

# International Conference on Business and Economics - Hellenic Open University

Vol 5, No 1 (2025)

Proceedings of the ICBE-HOU 2025



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### To cite this article:

Kaouri, A., & Androulakis, G. (2026). Overtourism: Causes, Consequences, and Sustainable Solutions . *International Conference on Business and Economics - Hellenic Open University*, 5(1). Retrieved from <https://eproceedings.epublishing.ekt.gr/index.php/ICBE-HOU/article/view/9737>

# Overtourism: Causes, Consequences, and Sustainable Solutions

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## Abstract

The problem of over-tourism is a concern for many major tourist destinations throughout the globe, especially those with limited ecological and spatial capacities. This study addresses the problems of Mykonos and Santorini, two of the most well-known Greek Islands in the world, both experiencing extreme seasonal crowding due to excessive tourism pressure. The study uses second-hand data from official sources (Bank of Greece; ELSTAT; Fraport Greece) and evaluates the primary reasons for over-tourism (cruise ship traffic, uncontrolled short-term rentals and lack of adequate infrastructure). The findings indicate that although tourism has generated significant economic benefits, it has also led to environmental degradation, housing shortages, and declining quality of life for residents. A number of policy recommendations are proposed as part of this research, which seek to improve sustainable tourism practices by implementing regulatory changes, investing in new infrastructure and developing partnerships between stakeholders. The ultimate goal of these suggestions is to develop a balanced model for sustainable tourism, which will help ensure the long-term viability of the tourist industry and the viability of the local community.

**Keywords:** Overtourism, Sustainable Tourism, Mykonos, Santorini, Tourism Policy

**JEL Classification Codes:** Z32, Q01, R58

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## 1. Introduction

Tourism has long been a key driver of economic development in coastal and island regions. In countries such as Greece, tourism contributes significantly to national revenue, employment, and infrastructure

development. However, the rapid and often unregulated growth of tourism over recent decades has led to the emergence of overtourism. Among the most serious consequences of overtourism are infrastructure stress, environmental degradation, and social disruption.

Furthermore, Mykonos and Santorini represent prominent Greek island destinations where this phenomenon is particularly evident. The visitation to the Cyclades Islands, the area of great natural beauty combined with significant historical attributes, and a world-wide advertising program, has risen steeply. While this increased visitation has produced certain benefits, it has also imposed many conditions which fall in the category of problems. These issues alluded to include overcrowding through the peak season, exorbitant land prices, dislocation of local population, water shortage and disposal of refuse have raised the issues of sustainability of development in tourism growing areas.

Despite the extensive international literature on overtourism, limited empirical research has systematically examined small Mediterranean island destinations using recent post-COVID data. Mykonos and Santorini represent emblematic cases of high-intensity island tourism, yet existing studies often remain descriptive or focus solely on economic contribution rather than structural sustainability limits. This study is motivated by the need to provide an updated, data-driven assessment of overtourism dynamics in these destinations during the critical 2019–2023 recovery period.

The primary aim of this research is to examine whether tourism growth in Mykonos and Santorini has exceeded sustainable carrying capacity thresholds and to evaluate whether economic gains are aligned with infrastructure readiness and governance capacity.

The study employs a mixed-method approach based primarily on secondary quantitative data from official institutional sources (Bank of Greece, ELSTAT, Fraport Greece) combined with qualitative policy analysis.

Moreover, it contributes to the literature in three ways. First, it provides updated empirical evidence on overtourism in Greek island destinations using post-pandemic data. Second, it integrates tourism intensity indicators (tourist-to-resident ratios, seasonality concentration, cruise density) with economic expenditure metrics to assess sustainability imbalance. Third, it links empirical findings with actionable, island-specific governance recommendations.

The remainder of the paper is structured as follows: Section 2 reviews the relevant literature and identifies the research gap. Section 3 presents the methodology and research questions. Section 4 presents the empirical findings. Section 5 discusses policy recommendations. Section 6 provides discussion and theoretical implications, and Section 7 concludes the study.

## **2. Literature Review**

Overtourism as a phenomenon recently became a global issue, especially within regions facing rapid tourism development, weak governance and the commodification of iconic destinations. Since the mid-2010s, the attention of scholars was drawn to some of the multiple impacts of increasing tourism traffic flows in geographies that surpassed their ecological, social and infrastructural capacity. Today, overtourism is an important part of the discussion in tourism studies, regional planning and sustainability discourse and brings with it fundamental questions regarding the long-term capacity and sustainability of current tourism models within vulnerable geographies, such as coastal and island economies.

### **2.1 Conceptualizing Overtourism**

Overtourism is not merely a function of visitor numbers, but of the imbalance between tourist flows and destination capacity. According to UNWTO (2018), overtourism is defined as a situation in which tourism has reached a level that negatively affects residents, degrades the environment, and reduces visitor satisfaction. Dodds and Butler (2019) argue that overtourism is not simply a matter of visitor numbers, but rather of governance capacity and management effectiveness. Bramwell and Lane (2011) associate overtourism with unsustainable tourism development, emphasizing the absence of long-term planning and integration with broader social and environmental priorities. Milano, Cheer, and Novelli (2019) adopt a perception-based perspective, highlighting feelings of congestion, alienation, and loss of identity among residents. Taken together, these approaches demonstrate that overtourism is both a quantitative and qualitative phenomenon requiring interdisciplinary responses.

They point out that even without reaching ecological thresholds, a city where tourism is so dense can become increasingly uninhabited or undesired as a result of the sociocultural disruptions tourism has a tendency to produce. With all of this approaches, overtourism is a quantitative and qualitative phenomenon a problem which calls for nuanced, interdisciplinary responses.

### **2.2 Global and Regional Case Studies**

There are numerous cases of overtourism throughout Europe and the Mediterranean. In Venice, it has become the "open-air museum" due to the influx of cruise ships and 3-day tourists, forcing locals to sell their homes for lower real estate prices and making the area an exhibition (Seraphin, Sheeran and Pilato, 2018). In Barcelona, locals have been protesting the development of tourism that is replacing them due to the increasing cost of living and remodeling the houses and stores into inns and apartments for travelers (Cocola-Gant, 2022).

The city of Dubrovnik has enforced UNESCO's guidelines for the sake of visitor management. They have been limiting the arrival of cruise ships, using security cameras to monitor crowd density and placing limits

on what time tourists may visit certain historical sites. These show that though overtourism is happening all over the world, the ways to solve the issues are local and place-based. The actions taken reflect the political, environmental and economic settings in each area. In rural and island overtourism has its own attributes. Papageorgiou (2016) stresses that small islands suffer from constraints in their availability of resources and can often be classified as environmentally sensitive areas. The small population and scarce space means that the relatively small increase in tourism can be far more disruptive to small islands than it would be in a larger area. Tourism can be detrimental in regards to carrying capacity, transformation of economies, landscape alteration and loss of biodiversity.

### **2.3 Key Drivers of Overtourism**

The literature identifies several interlocking drivers that facilitate and exacerbate overtourism, including structural shifts in the tourism industry, technological disruptions, socio-economic transformations, and policy failures. These drivers do not operate independently; rather, they reinforce one another and contribute to cumulative pressures in popular destinations.

One major driver is the expansion of low-cost travel and cruise tourism. The deregulation of the aviation sector and the proliferation of budget airlines have significantly increased travel accessibility, broadening participation in international tourism. While this democratization of travel has generated economic opportunities, it has also intensified seasonal concentration in highly attractive destinations. At the same time, cruise companies, often operating with limited local oversight, can deliver thousands of passengers within a few hours. This pattern generates short-term congestion, strains infrastructure, and frequently produces limited economic spillover for local communities (Gössling et al., 2023).

Technological change and platform capitalism constitute another powerful driver. Social media platforms such as Instagram, YouTube, and TikTok have reshaped tourist behavior by encouraging “bucket-list” travel and location-based image sharing. The visibility of iconic landscapes and curated experiences accelerates demand for specific sites, amplifying spatial concentration. In parallel, digital accommodation platforms such as Airbnb have expanded lodging capacity beyond traditional hotel districts. Guttentag (2015) and Zervas, Proserpio, and Byers (2017) demonstrate that such platforms often circumvent zoning and regulatory frameworks, contributing to residential displacement, gentrification, and rising rental prices in local communities.

Seasonality and climate constraints further intensify overtourism dynamics, particularly in Mediterranean destinations. Tourist activity is heavily concentrated between June and September, creating pronounced peaks in demand for water, electricity, waste management, and transportation services. Postma and Schmuecker (2017) argue that such seasonal surges generate structural

inefficiencies, with infrastructure underutilized during the off-season yet overwhelmed during peak months. This imbalance undermines long-term sustainability and planning efficiency.

Finally, regulatory inadequacy plays a central role in the escalation of overtourism. The literature frequently highlights the limited capacity of local governments to anticipate and manage rapid tourism expansion. Authorities may lack sufficient legal authority, financial resources, or political support to enforce zoning regulations, control short-term rentals, or implement comprehensive planning strategies. As Bramwell and Lane (2011) emphasize, weak governance frameworks allow market forces to dominate, often at the expense of environmental protection and social equity.

These drivers are particularly evident in Mykonos and Santorini, where public infrastructure has not kept pace with the exponential growth in visitor numbers, cruise ship arrivals, and luxury real estate development. The interaction of increased accessibility, digital amplification, seasonal concentration, and regulatory constraints has contributed to the structural pressures observed in both island destinations.

#### **2.4 Impacts of Overtourism**

The ramifications of overtourism are extensive, multidimensional, and often cumulative in nature. They extend beyond simple congestion and encompass environmental, social, economic, and cultural dimensions that interact and reinforce one another.

Environmental degradation is among the most visible consequences. Typical manifestations include overconsumption of freshwater resources, marine pollution caused by cruise ships and boat traffic, deterioration of footpaths and coastal areas, and the generation of excessive volumes of solid waste. In destinations such as Santorini, where freshwater resources are scarce and the population depends heavily on desalination or water imports, the sharp increase in demand during peak summer months generates ecological stress and periodic service disruptions. These pressures highlight the vulnerability of small island ecosystems to concentrated tourist activity.

Social displacement constitutes another significant impact. The widespread conversion of residential properties into short-term rentals has intensified housing affordability challenges and reduced the availability of long-term accommodation for local residents. As property prices and rental rates rise, many residents are forced to relocate, and younger generations face increasing difficulty remaining in or returning to their communities. This process weakens social cohesion, disrupts established neighborhood networks, and gradually alters the social fabric and identity of affected areas.

Economic distortion also emerges as a structural consequence of tourism dependence. Although tourism generates substantial public revenue and employment opportunities, excessive reliance on the sector can create a mono-economy vulnerable to external shocks, seasonal volatility, and global crises.

The prioritization of tourism may divert investment from other sectors such as education, healthcare, and agriculture, thereby limiting economic diversification. Moreover, employment opportunities within tourism are often seasonal or precarious, offering limited job security and reduced labor protections for local workers.

Cultural commodification further illustrates the transformative effects of overtourism. Local traditions, festivals, and everyday practices may be modified to align with tourist expectations, resulting in the simplification, staging, or commercialization of cultural expressions. Over time, cultural heritage risks being reframed as a marketable product rather than a lived social experience, potentially eroding authenticity and community ownership.

Finally, community backlash represents a growing sociopolitical response to overtourism pressures. Resident dissatisfaction may manifest in protests, political mobilization, or opposition to further tourism development. The phenomenon often described as “tourism-phobia” has already been documented in cities such as Venice and Barcelona and is increasingly visible in parts of the Cyclades. Such reactions signal deeper tensions between economic growth objectives and quality-of-life concerns, underscoring the urgency of balanced and inclusive tourism governance.

## **2.5 Governance Responses and Theoretical Frameworks**

Tackling overtourism necessitates comprehensive solutions rather than temporary fixes. Researchers such as Koens et al. (2018) and Hall (2008) support the idea of unified governance frameworks that engage all parties involved, local residents, business owners, tourists, and government officials.

The literature supports a combination of visitor quotas and dynamic caps based on real-time monitoring, zoning reforms to limit short-term rentals and preserve residential areas, tourism taxes and environmental fees to finance sustainability initiatives, seasonal and geographic redistribution strategies that promote travel in off-peak periods or to lesser-known destinations, and education campaigns targeting both tourists and local entrepreneurs.

The most effective responses combine top-down regulation with bottom-up community engagement, grounded in context-specific data and long-term sustainability goals.

## **2.6 Greek Tourism and the Cycladic Case**

Tourism is a major contributor to the Greek economy and accounts for around 20% of the GDP (Bank of Greece, 2023). Within the national tourism framework, the Cyclades islands represent both a success story and a source of persistent structural challenges. Mykonos is primarily associated with luxury tourism and nightlife, whereas Santorini is internationally recognized for its landscapes and cruise tourism intensity. Despite their different approaches to marketing each island has similar problems: an

overabundance of cruise visitors, real estate skyrocketing, waste facilities falling short, and the local populace feeling increasingly out of it. According to studies and reports (Fraport Greece, 2024, Hellenic Statistical Authority) both of these destinations have surpassed their sustainable capacity in the hottest summer months.

Furthermore, in the case of Santorini the problem is due to the number of cruise ships coming to the island at a time which cause an overloading of the facilities of the island where they experience traffic congestion, sanitation inadequacies, and limited public access. Further the increasing number of Airbnb rentals is an important factor in the shortage of housing available making neighborhoods which were once inhabited problematic with a population mostly made up of short-term tourists.

Moreover, there are local remedies proposed as the limiting of the number of cruise boats per day in Santorini and mention of limiting the number of vehicles in Mykonos yet these proposals will be found to be superficial and ineffectual. The structure of government is very discontinuous, enforcement of regulations is not done and economic conflicts prevent the application of a total remedy to these spiraling situations.

## **2.7 Research Gap**

While overtourism has been widely examined in large urban destinations such as Barcelona, Venice, and Amsterdam, comparatively fewer empirical studies focus on small island economies where spatial and environmental constraints are significantly stronger. In the Greek context, existing research tends to emphasize tourism's macroeconomic contribution rather than structural carrying capacity limits or governance adequacy. Furthermore, limited studies integrate post-COVID tourism recovery data with sustainability indicators. This creates a gap in understanding how rapid recovery interacts with infrastructure resilience and local community wellbeing in island destinations. The present study addresses this gap by providing an updated, data-driven evaluation of overtourism dynamics in Mykonos and Santorini.

## **2.8 Hypotheses Development**

Building upon the literature on overtourism, tourism carrying capacity, and tourism governance discussed in the previous sections, this study seeks to empirically examine the structural pressures generated by tourism growth in the Greek island destinations of Mykonos and Santorini. The research questions formulated earlier provide the conceptual framework for investigating whether tourism development in these destinations has evolved in a manner consistent with sustainable planning and governance principles. Previous studies emphasize that overtourism emerges when visitor growth exceeds

the ecological, infrastructural, and social capacity of a destination, particularly in geographically constrained environments such as small islands.

Within this theoretical context, the first hypothesis examines whether the rapid growth in tourism during the period 2019–2023 has surpassed the sustainable carrying capacity of the two destinations. The second hypothesis explores whether the increase in tourist arrivals has been accompanied by proportional improvements in infrastructure systems and governance mechanisms responsible for managing tourism activity. Finally, the third hypothesis focuses on the relationship between tourism intensity and social and environmental pressures, suggesting that exceptionally high tourist-to-resident ratios may generate significant stress on local resources, community wellbeing, and environmental sustainability.

These hypotheses collectively guide the empirical investigation of the study and provide the analytical basis for interpreting the statistical evidence presented in the following methodology and results sections.

### **3. Methodology**

Given the macro-structural nature of overtourism, official longitudinal datasets provide more reliable indicators of systemic pressure than small-scale survey evidence. Overtourism is not merely a perception-based phenomenon but one that can be observed through measurable indicators such as visitor volume, seasonality concentration, infrastructure capacity, and tourism intensity ratios. Descriptive statistical techniques are therefore appropriate for identifying escalation trends, demographic imbalances, and structural asymmetries that signal sustainability stress. This approach allows for an objective and longitudinal assessment of overtourism dynamics over time.

This research employs a mixed-methods framework to explore the structural causes and consequences of overtourism in the Greek islands of Mykonos and Santorini. The methodological design integrates quantitative analysis of secondary institutional datasets with qualitative interpretation of policy measures and governance responses. The underlying premise of the study is that overtourism is driven not only by high visitor numbers, but also by rapid, largely unregulated development combined with insufficient planning capacity and weak regulatory enforcement. By combining statistical evidence with policy evaluation, the study aims to generate empirically grounded insights capable of informing sustainable tourism governance, both in the examined destinations and in comparable Mediterranean island contexts.

#### **3.1 Research Questions**

Drawing on the theoretical foundations outlined in the previous sections and the hypotheses developed in the previous section, this study is guided by the following research questions.

The first research question examines the extent to which tourism growth in Mykonos and Santorini has exceeded sustainable carrying capacity thresholds during the period 2019–2023. This question directly responds to the theoretical debate on overtourism and carrying capacity limits discussed in the literature review.

The second research question investigates whether the increase in visitor numbers corresponds to proportional economic value generation or whether it reflects volume-driven expansion accompanied by structural imbalance.

The third research question evaluates whether infrastructure systems and governance mechanisms are adequately aligned with the scale and pace of tourism growth, particularly in areas such as water management, housing availability, waste systems, and regulatory enforcement.

These research questions provide the analytical framework guiding the empirical investigation presented in the following subsections.

### **3.2 Research Design**

In order to fulfill the dual objective of describing and explaining overtourism dynamics, the study adopts a descriptive case study design. Mykonos and Santorini are selected as illustrative case studies of high-intensity island tourism in the Eastern Mediterranean. These destinations are particularly suitable for analysis due to their international visibility, pronounced seasonality, spatial limitations, and documented infrastructure strain.

The research design incorporates both longitudinal and cross-sectional perspectives. Longitudinal analysis enables the examination of tourism trends over the period 2019–2023, capturing pre-pandemic conditions, the disruption caused by COVID-19, and the subsequent recovery phase. Cross-sectional analysis allows for the evaluation of structural relationships between visitor flows, economic indicators, and infrastructure capacity within specific peak periods.

Although the study does not employ econometric modeling, systematic data processing and comparative trend analysis are used to identify escalation patterns, seasonal concentration thresholds, and tourism intensity metrics. The absence of complex modeling does not reduce analytical rigor; rather, the study prioritizes structural clarity and empirical transparency in assessing overtourism conditions.

### **3.3 Data Sources**

The empirical analysis relies exclusively on secondary data derived from official institutional and governmental sources. These datasets provide reliable and standardized indicators for evaluating tourism volume, economic impact, and infrastructure pressure.

Data from the Bank of Greece were utilized to obtain information on tourism receipts, average expenditure per trip, and per-night spending by country of origin. These indicators allow for the assessment of tourism's economic dimension and value generation patterns.

Air traffic data were obtained from Fraport Greece, including annual passenger numbers for Mykonos and Santorini airports, as well as the distribution between domestic and international arrivals. These figures serve as primary indicators of tourism volume and seasonality concentration.

Additional data were sourced from the Hellenic Statistical Authority (ELSTAT), including information on overnight stays, accommodation capacity, tourist entries, and resident population figures. These statistics are essential for calculating tourism intensity metrics, particularly tourist-to-resident ratios and accommodation density indicators.

Supplementary information on cruise tourism flows and temporary regulatory measures was gathered from official port authorities and publicly available reports. These data provide insight into day-visitor concentration and short-term infrastructure stress associated with cruise arrivals.

Finally, academic literature and reputable media analyses were consulted to contextualize quantitative findings and to capture qualitative dimensions such as resident dissatisfaction, housing pressures, and governance challenges.

The primary dataset covers the period 2019-2023, enabling comparison between pre-pandemic levels and post-COVID recovery dynamics. Data from 2020-2021 are incorporated selectively, recognizing that these years represent exceptional global disruption rather than structural tourism trends.

### **3.4 Data Analysis**

The data were analyzed using descriptive statistical techniques appropriate for evaluating structural tourism dynamics. Year-on-year growth rates were calculated to detect escalation patterns in tourist arrivals. Tourism intensity was assessed through tourist-to-resident ratios, which serve as indicators of demographic pressure and social carrying capacity stress. Seasonal concentration was examined through distribution analysis of monthly arrivals, highlighting temporal imbalances in visitor flows.

Economic impact was evaluated using average expenditure per trip and per overnight stay, allowing comparison between volume growth and value generation. Cruise passenger density indicators were also examined to capture day-trip concentration and short-term infrastructure load.

In addition to quantitative analysis, a qualitative assessment of policy and governance measures was conducted. Official documents, regulatory announcements, and planning frameworks were reviewed to evaluate institutional responsiveness, enforcement capacity, and alignment between tourism expansion

and sustainability objectives. This dual analytical approach enables interpretation of statistical findings within a broader governance context.

Visual representations, including charts and time-series figures, were used to facilitate comparison across years and destinations. These visual tools support the interpretation of escalation patterns while reinforcing the argument that overtourism is not solely a function of visitor numbers, but also of planning adequacy and regulatory capacity.

### **3.5 Limitations**

Several methodological limitations must be acknowledged. First, the study relies exclusively on secondary data. Although institutional datasets are generally reliable, they may not fully capture informal economic activity, including unlicensed short-term rentals, or non-quantifiable social impacts such as cultural alienation.

Second, primary survey data from residents and business stakeholders were not collected due to logistical constraints. While such data would have enriched the qualitative dimension of the study, the use of multi-source institutional datasets provides a robust macro-level assessment of structural tourism pressures.

Third, evaluating the effectiveness of specific policy measures, such as cruise ship restrictions or zoning regulations, is constrained by limited transparency and inconsistent monitoring mechanisms at the local level. Consequently, policy impact is inferred through proxy indicators rather than direct causal measurement.

Despite these limitations, the triangulation of economic, demographic, and infrastructure datasets enhances the credibility, consistency, and analytical validity of the findings.

### **3.6 Ethical Considerations**

All data used in this study are publicly available or obtained from official institutional repositories. No personal or sensitive information was collected or analyzed. The research adheres to academic integrity standards, ensuring proper citation of sources and transparent reporting of data. All visualizations and analytical interpretations were developed by the author based on documented institutional statistics.

## **4. Results**

The analysis of overtourism in Mykonos and Santorini was based on empirical data obtained from the relevant official Greek institutions, i.e. the Bank of Greece, the Fraport Greece and the Hellenic Statistical Authority, ELSTAT. This section presents trends in tourist arrivals, economic impact, and structural tourism

patterns for the core analytical period 2019–2023, with preliminary 2024 year-to-date data included for indicative purposes. The objective is to assess both the magnitude and the structural characteristics of tourism pressure affecting these destinations (Bank of Greece, 2023; Fraport Greece, 2024; ELSTAT, 2024). Preliminary data for 2024 (year-to-date) are included for indicative purposes only in order to illustrate emerging post-2023 trends and do not alter the core analytical focus on the 2019–2023 period.

Year	Mykonos Arrivals (000s)	Santorini Arrivals (000s)	% Change
2019	1,200	2,000	-
2023	1,500	2,500	+25%
2024 YTD	1,725	2,700	+15%

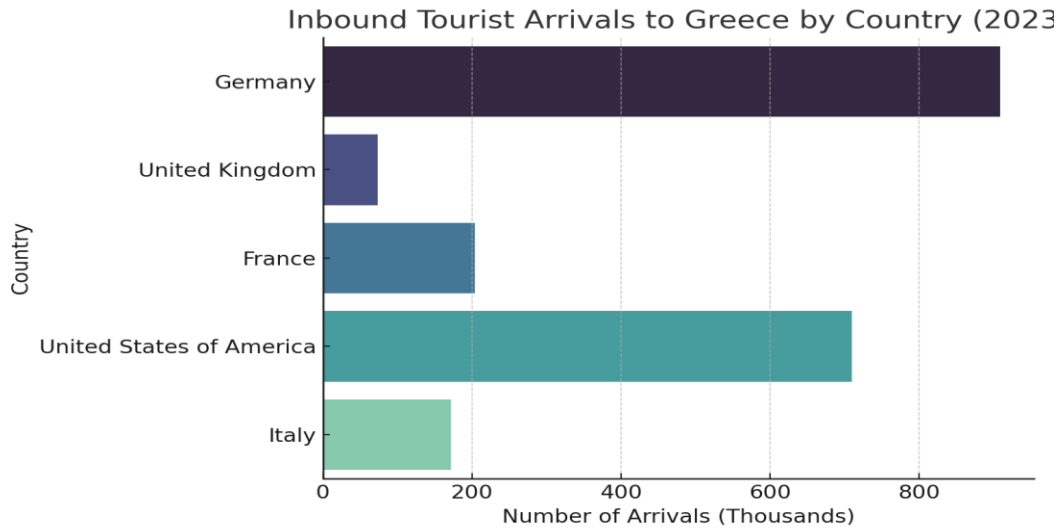
Source: ELSTAT/Fraport

**4.1 Tourist Arrivals and Volume Trends**

A vital sign of overtourism is the large concentration of visitors in a small area over a short period. In Greece after the COVID-19 pandemic, there was a large increase in the number of tourists. The maximum number of international travelers returned in 2023 to historic proportions (Bank of Greece, 2023). At the same time, statistics show that an unequal amount of the tourist load is borne by Mykonos and Santorini in particular in the summer season.

Specifically, the arrival of cruise ship passengers makes for peaks of concentration during day-time which strain local infrastructure. In a recent report by Fraport Greece (2024), it is stated that the airports of Santorini and Mykonos received in 2023 a total of over 3.3 million travelers, with the cruise ship arrivals still on the increase. The contributing nations towards this trend in visitors were chiefly Germany, the United Kingdom, the USA, France and Italy. These 5 countries represented a large part of incoming tourism as shown below.

**Figure 1: Inbound Tourist Arrivals to Greece by Top Five Countries of Origin**

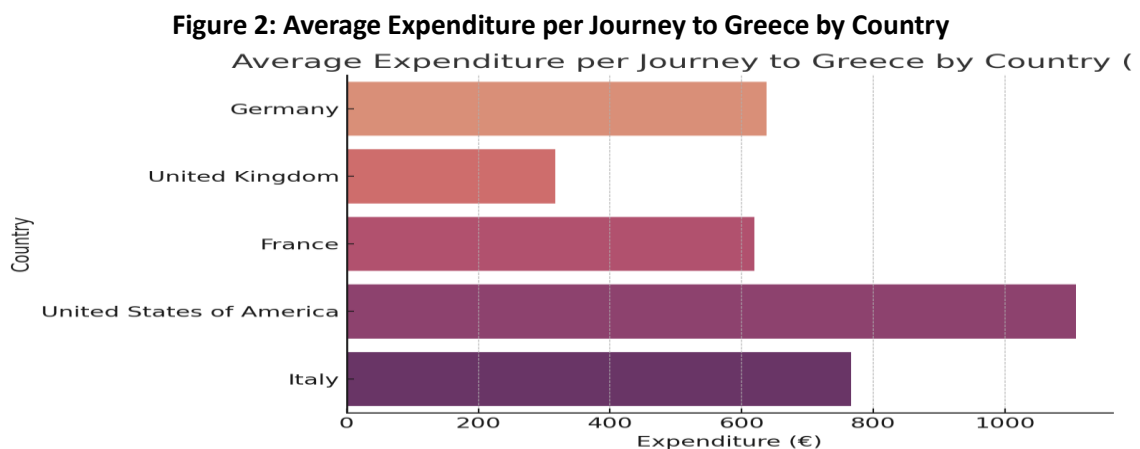


Source: (ELSTAT, 2024).

#### 4.2 Economic Dimension: Expenditure Patterns

Although a great number of arrivals may reveal economic advantages, the literature on overtourism emphasizes that quality should take precedence over quantity (Milano, Cheer, and Novelli, 2019; Gössling et al., 2023). The financial impact made by each tourist is an important measurement: a destination may attract fewer tourists, but with a greater expenditure, thus generating economic benefits, without putting a strain on local infrastructures.

In the case of Greece, the Bank of Greece (2023) provides figures which show differences in expenditure according to tourists' country of origin. It appears from the below that tourists from the USA and France represent some of the highest average expenditure per trip.



Source: (Bank of Greece, 2023).

The figure illustrates several key points. Tourists from the United States consistently spend more per overnight stay compared to their European counterparts, highlighting the significance of long-haul, high-value travelers. Despite minor fluctuations, most countries show a post-COVID recovery in spending patterns by 2022–2023. However, the increase in spending does not necessarily correlate with infrastructure improvements or greater sustainability in tourism practices on the islands.

This highlights the issue that although revenues are rising, the local capabilities are not being enhanced at a comparable pace, resulting in unequal pressure on services and the environment (Dodds and Butler, 2019; Bramwell and Lane, 2011).

#### **4.3. Infrastructure Load and Seasonality**

According to Fraport Greece (2024), Mykonos and Santorini welcomed more than 4 million air travelers each year by 2023. Nevertheless, most of these arrivals occur during the peak summer months, from June to September. This seasonal concentration generates acute pressure on water and waste management systems, contributes to short-term housing inflation driven by tourist rentals, and increases traffic congestion in port and central areas.

The infrastructure on both islands was primarily designed for significantly smaller local populations and faces challenges when trying to accommodate peak tourist demand. The disparity between the number of tourists and the available infrastructure heightens the issues associated with overtourism (Postma and Schmuecker, 2017).

#### **4.4. Tourism Intensity Index: Tourists-to-Resident Ratio**

An indicator of overtourism pressure is the ratio of tourists to residents. Throughout the peak months, both islands exhibit notably high values. For example, in August 2023:

- Mykonos had a ratio of approximately 15:1.
- Santorini exceeded 20:1.

These numbers indicate a degree of crowding that exceeds the social and environmental carrying capacities established by Coccossis and Mexa (2017) and UNWTO (2018). This indicates that for each local inhabitant, there were between 15 to 20 visitors, which represents an unsustainable burden by most urban and environmental criteria.

#### **4.5 Impacts Specific to Mykonos and Santorini**

Field-based reports, media documentation, and academic findings indicate several island-specific impacts. Housing shortages have intensified due to the conversion of residential units into short-term rentals, particularly through digital platforms. Water scarcity is especially acute in Santorini, which relies heavily on desalination systems. Traffic congestion peaks during cruise ship docking hours, reducing both

visitor satisfaction and resident mobility. Environmental degradation is visible in waste overload and coastal ecosystem stress, while cultural commodification risks diluting traditional practices and local identity (Papageorgiou, 2016; Milano et al., 2019).

Statements from residents and discussions with stakeholders indicate a growing malaise in the community. Some business people profit from economic rewards, while others express concern regarding the sustainability of those rewards. Tourists experience problems with congestion and loss of authenticity, precisely the problems which motivated the visit to those geographical areas.

**Table 1: Comparative Summary of Overtourism Indicators in Mykonos and Santorini**

Indicator	Mykonos	Santorini
Annual Airport Traffic (2023)	~1.6 million passengers	~1.7 million passengers
Cruise Ship Arrivals	Moderate	High (frequent double-docking)
Peak Season Duration	June–August	May–October
Infrastructure Capacity	Overburdened	Severely strained
Water Availability	Moderate (import-based)	Low (desalination dependent)
Tourist Spending (average)	High-end tourism, nightlife	Mid-range and cruise-heavy

**Source:** Bank of Greece, (2023); Fraport Greece, (2024); ELSTAT, (2024).

The empirical evidence indicates that tourism arrivals in both Mykonos and Santorini have fully recovered and, in several instances, surpassed pre-pandemic levels. This rapid rebound has resulted in exceptionally high seasonal concentration and tourist-to-resident ratios that exceed commonly referenced sustainability benchmarks in island destinations. Furthermore, available data suggest that infrastructure systems have not expanded proportionally to visitor growth, particularly in relation to housing availability, waste management, and water resources. Although tourism receipts and per capita expenditures demonstrate economic strength, these gains appear to be accompanied by increasing environmental strain and social pressure. Taken together, the findings support the argument that overtourism in these destinations reflects structural governance and planning challenges rather than mere visitor popularity.

## **5. Policy Recommendations**

The challenges posed by overtourism, demonstrated by statistical analysis and personal impressions, demand swift and sustained policy initiatives. Given the substantial environmental harm, social issues and occupied infrastructure of Mykonos and Santorini, the policies must be progressed beyond trivial alterations to establish strategic, data-driven solutions. The following proposals are presented under the headings of five fundamental pillars: regulation, infrastructure, economic reform, social inclusion, and global best practice initiatives. These proposals are not aimed at reducing tourism as an economic contributor, but at reshaping the infrastructure to a sustainable and socially equitable form (Dodds and Butler, 2019; UNWTO, 2018).

These policy proposals provide a governance framework applicable not only to Mykonos and Santorini but also to other small island destinations facing tourism saturation. The findings may inform national tourism planning, EU sustainability strategies, and municipal zoning reforms in fragile coastal economies.

### **5.1 Strategic Visitor Management and Regulation**

Visitor numbers during peak season place extreme pressure on the islands' limited physical space and operational capacity, necessitating targeted regulatory interventions. One critical measure involves the establishment of scientifically grounded carrying capacity thresholds. Regulatory authorities should conduct comprehensive environmental, spatial, and social carrying capacity assessments for highly congested sites such as the Caldera in Santorini and Little Venice in Mykonos. The findings of these assessments should serve as the basis for legally enforceable maximum daily visitor caps, ensuring that tourism activity remains within sustainable limits (Coccosis & Mexa, 2017).

Cruise tourism management represents another priority area. Although cruise ship arrivals can deliver tens of thousands of visitors per day, they often generate severe traffic congestion and substantial environmental pressure while producing limited economic spillover for local businesses. Contrary to common assumptions, the high volume of short-term cruise visitors does not necessarily translate into proportional local expenditure. Consequently, implementing a regulated cruise management framework would be advisable. Such a system could include daily docking limits per port, structured time-slot reservations to stagger passenger arrivals, and differentiated environmental taxation for short-term disembarkations. Comparable regulatory approaches have been introduced in destinations such as Dubrovnik and Venice, demonstrating that coordinated scheduling and capacity controls can mitigate congestion and environmental strain (S raphin et al., 2018).

Transport regulation is equally important in addressing infrastructure overload. The excessive use of rental all-terrain vehicles (ATVs) and scooters contributes to traffic congestion, road safety incidents, and

environmental pollution. Introducing a permit-based system for vehicle rental companies, combined with controlled or time-restricted access to historically sensitive areas, could reduce congestion and improve both resident mobility and visitor experience (Milano, Cheer, & Novelli, 2019).

Finally, the enforcement of spatial zoning policies can help redistribute tourist flows away from highly vulnerable areas. By identifying environmentally or culturally sensitive zones, such as the cliffside paths of Oia, local authorities can redirect visitor traffic through coordinated signage, digital navigation tools, and collaboration with tour operators. Smart tourism management strategies that integrate real-time data and digital routing applications may support more balanced distribution patterns and reduce localized overcrowding (Boes, Buhalis, & Inversini, 2016).

## **5.2 Sustainable Infrastructure and Environmental Resilience**

Overtourism cannot be effectively managed without a comprehensive upgrade of island infrastructure, much of which was originally designed to serve pre-tourism population levels (Ashworth & Page, 2011). Structural modernization is therefore a prerequisite for achieving long-term sustainability in high-intensity destinations such as Mykonos and Santorini.

Investment in smart infrastructure systems represents an important starting point. The use of real-time visitor monitoring technologies, including mobile data analytics and sensor-based tracking systems, can provide authorities with accurate information on daily tourist flows and congestion levels. Such data-driven tools enable adaptive management strategies and more responsive policy interventions. Similarly, smart water meters and electricity usage monitoring systems can help identify utility stress points, allowing for early intervention before shortages or service disruptions occur.

Water resource management is particularly critical given the arid climatic conditions of the Cycladic islands. Santorini, in particular, depends heavily on desalination facilities and imported water supplies. Expanding desalination capacity through renewable energy-powered systems would reduce environmental impact while strengthening supply resilience. In addition, the introduction of rainwater harvesting incentives for hotels and private residences could supplement existing resources and reduce seasonal demand pressures (Papageorgiou, 2016).

Waste management modernization is equally urgent. During peak tourism months, both islands experience significant waste accumulation that exceeds processing capacity (UNWTO, 2018). Addressing this issue requires expansion of recycling infrastructure, the introduction of mandatory composting practices within hospitality businesses, and increased financial support for sanitation personnel and waste logistics systems. Strengthening collection efficiency and investing in circular economy initiatives would further mitigate environmental degradation.

Finally, balancing port and airport load distribution could reduce localized congestion. Developing secondary docking facilities or encouraging the use of alternative entry points, including smaller neighboring islands connected by high-speed boat services, may help disperse visitor flows more evenly across the region (Gössling, Scott, & Hall, 2020). Such measures would alleviate pressure on primary infrastructure nodes while maintaining accessibility.

### **5.3 Economic Diversification and Seasonality Reform**

The tourism sectors of Mykonos and Santorini are characterized by strong seasonality and limited diversification, resulting in pronounced fluctuations in visitor flows and recurrent overcrowding during peak months. Achieving sustainable long-term growth therefore requires a strategic redistribution of tourism activity across both time and space (Andriotis, 2006; Bramwell & Lane, 2011).

One essential strategy involves the promotion of off-season tourism. National and regional tourism authorities could reorient marketing campaigns toward the spring and autumn months in order to extend the tourist season and reduce peak pressure. Such efforts may be supported through targeted airfare reduction programs, the organization of cultural festivals outside the summer period, and the development of incentivized travel packages aimed at pensioners, students, and digital nomads. By broadening the temporal distribution of demand, these measures would contribute to more stable employment patterns and improved infrastructure utilization throughout the year.

Diversification of tourism offerings is equally important. The development of alternative tourism sectors can reduce dependence on mass seasonal visitation and expand the experiential range of the islands. Agrotourism and viticulture present particularly promising opportunities in Santorini, where volcanic soil conditions support distinctive vineyard cultivation. Ecotourism initiatives, including guided hiking routes, geological tours, and protected nature trails, can provide lower-impact visitor experiences while raising environmental awareness. Additionally, investment in cultural heritage tourism, through enhanced museums, archaeological site interpretation, and immersive storytelling initiatives, can reposition the islands beyond nightlife branding and social media-driven landmark tourism.

Strengthening local supply chains further enhances sustainable tourism development. Encouraging hospitality businesses and retailers to source food, wine, and artisanal products locally can increase economic retention within the islands and reduce dependency on imported goods. Such measures not only support local producers but also reinforce place-based identity and contribute to more resilient economic structures.

### **5.4 Regulation of Short-Term Rentals and Housing Equity**

Housing inequality driven by the rapid expansion of short-term rental platforms has emerged as a significant source of resident dissatisfaction and social tension (Zervas, Proserpio, & Byers, 2017). The conversion of residential housing stock into tourist accommodation has reduced long-term rental availability, increased property prices, and intensified displacement pressures in central areas of both islands.

Addressing this issue requires a coherent regulatory framework for short-term rentals. All properties listed on platforms such as Airbnb and similar digital intermediaries should be required to register within a centralized government database to ensure transparency and regulatory oversight. Authorities could also impose annual caps on the number of rental days permitted for non-resident property owners, thereby limiting the transformation of residential neighborhoods into de facto tourist districts. In addition, designated residential-only zones could be established in which short-term rentals are restricted or prohibited, preserving housing availability for permanent residents.

Reform of municipal tourist taxation can further contribute to housing stabilization. Allocating a defined proportion of tourist tax revenues directly toward affordable housing initiatives, rental subsidies, or accommodation support for seasonal workers would strengthen social equity and redistribute tourism-generated income more effectively within the community.

Complementary long-term rental incentives may also prove effective. Providing tax reductions, financial grants, or other fiscal benefits to landlords who offer year-long leases to local families or tourism-sector employees could encourage the retention of permanent residents and stabilize neighborhood structures (Coldwell, 2017).

### **5.5 Community Participation, Education, and Cultural Safeguards**

Tourism development should not marginalize local voices or undermine community participation in decision-making processes. Engaging residents and local stakeholders in tourism planning enhances social cohesion, strengthens democratic accountability, and promotes more balanced governance outcomes (Dodds & Butler, 2019).

One mechanism to institutionalize community participation is the establishment of permanent tourism councils composed of representatives from local government, business associations, resident groups, and environmental organizations. Such multi-stakeholder bodies can facilitate dialogue, improve transparency, and ensure that policy decisions reflect a broader range of social interests (UNWTO, 2018). Inclusive governance structures are particularly important in high-intensity destinations where economic priorities may otherwise dominate sustainability considerations.

Cultural stewardship initiatives further contribute to responsible tourism management. Educational campaigns aimed at informing visitors about local traditions, customs, and expected behaviors can foster mutual respect between residents and tourists. Training programs for tour guides, hospitality staff, and short-term rental hosts in cultural sensitivity and sustainability ethics may enhance the quality of visitor experiences while reducing socially disruptive conduct. Additionally, restoration and preservation programs for neglected heritage sites, supported through public–private partnerships, can safeguard cultural assets while distributing tourism benefits toward conservation efforts.

Visitor responsibility campaigns also represent an effective soft-governance tool. Drawing inspiration from initiatives implemented in countries such as Iceland and New Zealand, local authorities could introduce a voluntary “Tourist Pledge” displayed at ports, airports, and accommodation facilities, encouraging environmentally responsible behavior and respect for community life (Gössling et al., 2020). Such symbolic commitments, when supported by awareness campaigns, can reinforce norms of sustainable conduct and contribute to a more respectful tourism culture.

## **6. Discussion**

The issue of overtourism in Mykonos and Santorini presents a fascinating example for exploring the connections between economic reliance, environmental fragility, and governance effectiveness in island destinations. The findings indicate that both islands display typical signs of overtourism, characterized by elevated visitor numbers, seasonal pressure on infrastructure, and socio-spatial conflicts. This section offers a critical analysis of these results in the context of existing research and international best practices, while also considering the obstacles and constraints that influence the pathways towards sustainable change.

### **6.1 A Paradox of Success**

Tourism has undeniably transformed Mykonos and Santorini into icons of international cultural prestige. However, this success generates a structural paradox: the features that attracted tourists (the authenticity, the quietness and the beauty of the landscapes) are currently at risk due to an increasing number of tourists visiting the islands. According to Doxey’s Irridex model and carrying capacity theory, excessive tourism growth can deteriorate residents’ quality of life and environmental conditions.

Although both islands benefit from considerable economic advantages, they do not equally share the wealth generated. The boom in luxury industry is creating difficulties for essential public services, including housing, utilities and workforce. The example of cruise tourism is especially enlightening: although it

increases the number of tourists visiting the islands, it usually generates little spending per tourist and does not contribute to the local economy. This situation illustrates the criticism of cruise tourism models which can be seen in many cities around the world, including Barcelona and Venice, and reinforces the need for tailored tourist management policies.

### **6.2 Social and Spatial Implications**

In addition, the results illustrate the impacts of overtourism on local identity and social cohesion. The transformation of residential districts into temporary tourist centers has contributed to the loss of links among residents, contributing to dissatisfaction of local residents. This confirms Lefebvre's theory of "The Right to the City," which states that the use of urban spaces should give priority to the needs of the inhabitants rather than to the pursuit of profit. Thus, for example, in the case of Santorini, traditional houses in neighborhoods such as Oia have been replaced by short-term rentals, rendering impossible for local residents to continue living in their neighborhood. On the other hand, in Mykonos, the importance of nighttime tourist activities has changed the cultural identity of the island, transforming its heritage into an entertainment product and eliminating its intangible aspects. Therefore, the social conflicts identified create a problem for policymakers, who must find a balance between the interests of the economy and the preservation of the cultural identity and equity for future generations.

### **6.3 Environmental Stress and Governance Gaps**

Due to their small size and scarce resources, the islands are also ecologically particularly susceptible to the impacts of overtourism. In particular, the increase in the population of tourists creates serious problems for waste management systems, energy infrastructures, and particularly for the water resources in Santorini, creating significant risks to the environmental sustainability of the destination. Moreover, the problems mentioned reflect the weaknesses of governance, such as insufficient enforcement of zoning regulations, insufficient integration of data in planning processes, and insufficient coordination among stakeholders.

Moreover, to date, the majority of policy responses have been largely reactive and fragmented. While there have been discussions about limiting the arrival of cruise ships, or establishing limits on rentals, there is a general lack of effective enforcement due to political opposition and economic interests. This demonstrates a deeper problem of institutional stagnation and the need for capacity development within local authorities.

### **6.4 Lessons from International Comparisons**

Studying comparative cases can provide a wealth of knowledge. For example, cities like Amsterdam, Kyoto, and Reykjavik have developed successful tourist management systems by combining technological

advancements with the participation of their communities and diversifying the economy. Therefore, these examples demonstrate that overtourism is not an inevitable consequence of high visitor numbers, but rather the result of inadequate planning and policy coordination.

Additionally, the next step for both Mykonos and Santorini will be to develop a long term vision for tourism through the establishment of a regenerative tourism model (emphasis on sustainable practices, preservation of culture, and the well-being of the local community), rather than relying on short-sighted decisions to continue growing tourism and ignoring the long-term consequences of those choices.

### **6.5 Study Limitations and Areas for Future Research**

This study provides a comprehensive overview of the phenomenon of overtourism; however, several limitations should be acknowledged. First, the analysis relies primarily on national-level data, which restricts the level of detail that can be derived specifically for the cases of Mykonos and Santorini. As a result, certain local dynamics and micro-level variations may not be fully captured within the scope of the study. Additionally, due to time constraints, the research did not incorporate the collection of primary survey data from key stakeholders. The inclusion of such data could have offered more in-depth insights into the perceptions and experiences of residents, local authorities, and tourism industry actors, thereby enriching the overall analysis.

Future research could address these limitations by adopting methodological approaches that provide deeper and more localized insights. For instance, longitudinal surveys examining resident sentiment over time would allow researchers to better understand how community attitudes toward tourism evolve as visitor numbers fluctuate. Furthermore, spatial analysis using Geographic Information Systems (GIS) could be employed to map tourist flows and identify areas experiencing the highest levels of pressure. Environmental impact assessments conducted at the micro-local level would also be valuable in evaluating the ecological consequences of tourism activity in specific locations. Finally, comparative studies involving other island destinations, such as Malta, the Balearic Islands, or the Azores, could offer useful benchmarks and highlight similarities and differences in tourism management strategies.

Overall, further research along these lines would contribute to a more nuanced understanding of overtourism and support the development of more effective policy responses. Such work would also enrich the broader academic and policy discourse on sustainable tourism governance, particularly in destinations that are environmentally and socially vulnerable.

## 7. Conclusions

This research aimed to explore the issue of overtourism in the Cycladic islands of Mykonos and Santorini, based on the premise that overtourism in these locations results not only from a high volume of visitors but also from underlying deficiencies in planning, regulation, and infrastructure. By examining secondary data regarding tourist arrivals, spending, and infrastructure strain over a five-year period (2019–2023), the study offers empirical evidence supporting this premise.

The results clearly indicate that tourism levels have reached or even exceeded those seen before the pandemic, with both islands experiencing extremely high ratios of tourists to residents during the peak summer months. This situation is further intensified by factors such as day visits from cruise ships, the expansion of short-term rental options, and the concentration of demand during specific seasons, all of which exert unsustainable pressure on water resources, waste management, transportation systems, and housing availability.

While the economic advantages of tourism are significant, especially regarding per capita expenditures by visitors from nations such as the United States, the United Kingdom, and Germany, these benefits seem to be inequitably shared. Moreover, they often come with a decline in resident satisfaction and an increase in environmental harm.

Crucially, the evidence indicates that the growth of tourism has primarily been driven by demand, whereas responses on the supply side, including zoning regulations, improvements to infrastructure, or restrictions on visitor numbers, have not kept pace and have often been poorly enforced. These findings indicate that overtourism in Mykonos and Santorini is not an inevitable outcome of destination attractiveness, but rather a consequence of governance and planning deficiencies. Tackling this issue necessitates a shift from merely reactive solutions to a more holistic approach that harmonizes tourism development with social, environmental, and spatial planning objectives.

Overall, the findings confirm that overtourism in Mykonos and Santorini is not merely a function of high visitor numbers but a reflection of governance and planning deficiencies. The findings provide substantial support for the research questions formulated in this study, reinforcing the argument that structural reforms are necessary to transition from growth-oriented tourism to sustainable island management.

Future studies could expand on this research by integrating qualitative perspectives from residents, tourists, and local officials, in addition to employing econometric modeling to explore the causal relationships between tourism metrics and quality-of-life factors. At present, the findings highlight an

urgent need for coordinated governance, transparent data utilization, and a reevaluation of priorities, moving from unchecked growth to sustainable practices with defined limits.

Overall, the empirical findings support the hypotheses formulated in this study, indicating that tourism growth in Mykonos and Santorini has exceeded sustainable capacity thresholds while infrastructure development and governance mechanisms have not kept pace with visitor expansion.

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