



# Tourism And Climate Change: Mitigation And Adaptation Strategies In A Hospitality Industry In Bangladesh

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## ARTICLE INFO

## ABSTRACT

As global temperatures rise and weather patterns become increasingly erratic, the hospitality sector faces unprecedented challenges in mitigating emissions, promoting sustainability, and enhancing resilience to climate-related hazards. This paper explores the complex interplay between tourism and climate change, focusing on the mitigation and adaptation strategies employed by the hospitality industry to address these challenges. This study also examines the impacts of climate change activities on tourism that including shifts within tourist behavior, changes in destination competitiveness, and vulnerabilities to extreme weather events. In the research methods, quantitative method was conducted where the purposive sampling method was used to collect primary data collection approach. 200 primary questionnaires through google forms and hard copies were distributed to among desired respondents where response rate is 65%. After cleaning the datasets, 130 responses were usable to use in the analysis portion. Microsoft excel was used to retrieve the result of the research. Major finding of the study represented on the effectiveness of mitigation measures, such as energy-efficient technologies, sustainable resource management practices, and renewable energy integration, in reducing carbon footprints and promoting environmental stewardship in hotel operations. In the recommendation and implications part of the research paper, this paper provides insights into the challenges and opportunities for the hospitality industry in mitigating and adapting to climate change, while ensuring the long-term sustainability and viability of tourism development.

**KEYWORDS:** Tourism, Climate Change, Mitigation, Adaptation Strategy, Hospitality Industry

## Introduction

The global tourism sector benefits from the beauty and abundance of natural resources. The very foundation of its success, though, is delicately balanced against the increasing force of climate change. Travel patterns are being disrupted, destinations are being threatened, and millions of people's livelihoods in the hospitality industry are at risk due to the effects of a warming world, which range from melting glaciers to strengthening storms (Becken, 2015).

Recent years have seen the interaction between tourism and climate change emerge as a significant topic of concern, necessitating extensive research to address the issues facing the hospitality sector. The tourism industry is more susceptible to the effects of climate change as temperatures rise globally and extreme weather events occur more frequently (Abbass et al., 2022). Scholars and experts in the business are investigating ways for adaptation and mitigation in response to this urgent issue, with the aim of safeguarding the hospitality sector's sustainability (Bhuiyan et al., 2023b).

The Intergovernmental Panel on Climate Change (IPCC) states that urgent action is required to address climate change as it is a reality (IPCC, 2018). Due to its intrinsic connection to the environment, the tourist sector is faced with particular difficulties as a result of these shifts. The goal of this study is to explore the complex interplay between tourism and climate change, with a particular emphasis on adaptation and mitigation tactics used by the hospitality industry (Paglia & Parker, 2021).

The hospitality sector is facing a variety of impacts from climate change, including altered consumer behavior, supply chain disruptions, and higher operating costs (Legrand et al., 2022). Understanding the nuances of this relationship will help this research provide insightful analysis and useful ideas to strengthen the hospitality industry's resilience to climate-related concerns.

The hospitality sector is crucial to the world's tourism economy because it creates jobs and boosts economic growth. But the industry is becoming more vulnerable to the effects of climate change, which presents grave risks to its long-term viability. Events linked to climate change, such as severe weather, increasing sea levels, and altered precipitation patterns, affect the hotel industry directly and indirectly (Mat et al., 2019). According to the World Tourism Organization (UNWTO), both the tourism industry as well as the hospitality industry contribute to changing climate patterns. The relationship between tourism and climate change (TCC) highlights how urgent it is to put into practice practical measures to reduce environmental damage and adjust to changing weather patterns. Ignoring these issues compromises not just the sustainability of individual hospitality enterprises but also the resilience of travel destinations as a whole (Almuhzzi & Al-Azri, 2019).

The objective of this research is to enhance the current knowledge base by examining the particular effects of climate change on the hospitality sector and by determining effective solutions for mitigation and adaptation. In order to advise policymakers, industry stakeholders, and practitioners on the steps required to promote climate-resilient hospitality practices, a thorough understanding of these dynamics is important (Amin et al., 2024).

### Research Gaps

The hospitality sector, which is essential to the world's tourism economy, is under a serious threat from climate change (Bhuiyan et al., 2023a). The hotel business faces unique challenges that must be addressed when climate-related events worsen and threaten the company's survival (Nyberg et al., 2022). The Intergovernmental Panel on Climate Change (IPCC) issues a warning about the rising risks and vulnerabilities brought about by climate change, stating that immediate action is required to reduce its effects and adapt to them (Paglia & Parker, 2021). In order to provide a thorough analysis of the complex interaction between TCC within the framework of the hospitality business, this study tries to identify and examine these particular difficulties. This research aims to provide focused solutions to improve the industry's resilience and sustainability by identifying the particular issues that each component of the business faces (Islam & Bhuiyan, 2022).

### Objectives

The primary objective of this research is to assess the vulnerabilities of the hospitality sector to climate change impacts. In pursuit of this overarching goal, the study is developed to acquire the following specific objectives:

1. To identify specific mitigation strategies that reduce the carbon footprint of the hospitality industry.
2. To provide practical recommendations of hospitality sector to enhance resilience and sustainability in the face of climate-related challenges.

### Literature Review

Climate change is increasingly recognized as one among many pressing challenges facing within the world tourism industry (TI), with implications for both destinations and businesses within the hospitality sector (Gössling et al., 2020). This literature review aims to provide insights into the current reason of the impacts of Climate Change on tourism and explore mitigation and adjustment strategies employed by the hospitality industry to address these challenges (Amin et al., 2024).

The impacts of CC on tourism are multifaceted as well as encompass various aspects of destination attractiveness, visitor experience, and tourism infrastructure (Samora et al., 2023). One significant impact is the alteration of natural landscapes and ecosystems, leading to changes in biodiversity, weather patterns, and the frequency of extreme weather events (Gössling et al., 2018). For instance, coastal destinations are particularly vulnerable to sea-level rise, erosion, and storm surges, which threaten beach erosion and damage infrastructure (Hall et al., 2015). Furthermore, climate change affects tourist behavior and preferences, with shifts in travel patterns, destination choices, and seasonal demand observed in reaction to changing climate

conditions (Gössling et al., 2020). Rising temperatures and changing weather patterns also influence outdoor recreational activities such as skiing, hiking, and wildlife viewing, impacting destination competitiveness and revenue generation (Winter et al., 2019).

Torres-Bagur et al. (2019) directed a study and found that perceptions of climate change and its effects differed according to the type of establishment and location, such as coastal areas, cities, or inland regions. Significant disparities were noted in the perceptions regarding the allocation of responsibilities for implementing measures to mitigate and adapt to the impacts of climate change, such as water shortages, among the key stakeholders involved in ensuring the sustainability of tourism (Abbass et al., 2022). These stakeholders include government entities, tourist establishments, and clients. The tourism industry worldwide is at risk from the potential outcomes and impacts of climate change. This includes tourism-dependent businesses, communities, and livelihoods that may become more vulnerable to climate change-related stresses (Pandy, 2017). Therefore, it is crucial to implement measures that aim to reduce or counter this vulnerability. Vulnerability has a significantly more profound impact than resistance. The tourism sector exhibits greater susceptibility, yet also greater capacity for recovery, in the face of climate change as compared to the broader economy (Milon & Zafarullah, 2024). The impact of these impacts differs among nations with different income levels: countries with the lowest income levels exhibit more vulnerability and lower resilience, while those with the greatest income levels have the least vulnerability and the highest resilience. (Dogru et al., 2019).

Highly exposed and with limited adaptation capacity, large emerging countries are likely to be particularly susceptible. Small island states are particularly susceptible to the impacts of climate change due to their heightened vulnerability (Akter et al., 2023). Countries with high latitudes and those located in the Mediterranean region have relatively low vulnerability levels. (Perch-Nielsen, 2010). The impact on climate change poses a significant challenge to the long-term viability of global tourism. After analysing the present and predicted increase in emissions from international tourism, as well as the policies and strategies of key organisations, industry, and national governments, it is evident that tourism is based on a pro-growth approach that does not provide any possibility of achieving absolute reductions in emissions in the near future. Urban tourism destinations primarily rely on and adhere to the directives provided by the government and municipal councils in order to formulate a plan for adjusting the urban tourism industry to climate change. Greater sustainability in the hotel industry requires three key approaches: implementing energy solutions, enhancing and expanding green infrastructure for tourist activities, and fostering collaboration among stakeholders in tourism and urban planning (Lopes et al., 2022).

Peeters & Dubois (2010) conducted a research on the topic of "Tourism travel under climate change mitigation constraint." The researchers discovered that tourists are responsible for 4.4% of the total worldwide carbon dioxide emissions, as stated in their study. Additionally, these outflow are forecasted to increase at an approximate rate of 3.2% until 2035. This increase poses a dilemma because a global decrease in emissions of 3-6% is necessary to prevent 'dangerous' climate change.

Saarinen & Tervo (2006) stated that the aim was to ascertain the perceptions and adaptation methods of Finnish nature-based tourist entrepreneurs regarding climate change. The study was done by interviewing business people involved in nature-based tourism in northern Finland and the Finnish Lake District in southeast Finland. The researchers discovered that the entrepreneurs possessed knowledge regarding the matter of global climate change. Nevertheless, 50% of the participants expressed scepticism regarding the existence of the phenomena and its potential impact on the region's tourism economy in the future. The climate change scepticism may account for the lack of adoption of adaptation techniques, while alternative adaptation mechanisms were employed to address the typical fluctuations in weather patterns and market dynamics (Abbass et al., 2022).

Over the past ten years, several significant gaps in knowledge have been identified in various areas of impact, regional knowledge, and the perceptions of both tourists and tourism operators regarding the risks and ability to adapt to climate change. These findings suggest that the tourism sector is currently ill-equipped to handle the challenges posed by climate change (Scott et al., 2012). Dubois & Ceron (2006) emphasize in their article that climate change adaptation and mitigation are interconnected aspects of the tourism business. Tourist operators should prioritize the reduction of their carbon footprint. Their activities seem extremely susceptible to the effects of climate change, but this issue has only arisen in the recent past (Akter et al., 2023).

The climate exerts both direct and indirect effects on tourists' decision-making and the appeal of destinations. Tourism, as an economic sector, is remarkably vulnerable to the impacts of CC. Furthermore, policy deliberations regarding the reduction of climate change, such as implementing 'green taxes' on airlines and/or tourists, and even advocating for avoiding holiday activities that have an influence on the climate system, undoubtedly affect the patterns of tourism and the behaviour of tourists (Hall, 2008). The tourist and travel industry currently has a greater impact on climate change compared to its direct contribution to the global economy. Therefore, it can be considered a relatively inefficient sector in terms of its environmental impact on global warming (Bhuiyan, 2019). The tourist and travel industry is increasingly reliant on energy-intensive transportation and activities, as well as more expensive hotels, which in turn reduces eco-efficiency even further. Air transport is responsible for a growing proportion of global warming associated with tourism and travel, with the present share already exceeding 60% (Gössling & Humpe, 2020).

To mitigate the adverse impacts of climate change, the hospitality industry has adopted various strategies aimed at reducing greenhouse gas emissions, promoting sustainability, and enhancing environmental

stewardship (Yousaf et al., 2021). One common approach is the adoption of energy-efficient technologies and practices to minimize energy consumption and carbon footprints in hotel operations. This includes measures such as heating, energy-efficient lighting, air conditioning (HVAC) systems, ventilation, and as well as the integration of renewable energy sources such as solar panels and wind turbines (Bigano et al., 2016).

Moreover, sustainable resource management practices, including water conservation, waste reduction, and recycling initiatives, are implemented to minimize environmental impact and enhance operational efficiency (Pujara et al., 2019). For example, hotels may implement water-saving measures such as low-flow faucets, dual-flush toilets, and greywater recycling systems to reduce water consumption and preserve freshwater resources (Styles et al., 2015).

In addition to mitigation efforts, adaptation strategies are essential for building resilience and enhancing the capacity of the hospitality sector to cope with CC impacts (Bhuiyan, 2017). Adaptation measures include infrastructure upgrades, disaster preparedness planning, and risk management strategies aimed at minimizing vulnerability and ensuring business continuity in the face of climate-related hazards (Torabi et al., 2018)

For instance, hotels located in coastal areas prone to sea-level rise and storm surges may implement shoreline protection measures, such as dikes, seawalls, and beach nourishment ventures, to mitigate erosion and stop property damage (Bro/ker & Mangor, 2011). Similarly, disaster preparedness plans, including evacuation procedures, emergency response protocols, and business continuity strategies, are crucial for minimizing disruptions and ensuring guest safety during extreme weather events (McCool, 2012).

In conclusion, climate change presents substantial obstacles to the tourism sector, necessitating proactive strategies to reduce emissions and adjust to evolving environmental circumstances. The hospitality sector plays a critical role in these efforts, employing a combination of mitigation and adaptation strategies to minimize environmental impact, enhance resilience, and ensure the long-term sustainability of tourism destinations and businesses.

## Methodology

### Population and Sampling

The population is the whole members of involving authorities in tourism stakeholders, local communities (Bhuiyan, 2023). Due to researcher's constraints, a large number of respondents was not possible to collect data because it was expensive and time consuming effort. The purposive sampling method was used to collect primary data collection approach (Akter et al., 2023). 200 primary questionnaires were distributed to among desired respondents where response rate is 65%. The primary data sources included interviews with tourism stakeholders, local communities, and surveys of tourists where 130 data were collected. After cleaning the datasets, 110 data were usable to analyses the research to achieve the research objectives. The secondary data included government reports, academic literature, published annual report and industry publications (Bhuiyan et al., 2024). By combining both primary and secondary data sources, this research study aimed to provide a comprehensive understanding of the interplay between tourism and climate change, and to identify effective mitigation and adaptation strategies for the hospitality industry (Molla et al., 2023).

### Data Collection Methods

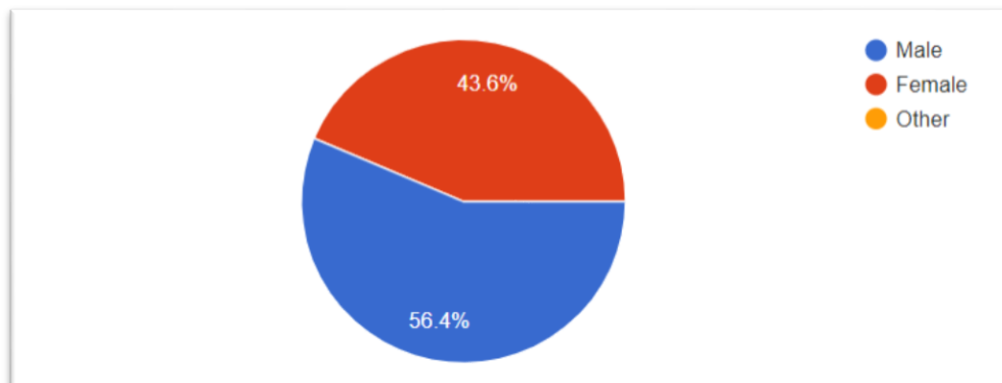
Primary data had been collected through questionnaire by using Google Form that conducted with tourism stakeholders and local communities as well as tourist (Bhuiyan & Akter, 2024). These interviews provided valuable insights into the perspectives, experiences, and challenges faced by individuals directly involved in the tourism sector and local communities affected by tourism activities (Mani, 2019). In addition to interviews, surveys were conducted with tourists visiting the study area (Milon & Zafarullah, 2024). These surveys aimed to gather quantitative data on tourist preferences, behaviors, and perceptions related to climate change and its impact on tourism destinations (Bhuiyan et al., 2024). Complementing the primary data, secondary data sources were also utilized. These included government reports, academic literature, published annual reports, and industry publications. Secondary data sources provided background information, contextual understanding, and relevant statistics to support the findings and analysis of the study.

### Data Analysis

All survey responses and interview transcripts will be entered into a spreadsheet database using Microsoft Excel (Bhuiyan, 2023). Typos, formatting errors, and duplicate entries will be corrected or removed to ensure the integrity of the data. Microsoft Excel will be utilized for data analysis, allowing for easy manipulation and calculation of statistical measures (Khanom et al., 2022). Data analysis will focus on exploring relationships between identifying key findings, and addressing research objectives (Mikalef et al., 2020). Graphical representations of the survey data will be created using Microsoft Excel 2016. Bar charts and pie charts will be used to visually present quantitative data, allowing for easy interpretation and comparison of survey responses. Graphical presentations will complement the descriptive statistics and provide visual insights into the survey findings (Milon, 2024).

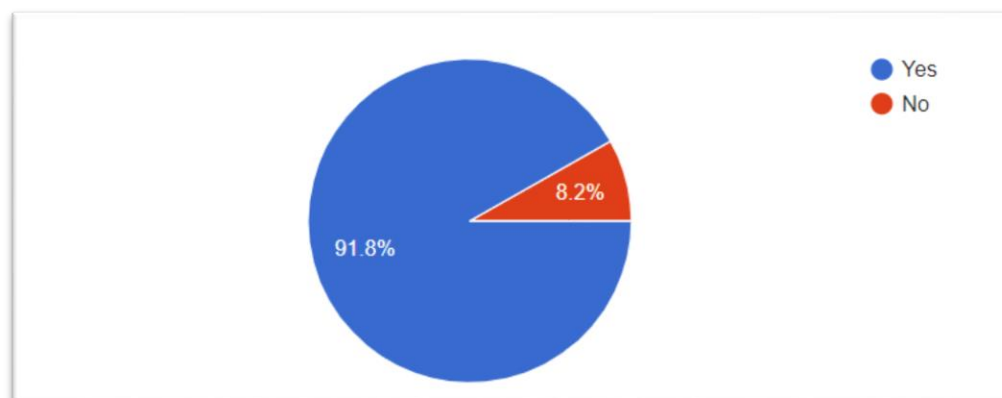
## Results and Discussion

From the Figure-01, we can infer that the Sample consists of 110 respondents. Among this Respondents the researcher chooses 62 Male (56.4%) and 48 Female (43.6%). The Maximum age levels of our respondents were 18-24 years old and 25-30 years old persons that was respectively 49.1% and 40.9% from the total respondents. Others were 35-44 years old was 7.3%; 45-54 years old was 0.9% and 2 respondents that was 1.8% were under the age of 18 years old from total 110 respondents.

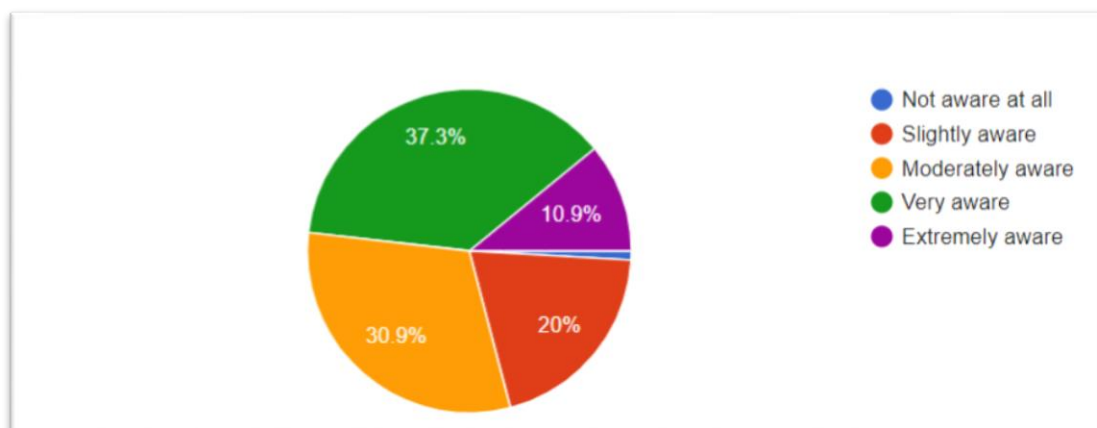


**Figure-01: Showing Gender through using Pie Chart**

**In figure-02**, we can see most of the participants of our study was familiar with Hospitality Business and Tourism sector as well as the also known to about the concept of Climate Change. As well as from **figure-03**, Maximum participants were very aware to the concept of climate change and also conscious for potential impacts on the tourism industry.



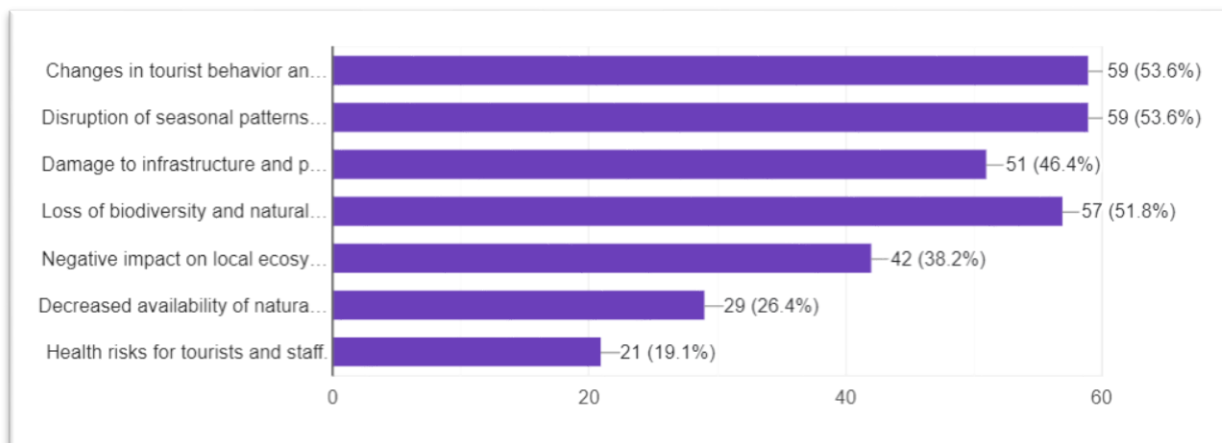
**Figure-02: Participants who are familiar with Hospitality Business and Tourism Sector.**



**Figure-03: Ratio of participants who are aware of the concept of climate change and its potential impacts on the tourism industry.**

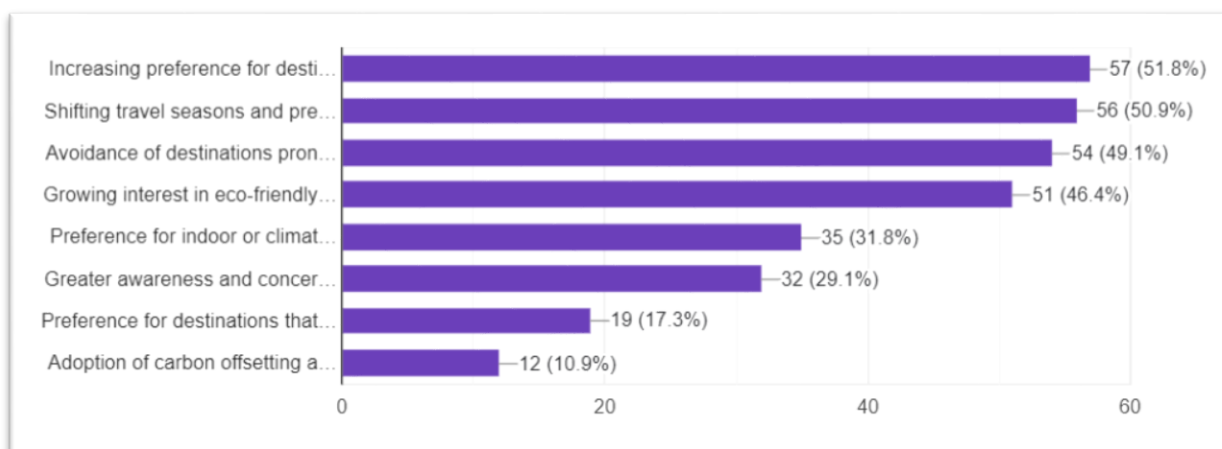


In our survey we try to find out the impact of CC on the T & H industry that was highlighted in the **figure-04**. From our survey we find that most of the participants think that impact of climate change creates Changes in tourist behavior and preferences, Disruption of seasonal patterns affecting tourist influx, Loss of biodiversity and natural attractions that recommended by 59 respondents that was 52.7% of total population. On the other hand, 52 respondents (46.4%) think that it creates Damage to infrastructure and property due to rising sea levels.



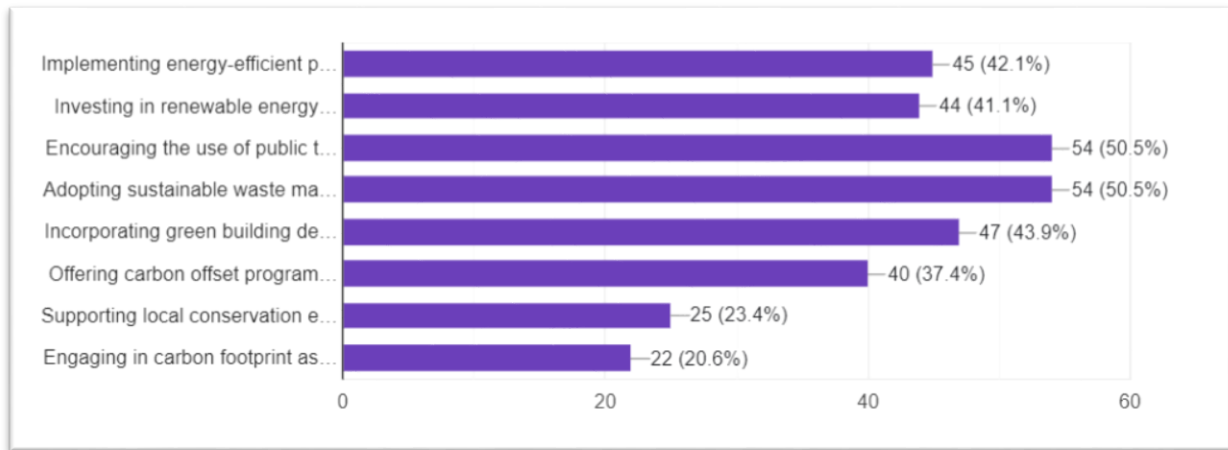
**Figure-04: Impact of CC on the Tourism and Hospitality Sector.**

In **figure 05** highlighted that from our survey we find out Climate change is affecting on the Tourist Behavior and Their preferences. Above 50% respondents agree that Climate change impact on Increasing preference for destinations with predictable weather patterns, shifting travel seasons and preferences due to changes in temperature, Avoidance of destinations prone to extreme weather events or natural disasters, Growing interest in eco-friendly and sustainable travel options.



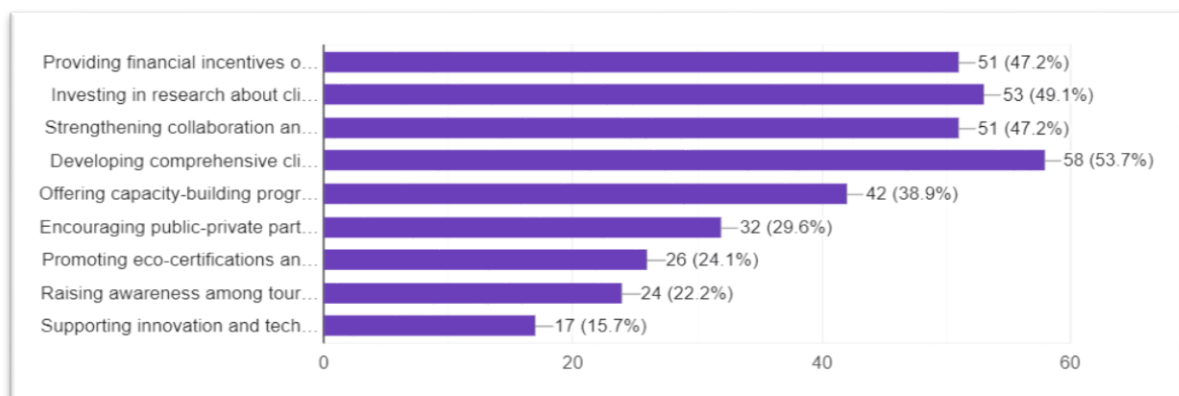
**Figure 05: Impact of Climate change on the Tourist Behavior and their preferences.**

Most of the people believe that Encouraging the use of public transportation, adopting sustainable waste management practices strategy, incorporating green building design principles into new construction, implementing energy-efficient practices, investing in renewable energy sources, offering carbon offset programs for travel emissions can take to reduce carbon footprint and mitigate climate changes that you see from the **figure-06**.



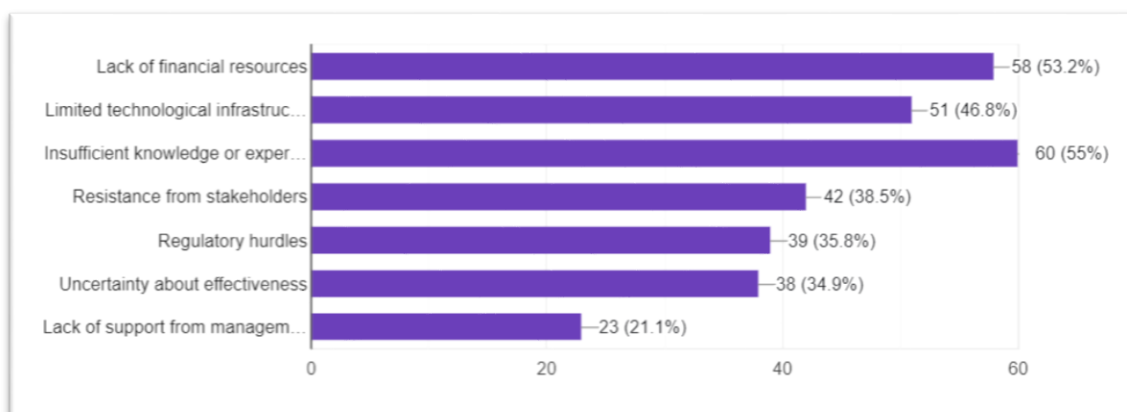
**Figure 06: Elements that reduce carbon footprint and mitigate climate change impacts.**

If you look at the **figure-07**, Some strategies that we can apply to overcoming the challenges of Climate Changes within our Hospitality Industry that are Providing financial incentives or subsidies, investing in research about climate change impacts, strengthening collaboration and communication among stakeholders, developing comprehensive climate change adaptation plans and policies, offering capacity-building programs and training opportunities.



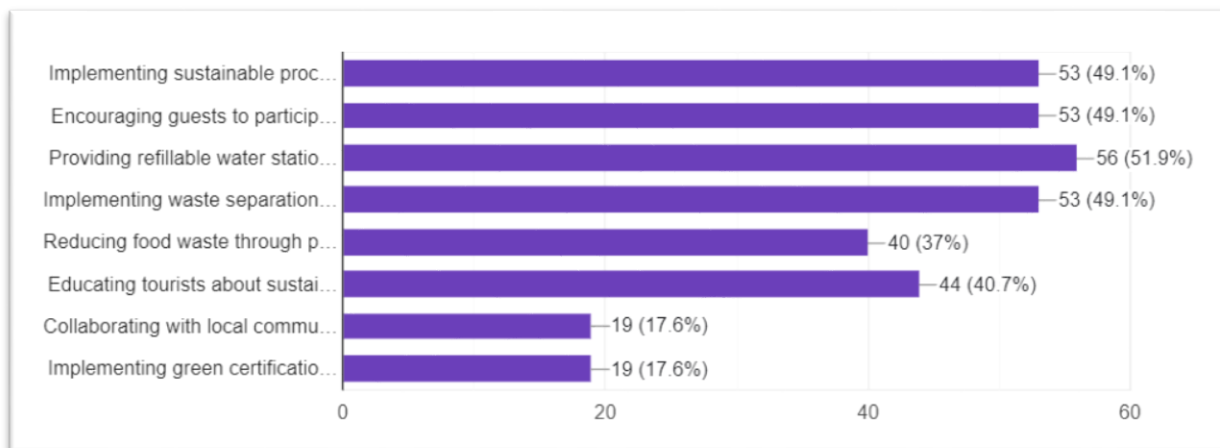
**Figure 07: Strategies to overcoming the challenges of Climate Changes within our Hospitality Industry.**

Our survey highlight the biggest challenges that face Tourism and Hospitality Industry in implementing mitigation strategies of Climate Change that we highlight in **figure-08**. We find that above 50% respondents think that Lack of financial resources, Limited technological infrastructure, Insufficient knowledge or expertise Human Resource are the biggest Challenges for mitigation of the impact of CC on the Hospitality and Tourism Industry.



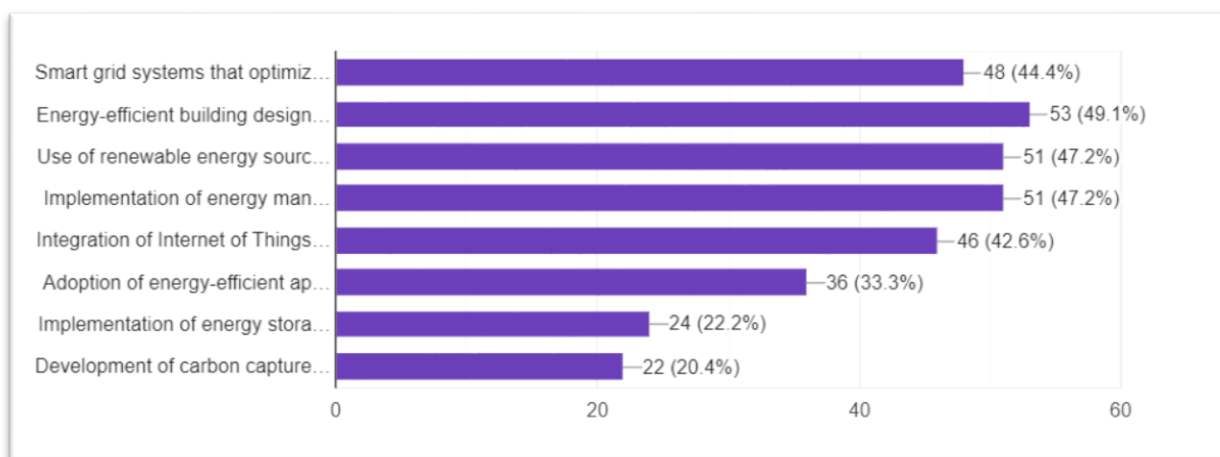
**Figure 08: Challenges of implementing mitigation strategies on Tourism and Hospitality Industry.**

Some strategies are most effective in promoting responsible consumption and waste reduction within the tourism industry to combat climate change, such as- implementing sustainable procurement practices, encouraging guests to participate in towel and linen reuse programs, providing refillable water stations or filtered water dispensers, implementing waste separation and recycling programs that you see in **figure 09**.



**Figure 09: Effective strategies in promoting responsible consumption and waste reduction.**

In the era of Technological Revolution, we use some innovative approaches or technologies that hold the most promise for reducing energy consumption and promoting sustainability in tourism operations that effective for Climate Change Mitigation, Such as- Smart grid systems that optimize energy usage, Energy-efficient building design and construction techniques, Use of renewable energy sources, Implementation of energy management systems, Integration of Internet of Things (IoT) devices for energy monitoring that was highlighted within the **figure-10**.

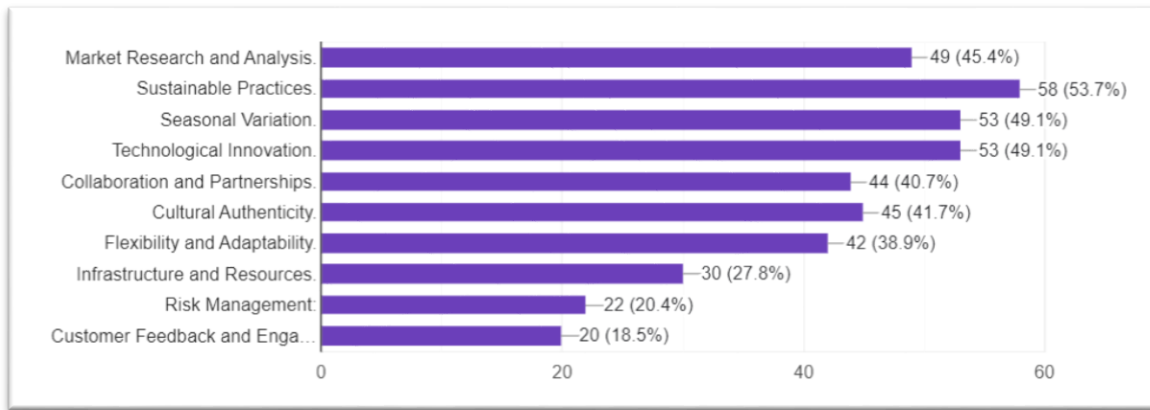


**Figure 10: Innovative approaches or technologies that hold the most promise for reducing energy consumption.**

If we able to mitigate climate change impacts, we can be benefited of implementing green infrastructure projects in tourist destinations. We able to reduced flood risks and improved storm water management, Enhanced biodiversity and ecosystem services, Creation of recreational spaces and amenities for tourists, Mitigation of urban heat island effects and improved air quality that gradually improve our Tourism Industry by improving the attractiveness of the destination and generating new tourist.

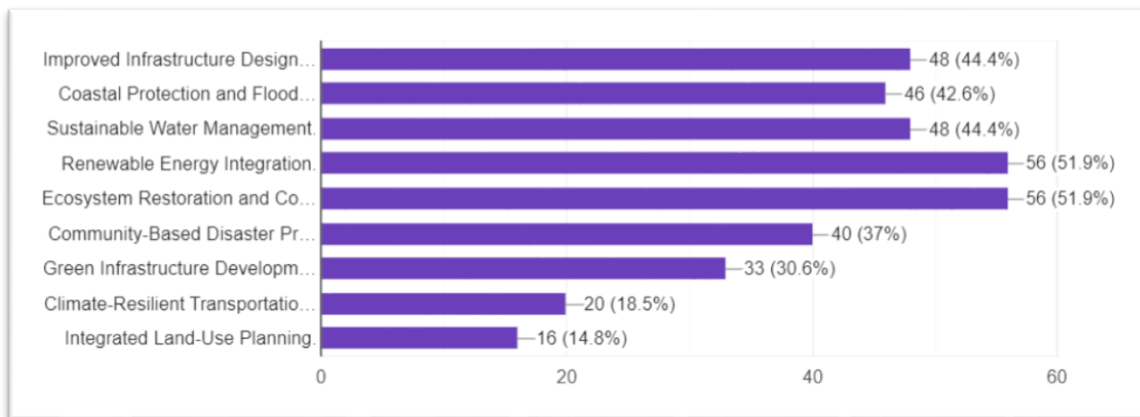
To improve the condition on our Tourism Industry and reduce climate change we use justify the real causes on this impact. If you follow the **figure-11** you can see, for this justification we use some key factors that tourism businesses should consider when diversifying their offerings to adapt to changing climate conditions and tourist preferences. Such as- Market Research and Analysis on the current situation justification, Sustainable Practices, Make Seasonal Variation with in Tourism destination and improve Technological Innovation for measuring current scenario of the Climate condition and predict previous alertness for the disaster.





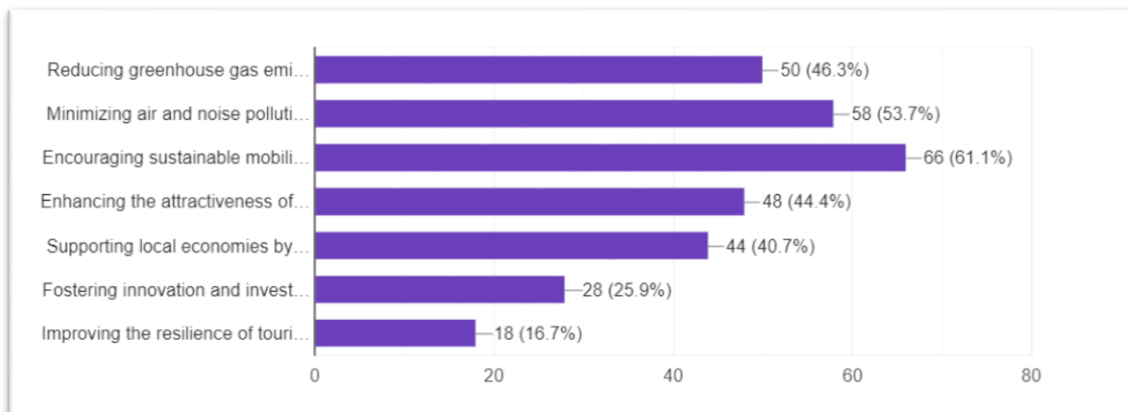
**Figure 11: Factors those tourism businesses should consider when diversifying their offerings to adapt to changing climate conditions and tourist preferences**

By analysing data we can find out in the **figure-12** that Some adaptation measures are most critical for enhancing the climate resilience of tourism infrastructure in vulnerable destinations that is Renewable Energy Integration, Ecosystem Restoration and Conservation, Improved Infrastructure Design and Retrofitting, Coastal Protection and Flood Mitigation and Sustainable Water Management. So, when consider to develop the condition of climate change and reduce impact we must need to focus on this element and try to properly use of these forces.



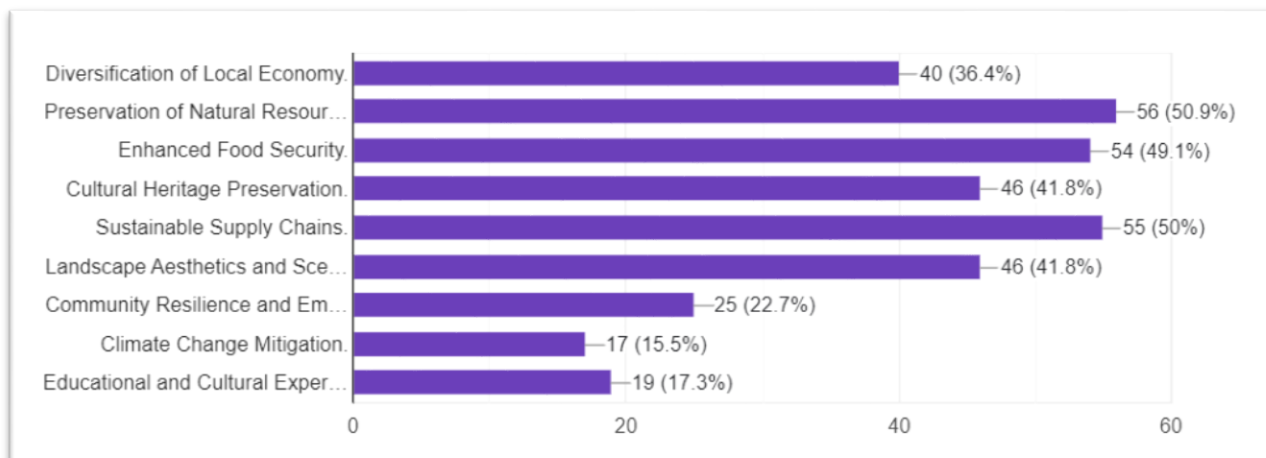
**Figure 12: Forces that enhance the climate resilience of tourism infrastructure in vulnerable destinations.**

In **figure-13** highlighted that Sustainable transportation options (such as electric vehicles or public transit) play in mitigating climate change impacts in the tourism sector by Encouraging sustainable mobility behaviors among tourists, such as walking, cycling, Reducing greenhouse gas emissions, and Minimizing air and noise pollution as well as this alternative transportation options make the alternative attractiveness of the destination that attract new Tourist.



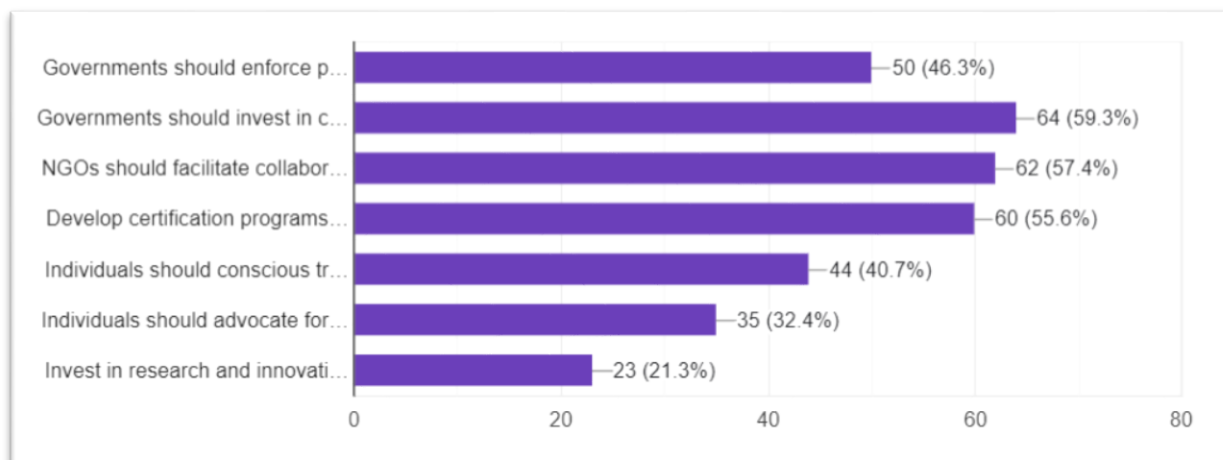
**Figure 13: Role of sustainable transportation options (such as electric vehicles or public transit) in mitigating climate change impacts.**

Besides this practices we can use Agricultural practices that contribute to the sustainability and resilience of tourism destinations, particularly in rural areas such as- Preservation of Natural Resources, Enhanced Food Security, Sustainable Supply Chains Landscape Aesthetics and Scenic Beauty, Cultural Heritage Preservation as well as it improves and create Diversification of Local Economy that we see in the **figure 14**.



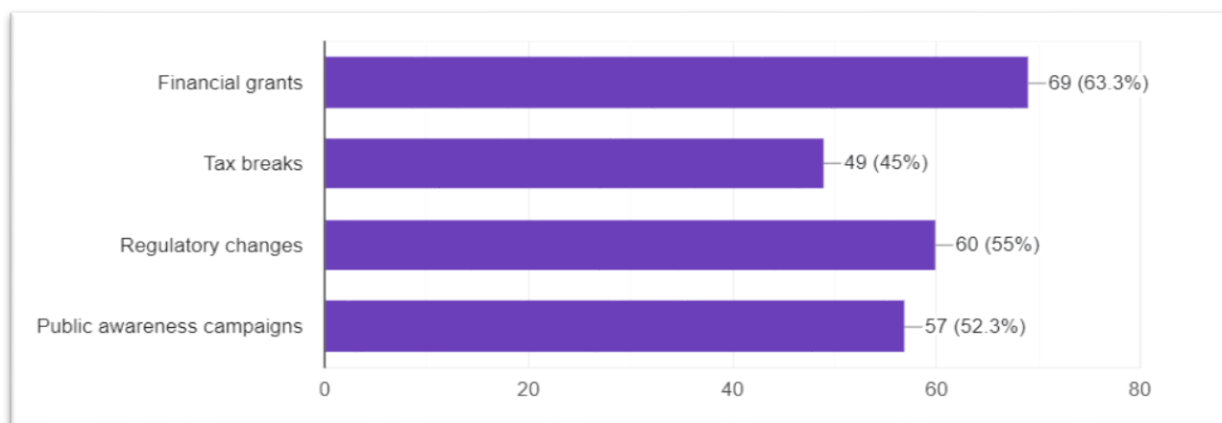
**Figure 14: Contribution of agricultural practices to the sustainability and resilience of tourism destinations particularly in rural areas.**

The next **figure-15** highlights key actions for governments, organizations, and individuals to address climate change impacts within the tourism industry. Suggestions include enforcing policies to regulate emissions, investing in climate-resilient infrastructure, and facilitating collaboration among stakeholders. The Certification programs also promote sustainable practices that also recommended fostering climate-resilient tourism by our research.



**Figure 15: Role of governments, NGOs and individuals in addressing Climate Change.**

At last by analysing our data from participants, we can say, by the **figure-16**, that if government should provide incentivize investment in additional mitigation strategies. Choices include financial grants, regulatory changes, and public awareness campaign and tax breaks. These mechanisms aim to encourage proactive measures for addressing climate change through various means, including financial incentives, regulatory support, and public engagement efforts.



**Figure 16: Government policies that most encourage to invest in mitigation strategies for Climate Change.**

By analyzing this questionnaire, several key findings emerge regarding stakeholders' perceptions and opinions on CC mitigation and adjustment strategies within the tourism and hospitality industry. Respondents show varying levels of awareness regarding climate change and its potential impacts on the sector, with a notable interest in implementing sustainable practices. Challenges in implementing mitigation strategies include financial constraints, technological limitations, and regulatory barriers. However, respondents express support for various measures to reduce carbon footprint and promote sustainability, including energy-efficient practices, sustainable transportation options, and responsible consumption initiatives. Collaboration among governments, organizations, and individuals is seen as essential in addressing climate change impacts within the industry, with calls for supportive policies, financial incentives, and public awareness campaigns. Furthermore, respondents emphasize the importance of community engagement, cultural preservation, and natural resource management in ensuring sustainable and inclusive tourism practices amidst climate change challenges. Overall, the findings highlight the need for concerted efforts and collective action to foster climate resilience and sustainability in the tourism and hospitality sector.

### Discussions

Based on the analysis of the questionnaire responses regarding "Tourism and Climate: Mitigation and Adaptation Strategies for the Hospitality Industry," several key findings and discussions emerge:

#### Awareness and Understanding of Climate Change

- The findings indicate varying levels of awareness and understanding of climate change among respondents. While some are very familiar with the concept, others show limited awareness.
- This highlights the importance of education and awareness campaigns to ensure that stakeholders within the hospitality industry are well-informed about the challenges posed by climate change.

#### Perceived Impacts of CC on T & H industry.

- Respondents recognize a range of potential impacts of CC on the tourism and hospitality industry, including changes in tourist behavior and preferences, disruption of seasonal patterns, damage to infrastructure, and health risks.
- This underscores the multifaceted nature of climate change impacts, which can have significant implications for the operations and sustainability of hospitality businesses.

#### Challenges in Implementing Mitigation Strategies

- The survey identifies several challenges faced by stakeholders in implementing mitigation strategies for climate change. These include financial constraints, limited technological infrastructure, regulatory hurdles, and uncertainty about effectiveness.
- Addressing these challenges requires a coordinated effort from governments, organizations, and individuals to provide support, resources, and incentives for sustainable practices.

#### Recommended Mitigation and Adaptation Measures

- Respondents offer a range of recommendations for mitigation and adaptation measures to address climate change in the hospitality industry. These include implementing energy-efficient practices, investing in renewable energy sources, promoting sustainable transportation options, and engaging in community-based initiatives.

- These recommendations highlight the importance of adopting a holistic approach to climate resilience, incorporating both technological solutions and community-driven efforts.

### **Importance of Collaboration and Engagement**

- Collaboration among governments, organizations, and individuals emerges as a critical factor in addressing climate change impacts within the tourism and hospitality sector. Stakeholders recognize the need for collective action to overcome barriers and promote sustainability.
- Engaging local communities, supporting research and innovation, and advocating for supportive policies are key strategies identified to enhance climate resilience and adaptation.

Overall, the findings suggest that while there is awareness of the challenges posed by climate change within the hospitality industry, there is also a need for concerted efforts to implement effective mitigation and adaptation strategies. By addressing the identified challenges and implementing the recommended measures, stakeholders can work towards a more sustainable and resilient future for tourism and hospitality.

### **Conclusion**

This paper highlights the critical need for proactive measures to address the challenges posed by climate change within the hospitality sector. Climate change presents multifaceted risks to tourism destinations, including changes in weather patterns, natural disasters, and environmental degradation, all of which have direct implications for the hospitality industry (Jarratt & Davies, 2020). However, amidst these challenges lie opportunities for innovation, collaboration, and sustainable development. The paper underscores the importance of raising awareness among tourism stakeholders about the impacts of CC and the urgency of adopting mitigation and adjustment strategies. By implementing energy-efficient technologies, sustainable resource management practices, and renewable energy integration, the hospitality industry can reduce its carbon footprint and enhance its resilience to climate-related hazards. Additionally, adaptation measures such as infrastructure upgrades, disaster preparedness planning, and community engagement are essential for ensuring the long-term sustainability of tourism destinations (Rahman et al., 2024).

Collaboration among stakeholders, including governments, businesses, local communities, and non-governmental organizations, is crucial for effective climate change adaptation and mitigation (Lassa, 2018). By working together, sharing knowledge and resources, and fostering partnerships, the hospitality industry can overcome barriers and capitalize on opportunities to build a more sustainable and resilient tourism sector. By prioritizing sustainability, resilience, and responsible tourism practices, the hospitality industry can contribute to the broader global efforts to combat climate change while ensuring the continued prosperity and enjoyment of tourism destinations for future generations (Islam et al., 2024)

### **Recommendations**

Tourism and climate change are intricately linked, presenting both challenges and opportunities for the hospitality industry. Climate change poses significant risks to tourism destinations, including changes in weather patterns, natural disasters, and loss of biodiversity, which can impact visitor experiences and destination attractiveness. However, by implementing proactive mitigation and adaptation strategies, the hospitality industry can enhance its resilience to climate change impacts while promoting sustainable tourism practices.

Through this report, we have explored various mitigation and adaptation measures employed by the hospitality industry to address climate change challenges. From energy-efficient technologies and sustainable resource management practices to infrastructure upgrades and community-based tourism initiatives, there are numerous opportunities for stakeholders to contribute to climate resilience and sustainability in the tourism sector. Addressing climate change challenges in the hospitality industry requires a multi-faceted approach that encompasses-

- Promotion of sustainable practices,
- Investment in climate resilience,
- Capacity building and training,
- Collaboration and partnerships, and
- Promotion of responsible tourism.

By implementing these recommendations, stakeholders can enhance the resilience and sustainability of tourism destinations, ensuring their long-term viability in the face of climate change. Together, we can build a more resilient and sustainable future for the tourism industry, benefiting both present and future generations.

### **Limitations and Future Directions**

During the course of their study, researchers encountered certain restrictions. The following items are: The investigation is constrained by the accessibility and dependability of data sources. The investigation is constrained to a particular time period. This study focuses exclusively on the issues and potential of adventure

tourism in Bangladesh (Bhuiyan et al, 2024). Therefore, the conclusions drawn from this research may not be applicable to other nations or areas. The findings are not representative of the perspectives of all stakeholders engaged in adventure tourism. Many authorities are often preoccupied and feel disrupted due to their busy job schedules. Future research would be extended the conceptual framework along with a vast sample size in order to accept in academic and tourism industry in the worldwide.

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