Middle East Journal of Scientific Publishing
Vol. (8) Issue (5)
Edition 29th
2025(1 - 30)

Doi: https://doi.org/10.63085/mejsp/856414

Mitigating the Environmental Impact of Mass Tourism in the Mediterranean: Pathways to Sustainable Development

Imed Elfaleh
Social studies department, college of Arts,
King Faisal University, KSA.
Karim Daouas
Ibn Rushd college for Management Sciences, Abha, KSA.

Published on: 6 November 2025

Abstract

Tourism has become a pivotal social and economic force, significantly shaping societies since the late 20th century. As a key contributor to global economic activity and job creation, its growth shows no signs of slowing, with international arrivals projected to rise steadily. However, the rapid proliferation of mass tourism in the Mediterranean region poses critical challenges to environmental sustainability, particularly in fragile ecosystems like coastal zones and rural landscapes. Seasonal tourism often leads to concentrated visitor flows, amplifying resource consumption, waste production, and pollution. Moreover, tourism infrastructure developments, such as hotels and transport networks, heighten pressures on local resources and ecosystems. This study investigates the environmental impacts of mass tourism in the Mediterranean using literature review and case study approach, emphasizing key factors such as energy demand, water consumption, and waste management. By analyzing data from diverse regional destinations, it illustrates how peak tourist seasons exacerbate environmental strain. Case studies from Costa Rica, Morocco, and Slovenia illustrate the tangible benefits of adopting innovative approaches such as ecotourism, community-led conservation, and zero-waste initiatives. To address these environmental pressures, it is most important to adopt the right sustainable tourism policies such as

stricter environmental regulations, incentives for eco-friendly infrastructure as well as promotion of off-season travel into their dictionary of price setting. Preparing the adoption of strengthening local governance capacities, enhancement of waste management systems, and promotion of models of community tourism, are thus important steps toward sustainability. Integrating these measures will make the region balance tourism expansion with environmental preservation for its long-term viability as a global travel destination.

Keywords: Mediterranean tourism, Environmental Impact, Sustainable Development, Resource Management

*** Introduction**

Tourism has become a pivotal aspect of social and economic development, as evidenced by a 25% increase in global participation in tourism within the last decade (Dwyer, 2023). Tourism currently accounts for about 10% of the entire global economic activity, producing jobs and earning billions for countries worldwide (Ranasinghe, Karunarathne & Herath, 2021). However, the rapid expansion of the tourism industry has also posed many environmental problems, especially in ecologically sensitive places such as the Mediterranean. The most lucrative tourism region is home to more than 30% of global international arrivals annually and thus faces increasing pressure on natural resources, particularly their coastal areas (Mejjad, Rossi & Pavel, 2022).

Tourism, although it has local economic benefits, has very significant environmental effects; for instance, it creates degradation in coastal ecosystems, depletion of water resources, and does not help in waste management (Chandel, 2022). Coastal countries such as Spain, France, and Italy face increased beach overcrowding and rising water consumption during the peak season; this has increased by up to 40% (Lukoseviciute & Pereira, 2021). Moreover, seasonal tourism increases resource use, causing an increase in energy use by 70% and waste generation by 25% for popular Mediterranean towns (Mena-Nieto et al., 2021). All these are signs of ecological pressure resulting from flourishing tourism development.

Many studies have tried to address the environmental impacts of mass tourism, but they have not provided enough research on the case-specific mitigation strategies as far as the Mediterranean goes. This study finds pertinent solutions for

sustainable economies that integrate with environmental concerns. This study places its hands on collecting relevant case studies of prominent Mediterranean destinations and consequently offering valuable solutions for resource consumption management, waste reduction, and environmental degradation mitigation. Finally, this research throws much weight into the ever-increasing discourse on sustainable tourism by providing case-based recommendations from the region for implementation by policymakers and other stakeholders in conserving the delicate ecosystems of the Mediterranean while keeping it economically sustainable. This study seeks to answer the following questions: (1) What are the primary environmental impacts of mass tourism in the Mediterranean? (2) How can sustainable tourism policies mitigate these effects? (3) What best practices from other regions can be adapted?"

The rest of this paper is organized in the following way: Section 2 reviews relevant literatures on environmental impacts of mass tourism and sustainable tourism strategies. Research methodology including a case study and data sources is outlined in Section 3. Findings are presented in Section 4 with key environmental issues such as resource consumption, waste management, and climate impact on Mediterranean discussed. Macroeconomic development strategies and best practices from the case studies are presented in Section 5. Finally, Section 6 concludes the study with key insights and policy recommendations for sustainable tourism in the Mediterranean.

*** Materials and Methods**

This study employs a qualitative methodology, focusing on a comprehensive literature review and case study analysis to examine the environmental impacts of mass tourism in the Mediterranean region.

*** Literature Review**

Relevant literature has been systematically reviewed to gather insights into the various dimensions of tourism and its environmental effects. This included peer-reviewed journal articles, reports from recognized organizations (such as the World Tourism Organization and the European Environment Agency), and case studies from Mediterranean countries. Key themes explored in the literature included energy consumption, waste generation, air and water pollution, and the socio-economic implications of tourism growth.

*** Data Collection**

Secondary data were collected from various sources to analyze trends in tourism growth, resource usage, and environmental issues. Key data points were sourced from reports on international tourist arrivals, environmental impact assessments, and government publications. Specific case studies have been identified to illustrate the impacts of mass tourism in selected Mediterranean destinations, such as Spain, Italy, Tunisia, and Greece. This case study approach facilitates a deeper understanding of localized issues and responses to tourism-related environmental challenges.

*** Data Analysis**

The collected data was analyzed thematically to identify patterns and relationships between tourism activities and environmental impacts. Metrics such as percentage changes in urban land cover, waste production rates, and energy consumption were evaluated. Statistical tools were used whenever applicable to support the interpretation of data trends, particularly in the context of energy demand surges during peak tourist seasons. This quantification also involved examining correlations between tourism density and environmental strain.

*** Sustainability Practices Evaluation**

The study further assessed existing sustainable tourism initiatives in the Mediterranean region through qualitative analysis of policies and practices aimed at mitigating environmental impacts. Examples of successful strategies, including ecotourism and community-led conservation efforts, were documented in literature and case studies. By employing this mixed-methods approach, the study not only delineates the adverse effects of mass tourism but also highlights potential pathways for sustainable practices and solutions that can be implemented across the Mediterranean region.

*** Review of Literature**

*** Rise of Mass Tourism and Its Environmental Impact**

The Mediterranean area is a traditional and globally popular tourist destination, with millions visiting every year for its charming combination of cultural monuments, historical sites, and scenic coastal lines (Gkarane & Vassiliadis, 2024). However, the rampant in-and-out race for mass tourism has brought pressure on the region's environmental sustainability. The demand for hotels, resorts, and holiday homes led to havoc with

coastal urbanization, replacing natural habitats with concrete structures, thereby threatening local biodiversity (Numbere & Maduike, 2022). Once pristine beaches and marine ecosystems have received too much damage due to overdevelopment, leading to habitat fragmentation and displacing native species. Although the environmental degradation goes on land, tourism pollution has been fast on the rise (Teng, Cox & Chatziantoniou, 2021).

It is the overexploitation of resources such as water and energy combined with heavy tourist influx that has caused severe soil erosion and deforestation in fragile coastal and inland regions. Waste generation has surged, with even anticipated seasonal spikes of plastic and other non-biodegradable materials totally overwhelming local waste management systems (Kaur, Singh & Kaur, 2025). When this waste gets disposed of improperly, it finds its way into the Mediterranean Sea causing more harm to marine pollution. The accumulation of plastic debris poses an immediate threat to marine life, with such species swallowing or burning due to entanglement and the weight of plastic. So far, sustainable interventions look to be providing hope for the survival of the region's exotic beauty as well as ecological balance.

While mass tourism tremendously facilitates economic development, it has exerted extreme pressure on the environment, especially for places that rely heavily on tourism. The most significant of these issues is the consideration of energy demand. According to Mena-Nieto et al. (2021), energy consumption in adoption-of-Mediterranean tourist hotspots increased up to 70% during high seasons, related to air conditioning, transportation, and hospitality services. This surge thus brings a huge load on local energy grids as well as a rise in greenhouse emissions.

The Mediterranean Basin, home to some of the world's most fragile coastal and rural ecosystems, is among the most affected regions. Attracting over 30% of global international tourist arrivals and contributing approximately 15% of global tourism revenue annually (UNWTO, 2022), the region demonstrates both the economic potential and the environmental pressures of tourism. This influx of visitors has created substantial economic opportunities while underscoring the urgent need to

manage environmental impacts and preserve local resources.

The rapid expansion of mass tourism has placed considerable strain on local communities and ecosystems, as evidenced by changes in permanent and seasonal human presence (Curci et al., 2022). Spataro (2000) emphasizes that the Mediterranean tourism sector faces unique challenges, particularly in striking a balance between economic growth and environmental sustainability. Additionally, De Francis et al. (2003) extensively reviewed the threats posed to soil quality in Mediterranean countries, further highlighting the environmental costs of unchecked tourism development. Addressing these interconnected challenges requires a comprehensive and region-specific approach to ensure that tourism supports sustainable development while mitigating its ecological footprint.

Some studies propose mitigation strategies to counteract the adverse impacts. As an example, Lukoseviciute and Pereira (2021) propose that energy-efficient infrastructures, such as solar-powered hotels and enhanced public transportation networks, could bestow benefits upon the tourism sector in terms of carbon reduction. Although such strategies may represent promising solutions, their effective implementation depends on local government legislation and economic incentives to promote sustainable business practices.

In contrast between high energy demands and possible counteractive strategies confirm the difficulty of achieving a sustainable status for mass tourism. While some destinations struggle with excess capacity in infrastructure and depletion of resources, others have shown that solutions via policy action or technological innovations can minimize adverse environmental effects. The major problem remains, whereas to large-scale acceptance of sustainable practices across different Mediterranean areas with various levels of capacity and political support factors.

The environmental risks posed by tourism in the Mediterranean are complex and deeply interwoven with the region's ecological and climatic vulnerabilities (Leka, Tsigarda & Stratigea, 2023). The sheer volume of visitors, particularly in peak seasons, places an unsustainable burden on local resources, with water shortages becoming increasingly common. Many Mediterranean destinations rely heavily on freshwater reserves, which are already under strain due to

rising temperatures and prolonged droughts (Gaaloul, Eslamian & Katlance, 2021). The excessive consumption of water in hotels, resorts, and recreational facilities, combined with high agricultural demands to sustain tourism-driven food supply chains, exacerbates this crisis. Additionally, waste management systems struggle to cope with the seasonal influx of tourists, leading to increased land and marine pollution (Kaur, Singh & Kaur, 2025).

Coastal and marine ecosystems are particularly threatened by intensified maritime activity, including cruise ships, private yachts, and ferries, which contribute to oil spills, anchor damage, and marine debris. Noise pollution from boat traffic disrupts marine species, affecting their migration and breeding patterns. The destruction of coral reefs and seagrass meadows—vital for maintaining marine biodiversity—further highlights the ecological cost of unchecked tourism (Morelle-Hungría et al., 2023). Compounding these threats, the Mediterranean is warming at an alarming rate, 20% faster than the global average, exacerbating desertification, coastal erosion, and biodiversity loss. Without sustainable policies, tourism risks irreversibly damaging the very landscapes that attract visitors.

*** Development of Tourism Infrastructure and Environmental Pressure**

Development of such systematic mass tourism solutions as new hotels, transport networks or recreational facilities demands an improvement of facility staff at all levels destination. It also has a reverse kind of effect- increased anthropogenic environmental pressure on specific places as a result of mass use. Mejjad, Rossi and Pavel (2022) report that in some cases habitat destruction, economic water consumption and irreversible degradation of land use have resulted from coastal urbanization in the Mediterranean. Always linking the large hotel developments with fragile ecosystems breaks biodiversity through causing rapid erosion along the shore.

The rapid expansion of mass tourism is intrinsically tied to the development of supporting infrastructure, including transportation networks (airports, ports, and roads) and hospitality establishments such as hotels and resorts. In the Mediterranean region, this growth has led to significant urbanization and resource exploitation, with coastal areas being

disproportionately affected. For example, Spain's Mediterranean coast has witnessed a staggering 47% increase in urban land cover between 1990 and 2018, primarily due to tourism-driven developments (EEA, 2023). In Tunisia, approximately 70% of hotel facilities are located along the coastline, exerting considerable pressure on local land, water resources, and biodiversity (Miossec, 1999). The table below highlights the increase in coastal urbanization in select Mediterranean countries:

Table 1: Increase in Coastal Urbanization in Selected Mediterranean Countries (1990–2018)

Country	Urban Land Cover (1990)	Urban Land Cover (2018)	% Change
Spain	12,400 km²	18,200 km²	47%
Italy	7,800 km²	10,100 km²	29%
Greece	2,500 km²	3,600 km²	44%
Tunisia	1,900 km²	2,700 km²	42%

Source: European Environment Agency (2023).

Such unchecked urbanization accelerates habitat destruction, beach erosion, and the loss of critical marine ecosystems like Posidonia seagrass meadows, which are crucial for carbon sequestration and biodiversity conservation (Bernet & Acosta, 2022).

Chandel (2022) contends that if tourism were to adopt sustainable infrastructure such as eco-friendly hotels with water recycling systems and green building materials, it could dramatically offset its ecological footprint. Compared to the difficulties derived from tourism's conventional infrastructures, these measures provide very clear evidence that development of infrastructure need not occur at the expense of environmental spare. While infrastructure has to be erected for growing tourist demands, unchecked development in itself propagates environmental degeneration. At least those destinations that embed eco-friendly infrastructure and can somehow enforce stricter regulatory mechanisms should, at one level or another, help lessen environmental catastrophes.

Achieving sustainable tourism in the Mediterranean requires a multidimensional approach that balances environmental conservation, economic viability, and social well-being (González-Morcillo et al., 2023). This involves the adoption of stringent policies that encourage eco-friendly practices, such as waste reduction, renewable energy use, and water conservation. Governments and tourism operators must invest in sustainable infrastructure, including green buildings, efficient public transport, and responsible waste management systems (Guo & Li, 2024). Additionally, fostering community

engagement is crucial, as local populations play a vital role in maintaining cultural and natural heritage. Encouraging local businesses to adopt sustainable tourism models ensures long-term economic benefits while minimizing environmental harm (Baloch et al., 2023).

Notable initiatives, such as the REBOOT MED project, have paved the way for sustainable tourism by promoting blue and eco-tourism products that align with circular economy principles. These efforts contribute to reducing tourism's ecological footprint while offering authentic experiences that attract conscious travelers (Zhichao & Yashu, 2024). Furthermore, the Mediterranean Strategy for Sustainable Development (MSSD) provides a comprehensive framework for aligning international sustainability commitments with regional challenges. By promoting cooperation among Mediterranean nations, the MSSD facilitates policy harmonization, knowledge exchange, and the implementation of sustainable practices (Paramana et al., 2023). Integrating these strategies can transform the Mediterranean into a model for sustainable tourism, preserving its unique landscapes and cultural heritage for future generations.

*** Waste Generation and Energy Consumption**

The seasonal influx of tourists leads to a dramatic 70–100% increase in waste generation in many popular destinations during peak periods. For instance, research conducted in the Balearic Islands (Spain) indicates an over 80% rise in solid waste production during summer months (EEA, 2023). Additionally, tourism has a pronounced impact on energy consumption, especially in areas with high concentrations of resorts, hotels, and recreational facilities. In Greece, regions heavily reliant on tourism exhibit an annual energy consumption of approximately 1.8 MWh per capita in the services sector, significantly higher than the 0.6 MWh recorded in less-frequented areas (Brussels, 2020). The following chart illustrates the correlation between tourism density and energy consumption in Mediterranean countries: -

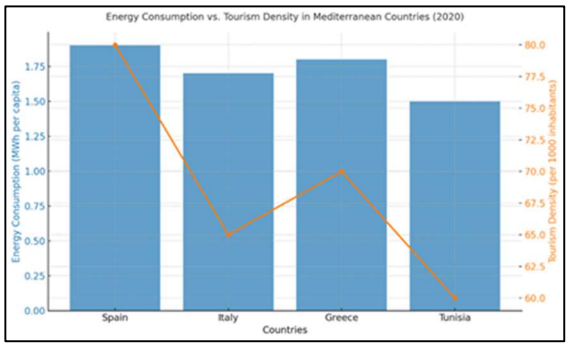

Figure 1: Energy consumption in the services sector vs. tourism density in selected Mediterranean countries (Source: Brussels Report, 2020)

*** Air and Water Pollution**

Transportation remains the primary contributor to air pollution in the tourism sector, with private vehicles and air travel accounting for approximately 60% of CO_2 emissions (Tourism's Carbon Emissions Report, 2019). In the Mediterranean, this issue is further amplified by the high dependence on short-haul flights and road-based travel for regional tourism. Water pollution also poses a significant challenge. In North African Mediterranean destinations, such as Tunisia and Morocco, up to 90% of untreated wastewater is discharged directly into the sea during peak tourism seasons (Hosni, 2000). This not only jeopardizes marine biodiversity but also diminishes the region's tourism appeal and threatens public health.

*** Tourism and Climate Change**

Tourism is responsible for approximately 5.3% of global greenhouse gas emissions, with transportation contributing a staggering 90% of this total (Tourism's Carbon Emissions Report, 2019). Tourism-dependent regions, such as the Mediterranean, are particularly susceptible to the adverse impacts of climate change, which include: -

1- Rising sea levels and coastal erosion threaten vital infrastructure and tourist attractions (Bernet & Acosta, 2022).

2- Increased temperatures lead to shorter ski seasons and reduced snow availability in mountain resorts (Michel, 2022).

3- Water scarcity, which is exacerbated during peak tourism periods, impacts both local populations and visitors.

An illustrative example of these challenges can be found in the study by Shaaban and Ramzy (2010), which examines the impact of climate change on tourism in Egypt. Their research highlights the perceptions of policymakers and tourism managers regarding the challenges posed by climate change, emphasizing the need for adaptive strategies tailored to mitigate the negative effects on tourism in vulnerable Mediterranean regions. The table below provides a summary of the primary climate change risks affecting tourism in Mediterranean regions: -

Table 2: Climate Change Risks and Their Impact on Tourism in Mediterranean Regions

Climate Risk	Impact on Tourism	Examples
Rising Sea Levels	Loss of coastal infrastructure	Greece, Egypt, Spain
Higher Temperatures	Shorter ski seasons	Alps, Pyrenees, Atlas Mountains
Water Scarcity	Reduced water availability for tourism	Tunisia, Morocco, Southern Spain

Source: IPCC Report (2022).

*** Environmental Risks of Mediterranean Tourism**

High tourist traffic in Mediterranean regions has introduced various environmental risks, especially in coastal and rustic locations, including those facing resource depletion and even pollution. One of the alarming issues is excessive consumption of water. According to Lukoseviciute and Pereira (2021), peak tourists can cause an increase in water consumption by 40%, so local freshwater supply, especially in arid regions, is under severe stress. Overuse has disturbing water availability and threatens sustainability in the long run.

As the world's most visited tourist region, the Mediterranean faces escalating environmental challenges linked to the rapid and often unregulated development of tourism. Coastal and marine ecosystems, in particular, are highly vulnerable, with land use changes, pollution, and biodiversity loss posing significant threats. Furthermore, coastal areas are facing challenges due to fluctuating human presence related to tourism activities. This phenomenon not only impacts local resources but also exacerbates the vulnerabilities of these ecosystems. As highlighted by Curci et al. (2022), this study examines the implications of such patterns on resource use, leading to increasing pressures on coastal and marine environments. In addition, studies have shown that coastal areas are particularly susceptible to climate change, negatively impacting both local communities and ecosystems (El-Masry et al., 2022). Furthermore, monitoring efforts reveal significant climatic shifts affecting the Mediterranean coast, emphasizing the need for comprehensive assessments (Gentilucci et al., 2021). El-Raey (2010) also discusses how climate change poses additional risks to coastal zones, impacting their ecological integrity and socio-economic viability.

According to Mena-Nieto et al. (2021), tourist destinations see an increase in waste generation by 25% during peak seasons, which can overwhelm the waste management systems in place. Plastics are often disposed of improperly, and untreated sewage gets poured directly into oceans that worsen marine

pollution and damage marine biodiversity and coastal ecosystems. However, some studies have proposed effective mitigation strategies. Chandel (2022) suggests that implementing strict waste management policies, including zero-waste initiatives and better recycling practices, would relieve some of that pressure on the environment. In a similar fashion, Mejjad, Rossi, and Pavel (2022) called for responsible tourism policies aimed at regulating water consumption and encouraging conservation activities amongst visiting tourists and businesses.

Thus, the contrast between an increase in environmental risks and those tempered with potential mitigation strategies emphasizes the necessity for sustainable tourism policies, and some Mediterranean destinations do apt with resource depletion and pollution, while others draw evidence of the fact that better environmental governance and sustainable tourism initiatives can greatly cut down on the ecological footprints of tourism. The challenge will be ensuring those strategies are broadly implemented and enforced in the region.

*** Impacts on Coastal and Marine Environments**

Coastal and marine ecosystems in the Mediterranean face significant pressures due to unregulated tourism development. As pointed out by De Francis et al. (2003), these pressures extend to soil degradation, which can have long-term implications for both terrestrial and marine health. In Egypt, Morocco, and Tunisia, coastal tourism has led to habitat destruction and the overexploitation of water resources. For example: -

1- Egypt: The Mediterranean coast of Egypt experiences a 30% rise in marine litter during peak summer months, severely impacting marine ecosystems (El Nemr et al., 2012).

2- Morocco: Coastal deforestation has surged by 20% since 2000, driven by tourism infrastructure expansion (Dalle, 2007).

3- Tunisia: Insufficient waste management systems struggle to cope with tourism demands, leading to untreated sewage being discharged directly into the Mediterranean Sea (Miossec, 1999).

Additionally, El-Masry et al. (2022) elaborate on the vulnerability of these regions to climate change, highlighting the ongoing risks faced by coastal ecosystems. Environmental impact assessments (EIAs) are critical for mitigating the adverse effects of coastal tourism projects. As Sheate (1997) notes, robust EIAs are essential for addressing issues such as habitat

destruction and resource overexploitation. Frihy (2001) further underscores the importance of EIAs, drawing lessons from the Egyptian Mediterranean Coast to illustrate their necessity in overcoming these challenges. By implementing such measures, stakeholders can ensure that tourism development aligns with the principles of environmental sustainability while minimizing ecological damage.

*** Towards Sustainable Tourism in the Mediterranean**

To mitigate these risks, Mediterranean nations have initiated efforts aimed at promoting ecotourism, reducing waste, and developing sustainable infrastructure. Notable examples include: -

1- Tunisia: A waste management charter introduced in the 1990s significantly improved sewage treatment capabilities, addressing coastal pollution concerns.

2- Morocco: Diversified tourism strategies have been implemented to alleviate pressures on coastal ecosystems, balancing development with environmental preservation (Badr et al., 2011).

*** Pathways to Sustainable Tourism Development**

Tourism as a Driver of Sustainable Development

Sustainable development seeks to harmonize economic growth, social equity, and environmental conservation, ensuring long-term viability. These three interconnected pillars (Purvis et al., 2019) are fundamental to responsible tourism: -

1- Economic Viability: Ensuring income generation and the sustainable operation of businesses over time.

2- Social Sustainability: Enhancing local livelihoods, respecting cultural heritage, and promoting social equity.

3- Environmental Sustainability: Protecting natural resources and reducing pollution to maintain ecological integrity.

The tourism sector holds immense potential to drive sustainable development by fostering meaningful connections between travelers, host communities, and their environments. However, this potential can only be realized through responsible management and innovative practices aimed at reducing tourism's environmental impact.

*** Global Growth and Contributions of Sustainable Tourism**

Ecotourism, a key component of sustainable tourism, has experienced significant global growth, fueled by heightened

environmental awareness and a rising demand for responsible travel experiences. As illustrated by Parolo et al. (2009), effective sustainable tourism strategies have been successfully implemented in sensitive areas such as Natura 2000 sites, which highlight the importance of protecting biodiversity while accommodating tourism.

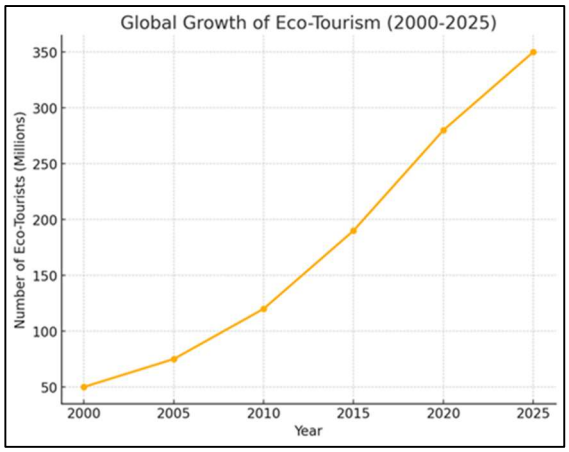

Figure 2: Global Growth of Ecotourism (2000–2025) (Source: Data compiled from UNEP (2023); figure created by the author)

The exponential growth of ecotourism, from 50 million travelers in 2000 to a projected 350 million by 2025 (UNWTO, 2022), underscores the increasing preference for environmentally conscious travel. This trend positions ecotourism as a viable and sustainable alternative to conventional mass tourism.

The worldwide trend towards sustainable tourism demonstrates the growing consciousness among travelers regarding the uncertain planetary impact of their travels, and an increasing demand for responsible travel opportunities (Holden, Jamal & Burini, 2022). This transition has encouraged the implementation of tourism concepts focusing on environmental conservation, cultural preservation, and economic justice. Sustainable tourism seeks to reduce environmental damage, promote responsible resource use, decrease carbon emissions, and encourage eco-friendly accommodation and transportation (Abdellatif, Hicham & Karim, 2024). Sustainable tourism fosters community development by creating jobs, supporting small local businesses, and reinvesting tourism revenues into local infrastructure and conservation.

Integration of sustainability into tourist destinations greatly enhances their resilience by ensuring that they become truly sustainable. Sustainable practices seek to reduce the negative impacts stemming from climate change, economic instability, and environmental degradation, thereby promoting sustainability itself (Hariram et al., 2023). In the Mediterranean region, a partnership between government entities, the private sector, and environmental NGOs has resulted in marine conservation programs designed to safeguard fragile ecosystems while attracting eco-minded travelers.

Marine protected areas (MPAs), as an example, were established to control fishing, preserve biodiversity, and maintain water quality (Grorud-Colvert et al., 2021). They not only guarantee the safety of marine habitats, but they also assist the local economy in developing eco-tourism through sustainable diving, wildlife watching, and cultural heritage tourism. The further development of sustainable tourism is the most important task for ensuring the future of travel and protecting natural and cultural treasures.

Key Contributions of Sustainable Tourism: -

1- Economic Benefits: In Costa Rica, ecotourism contributed 6.3% of the country's Gross Domestic Product (GDP) in 2016, supporting rural livelihoods and funding national conservation efforts (Benavides Vindas, 2020).

2- Environmental Protection: Sustainable initiatives, such as the adoption of solar energy, have reduced carbon emissions in tourism-dependent destinations like the Maldives by 30% (Bernet & Acosta, 2022).

3- Community Empowerment: Community-managed eco-lodges in Morocco have increased rural incomes by 20%, fostering economic development while simultaneously promoting conservation (Berriane, 2020).

*** Environmental Challenges in Tourism**

While tourism offers substantial economic and social benefits, unsustainable practices within the sector continue to place immense pressure on natural resources and contribute significantly to climate change. One critical area of concern is the accommodation sector, which faces its own set of sustainability challenges. An environmental assessment reveals significant issues related to resource consumption and waste management, as discussed by George et al. (2007). This includes evaluating energy usage, water consumption, and other environmental impacts linked to accommodation facilities. These challenges contribute to the overall carbon footprint of the tourism sector, highlighting the urgent need for comprehensive strategies to address emissions and promote sustainability.

*** CO_2 Emissions from Tourism**

One of the most pressing environmental challenges is the substantial carbon emissions generated by tourism, particularly through transportation. As Ritchie (2020) highlights, aviation contributes significantly to global CO_2 emissions, accounting for a

considerable share of tourism-related emissions, as illustrated in Figure 3.

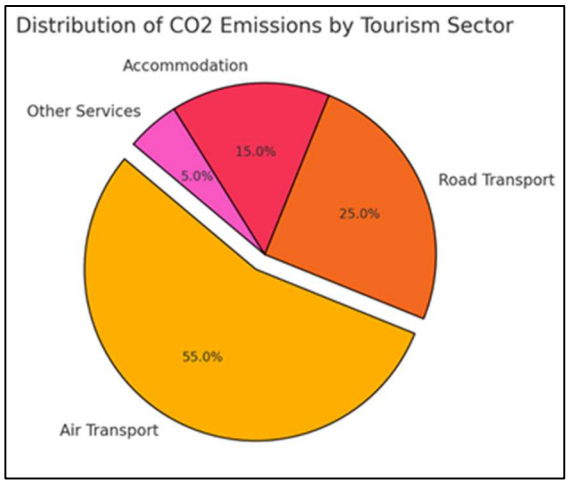

Figure 3: Distribution of CO_2 Emissions by Tourism Sector (Source: Data compiled from UNWTO (2022); figure created by the author)

The data indicate the following: -

1- Air transport contributes the largest portion, accounting for 55% of tourism-related CO_2 emissions.

2- Road transport follows at 25%, reflecting the widespread use of cars and buses for regional travel.

3- Accommodations are responsible for 15% of emissions, highlighting the need for more energy-efficient practices in the hospitality sector.

These findings highlight the urgent need to transition towards low-carbon transportation systems and implement energy-efficient technologies in the accommodation industry to minimize tourism's environmental footprint (UNWTO, 2022).

*** Resource Overuse and Pollution**

Tourism also places immense strain on local water and waste management systems, particularly during peak seasons: -

1- In Spain, water consumption per tourist exceeds 300 liters per day during peak tourism periods, exacerbating existing local water shortages (EEA, 2023).

2- In the Balearic Islands, waste generation surges by 80% in the summer months due to high tourist inflows, overwhelming local waste management infrastructure (Dogru et al., 2020).

While these environmental challenges remain significant, several destinations have successfully adopted innovative strategies to address these issues, as highlighted in the following case studies.

*** Case Studies of Successful Sustainable Tourism Initiatives**

Costa Rica: A Model for Ecotourism

Costa Rica provides a compelling example of how ecotourism can serve as a driver for sustainable development (Benavides Vindas, 2020): -

1- Economic Impact: Ecotourism contributes 6.3% to the national GDP and supports over 200,000 jobs.

2- Environmental Protection: Nearly 28% of the country's land area is

designated as protected national parks, financed primarily through ecotourism revenues.

3- Innovative Practices: Significant investments in renewable energy align with Costa Rica's ambitious goal of achieving carbon neutrality by 2050.

*** Morocco: Community-Led Conservation**

Morocco has effectively leveraged ecotourism to balance tourism development with environmental preservation: -

1- Talassemtane National Park: Community-managed programs within the park focus on sustainable practices, forest conservation, and reducing human environmental footprints. However, further research is needed to measure their effectiveness in mitigating deforestation and preserving biodiversity.

2- Tangier: Targeted conservation initiatives have addressed coastal degradation through stricter construction regulations, reforestation programs, and enhanced natural resource management. These efforts have successfully reduced coastal erosion by 35% since 2015 (Berriane, 2020).

Figure 4: Ecotourism Destinations in Morocco

*** Slovenia: Zero-Waste Tourism**

Slovenia has embraced innovative zero-waste principles to advance sustainable tourism: -

1- Waste Reduction: Hotels participating in the initiative cut waste production by 50% within five years.

2- Energy Efficiency: Renewable energy now supplies 60% of the energy demand in the country's primary tourism hotspots (Bernet & Acosta, 2022).

Table 3: Examples of Sustainable Tourism Practices and Results

Practice	Impact	Example
Renewable Energy Adoption	Reduces energy-related emissions	Solar-powered resorts in Maldives
Community-Led Conservation	Protects ecosystems and supports jobs	Talassemtane National Park in Morocco
Zero-Waste Programs	Reduces pollution and resource strain	Zero-waste hotels in Slovenia
Environmental Taxes	Funds conservation initiatives	Galápagos Islands' $100 tourist fee

Source: by the author.

This table showcases various sustainable tourism practices and their impacts, providing concrete examples of their implementation worldwide. It highlights how these initiatives contribute to reducing emissions, protecting the environment, and funding conservation efforts.

*** Strategies for Promoting Sustainable Tourism**

To overcome current challenges and secure the long-term viability of tourism, sustainable development requires coordinated efforts from all key stakeholders. Building on these successful examples, it is essential to develop comprehensive strategies that promote sustainable tourism across different regions. This involves collaboration among governments, businesses, communities, and tourists to implement effective policies and practices that ensure long-term sustainability in the tourism sector: -

1- Governments: Leading the Path to Sustainability: Governments are instrumental in advancing sustainable tourism through robust regulations, financial incentives, and strategic policy frameworks. As highlighted by Wood (2000), an analysis of environmental statement submissions underscores the critical need for robust assessment processes to guide sustainable decision-making. By aligning tourism activities with environmental conservation and local development priorities, governments ensure a balance between growth and sustainability. For example, Tunisia's $15 million investment in wastewater treatment systems has helped protect its coastal ecosystems, demonstrating the impact of governmental action in addressing environmental challenges (Miossec, 1999). Indeed, as Laliberté (2005) emphasizes, policy decisions must adhere to the principles of sustainable and equitable tourism to effectively promote inclusive growth within the sector.

2- Tourism Businesses: Driving Innovation and Responsibility**:** Tourism businesses, ranging from hotels to tour operators and transport providers, bear a significant responsibility for adopting environmentally friendly practices. This includes initiatives aimed at enhancing energy efficiency and reducing waste while integrating sustainability into their operational strategies. Furthermore, as noted by Rosalina et al. (2021), the challenges faced by rural tourism require innovative approaches to ensure that development aligns with both environmental and economic objectives. According to Sahut et al. (2000), understanding the crisis, longevity, and sustainability of businesses is crucial for effectively addressing these challenges. By adopting these responsible and innovative practices, businesses can not only mitigate their environmental impacts but also attract eco-conscious travelers, thereby ensuring their long-term viability. As discussed by

Kilipiris and Zardava (2012), addressing sustainability issues in tourism enterprises is essential for adapting to changing environmental conditions.

3- Communities: Guardians of Local Resources**:** Local communities are vital for the success of sustainable tourism initiatives. Through their participation in ecotourism projects, they play a key role in protecting natural resources, preserving cultural heritage, and fostering economic growth. Community-led projects offer a unique advantage by aligning tourism development with local needs, ensuring equitable benefits and resource sustainability.

4- Tourists: Making Responsible Choices**:** Tourists are essential actors in the sustainability equation. By choosing eco-certified accommodations, supporting local businesses, and adopting responsible travel behaviors—such as conserving resources and reducing waste—they drive demand for sustainable tourism. The growing awareness and preferences of tourists for eco-friendly options further encourage destinations and businesses to implement responsible practices. In this context, Leroux (2010) highlights that promoting sustainable tourism and ecotourism practices is crucial to fostering environmentally friendly behaviors among tourists, thereby supporting overall responsible tourism development.

Sustainable tourism development offers a pathway to balance economic growth, social equity, and environmental preservation. Case studies from Costa Rica, Morocco, and Slovenia demonstrate how innovative approaches—such as ecotourism, zero-waste programs, and renewable energy adoption—can address environmental challenges while fostering local development. Achieving sustainable tourism requires strong policies and collaboration between stakeholders, investments in low-carbon infrastructure and resource management, and increased awareness among tourists to promote responsible behaviors. These strategies ensure that tourism becomes a driving force for sustainability, preserving vibrant and resilient destinations for future generations.

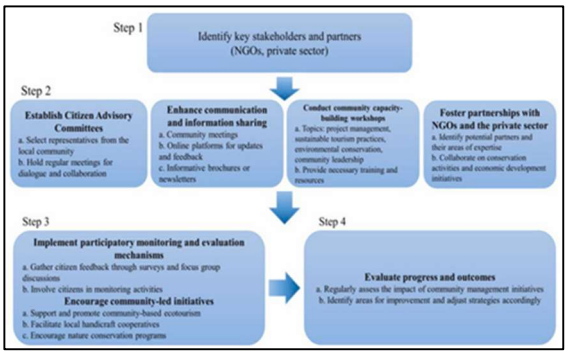

Figure 5: Factors impacting Sustainable Development in Eco-Tourism Settlements (Source: Habibulloev et al., 2024)

* Discussion

This study underscores the intricate relationship between mass tourism and environmental sustainability, highlighting the urgent need for sustainable tourism practices to mitigate adverse impacts on ecosystems. The exponential growth of international tourism, marked by a 25% rise in participation over the past decade (UNWTO, 2020), has amplified challenges, particularly in environmentally sensitive regions like coastal and rural areas. Projections suggest that this upward trend will persist, especially in developing nations where ecosystems face intensified pressures (Glaesser et al., 2017; Ruhanen et al., 2015).

The rapid development of tourism infrastructure, including hotels, transportation networks, and recreational facilities, has led to increased resource consumption, waste production, and pollution. Studies indicate that peak tourism seasons exacerbate these issues, placing significant strain on local resources and accelerating environmental degradation (Corluka, 2019; Holden, 2016). Effective strategies for waste management and resource conservation remain pivotal in addressing these challenges.

The intricate relationship between tourism density and environmental strain includes various factors, such as patterns of human presence, which are critically evaluated in recent studies (Curci et al., 2022). This research demonstrates a direct correlation between tourism density and environmental strain, focusing on key variables such as energy demand, water usage, and waste management. During peak tourist seasons, destinations report heightened energy consumption and waste production, as highlighted by case studies from various Mediterranean locations (Kovačić et al., 2016; Bakar & Rosbi, 2020).

Tourism also significantly contributes to global greenhouse gas emissions, with transportation alone accounting for approximately 90% of the sector's emissions (Bakar & Rosbi, 2020). Simultaneously, tourism-dependent regions such as the Mediterranean face escalating climate change risks, including rising

sea levels, coastal erosion, and extreme weather events (Bernet & Acosta, 2022). This dual challenge underscores the vulnerability of tourism economies and the urgent need for adaptation strategies to safeguard livelihoods and ecosystems.

Case studies from around the world provide valuable insights into successful sustainable tourism practices. Morocco's community-led ecotourism projects demonstrate how tourism growth can align with environmental conservation, while Costa Rica's investment in renewable energy exemplifies the potential for carbon neutrality in tourism development (Berriane, 2020; Benavides Vindas, 2020). Similarly, Slovenia's zero-waste initiatives highlight the capacity of tourism businesses to reduce pollution while maintaining economic profitability (Bernet & Acosta, 2022).

The findings emphasize the importance of collaboration among governments, businesses, communities, and tourists in advancing sustainable tourism. Policymakers are pivotal in fostering eco-friendly infrastructure, enforcing regulations, and offering incentives to encourage responsible tourism development (Martin, 2014; UNWTO, 2006). At the same time, tourists must take accountability by making informed decisions that support sustainable practices and destinations.

*** Limitations**

While this study offers valuable insights into the environmental impacts of mass tourism in the Mediterranean and pathways for sustainable tourism development, several limitations must be acknowledged. A primary limitation is the reliance on secondary data and case studies from existing literature. Variations in reporting standards for resource consumption and carbon emissions across regions posed challenges for direct comparisons. Additionally, the lack of up-to-date, disaggregated data for specific Mediterranean destinations restricted the precision of some findings.

Another limitation lies in the regional focus of this study, which centers on the Mediterranean. While the region serves as a significant case for examining tourism's environmental challenges, the findings may not fully encompass the diverse realities faced by other global regions. Differences in governance structures, infrastructure, and socio-economic contexts necessitate caution when generalizing these results. The scope of the case studies

also represents a limitation. While examples from Costa Rica, Morocco, and Slovenia demonstrate successful sustainable tourism initiatives, they may not reflect the full spectrum of strategies applicable to other destinations. Localized factors, such as cultural norms and policy environments, influence both the implementation and outcomes of such initiatives.

Furthermore, while the study acknowledges the link between tourism and climate change, it does not delve deeply into future projections or the long-term implications of global warming for specific destinations. Integrating climate modeling and scenario analysis could enrich the understanding of these complex dynamics. Lastly, the study recognizes the critical role of tourist behavior in advancing sustainability but does not include primary research or surveys on traveler perceptions and willingness to adopt eco-friendly practices. Collecting direct data on these factors would enhance the understanding of how tourists can actively contribute to sustainable tourism.

Despite these limitations, this study provides a robust foundation for examining the environmental challenges of mass tourism. It also identifies actionable strategies for promoting sustainable tourism development. Future research addressing these gaps—particularly through primary data collection, broader geographical analysis, and long-term monitoring—will further advance the discourse on sustainable tourism.

*** Conclusion**

The Mediterranean region, as the focus of this study, embodies both a challenge and an opportunity. Sustainable management has the potential to emerge as a global exemplar for balancing tourism growth with environmental preservation. Ultimately, sustainable tourism is not just an option but a necessity to ensure that destinations remain vibrant and viable for future generations.

This study highlights the urgent need to mitigate the environmental impacts of mass tourism, particularly in ecologically fragile regions like the Mediterranean. While tourism catalyzes economic growth, social development, and cultural exchange, its environmental consequences can be severe when development lacks sustainability. The findings underscore the importance of embedding sustainability into tourism practices to ensure long-term

viability and ecological integrity. By analyzing global and regional case studies, this research demonstrates how sustainable tourism can strike a balance between economic growth, social equity, and environmental preservation. To secure a sustainable future, governments must enforce stringent regulations, invest in eco-friendly infrastructure, and foster policies that minimize resource depletion and emissions. Tourism businesses, on their part, must adopt innovative practices, such as integrating renewable energy solutions, to reduce their environmental footprint. Tourists also play a pivotal role by making informed choices, supporting sustainable destinations, and encouraging eco-conscious practices.

Achieving these goals requires a shared commitment, robust international cooperation, and a recognition that tourism's long-term success depends on the well-being of the environments and communities it affects. By adopting these strategies, tourism can evolve into a transformative force that preserves natural and cultural resources while fostering economic resilience.

*** Competing Interest**

The author reports there are no competing interests to declare.

*** Data Availability**

All data supporting the findings of this study are available within the article and its supplementary materials.

Ethical Approval

None

*** References**

Abdellatif, H., Hicham, B., & Karim, B. (2024). Responsible green tourism: A new path for eco-friendly tourism development. International journal of economic perspectives, 18(2), 560-589.

Badr, E.-S. A., Zahran, A. A., & Cashmore, M. (2011). Benchmarking performance: Environmental impact statements in Egypt. Environmental Impact Assessment Review, 31(3), 279-285.

Bakar, N. A., and Rosbi, S. (2020). Effect of Coronavirus disease (COVID-19) to tourism industry. International Journal of Advanced Engineering Research and Science, 7(4), 189-193.

Baloch, Q. B., Shah, S. N., Iqbal, N., Sheeraz, M., Asadullah, M., Mahar, S., & Khan, A. U. (2023). Impact of tourism development upon environmental sustainability: a

suggested framework for sustainable ecotourism. Environmental Science and Pollution Research, 30(3), 5917-5930.

Benavides Vindas, S. (2020). El aporte del turismo a la economía costarricense: más de una década después. Economía y Sociedad, 25(57), 1-29. DOI: 10.15359/eys.25-57.1

Bernet, M., & Acosta, L. T. (2022). Rising sea level and increasing tropical cyclone frequency are threatening the population of San Andrés Island, Colombia, western Caribbean. BSGF-Earth Sciences Bulletin, 193(1), 4.

Berriane, M. (2020). Le tourisme marocain de l'après-COVID-19 : simple reprise ou transition vers un nouveau modèle ? Téoros, 39(3). DOI: 10.7202/1074905.

Brussels. (2020). Report from the commission to the european parliament, the council, the european economic and social committee and the committee of the regions. https://eur-lex.europa.eu/legal-content/FR/TXT/HTML/?uri=CELEX:52020DC0950&from=FR

Chandel, S. P. K. (2022). Impacts of tourism on environment. Central Asian Journal of Innovations on Tourism Management and Finance, 3(10), 90-98.

Corluka, G. (2019). Tourism seasonality–an overview. Journal of Business Paradigms, 4(1), 21-43.

Curci, F., Kercuku, A., Zanfi, F., & Novak, C. (2022). Permanent and seasonal human presence in the coastal settlements of Lecce. An analysis using mobile phone tracking data. TEMA, 2, 57-71.

Dalle, I. (2007). Maroc: histoire, société, culture. La decouverte.

De Franchis, L., Plan Bleu, S.-A., & Ibanez, F. (2003). Threats to soils in Mediterranean countries: Document review.

Dogru, T., Bulut, U., Kocak, E., Isik, C., Suess, C., & Sirakaya-Turk, E. (2020). The nexus between tourism, economic growth, renewable energy consumption, and carbon dioxide emissions: contemporary evidence from OECD countries. Environmental Science and Pollution Research, 27, 40930-40948.

Dwyer, L. (2023). Tourism development and sustainable well-being: A Beyond GDP perspective. Journal of Sustainable Tourism, 31(10), 2399-2416.

El Nemr, A., Khaled, A., Moneer, A. A., & El Sikaily, A. (2012). Risk probability due to heavy metals in bivalve from Egyptian Mediterranean coast. The Egyptian Journal of Aquatic Research, 38(2), 67-75.

El-Masry, E. A., El-Sayed, M. K., Awad, M. A., El-Sammak, A. A., & Sabarouti, M. A. E. (2022). Vulnerability of tourism to climate change on the Mediterranean coastal area of El Hammam–EL Alamein, Egypt. Environment, Development and Sustainability, 24(1), 1145-1165.

El-Raey, M. (2010). Impacts and implications of climate change for the coastal zones of Egypt. Coastal zones and climate change, 7, 31-50.

European Environment Agency (EEA). (2023). Overcrowding and environmental pressures in coastal Mediterranean regions. https://www.eea.europa.eu

European Environment Agency. (2023). Urban land cover changes and environmental pressures in Mediterranean coastal regions. https://www.eea.europa.eu.

Frihy, O. E. (2001). The necessity of environmental impact assessment (EIA) in implementing coastal projects: lessons learned from the Egyptian Mediterranean Coast. Ocean & Coastal Management, 44(7-8), 489-516.

Gaaloul, N., Eslamian, S. A. E. I. D., & Katlance, R. (2021). Impacts of climate change and water resources management in the southern mediterranean countries. Water Productivity Journal, 1(1), 51-72.

Gentilucci, M., Moustafa, A. A., Abdel-Gawad, F. K., Mansour, S. R., Coppola, M. R., Caserta, L., Inglese, S., Pambianchi, G., & Guerriero, G. (2021). Advances in Egyptian Mediterranean coast climate change monitoring. Water, 13(13), 1870.

George, C. Y., Mahon, R., & Cumberbatch, J. (2007). An environmental assessment of the accommodation sector in

the Grenadine Islands. In: Citeseer.

Gkarane, S., & Vassiliadis, C. A. (2024). Exploring Underwater Tourism in EU-Mediterranean Coastal Areas for Sustainable Development. In Contemporary Marketing Management for Tourism and Hospitality: How New Tech and Gen Z Drive Sustainable Business Transformation (pp. 283-310). Cham: Springer International Publishing.

Glaesser, D., Kester, J., Paulose, H., Alizadeh, A., & Valentin, B. (2017). Global travel patterns: an overview. Journal of Travel Medicine, 24(4).

González-Morcillo, S., Horrach-Rosselló, P., Valero-Sierra, O., & Mulet-Forteza, C. (2023). Forgotten effects of active tourism activities in Spain on sustainable development dimensions. Environment, Development and Sustainability, 25(10), 10743-10763.

Grorud-Colvert, K., Sullivan-Stack, J., Roberts, C., Constant, V., Horta e Costa, B., Pike, E. P., ... & Lubchenco, J. (2021). The MPA Guide: A framework to achieve global goals for the ocean. Science, 373(6560), eabf0861.

Guo, Z., & Li, Y. (2024). Analysis of the Decisive Factors of Government Attracting Tourists in Public Management from the Perspective of Environmental Protection. Problemy Ekorozwoju, 19(1), 285-295.

Habibulloev, S., Han, F., Bakhtiyorov, Z., Xuankai, M. A., & Nuhzor, O. (2024). Factors influencing sustainable development in Eco-tourism settlements: A comparative analysis. Heliyon, 10(4).

Hariram, N. P., Mekha, K. B., Suganthan, V., & Sudhakar, K. (2023). Sustainalism: An integrated socio-economic-environmental model to address sustainable development and sustainability. Sustainability, 1 5(13), 10682.

Holden, A. (2016). Environment and tourism. Routledge.

Holden, A., Jamal, T., & Burini, F. (2022). The future of tourism in the Anthropocene. Annual Review of Environment and Resources, 47(1), 423-447.

Hosni, E. (2000). Stratégie pour un développement durable du

tourisme au Sahara. CLT-2OOO/WS/l. Unesco.

Intergovernmental Panel on Climate Change (IPCC). (2022). Climate Change 2022: Impacts, Adaptation, and Vulnerability. Geneva: IPCC. https://www.ipcc.ch/report/ar6/wg2/.

Internal Market, Industry, Entrepreneurship and SMEs. (2023). European Commission. https://single-market-economy.ec.europa.eu/sectors/tourism/eu-funding-and-businesses/business-portal/getting-know-potential-clients/emerging-markets_en

Kaur, M., Singh, A., & Kaur, A. (2025). Challenges and Consequences of Improper Waste Disposal in Rural Tourism. In Solid Waste Management and Disposal Practices in Rural Tourism (pp. 317-352). IGI Global.

Khan, N., Hassan, A. U., Fahad, S., & Naushad, M. (2020). Factors affecting tourism industry and its impacts on global economy of the world. Available at SSRN 3559353.

Kilipiris, F., & Zardava, S. (2012). Developing sustainable tourism in a changing environment: issues for the tourism enterprises (travel agencies and hospitality enterprises). Procedia-Social and Behavioral Sciences, 44, 44-52.

Kovačić, M., Favro, S., & Mezak, V. (2016). Construction of nautical tourism ports as an incentive to local development. Environmental Engineering & Management Journal (EEMJ), 15(2).

Laliberté, M. (2005). Le tourisme durable, équitable, solidaire, responsable, social…: un brin de compréhension. Téoros. Revue de recherche en tourisme, 24(24-2), 69-71.

Leka, A., Tsigarda, N., & Stratigea, A. (2023, June). Assessing Tourism Environmental Sustainability in Mediterranean Insular Destinations–Case Study Zakynthos Island. In International Conference on Computational Science and Its Applications (pp. 371-390). Cham: Springer Nature Switzerland.

Leroux 1, E. (2010). Vers un Tourisme Durable ou un écotourisme. Revue

management et avenir(4), 234-238.

Lukoseviciute, G., & Pereira, L. N. (2021). Tourists' perceptions of beach quality improvement during the off-peak season: a segmentation approach. Tourism & Management Studies, 17(2), 17-28.

Martin, J.-Y. (2014). Développement durable?: Doctrines, pratiques, évaluations. IRD Éditions.

Mejjad, N., Rossi, A., & Pavel, A. B. (2022). The coastal tourism industry in the Mediterranean: A critical review of the socio-economic and environmental pressures & impacts. Tourism Management Perspectives, 44, 101007.

Mena-Nieto, A., Estay-Ossandon, C., & Dos Santos, S. P. (2021). Will the Balearics and the Canary Islands meet the European Union targets for municipal waste? A comparative study from 2000 to 2035. Science of the Total Environment, 783, 147081.

Michel, B. (2022). The future of a sustainable ski resort industry in regard to climate change. THESEUS.

Miossec, J.-M. (1999). Les acteurs de l'aménagement touristique tunisien: les leçons d'une performance. Le tourisme au Maghreb: Diversification du produit et développement régional et local. Publications de la Faculté des Lettres et des Sciences Humaines de Rabat. Série: Colloques et Séminaires, 79, 65-85.

Morelle-Hungría, E., Fonfría, E., Dobson, J., & Bordehore, C. (2023). Underwater Noise Pollution as an Ecological Crime: A Global Problem in the Anthropocene. Kriminologie-Das Online-Journal| Criminology-The Online Journal, (5), 348-363.

Numbere, A. O., & Maduike, E. M. (2022). The impact of unsustainable exploitation of forest and aquatic resources of the Niger Delta, Nigeria. In Biodiversity in Africa: potentials, threats and conservation (pp. 239-265). Singapore: Springer Nature Singapore.

Paramana, T., Dassenakis, M., Bassan, N., Dallangelo, C., Campostrini, P., Raicevich, S., ... & Pagkou, P. (2023). Achieving coherence between the marine strategy framework directive and the maritime

spatial planning directive. Marine policy, 155, 105733.

Parolo, G., Rossi, G., Ferrarini, A., Pedrini, S., & Folatti, M. (2009). Sustainable tourism strategies in a Natura 2000 site in the Italian Alps. Sustainable tourism strategies in a Natura 2000 site in the Italian Alps, 54-59.

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: in search of conceptual origins. Sustainability science, 14, 681-695.

Ranasinghe, R., Karunarathne, A. C. I. D., & Herath, J. (2021). After corona (COVID-19) impacts on global poverty and recovery of tourism based service economies: An appraisal. International Journal of Tourism and Hospitality, 1(1), 52-64.

Ritchie, H. (2020). Climate change and flying: what share of global CO2 emissions come from aviation? https://ourworldindata.org/co2-emissions-from-aviation

Rosalina, P. D., Dupre, K., & Wang, Y. (2021). Rural tourism: A systematic literature review on definitions and challenges. Journal of Hospitality and Tourism Management, 47, 134-149.

Ruhanen, L., Weiler, B., Moyle, B. D., & McLennan, C.-L. J. (2015). Trends and patterns in sustainable tourism research: A 25-year bibliometric analysis. Journal of Sustainable Tourism, 23(4), 517-535.

Sahut, J., Boulerne, S., & Lantz, J. (2000). Crise, longévité et durabilité des entreprises. Gestion, 6.

Schmidt, H.-W. (2002). Tourisme et environnement. European Commission. https://ec.europa.eu/eurostat/documents/3433488/5511164/KS-NP-02-040 FR.PDF/6e04ccc9-6916-41b1-9183-f8f837cf3c08?version=1.0

Shaaban, I., & Ramzy, Y. (2010). The impact of climate change on tourism in Egypt is perceived by both policymakers and tourism managers. WIT Transactions on Ecology and the Environment, 139, 241-251.

Sheate, W. R. (1997). The Environmental Impact Assessment Amendment Directive 97/11/EC-A Small

Step Forward? European Energy and Environmental Law Review, 6(8/9).

Spataro, A. (2000). Le tourisme en Méditerranée. Le tourisme en Mediterranée, 1-142.

Teng, Y., Cox, A., & Chatziantoniou, I. (2021). Environmental degradation, economic growth and tourism development in Chinese regions. Environmental Science and Pollution Research, 28, 33781-33793.

Tourism's carbon emissions measured in landmark report launched at cop25. (2019). https://www.unwto.org/news/tourisms-carbon-emissions-measured-in-landmark-report-launched-at-cop25

UNEP (2023). Global Ecotourism Market Report 2023. United Nations Environment Program.

UNWTO. (2006). Towards Sustainable Tourism: A Guide for Policy Makers. United Nations World Tourism Organization. Madrid.

UNWTO. (2020). International Tourism Highlights, 2020 Edition. United Nations World Tourism Organization. Madrid. DOI: 10.18111/9789284422456

UNWTO. (2022). Mediterranean tourism insights and trends. United Nations World Tourism Organization. Madrid.

Wood, G. (2000). Ten years on: an empirical analysis of UK environmental statement submissions since the implementation of Directive 85/337/EEC. Journal of Environmental Planning and Management, 43(5), 721-747.

Zhichao, Y., & Yashu, Y. (2024). Principles of Green Eco-Friendly Tourism Towards Promoting Environmental Sustainability. MARKAZIY OSIYO MADANIY ME'ROSI VA TURIZM TENDENSIYALARI JURNALI (ISSN: 3060-4834), 1(2), 18-28.