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Posted Date: 18 December 2024

doi: 10.20944/preprints202412.1455.v1

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Article

A Qualitative Study of Climate Change Preparedness and Action for Tourism Small and Medium Sized Enterprises

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Abstract: This study explores the preparedness and response strategies of tourism businesses to climate change through an in-depth qualitative analysis. Using open-ended questionnaires, we collected detailed narratives from a diverse range of tourism businesses, allowing respondents to express their perceptions, strategies, and challenges in their own words. Thematic analysis of the data revealed a wide variation in how businesses understand and respond to climate risks. While most participants acknowledged climate change as a critical issue, many reported significant barriers, such as financial constraints and lack of expertise, which hindered their ability to implement meaningful strategies. Key themes that emerged from the data include the role of external support in overcoming financial and technical challenges, the diversity of mitigation strategies adopted, and the gap between climate awareness and practical action. This study pinpoints the need for tailored interventions to support small and medium-sized enterprises (SMEs) in the tourism sector, highlighting the complexity of translating climate change awareness into tangible business practices. The findings contribute to the growing discourse on sustainable tourism by offering an understanding of the challenges and opportunities that businesses face in addressing climate change.

Keywords: climate change; sustainable tourism; qualitative research; SME; thematic analysis; climate adaptation

1. Introduction

The impact of climate change on global economies, ecosystems, and communities has become one of the most pressing challenges of the 21st century. As the world grapples with rising temperatures, increasing frequency of extreme weather events, and shifting climatic patterns, the need for comprehensive and effective strategies to mitigate and adapt to these changes has never been more urgent. This is particularly true for the tourism sector, a vital component of many national economies, which is uniquely vulnerable to the effects of climate change. The sector's reliance on natural environments, stable weather conditions and the mobility of people means that climate change poses both direct and indirect threats to its sustainability and profitability (OECD, 2022).

Tourism is a significant economic driver, contributing to job creation, foreign exchange earnings and regional development. According to the World Travel & Tourism Council (WTTC), the tourism industry accounted for 10.4% of global GDP and supported 319 million jobs worldwide in 2018 (WTTC, 2019). However, this economic contribution is under threat as climate change alters the landscapes and environments that attract tourists, disrupts travel patterns and increases operational costs due to the need for climate adaptation and mitigation measures. The vulnerability of the tourism sector with respect to climate change manifests itself in various ways. Coastal destinations face rising sea levels, increased storm surges and coastal erosion, which can damage infrastructure and reduce the attractiveness of these areas. Mountainous regions, dependent on winter sports tourism, are experiencing reduced snowfall and shorter ski seasons, directly impacting revenue. Additionally, the increasing frequency and intensity of heatwaves, wildfires, and hurricanes pose significant risks to tourist safety and destination reputation. These changes not only affect the physical environment, but

also influence tourist perceptions and travel behaviors, potentially leading to shifts in tourism demand patterns.

The urgency of addressing climate change within the tourism sector is supported by several stylized facts and emerging trends. First, scientific consensus indicates that human-induced climate change is accelerating, with global temperatures projected to rise between 1.5°C and 2°C above pre-industrial levels by the end of the century, if current emission trends continue. This temperature increase is expected to exacerbate the frequency and severity of extreme weather events, leading to more frequent natural disasters and environmental degradation. For the tourism sector, this means more significant disruptions and higher costs associated with damage repair, insurance and the implementation of adaptive measures.

Second, the tourism sector itself is a notable contributor to climate change. According to the United Nations World Tourism Organization (UNWTO), tourism-related activities account for approximately 8% of global greenhouse gas (GHG) emissions (UN Tourism, 2019). These emissions primarily stem from transportation (especially aviation), accommodation and other tourism-related services. Therefore, the sector has a dual responsibility: to reduce its carbon footprint, while simultaneously adapting to the unavoidable impacts of climate change.

Third, consumer awareness and demand for sustainable tourism are growing. Increasingly, tourists are seeking destinations and services that prioritize environmental sustainability and social responsibility. This shift in consumer preferences presents both a challenge and an opportunity for the tourism industry. Businesses that proactively adopt sustainable practices can enhance their competitiveness and reputation, attracting environmentally conscious travelers. Conversely, those that fail to adapt may find themselves at a disadvantage as consumer expectations evolve (Sustainable Tourism Network, 2024).

Despite the evident need for action, many businesses in the tourism sector face significant barriers to implementing effective climate strategies. Financial constraints, lack of technical expertise, and limited access to relevant information are common challenges. Additionally, the perceived complexity and costs associated with transitioning to more sustainable practices can be daunting, particularly for small and medium-sized enterprises (SMEs) that constitute a large portion of the tourism industry. Policymakers and industry stakeholders must collaborate to create an enabling environment that supports and incentivizes businesses to integrate climate considerations into their operations. Given the importance of the tourism sector and its vulnerability, it is imperative for businesses within the tourism industry to develop robust strategies to mitigate their impact on climate change and adapt to its effects. However, the degree to which businesses are prepared for and are actively addressing these challenges varies widely.

Our paper aims to explore these variations by examining the preparedness and response strategies of businesses in the tourism sector concerning climate change. Through an investigation of the business strategies, challenges, and motivations, the study aims to identify best practices and areas requiring further support and intervention. The methodology involves a qualitative questionnaire distributed to a diverse range of tourism businesses, collecting data on their awareness, strategic initiatives, and perceived barriers related to climate change. The findings of this study are expected to contribute to the broader discourse on sustainable tourism and climate resilience. By highlighting successful strategies and identifying key challenges, the research aims to inform policymakers, industry leaders, and other stakeholders about effective ways to support the tourism sector in its transition towards sustainability.

The rest of the paper is structured as follows: Besides this introduction, Part 2 is the literature review, Part 3 is the methodology, Part 4 is the results and discussion, and Part 5 is the conclusion.

2. Literature Review

The intersection of climate change and tourism has emerged as a critical area of research, highlighting the profound impact on various aspects of the tourism industry. This literature review synthesizes findings from various studies that claim to be investigating the topic, in order to provide a comprehensive understanding of how climate change affects tourism, the perceptions of

stakeholders, adaptive responses and the alignment of tourism practices with sustainable development goals (SDGs). The literature so far covers nature-based tourism, coastal and island destinations, winter tourism activities and the broader implications for sustainable tourism development.

A first identifiable strand of literature appears to be dealing with the impact of climate change on tourism. Such literature by Mushawemhuka et al., (2018) and Craig et al., (2023) deals with nature-based tourism, which depends heavily on favorable climatic conditions and stable ecosystems and consequently faces significant challenges due to climate change. Mushawemhuka et al., (2018) and Craig et al., (2023) emphasize the vulnerability of this sector to increased temperatures, reduced precipitation and extreme weather events. These climatic threats directly impact tourist activities and the overall appeal of destinations, necessitating robust adaptation strategies. To this strand of literature also belong studies by Shakeela and Becken (2015), Nilsson Vestola (2023) and Peeters and Papp (2024) who reveal that coastal and island destinations are particularly susceptible to the effects of climate change. Shakeela and Becken (2015) and Nilsson Vestola (2023) and Peeters and Papp (2024) highlight the existential threats posed by rising sea levels, increased storm frequency and coastal erosion. The Maldives, as a prime example, illustrates how low-lying geographies are highly vulnerable to climate-induced risks. The social amplification of risk framework (SARF) in the Maldives reveals how personal experiences with natural disasters amplify concerns about climate change, although economic and political motivations often attenuate these risks. Last, the study by Xiao et al., (2020) deals with winter tourism activities, such as snowmobiling, which are also highly sensitive to changing climatic conditions. Xiao et al., (2020) found that snowmobiling in Vermont is significantly affected by changing snow conditions, with local snowmobilers being more sensitive to these changes than non-locals. Maintaining high-quality snowmobiling experiences and developing adaptation strategies for both local and non-local markets are essential to address these challenges (snowmobilers' perceptions).

Another strand of literature deals with stakeholder perceptions and adaptive responses. Stakeholder perceptions play a crucial role in shaping adaptive responses to climate change in the tourism sector. Fitchett et al., (2020), Nilsson Vestola (2023) and Peeters and Papp (2024) explore the perceptions of tourism businesses and consumers, revealing a general awareness of climate impacts but varying levels of concern and preparedness. Barriers to proactive climate action include limited resources, lack of knowledge and a belief that action is unnecessary. Building stronger public-private partnerships and increasing the availability of tailored scientific information are suggested to enhance adaptive capacity. In the Maldives, the SARF framework shows how experiences with natural disasters like the 2004 Indian Ocean tsunami amplify climate change concerns. However, local perceptions are often attenuated by economic and political considerations aimed at maintaining tourism attractiveness, creating a policy environment where adequate adaptation measures are insufficiently prioritized.

A third strand of literature in the field we are investigating, is about the adaptation strategies and sustainable development goals (SDGs). Aligning tourism investment, business, and operations with the SDGs is critical for achieving long-term sustainability. Nair and McLeod (2020) discuss how Caribbean countries are working to align their tourism practices with the SDGs, despite challenges such as environmental pollution, over-construction, and social disparities. The alignment with SDGs like decent work and economic growth (SDG 8), responsible consumption and production (SDG 12), and life below water (SDG 14) is essential for sustainable tourism development. This literature strand also highlights the need for comprehensive policy frameworks that support sustainable tourism practices. Hoogendoorn and Fitchett (2018) and Saarinen et al., (2020) emphasize the importance of integrating climate resilience and adaptive capacity into tourism policies. This involves not only immediate infrastructural responses, but also long-term sustainability goals, such as reducing the carbon footprint of tourism activities and fostering a culture of sustainability.

A fourth strand of literature handles policy and governance. Effective governance is pivotal in enhancing the resilience of tourism sectors to climate change. The Maldives experience shows the importance of political will and international collaboration in addressing climate vulnerabilities.

Robust and transparent policy-making processes, engaging local communities in the adaptation process, and ensuring inclusive policies are crucial steps towards building resilient tourism sectors. Nair and McLeod (2020) recommend immediate action by all stakeholders to raise awareness and implement focused climate actions to secure the future of tourism in the Caribbean. They emphasize the need for climate-resilient business models, evaluation of investments aligned with SDGs, and inclusion of indigenous communities in tourism development.

The relationship of climate change and tourism necessitates comprehensive and forward-thinking strategies to mitigate risks and enhance resilience. The vulnerabilities of nature-based, coastal, island, and winter tourism activities highlight the need for integrated adaptation measures aligned with sustainable development goals. Effective policy and governance, stakeholder engagement, and robust adaptive strategies are essential to ensure the long-term sustainability and viability of the tourism sector in the face of climate change.

Supported by the aforementioned literature review, our paper examines several research questions related to the impact of climate change on businesses within the tourism sector. These questions aim to explore the perceptions, preparedness, and strategies of tourism businesses in addressing climate-related issues:

Question 1: How do tourism businesses perceive the significance of climate change, and to what extent do they prioritize it among their key business concerns?

Question 2: What are the perceived challenges and barriers that lead to the gap between climate change awareness and the implementation of mitigation strategies among tourism businesses?

Question 3: What barriers, including financial, regulatory, and knowledge-related challenges, do tourism businesses face in addressing climate change?

Question 4: What types of measures, both practical and abstract, do businesses with well-defined climate strategies adopt to mitigate climate risks?

Question 5: How do tourism businesses allocate budgets for climate change mitigation, and what factors influence the variability in financial planning and resource availability?

Question 6: How do tourism businesses differ in their preparedness and strategic implementation of climate measures, and what factors contribute to these variations?

By answering these questions, this paper contributes to a deeper understanding of the current state of climate change preparedness and response within the tourism sector. It identifies key challenges, opportunities and practical measures that can inform policymakers, industry leaders and other stakeholders in supporting the transition towards sustainable tourism practices.

Our paper brings novelty in the up-to-date literature in the following ways: Unlike many studies that rely primarily on quantitative data or broad qualitative interviews, our research uses a comprehensive and detailed qualitative questionnaire. This method allows for varied insights into the specific perceptions, strategies and challenges faced by tourism businesses regarding climate change. The open-ended questions in our questionnaire enable respondents to provide detailed and context-specific information, capturing the complexity and variability of their experiences and responses to climate change. Moreover, our study specifically examines the varying levels of preparedness among businesses in the tourism sector, providing a granular understanding of how ready these businesses are to tackle climate-related challenges. By evaluating the extent to which businesses have developed and implemented specific strategies for carbon footprint reduction and climate risk mitigation, our study highlights the gap between recognition of climate issues and practical action.

On top of that, our paper examines how businesses allocate budgets for climate change mitigation, providing insights into the financial planning and resource allocation strategies within the tourism sector. This detailed financial perspective is often underexplored in existing literature. Findings on the variability of budget allocations, ranging from specific amounts to percentage-based responses highlight the diverse financial strategies employed by tourism businesses. Our paper identifies the specific barriers and opportunities faced by SMEs in the tourism sector, such as financial constraints, lack of technical expertise and regulatory hurdles. This focus fills a critical gap in the literature, which often overlooks the unique needs of smaller businesses. Last, but not least, the

practical recommendations tailored to SMEs provide actionable strategies that can help these businesses enhance their adaptive capacity and resilience to climate change. Our paper identifies both practical measures (e.g., adoption of renewable energy, energy consumption reduction) and less tangible measures (e.g., encouraging customer behavior change, staff education) employed by businesses. This holistic approach provides a comprehensive view of how businesses are addressing climate risks.

3. Methodology

This paper applies qualitative research. This is a method of inquiry that seeks to understand human behaviors, experiences, and social phenomena. Unlike quantitative research, which focuses on numerical data and statistical analysis, qualitative research involves collecting non-numerical data such as interviews, observations and textual analysis. This approach allows researchers to explore the depth and richness of participants' perspectives, uncovering insights that might be overlooked in more structured quantitative studies. Techniques such as thematic analysis, grounded theory, and case studies are commonly used to analyze qualitative data. The goal is to interpret the meaning, identify patterns and construct theories that explain the underlying dynamics of the studied phenomena. Qualitative research is particularly valuable in fields like sociology, psychology and anthropology, where understanding context, culture and subjective experiences is crucial. By emphasizing context and depth, qualitative research provides a different view of the world, contributing to a more comprehensive understanding of human behavior and social processes (Oranga and Matere, 2023). The qualitative questionnaire in this study has many advantages derived from its attributes such as shown in Table 1:

Table 1. Attributes and explanation of a qualitative questionnaire in this research.

Attributes	Explanation
In-depth understanding of business perceptions	The questionnaire allows for a detailed exploration of how tourism businesses perceive the impact of climate change on their operations, uncovering rich insights into their concerns and priorities.
Flexible responses	By asking open-ended questions, businesses can describe their experiences and strategies in their own words, providing nuanced and detailed responses that capture the complexity of their situations.
Contextual insights	The responses provide context-specific information about the unique challenges and opportunities faced by different businesses, helping to understand the varied impacts of climate change across the tourism sector.
Exploration of complex issues	The questionnaire addresses multifaceted issues such as the integration of sustainability practices, the effectiveness of current strategies, and the perceived barriers to climate action, which are difficult to quantify but crucial to understand.
Identification of patterns and themes	Analyzing the qualitative data helps identifying common themes, trends, and patterns in how businesses are responding to climate change, which can inform broader industry strategies and policies.
Adaptability	The qualitative approach allows for the adaptation of follow-up questions based on initial responses, enabling a more dynamic and responsive data collection process that can uncover emerging issues.

Attributes	Explanation
Enhanced engagement and reflection	Businesses are likely to feel more engaged and valued when they can freely express their thoughts and experiences, leading to more honest and reflective responses that provide valuable insights.
Development of hypotheses	The findings from the qualitative questionnaire can generate hypotheses about the effectiveness of various strategies and the factors influencing business decisions, which can be tested in future quantitative research.
Exploration of new areas	The questionnaire allows for the discovery of new insights and areas of interest regarding climate change adaptation and mitigation in the tourism sector, guiding future research and interventions.
Rich data for analysis	The detailed responses provide a wealth of qualitative data that can be used to create comprehensive case studies, narratives, and reports, offering a holistic view of how tourism businesses are coping with and planning for climate change.

Source: The author.

3.1. The Qualitative Questionnaire and Sampling

The questionnaire was developed by the author and tested for clarity and functionality with a pilot group of three individuals. It is designed to collect detailed qualitative data from businesses about the impact of climate change on their operations. Primarily targeted at businesses in the tourism sector, the questionnaire includes a series of open-ended questions aimed at exploring the perceptions, strategies and challenges these businesses face. The specific questions are outlined in Table 2.

Table 2. Explanation of qualitative questionnaire.

	Theme	Explanation
1	Description of Business Activities	Request for a brief description of the company's operations.
2	Importance of Climate Change	Question on exploring climate change as one of the top five most important issues for the business.
3	Climate Change Strategy	Question on examining the strategy of the company to address climate change or reduce its carbon footprint.
4	Strategy Certification	Question on understanding the strategy is part of a certification framework.
5	Emission Reduction Targets	Question on exploring the company targets for reducing carbon dioxide emissions.
6	Impacts of Climate Change	Businesses are asked to assess and justify with a YES or NO how climate change might affect various aspects of

	Theme	Explanation
		the business, such as the quality of raw materials, products, investments in technology, location, product demand, and the use of natural resources.
7	Risk to Destination Sustainability	Assessment of the risk posed by climate change to the sustainability of the tourist destination.
8	Risks to Suppliers	Assessment of the risks of climate change for the company's suppliers.
9	Budget for Climate Change Mitigation	Estimation of the budget the company will allocate to address the risks of climate change.
10	Timing for Emission Reduction	Suitable timing for reducing the company's carbon dioxide emissions.
11	Education on Climate Change	Availability to attend educational seminars on climate change.
12	Profit Contribution	Percentage of profits the company is willing to contribute for the prevention, adaptation, and restoration from climate change.
13	Obstacles in Achieving Climate Goals	Obstacles the company faces in achieving its climate goals.
14	Measures to Achieve Climate Goals	Ways in which businesses can more easily achieve their climate goals.
15	First Action in Response to Climate Change	Suggested first action the company should take in response to climate change.
16	Cost of First Action	Estimation of the cost of the proposed action (in Question 15).
17	Production of Low Carbon Footprint Products	Question on exploring the company products with a low carbon footprint.
18	Specialist for Carbon Footprint	Availability of a specialist within the company to manage the carbon footprint.
19	Verification of the Research	Provision of a phone number for the verification of the research.

The questionnaire was accompanied by a letter that outlined the purpose of the research, highlighting the importance of business participation and ensuring the anonymity of all respondents. Participant confidentiality was guaranteed and the study received ethical approval from the Agricultural University of Athens (AUA) Ethics Committee, Committee EIDE, Nu: 17/01.03.2024. The survey was conducted between March 1st and May 1st by trained interviewers. A purposive sampling strategy was used, focusing on regions in Greece with high tourism activity, such as islands and coastal areas. Despite three follow-up attempts, the response rate was 15%, primarily due to the voluntary nature of participation, the lack of financial incentives and the difficulty in reaching busy tourism businesses. Respondents were typically business owners or key executives, including managers and chief accountants. The final sample consisted of 33 small and medium tourism enterprises, with 50% of them being hotels. The duration of each interview was approximately 30 minutes.

3.2. Steps in Thematic Analysis

Table 3 shows and explains the steps identified for qualitative research.

Table 3. Steps in thematic analysis.

Steps	Goal	Implementation
Familiarization with the data	To become deeply familiar with the data, whether it is interview transcripts, open-ended questionnaire responses, or other qualitative data.	Read through the data multiple times, take initial notes on key ideas or recurring patterns, start identifying potential areas of interest or emerging ideas.
Generating initial codes	To start systematically coding the data by identifying key segments that relate to the research question (s).	<p>Go through the data line by line and assign codes to important pieces of text (e.g., words, sentences, or paragraphs).</p> <p>Codes are shorthand labels or summaries that describe the key idea in a particular section of the data.</p> <p>The codes must be simple and focus on capturing essential features or recurring ideas in the data.</p>
Searching for themes	To identify themes by grouping related codes together. Themes represent broader patterns in the data and capture important aspects of the research questions.	<p>Look for relationships between codes and start grouping them into broader themes.</p> <p>Ask yourself: What are the underlying ideas or patterns across the different codes?</p> <p>This phase involves combining codes to create candidate themes that are potentially</p>

Steps	Goal	Implementation
		important in explaining the data.
Reviewing themes	To refine the themes and ensure they accurately represent the data.	<p>Re-read the data to check that your themes are consistent and coherent.</p> <p>Merge or split themes as needed to ensure that each theme represents a distinct and meaningful aspect of the data.</p> <p>Ensure that all important data is captured within your themes and that no data has been overlooked.</p>
Defining and naming themes	To define what each theme means and what aspect of the data it captures.	<p>Write a detailed description for each theme, explaining its importance and relevance to your research question.</p> <p>Ensure that each theme has a clear and concise name that captures its essence.</p> <p>Consider how the themes relate to each other and to the overall story that your data tells.</p>
Writing up the analysis	-	-

Source: The author.

4. Results and Discussion

In response to the question exploring whether businesses consider climate change to be one of the top five most important issues they face, many participants expressed a strong awareness of its significance. Several respondents indicated that climate change is indeed a critical concern in their operations. However, when asked about the presence of a specific strategy to manage their carbon footprint, responses revealed varying levels of preparedness. While some businesses had developed concrete strategies, a portion of them mentioned that these strategies were integrated within formal certification frameworks. Additionally, a subset of participants reported setting targets for reducing carbon dioxide emissions, though responses varied in terms of how specific or measurable these targets were. This suggests a spectrum of engagement with climate action, ranging from awareness to tangible, structured approaches.

When exploring how businesses believe climate change will affect their operations, participants provided diverse insights into the potential impacts. Many businesses expressed concerns about the quality of raw materials they rely on, including agricultural products, seafood, water supply, and energy, highlighting the vulnerability of these resources to climate disruptions. Similarly, some respondents reflected on how the quality of their products, such as aesthetic appeal and outdoor activities could be compromised by climate change.

A significant number of businesses noted that climate change would necessitate increased investments in technology and equipment, emphasizing the importance of resilient infrastructure, energy efficiency, and renewable energy solutions. These responses suggest that businesses are aware of the need to adapt through technological innovations, especially in areas like water management, climate control, and risk management.

In terms of location, a few participants raised concerns about coastal erosion, sea-level rise, and extreme weather events, which could directly threaten their operations. Others mentioned that climate change would impact customer demand, pointing to shifts in seasonal patterns, destination appeal, and the broader ecosystem of tourism. This indicates that businesses are beginning to see climate change not only as a physical challenge, but as a factor influencing customer behavior and preferences.

Finally, several respondents discussed how climate change would reshape their use of natural resources, with specific attention to water management, energy consumption and waste management. This highlights a growing recognition of the need for sustainable practices, biodiversity conservation and collaboration in response to climate risks.

When asked about the perceived risk that climate change poses to the sustainability of the tourist destination where their business is located, respondents expressed mixed views. Some businesses expressed a high level of concern, identifying significant risks related to climate change impacts, while others viewed the risk as relatively low, possibly reflecting confidence in their location's resilience or a perceived ability to adapt. This divergence suggests that businesses' perceptions of risk are influenced by factors such as geographic location, proximity to vulnerable areas or previous experiences with climate-related disruptions.

Interestingly, when considering the risks posed to their suppliers, many businesses perceived a higher level of threat. Several respondents indicated that climate change may more severely impact their supply chains, particularly suppliers located in areas highly vulnerable to climate disruptions. This points to a broader awareness of the interconnectedness of global supply chains and the potential challenges associated with relying on imported rather than locally sourced raw materials.

In terms of the financial resources required to address the risks of climate change, businesses expressed varied opinions on the necessary budget allocation. Some provided specific estimates, while others were less certain, indicating that businesses are at different stages in planning for climate adaptation. This variability in responses suggests a wide range of preparedness levels, with some businesses actively setting aside funds for climate resilience, while others may still be in the early stages of considering how to address these challenges.

When discussing the estimated budgets, businesses believe they will need to allocate to address the risks posed by climate change, responses varied widely. Some businesses chose to provide estimates as percentages of their overall budgets, while others offered specific monetary figures. This divergence may reflect differences in business size, financial complexity, and planning approaches. Smaller businesses, for example, may find it more straightforward to provide specific numbers due to their limited resources, while larger businesses with more complex financial structures might prefer percentages to allow for greater flexibility in budget adjustments.

Interestingly, the choice of how to express the budget, whether as a percentage or a specific amount, may also be influenced by individual preferences and the cognitive skills of the respondents, shaped by factors such as their educational background. Businesses that indicated they would allocate funds "as needed" might already have established strategies, suggesting they are prepared to adjust resources based on emerging climate risks. Conversely, those who responded "nothing" or "as needed" without providing an estimate may not have developed formal plans or might not foresee significant changes to their current approach.

These varied responses reveal the complexity of financial planning for climate resilience, highlighting how businesses' preparedness and strategic thinking shape their approach to resource allocation. While some businesses demonstrated a proactive stance in setting aside resources, others appeared uncertain or hesitant, suggesting a need for more support and guidance in this area.

When asked about the appropriate timing for reducing carbon dioxide emissions, businesses provided a range of responses that reflected their operational priorities and perceptions of urgency. Some businesses framed their responses in relation to the tourist season, emphasizing the practical constraints of implementing changes during peak or off-season periods. These respondents indicated that the timing of their actions would likely align with quieter periods, such as the end of the season or during winter, allowing them to make necessary adjustments without disrupting business operations.

Other participants expressed a more immediate sense of urgency, with many stating that actions should be taken in the short term, either "immediately" or "as soon as possible." This suggests a proactive approach among some businesses, driven by an awareness of the need for swift action in mitigating carbon emissions. A smaller group of respondents took a longer-term view, planning to implement changes over the next few years, indicating a more gradual, strategic approach to emission reductions.

Interestingly, a number of businesses provided responses that reflected a continuous or ongoing effort to manage carbon emissions. These businesses emphasized that they had already begun making changes or that emissions reduction was an integral part of their regular operations. This suggests that some businesses view emission reduction not as a one-time project but as an ongoing commitment embedded within their broader sustainability efforts.

When asked about their willingness to attend educational seminars on climate change, company representatives provided varied responses, with some expressing a strong commitment to dedicating significant time, while others indicated more modest availability. Many participants showed interest in dedicating around 10 hours per week, reflecting a keen awareness of the importance of ongoing education in addressing climate-related challenges. The range of responses, from 2 to 30 hours per week, illustrates the diversity of businesses' capacity and willingness to engage in educational opportunities, likely influenced by their operational constraints and perceived need for climate education.

In terms of financial commitment, businesses were also asked about the percentage of profits they would be willing to allocate for climate change prevention, adaptation, and restoration efforts. While some businesses indicated a willingness to contribute around 8-10% of their profits, others expressed more conservative or flexible approaches, reflecting their financial limitations or varying degrees of readiness to invest in climate initiatives.

A number of businesses acknowledged facing obstacles in achieving their climate goals, with some highlighting financial barriers and others pointing to knowledge gaps or regulatory challenges. In response to the question about how businesses could more easily achieve their climate goals, several themes emerged. A significant portion of respondents emphasized the importance of renewable energy adoption and energy-saving measures as key strategies. Others highlighted the need for recycling initiatives and financial support, such as co-funding, grants, and tax exemptions, which they believed could help offset the costs associated with climate action.

Educational policies, including customer guidance and staff training, were frequently mentioned as crucial to achieving climate goals, reflecting the role of knowledge-sharing and awareness-building in driving sustainable business practices. A smaller group of respondents suggested that institutions such as the State or local chambers of commerce could play a pivotal role in supporting businesses' climate efforts, indicating a desire for more structured, institutional support in tackling climate-related challenges.

When asked about the priority of actions that businesses should take in response to climate change, participants provided a range of suggestions that were categorized into two broad themes: "specific solutions" and "abstract (non-tangible) solutions." The "specific solutions" primarily focused on tangible, actionable measures such as the adoption of renewable energy, upgrading infrastructure for energy efficiency, and implementing recycling programs. These responses reflect an emphasis on direct, practical interventions that businesses perceive as immediately impactful in reducing their environmental footprint.

In contrast, the "abstract solutions" focused more on intangible, long-term strategies, such as fostering a culture of sustainability through customer education, promoting behavioral change, and seeking expert advice on climate strategies. These responses suggest that many businesses recognize the importance of cultivating awareness and engagement, both internally and externally, as a key aspect of their climate response.

This division between specific and abstract solutions reveals that businesses are approaching climate action from multiple angles balancing immediate, concrete actions with broader, strategic efforts to influence long-term behavior and operations. Table 3 provides a detailed breakdown of the solutions identified by respondents, illustrating the varied approaches businesses are considering addressing climate risks.

Table 3. Categorization of solutions suggested as responses to question 15.

Tangible solutions	Non-tangible solutions
Electric tickets: Use of digital tickets to reduce paper usage.	Customer encouragement: Motivating customers to adopt more environmentally friendly practices.
Electric energy: Installation and use of renewable energy sources.	Change of habits: Promoting the change of daily habits towards more sustainable practices.
Reduced energy consumption: Measures to minimize energy consumption.	Advice from experts: Seeking guidance and directions from climate change experts.
Equipment change: Replacing old equipment with more energy-efficient models.	Training: Educating staff and customers about climate change and sustainable practices.
Use of natural gas: Transition to natural gas as a cleaner energy source.	Funds: Securing and allocating financial resources for implementing environmental actions.
Smart systems: Installation and use of smart energy and resource management systems.	Implementation of environmental regulations: Adopting and adhering to environmental regulations and standards.
Building infrastructure: Upgrading or constructing building infrastructure with a focus on sustainability and energy efficiency.	Customer encouragement: Motivating customers to adopt more environmentally friendly practices.
Recycling/Renewable Energy (RES): Implementing recycling programs and using renewable energy sources.	Change of habits: Promoting the change of daily habits towards more sustainable practices.
Towel: Reducing the use of single-use items and using reusable options where possible.	Advice from experts: Seeking guidance and directions from climate change experts.
Electric tickets: Use of digital tickets to reduce paper usage.	Training: Educating staff and customers about climate change and sustainable practices.

Source: The author.

When asked about the cost of the actions identified in response to climate change (Question 15), businesses provided a wide range of estimates, reflecting the varying scales of operations and resource availability. The responses ranged from €1,500 to €200,000, suggesting that while some

businesses are prepared to make substantial investments in climate mitigation, others are constrained by financial limitations.

In response to whether their businesses produce products with a carbon footprint (Question 17), a portion of respondents acknowledged that their operations contribute to carbon emissions, while others did not identify any products with a notable carbon footprint. This variation highlights differing levels of awareness and understanding of how business activities impact climate change.

Regarding whether businesses have a dedicated specialist to manage their carbon footprint (Question 18), only a small number of respondents indicated that they have such expertise in-house. This finding points to a potential gap in technical knowledge and resources, suggesting that many businesses may lack the capacity to implement specialized carbon management strategies effectively.

Overall, the findings answer the research questions in Part 2, revealing that businesses' responses to climate change vary significantly in terms of preparedness, investment, and expertise. These results, summarized in Table 4, illustrate the broad spectrum of approaches and challenges that businesses face as they seek to address climate risks.

Table 4. Results for the research questions.

Theme/Exploratory Question	Insights Gained from Responses	Interpretation
1. Do businesses in the tourism sector recognize climate change as a significant concern and prioritize it accordingly?	Many businesses expressed concern about the impact of climate change on their operations, with participants highlighting its importance among key business issues.	This indicates a broad awareness of climate change, suggesting that businesses are beginning to see it as a critical factor in their strategic planning.
2. Is there a gap between businesses' recognition of climate change as a concern and the implementation of concrete strategies to address it?	While most businesses acknowledge the importance of climate change, fewer have developed concrete strategies or set measurable targets for carbon reduction.	This highlights a gap between awareness and action, suggesting that barriers such as financial constraints or lack of expertise may prevent businesses from translating recognition into practical strategies.
3. What are the key barriers preventing businesses from effectively addressing climate change?	Common barriers identified include financial limitations, lack of technical knowledge, and regulatory challenges.	These insights suggest that external support such as policy guidance, financial incentives, and access to technical expertise may be crucial in enabling businesses to overcome these challenges.
4. What types of strategies (practical or abstract) do businesses adopt in response to climate risks?	Respondents mentioned a variety of strategies, ranging from practical measures like adopting renewable energy and improving energy efficiency to more abstract strategies such as educating customers and promoting sustainable behaviors.	This reflects a multi-faceted approach to climate action, where businesses recognize the need for both immediate, tangible actions and longer-term cultural or behavioral shifts.
5. How do businesses allocate resources for climate change	The range of responses regarding budget allocations for climate-related actions varied significantly, with some businesses providing	This variability suggests that businesses' financial planning is highly dependent on their size, operational complexity, and

Theme/Exploratory Question	Insights Gained from Responses	Interpretation
mitigation, and what factors influence these allocations?	specific amounts and others expressing flexibility based on circumstances.	perceived urgency of climate risks.
6. How do levels of preparedness and strategic implementation vary among businesses in the tourism sector?	Businesses displayed varying levels of preparedness, with some taking proactive steps to mitigate climate risks, while others have yet to formalize specific strategies.	This points to a wide spectrum of engagement, reflecting differences in resource availability, awareness, and organizational priorities.

Source: The author.

5. Conclusions

This study highlights the varying levels of awareness, preparedness, and strategic implementation among businesses in the tourism sector concerning the impact of climate change. Through the use of a qualitative questionnaire, rich, detailed insights have been uncovered, illustrating how businesses perceive and respond to climate-related challenges. The open-ended format allowed respondents to express their views in their own words, resulting in a varied understanding of their unique concerns, priorities, and approaches.

The findings indicate that while many businesses recognize climate change as a critical issue, there is significant variation in how they respond. Although a majority of businesses acknowledge its importance, the depth and effectiveness of their strategies differ widely. Some businesses have developed specific strategies to address their carbon footprint, while others are at an earlier stage of engagement. This gap between recognition and concrete action reveals the need for enhanced support, guidance and resources to help businesses translate awareness into practical climate measures.

The study also reveals the diverse approaches businesses take in managing climate risks. Specific strategies, such as adopting renewable energy, reducing energy consumption, and upgrading equipment, are common among businesses with more defined plans. At the same time, more abstract strategies like promoting customer behavior change, educating staff, and seeking expert advice, highlight a holistic approach to addressing the complexity of climate challenges.

The variability in responses regarding budget allocation for climate mitigation further reflects the diverse nature of businesses in the tourism sector. Some provided specific monetary amounts, while others expressed their plans in percentage terms or indicated that their allocation would be flexible depending on circumstances. This suggests that financial planning for climate action is influenced by the scale, resources, and strategic priorities of each business.

This qualitative approach has provided deep contextual insights, identifying emerging patterns and themes that might not have been captured through a purely quantitative lens. The multifaceted challenges businesses face, ranging from financial constraints and lack of expertise to regulatory hurdles, emphasize the need for supportive policies, financial incentives, and educational programs to enable more effective climate adaptation within the tourism sector.

In conclusion, the qualitative questionnaire proved invaluable in capturing the complexity of businesses' experiences and strategies regarding climate change. While awareness of the issue is growing, there remains much to be done to translate this into comprehensive, actionable strategies. Stronger collaboration between businesses, policymakers, and experts will be critical in overcoming the barriers identified and in fostering a more resilient, sustainable tourism industry. This study lays the groundwork for further research, aiming to enhance the sector's contribution to global climate change mitigation efforts.

As a recommendation for future research, developing specific metrics and indicators to measure the resilience of tourism businesses to climate change would be invaluable. These tools could assist in benchmarking and improving climate preparedness across the sector. Additionally, future studies

could build on this research by incorporating quantitative analysis to further deepen our understanding of climate resilience in tourism.

Acknowledgments: The author would like to thank the interviewers for their valuable efforts.

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