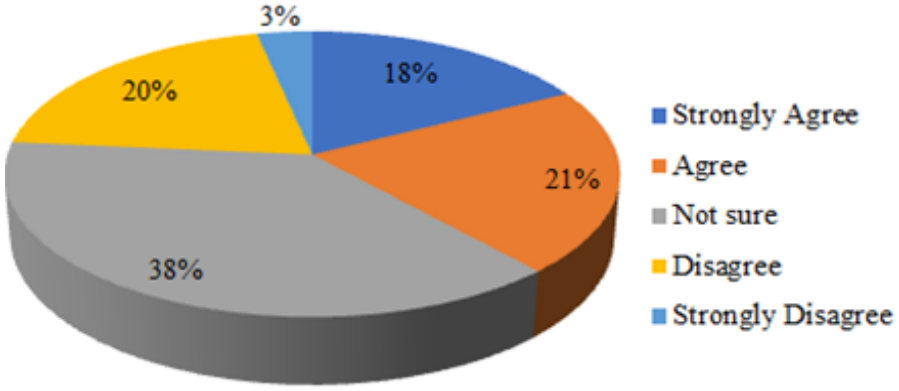

Figure 20. Respondents' view on whether the use of RE is simple to them.

The twenty-first statement, "I could use renewable energy with ease if I so desired," was posed and it was found that there were 49% of respondents who expressed agreement, with 22% strongly agreeing and 27% agreeing (Figure 21). There were 24% of respondents who were uncertain about the matter, and it was also noted that 27% expressed disagreement, with 22% disagreeing and 5% strongly disagreeing.

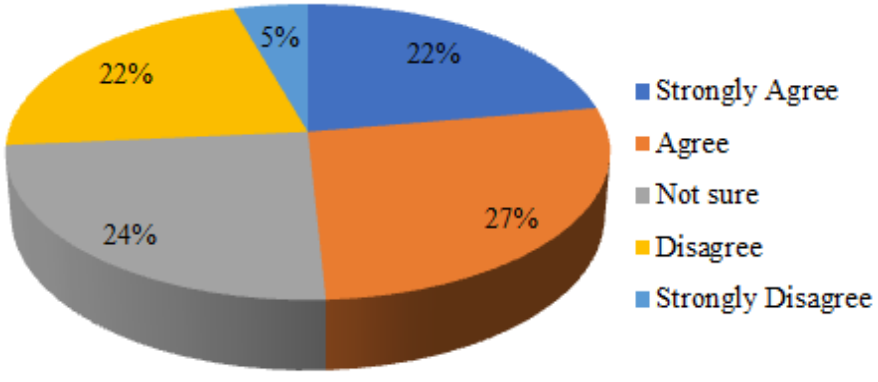

Figure 21. Respondents' view on whether they could use of RE with each if they desired so.

CONCLUSION

Given that college students are likely to be the leading force in energy production and consumption in the future, this research aimed to explore their perceptions of RE in Bangladesh. Overall, the findings of this study indicate that most respondents expressed a positive attitude toward RES. The findings detailed in Results & Discussion Section indicate that there is a dearth of awareness among a sizable number of students about the risks associated with the use of fossil fuels, global warming, and environmental degradation, as well as their impacts on nature, animals, humankind, and future generations, along with the benefits and barriers to adopting RE. This should be addressed in creating awareness programs for them in colleges. Education and awareness programs should be designed and undertaken in colleges in that direction, including environmental, technical, economic, and social aspects of sustainable energy by modifying the college curriculum. Colleges in different departments need to carry out studies on RES. Support for RE education initiatives is crucial to elevate expectations for and uphold the advancement of a safe and stable energy future. The journey towards meeting the energy needs of Bangladesh and protecting the environment for future generations requires their active participation and informed support. Their active participation could be ensured by considering the elements that shape college students' perceptions, attitudes, and intentions, improving knowledge, and creating scope for involvement.

Declaration by Authors

Acknowledgement: None
Source of Funding: None
Conflict of Interest: No conflicts of interest.

REFERENCES

1. Adedoyin FF, Nwulu N, Bekun FV. Environmental degradation, energy consumption and sustainable development: Accounting for the role of economic complexities with evidence from World Bank income clusters. Bus Strateg Environ 2021; 30:2727–40. https://doi.org/10.1002/bse.2774.
2. Ahmed AU, Alam M, Rahman AA. Adaptation to climate change in Bangladesh: future outlook. In: Huq S, Zarim Z, Asaduzzaman M, Mahtab F, editors. Vulnerability and Adaptation to Climate Change for Bangladesh, Kluwer Academic Publishers, Dordrecht (1999), Kluwer Academic Publishers, Dordrecht: Vulnerability and Adaptation to Climate Change for Bangladesh; 1999, p. 125–43.
3. Ahmed F, Al Amin AQ, Hasanuzzaman M, Saidur R. Alternative energy resources in Bangladesh and future prospect. Renew Sustain Energy Rev 2013; 25:698–707. https://doi.org/10.1016/j.rser.2013.05.008.
4. Ajzen I. Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. J Appl Soc Psychol 2002; 32:665–83. https://doi.org/10.1111/j.1559-1816.2002.tb00236.x.
5. Akinwale YO. Awareness and Perceptions of University Students in the Business College towards Energy Savings and Renewable Energy Sources in Saudi Arabia. Int J Energy Econ Policy 2022; 12:470–6. https://doi.org/10.32479/ijeep.13004.
6. Alam Hossain Mondal Md, Kamp LM, Pachova NI. Drivers, barriers, and strategies for implementation of renewable energy technologies in rural areas in Bangladesh—An innovation system analysis. Energy Policy 2010; 38:4626–34. https://doi.org/10.1016/j.enpol.2010.04.018.
7. Asadi S, OmSalameh Pourhashemi S, Nilashi M, Abdullah R, Samad S, Yadegaridehkordi E, et al. Investigating influence of green innovation on sustainability performance: A case on Malaysian hotel industry. J Clean Prod 2020; 258:120860. https://doi.org/10.1016/j.jclepro.2020.120860.
8. Ayers JM, Huq S. Supporting Adaptation to Climate Change: What Role for Official Development Assistance? Development Policy Review 2009; 27:675–92. https://doi.org/10.1111/j.1467-7679.2009.00465.x.

9. BBS. Population and Housing Census 2022. Dhaka: Bangladesh Bureau of Statistics; 2023.
10. Bollinger B, Gillingham K. Peer Effects in the Diffusion of Solar Photovoltaic Panels. Mark Sci 2012; 31:900–12. https://doi.org/10.1287/mksc.1120.0727.
11. Boztepe A. Green marketing and its impact on consumer behavior. Eur J Educ Political Stud 2012;5.
12. Bulent Cavas, Pinar Cavas, Ceren Tekkaya, Jale Cakiroglu, Teoman Kesercioglu. Turkish Students' Views on Environmental Challenges with respect to Gender: An Analysis of ROSE Data. Sci Educ Int 2009; 20:69–78.
13. Cevik EI, Yıldırım DÇ, Dibooglu S. Renewable and non-renewable energy consumption and economic growth in the US: A Markov-Switching VAR analysis. Energy Environ 2020; 32:0958305X2094403. https://doi.org/10.1177/0958305x20944035.
14. Child M, Haukkala T, Breyer C. The Role of Solar Photovoltaics and Energy Storage Solutions in a 100% Renewable Energy System for Finland in 2050. Sustainability 2017; 9:1358. https://doi.org/10.3390/su9081358.
15. Črne-Hladnik H, Peklaj C, Košmelj K, Hladnik A, Javornik B. Assessment of Slovene secondary school students' attitudes to biotechnology in terms of usefulness, moral acceptability and risk perception. Public Underst Sci 2009; 18:747–58. https://doi.org/10.1177/0963662509337361.
16. Davis FD. Perceived usefulness, perceived ease of use, and user acceptance of information technology. J Risk Uncertain 1989; 18:321–5. https://doi.org/10.1023/a:1011156710779.
17. Debnath KB, Mourshed M. Why is Bangladesh's electricity generation heading towards a GHG emissions-intensive future? Carbon Management 2022; 13:216–37. https://doi.org/10.1080/17583004.2022.2068454.
18. Devine-Wright P. Reconsidering Public Acceptance of Renewable Energy Technologies: a Critical Review. In: Jamasb T, Grubb M, Pollitt M, editors. Delivering a Low CarbonElectricity System: Technologies, Economics and Policy, Cambridge University Press.; 2008, p. 1–15.
19. Dewi RP, Khoirunisa N. Middle school student's perception of climate change at Boyolali District, Indonesia. IOP Conference Series: Earth and Environmental Science 2018; 200:012061. https://doi.org/10.1088/1755-1315/200/1/012061.
20. Eckstein D, Kunzel V, Schafer L, Winges M. Global Climate Risk Index 2020. Who Suffers Most from Extreme Weather Events? Weather-Related Loss Events in 2018 and 1999 to 2018. Bonn: Germanwatch Nord-Süd Initiative E.V; 2018.
21. Ellabban O, Abu-Rub H. Smart grid customers' acceptance and engagement: An overview. Renew Sustain Energy Rev 2016; 65:1285–98. https://doi.org/10.1016/j.rser.2016.06.021.
22. Glanz K, Rimer BK, Viswanath K. The Scope of Health Behavior and Health Education. In: Glanz K, Rimer BK, Viswanath K, editors. Health Behavior and Health Education, San Francisco, CA: Jossey-Bass.; 2008, p. 3–22.
23. Greenberg M. Energy sources, public policy, and public preferences: Analysis of US national and site-specific data. Energy Policy 2009; 37:3242–9. https://doi.org/10.1016/j.enpol.2009.04.020.
24. Hagen B, Pijawka D. Public Perceptions and Support of Renewable Energy in North America in the Context of Global Climate Change. Int J Disaster Risk Sci 2015; 6:385–98. https://doi.org/10.1007/s13753-015-0068-z.
25. Hai MA, Mekhilef S, Hossain KM. Public Readiness to Adopt Solar Energy – Responses of Some Finnish Citizens. J Clean Energy Technol 2018; 6:268–77. https://doi.org/10.18178/jocet.2018.6.4.473.
26. Hai MA, Moula ME, Lahdelma R. Social acceptance of renewables. In: Moula ME, Lahdelma R, Hai MA, editors. Users' Acceptance of Renewable Solutions, Espoo, Finland: Aalto University; 2015, p. 10–31.
27. Hai MA, Moula MME, Seppälä U. Results of intention-behaviour gap for solar energy in regular residential buildings in Finland. Int J Sustain Built Environ 2017; 6:317–29. https://doi.org/10.1016/j.ijsbe.2017.04.002.
28. Hai MA. Rethinking the social acceptance of solar energy: Exploring "states of willingness" in Finland. Energy Res Soc Sci

2019; 51:96–106. https://doi.org/10.1016/j.erss.2018.12.013.
29. Hai MA. Social acceptance of solar energy as intention, willingness, and readiness. Helsinki: University of Helsinki; 2021.
30. Halder P, Pietarinen J, Havu-Nuutinen S, Pelkonen P, Chang C-Y, Prokop P, et al. Knowledge, Perceptions, and Attitudes as Determinants of Youths' Intentions to Use Bioenergy—A Cross-National Perspective. Int J Green Energy 2013; 10:797–813. https://doi.org/10.1080/15435075.2012.706244.
31. Halder P. Forest Biomass for Energy Production: Perceptions of State Forestry Professionals from China and India. Challenges 2014; 5:338–50. https://doi.org/10.3390/challe5020338.
32. Heiskanen E, Nissilä H, Lovio R. Demonstration buildings as protected spaces for clean energy solutions – the case of solar building integration in Finland. J Clean Prod 2015; 109:347–56. https://doi.org/10.1016/j.jclepro.2015.04.090.
33. Hossain S. Rapid Urban Growth and Poverty in Dhaka City. Bangladesh E-Journal of Sociology 2008; 5:57–80.
34. Hussain A, Mkpojiogu EOC, Ezekwudo CC. Improving the Academic Self-Efficacy of Students Using Mobile Educational Apps in Virtual Learning: A Review. Int J Interact Mob Technol (IJIM) 2021; 15:149. https://doi.org/10.3991/ijim.v15i06.20627.
35. Islam S, Khan MdZR. A Review of Energy Sector of Bangladesh. Energy Procedia 2017; 110:611–8. https://doi.org/10.1016/j.egypro.2017.03.193.
36. Jabeen G, Yan Q, Ahmad M, Fatima N, Qamar S. Consumers' intention-based influence factors of renewable power generation technology utilization: A structural equation modeling approach. J Clean Prod 2019; 237:117737. https://doi.org/10.1016/j.jclepro.2019.117737.
37. Jansson J. Consumer eco-innovation adoption: assessing attitudinal factors and perceived product characteristics. Bus Strateg Environ 2011; 20:192–210. https://doi.org/10.1002/bse.690.
38. Kardooni R, Yusoff SB, Kari FB. Renewable energy technology acceptance in Peninsular Malaysia. Energy Policy 2016; 88:1–10. https://doi.org/10.1016/j.enpol.2015.10.005.
39. Karytsas S, Theodoropoulou H. Socioeconomic and demographic factors that influence publics' awareness on the different forms of renewable energy sources. Renew Energy 2014; 71:480–5. https://doi.org/10.1016/j.renene.2014.05.059
40. Keramitsoglou KM. Exploring adolescents' knowledge, perceptions and attitudes towards Renewable Energy Sources: A colour choice approach. Renew Sustain Energy Rev 2016; 59:1159–69. https://doi.org/10.1016/j.rser.2015.12.047.
41. Mahalik JR, Bianca MD, Harris MP. Men's attitudes toward mask-wearing during COVID-19: Understanding the complexities of mask-ulinity. J Health Psychol 2021; 27:135910532199079. https://doi.org/10.1177/1359105321990793.
42. Masud MH, Nuruzzaman M, Ahamed R, Ananno AA, Tomal ANMA. Renewable energy in Bangladesh: current situation and future prospect. Int J Sustain Energy 2019; 39:132–75. https://doi.org/10.1080/14786451.2019.1659270.
43. Masukujjaman M, Alam SS, Siwar C, Halim SA. Purchase intention of renewable energy technology in rural areas in Bangladesh: Empirical evidence. Renew Energy 2021; 170:639–51. https://doi.org/10.1016/j.renene.2021.01.125.
44. Milfont TL, Thomson R. A within-country study of biased comparative judgements about the severity of environmental problems. Soc Psychol Bull 2020;15. https://doi.org/10.32872/spb.3019.
45. Ng B-Y, Kankanhalli A, Xu Y (Calvin). Studying users' computer security behavior: A health belief perspective. Decis Support Syst 2009; 46:815–25. https://doi.org/10.1016/j.dss.2008.11.010.
46. Nishat A, Mukherjee N. Climate Change Impacts, Scenario and Vulnerability of Bangladesh. In: Shaw R, Mallick F, Islam A, editors. Climate Change Adaptation Actions in Bangladesh. Disaster Risk Reduction., Tokyo: Springer; 2013.
47. Paul J, Modi A, Patel J. Predicting green product consumption using theory of planned behavior and reasoned action. Journal of Retailing and Consumer Services 2016; 29:123–34.

48. Potter G. Environmental Education for the 21st Century: Where Do We Go Now? J Environ Educ 2009; 41:22–33. https://doi.org/10.1080/00958960903209975.
49. Prasad RR, Mkumbachi RL. University students' perceptions of climate change: the case study of the University of the South Pacific-Fiji Islands Int J Clim Change Strateg Manag 2021; ahead-of-print. https://doi.org/10.1108/ijccsm-12-2020-0126.
50. Qian L, Yin J. Linking Chinese cultural values and the adoption of electric vehicles: The mediating role of ethical evaluation. Transp Res D: Transp Environ 2017; 56:175–88. https://doi.org/10.1016/j.trd.2017.07.029.
51. Qin W, Brown JL. Public reactions to information about genetically engineered foods: effects of information formats and male/female differences. Public Underst Sci 2007; 16:471–88. https://doi.org/10.1177/0963662506065336.
52. Robertson I. Sociology. 3rd ed. New York: Worth Publishers; 1987.
53. Rogers EM. Diffusion of Innovations. 5th ed. New York: Free Press; 2003.
54. Roy S, Mohapatra S. Problems of adoption of solar power and subsequent switching behavior: an exploration in India. Int J Energy Sect Manag 2021; ahead-of-print. https://doi.org/10.1108/ijesm-08-2020-0015.
55. Sarin S, Sego T, Chanvarasuth N. Strategic Use of Bundling for Reducing Consumers' Perceived Risk Associated with the Purchase of New High-Tech Products. Journal of Marketing Theory and Practice 2003; 11:71–83. https://doi.org/10.1080/10696679.2003.11658502.
56. Scuotto V, Beatrice O, Valentina C, Nicotra M, Di Gioia L, Farina Briamonte M. Uncovering the micro-foundations of knowledge sharing in open innovation partnerships: An intention-based perspective of technology transfer. Technol Forecast Soc Change 2020; 152:119906. https://doi.org/10.1016/j.techfore.2019.119906.
57. Shahin W, Kennedy GA, Stupans I. The Impact of Personal and Cultural Beliefs on Medication Adherence of Patients with Chronic illnesses: a Systematic Review. Patient Prefer Adherence 2019; Volume 13:1019–35. https://doi.org/10.2147/ppa.s212046.
58. Shields T, Zeng K. The Reverse Environmental Gender Gap in China: Evidence from "The China Survey". Social Science Quarterly 2011; 93:1–20. https://doi.org/10.1111/j.1540-6237.2011.00802.x.
59. Spence A, Demski C, Butler C, Parkhill K, Pidgeon N. Public perceptions of demand-side management and a smarter energy future. Nat Clim Change 2015; 5:550–4. https://doi.org/10.1038/nclimate2610.
60. Steg L, Perlaviciute G, van der Werff E. Understanding the human dimensions of a sustainable energy transition. Front Psychol 2015;6. https://doi.org/10.3389/fpsyg.2015.00805.
61. Stephens JC, Bielicki J, Rand GM. Learning about carbon capture and storage: Changing stakeholder perceptions with expert information. Energy Procedia 2009; 1:4655–63. https://doi.org/10.1016/j.egypro.2009.02.288.
62. Sultana N, Hossen, S, Khatun R. Assessment of Environmental Knowledge and Attitude of Secondary Level Students of Tangail, Bangladesh. Int J Environ Sci 2017; 3:41–6. https://doi.org/10.20431/2454-9444.0302005.
63. Sütterlin B, Siegrist M. Public acceptance of renewable energy technologies from an abstract versus concrete perspective and the positive imagery of solar power. Energy Policy 2017; 106:356–66. https://doi.org/10.1016/j.enpol.2017.03.061.
64. Trinh VL, Chung CK. Renewable energy for SDG-7 and sustainable electrical production, integration, industrial application, and globalization: Review. Clean Eng Technol 2023; 15:100657. https://doi.org/10.1016/j.clet.2023.100657.
65. Uzzell DL. The psycho-spatial dimension of global environmental problems. J Environ Psychol 2000; 20:307–18. https://doi.org/10.1006/jevp.2000.0175.
66. Wall WP, Khalid B, Urbański M, Kot M. Factors Influencing Consumer's Adoption of Renewable Energy. Energies 2021; 14:5420. https://doi.org/10.3390/en14175420.
67. Wang Q, Dacko SG, Gad M. Factors influencing consumers' evaluation and

adoption intention of really-new products or services: prior knowledge, innovativeness and timing of product evaluation. ACR North American Advances 2008; 35:416–22.
68. Wang X, Guo L. How to Promote University Students to Innovative Use Renewable Energy? An Inquiry-Based Learning Course Model. Sustainability 2021; 13:1418. https://doi.org/10.3390/su13031418.
69. Washim Akram Md, Arman Arefin Md, Nusrat A. Prospect of green power generation as a solution to energy crisis in Bangladesh. Energy Systms 2021. https://doi.org/10.1007/s12667-020-00421-9.
70. Whittle C, Jones CR, While A. Empowering householders: Identifying predictors of intentions to use a home energy management system in the United Kingdom. Energy Policy 2020; 139:111343. https://doi.org/10.1016/j.enpol.2020.111343.
71. Wojuola RN, Alant BP. Public perceptions about renewable energy technologies in Nigeria. Afr J Sci Technol Innov Dev 2017; 9:399–409. https://doi.org/10.1080/20421338.2017.1340248.
72. Wright YL. Relating Recycling: Demographics, Attitudes, Knowledge and Recycling Behavior among UC Berkeley Students. UC Berkeley Student Recycling 2011:1–17.
73. Yapici G, Ögenler O, Kurt AÖ, Koçaş F, Şaşmaz T. Assessment of Environmental Attitudes and Risk Perceptions among University Students in Mersin, Turkey. Journal of Environmental and Public Health 2017; 2017:1–8. https://doi.org/10.1155/2017/5650926.
74. Yazdanpanah M, Komendantova N, Ardestani RS. Governance of energy transition in Iran: Investigating public acceptance and willingness to use renewable energy sources through socio-psychological model. Renew Sustain Energy Rev 2015; 45:565–73. https://doi.org/10.1016/j.rser.2015.02.002.
75. Yazdanpanah M, Komendantova N, Shirazi ZN, Linnerooth-Bayer J. Green or in between? Examining youth perceptions of renewable energy in Iran. Energy Res Soc Sci 2015; 8:78–85. https://doi.org/10.1016/j.erss.2015.04.011.
76. Zahari AR, Esa E. Drivers and inhibitors adopting renewable energy: an empirical study in Malaysia. Int J Energy Sect Manag 2018; 12:581–600. https://doi.org/10.1108/ijesm-02-2017-0004.
77. Zobeidi T, Yaghoubi J, Yazdanpanah M. Farmers' incremental adaptation to water scarcity: An application of the model of private proactive adaptation to climate change (MPPACC). Agric Water Manag 2022; 264:107528. https://doi.org/10.1016/j.agwat.2022.107528.
78. Zulu S, Zulu E, Chabala M. Factors influencing households' intention to adopt solar energy solutions in Zambia: insights from the theory of planned behaviour. Smart Sustain Built Environ 2021; ahead-of-print. https://doi.org/10.1108/sasbe-01-2021-0008.

How to cite this article: Md. Abdul Hai. The Future of sustainability: exploring college students' perception of renewable energy in Bangladesh. *International Journal of Research and Review*. 2025; 12(12): 209-229. DOI: *https://doi.org/10.52403/ijrr.20251224*

******