

Advances in Spatial Science

Paula Remoaldo · Hélder Lopes ·  
Vítor Ribeiro · Juliana Alves *Editors*

# Tourism and Climate Change in the 21st Century

Challenges and Solutions

 Springer

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# Preface

Knowledge of the effects of climate change on tourism and the effectiveness of the sector's adaptation to climate change continues to be inadequate and lags behind other economic sectors that have a long tradition of academic development, government involvement and business participation. This is a concern considering the tourist industry's continuous rapid growth on a global scale and its importance in many national economies. In the context of rapid changes, many issues are still on the real agenda, even in the light of the social, economic and environmental research interests in the field that underpins tourism and climate change. This book emphasises the need for more in-depth knowledge, the lack of contact among stakeholders and the resource constraints, particularly with regard to the implementation of the new stage of tourism (new segments and interests).

Among the eight chapters, the authors' contributions try to update research on the identified lack of research. It focuses on the tourism adaptation, mitigation and resilience to climate change. Managing water resources in tourist areas, the circular economy, mobility and transportation, the psychological effects of weather and climate on leisure activities and theoretical aspects of adaptation, mitigation and resilience in tourism are the authors' main concerns.

The goal of the book is to highlight the research between tourism and climate change across various dimensions to:

- (i) discuss some of the basic ideas and concepts;
- (ii) find solutions and good practices to the main present and future challenges;
- (iii) use new geo-technological approaches to measure and simplify planning strategies;
- (iv) provide insights for better communication;
- (v) contribute to a more effective role of citizen science and stakeholders' engagement.

Within this framework, the book is a collection of scholarly articles that explore the complex relationships between climate change and tourism, examining the major obstacles and their effects. Nowadays, researchers highlight that the tourism industry

is acutely sensitive to climatic alterations. Additionally, they clarify how these inter-related dynamics can have a significant impact on the industry, affecting travel destinations, seasonal trends and traveller experiences in general. The studies emphasise how urgent it is to take more drastic action right now to address the many threats that climate change poses to both human health and the travel and tourism sector.

The first three chapters of the book focus on the theoretical background. Chapter 1 explores the complex relationship between tourism and climate change, highlighting the significant impact of anthropogenic climate change on tourism activities worldwide. It highlights the vulnerability of different geographical regions to climate change, exploring how coastal areas, mountainous regions, urban centres, tropical islands, desert destinations and historic cities are affected differently. The chapter also emphasises the critical role of geo technologies in tourism studies, highlighting their contribution to understanding spatial patterns, assessing climate change impacts, facilitating adaptive spatial planning and promoting sustainable tourism development. It also addresses the psychological impacts of climate change, highlighting the importance of addressing mental health concerns in the face of climate-related challenges.

Alexandra Esteves and Isabel Amaral describe in Chap. 2 a qualitative study entitled “Challenges and Crossroads Towards Sustainability-Oriented Tourism Facing Humanity and Its Relationship with Nature Throughout Contemporary History”. It introduces the reader to the main effects of pandemics and climate change on human mobility, tourism and leisure activities, underlining the lack of global understanding of mankind’s responsibility to protect Nature. It is an issue that has only rarely been addressed in analysis of tourism activity. Tourism is very sensible to the spread of contagious diseases, affecting economic development. The authors analyse Bubonic Plague, Cholera, Yellow Fever, Malaria, Ebola, SARS, MERS and COVID-19, as well as the impact of tourism on zoonoses and climate change, due to tourists’ lifestyles and consumption patterns. It is assumed that sustainable tourism practices can help reduce the spread of several diseases, by fostering responsible tourist behaviour, reducing the carbon footprint and promoting a more sustainable future. Given the complexity of this relationship (zoonoses, climate change and tourism), the authors suggest that a holistic approach is needed, and in the wake of the COVID-19 pandemic, we must rethink the future.

Chapter 3 is grounded on empirical studies and begins with a more diversified analysis. It is entitled as “A Scientific-Metric Analysis of Urban Tourism and Climate Change—An Investigation Based on Web of Science and Scopus”. It explores the intersections between urban tourism and climate change, highlighting the relevance of the literature review to foster new approaches. The COVID-19 pandemic disrupted the tourism sector’s growth, which emphasises the need for climate adaptation strategies. Despite the sector’s importance, research on the effects of climate change on tourism behind that of other industries. The chapter analyses the limited focus on urban areas within this context and emphasises the absence of a literature review specific to urban tourism. It cites previous studies that have identified challenges, such as under-studied cities, measuring climate effects and raising awareness within

tourism communities. The increasing importance of climate and weather conditions in tourism decision-making is discussed, with studies showing that extreme weather events can significantly impact travel choices given that the findings of the Intergovernmental Panel on Climate Change (IPCC) indicate that stakeholders must prepare for drastic climate changes. The chapter mentions the usual approaches to, and relevance of, using citizen science and collaborative methods.

Taking into consideration Chap. 4, it was produced by Carmen Minguez and Sandra Ricart and is entitled “Is the Tourism Perspective Envisaged in Climate Change Adaptation Planning? Evaluating the Road Map of Political, Social, and Environmental Dimension in Spanish Destinations”. It provides a thought-provoking exploration of the crucial intersection between tourism and climate change in Spain. Their insightful analysis scrutinises the Spanish National Plan for Adaptation to Climate Change 2021–2030 (PNACC) and local climate adaptation strategies, focusing on measures designed to bolster the adaptive capacity of the tourism industry. The authors pose pertinent research questions, guiding us through this intricate landscape: What actions are advocated within the PNACC, as well as local strategies, to address the challenges posed by climate change? Does the nature of a tourist destination influence the design and prioritisation of these actions? How do public and private entities work together in reducing the tourism industry’s vulnerability to the impacts of climate change? The chapter takes us on a journey, evaluating Spain’s top-ten tourist cities, employing a triple-loop approach that traverses the political, social and environmental dimensions of climate change adaptation. It also scrutinises policy coherence standards, in order to reveal critical insights.

Chapter 5 “Climate Change Acknowledgement and Adaptation and Mitigation Responses in Rural Tourism Destinations”, by M. Belén Gómez-Martín, Xosé A. Armesto-López, Martí Cors-Iglesias and Emilio Martínez-Ibarra, offers a captivating exploration of the intricate relationship between rural tourism and climate change. Their research analyses the perceptions, responses and challenges faced by key stakeholders in Catalonia (Spain), shedding light on the profound impacts of climate change on this vital sector. The authors employ a meticulous mixed methodology, blending quantitative and qualitative approaches, to unearth the perceptions of climate change risk among these stakeholders. Their study offers a comprehensive understanding of how climate change is affecting rural tourism businesses and the strategies being employed for adaptation and mitigation. We discover the awareness and concern among stakeholders about climate change, its origins and consequences. This heightened awareness is not purely academic; it has practical implications for the preservation of local landscapes and the productive activities that they sustain. Intriguingly, the research unveils disparities in perceptions and responses between the stakeholders who are directly involved in the primary sector of the economy and those who are not. This divergence reflects the intricate interplay between risk perception and the sociocultural and economic contexts within which individuals operate.

In Chap. 6, “Regional Resilience and Dependence on Tourism in a Changing Climate”, André Samora-Arvela, Patrícia Pinto, Thomas Panagopoulos, Eric Vaz, Jorge Ferreira, Helena Pina and Diogo Pinto focus on the loss of beach area in the



Algarve region due to rising sea levels. They indicate that the main expected impacts of climate change are increased temperatures, thermal comfort for outdoor activities, wildfires, floods, flash floods and reduction in water availability. To compensate these ongoing problems and to avoid significant economic losses, the authors defend a diversification strategy based on sustainable tourism, supported by nature-based, cultural and creative tourism. The strategic guidelines presented are supported by a methodology based on a survey of residents and tourists and a Delphi survey. The authors recognise that the purposed tourist diversification will contribute to the regional resilience of the Algarve region and fulfil the 17 Sustainable Development Goals.

Chapter 7 is also concerned with territories in the Iberian Peninsula, particularly with the Alicante region, that borders the Mediterranean. This chapter “Climate Change and Tourism in Spain. The Case of the Canary Islands and the Costa Blanca (Alicante): Comparative Analysis” is produced by Pedro Dorta Antequera, Esther Sánchez-Almodóvar, Abel López-Díez, Jaime Díez-Pacheco and Jorge Olcina-Cantos. The authors analyse two leading tourism destinations: the Canary Islands and the Costa Blanca (Alicante) adopt a scalar approach to understand the importance of tourism activity in Spain. It analyses the relationship between climate change and tourism in Spain based on a review of the most recent specialised literature on tourism, climate change and climate risks and statistical data from secondary sources, particularly from the European Commission, European Parliament and, at a national level, from the Spanish State Meteorological Agency (AEMET). They highlight the need to increase adaptation policies, based on a clear acceleration of the effects of climate change over the coming decades.

Concerning Chap. 8, “Coastal Tourism Adaptation to Climate Change in Brazil: Practices and Alternative Solutions”, deals with the impacts of climate change on coastal tourism. Isabel Jurema Grimm introduces adaptation practices and solutions addressing the primary current and future challenges related to the impacts of extreme weather events on coastal tourism in Brazil. The Brazilian coast’s vulnerability to climate change-induced impacts necessitates proactive and adaptive solutions to safeguard its economic and environmental assets and which will foster practices to mitigate the adverse effects of climate change on these coastal areas. Coastal tourism, among the sectors susceptible to climate change, faces the increased occurrence of intense heatwaves, coupled with decreased beach accessibility, due to rising sea levels. This will alter the recreational experience at destinations, impacting tourist demand and spending. The author used qualitative research methods, including bibliographical and documental research, with data collected from CAPES Portal and Google Scholar. Complementary documents from Balneário Camboriú were consulted. Institutional websites and news reports were also reviewed.

Chapter 9, “A Debate on Turkey Tourism’s Adaptation to Climate Change”, presents a debate on the Turkish tourism sector’s adaptation to climate change. It provides some key information about each of the seven official geographical regions while providing recommendations (with 4 of these regions being coastal and the remaining 3 exhibiting varying degrees of continental climate characteristics). The authors, Gamze Coban Yildiz and Onur Sevket Yildiz, propose both local

and general strategies for adaptation and mitigation. The chapter relies on secondary data, encompassing relevant literature, tourism development data and meteorological measurements and projections, to analyse the relationship between climate change and tourism. The authors provide a comprehensive analysis that considers the diversity of Turkey's geographical regions, with in-depth examination of each region, encompassing an overview of their climate characteristics and tourism activities. The analysis then delves into the implications and offers recommendations for adapting to, or mitigating the risks of, climate change. These recommendations are developed considering climate projections and their specific relevance to the tourism industry. The authors believe that the results and recommendations developed in this study may provide a starting point both for practitioners and researchers.

Finally, Chap. 10, "Conservation-Based Tourism Development, Climate Change, Inclusion of Locals, and Post-human-Wildlife Co-existence Conflicts: A Case Study of Gonarezhou National Park", Zimbabwe, by Tawanda Makuyana, Regina Makoni and Serena Lucrezi, analyses a crucial, yet rarely studied, relationship. It is necessary to develop more in-depth analysis of conservation-based tourism development, climate change, local inclusion and post-human-wildlife co-existence conflicts in African Trans-frontier Conservation Areas. Using a qualitative approach, the chapter describes the symbiotic relationship between the effects of climate change and the communities impacted by such effects. The increase of population in territories located near national parks has led to humans encroaching on wildlife habitats, increasing conflicts of human-wildlife co-existence. On the other hand, it is assumed that ongoing conservation-based tourism development initiatives tend to primarily involve elite communities. This chapter identifies gaps and can make a relevant contribution to induce policymakers and managers of organisations concerned with wildlife, tourism and communities around protected areas incorporating new policies in their planning.

This book must be viewed as a forum of discussion of a scientific perspective, but also of crucial social and environmental issues. Its contribution can have an impact on several scientific fields, such as tourism studies, tourism geography, environmental studies, entrepreneurship, sociology, economic growth and regional and local development. It uses different research approaches and techniques to analyse several challenges and scenarios induced by climate change in several countries.

Guimarães, Portugal

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# Chapter 1

## An Introduction to Spatial and Territorial Dimensions of Tourism and Climate Change



Hélder Lopes, Paula Remoaldo, Vítor Ribeiro, and Juliana A. Alves

**Abstract** This introductory chapter assesses the complex relationship between tourism and climate change, focusing on the spatial and territorial dimensions. It discusses the vulnerability of tourism destinations to climate impacts in different geographical areas, highlighting the role of geotechnologies in tourism studies. It also explores sustainable tourism development to address spatial inequalities and mitigate climate-related risks, while highlighting the psychological impacts of climate change on individuals' mental health. Key findings underscore the importance of interdisciplinary approaches to trying to understand and address the complex challenges posed by climate change in the tourism sector.

**Keywords** Tourism · Climate change · Geotechnologies · Sustainable development · Mental health

The findings of the Intergovernmental Panel on Climate Change (IPCC) reveal that anthropogenic climate change stands out as the predominant catalyst for alarming and far-reaching disturbances within the natural world (IPCC, 2023). This phenomenon is markedly affecting the lives of billions of persons across the globe, despite ongoing

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efforts to mitigate these risks. Moreover, the repercussions of climate change are casting detrimental effects on tourism activity, presenting a growing threat to our general capacity of fruition of destinations (Silva Lopes et al., 2021).

At present, the world is grappling with substantial climate-induced perils forecasted for the forthcoming decades, as global warming teeters on the brink of surpassing the critical 1.5 °C threshold (McKay et al., 2022). Even transiently exceeding this limit is poised to unleash further serious ramifications, some of which might prove to be irreversible. Given this scenario, there exists a recognized need for literature that can enhance the understanding of the intricate interplay between climate change and tourism, while also spotlighting the pivotal role played by hazards within this complex framework (e.g., Loehr & Becken, 2021; Scott et al., 2012; Silva Lopes et al., 2021; Silva Lopes et al., 2021).

Considering the relationship between environment and climate, tourism is considered a very vulnerable economic sector. It is also highly sensitive to the climate, similar to agriculture, the insurance industry, energy, and transport sectors. Tourism contributes significantly to greenhouse gas (GHG) emissions growth, particularly produced by transport, accommodation, and activities. Indeed, several subjects can be associated to tourism studies. One can highlight the climate change vulnerability and spatial footprint, the contribution of geotechnologies, the sustainability, and the psychological effects associated to Tourism.

The main objectives of this brief chapter are to undertake a critical analysis on the global climate vulnerability (highlighting different geographies worldwide) and the psychological effects of the climate crisis and also to confirm the contribution of geotechnologies to a more holistic approach in tourism research.

The chapter is structured as follows: after the introduction, we deal with the global tourism and vulnerability to climate impacts. In the second section, we present the contribution of geotechnologies in tourism studies and some examples of how geotechnologies can enhance tourism product development in a more sustainable way. Some aspects of sustainable tourism's role, especially the relevance of the local community in decision-making, are present in the third section. Finally, we present a recent discussion and still little treated within the tourism studies: the impacts of climate change on mental health, ending up asking ourselves: can climate change also affect tourist behavior?

### ***The Spatial Footprint of Tourism: Climate Change Vulnerability in Different Geographies***

The global distribution of tourist destinations and the spatial extent of the tourism industry have evolved significantly in recent years, with tourism spreading across the globe (Seyfi et al., 2022). The significance of tourism is underscored by recent data from the UNWTO, revealing that international arrivals reached 80% of pre-pandemic levels in the first quarter of 2023. An estimated 235 million tourists embarked on international journeys during the initial three months, surpassing the figures from the same period in 2022 by more than double (UNWTO, 2023). This remarkable recovery in international tourism highlights its resilience and its critical role in global economies as a driver of growth and employment. Popular tourist regions such as Europe, Asia,



and North America continue to attract millions of visitors, while emerging destinations in Africa, Latin America, and the Middle East are gaining prominence (Scott & Gössling, 2022; Scott et al., 2019).

Different regions experience varying levels of tourist influx and environmental impact due to their unique spatial characteristics. Accessibility, cultural attractions, and natural beauty significantly influence a region's popularity among tourists (Kim & Brown, 2012). Coastal areas are vulnerable to climate change, facing threats like rising sea levels, storm surges, and hurricanes (IPCC, 2023). Mountain regions are impacted by changes in snowfall and glacial melt, affecting winter sports tourism and freshwater resources (Scott et al., 2019). Urban centers, including major cities, deal with climate vulnerabilities such as heatwaves, air pollution, and extreme weather events (Romero-Lankao & Dodman, 2011). Tropical islands like the Maldives and the Caribbean depend heavily on tourism but face threats from rising sea levels and extreme weather events (Scott et al., 2019). Desert destinations like Dubai confront water scarcity and heat-related challenges, necessitating innovative solutions (Kelbaugh, 2019). Historic cities like Venice must balance cultural preservation with tourism industry needs (Sesana et al., 2019). The carbon footprint of tourism, driven by travel patterns and accommodations, plays a pivotal role in environmental impact (McKercher et al., 2010; Pereira et al., 2019). Efforts to reduce emissions include advancements in aircraft technology and sustainable aviation fuels (Pereira et al., 2019).

The future aligns climate change vulnerability with expected tourism growth, particularly in Sub-Saharan Africa and South Asia, two highly vulnerable sub-regions (Scott et al., 2019). Limitations exist in current indices assessing vulnerability, with variations across different assessments (Scott et al., 2019; Silva Lopes et al., 2021) (Fig. 1.1).

### ***Contribution of Geotechnologies in Tourism Studies***

Tourism is very dependent of spatial characteristics due to highly mobility-driven and pattern identification. Consequently, spatial analysis is very important to measure, monitor, model, predict, and map it toward a more realistic spatial planning to achieve more competitive tourist destinations. Geotechnologies have become the main geospatial tools, extensively used in tourism, to produce spatial analysis (Bahaire and Elliott-White, 1999; Ribeiro, 2022). Also the geotechnologies can contribute to implement the 4-Ws approach answer the 4 categories: What, Where, Who, and Why (Yang et al., 2023). Geotechnologies is a set of tools, data, and methods that include Geographic Information Systems (GIS), remote sensing, web mapping, and GPS/GNNS (Ribeiro, 2022; Ribeiro et al., 2018, 2020; Kerski, 2015).

The collaboration between academics and organizations like the Global Sustainable Tourism Dashboard can enhance tracking of climate change vulnerability (<https://www.tourismdashboard.org/explore-the-data/>). Research should expand to include underrepresented areas, particularly those affected by climate change, health issues, or wildfires (Silva Lopes et al., 2021, 2022). Embracing geospatial technologies in tourism studies, such as GIS, remote sensing, and web mapping can be particularly relevant for tourism planning and impact assessment. One can use



**Fig. 1.1** Global tourism and vulnerability to climate impacts. *Source* Own elaboration, based on IPCC (1990, 1995, 2001, 2007, 2013) and Scott et al. (2016a, b)

geotechnologies to enhance tourism product development in a more sustainable way, such as;

### 1. *Tourism Accessibility and Tourist Spatial Patterns*

- Overview spatial distribution of tourist origin-destinations and the spatial extent of the tourism industry.
- Analyze territory degree of tourist influx and environmental impact due to their spatial characteristics.
- Explore how diverse geographical contexts, such as coastal areas, mountain regions, and urban centers, contribute to spatial vulnerability to climate change impacts.
- Examine case studies highlighting the unique challenges faced by different types of tourist destinations.
- Explore the carbon footprint associated to tourists' travel patterns.
- Analyze how transportation modes and accommodation choices impact the environmental.

### 2. *Spatial Analysis of Climate Change Effects on Tourism*

- Introduction to spatial analysis techniques used to assess the impacts of climate change on tourist destinations.
- Discussion on how geotechnologies, particularly Geographic Information System (GIS) and remote sensing, aid in understanding shifts in climate patterns and their implications for tourism.

### 3. *Adaptive Spatial Planning for Climate-Resilient Tourism—Strategies, Zoning, and Policies*

- Examination of the role of spatial planning in building resilient tourist destinations against climate change effects.
- Presentation of strategies such as zoning, land use planning, and disaster risk reduction to enhance destination sustainability.
- Identify new sustainable tourist products.
- Model and create scenarios.

#### 4. *Sustainable Tourism Development*

- Analysis of how sustainable tourism development can address spatial inequalities and contribute to more equitable distribution of economic benefits.
- Consideration of ways to involve local communities in decision-making processes to ensure spatially inclusive development.
- Identify spatial inequalities.
- Promote a tourism more accessible for all.
- Tourism marketing and traveler's experience enhancement using emergent geospatial technologies.

Effectively, the use of geotechnologies in tourism creates numerous potentials for both enterprises and their customers. It enables, for example, the use of up-to-date information for tourist and planners, reduces costs, contributes to create more sustainable communities and territories, and also enhances deliverable services. It can contribute to improve both demand and supply sides.

## **The Sustainable Tourism's Role**

As the global community grapples with the far-reaching impacts of climate change, it becomes increasingly imperative to address not only environmental concerns but also the socioeconomic disparities that often accompany these changes. Sustainable tourism development emerges as a potent instrument for mitigating spatial inequalities and fostering a more equitable distribution of economic benefits in the context of climate change.

In regions prone to the adverse effects of climate change, such as extreme weather events or rising sea levels, tourism that is prepared for these challenges can offer economic stability. By actively engaging in climate adaptation measures, local communities can reduce vulnerabilities, ensuring that tourism remains a viable economic option for years to come. The solution to mitigate the impacts of climate change and tourism-related emissions lies in collaborations between visitors and local communities and between them and other relevant private and public stakeholders, to create strategies for moving away from the still prevailing mass tourism and embracing sustainable tourism models. The countries need to develop measures in order to build a more resilient tourism economy post COVID-19 and that can answer positively to present and future climate changes challenges (OECD, 2020).

Sustainable tourism encourages the exploration of new and less-visited areas. As climate-related factors impact the attractiveness and accessibility of certain destinations, sustainable practices can promote diversification and dispersion. This approach prevents the concentration of tourists in a few locations, thereby distributing economic benefits across a broader geographical spectrum. The sector urgently needs a tourism policy that allows for a more balanced cooperation between countries and high and low-density territories (intraregional scale), exchange of good practices and that is prepared to mitigate the massified tourism and extreme events related to climate change.

Sustainable tourism's emphasis on community involvement and empowerment plays a pivotal role in addressing spatial inequalities. Local communities often bear the brunt of climate change impacts. By involving them in decision-making, profit-sharing, and adaptation planning, sustainable tourism ensures that these communities participate in and benefit from the industry's growth. This inclusivity can be a potent driver of equity, especially in regions disproportionately affected by climate change.

As climate change poses threats to ecosystems and biodiversity, sustainable tourism highlights the importance of environmental conservation. Tourists seeking nature-based experiences often show greater interest in regions committed to preserving their natural beauty. This creates an incentive for local communities to engage in sustainable practices and ecosystem protection, leading to both environmental and economic benefits that are equitably distributed.

## Psychological Effects

The latest document from the World Health Organization (WHO), presented at the Stockholm + 50 Conference, states that the climate crisis amplifies numerous social and environmental risk factors, resulting in psychosocial impacts that can lead individuals to emotional distress, the development of new mental health conditions, and exacerbation of existing conditions (World Health Organization, 2022).

It is not surprising that rising ambient temperatures are associated with increased rates of aggression and violent suicides, while prolonged droughts can elevate suicide rates among farmers and negatively affect mental health, leading to higher levels of stress. Experiencing climate disasters can also intensify post-traumatic stress disorder, adaptive disorders, and depression (Padhy et al., 2015). Furthermore, climate change and global warming can lead to population migrations, potentially causing acculturation stress and contributing to the rise of physical health issues related to psychological stress (Padhy et al., 2015). Among the lesser-known and often marginalized effects of climate change are feelings of helplessness, fear, and sadness; suicidal behavior; the use of alcohol and illicit substances; mental health conditions (e.g., anxiety and depression); and emerging concepts (e.g., eco-anxiety and solastalgia—Cianconi et al., 2020; World Health Organization, 2022).

Therefore, climate change has significant implications for mental health and impacts on social, economic, and environmental aspects, with more severe consequences for disadvantaged populations. Similarly, a full understanding of the social and environmental challenges posed by climate change can lead to emotional stress and anxiety (Fritze et al., 2008).

Recognizing the importance of global intervention, in policies with both immediate and long-term impacts, the science community cannot abstain from developing strategies and programs to address issues related to individuals' psychological health.

A study conducted in China, analyzing 400 million posts on the Weibo social network, yielded important insights into the impacts of climate change on mental health. The authors concluded that extreme weather conditions worsened emotional expressions and that global warming could have highly detrimental effects on individuals' well-being in the future (Wang et al., 2020).

As a result, in order to develop strategies to mitigate the aforementioned issues and the subsequent necessary adaptations, it is essential to understand how the impacts of climate change alter individual well-being from a multidisciplinary perspective. Nevertheless, these day-to-day impacts are still relatively poorly understood, particularly in the field of Social Sciences.

## Conclusions

Climate change still be an up-to-date and policy concern subject. Among other things, the tourism industry has been identified as a key contributor to climate change. This is due since tourist movement and territory consumption heart of the tourist activity. It is affected both from the supply and demand sides. It will affect the global tourism footprint and the sustainable communities and territories. Here geotechnologies can contribute to obtain a more realistic picture of the patterns and create scenarios to get more sustainable policies and decisions. Take into account all potential of geotechnologies one can reach a more sustainable touristic activity. Also, with the relevance of global intervention in adaptation and mitigation policies, the scientific community cannot avoid adopting strategies and initiatives to address concerns concerning individuals' psychological health to mitigate emotional stress and anxiety.

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# Chapter 2

## Challenges and Crossroads Towards Sustainability-Oriented Tourism Facing Humanity and Its Relationship with Nature Throughout Contemporary History



Alexandra Esteves and Isabel Amaral

**Abstract** The relationship between human beings and Nature has been marked, especially since the Industrial Revolution, by a growing imbalance, which translates, amongst other manifestations, into the destruction and unbridled consumption of resources, which have led to the disappearance of large patches of forest and habitats essential for the survival of many animal and plant species, and, at the same time, for the development of other biomes harmful to the survival of human societies. The successive intervention of human beings on ecosystems has potentiated the emergence of zoonoses of epidemic and pandemic dimensions, and History shows how the occurrence of these impacts has been increasingly frequent and how urgent it is to reflect on the unruly attitude of society towards Nature, especially in the context of climate change and Anthropocene discussion. The bubonic plague, cholera, and yellow fever, which were present in the nineteenth century, are clear examples of the effects of globalization on the spread of diseases, thus demonstrating the need for international cooperation to control and struggle against them. In the twentieth century, other examples such as malaria, the Spanish flu, SARS, MERS, and COVID-19, whose consequences we intend to analyse in more depth, translate into a double effect of global lack of responsibility for the protection of Nature. After all, history proves that human action can lead to the emergence and spread of diseases of epidemic proportions that end up affecting the lives of people and societies, at an economic, social and cultural level. Tourism was one of the activities most affected by the COVID-19 pandemic. Born at the end of the seventeenth century, with the

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Grand Tour, tourism has known, throughout its own history, fluctuations dictated by events of a different nature, namely political (e.g. the French Revolution), social, and health. Thus, with this work, having as theoretical basis elements collected in the history of health/disease and in the environmental history, it is intended to reflect on the effects of pandemics and climate change verified with greater incidence in recent years on human mobility, tourism and leisure activities, as well as underlining the importance of the thickness of history in a debate that we consider crucial and urgent to increase public awareness on a global scale.

**Keywords** Nature · Climate change · Pandemics · Tourism · Environmental history

## Introduction

The relationship between human beings and Nature has been marked, especially since the Industrial Revolution, by a growing imbalance, which translates, among other manifestations, into the destruction and unbridled consumption of resources. This has, in turn, led to the disappearance of large patches of forest, and habitats that were essential to the survival of many animal and plant species, and, at the same time, for the development of other biomes that could be harmful to the survival of human societies.

The successive intervention of human beings on ecosystems has potentiated the emergence of zoonoses of epidemic and pandemic dimensions, and History shows how the occurrence of these impacts has been increasingly frequent. Also, how urgent it has become to reflect on the unruly attitude of society towards Nature. The bubonic plague, cholera, and yellow fever, which were present in the nineteenth century, are clear examples of the effects of globalization on the spread of diseases, thus demonstrating the need for international cooperation to control and fight against them. In the last two centuries other examples of diseases such as malaria, the Spanish flu, SARS, MERS and COVID-19, whose consequences we intend to analyse in more depth, have translated into a double effect of the global lack of responsibility in the protection of Nature (Hon, 2013). After all, History proves that human action can lead to the emergence and spread of diseases of epidemic proportions that end up affecting the lives of people and societies, at economic, social, and cultural levels.

Tourism was one of the activities mostly affected by the spread of contagious diseases. Born at the end of the seventeenth century with the Grand Tour, tourism has known, throughout its own history, fluctuations dictated by events of a different nature, namely political (e.g. the French Revolution), social and medical.

In this chapter, we will seek to establish the relationship between Tourism, Human-Nature interaction, and the spread of certain diseases throughout Contemporary History, examining different periods marked by significant epidemics with far-reaching consequences (such as bubonic plague, cholera, yellow fever, malaria, Ebola, SARS, MERS, and COVID-19). We will reflect on the intrusive actions of

humans in nature (Butcher, 2020; Higgins-Desbiolles, 2020) particularly through travel and poorly regulated tourism activities, which have resulted in interference with the animal kingdom and ecosystems, compounded by climate change, and have contributed to the emergence of new pathogens. One of the consequences of this scenario has been human exposure to a range of threats, as witnessed recently, with the potential for new post-COVID epidemic outbreaks. Within this context, we propose to reflect on the role of Tourism in the global sustainability agenda, encompassing concepts such as innovation, resilience, responsibility, and forward-thinking (Butler, 1999).

Through this qualitative study, we aim to reflect on the profound effects of epidemics and climate change that have significantly influenced human mobility, tourism, and leisure activities. Drawing from elements collected from the history of health/disease and environmental history, our analysis encompasses, not only the impacts of and after the COVID-19 pandemic (Gössling et al., 2021), but also those dating back to the nineteenth century. Our goal is to identify solutions that can effectively mitigate these effects and contribute to the development of a healthy and sustainable society and planet, based on a historical perspective.

The chapter comprises four topics. Firstly, we provide a contextualization of the essential relationship between humanity and the environment, starting from the Industrial Revolution. We emphasize the impacts of this interaction between Mankind and Nature. In the second part, we examine the significance of tourism in relation to diseases and the environment. Moving on to the third part, we delve into the historical significance of epidemics and explore how they can serve as examples for envisioning a sustainable future for humanity and the planet, with tourism playing a fundamental role. Finally, we present the main conclusions that enable us to explore the future challenges of tourism within the broader global and planetary agenda. This agenda encompasses the increasing interactions between society, the natural world, and diseases, presenting unexpected challenges that are progressively more difficult to address. Ultimately, the question remains: *quo vadis?*

## **Mankind and Nature**

The relationships and impacts of human action on the environment and the planet have long been known and subjected to reflection across different areas of knowledge (Quammen, 2020). Its interpretation in the field of History has been lesser common, although in recent years there has been a growth in the number of studies in this domain, mainly due to the development of environmental history and, to a lesser extent, the history of health. Our work is included in the latter field and aims to assess how humanity's progress over the course of last two centuries has contributed to a broader discussion in the context of the Anthropocene, in which the ecological footprint and public health challenges are evident. Simultaneously, we will analyse the impacts of these advancements on tourism, considering both positive and negative effects. Also, how tourism has played a role in the emergence of new public