

# THE ROLE OF ARTIFICIAL INTELLIGENCE

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*in*

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# REGENERATIVE TOURISM AND GREEN DESTINATIONS

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*Edited by*

ALHAMZAH ALNOOR  
GÜL ERKOL BAYRAM  
CHEW XINYING  
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NEW PERSPECTIVES IN TOURISM  
AND HOSPITALITY MANAGEMENT

# **The Role of Artificial Intelligence in Regenerative Tourism and Green Destinations**

# NEW PERSPECTIVES IN TOURISM AND HOSPITALITY MANAGEMENT

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# **The Role of Artificial Intelligence in Regenerative Tourism and Green Destinations**

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# Foreword

Artificial intelligence (AI) is being used to optimise energy consumption, oversee waste management and predict climate change patterns. These AI-enabled solutions are becoming effective and cost-effective options for businesses and governments worldwide. In contrast, green behaviour is a trend that reflects the growing awareness of reducing environmental impacts and is becoming increasingly widespread in society. Individuals, companies and governments are taking steps to reduce their carbon footprint, conserve resources and promote sustainable practices. The combination of AI and green behaviour can make these efforts more effective.

The use of AI in the tourism sector and destinations enables tourists to access services and products more easily. Smart applications developed in this contexts allow tourists to purchase services that produce more with less energy. The use of AI in destinations can optimise energy consumption, significantly reduce energy waste and provide a more environmentally friendly environment. Additionally, AI can be used in waste management in destinations to sort and recycle waste more efficiently and encourage the recycling of materials, thereby preserving resources.

One of the most significant challenges of green destinations is the protection of green areas and forests. AI plays a crucial role in monitoring and combating deforestation. It analyses satellite images to detect changes in forest cover and notifies authorities of illegal logging activities, enabling timely intervention and preventing forest loss. Additionally, it predicts climate change patterns, providing valuable information for policy and decision-making processes.

However, the use of AI in promoting environmental sustainability in destinations presents several challenges. These include concerns about the energy consumption of AI systems, data privacy and security. Additionally, the use of AI may require investment and technical expertise that may be beyond the reach of many developing countries. Nevertheless, the potential of using AI in destinations to support environmental sustainability is undeniable. The intersection of AI and green behaviour presents an opportunity to address environmental challenges with greater efficiency and effectiveness. AI can aid in resource conservation, waste reduction, deforestation prevention and the transition to renewable energy in various destinations.

*The Role of Artificial Intelligence in Regenerative Tourism and Green Destinations* book aims to serve as a theoretical and practical resource on the subject, as well as provide a perspective for future research.

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# Introduction

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## Abstract

This book is essential for anyone in artificial intelligence (AI) and destination management in the tourism industry or government. The book includes both theoretical and practical writings for stakeholders. In all chapters, we provide titles including AI, regenerative and green destinations, sustainable tourism, tourist motivations and expectations, good examples of smart destinations and regions, the regeneration of the tourism industry via AI, rethinking tourism activities and products, current issues in robots, self-service technology, effect of pandemic on smart destinations, sustainable gastronomy and regenerative tourism and tourism issues are discussed in the management plans of the centralisation. This book provides cases and empirical studies that deal in depth with the current situation, challenges, solutions and future strategies after technological development of tourism and increasing interest on smart destinations from a responsible perspective, for readers with an equitable interest or involvement with the organizations in inquiry.

*Keywords:* Artificial intelligence; regenerative destinations; green destinations; sustainable tourism; destination management; tourism industry

## Introduction

Until now, sustainable tourism has primarily concentrated on reducing the negative effects of tourism on the environment. However, a fresh direction is emerging, whereby tourism is employed as a means to catalyze the development

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of the local community. Regenerative tourism, as it is known, prioritizes life's essentials and supports the well-being of the local populace by fulfilling their basic requirements. This approach aims to create a positive impact that fosters better quality of life for all. Assisting communities and tourism sites to continuously rejuvenate is one of the key benefits. Another significant concept is eco-tourism, which strives to safeguard the environment and pass it on to future generations. This is crucial for creating a sustainable future since it encourages consumers to produce less waste and use energy efficiently.

The swift advances in technology significantly impact the tourism industry as well as other businesses and lead to differentiated service offerings. The advancement of internet, mobile devices, smart applications and social media technologies has enabled the creation of innovative service models in the tourism sector. The types of services provided within the tourism industry and the potential use of artificial intelligence (AI), along with its application areas, are the focal points of relevant research on this subject. The use of AI technologies, an important Industry 4.0 development, has grown significantly in recent years. AI, previously a technical science research subject, now undergoes analysis across wide-ranging fields, including education, management and marketing. The application of AI technology in tourist destinations has recently gained attention among researchers. As a significant sector of the service industry, tourism is labour-intensive and the use of AI is a topic of discussion in the field. AI is the technology that grants machines the capacity to reason, make decisions and complete tasks. The use of AI systems and software can significantly benefit individuals and organizations. In the realm of AI, robots and chatbots are noteworthy examples and frequently used in destination development projects. If the current issues are resolved, it could be feasible to integrate the technologies which were developed to further use other AI technologies in smart tourism into destinations, with the backing of stakeholders.

The rapid progression of technology is transforming social and commercial environments, altering processes ranging from consumer behaviour to product and service presentation, particularly in the sphere of business. The digital transformation process, which has received marked attention from enterprises in recent times, sees daily emergence of new advancements, one of which is AI-based applications that are at the forefront of contemporary discourse. It is predicted that destinations capable of keeping up with technological changes and developments have a competitive advantage and are preferred by tourists. Hence, smart destination development is crucial. Robots and AI applications play a significant role in smart tourism and are applied to various destination-related areas. New technologies are constantly emerging that require integration into tourist destinations, supported by all stakeholders.

The relatively new concept of AI tourism is quickly gaining popularity due to growing interest in exploring the latest developments in AI technology. This book delves into the role of AI in regenerative and sustainable tourism. The book offers an extensive analysis of how AI affects eco-friendly and restorative destinations. It encompasses a wide range of topics, from excursions to AI research facilities within the destinations, to engaging with cutting-edge robots, to learning about

the most recent AI-based goods and services. Its informative presentation makes it a highly valuable resource.

AI's involvement in regenerative and green destinations showcases its use of advanced language skills to create captivating and informative descriptions of each location, rather than just presenting bland facts and figures. This feature renders the book an excellent resource for those seeking to expand their knowledge of AI, regenerative tourism and green destinations. The publication presents a detailed and captivating view of some of the most exciting eco-friendly destinations in this sector. The book on AI and destination offers extensive information on green and regenerative tourism destinations, alongside useful guidance on AI-oriented travel planning. The latter includes tips on securing the most economical travel and accommodation arrangements, as well as provisions for exploring novel territories and technologies. Given the scope and quality of its insights, the book on AI and destination is an invaluable asset to all prospective tourists hoping to discover the limitless possibilities of AI-powered travel. The systematized approach of this guidebook ensures a hassle-free and seamless user experience. Whether you are interested in the latest AI technologies or curious about the future of travel, this book offers valuable information and inspiration.

The book offers theoretical and practical content for academics, researchers, students, tourism employees, business managers, tourist guides and representatives of local and national institutions. This book is the result of reflections involving research studies of different nationalities.

The book contains 25 chapters written by 61 authors located in 16 different countries and affiliated with 43 different universities.

In the *first chapter*, Mohammed Alawi Al-Sakkaf, Mohammed Basendwah, Saleh Amarnah and Abdullah Mohammed Sadaa address the concept of RT. Despite RT is still under research, there are recognized attempts to conceptualize RT from different thoughts, paradigms, worldviews and frameworks, even though the integral or alternative paradigms lack a detailed description (Bellato et al., 2022; Bhalla & Chowdhary, 2022; Higgins-Desbiolles, 2020). Therefore, the goal of this chapter is to overview the current debates on the background of RT, its definitions and its relationship with sustainability and tourism besides exploring the RT paradigms, principles and objectives in extant literature.

In the *second chapter*, Hitmi Khalifa Alhitmi, Eman Zameer Rahman, Syed Haider Ali Shah and Muhammad Nawaz Tunio explore the concept of regenerative tourism as a sustainable approach to travel and destination development. It examines the interconnectedness of regenerative agriculture and tourism, incorporating the adaptive cycle model and principles from the regenerative development framework. The chapter proposes a conceptual framework comprising five design dimensions: regeneration mindset, inherent potential, systems capability, intended system effects and tasks and resources.

In the *third chapter*, Mohammed Alawi Al-Sakkaf, Waled Ahmed Al-Attas, Nasser khalufi and Mohsen Ali Murshid focus on green tourism and ecotourism. The thematic concepts of green and responsible tourism raised questions about the definitions of both notions and their nexus of sustainability. Thus, the current chapter looks for an overview to understand green and responsible tourism, their

emerging, definitions, practices and their role in the current scenario in the post-pandemic era.

In the *fourth chapter*, Shakeel Basheer, Sandeep Walia, Danish Mehraj, Sheezan Farooq and Murtaza Ahmad Reshi argue about AI's contributions to the development of virtual tour guides, offering tailored experiences based on travellers' interests, preferences and abilities. However, the chapter also addresses the broader implications of these technologies on the tourism industry, considering potential job displacement and economic impacts on local communities. It concludes by emphasizing the importance of utilizing these innovations in a manner that benefits both travelers and localities. In summary, this chapter provides an extensive exploration of the convergence of tourism, AI and travel, shedding light on the potential for growth and innovation in the industry while acknowledging the challenges and considerations associated with the metaverse in tourism and travel.

In the *fifth chapter*, Muhammad Imran Afzal, Sanaullah Al.Azhari, Rabia Kishwer, International Islamic University, and Syed Bilawal Ali Shah seek answers to the growth of sustainable tourism as a major topic of discussion on a global scale, and the hospitality industry. The hospitality industry in China is experiencing rapid growth, and with the assistance of AI, the country may be able to realize sustainable growth in the tourism sector. Within the context of the Chinese hospitality industry, this chapter investigated the role AI plays in promoting sustainable tourism and how the Chinese government is supporting the hospitality industry in doing so. Sustainable tourism practices increase travellers' trip experiences while protecting the environment and local people; however, China could invest more in AI technology to promote sustainable tourism, which might benefit the economy, environment and society. This chapter examines AI deployment in the Chinese hotel industry and its challenges and benefits. AI technology can increase service quality, operational efficiency and hospitality operators' competitiveness, according to the authors. AI application requires careful consideration of employee training, ethics and customer privacy.

In the *sixth chapter*, Maria Ahmed Ajaz, Aiza Saeed, Ayesha Yaseen, Aleena Syed and Muthmainnah investigate the effects that AI has had on the tourism industry in Europe, with a particular focus on how the hospitality industry has reacted to the advent of this technology. Following an overview of the tourism and hospitality industries in Europe, the chapter begins with an introduction to AI in the tourism industry. The section on the methodology describes the various approaches to research that were utilized in this study, and the section on the conclusion summarizes the findings.

Kamran Jamshed, Syed Haider Ali Shah, Fedwa Jebli and Basheer M. Al-Ghazali, in the *seventh chapter*, investigate the use of AI and smart destinations in China and Hong Kong with the goals of enhancing tourist experiences, boosting environmental sustainability and propelling economic expansion. AI and smart destinations have greatly impacted China and Hong Kong tourism. AI has improved tourism, customer service and trip recommendations, while intelligent destinations reduce carbon emissions and promote ecotourism to sustain tourism. AI and intelligent locations boost visitor satisfaction and economic

growth. As the tourism industry faces future challenges, AI technology and smart destinations will be crucial to creatively and sustainably rebuild tourism. Smart locations and AI have transformed tourism by offering customized, efficient and environmentally responsible travel experiences.

In the *eighth chapter*, Kamran Jamshed, Muhammad Asif Qureshi, Rabia Kishwer and Samrah Jamshaid focus on the tourism industry and AI applications, and in this chapter, both benefits and challenges were presented. This chapter explores how the hospitality industry in Japan, known for its exceptional service and cultural richness, and how the hospitality industry is leveraging AI to redefine the guest experience and streamline operations. AI brings forth a multitude of advantages to the tourism industry and also by analyzing vast amounts of data, AI algorithms can provide personalized recommendations tailored to individual preferences, enabling travellers to discover hidden gems and create unforgettable memories. The usage of AI-powered chatbots and virtual assistants facilitates seamless communication, offering instant responses to inquiries and enhancing customer satisfaction.

In the *ninth chapter*, Kamran Jamshed, Adel Omar and Alaa Last El-shari investigate the hospitality industry of China and the shift from sustainable tourism to regenerative tourism. Consumer expectations, government programmes and AI are driving this shift from sustainable to regenerative tourism. Despite the challenges of transitioning tourism from sustainable to regenerative, many Chinese initiatives and programmes are helping the environment and communities.

In the *tenth chapter*, Eman Zameer Rahman, Shahab Aziz, Syed Bilawal Ali Shah and Andi Asrifan examine the effect of the Regenerative Tourism Movement on the global industry and the role of AI in driving sustainability and innovation. The Regenerative Tourism Movement represents a paradigm shift in the tourism industry, focusing on the interconnectedness of economic, social, cultural and environmental well-being. This approach aims to generate positive impacts on local systems by fostering partnerships, diversity in local economies and transformative experiences for travelers. The chapter explores the key principles and nature-based solutions associated with regenerative tourism. Additionally, it delves into the role of AI in the tourism sector, highlighting its potential to enhance sustainability practices, deliver personalized experiences and streamline operations. Various AI tools and technologies, such as data analytics, machine learning, natural language processing, computer vision, IoT integration, recommender systems, optimization algorithms, blockchain technology and AR/VR, are discussed in the context of regenerative tourism. The chapter concludes by outlining the benefits of AI in sustainable and regenerative tourism, emphasizing reduced environmental impact, enhanced efficiency and improved customer service. It also highlights the challenges and considerations associated with AI adoption in the tourism industry. Recommendations for the integration of AI-driven solutions and future directions for research in this field are provided, aiming to inspire further exploration and implementation of AI in regenerative tourism.

Sandhya H, Sejana Jose V and Bindi Varghese, in the *11th chapter*, propose to understand the prospects of smart technologies that can transform tourism destinations and instigate regenerative development process. Bio-based resource consumption and technology-driven practices aimed for better sustainable development has been the need of the era. This study emphasizes the theory of regenerative tourism, which attempts to preserve and improve a destination's natural and cultural resources while contributing to the socioeconomic development of the host communities. It examines how transformational technologies, like smart infrastructure, big data analytics, and renewable energy systems, could assist the tourism industry achieve the transition to a green economy. This paper illustrates the benefits and problems of integrating such technologies into the tourism infrastructure of a destination. Additionally, it highlights the necessity of cooperation among stakeholders and policymakers and examines the possible environmental, social and economic implications of using a regenerative approach to tourism. The results of this study contribute to the expanding body of knowledge on the development of sustainable tourism and shed light on the transformative potential of technology in creating a more sustainable and resilient future.

In the *12th chapter*, Mohammed Basendwah, Saleh Amarneh, Hamid Hazim Majid and Alhamzah Alnoor explore the motivations and travellers' expectations. According to the authors, travellers seeking eco-friendly experiences are drawn to destinations that prioritize sustainability and demonstrate a commitment to preserving the environment. It is worth mentioning that the appeal of green destinations goes beyond natural beauty. Travellers are increasingly interested in engaging with local communities, learning about their cultures, and supporting sustainable practices (Hang & Adrien, 2021). This desire for authentic experiences aligns with tourists' motivations for green destinations.

Eda Hazarhun and Burçin Cevdet Çetinsöz, in the *13th chapter*, discuss the rapid increase in global warming and environmental disasters, destination management and tourists' environmental awareness. This increase in environmental awareness has led destinations to prioritize green practices that reduce environmental pollution. Moreover, in recent years, with the rapid development of technology, AI technology has also been used in applications that reduce environmental pollution in destinations. This is because environmentally friendly products and services offered by destinations have started to have an impact on tourists' travel choices. Additionally, tourists' awareness and loyalty towards environmentally friendly destinations have started to increase, resulting in the formation of brand value for destinations. Therefore, green practices and AI technologies play a role in the formation of consumer-based destination green brand value.

In the *14th chapter*, Tefvik Demirciftci examine current issues on robots and self-service technology within the context of responsible and creative tourism. As the tourism industry continues to evolve and adapt to changing consumer demands, automated systems and AI have gained significant attention. However, concerns related to ethical, social and environmental aspects have arisen alongside the benefits offered by these technologies. This chapter explores the emerging

challenges surrounding the integration of robots and self-service technology in responsible and creative tourism.

Manpreet Arora and Monika Chandel, in the *15th chapter*, focus on AI in promoting green destinations for sustainable tourism development. The growth and promotion of green tourism destinations can have many potential benefits from AI. The literature on AI and applications of AI in promoting green destinations is very less. The major areas of research in this direction are related with nature-based tourism or sustainable tourism. There is a great potential to research in this area as AI can play an important role in promoting green destinations. Simultaneously, AI can play the role of enabler to achieve environmental targets by promoting various green destinations. The major finding of this chapter is that the research in this area is majorly revolving around tourist destinations and sustainable development. Another area of research where AI is used is ecotourism and sustainable tourism. With the help of various decision support systems, sustainable tourism can be promoted. Social media platforms and digitalization of tourism is a great enabler of using AI in the field of tourism.

In the *16th chapter*, Salameh Jamil Salameh Alkhazaleh, Laith Jabur Ali Daradkah, Ibrahim Barjes Saad Almashaqbeh and Abdullah Mohammed Sadaa focus on AI's impact on sustainable tourism developments. It supports increased efficiency in different sectors. AI is among various sectors' most innovative and measurable solutions. AI has revolutionized new ideas in our daily lives, such as the Internet of things, the Internet of people and the sharing economy. Like other sectors, the tourism sector is one of the sectors affected by AI where different intelligent systems are used in travel agencies and transport companies. In addition, technological breakthroughs are expected to increase in the tourism sector, leading to a rearrangement of the technological revolution in the tourism sector. We hope that the process of technological progress in the field of tourism is constantly advancing and cannot be stopped. Accordingly, we came to the following question: How can adaptation be made to the progress brought by AI to the tourism sector? The continuous technological advancement in the tourism sector is expected to lead to the end of human civilization, especially since technological machines have become more intelligent than humans.

In the *17th chapter*, Elif Şenel explains augmented reality (AR)'s importance for destinations. It is a variation of virtual reality, is a technology that can appeal to a number of senses with its sound, video, image or touch sense features, take the information created by computers or digital environments and adapts it to the real environment, thus allowing the user to see and explore the real world. Although AR technology has the potential to be used to develop all senses in general, it is widely used today. AR, which is the subject of many scientific research, is turning into a subject that is especially curious and excited by the tourism sector and that consumers are very interested in. In particular, within the scope of examining consumer behaviours and searching for solutions, businesses have started to benefit from AR technologies in order to respond to the demands of consumers who spend the majority of their time with technology and to offer different, unforgettable and unique experiences. Moreover, promotional activities are very important in terms of preferability among competing destinations.

At this point, the effect of AR on the persuasion efforts carried out within the marketing process for all kinds of messages and destinations conveyed to consumers cannot be denied. Therefore, AR technologies constitute one of the most effective steps in facilitating consumers' travel, creating a rich experience, speeding up their decision-making processes, enabling them to revisit the destination and increasing their satisfaction. In this book chapter, what AR is, why it has an important place in destinations and marketing and the use of AR in destinations, hotels, cafes, bars and restaurants, and finally in recreation areas, is discussed.

In the *18th chapter*, Cemal Artun discusses the design of an appropriate policy and planning for the management of regenerative tourism. Regenerative tourism emphasizes a conscious intervention in the tourism industry with its creativity, innovative and responsible characteristics. This intervention can be evaluated within the scope of destination policy and planning for solving the problems about standardization and commercialization. Thus, it will conceptually be tried to put forward a planning and policy making process that is suitable for regenerative tourism.

Waleed Khan, Nangyalay Khan, Muhammad Humayun and Arab Naz, in the *19th chapter*, analyze their study on review-based analysis combined with some case studies that focuses on establishing a link between AI and the emerging trends of regenerative tourism and green destinations. Regenerative tourism and green destinations are the new hallmark, promoting sustainability in the travel industry by restoring ecosystems and encouraging friendly practices. The incorporation of AI into sustainable tourism has a potential to revolutionize how one can approach tourism by providing customer experiences and to contribute towards a sustainable future. AI has naturally found its place in industries due to the advancements in data analysis and computing power. In the context of tourism, AI's data-driven capabilities are discussed in the current review, to showcase how they enable recommendations for intelligent automation and efficient resource management. With the implementation of AI-powered technologies, tourism operations become more efficient, providing opportunities for sustainable development and conservation in green destinations. The integration of AI in destinations encompasses applications such as energy management, waste reduction, transportation optimization and sustainable resource management. These AI-driven solutions play an important role in minimizing the impact caused by tourism activities while conserving natural resources. Additionally, AI facilitates delivering experiences that align with eco-values through recommendation systems and virtual assistants. The chapter tackles issues related to AI such as protecting data privacy addressing biases dealing with job displacement and ensuring cultural relevance. It emphasizes the significance of inclusive implementation of AI and explores the challenges faced when implementing AI solutions in developing regions that have limited resources.

In the *20th chapter*, Arzu TOKER discusses the concepts of responsible tourism and creative tourism through regenerative tourism, which has sparked a debate, particularly in the post-pandemic world, and reviews these concepts in terms of their similarities and differences in light of current literature. It is also