



# Exploring the impact of climate change on lodging establishments: a systematic literature review

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## Abstract

**Purpose** This study aimed to identify scientific research concentrating on climate change impacts on accommodation services and examine the most relevant outputs related to management strategies due to exposure to climate change.

**Methodology** It used a systematic review of the literature of scientific articles published in the Web of Science and SCOPUS. The search strings were validated by academics, who suggested adding more keywords for studying the relationship between accommodation settings and climate change. As a result, four search strings were established and identified 39 articles for qualitative analysis with MAXQDA.

**Findings** Some studies asserted that corporate social responsibility is important for mitigating climate change issues. hotels work together with local businesses, enforcing the community's adaptive capacity to climate change and supporting the need for education and training programs to understand climate change risks better. Moreover, green human resources management directly relates to the level of environmental awareness in local communities. Using air conditioning for combating heat waves consumes high amounts of energy. One option lies in energy-efficient buildings such as passive houses, using compact designs for reducing the cost of operation. Currently, hotel operations rely more on being more transparent regarding informing guests and influencing eco-friendly choices. On the other hand, there is an investment in training employees regarding good practices for energy use and management. Such action leads to accountable energy savings. Nevertheless, hotels still struggling to adapt because of their elevated energy consumption for heating, hot water, lightning, or cooling aggregates.

**Keywords** Accommodation sector · Climate change impact · Hotel management · Resilience · Vulnerability

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## 1 Introduction

Climate change is a pressing global concern demanding immediate attention and collaborative action across all sectors, including the hospitality industry. As the world experiences unprecedented shifts in weather patterns, rising temperatures and extreme weather events (Olabi and Abdelkareem 2022; Rummukainen 2012), the impact of climate change on the hospitality sector has become increasingly evident (Ben Youssef and Zeqiri 2022). The hospitality industry, which includes hotels, resorts, restaurants, and other accommodation facilities, plays a significant role in global carbon emissions due to its energy-intensive operations and reliance on natural resources.

The hotel industry's energy consumption has become a focal point in global efforts to combat climate change and promote sustainability. The sector has a significant environmental footprint, with America's 47,000 hotels spending a staggering \$2,196 per available room per year on energy, representing approximately 6% of their operating costs (EnergyStar 2015). The stark contrast between the energy costs of a single hotel room and an average residential home highlights the significant energy consumption of the hotel industry. While the average monthly residential electricity bill in the United States is \$115, or \$1,380 per year, a single hotel room cost almost twice as much. This significant disparity underscores the energy-intensive nature of hotel operations, which include various amenities, lighting, heating, cooling, and other services to meet the comfort and needs of guests. It is therefore increasingly important for hotels to adopt energy-efficient practices and sustainable measures to reduce their environmental impact and help mitigate climate change.

The impact of climate change on hotels extends beyond energy consumption, encompassing economic consequences as well. Empirical evidence from a comprehensive study reveals that the hotel industry's profits are significantly affected by temperature variations, exhibiting both spatial and seasonal differences. A study utilized a rich dataset of monthly financial records from over 1700 hotels across 50 US states during 2016–2018, representing approximately 3.2% of the national hotel industry (He et al. 2019). The research demonstrates that deviations from the optimal temperature range of 18 to 20 °C result in a decrease in the hotel industry's profit rate. This effect is driven by various factors, including reduced customer numbers, decreased revenue, and higher costs per occupied room, partially attributed to increased electricity and water usage. The implications of this impact can be long-lasting and vary depending on the hotel's chain scale, with higher-end hotels experiencing a relatively less severe impact according to the study.

Furthermore, certain research has delved into consumer perception points of view regarding environmentally friendly hotels as a strategic policy (e.g., Kim et al. 2012). For instance, ecologically innovative (green) hotels are now expected to set the benchmark in protecting the environment and mitigating human health hazards. The need for this study arises from the recognition that eco-innovative (green) hotels not only need to be established and promoted but also accepted and adopted by guests (Sharma and Chen 2023). The marketing of environmentally friendly hotels in China through religious segmentation has been explored using a theory of planned behaviour approach. This research investigates how religious beliefs and values can influence consumers' intentions and behaviours towards choosing eco-friendly accommodations (Wang and Wong 2020).

While the existing study sheds light on the economic and energy consumption impact of climate change on hotels and consumer perceptions, it is essential to acknowledge that vary-

ing perspectives on this issue exist, and there remains a substantial need to explore other aspects comprehensively. The statistics also reveal an opportunity for positive change. By embracing energy efficiency as a strategic priority, hotels can simultaneously improve their financial performance (Lee and Park 2009), and make a meaningful contribution to protecting the environment.

This study has the objective of identifying scientific research concentrating on climate change impacts on accommodation services and examining the most relevant outputs related to the management of accommodation services and exposure to climate change. Despite the growing importance of this topic, there is a notable scarcity of comprehensive studies examining the specific impacts of climate change on lodging establishments. Using a systematic literature review (SLR), the study aims to bridge this gap by providing a consolidated overview of existing research and identifying gaps in the current knowledge. By doing so, this study seeks to define a framework and research agenda to guide future investigations into the issue, ultimately offering valuable insights for stakeholders in the hospitality industry. The current study intends to address the following questions in its research:

- 1) What is currently understood and researched concerning the connection between accommodation services (and lodging establishments) and climate change?
- 2) What are the gaps in current research on the topic, and what areas require further investigation to develop a more comprehensive understanding of the issue?

Conducting an SLR is of utmost importance when it comes to gathering and analyzing existing literature comprehensively. It is required to make a rigorous and comprehensive search of the literature, ensuring that all relevant findings are included. This helps to emphasize topics requiring further research. It is seen as a way for saving time, likewise, prevent duplication of work (Snyder 2019).

This paper is structured with the first section introducing climate change and the relationship with accommodation services. The second section presents a brief state of the art related to the study, section three presents the methodology used for the SLR retrieving the most important pieces of work for this study, and section four illustrates the main findings of the SLR, and section five presents the main conclusions from the analysis of the SLR.

## 2 Facts about climate change and accommodation services

According to Koçak et al. (2020), Tourism's contribution to global carbon emissions remains debatable, yet it's evident that the industry suffers from the impacts of global warming. Embracing sustainable tourism policies is crucial to curbing environmental impact and shielding against climate change's adverse effects. As per the findings outlined in the report of the Second International Conference on Climate Change and Tourism in 2007, accommodations account for 21% of the overall emissions generated by the global tourism sector. (UNWTO & UNEP, 2008). Also, there is scant evidence indicating that the industry has commenced efforts toward low-carbon construction or retrofitting, as highlighted by Su et al. (2013).

Addressing climate change requires the implementation of technological, economic, and socio-cultural changes with the goal of reducing green house gas (GHG) emissions (Ben Youssef and Zeqiri 2022; Damm et al. 2017; Gössling et al. 2023; Gössling and Lund-Durlacher 2021; Hall et al. 2013; He et al. 2019). For the tourism industry to make a meaningful

impact on the global emission reduction targets, it must engage in significant emissions cuts. The most effective improvement approach should involve a range of strategies, including voluntary acts, fiscal incentives, and monitoring instruments. This should be directed toward a variety of stakeholders as delineated in the following strategies:

- Reducing GHG emissions involving cutting energy use, necessitating collaboration among stakeholders, especially accommodation providers. Adapting management practices to evolving climate challenges is vital.
- Enhancements in energy efficiency for reduction of energy demand. The adoption of new technologies in aviation is estimated to result in potential CO<sub>2</sub> reductions of up to 50%. Similar endeavors are being pursued within the accommodation sector.
- All forms of renewable energy hold significance for the tourism industry, with their economic viability, feasibility, and technical aspects closely interlinked.
- Advocating ecologically sound CO<sub>2</sub> storage involves preventing deforestation. Accommodation services integrate carbon offsetting by assessing guest footprint and initiating tree-planting.

For instance, Gössling and Lund-Durlacher's (2021) study on energy use and greenhouse gas emissions in Austrian accommodations indicates potential for decarbonization despite lower emissions compared to transportation. The detailed assessment identifies reduction opportunities, proposes effective management interventions and policies. Its insights are vital for policymakers, industry experts, researchers, and the public, underscoring the sector's significance in reducing emissions and guiding sustainable practices.

As a matter of fact, the accommodation sector is both implicated in sustainability issues and offers solutions. People's perceptions of hotels, especially tourists', directly affect business (Gössling et al. 2016; Torres-Bagur et al. 2019). Merli et al. (2019) emphasized the business impact, highlighting guest satisfaction's pivotal role in fostering customer loyalty. Sustainable practices in hotels positively influence guest satisfaction and loyalty compared to non-sustainable ones, emphasizing guests' appreciation for eco-friendly efforts.

In summary, this succinct analysis of the state-of-the-art in climate change impacts on accommodation services offers a snapshot of the current landscape. It lays the groundwork for future exploration, encouraging further research into the complexities of climate change to contribute to ongoing knowledge expansion.

### 3 Methodology

An SLR was conducted for a methodical and comprehensive approach to analyzing existing research studies on climate change and the relationship to accommodation services. It involves identifying, evaluating, and synthesizing relevant literature to provide an overview of the existing knowledge. This type of review follows a predefined protocol aiming to minimize bias by incorporating rigorous search strategies and inclusion/exclusion criteria topics (Denyer and Tranfield 2009; Fragoso et al. 2020; Tranfield et al. 2003).

Literature reviews are indeed used in various fields of research, and they serve as critical components in the research process. Both systematic literature reviews and narrative

reviews have their significance, but they differ in terms of methodology and objectives (Subramanian et al. 2022).

SLRs are particularly useful when the research question demands an objective, evidence-based, and replicable synthesis of existing literature. The concept of systematic reviews can be traced back to the medical field, where researchers started using systematic methods to evaluate the effectiveness of healthcare interventions. By conducting SLRs, researchers in the field can enhance the knowledge base, inform policymaking, and for example improve medical practices. This rigorous approach ensures that the findings are reliable and can be replicated, contributing to the overall progress and success of science. Through the synthesis of existing research, gaps in knowledge can be identified, leading to further investigations and breakthroughs in the field (Denyer and Tranfield 2009).

In the social sciences, SLRs gained popularity and recognition later, but their roots can be found in earlier practices of comprehensive literature reviews and meta-analyses (Moher et al. 2009). Researchers in fields like psychology, education, sociology, and other social science disciplines began adopting the systematic approach to review the growing body of literature and provide evidence-based insights into various research questions. As evidence-based practices gained prominence, researchers recognized the need for rigorous and transparent methods to synthesize research findings systematically. Consequently, systematic reviews and meta-analyses became more prevalent in social sciences research (Chapman 2021).

### 3.1 Data collection and selection

In June 2023, the first set of keywords (“Climate change”; Adaptation; Hotel) was inserted on the Web of Science (WoS), a reputable scientific database, allowing to find 80 scientific documents dating from 2009 to 2023 and identify potential reviewers for an ad-hoc procedure. In the initial phase of the SLR, an examination of the WoS search disclosed that the first three authors contributing to this topic were recognized as Susanne Becken with 7 publications, Maria Torres-bagur, with 4 publications, and David Weaver, with also 4 publications. An email was sent to each author explaining the purpose of the research and kindly asking them to validate the set of keywords-strings used for this research.

After one week, no answer was received, and other academics with international reputations and acknowledged work on this topic, but not necessarily linked to the keywords-strings in the WoS were contacted.

Michael Hall stated that “you definitely need other terms I think - or otherwise define exactly what you mean by a hotel? as there are many cognate terms like lodging, accommodation etc. “, and Oscar Frausto stated that: “in the analysis of climate change there are the following concepts: Vulnerability (climate vulnerability), mitigation, exposure (exposure to CC) and impacts”.

Therefore, step two consisted of the new keywords combined into search strings (Fragoso et al. 2020) to find as many documents as possible related to the topic in the WoS as described in Table 1. To enhance understanding of the subject and conduct a more thorough SLR, the same search strings were utilized when querying the Scopus database.

The inclusion of these strings resulted in an additional 10 documents beyond the initial search in the WoS, significantly enhancing precision in locating scientific data pertinent to the study’s topic. The Scopus search yielded nearly 2000 documents for the SLR, primarily

**Table 1** Keywords strings used for the systematic literature review

String	N° of documents WoS	N° of documents Scopus
1. “Climate change” (All Fields) and “hotel management” (All Fields) and resilience (All Fields)	9	23
2. ((ALL=(“Climate change impact”)) AND ALL=(“accommodation sector”)) AND ALL=(mitigation)	7	16
3. ((ALL=(“Climate change impact”)) AND ALL=(“accommodation sector”)) AND ALL=(vulnerability)	5	22
4. “Global warming” (All Fields) AND accommodation (All Fields)	69	
5. “Global warming” (All Fields) AND “accommodation establishment” (All Fields)		16
<b>Total</b>	<b>90</b>	<b>77</b>

**Table 2** Criteria and rationales for exclusion

Criterion	Rationale
Publications found in academic books or any non-scholarly sources	Despite the inclusion of scholarly books, those intended for broader readerships or authored by non-experts may lack scholarly attributes. The certainty of a blind review is not guaranteed. For rigorous academic research, it is crucial to critically evaluate sources, prioritizing scholarly materials for accuracy and reliability. In this SLR, we deliberately exclude non-scholarly sources, even though media frequently discusses climate change impacts on accommodation settings.
Duplicated articles	Articles must have only one entry
Research conducted in unrelated fields or studies that fall outside the scope of climate change, and accommodation settings	To ensure the relevance of the final sample and maintain a focus on the impacts of climate change on the lodging domain, papers that centre around topics unrelated to climate change, hotel management, or those conducted in contexts outside the scope of climate change’s influence on lodging are excluded from consideration.

Adapted from (Fragoso et al. 2020)

driven by the inclusion of 1899 documents associated with string #4. Acknowledging the need for increased specificity, the authors introduced string #5, integrating the term “establishment” into the search aligned with the paper’s title. This adjustment led to the discovery of 16 pertinent papers, contributing to a total of 77 documents utilized in the Systematic Literature Review (SLR) from Scopus.

Applying this string in the WoS yielded only 6 documents, a notable contrast to the 69 obtained previously for a more comprehensive analysis. Consequently, string #4 was exclusively used in the WoS, while string #5 was solely employed in Scopus.

The third phase entailed applying the exclusion criteria, as detailed in Table 2, to the total of 167 documents, aiming to sift out papers not aligned with the SLR’s intended scope. papers published in non-scientific journals were excluded from the study due to the absence

of a blind reviewing process. Furthermore, repeated articles and those focused only on climate change, and not related to accommodation settings were removed to ensure reliability.

In the final step, inclusion criteria were applied to ensure that the documents discussed in the SLR meet specific conditions. By applying these inclusion criteria, the study aims to select papers that meet these quality standards and have the potential to contribute meaningfully to the systematic review. This ensures that the papers selected for analysis are rigorous and relevant and add value to the understanding of the topic under investigation.

Therefore, the inclusion criteria were formulated to guarantee the following aspects:

1. The papers should have clear and focused research questions that are relevant to the topic of the systematic review.
2. The papers should provide a clear description of the sample or participants involved in the study.
3. They should also outline the methodology used to collect data or conduct the research, ensuring transparency and replicability.
4. The papers should include a thorough discussion of the findings or results obtained from the research.
5. The papers should make a distinct and valuable contribution to the existing body of knowledge in the field. This contribution can be in the form of new insights, theoretical advancements, empirical evidence, or practical implications.

The search, selection, exclusion, and inclusion process provided 39 papers (see Annexe I and Annexe II) for analysis as described in Table 3.

### 3.2 Data analysis

The methodology for data analysis followed a qualitative research approach with MAX-QDA Plus 2022, involving analysing textual data extracted from the SLR to identify patterns, themes, and insights. Coding included the list of keywords used in the SLR to label and categorize the content from the 39 papers. Table 4 illustrates the coding used for content analysis:

All extractions were analysed for content analysis (Rädiker and Kuckartz 2020; Richards 2023), and Fig. 1 provides an overview of the number of papers used in this SLR, found in the WoS and Scopus database. We can observe that from 2012 to 2019, there were up to three papers published and listed within the chosen key strings, and afterwards, there was denotated more publication addressing the topic of climate change impacts on accommodation services.

The research on climate change impacts within accommodations explores various facets, particularly focusing on adaptation and mitigation in coastal regions. It underscores the energy needs in tourism, associated greenhouse gas emissions, and the crucial need

**Table 3** Resume of the selection of papers for systematic literature review

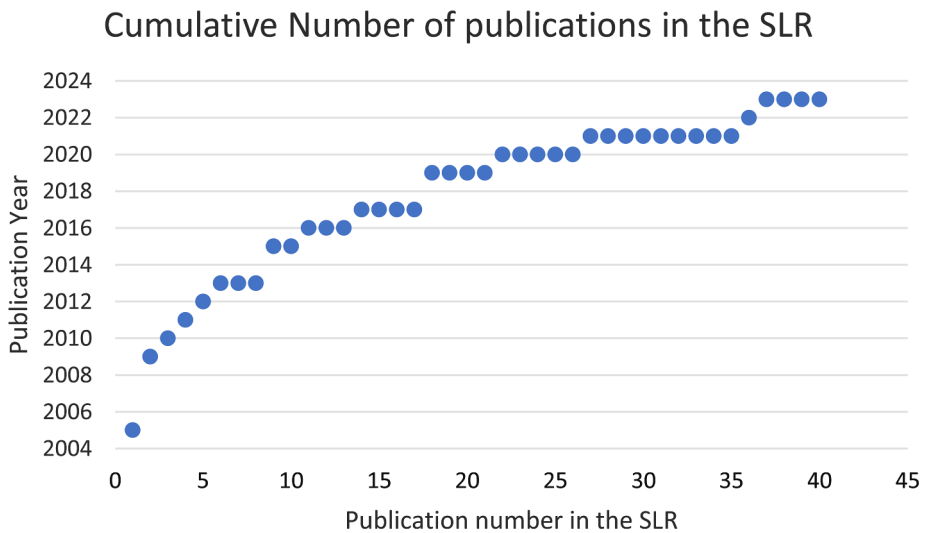
Condition	WoS	Scopus	Total
Academic papers found with the first keywords	80	77	167
Academic papers found ad-hoc (4 strings)	90	3	8
Papers excluded based on Criterion 1	5	18	18
Papers excluded based on Criterion 2	1	40	101
Papers excluded based on Criterion 3	61		
<b><i>The final sample of papers for the SLR</i></b>	<b>23</b>	<b>16</b>	<b>39</b>

**Table 4** List of codes used for content analysis

Code list	Remarks
Climate change	Related to changes due to climate change.
Climate change impact	Any impact derived from climate change.
Vulnerability	How people and organisations show their exposure to climate change.
Mitigation	Forms for mitigating impacts from climate change.
Resilience	Forms and actions reflecting resilience related to climate change affecting people and organisations.
Adaptation and adaptive capacity	Measures for adaption to a new reality derived by climate change impact.
Hotel accommodation	Accommodation settings in hotels.
Accommodation sector	Forms of accommodation and their relationship with climate change.
Hotel management	Management Styles, and Actions in Hotel Accommodation
Operational Challenges	<ul style="list-style-type: none"> <li>- Climate change can pose operational challenges for lodging establishments, affecting their day-to-day activities and service delivery.</li> <li>- Increased temperatures may require enhanced cooling systems and energy consumption, impacting operational costs and carbon footprints.</li> <li>- Water scarcity and changing precipitation patterns may necessitate water management strategies, such as efficient irrigation and water recycling, to maintain landscaping and amenities.</li> <li>- Extreme weather events can disrupt operations, leading to cancellations, property damage, and evacuation procedures.</li> </ul>
Quantitative method	Quantitative approach.
Qualitative method	Qualitative approach.
Changing Guest Preferences and Behaviour	<ul style="list-style-type: none"> <li>- Climate change awareness among guests seeking environmentally sustainable accommodation options.</li> <li>- Travelers showing a preference for eco-friendly hotels and resorts that employ energy-efficient practices, waste reduction initiatives, and green certifications.</li> <li>- Sustainable tourism practices, such as nature conservation and community engagement.</li> <li>- Lodging establishments that proactively adopt sustainable practices.</li> </ul>
Regulatory and Policy Considerations	<ul style="list-style-type: none"> <li>- Governments and regulatory bodies introducing policies to address climate change mitigation and adaptation in the hospitality sector.</li> <li>- Environmental regulations, building codes, and energy efficiency standards impact the design, construction, and operation of lodging establishments.</li> <li>- Incentives and grants available to support sustainable practices, renewable energy adoption, and carbon reduction initiatives.</li> <li>- Collaboration between policymakers, industry associations, and lodging.</li> </ul>
Infrastructure Adaptation and Resilience	<ul style="list-style-type: none"> <li>- Discuss the measures taken by lodging establishments to adapt to climate change and enhance their resilience.</li> <li>- Highlight examples of sustainable building practices, renewable energy adoption, and water conservation strategies.</li> </ul>

for deploying strategies to adapt and mitigate these effects. The emphasis on coastal areas suggests vulnerability, urging for proactive measures. Understanding the interplay between energy demands, emissions, and adaptation strategies is pivotal for developing sustainable practices within accommodations, ensuring they effectively address and navigate the challenges posed by climate change impacts, especially in vulnerable coastal regions.





**Fig. 1** Publications in the SLR focussed on climate change impacts on lodging establishments

## 4 Findings and discussion

### 4.1 Theme 1: accommodation settings and climate change

Within the hospitality sector, accommodations are regarded as primary contributors to greenhouse gas emissions. This is attributed to their extensive use of air-conditioning, substantial energy requirements, and their occupancy of significant natural areas crucial for conservation and coastal protection (Gössling et al. 2023). It has been considered that accommodation accounts for 21% of total estimated CO<sub>2</sub> emissions generated overall by tourists (Howitt et al. 2010; Leyva and Parra 2021), and as stated by Lenzen et al. (2018, p. 5) “the carbon footprint of tourism is comprised by not only transport, but by the energy and commodities purchased by travellers including food, souvenirs, and accommodation”.

Hospitality businesses like hotels and resorts significantly contribute to climate change through substantial carbon dioxide emissions, water consumption, and waste disposal (Gössling et al. 2023; Reid et al. 2017). It is also understood that energy consumption (Becken 2005) is linked to the hotel star-rating, the range of services they offer, and their heating and cooling requirements. According to Gössling and Lund-Durlacher (2021, p. 3), “guest profiles also have a significant role in energy consumption, as there is evidence that specific nationalities have expectations leading to higher energy use”. The studies encompass energy use, climate change, and emissions in the accommodation sector. They delve into diverse topics, including operators’ perceptions of energy usage, the potential for increased utilization of renewable energy sources in tourism, and emissions associated with various accommodation types (Gössling et al. 2023).

Gössling et al. (2011) and Simpson et al. (2008) highlighted that the infrastructure and equipment in hospitality services increase susceptibility to climate change effects. Ben Yousef and Zeqiri (2022) proposed mitigating measures, suggesting optimizing energy con-

sumption, utilizing efficient building design, and integrating greenery in and around structures to mitigate the heat island effect and maintain cooler environments.

For this reason, the investments in thermal insulation reduce the need for energy consumption, either for warming up in winter, wither for cooling in summer (Gössling and Lund-Durlacher 2021).

An alternative viewpoint associates climate change with accommodation services, indicating that facilities offering equivalent comfort can display differing environmental metrics due to various factors. These encompass the technology utilized in equipment, resource consumption patterns, building longevity, and occupancy rates, all impacting the overall sustainability performance. This means that despite consistent guest comfort, the environmental impact of accommodation services can significantly vary. (de Souza et al. 2021).

Based on the United Nations Environment Programme (2011) report about Tourism, Energy and Resource Efficiency, Camelia et al. (2020) considered the data focused on CO<sub>2</sub> emissions a good setting for studying the contribution of accommodation and food service to climate change. Accommodation has a high energy demand, making a significant contribution to GHG emissions.

Tourist accommodations use varied energy sources like hydro or diesel-generated electricity, alongside petrol, diesel for vehicles, and widespread use of LPG. Some employ renewable energy, notably solar-based systems (Becken 2005). For example, cooling systems such as air-conditioning requiring more than 800KW per year, must improve energy efficiency by implementing a monitoring system with acknowledgeable energy-saving planning. These measures can help optimize energy consumption and reduce environmental impact (Su et al. 2013). Also, the demand for energy is associated to technical operations related to pumping systems, desalination and cooling water (Azevedo de Almeida & Mostafavi, 2016).

Despite the prevailing energy wastage in most accommodation establishments, there is often limited interest in energy-saving practices, partly due to the perceived low cost of energy (Su et al. 2013). Numbers for calculating guest emissions vary among different authors, and they depend also on the type of accommodation (Gössling, 2010). The calculation of direct emissions related to energy throughput does not consider food processing and service (Gössling and Peeters 2015).

From being significant consumers of energy within the tourism sector and serving as hubs for various stakeholders, accommodation establishments can play an important role in decarbonization. They are considered tourist assets contributing greatly to greenhouse gas emissions (UNWTO & UNEP, 2008). According to Baca-Motes et al. (2013), Goldstein et al. (2008), Gössling et al. (2019), and Cvelbar et al. (2017) a measure for saving energy targets good practices in the guest room, such as procedures for towels and bed-linen use and washing, and an optimized use of air-conditioning units.

Agreeing to the literature, custom strategies for climate change awareness should be implemented by each accommodation, emphasizing the communication of green credentials as a mark of superior quality in promoting eco-friendly features. (Gössling and Lund-Durlacher 2021). Although, according to Gossling & Higham (2021), investments in technology aimed at reducing the ecological footprint still carry a significant cost. However, the prevailing perception highlights low-carbon models to enhance economic resilience and sustainability.

A different perspective is linked to systemic risks arising from climate change going beyond the direct impact of changes in global mean temperature. These risks are instead shaped by countless socioeconomic processes, including development guidelines and sophisticated interactions in the surroundings (Loehr 2020). Nevertheless, several businesses, notably five in the Mamanuca Islands, seemingly unaffected by climate change factors despite their vulnerability, raise questions. This paradox warrants research to determine if these resorts are truly unaffected, well-adapted, or unaware of climate change impacts (Becken 2005).

The growing uncertainty and susceptibility of the global tourism system mentioned by Scott et al. (2012) points out the importance of destinations in recognizing the mutually reliant risk of low profitability, GHG emissions, and respective climate change. This call for fundamental changes in destination management, moving away from tourist arrivals dependency, and instead adopting sustainable approaches addressing current challenges.

For example, while hotel guests may be aware of natural disasters due to media coverage, they often lack awareness of business strategies implemented by hotels to address climate change issues (Su et al. 2013). For example, short-term weather forecasts assist in pinpointing locations and timing of potential flash floods, enabling operational activation of tourism disaster preparedness plans, including evacuating vulnerable coastal hotels when flood warnings are issued (Mahon et al. 2021).

In regards to coastal accommodation settings, Moreno (2010), and Moreno and Amelung (2009), argue that rising temperatures can be perceived as a positive aspect, but authors like Buzinde et al. (2010) point out as negative the rising sea level, and the loss of sand, as stated by Torres-Bagur et al. (2019).

Apart from climate denialism, these approaches encompass a range of stances, such as encouraging reasonable carbon emissions reductions, embracing climate adaptation or privileged accommodation as strategies, and engaging in climate opportunism.

The presence of privileged accommodation becomes more evident when examining efforts to handle climate change. Guiding principles related to “adapting” to climate change impacts, can be seen as a manifestation of “privileged accommodation” to the changing climate. This is especially relevant given the division within the corporate community, with some fiercely opposing carbon emission reductions and others providing only tepid support for minor emissions reductions (Bonds 2016).

According to Domhoff (2013), think tanks play a significant role in manipulating public opinion on behalf of the corporate community. To achieve this, books, and grey literature are written with other formats in social media supporting understandings of crucial matters that align with the interests of big business. Shaping public opinion on climate change and climate science is one specific example of the opinion-shaping work they undertake (Bonds 2016).

The future outlook for tourism entails the internalization of climate change costs, which poses challenges, particularly for industries with narrow profit margins (Anderson et al. 2022).

Based on the trends and focus areas presented in the text, it was possible to create clusters categorized as follows:

#### *Cluster 1: GHG Emissions and Environmental Impact of Accommodation*

- The cluster underscores the substantial role of accommodations in greenhouse gas

emissions, attributing it to factors like air-conditioning usage, energy demand, and land occupation in natural areas. Additionally, it involves discussions that explore diverse environmental indicators, strategies for energy optimization, and the notable energy demands associated with accommodations.

#### *Cluster 2: Energy Efficiency and Technology in Accommodation*

- The cluster highlights the significance of energy-saving practices, underscoring the imperative for enhancements despite prevalent energy wastage, and examining the role of technology in reducing ecological footprints. It also includes recommendations aimed at conserving energy through specific practices implemented in guest rooms.

#### *Cluster 3: Sustainability and Adaptation Strategies in the Tourism Industry*

- The cluster encompasses discussions on tailor-made strategies addressing climate change, emphasizing the communication of green credentials, and advocating for sustainable approaches in destination management. It also considers the outlook for tourism, focusing on the internalization of climate change costs and the challenges faced by industries with narrow profit margins.

#### *Cluster 4: Impact of Climate Change and Socioeconomic Factors on Accommodation*

- The cluster examines the vulnerability of accommodations to climate change, specifically their susceptibility to rising temperatures and the consequential effects on coastal areas. Additionally, it delves into the broader perspective of systemic risks associated with climate change, encompassing socioeconomic processes and development guidelines.

## **4.2 Theme 2: regulatory and policy considerations**

Barriers to implementing climate change mitigation or adaptation were identified by various businesses surveyed. Some of these barriers included a lack of knowledge, incentives by the government, financial limitations, inadequate legislation, and customer expectations counteracting specific measures (Becken 2005).

For example, the collaboration between entrepreneurs and the government enhances Corporate Social Responsibility (CSR) actions in tourism destinations and tends to receive better acceptance from the local communities (Rahmawati et al. 2019).

Based on findings, policy entrepreneurs aim to advance their proposals through responsive accommodation offering a more inclusive setting where guests should carefully consider the advantages and disadvantages of this approach. Its suitability might vary across different contexts, and what works well in one circumstance may not be as effective in another (Bullock and Theodoridis 2017). Hence, there is a need for improvement in communicating inclusive criteria related to accommodation (Gössling and Lund-Durlacher 2021).

Camelia et al. (2020) studied several authors interested in regulatory and policy considerations, considering that the importance of energy-efficiency regulations as a mitiga-

tion strategy is emphasized by offering rewards to accommodation and catering businesses reducing GHG and imposing consequences on those that fall short. This can be an incentive for energy-savings, and improvements of their environmentally friendly image by balancing negative impacts from GHG. As per Dwyer et al. (2012) a carbon pricing system in hospitality should be agreed upon to encouragement of tourists to look after energy-efficient settings, and responsible travelling practices.

Resuming, the correlation between policymaking and vulnerability to climate change in tourist destinations transforms into the influence of decision-making, policies, and strategies on vulnerability (Becken 2005).

### **4.3 Theme 3: changing guest preferences and behavior**

Encouraging travellers to make environmentally sustainable choices in their accommodation planning can have a significant impact on promoting positive transformation. However, for this empowerment to be effective, travellers need access to consistent and reliable information, as well as various green options, to make informed decisions (GSTC 2022; Travalyst 2023).

Gössling et al. (2011), Juvan et al. (Juvan et al. 2018), Mair and Bergin-Seers (2010) observed that some individuals exhibit pro-environmental attitudes when it comes to energy conservation, while the majority of people tend to be resistant to altering their behaviour in leisure-related contexts. Guests' increasing preference for eco-friendly accommodations compels providers to embrace sustainable measures for energy, water, and waste reduction. It must be understood that guest behaviour directly affects resource utilization, impacting the environment. Hence, the industry responds by advocating sustainability, investing in energy-efficient technology, and educating guests, becoming vital in combating climate change effects.

### **4.4 Theme 4: vulnerability to climate change**

Vulnerability is frequently discussed concerning biophysical consequences, such as the impacts of sea-level rise, bushfires, or coastal erosion (Rahmawati et al. 2019). However, is linked also to resilience by the power of adapting to a new circumstance.

Vulnerability is defined as “the propensity or predisposition to be adversely affected. It encompasses a variety of concepts and elements including sensitivity or susceptibility to harm and lack of capacity to cope and adapt” (IPCC 2014, p. 5). Subsequently, accommodation establishments are deemed susceptible to the effects of climate change, with restricted possibilities for adaptation. (Gössling and Lund-Durlacher 2021). Hence, hotels are considered a fixed asset, and they are also more vulnerable to climate change (Su et al. 2013).

The changing weather patterns have introduced new vulnerabilities for tourism. Tourists may now opt for destinations that are more resilient to weather variations, leading to last-minute accommodation bookings, cancellations, or switching to alternative destinations. As consequence, adaptation to these shifts is becoming crucial for the tourism industry (Gössling et al. 2016; Scott et al. 2012).

We all know that weather conditions influence guest bookings. For example, being Austria a well-known country for winter activities, in January 2019 roads were closed because of extreme snowfall, affecting bookings (Gössling and Lund-Durlacher 2021). The opposite

event was reported by rising temperatures leading to several droughts influencing water levels, biological quality parameters (Torres-Bagur et al. 2019).

The water scarcity and low humidity levels create favorable conditions for forest fires (Scott et al. 2012). When these fires occur, the air quality significantly deteriorates, posing health risks due to exposure to smoke, particles, and heat, thereby affecting tourism destinations. Additionally, the aftermath includes damage to accommodation facilities, potentially diminishing the appeal of the affected area and adversely impacting the local economy. (PĂCURAR 2015).

Accommodation services are at risk in any latitude because climate change affects globally. It is estimated that at least 50% of accommodations are vulnerable to sea level rise (Sagoe-Addy and Appeaning Addo 2013). Aligned with this, certain research outcomes empower insurance companies to modify their business models and premiums in response to losses and risk exposure from natural hazards. Construction firms involved in hotel development can reevaluate designs and safety protocols in relation to susceptibility to precipitation and the proximity of water systems (Yum et al. 2020).

The main idea highlights the vulnerability of accommodation services in the tourism industry due to climate change impacts such as sea-level rise, extreme weather, and natural disasters. This vulnerability influences guest behaviour, affects bookings, and poses risks to accommodation infrastructure globally, prompting the need for adaptation strategies, insurance adjustments, and revised construction protocols to address environmental risks.

#### 4.5 Theme 5: mitigating climate change

In this paper, various mitigation approaches for accommodation services are identified, aiming to reduce CO<sub>2</sub> emissions in the tourism industry (Camelia et al. 2020).

A perspective involves emphasizing the significance of architecture and sustainable design in constructing passive houses. Energy-efficient structures and sustainability initiatives contribute positively to environmentally friendly solutions, thereby minimizing their impacts.

It was identified the need for training environmentally conscious professionals, crucial for effectively mitigating the impacts of climate change (Gössling and Lund-Durlacher 2021), and there are initiatives supporting people with disabilities working in hotels, empowering local communities by providing them with access to free education and specialized skill training opportunities (Rahmawati et al. 2019).

CSR actions in tourism destinations can lead to nature conservation for fighting climate change. Through green human resources, environmental awareness leads to more pro-environmental actions among local communities (Rahmawati et al. 2019). Resorts tackle erosion with seawalls, tree planting (coconut palms/mangroves). However, these structures often induce erosion elsewhere, requiring additional protection measures. Erosion worsens without modern construction approaches (Becken 2005).

On the other hand, relief actions to rising sea levels or other calamities can be taken as a strategy linked to adaptive capacity (Rahmawati et al. 2019). For example, in Ghana, coastal development is thriving, but sea levels rising are not taken in consideration. Still, climate change issues deployed meetings to address mitigation strategies (Sagoe-Addy and Appeaning Addo 2013).

The implementation of awareness programs for facility operators, focusing on environmental and climate change issues, will enhance adaptation and mitigation strategies. This, in turn, will help reduce the vulnerability of tourism facilities to sea level rises and other critical infrastructure, such as roads, which carry significant social implications. By promoting informed decision-making and sustainable practices, these initiatives aim to safeguard tourism facilities from potential risks posed by climate-related challenges (Sagoe-Addy and Appeaning Addo 2013).

The identified aspects underscore varied mitigation strategies in accommodation services for reducing CO<sub>2</sub> emissions in the tourism sector. These strategies include sustainable design in architecture, training environmentally conscious professionals, empowering local communities, implementing CSR actions (De Grosbois and Fennell 2022) for nature conservation, and adapting to rising sea levels (Becken 2005). Efforts also focus on waste management, electricity consumption, and promoting informed decision-making through awareness programs (Nhep et al. 2021).

#### **4.6 Theme 6: resilience to climate change**

To effectively reduce the effects of global climate change, it is crucial to prioritize actions at the local level. This approach is essential because the consequences are predominantly experienced and directly impact local communities. By implementing targeted and context-specific measures, local initiatives can play a vital role in building resilience and combating the challenges posed by climate change (Lindseth 2004).

The resilience of tourism establishments is intricately connected to the resilience of the communities in which they operate. This connection plays a vital role in their collective ability to rebound and recover from various events and challenges (Loehr 2020).

The basic concepts for addressing resilience to climate change involve the ability to adapt to climate change adversities, resilience, linked to the level of exposure to potential harm or incapacity to respond to adverse conditions, vulnerability, and the capacity to adapt to a new circumstance resulting from climate change (Rahmawati et al. 2019).

Local-level actions prioritize mitigating global climate change effects, directly benefiting communities (Reid et al. 2017). Context-specific measures enhance resilience, crucial for both tourism establishments and localities. Resilience, adaptability to adverse conditions, vulnerability, and capacity to embrace change are fundamental concepts. Strengthening community resilience translates into strengthening the tourism sector's ability to navigate climate-related challenges.

#### **4.7 Theme 7: adaptation to climate change**

Adaptation is considered very important for fighting climate change because is driven by current effects, or it is an anticipation of potential effects of climate change. Adaptation is directed to reduce damage or destruction from climate risk (Loehr 2020).

Adaptation requires strategies to prepare communities addressing climate change issues and integrate solutions into their lives with minimal disruption. To develop community adaptive capacity, it is important that individuals can adapt, and community leaders are capable to work on combined actions. Hence, communication must be clear, and effective, and the community must be engaged in tackling climate change with the available funding.

Native culture and practices must be considered in any plan of action (Rahmawati et al. 2019).

It is acknowledgeable that tourist destinations face many challenges in adaptation to climate change (Gössling and Higham 2021), but “by undertaking social responsibility initiatives, tourism businesses could enhance community adaptive capacity to climate change” (Rahmawati et al. 2019, p. 1270).

Research has indicated that incorporating social responsibility measures within hotels leads to improved well-being among staff members and strengthens their sense of affiliation with the company. These initiatives not only enhance the working environment but also foster a deeper connection and commitment from employees to the hotel’s mission and values (Gössling and Lund-Durlacher 2021).

The effects of climate change will be substantial on tourism communities. However, there is a lack of comprehensive understanding regarding how the CSR efforts of businesses contribute to building the adaptive capacity of these communities to cope with climate change. Look to the example of Bali, which has two factors increasing vulnerability to climate change, vulnerable to rising sea water and low altitude lands being crowded with human settlements (Rahmawati et al. 2019).

Technological advances can be introduced in hotel operations for assisting the decision-making process to tackle abusive energy consumption and be more energy efficient. (Khatib 2023). For instance, energy demand can be assisted with photovoltaic production (Gössling and Lund-Durlacher 2021).

As complementary actions, travel agencies, tour operators, and Internet platforms could promote and emphasize environmentally friendly accommodation establishments. By showcasing and featuring eco-conscious options, they can encourage travellers to make more sustainable choices while contributing to the growth of environmentally responsible tourism (Gössling and Lund-Durlacher 2021).

There are jobs linked to the circular economy sustaining local community groups, which can also be part of CSR initiatives (Rahmawati et al. 2019). The circular economy is a regenerative economic model that aims to minimize waste and maximize resource use by promoting the reusability, repairability, and recycling of products and materials. Jobs related to the circular economy can have a positive impact on the environment, society, and the local economy.

In regard to migration, adaptation strategies can demand strategic joint actions of two countries. It is important to recognize that climate-induced migration is a complex and multifaceted issue that requires a global response (Khatib 2023). International collaboration, negotiation, and joint actions are necessary to effectively address the challenges posed by climate-induced migration and to ensure the protection and well-being of affected communities across borders.

The implementation of awareness programs for facility operators, focusing on environmental and climate change issues, will enhance adaptation and mitigation strategies. This, in turn, will help reduce the vulnerability of tourism facilities to sea level rises and other critical infrastructure, such as roads, which carry significant social implications. By promoting informed decision-making and sustainable practices, these initiatives aim to safeguard tourism facilities from potential risks posed by climate-related challenges (Sagoe-Addy and Appeaning Addo 2013).



## 5 Conclusion

Responding to the proposed objective of pinpointing scientific research focused on climate change's influence on accommodation services and assessing pertinent findings concerning their management and climate exposure, key publications in WoS and Scopus were retrieved, denoting quality documents and a replicable framework for future research in this domain.

Answering to what is currently understood and researched concerning the connection between accommodation services (and lodging establishments) and climate change, the research emphasizes the substantial impact of accommodation services on climate change due to their significant energy consumption and GHG emissions. Studies explore sustainable practices, including energy efficiency, waste reduction, and guest behaviour modification, as crucial avenues to minimize environmental footprints. Additionally, research examines the vulnerability of lodging establishments to climate shifts, necessitating adaptive strategies to ensure long-term resilience and sustainability in the face of changing environmental conditions (Azevedo de Almeida & Mostafavi, 2016; Camelia et al. 2020; Dolnicar et al. 2017; Gössling and Higham 2021; Merli et al. 2019; Nhep et al. 2021).

Accommodation services presently lack robust communication strategies with guests regarding environmental practices, impacting eco-friendly choices. Despite attempts, some guests do not engage in energy-saving practices (Gössling and Lund-Durlacher 2021; Simancas Cruz and Peñarrubia Zaragoza 2019). Furthermore, escalating weather extremes due to climate change, like heatwaves and storms, heighten vulnerability in accommodations, demanding enhanced infrastructure and disaster readiness (Azevedo de Almeida & Mostafavi, 2016).

Climate change influences shifting tourism patterns, impacting popular destinations' seasonality and peak seasons. To adapt, accommodation providers must diversify offerings, adjust marketing strategies, and staffing levels accordingly. Moreover, rising sea levels and coastal erosion pose significant threats to coastal communities and accommodations. Investing in protective measures, sustainable building practices, and shoreline management becomes crucial for long-term viability (Mahon et al. 2021; Pathak et al. 2021; Pegg et al. 2012; Rahmawati et al. 2019).

In conclusion, climate change poses significant challenges and opportunities for accommodation settings. Understanding and addressing the impacts of climate change are essential for ensuring the resilience and long-term sustainability of the tourism industry. Accommodation providers can proactively adapt to these changes, integrate sustainable practices, and engage in collaborative efforts to mitigate risks and leverage opportunities presented by a changing climate.

The considered studies align with emerging trends for mitigating climate change in the hospitality industry. For example, CSR is advocated as a crucial tool for linking accommodation settings with local businesses and communities, fostering awareness campaigns and investing in green human resources. These actions empower employees, enhance understanding of climate change risks, and contribute to broader mitigation efforts (Gössling and Lund-Durlacher 2021; Rahmawati et al. 2019).

As practical implications, there is enough evidence that further research must be conducted to identify additional studies. Accommodation services and actions for mitigating climate change exposure carry an important role in sustainable tourism development

(Cerutti et al. 2016). There is a need to identify good practices for management that benefits both entrepreneurs and local communities.

Accommodation services are connected to climate change, but the literature tends to concentrate mostly on energy usage and greenhouse gas emissions (De Grosbois and Fennell 2022), and current practices for adaptation (Liu-Lastres et al. 2020; Loehr 2020; Tsai et al. 2020). Numerous authors document environmental practices like energy management, waste reduction, recycling, staff education, and sustainable business methods (Leyva and Parra 2021). However, there's a gap concerning the outcomes of these practices—specifically, the socio-economic impacts and how businesses monitor these effects. In essence, there's a lack of insight into the socioeconomic benefits and how businesses assess their impact.

Current gaps in research on climate change and accommodation services demand exploration in key domains. Primarily, more extensive studies are needed to delve into the economic ramifications of climate change on lodging establishments, encompassing financial vulnerabilities, market fluctuations, and sustainable long-term strategies. Understanding guest behaviours towards sustainable practices requires deeper analysis to develop effective eco-friendly strategies. Additionally, comprehensive research on the efficacy of sustainable initiatives in curbing accommodations' carbon footprint is crucial. Exploring emerging technologies and innovative design for climate-resilient accommodations is essential for future adaptation and mitigation strategies. Lastly, there's insufficient research on the impacts of the Sustainable Development Goals in this context.

## Annexe I: Articles extracted from the WoS for the SLR

Authors	Source Title	Publication Year
Bullock, G; Theodoridis, AG	Addressing concerns about climate policies: the possibilities and perils of responsive accommodation	ENVIRONMENTAL POLITICS 2017
Cerutti, AK; Beccaro, GL; Bruun, S; Donno, D; Bonvegna, L; Bounous, G	Assessment methods for sustainable tourism declarations: the case of holiday farms	JOURNAL OF CLEANER PRODUCTION 2016
Bonds, E	Beyond Denialism: Think Tank Approaches to Climate Change	SOCIOLOGY COMPASS 2016
Howitt, OJA; Revol, VGN; Smith, IJ; Rodger, CJ	Carbon emissions from international cruise ship passengers' travel to and from New Zealand	ENERGY POLICY 2010
Khatib, AN	Climate Change and Travel: Harmonizing to Abate Impact	CURRENT INFECTIOUS DISEASE REPORTS 2023
Sagoe-Addy, K; Addo, KA	Effect of predicted sea level rise on tourism facilities along Ghana's Accra coast	JOURNAL OF COASTAL CONSERVATION 2013

Authors	Source Title	Publication Year
Terpstra, T	Emotions, Trust, and Perceived Risk: Affective and Cognitive Routes to Flood Preparedness Behavior	RISK ANALYSIS 2011
Arnone, M; Canova, A; Balocco, S; Lazzeroni, P; Mariuzzo, I; Portoraro, A; Repetto, M	Environmental perspective of decarbonization actions in the Italian UNESCO site of the Vineyard landscape of Piedmont Region	ENERGY SOURCES PART B-ECONOMICS PLANNING AND POLICY 2023
Rahmawati, PI; Jiang, M; DeLacy, T	Framework for stakeholder collaboration in harnessing corporate social responsibility implementation in tourist destination to build community adaptive capacity to climate change	CORPORATE SOCIAL RESPONSIBILITY AND ENVIRONMENTAL MANAGEMENT 2019
Souza, HHD; Evangelista, PPD; Medeiros, DL; Alberti, J; Fullana-i-Palmer, P; Boncz, MA; Kiperstok, A; Goncalves, JP	Functional unit influence on building life cycle assessment	INTERNATIONAL JOURNAL OF LIFE CYCLE ASSESSMENT 2021
Su, YP; Hall, CM; Ozanne, L	Hospitality Industry Responses to Climate Change: A Benchmark Study of Taiwanese Tourist Hotels	ASIA PACIFIC JOURNAL OF TOURISM RESEARCH 2013
Kugiejko, M	Increase of tourist traffic on Spitsbergen: An environmental challenge or chance for progress in the region?	POLISH POLAR RESEARCH 2021
Falk, M; Vieru, M	International tourism demand to Finnish Lapland in the early winter season	CURRENT ISSUES IN TOURISM 2019
Yum, SG; Kim, JM; Son, K	Natural Hazard Influence Model of Maintenance and Repair Cost for Sustainable Accommodation Facilities	SUSTAINABILITY 2020
Torres-Bagur, M; Palom, AR; Vila-Subiros, J	Perceptions of climate change and water availability in the Mediterranean tourist sector A case study of the Muga River basin (Girona, Spain)	INTERNATIONAL JOURNAL OF CLIMATE CHANGE STRATEGIES AND MANAGEMENT 2019
de Almeida, BA; Mostafavi, A	Resilience of Infrastructure Systems to Sea-Level Rise in Coastal Areas: Impacts, Adaptation Measures, and Implementation Challenges	SUSTAINABILITY 2016
Camelia, S; Ion, HR; Marius-Razvan, S	The analysis of CO2 emissions determinants in accommodation and food service activities using quantile regressions	ROMANIAN STATISTICAL REVIEW 2020
Pacurar, A	THE CLIMATE CHANGE AND ITS IMPACT ON INTERNATIONAL DIMENSION OF TOURISM	CARPATHIAN JOURNAL OF EARTH AND ENVIRONMENTAL SCIENCES 2015
Russomanno, A	THE ETHICS OF HEAT: FUNDAMENTALS AND CHALLENGES IN ALLOCATING THE GLOBAL COMMONS	UNIVERSITY OF ILLINOIS LAW REVIEW 2009
Gössling, S; Higham, J	The Low-Carbon Imperative: Destination Management under Urgent Climate Change	JOURNAL OF TRAVEL RESEARCH 2021
Loehr, J	The Vanuatu Tourism Adaptation System: a holistic approach to reducing climate risk	JOURNAL OF SUSTAINABLE TOURISM 2020

Authors	Source Title	Publication Year	
Pablo-Romero, MD; Pozo-Barajas, R; Sanchez-Rivas, J	Tourism and temperature effects on the electricity consumption of the hospitality sector	JOURNAL OF CLEAN-ENER PRODUCTION	2019
Gössling, S; Lund-Durlacher, D	Tourist accommodation, climate change and mitigation: An assessment for Austria	JOURNAL OF OUT-DOOR RECREATION AND TOURISM-RESEARCH PLANNING AND MANAGEMENT	2021

## Annexe II: Articles extracted from Scopus for the SLR

Authors	Source Title	Publication Year	
Susanne Becken	A review of tourism and climate change as an evolving knowledge domain	Tourism Management Perspectives	2013
Guglielmo Ricciardi, Marta Ellena, Giuliana Barbato, Giuseppe Giugliano, Pasquale Schiano, Sara Leporati, Claudia Traina, Paola Mercogliano	Climate change adaptation cycle for pilot projects development in small municipalities: The northwestern Italian regions case study,	City and Environment Interactions,	2023
Tinat Nhep, Christian Schott, Mondher Sahli	Climate change adaptation in Cambodia's coastal hotel sector: An analysis of adaptation measures and hotel characteristics,	Tourism Management Perspectives,	2021
Rochelle Mahon, Jodi-Ann Petrie, Adrian Trotman, Jimena Eyzaguirre, Ravidya Burrowes, Lindsay Matthews, Candrice J. Van Meerbeeck, Amanda Charles	Climate services for tourism: Insights from Caribbean Small Island Developing States	Climate Services	2021
Sacha Reid, Nicole Johnston, Anoop Patiar	Coastal resorts setting the pace: An evaluation of sustainable hotel practices	Journal of Hospitality and Tourism Management	2017
Danuta de Grosbois, David A. Fennell	Determinants of climate change disclosure practices of global hotel companies: Application of institutional and stakeholder theories	Tourism Management	2022
Chung-Hung Tsai, Shu-Chuan Linliu, Richard C.Y. Chang, Athena H.N. Mak	Disaster prevention management in the hotel industry: Hotel disaster prevention literacy	Journal of Hospitality and Tourism Management	2020
Eddy Soria Leyva, Dayana Parra Parra	Environmental approach in the hotel industry: Riding the wave of change	Sustainable Futures	2021
Susanne Becken	Harmonising climate change adaptation and mitigation: The case of tourist resorts in Fiji	Global Environmental Change	2005
Lucía Melián-Alzola, Margarita Fernández-Monroy, Marisa Hidalgo-Peñate	Hotels in contexts of uncertainty: Measuring organisational resilience	Tourism Management Perspectives	2020

Authors	Source Title	Publication Year
Andrea Damm, Wouter Greuell, Oskar Landgren, Franz Prettenthaler	Impacts of +2°C global warming on winter tourism demand in Europe	Climate Services 2017
Arsum Pathak, Philip E. van Beynen, Fenda A. Akiwumi, Kenyon C. Lindeman	Impacts of climate change on the tourism sector of a Small Island Developing State: A case study for the Bahamas	Environmental Development 2021
C. Michael Hall, Bas Amelung, Scott Cohen, Eke Eijgelaar, Stefan Gössling, James Higham, Rik Leemans, Paul Peeters, Yael Ram, Daniel Scott, Carlo Aall, Bruno Abegg, Jorge E. Araña, Stewart Barr, Susanne Becken, Ralf Buckley, Peter Burns, Tim Coles, Jackie Dawson, Rouven Doran, Ghislain Dubois, David Timothy Duval, David Fennell, Alison M. Gill, Martin Gren, Werner Gronau, Jo Guiver, Debbie Hopkins, Edward H. Huijbens, Ko Koens, Machiel Lamers, Christopher Lemieux, Alan Lew, Patrick Long, Frans W. Melissen, Jeroen Nawijn, Sarah Nicholls, Jan-Henrik Nilsson, Robin Nunkoo, Alan Pomeroy, Arianne C. Reis, Dirk Reiser, Robert B. Richardson, Christian M. Rogerson, Jarkko Saarinen, Anna Särkämä, Robert Steiger, Paul Upham, Sander van der Linden, Gustav Visser, Geoffrey Wall, David Weaver	No time for smokescreen skepticism: A rejoinder to Shani and Arad	Tourism Management 2015
Federico Cavallaro, Olga Irranca Galati, Silvio Nocera	Policy Strategies for the Mitigation of GHG Emissions caused by the Mass-Tourism Mobility in Coastal Areas	Transportation Research Procedia 2017
David Weaver, Brent D. Moyle, Char-lee McLennan, Luca Casali	Taming the wicked problem of climate change with “virtuous challenges”: An integrated management heuristic	Journal of Environmental Management 2023
Shane Pegg, Ian Patterson, Pablo Vila Gariddo	The impact of seasonality on tourism and hospitality operations in the alpine region of New South Wales, Australia	International Journal of Hospitality Management 2012

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