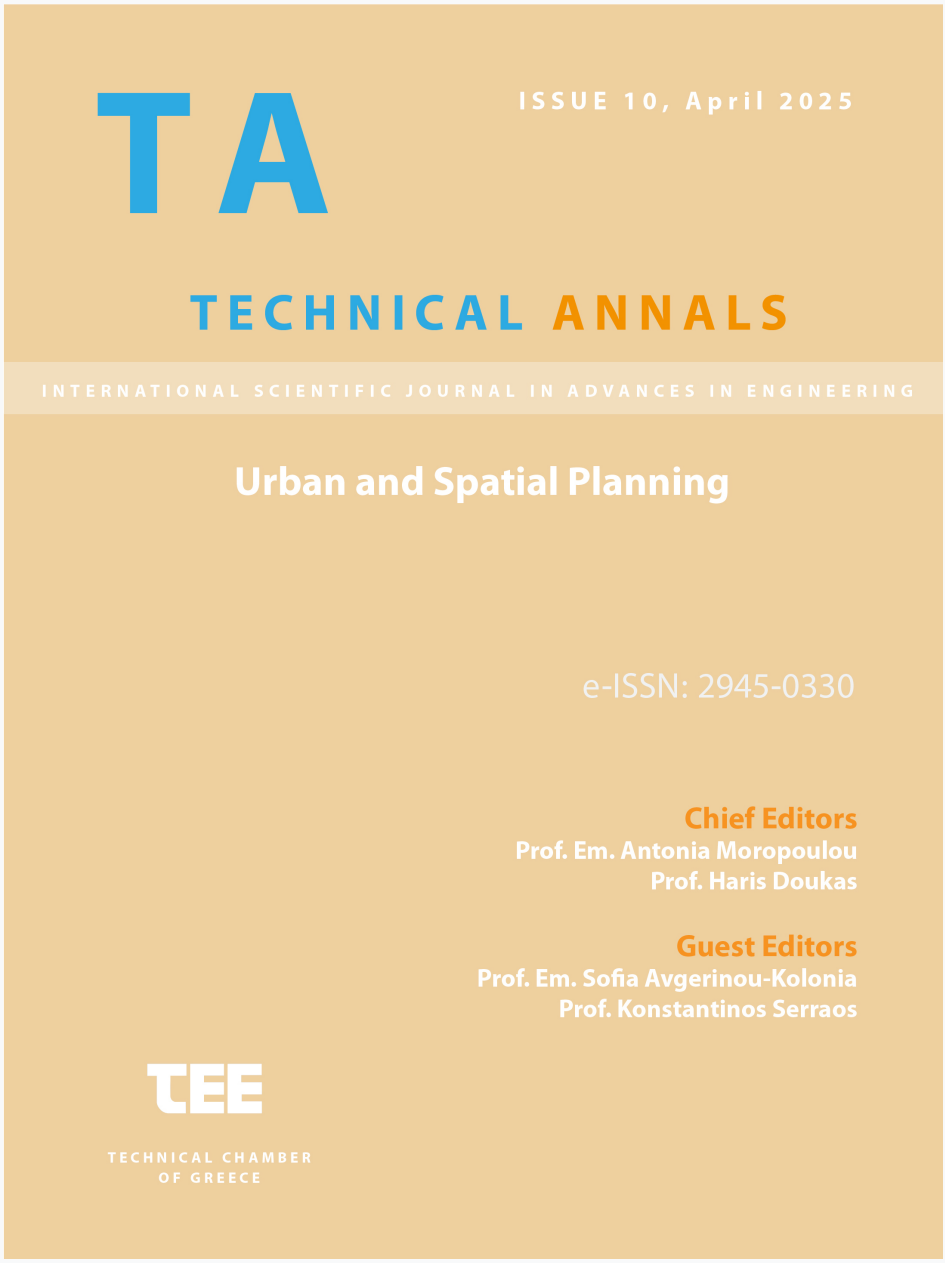
# Technical Annals

Vol 1, No 10 (2025)

Technical Annals



ISSUE 10, April 2025

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# TECHNICAL ANNALS

INTERNATIONAL SCIENTIFIC JOURNAL IN ADVANCES IN ENGINEERING

## Urban and Spatial Planning

e-ISSN: 2945-0330



TEE
TECHNICAL CHAMBER
OF GREECE

# Technical Annals
Journal of the Technical Chamber of Greece

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## About

With particular joy, respect and commitment to the history of TEE (TCG), to the future of the scientific role of the Chamber and to the work of Greek Engineers as a whole, the Technical Chamber of Greece is proceeding with the publication of an international scientific journal. After several years without regular scientific publications, due to the special economic situation of the country, but having as a source of our history the TECHNICAL ANNALS, published by the TCG for decades, we undertake this role again to give another scientific podium to the Engineering community.

More specific, the Governing Committee of TCG, in accordance to Decisions No A14/Σ39/2021, A16/Σ7/2022 and A41/Σ16/2022, proceeded to publish of the Scientific Journal entitled «Technical Annals» by the Technical Chamber of Greece (TCG) concerned with Advances in Engineering, in English language. The content of the journal will be available electronically and via Open Access, through the e-Publishing service of the National Documentation Centre (EKT).

The Governing Committee of the TCG assigned the responsibility of the publication to the Editorial Board and the Scientific Board of the Journal.

We inform all Engineers IN Greece and in the World, the Academic and Research Community that we are proceeding with this publication in order to give the floor for communication, publicity and recognition, by the International Community, of the Research and Innovation that Engineers produce in practice, on construction sites,in urban space, in regional areas, in industry, in development, in environment, in energy, in the digital world, in universities, in research centers, in startups, in businesses, etc.

We aspire to attract your interest, find in you critical readers, feed your scientific work and publish the results of your research through the International Scientific Journal of TCG.

Looking forward to an important publication that we'd like to become everyone's business.

## Topics

The scope of the journal will include all Fields of Engineering:

1. Civil Engineering
2. Architectural Engineering
3. Mechanical Engineering
4. Electrical & Computer Engineering
5. Rural & Surveying Engineering
6. Chemical Engineering
7. Mining & Metallurgical Engineering
8. Naval Architecture & Marine Engineering
9. Electronic Engineering
10. Engineering of Urban Planning & Regional Development
11. Environmental Engineering
12. Mineral Resources Engineering
13. Production & Management Engineering

Furthermore, it will be concerned with Interdisciplinary Thematic Areas, which are at the cutting edge of Research and Innovation, such as:

Agricultural Engineering and Food Processing, Artificial Intelligence, Aerodynamics, Bioengineering, Circular Economy, Climate Change, Cultural Heritage, Education and Learning Processes, Energy, Environment, Economy, Geoinformatics, Human Modelling, Industrial Symbiosis, Management and Quality Control, Material Science and Engineering, Naval Coastal and Maritime Design Engineering and

Planning, Spatial Planning, Sustainable Development, Systems' and Processes Engineering, Technology, Transportation, Processes, among others, and the thematic areas will be dynamically adjusted and determined taking into account both the progress of Science and Engineering, as well as future trends and the trending concerns and needs of Society.

## Information for Volume Editors and Authors

Moreover, conferences, in which TCG is either co-organizing or participating in their Organizing and Scientific Committee, will be able to submit a request to publish their Proceedings (in either Greek or English language) always through the "e-Publishing" mechanism, as long as the request has been submitted to TCG and has the approval of TCG's Governing Bodies, either six months before the conference date *(in cases where the proceedings are to be published prior to the conference initiation)*, or three months before the conference date *(in cases where the proceedings are to be issued after the Conference)*.

The Governing Committee of the TCG assigned the responsibility of the publication to the Editorial Board and the Scientific Board of the Journal; the list of members of each board is herein attached.

Antonia Moropoulou · Haris Doukas · SofiaAvgerinou-Kolonia · Konstantinos Serraos

# ISSUE
# Urban and Spatial Planning

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The Technical Chamber of Greece (TCG) decided to republish in English a Scientific International Open Access e-Journal. The "Technical Annals" - a journal which was counting decades of life following T.C.G. activities – will be edited by the T.C.G. through e-Publishing Platform at the EKT (National Documentation Centre) and will concern all the advancements in Engineering, referring to the disciplines:

- Civil Engineering
- Architect Engineering
- Mechanical Engineering
- Electrical & Computer Engineering
- Rural & Surveying Engineering
- Chemical Engineering
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- Naval Architecture & Marine Engineering
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Referring also to interdisciplinary Thematic Areas at the forefront of Research and Innovation such as: Agricultural Engineering and Food Processing, Artificial Intelligence, Aerodynamics, Bioengineering, Circular Economy, Climate Change, Cultural Heritage, Education and Learning Processes, Energy, Environment, Economy, Geoinformatics, Human Modelling, Industrial Symbiosis, Management and Quality Control, Material Science and Engineering, Naval Coastal and Maritime Design Engineering and Planning, Spatial Planning, Sustainable Development, Systems' and Processes Engineering, Technology, Transportation, Processes, et al as dynamically will be defined by the progress of science and engineering, the future trends and the social needs.

Through the e-journal, TCG is aiming to publish at least three volumes per year, to connect Greek Engineers with the International Community of Engineering Science and Innovation, for the benefit of the public interest and the promotion of science through research, innovation, and development, in compliance with its constitutional targets.

Technical Annals is a peer-reviewed journal.

# Preface

### Spatial Planning in Europe and Greece: Contemporary Challenges

Europe has undergone significant transformations in recent decades, driven by successive crises and new developments, particularly in the economic, social, environmental, energy, and geopolitical fields. In this context, environmental management and the increasing risk of natural disasters, partly due to the escalating climate crisis, have gained particular importance.

Given these wide-ranging developments, along with other more localized changes that have significant spatial impacts and/or require substantial spatial policies for effective management, the study of spatial planning across all critical scales in Europe—and in Greece in particular—becomes especially relevant. Emphasis is placed on regional spatial planning, urban planning, and urban design, with particular attention to cross-border, interregional, and intermunicipal planning.

Building on this context, **ISSUE 10** of Technical Annals aims to highlight the contemporary challenges emerging in this evolving European and, especially, Greek landscape that impact spatial planning. It also explores the tools, methods, and techniques developed and shaped by spatial planning to provide direction and support for corresponding policies by national and local authorities.

A total of 10 papers were submitted to this special issue, addressing current topics such as:

- The critical role of the interaction between spatial and development planning systems in shaping spatial development and achieving policy objectives, especially during times of ongoing crises and rapid change.
- The concepts of resilience and vulnerability, and their complex interconnections with spatial planning and land development.
- The multifaceted role that spatial planning must play in protecting and managing the marine environment and promoting sustainable development in Greek tourist destinations.
- Tools for enhancing urban sustainability, with emphasis on cultural heritage protection, public well-being and health, urban greening, and sustainable mobility.

Through case studies, policy analyses, and the exploration of emerging trends, the contributions offer valuable insights. We hope these insights assist practitioners, decision-makers, and stakeholders in formulating effective planning strategies and policy proposals.

**The main findings of this special issue can be summarized as follows:**

- **Policy recommendations** to address weak synergies, incoherence, and poor coordination between development choices and spatial planning include the redesign of key sectors (e.g., industry and tourism), enhanced cooperation among planning authorities, better alignment of development investments with spatial policies, and meaningful stakeholder engagement.
- **Achieving a balance** between competitiveness, environmental protection, and social well-being is essential. A national strategy for terrestrial and marine spatial management is needed—one that prioritizes environmental sustainability and community resilience.
- **Vulnerability** should be understood as stemming from complex and enduring factors that are deeply intertwined with modes and processes of land development. Drawing from innovative international practices, addressing vulnerability can become a creative and proactive domain for developing novel spatial policies.
- Regarding the **Greek urban context**, a strategy is proposed that integrates polycentric development

principles and preserves the diversity of urban functions. Objectives include increased resilience, sustainability, and improved quality of life. Proposals for improvement—targeting both residents and visitors—include enhancing cultural heritage conservation, expanding sustainable transportation, increasing green spaces, and strengthening resilience to climate change. A key prerequisite for the strategy's success is the enhancement of effective public participation in planning processes.

This edition would not have been possible without the commitment of the TMM-CH editors of this volume (Antonia Moropoulou, Haris Doukas, Sofia Avgerinou-Kolonia, Kostas Serraos); as well as the valuable assistance of the editing team at Technical Annals managing by Mrs Lilly Athini (Fotini Kyritsi, Eleni Bairaktari, Evridiki Karathanasi, Panagiotis Vrelos, Maria Sinigalia, Manolis Erotokritos, Isabella Tsavari, Dimitris Psarris, George Trachanas), to whom we are most grateful.

April 2025 Sofia Avgerinou-Kolonia - Kostas Serraos, Guest Editors

# Special Issue Contents

## Spatial Planning

# Technical Annals
# Issue 10
# April 2025

# Spatial Planning

# Synergies between spatial and development planning in Greece. The case of industry

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**Abstract.** This study examines the interplay between spatial and development planning systems, emphasizing its critical role in shaping spatial development and implementing policy objectives. The interaction between these systems significantly impacts planning effectiveness, with optimal integration being a key concern of the European Union's development strategy. Greece encounters persistent challenges in linking these systems, which hinders sustainable development opportunities and the advancement of critical sectors like industry, resulting in multifaceted side-effects. This paper seeks to uncover synergies and propose solutions to enhance integration, using the sector of industry as a case study to illustrate the consequences of insufficient integration. It employs an approach that analyzes these matters at all tiers of spatial and developmental planning, ranging from the national to the local level. Stronger cooperation between planning authorities, better alignment of industrial investment initiatives with spatial policies, effective decentralization to redistribute industrial activity, and the promotion of organized industrial zones constitute some policy recommendations aimed at addressing weak synergy, inconsistency, and insufficient coordination of development options with spatial arrangements.

**Keywords:** spatial planning, development planning, system, industry, Informal Industrial Concentrations, Greece

## 1 Introduction

Spatial planning is a fundamental responsibility of the state apparatus and serves as a crucial component for the spatial development and evolutionary growth of a territorial area. The concept is complex and multifaceted, serving as an intervention process that affects the future spatial distribution of activities and their interconnections. It aims to fulfill specific policy objectives directly related to the respective spatial system [1,2]. In contemporary literature, spatial planning encompasses far more than mere land use planning and regulatory action [3]. Its role fluctuates based on the level of reference: it acts as a guide for spatial development and a mechanism for the allocation of economic activity and social welfare at the national level, as a tool that shapes development at the

regional level, and as an instrument for regulating land use and property at the local level [3,4]. While primarily a public sector activity involving various levels (central, regional, local), its successful conception and implementation necessitate an understanding of private sector processes and market dynamics. It includes measures that aim to coordinate the spatial impacts of various sectoral policies, striving to reconcile frequently conflicting policy objectives. This specific "quality" of spatial planning often leads to a recurring issue of insufficient cooperation among different policies and their wider spatial implications [4-7].

According to Boudeville [8], spatial planning evolves over time through the interplay of two systems: the spatial planning system and the development planning system [as cited in 9]. A planning system constitutes "the combination of legal, institutional and other arrangements in place in a country or region for undertaking spatial planning" [6]. Spatial planning systems demonstrate a dynamic interaction of stability and change. They provide planning experts with consistent and reliable principles for spatial planning based on organizational and judicial settings at a certain time and place [10 as cited in 11]. They comprise three essential elements: central-local interactions, the importance of the institutional framework in the political-administrative process, and state-citizen relations [12].

Development planning systems focus on the economic dimension of planning, namely on the arrangement and organization of space, mainly through the enhancement of the quality and adequacy of production systems, at various scales. In particular, development planning systems refer to a combination of actions by which the government seeks to shape, direct, and control the structure and allocation of its economic resources and activities [13 as cited in 14]. Its primary objective is to address social, economic, and spatial issues while simultaneously leveraging the inherent traits and assets of each region for its continued development. Development planning is fundamentally regulated by essential principles and conditions, including its long-term orientation, the involvement of organizations responsible for executing the planning programs, and its holistic nature, as it encompasses dimensions beyond the economic sphere [9,15–18].

The degree of interaction between the two systems substantially influences the effectiveness of planning and specific policies. Wassenhoven et al. [19] indicate that the relationship between the two systems exemplifies a State's long-term vision to influence its future identity through planning. Nevertheless, their optimal integration can be achieved based on the way in which spatial and development policies are intertwined, the planning tools used, and the actors involved. This is a principal concern of the EU's development strategy, articulated within the framework of broader initiatives aimed at ensuring economic, social, and territorial cohesion. The necessity to integrate spatial and development planning resulted in a succession of institutional actions that peaked in the mid-1980s and the1990s.

The enactment of the Single European Act (SEA) (year 1986) set the programming framework for European integration and a strategic plan for the integration of the European space [18,20]. Actually, with the enactment of the SEA, Cohesion Policy is institutionalized as an official policy of the EU. The implementation of Cohesion Policy is directly linked to the achievement of economic and social cohesion between EU regions, as a necessary condition for achieving the goal of the Single European Market

(SEM). The SEA highlights the notion that the SEM can bring about differentiated spatial effects [21,22], as a result of the inability of the market to create optimal economic space conditions [79]. Since then, the EU has made efforts to broaden the issue of spatial policy in the light of regional development, either institutionally (e.g. Maastricht Treaty in 1992, Amsterdam Treaty in 1997) or at a programmatic level (e.g. Europe 2000 report, Europe 2000+ report) [23–25]. The above efforts culminated in the approval of the European Spatial Development Perspective in 1999, a plan which, in the context of ensuring the sustainable operation, organization and development of the EU's spatial network, established the first common framework of institutions, objectives and political directions of the Union's spatial policy and contributed to the gradual change in the design of regional policy [19,26,27].

During the 2000s, the EU was also significantly strengthened in the field of "monitoring", through the launching of new bodies that would ensure the necessary spatial information for the formulation and coordination of sectoral program policies (e.g. the European Spatial Planning Observatory Network – ESPON, and the Subcommittee for the Spatial and Urban Development) [28,29]. The Cohesion Reports that followed emphasized the need for institutional (and especially constitutional) enshrining of the spatial dimension of regional development, so that EU member states could adapt their national and regional planning to a common framework of development and spatial strategies [30]. Under this perspective, the EU proceeded with its constitutional revision with the Treaty of Lisbon (year 2007), in which the territorial dimension of development policies was enshrined and summarized in the concept of "territorial cohesion" [25,28,31]. On the basis of the Treaty of Lisbon, the EU also promoted programmatic interventions that directly addressed the issue of territorial cohesion, such as the preparation of the "Leipzig Charter" (year 2007), the adoption of the “Territorial Agenda for the European Union” (year 2007) and the introduction of the "Green Paper on Territorial Cohesion" (year 2008). At the same time, a significant contribution to strengthening the "place-based approach" of the Cohesion Policy was the "Barca report" (year 2009) [32-35] which, among other things, emphasizes the need for the member-States to review their national strategies, so as to form an integrated system of spatial and development planning. Thus, the interplay between spatial and development planning has been a focus of concern in numerous European countries.

In Portugal, where the spatial planning system has been profoundly shaped by the "Napoleonic" framework [36 as cited in 37], policies for the integrated territorial development of important country's development sectors (infrastructure, transport, energy, industry, industry, tourism, agriculture, etc.) are defined by the Sectoral Programmes (*Programas Setoriais* – PS). The Specific Programmes (*Programas Especiais* – PE) contain the guidelines for the sustainable management and protection of natural resources of national importance (coasts, rivers, archaeological sites, etc.) and, together with the PS, complete the National Programme of Territorial Planning Policies (*Programa Nacional da Política de Ordenamento do Território* – PNPOT). At the regional level, the Regional Programmes (*Programa Regional de Ordenamento do Território* – PROT) specify the PNPOT guidelines in each regional unit and are directly linked to the framework of the Regional Operational Programmes (POR), in order to ensure the optimal adaptation of investments in the Portuguese territory. At the local level, the

strategic directives established by the national and regional programmes are executed through Master Plans *(Plano Director* – PD), Urban Development Plans (*Plano de Urbanização* – PU) and Detailed Local Plans (*Plano de Pormenor* – PP). PD serve as strategic spatial and development policy frameworks, shaping the territorial and development model of each municipality according to their specific characteristics. PUs and PPs focus on the organisation of land use, providing specific guidelines for certain areas (urban, rural, tourist, etc.) [38].

In Ireland, where the spatial planning system was based on the principles of the Anglo-Saxon model [39,40], significant efforts have been made in recent years to improve the degree of integration of spatial policies with development choices. These efforts concerned the alignment of the proposed investments of the National Development Plan (NDP) for the balanced regional development of the country's urban centres with the basic principles and proposals of the National Spatial Strategy (NSS) [41]. Currently, the National Planning Framework (NPF) governs the country's spatial policy, and its strategies determine the content of the development and spatial plans at the underlying planning levels. The Regional Spatial and Economic Strategies (RSES) attempt to distribute and organise economic development fairly and evenly across Ireland's three regions, as well as define each region's long-term economic and spatial pattern. Finally, Development and Local Area Plans (LAPs) define the structure and organization of space at the local level, as well as each municipality's development priorities in accordance with national and regional policies [42,43].

The Danish spatial planning system is a based on the principles of decentralization, framework control and public participation [44]. The National Planning Report (NPR) serves as the primary spatial policy framework delineating the vision and thematic priorities for the country's spatial development. The NPR is accompanied by the Overview of National Interests in Municipal Planning (Oversigt over Ænationale Interesser i Kommuneplanlaegning), a binding framework of principles and objectives that safeguards Denmark's national interests, to which the corresponding municipal plans must conform. The local government is paramount in the Danish spatial planning framework, formulating three categories of plans: Strategies for Planning (SP – Planstrategi), Municipal Plans (MP – Kommuneplan), and Local Plans (LP – Lokalplan). The SP and MP establish objectives and strategies for the economic, social and developmental advancement of the Municipalities, encompassing precise directives for the organization of land use. Conversely, the LP are regulatory frameworks that furnish comprehensive regulations for land utilization, infrastructure, housing, and other aspects, enabling the pertinent municipal authority to delineate the urban planning paradigm of each locality. At the regional level, regions formulate Regional Development Strategies (Regional Udviklingsstrategi), which are strategically oriented and concentrate on development planning and regional development [45,46].

Greece has historically experienced a deficiency in the connection between spatial and development planning, a challenge that persists despite recent programmatic and institutional efforts. The inadequate horizontal linkage between spatial planning and development programs at each spatial level severely influenced the advancement of essential productive activities, such as the industry sector.

This paper aims to explore potential synergies between spatial and development planning in Greece, identify the key elements contributing to the enduring distance between the two systems, and propose possible ways to address the issue. The paper employs an approach that examines these issues across all levels of spatial and development planning, from the national to the local level. The industry sector serves as the case study for this research, owing to its persistent failure in achieving rational and integrated spatial organization and development over time. The presentation of the Kalochori Informal Industrial Concentration in northern Greece highlights the spatial ramifications of inadequate integration within spatial planning policy and the disjunction between the two systems.

## 2 Spatial and development planning in Greece: A brief overview of two parallel systems

In Greece the concurrent development of the two systems, spatial and development planning, has been, diachronically, observed [8 as cited in 9]. Spatial planning system and development planning system were formulated very recently as integrated policies, and to this day, each system has forged its own distinct path.

The first integrated spatial planning "system" at the institutional level was established in the late 1990s (L. 2508/1997 and L. 2742/1999), providing a systematic and formal hierarchy of plans from the national to the local level [11]. According to this system, the first national and regional spatial plans, referred to as "Frameworks", were put into effect as well as several local urban plans that covered approximately 20% of Greek territory, defining land uses and building regulations (former Deputy Minister of the Environment and Energy, statement June 2018, 2020). The majority of these local urban plans were drawn up before the issuance of the Frameworks, rendering the need for lower tiers to conform to higher tiers effectively obsolete [11]. The low level of integration might be also attributed to the "polyphony" in the theory and methodology of planning practice [47].

Over the following decade, a series of legislations were issued that aimed at either reforming the country’s administrative structure (L. 3852/2010) or aligning with EU directives (such as L. 3827/2010 which incorporated the European Commission's guidelines for the integrated and sustainable development and conservation of each country's natural and productive resources) [2,48]. Simultaneously, the memorandum obligations to tackle the economic crisis which arose in 2008-2009 were coupled with the introduction of various laws regarding the restructuring of procedures for sectoral activities, particularly in the industrial and business sectors. These new provisions increased the reliance of spatial planning on private sector resources and development activities [49] and created a parallel planning framework that bypassed the current official planning system [3,50,51 as cited in 11]. The above developments necessitated a recalibration of the spatial planning system, in accordance with a “liberalizing” trend [52].

The current version of L. 4447/2016, entitled "Spatial and Urban Planning Reform - Sustainable Development" (GG 241A/23.12.2016, it replaced L. 4269/2014),

exemplifies the efforts during the crisis and post-crisis period to address past problems, including the alignment of planning levels with the implementation of development planning and the improvement of coordination among development, sectoral, and spatial policies (Explanatory Report on L. 4447/2016). According to this law as in force, *"the main spatial planning system includes all spatial planning frameworks and urban plans…, as they are systematically structured and hierarchically arranged in levels, based on the geographical scale to which they refer, their mission and content. The broader spatial planning system includes all legislative and regulatory acts of spatial and urban planning*". This planning system provides two levels: (a) National and regional spatial plans are strategic and include medium-term or long-term objectives, guidelines for spatial development and economic activities, and provisions for the protection of sensitive areas; and (b) Urban plans at the local level are regulatory, governing land uses, plot ratios, etc. bi) Local Urban Plans (LUPs) (formerly General Urban Plans (GUPs)) regulate the sustainable spatial organization and development of municipalities, bii) Special Urban Plans (SUPs) cover spatial interventions and strategic investment projects (of public and private interest) regardless of administrative boundaries, and biii) street layout Implementation Plans delineate, at the scale of a city, settlement, or specific zones, the regulations of the LUPs and SUPs concerning land uses and building conditions. All the upper tier frameworks are binding for the lower tier urban and local plans [53,54].

At the end of the previous decade, the Regional Spatial Planning Frameworks were modified, while the Special (national sectoral) Spatial Planning Frameworks are presently undergoing revision. The recent initiation of an Urban Planning Reform Program, named "Konstantinos Doxiadis," financed by the Recovery and Resilience Fund (RRF), aims to achieve urban planning coverage for 80% of the Greek territory by the end of 2025. The implementation of integrated planning has been claimed to address the necessity for fostering investments and initiatives capable of revitalizing the national economy and growth rates, which are presently hindered by disorganized construction, inadequate planning, outdated plans, and legal ambiguity [55,56].

Regarding the development planning system, EU regional policy (i.e., Cohesion Policy) complements and coordinates – without replacing – national regional policies. This means that EU regional policy is a subset of regional policy in the EU, as the latter also includes national regional policies. This refers to the possibility for each EU Member State to pursue its national regional policy towards achieving development objectives that do not fall within the scope of EU regional policy and are therefore not (co)financed by it. Of course, concerning Greece the structure and the evolution of the national development policy shows absolute identification with the European one. Such a situation had a solid foundation already from the late 1980s and the early 1990s. During the period 1989-2019, the European regional policy is organically linked to the regional policies of the EU countries, and, in particular, to the regional policy of Greece, and regional development planning is part of the wider development framework of the European space. In this direction, multi-year planning (i.e., Programming Periods) is introduced and corresponding multi-year regional development programs are formulated. These programs refer to the Programming Periods 1989-93, 1994-99, 2000-06, 2007-13, 2014-20, and 2021-27. Within each Programming Period, the resources of the

European Structural and Investment Funds (ESIFs) are distributed, and the regional development policy is formulated based on the strategic objective that has been set.

In the direction of the more effective implementation of the EU Cohesion Policy, starting from the Programming Period 2014-20, the approach of implementing place-based development policies [32–35] is gaining ground. The implementation of regional policy in the light of the place-based approach is based on the one hand on the recognition of the importance of the geographical context, and especially of its social, cultural and institutional manifestations, and on the other hand on the admission of the lack of sufficient knowledge about the spatially localized development issues on behalf of the superior planning bodies due to the lack of (sufficient) engagement with the relevant underlying actors and institutions. The place-based approach to the implementation of regional policy advocates addressing development obstacles and exploring the development potential of individual spatial entities (sub-regional, inter-regional, urban, rural, urban-rural) on the basis of a combination of interventions and at the initiative of local development bodies [18]. The EU Cohesion Policy provides the possibility of utilizing (new) tools which transform the theoretical construct of the place-based approach into real actions of ISD. The tools of ISD are summarized in ITI, SUD, and CLLD and define a number of parameters (types and selection criteria of spatial entities, content and evaluation criteria of policies, objectives, priorities and funding of actions) as well as the synergies with the actions of the relevant regional development programs.

The sub-period from 2020 onwards is marked by the establishment of the RRF. This is the central pillar of the financial instrument NGEU which was created in response to the need to deal with the effects of the COVID-19 pandemic [57–60]. Being an indirect "confession" of the inadequacies of the market – which had already been demonstrated during the period of the economic crisis (period 2008–2015) [61] – and the weaknesses of the EU Cohesion Policy until then, the establishment of the RRF may signal the evolution of the EU Cohesion Policy and constitutes a leap in the direction of the fiscal integration of the EU. The RRF can develop into an established practice to the extent that the absorption of its resources occurs in a smooth manner and brings multiplier benefits to their recipients.

Concerning the national aspect of the development policy in Greece, probably the most important element is the enactment of the so-called Development and Investment Laws (L. 3299/2004, L. 3908/2011, L. 4399/2016, L. 4635/2019, and L. 4887/2022 the most recent ones). The latter are commonly used regional policy means of reducing unemployment and stimulating economic growth in peripheral and lagging regions (with positive implications for the national economy). Their enactment aimed at increasing the supply of new businesses (both domestic and foreign) as well as their survival and growth at the early stages of their existence [62–64].

## 3 The sector of industry as a case of synergy between spatial planning system and development planning system

By studying the structural composition and evolution of the spatial planning system and the development planning system in Greece, one can easily identify the inadequacy or, at the very least, the challenges in linking spatial and development planning [15]. This issue becomes even more apparent when analyzing specific activities or sectors whose organization and development are shaped by the country's spatial and development policies. One such case – the most prominent one – is the sector of industry.

Industrial development in Greece first emerged in the early 1920s, and until today, its spatial structure and evolution are governed by two key characteristics. The first concerns the "ad hoc" location logic of industrial units across the Greek territory, either through the decisions of industrial investors or, in many cases, through the institutional encouragement of government policies [65,66]. The second characteristic relates to the "decentralization" policy, which was particularly promoted in the 1980s and was institutionally reinforced through frameworks that provided incentives for the deindustrialization of major urban centers such as Athens (the capital and the most populated city) and Thessaloniki (the second most populated city).

However, the lack of coherence and coordination between the tools of development and spatial planning, along with the governments' inertia in implementing spatial policies due to the absence of spatial plans, resulted in the uncontrolled spread of industrial units, leading to severe environmental and developmental issues in various areas of the country (such as Kalohori, Schimatari, and Corinth) [9].

In the field of spatial planning, the National Spatial Planning Framework (GG 128/A/2008, corresponding today to the National Spatial Strategy according to the current institutional planning framework) sets as a directive (Article 7) the coordination of institutional provisions of various spatial policies to better promote entrepreneurship and ensure transparency and legal certainty in the location of industrial units. In the implementation mechanisms (Article 12), it is stated as a prerequisite to strengthen cooperation between national spatial planning and development programming through the operation of a network of collaboration among the services of the relevant ministries. The main objective is to recognize the spatial dimension of development planning, which requires linking economic incentive legislation with specific geographic areas and goals set in the Spatial Planning Frameworks. Moreover, revising spatial and urban planning legislation to achieve a meaningful connection between spatial and development planning is needed.

In the Special Spatial Planning Framework for Industry (GG 151/2009), the disparity in development rates among the country's regions is attributed, among other factors, to the inability of regional development policies to mobilize private and direct investments that could help address structural weaknesses in the productive model. The guidelines for development planning (Article 10) call for Operational Plans to ensure adequate funding for new industrial zones and relocation incentives for industrial units. Additionally, project selection criteria should explicitly require alignment with the directions set by the Special Spatial Framework for Industry. Finally, the Action Program (Article

11) provides for the financing of measures and initiatives through the Operational Programs of the National Strategic Reference Framework (NSRF).

The key pillars of the legislative reforms promoted during the 2010s included strengthening the coordination between development, sectoral, and spatial policies. For example, Explanatory Report to Parliament on L. 4447/2016 highlights that the National Spatial Strategy serves as the foundation for coordinating spatial and regional plans, investment strategies, as well as state and local government programs that influence national development and territorial cohesion [54].

As an example of the provisions of spatial planning on the regional level, the recently revised Regional Spatial Planning Framework (RSPF) for Central Macedonia (GG 485D/20.08.2020) includes guidelines that clearly demonstrate the integration of regional and spatial development dimensions and objectives into a unified strategy, linking the spatial component of planning with development priorities. This is particularly evident in Article 3, which defines the region's development model by incorporating proposals for spatial development and organization aligned with strategic development priorities, within a broader environment of interregional competition and the liberalization of international flows of goods and capital. The need to enhance competitiveness and the significance of new investments are emphasized. Additionally, the active involvement of the Ministry of Environment in the planning of the NSRF is deemed necessary to ensure compliance with the provisions of L. 4447/2016, which mandates the prioritization of projects and actions that promote the implementation of the RSPF for Central Macedonia within the region's development program.

At the local level, the technical specifications of the LUPs (GG 3545/B/2021, they have replaced the general urban plans) emphasize the need to establish a strong and balanced productive base, in accordance with the directions of development planning. This includes ensuring sufficient land allocation for the siting of necessary economic activities, particularly those that align with the comparative advantages of each region. However, no further guidelines are provided.

Concerning development planning, its interplay with the spatial planning system is examined at both the institutional and the programmatic dimension [9,17] The institutional dimension concerns the Development and Investment Laws. L. 3299/2004, in particular, contributes to the configuration of the investment landscape of the country through the increase of financial aid to businesses, the promotion of investments in new fields, and the strengthening of the technological development of SME. The national territory is divided into 3 zones, on the basis of developmental characteristics, and special incentives are provided for each zone. Law 3908/2011 sought to simplify the approval procedures for investment projects, while strengthening the audit controls and evaluation mechanisms of investment programs, thus increasing transparency and reducing bureaucracy. Law 4399/2016 sought to create new jobs and increase investment activity by setting the minimum amount of investment plans and restructuring tax incentives. Its most important innovations were the readjustment of the method by which investments were spatially distributed and the increase in investments related to the "Integrated Spatial and Sectoral Plans". Particularly, special reference is made to the spatial and sectoral approach of investment programs, which will contribute to the development of additional benefits for the region where they are developed. Perhaps the

most decisive intervention in the development planning system was achieved with Law 4635/2019, which sought to attract strategic investment programs that contribute to the development of innovation, the increase in employment, the improvement of social services and the implementation of smart and green development projects. The most important aspect, however, is that it constituted an important chapter for the institutional arrangement of the National Development Planning and the National Policy of the Public Investment Program (PIP). The Law is distinguished by its enhanced spatial character as provisions with a direct or indirect spatial footprint were included that concerned industrial activities, organized receptors and business parks (Articles 13, 11 and 12), as well as the single digital map (Article 4). The existing Law 4887/2022 added no new mechanisms towards strengthening the spatial dimension of development planning. It includes (article 7) specific provisions aimed at promoting investments in the field of the 4th industrial revolution by supporting investment projects that promote the adoption of advanced technologies (such as artificial intelligence, robotics and the Internet of Things). A particular spatial dimension is the strengthening of the areas included in the Just Development Transition Plan.

The programming dimension, mainly, concerns the "Competitiveness and Entrepreneurship" Operational Program that focuses on the sectoral development of industrial activity. Given its horizontal, sectoral, character, the aforementioned Operational Program for the Programming Period 2007-2013 does not adequately deal with the issue of the interplay of the two systems. However, the aforementioned Operational Program predicts that the institutional and programmatic integration of the National and Special Spatial Planning Frameworks for key development sectors (RES, Aquaculture, Tourism, Manufacturing) will play a decisive role in resolving the problems of locating business activities and in increasing the pace of investment implementation in special categories of activities. During the Programming Period 2007-2013 there is also the Regional Operational Program of Kentriki Makedonia that a special section (Section 2.10) in which development actions are analyzed for specific axes that have spatial characteristics (development poles, urban areas, mountainous areas, coastal areas, island areas, rural areas, areas related to fishing activity). During the period 2014-2020, both the "Competitiveness and Entrepreneurship" Operational Program and the Operational Program for Central Macedonia contain deal more emphatically with the issue of the interplay of the two systems, containing strategic directions that serve the policy of ISD. This situation reflects the place-based character of Cohesion Policy. In this light, strategies and actions that concerns ITIs, SUDs and CLLDs are promoted.

## 4 The spatial impacts of weak integration between spatial and development planning: The case of Kalochori Informal Industrial Concentration

The ineffectiveness of policies and the insufficient connection of spatial and development planning adversely impacted the spatial structure of the sector of industry in Greece. An illustrative example is the case of Kalochori, Thessaloniki, where the aforementioned deficiencies resulted in the establishment of one of the largest Informal

Industrial Concentrations (IICs) in the entire country. IICs are characterized by intense economic activity, inadequate infrastructure, deficient urban planning, and environmental challenges (Article 41, paragraph 2 of L. 3982/2011). They are frequently located on the outskirts of large urban areas, and their proliferation in Greece is ascribed to the lack of an integrated spatial consideration of industry location, combined with the absence of a national industrial development policy [67]. According to Gourgiotis et al [68], the phenomenon of IICs occurred in two periods: a) 1970–1990, during efforts to regulate industrial land use and protect the environment. Policies included the dissuasion of industrial businesses from launching new installations in the major urban agglomerations and the classification of industrial activities based on the type of nuisance they caused. Despite state policies, IICs continued to establish at the outskirts of major urban centers; b) 1990-2020, when investments declined, leading to the 2009 economic crisis. Institutional reforms and improvements allowed private firms to organize themselves in a business park or IIC.

According to the Operational Plan of the Ministry of Development for the establishment of business parks in Greece [69], the industrial concentration in Kalochori is one of nine (9) IICs located within the Regional Unit of Thessaloniki in the Region of Central Macedonia, encompassing a total area of 5,556 Ha. The industrial concentration at Kalochori covers an estimated surface area of 1,640 Ha and is situated within a broader zone of 4,253 Ha (Figure 1), designated as “IIC Oreokastro – Kalochori” in the Operational Plan. The overall number of firms in the “IIC Oreokastro - Kalochori" is approximately 1,845, with around 30% situated within the confines of the Kalochori concentration [70].

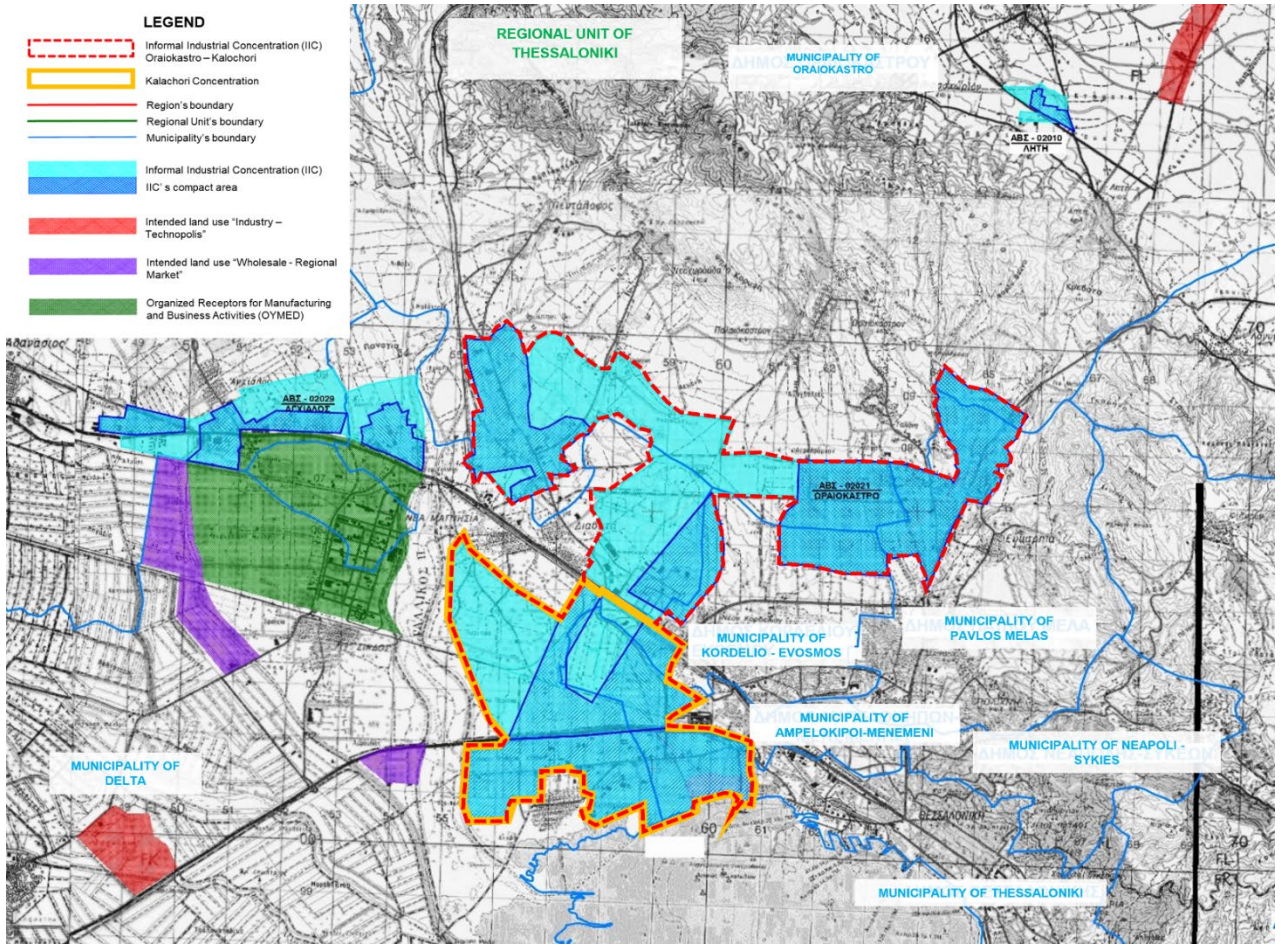


**Fig. 1.** Informal Industrial Concentrations (IICs) in Central Macedonia – Indication of "IIC Oreokastro – Kalochori (*YPAN, 2020, https://www.ggb.gr/sites/default/files/basic-page-files/ΑΒΣ-02_03_K_ΜΑΚΕΔΟΝΙΑ.pdf; Own Edit*)

The main features of Kalochori IIC are its disordered urban planning and high building density, the lack of infrastructure, and the widespread urban and environmental problems. These characteristics are prevalent among all informal industrial clusters in the country and attributed to four main reasons. The first reason is that in the IICs, the provisions for "off-plan" construction apply. The development of industrial activity outside the "official" (i.e. planned) city boundaries is associated with the presence of inadequate technical infrastructure (such as road network, sewage system, waste treatment facilities) within the IIC, most of which fails to comply with requisite technical and quality standards. This evolution was significantly influenced by the choice to locate the industrial units in rural areas, far from central infrastructure networks, as well as by the private initiatives of the companies that bore financial responsibility and were compelled to independently design the requisite technical infrastructure. The ongoing execution of this practice, along with the lack of a thorough, cohesive, and carefully developed plan, adversely affects public health, ecosystems, and the overall natural and anthropogenic environment of the area. The second reason is due to the prohibition on the establishment of industries in organized receptors located in metropolitan areas (despite the recent exceptions for industries of medium environmental nuisance). The prohibitions are due to the fact that industries continued to establish in metropolitan areas despite the zero incentives granted by the Development and Investment Laws. The third reason pertains to the failure to identify suitable areas for the organized spatial development of productive activity. This failure can be ascribed, firstly, to the delay of spatial planning frameworks until at least the mid-2000s, resulting in a lack of clearly articulated and enforceable policy directives, and secondly, to the delay in approving regulatory plans at the local level and in activating existing organized industrial receptors. The fourth reason pertains to the capacity of the established organized receptors to address the actual needs of the sector, particularly in areas with increased demand. The Thessaloniki Industrial Area (namely *VIPE Sindou*), located near Kalochori and operational since 1970 (depicted in green in Figure 1), spans 940 Ha and, according to the Hellenic Federation of Enterprises [71] maintained a 96% occupancy rate until 2012. Therefore, the location of the industrial units took place linearly along the routes of Northern Greece's two major highways, PATHE and EGNATIA, lacking comprehensive planning and utilizing the stipulations of out-of-plan construction.

In addressing the integration of spatial and development planning within the study area, the prior Regional Spatial Planning Framework of Central Macedonia (GG 218D/2004) sought to achieve sustainable spatial organization of the secondary sector by determining the following immediate priorities: a) the establishment of new organized receptors for manufacturing activities, b) the resolution of industrial concentrations surrounding the Thessaloniki Urban Complex and other major urban centers, c) the modernization of the operational framework for existing Industrial Areas, d) the identification of new locations for the development of manufacturing and freight activities along critical transport networks of supra-local significance. It stipulated a range of actions such as anti-pollution initiatives in the Sindos Industrial Area and the organization of secondary and tertiary activity receptors in the peri-urban region of Thessaloniki, including the Kalochori area. The Regional Framework underscored the

importance of the local urban plans (GPUs) in addressing issues regarding the industrial concentrations through the implementation of appropriate spatial regulations.

The current Regional Spatial Planning Framework (GG 485D/2020), consistent with its predecessor, and with the objective of "restructuring manufacturing", proposes the establishment of new Organized Receptors for Manufacturing and Business Activities (namely *OYMED*), the expansion of existing industrial parks (e.g. *VIPE Sindos*), and the remediation of IICs, including Kalochori, in alignment with the directives of the overarching Special Spatial Planning Framework for Industry. The lower-level statutory plans (GUPs) must align with the same policy framework, promoting the development of OYMED, while simultaneously implementing measures to significantly restrict off-plan construction. No reference is made to aiding in the implementation of the Framework's guidelines via any type of development planning tool.

At the local level, the GUPs of the Municipal units of Echedoros (GG 304AAP/2011) and Menemeni (GG 73AAP/2016), which encompass Kalochori IIC, were not entirely aligned with the objectives of the Regional Spatial Planning Framework. While they defined organized receptors for manufacturing activity and the transformation of Kalochori IIC into a Business Park, they concurrently permitted the establishment of industrial and other production units outside these organized receptors, with the status of off-plan construction. Numerous industrial units coexist alongside primary sector activities, and urban planning permits their continued operation, upgrading, or expansion under certain conditions. In this instance also, there is no mention of employing development planning tools to facilitate the execution of the GUP. Only Menemeni's GUP Implementation Program states in general terms that the necessary studies and projects would be funded by "the Municipality's own resources – national and EU resources".

The logic of "ad hoc" location, as well as the widespread adoption of out-of-plan construction as a model of industrial spatial organization, hinder the ability of building a strong (institutionally, productively, and spatially) business ecosystem [9]. The contribution of the municipalities' development programs to the reversal of the above correlations is considered negligible, given a) their strategic nature, b) their one-dimensional development-economic approach, and c) the municipality's inability to define binding directions in its development model. A typical example is the two operational programs of the Municipalities of Delta and Ampelokipi - Menemeni in the study area for the period 2014–2019, which, while considering the spatial planning guidelines, do not include comprehensive actions for the qualitative upgrading and organization of the IICs.

## 5 Discussion and conclusions

While the integration of spatial and development planning has been examined at the EU level and in many countries, the article asserts that Greece continues to face persistent integration challenges. The paper's novelty is threefold. Firstly, it offers a country-specific analysis utilizing both prior research and a contemporary case study from the industry sector, yielding novel empirical insights. Addressing the primary issue of planning integration within the industrial sector reveals how inadequate planning

coordination can impede the advancement of this crucial economic sector. Secondly, the paper employs a multi-layered analysis by investigating planning integration difficulties across all governance levels, a perspective that has not been previously studied in the Greek context. Finally, an important outcome is the proposal of policy recommendations tailored to the Greek case.

The weak synergy, inconsistency, and insufficient coordination of development options with spatial arrangements compromise the integrated nature of planning, hinder opportunities for sustainable development, and impede the advancement of critical productive sectors such as industry. The preceding research highlighted the deficient vertical integration of spatial planning policy and its insufficient synergy with development planning in Greece. This is because the spatial and development planning systems in Greece, which are internally defined by vertically hierarchical, binding relationships, are insufficiently integrated. The absence of sufficient integration (or interplay) ultimately brings about multifaceted side-effects. The case of the formation of the IIC in Kalochori is notable, with implications for regional development planning, the organization of space, the environment and public health. This section concisely discusses the findings of the prior analysis and concludes with policy recommendations to address the issue.

The developmental aspect of spatial planning at the national, regional, and local levels remains insufficiently advanced, limiting the effective integration of spatial with development planning. Most spatial planning frameworks exhibit a deficiency in mechanisms and guidance for integration with development programs; when interconnection is attempted, it typically manifests merely as a statement about using development planning programs for funding spatial planning implementation.

Before the enactment of Laws 4269/2014 and 4447/2016, the competent body for coordinating spatial and development plans was the Government Policy Coordination Committee on Spatial Planning and Sustainable Development. The Committee was established in 1999 (Article 3 of Law 2742/1999, Government Gazette 207/A), and its responsibilities included:

- Designing a unified and coordinated policy for spatial planning and sustainable development at the national level and developing measures for its effective implementation
- Approving the General and Special Spatial Frameworks and aligning them with the broader governmental directions in the areas of economic policy, social cohesion, and quality of life
- Coordinating the implementing bodies of the aforementioned frameworks

The Committee's role was considered limited, and in 2014, it was abolished.

Today, the National Spatial Strategy (NSS) serves as a document outlining the fundamental principles for coordinating various policies with spatial implications. The NSS is drafted by the Ministry of Environment and Energy, in collaboration with the relevant ministries, and approved by the Council of Ministers, without having a binding character. For the preparation of the Special Spatial Frameworks, executive coordination and monitoring committees are established, comprising representatives of the competent ministries on a case-by-case basis. The NSS consists a fundamental framework for the nation's spatial planning strategy, clearly aiming to integrate the two systems by

coordinating the strategies and actions of the spatial frameworks, including the directives of development programs and the PIP. Nonetheless, the NSS has yet to be promoted.

At the same level, the Special Spatial Planning Framework for Industry, while considering the development planning framework for shaping and establishing the spatial structure of industrial (and other productive) activities, falls short of considerably strengthening the linkage. In contrast to its ambitious relevant programming aims, it eventually advocates development programs as the primary means of acquiring resources for action program implementation. The preceding demonstrates that the linkage of the two systems at the national level of spatial planning is inactive, particularly for a sector that is directly influenced by development programs (Development Laws, PIP, NSRF).

The current Regional Spatial Planning Framework of Central Macedonia, relevant to the case study of this paper, aims to strengthen its structure and approach to development planning by including the region's development model in combination with the spatial model. At the same time, in order to harmonize its directions with the Special Spatial Planning Framework for Industry, it takes into account the respective development programs of the regional and national levels, and it provides for a "feedback" mechanism to resolve any issue in the event of non-harmonization and "conflict" between the directions of the Regional Framework and the overarching planning level. However, in this case, too, its developmental purpose is confined to obtaining financial resources to meet the needs of the action program.

At the local level, the examination of the GUPs in the Kalochori area, where the Informal Industrial Concentration is situated, reveals an emphasis on provisions that are exclusively spatial in nature, lacking integration with development planning and the necessary requirement for harmonization. Contemporary Local Urban Plans, according to their specifications, could substantially enhance the potential for aligning spatial and developmental initiatives toward a unified objective. This assumes the release from the time-consuming procedures of local spatial planning and the recognition of the significance of an integrated and substantive approach to spatial and developmental issues by the stakeholders engaged in the relevant processes.

The emergence of the territorial cohesion dimension forms a framework for the promotion of spatial planning as a tool for coordinating and integrating planning policies, as well as guiding spatial outcomes, with an emphasis on its strategic nature. In addition, the place-based approach that inspires planning has a catalytic effect on the effort of development planning for the optimal utilization of spatial advantages. The formation of (favorable) conditions for fostering synergies, horizontally, between spatial and development systems (policies) becomes evident. In this direction, the activation of tools with integrated character is deemed necessary.

A capable tool for integrating spatial and development planning at the sub-regional scale is the Special Spatial Intervention Area (SSIA). Along with the Plan for Integrated Urban Intervention (PIUI), which focuses on the urban scale [72], these constitute the tools for integrated spatial interventions within the Greek planning system (Law 2742/1999). They share similarities in philosophy and strategic approach with the Integrated Territorial Investments (ITI) promoted by recent European policy [73,74]. The

SSIA is distinguished by its complex and integrated nature, as it combines spatial and development-oriented regulations and actions, enabling synergies between relevant policies. Through special economic incentive schemes and compensatory fees, it allows for the direct incorporation of development policy directions at the local level. Despite its distinctive characteristics, it has not yet been activated.

The recent institutional reform of the framework that governs planning in Greece restores an, albeit non-binding, relationship between the specific (i.e., sectoral) frameworks and the corresponding development tools. Special mention should be made of the tool of the SUPs (Special Urban Plans), which is "adapted" in many ways to development planning, and which has received negative criticism as it is considered to be a means of circumventing "traditional" spatial planning. At the same time, the Development and Investment Laws, that provide incentives to businesses, have acquired a more profound spatial dimension.

At the national level, the establishment of a National Spatial and Development Strategy would be beneficial, integrating the country's development and spatial policies within a common framework. Moreover, the role of existing national programs (Development Laws and the PIP) will be strengthened, as they need to be incorporated into the core structure of the unified framework. The development of unified regional plans may be pursued as a potential solution to the existing disconnection, therefore clarifying the strategic directions set at the national level and establishing fundamental planning frameworks at the local level. After all, according to Gourgiotis and Tsilimigas (2016) [75], the regional level serves as a crucial arena for the reconfiguration of economic, social, and ecological structures, while simultaneously fostering the interconnection among several related scientific disciplines. The European experience has produced positive results from the execution of similar plans in countries like Portugal, Ireland, and Denmark, where regional and municipal authorities possess autonomy and significantly contribute to economic and spatial planning.

To maximize this outcome, the administrative structure of spatial policy authorities at both levels will be of critical importance. This necessitates the establishment of unified policy bodies to formulate integrated development strategies with a clear and distinct spatial perspective. Furthermore, the enhancement of participatory planning within the Greek system is essential, ensuring the active engagement of local planning authorities in the formulation of regional plans, alongside a reconsideration of the traditional and dominant top-down planning approaches [76–78].

In conclusion, the lack of effective integration between spatial and development planning in Greece has led to uncoordinated industrial expansion, causing environmental and developmental challenges. Despite actions to address this issue through spatial planning, inconsistencies and institutional inertia undermine the effort. Additionally, while decentralization policies aimed to redistribute industrial activity, the lack of geographical criteria has often led to uncontrolled sitting rather than balanced regional development.

The need for stronger cooperation between planning authorities, better alignment of industrial investment programs with spatial policies, and the promotion of organized industrial zones remain critical. Recent legislative reforms have introduced frameworks to bridge the gap between spatial and development planning, yet their

practical effectiveness remains limited. A more holistic and coordinated approach, including clearer guidelines at the local level and stronger institutional mechanisms, could enhance spatial development policies, ensuring sustainable industrial growth while minimizing negative impacts. Strengthening collaboration between ministries and ensuring that economic incentive legislation aligns with spatial planning frameworks will be key to achieving a more structured and efficient industrial landscape.

## References

1. Wassenhoven, L.: The democratic nature of spatial planning and the challenge of the rational "model". Aeihoros: Essays on Spatial Planning and Development 1(1), 30-49 (2002). (in Greek). https://.org/10.26253/heal.uth.ojs.aei.2002.59
2. Giaoutzi, M., Stratigea, A.: *Spatial Planning.* Kritiki, Athens (2011)
3. Vitopoulou, A., Gemenetzi, G., Giannakou, A., Kaukalas, G., Tasopoulou, A.: Sustainable Cities: Adaptation and Resilience in Times of Crisis. Hellenic Academic Libraries (HEAL), Athens (2015). (in Greek)
4. Koresawa, A., Konvitz, J.: Towards a new role for spatial planning. In: OECD, Towards a New Role for Spatial Planning. Chapter 1, p.p. 11-32. OECD Publications Serivice, Paris (2001). file:///C:/Users/admin/Downloads/9789264189928-en%20(2).pdf last accessed 2025/01/10
5. Rydin, Y.: The British planning system. An introduction. MacMilan, London. (1993)
6. UN (United Nations); Stead, D.; Nadin, V. Spatial planning: Key instrument for development and effective governance with special reference to countries in transition. United Nations Economic Commission for Europe, New York and Geneva (2008)
7. Asprogerakas, E., Zachari, V.: The EU territorial cohesion discourse and the spatial planning system in Greece. European Planning Studies 28 (3), 583-603 (2019)
8. Boudeville, R.J. Amenagement du territoire et polarisation. M. Th. Genin, Librairies Techniques, Paris (1972)
9. Asprogerakas, E., Kallioras, D.: Spatial and developmental planning in Greece: interplay issues. Aeihoros: Essays on Spatial Planning and Development (31), 62–93 (2020). (in Greek). doi: https://.org/10.26253/heal.uth.ojs.aei.2020.42
10. Münter, A., Reimer, M. Planning systems on the move? Persistence and change of the German planning system. Planning Practice & Research. 38(5), 659–677 (2020). doi:10.1080/02697459.2020.1832362
11. Tasopoulou, A.: Shifts in planning tradition amid an economic crisis and in light of a planning reform: the case of Greece. Planning Practice & Research (2024). doi: 10.1080/02697459.2024.2389748
12. Andrikopoulou, H., Yiannakou, A., Kafkalas, G., Pitsiava, M.: City and Urban Planning Practices for Sustainable Urban Development. 2nd revised edn.. Kritiki, Athens (2014). (in Greek)
13. Skountzos, T.: Economic Planning. Stamouli, Athens (1992). (in Greek).
14. Papadaskalopoulos, A., Christofakis, M.: Regional and Development Planning. Papazisi, Athens (2016). (in Greek)
15. Economou, D.: Spatial planning systems: the Greek reality and international experience. The The Greek Review of Social Research. (101), 3–57 (2000). (in Greek). doi: https://.org/10.12681/grsr.993
16. Michaelides, G.: Planning and evaluation in development and crisis. Vanias, Thessaloniki (2012). (in Greek)

17. Petrakos, G., Psycharis, Y.: Spatial development in Greece. 2nd edn. Kritiki, Athens (2016). (in Greek)
18. Kallioras, D., Kritikos, A.: The evolution of EU Cohesion Policy after the establishment of the Recovery Fund. DiaNEOsis: Research and Policy Institute (2023). (in Greek). https://www.dianeosis.org/2023/07/i-metekseliksi-tis-politikis-synoxis-stin-ee-meta-ti-systasi-tou-tameioy-anakampsis/, last accessed 2025/01/12
19. Wassenhoven, L., Sapountzaki, K., Asprogerakas, E., Gianniris, H., Pagonis, T.: Territorial Governance: Theory, European Experience and the Case of Greece. Kritiki, Athens (2010). (in Greek)
20. Kamhis, M.: The unification of the European space: A large-scale design project. Kritiki, Athens (2007). (in Greek).
21. Benko, G., Lipietz, A.: (1992), Les régions qui qagnent. Districts et réschaux: Les nouveaux paradigmes de la géographie economique. Presses Universitaires de France, Paris (1992)
22. Heinelt, H., Petzold, W.: The structural funds and EU cohesion policy. In Hubert, H., Münch, S.: Handbook of European Policies. pp. 134 – 155. Edwar Elgar Publishing, Cheltenham (2018)
23. Faludi, A.: Spatial planning traditions in Europe: Their role in the ESDP process. International Planning Studies 9(2-3), 155–172 (2004). doi: 10.1080/1356347042000311758
24. Asprogerakas, E., Zachari, V.: In search of a spatial policy for the EU and the prospect of integrated planning approaches in Greece. Regional Science Inquiry III (1), 87–105 (2012). (in Greek). https://econpapers.repec.org/article/hrsjrnkpe/v_3aiii_3ay_3a2012_3ai_3a1_3ap_3a87-105.htm, last accessed 2025/01/27
25. Karanika, M., Kallioras, D.: EU Spatiality under Question – Territorial Cohesion in Danger. Territories: A Trans-Cultural Journal of Regional Studies 1(1), 60–72 (2018). https://escholarship.org/uc/item/6sg0n7gg, last accessed 2025/01/27
26. Andrikopoulou, H: Territorial cohesion and spatial development in the European Union. In: Kaukalas, G.: Spatial development issues: Theoretical Approaches and Policies, pp. 173 – 212. Kritiki, Athens (2004) (in Greek)
27. Thoidou, E.: Spatial policy integration and spatial development: European perspectives and Greek experience. In Kaukalas, G.: Spatial development issues: Theoretical Approaches and Policies. pp. 213–238. Kritiki, Athens (2004) (in Greek)
28. Zachari, V., Asprogerakas, E.: Cohesion policy as a framework for local development. In Proceedings of the 11th Scientific Conference of the Greek Section of the European and International Society of Regional Science (ERSA-GR), "Agricultural Economy, Rural Space, Regional and Local Development". Patras, June 14-15 (2013)
29. Böhme, K.: Territorial evidence supporting policy-making in Europe: How ESPON came, saw and conquered. disP – The Planning Review 52, 62–67 (2016). doi: https://.org/10.1080/02513625.2016.1195589
30. Madanipour, A., Shucksmith, M., Brooks, E.: The concept of spatial justice and the European Union's territorial cohesion. European Planning Studies 30(5), 807-824 (2021). doi: 10.1080/09654313.2021.1928040
31. Faludi, A.: A historical institutionalist account of European spatial planning. Planning Perspectives. 33 (4), 507 – 522 (2018). doi: 10.1080/02665433.2018.1437554
32. Barca, F.: An agenda for a reformed cohesion policy: A place – based approach to meeting European Union challenges and expectations. Independent report prepared under the request of Danuta Hubner, Commissioner for Regional Policy (2009)
33. Garcilazo, J. – E., Martins, J. – O., Tompson, W.: Why Policies May Need to be Place-Based in Order to be People-Centred. OECD Regional Development Policy Division

(2010). https://cepr.org/voxeu/columns/why-policies-may-need-be-place-based-order-be-people-centred last accessed 2025/02/10
34. Farole, T., Rodríguez-Pose, A., Storper, M.: Cohesion Policy in the European Union: Growth, Geography, Institutions. JCMS: Journal of Common Market Studies 49(5), 1089 – 1111 (2011): https://.org/10.1111/j.1468-5965.2010.02161.x
35. Barca, F., McCann, P., Rodríguez-Pose, A.: The Case For Regional Development Intervention: Place-Based Versus Place-Neutral Approaches. Journal of Regional Science 52(1), 134-152 (2012). doi:10.1111/j.1467-9787.2011.00756.x
36. Newman, P., Thornley, A.: Urban Planning in Europe: International Competition, National Systems, and Planning Projects. Routledge, London (1996)
37. Gorzym-Wilkowski, W., Trykacz, K.: Public Interest in Spatial Planning Systems in Poland and Portugal. Land 11(1), no. 73 (2022) doi: https://.org/10.3390/land11010073
38. Cavaco, C., Mourato J. – M., Costa, J. – P., Vilares, E., Moreira, P., Magalhães, M.: Spatial Planning and Regional Development in Portugal, DGTerritório – Directorate, Lisboa (2021). https://www.researchgate.net/publication/360463808_Spatial_Planning_and_Regional_Development_in_Portugal last accessed 2025/02/23
39. Kayanan C. – M., Heaphy, L., Moore-Cherry, N.: Policy, planning practice and the lived experience in a charging Ireland: Provoking thoughts for/of change? Irish Geography 56(1), (2024). doi: 10.55650/igj.2023.1484
40. Bartley, B., Waddington, S.: The Emergence and Evolution of urban planning in Ireland. Geographical Viewport (29), 7–14 (2001). https://mural.maynoothuniversity.ie/id/eprint/9217/1/SW_GV%20emergence%202001.pdf last accessed 2025/02/24
41. Counsell, D., Lloyd, G.: Linking Spatial Planning with Public Investment: Perspectives from the Island of Ireland. International Center for Local and Regional Development (2), 1–7 (2009). https://iclrd.org/wp-content/uploads/2010/01/Paper-2-Linking-planning-Investment-Dec09-1.pdf last accessed 2025/02/24
42. Office of Planning Regulator – OPR: Introducing the Planning System, Planning Leaflet 1 (2022) https://www.opr.ie/wp-content/uploads/2022/10/Planning-Leaflet-1-Introducing-the-Planning-System.pdf last accessed 2025/02/24
43. Department of Housing, Local Government and Heritage: Overview of Planning in Ireland, Chapter 3: Local Authority Development Plans (2025) https://www.gov.ie/en/publication/ba0c5-overview-of-planning-in-ireland/#local-authority-development-plans last accessed 2025/02/24
44. Galland, D., Enemark, S.: The Danish national spatial planning framework: Fluctuating capacities of planning policies and institutions. In Knapp, G.-J., Nedovic-Budic, Z., Carbonell (Eds.), A.: Planning for States and Nation-States: In the US and Europe Lincoln Institute of Land Policy. pp. 339–375. Lincoln Institute of Land Policy (2015). https://www.researchgate.net/publication/304797126_The_Danish_national_spatial_planning_framework_Fluctuating_capacities_of_planning_policies_and_institutions last accessed 2025/02/21
45. OECD. Land-use Planning Systems in the OECD: Country Fact Sheets. OECD Regional Development Studies, 81 – 86 (2017). doi: https://.org/10.1787/9789264268579-en
46. [46] Danish Ministry of the Environment: Spatial Planning in Denmark (2007). https://www.petkovstudio.com/bg/wp-content/uploads/2017/03/Planning_260907_NY6.pdf last accessed 2025/02/21
47. Giannakourou, G.: The Investiment's spacing in Greece: historical transformations and contemporary demands. In Economou, E., Petrakos, G.: Greek cities development: Scientific approaches to urban analysis and policy. University Publications of Thessaly – Gutenberg, 457 – 480 (2010). (in Greek)

48. Kyvelou, S., Gourgiotis, A.: Landscape as connecting link of nature and culture: Spatial planning policy implications in Greece. Urban Science 3(3), pages: 20, (2019) doi: https://doi.org/10.3390/urbansci3030081
49. Giannakourou, G., Balla, E.: Privatization of planning powers and planning processes in Greece: Current trends, future prospects. In 6th Conference of the Platform of Experts in Planning Law., Lisbon, (2012) https://internationalplanninglaw.net.technion.ac.il/files/2013/10/Greece_Privatization-of-planning-powers-and-processes.pdf
50. Karadimitiou, N., Pagonis, T.: Planning reform and development rights in Greece: Institutional persistence and elite rule in the face of the crisis, European Planning Studies, 27 (2), 1–18 (2019). doi:10.1080/09654313.2019.1579300
51. Chorianopoulos, I., Pagonis, T. H.: Tracing the Mediterranean City – Urbanism, Planning and Governance in the Metropolis of Athens. Kritiki, Athens (2020). (in Greek).
52. Chaintarlis, M.: The Legal Spatial Tools of a Strategic Nature. Theory and Practice. Nomiki Vivliothiki, Athens (2017). (in Greek)
53. Asprogerakas, E., Tasopoulou, A.: From sustainability to resilience: Tracing the transition path for spatial planning policy in Greece. European Spatial Research and Policy 31(1), 29–52 (2024). doi:10.18778/1231-1952.31.1.04
54. Asprogerakas, E., Melissas, D.: Reflections on the hierarchy of the spatial planning system in Greece (1999–2020). International Planning Studies 28(3-4), 332 – 346 (2023). doi: 10.1080/13563475.2023.2251692
55. Ministry of the Environment and Energy (YPEN), General Secretariat for Spatial Planning & Urban Environment: Programme of Local Urban Plans 2020-2030. (in Greek) https://ypen.gov.gr/wp-content/uploads/legacy/Files/ypourgeio/Grafeio%20Typou/20200617_Parousiasi_Programmatos_TPS.pdf last accessed 2025/02/26
56. Hellenic Federation of Enterprises (SEV): Spatial planning as a precondition for development (II), Special Report (64) (2021). https://www.sev.org.gr/wp-content/uploads/2021/04/2021-04-08_SR_Horotaxia%CE%99%CE%99.pdf last accessed 2025/02/26
57. Celi, G., Guarascio, D., Simonazzi, A.: A fragile and divided European Union meets Covid-19: further disintegration or 'Hamiltonian moment'? Journal of Industrial and Business Economics 47 (3), 411–424 (2020). doi: https://.org/10.1007/s40812-020-00165-8
58. [58] Conte, A., Lecca, P., Sakkas, S., Salotti S.: The 2020 territorial impact of COVID-19 in the EU: A RHOMOLO update. European Commission, Seville (2021). JRC125536.
59. De la Porte, C., Jensen, D., M.: The next generation EU: An analysis of the dimensions of conflict behind the deal. Social Policy & Administration 55(2), 388 – 402 (2021). doi: https://.org/10.1111/spol.12709
60. [60] McCann, P., Ortega-Argilés, R., Yuan, P.-Y.: The Covid-19 shock in European regions. Regional Studies 56(7), 1142–1160 (2021). doi: https://.org/10.1080/00343404.2021.1983164
61. [61] Petrakos, G,Artelaris, P., Kallioras, D.: Convergence and public debt in the European Union: An overlooked trade-off? Regional & Federal Studies 31(5), 671 – 688 (2021). doi: https://.org/10.1080/13597566.2020.1809382
62. Belso Martinez, J. A.: Entrepreneurship policies and new business performance and growth: an empirical analysis based on manufacturing industries. Environment and Planning C: Government and Policy 27, 195–215 (2009). doi: https://.org/10.1068/c0816b

63. Phelps, A. N.: From Branch Plant Economies to Knowledge Economies? Manufacturing Industry, Government Policy, and Economic Development in Britain's Old Industrial Regions. Environment and Planning C: Government and Policy 27, 574 – 592 (2009)
64. Petrakos, G.,Fotopoulos, G., Kallioras, D.: Peripherality and integration: Industrial growth and decline in the Greek regions. Environment and Planning C: Government and Policy 30, 347-361 (2012). doi: https://.org/10.1068/c10171r
65. Ministry of Development and Investment (YPAN) – General Secretariat for Industry Business Plan for the development of Business Parks in the Greek Territory, according to article 42, par. 3 of Law 3982/2011: Summary - Conclusions of the Business Plan (2018). (in Greek). https://www.ggb.gr/el/node/1274 last accessed 2025/02/28
66. Gourgiotis, A., Kyvelou, S., Lainas I.: Integrating Business Parks into the urban ecosystem: perspectives and conditions for a comprehensive transition. Aeihoros: Essays on Spatial Planning and Development (34), 79–125 (2022). (in Greek). doi: https://.org/10.26253/heal.uth.ojs.aei.2022.1256
67. Tasopoulou, A., Kiriakidou, C., Koukourikou, E., Bogdanos, M.: Multi-criteria analysis for the prioritization of Informal Industrial Concentrations (IIC) in respect of remediation and organization. The case of IICs in the Region of Central Macedonia, Greece. In: International Conference 'Changing Cities VI: Spatial, design, landscape, heritage & socio-economic dimensions', Rhodes, Greece (2024)
68. Gourgiotis, A., Kyvelou, S.S., Lainas, I.: Industrial Location in Greece: Fostering Green Transition and Synergies between Industrial and Spatial Planning Policies. Land 10 (271) (2021). doi: https://.org/10.3390/land10030271
69. Ministry of Development and Investment (YPAN) – General Secretariat for Industry: 1st Revision of the Business Plan for the development of Business Parks in the Greek Territory, according to article 42 par.3 of Law 3982/2011, Subproject: Informal Industrial Concentrations (IICs), Technical Report (2020). (in Greek). https://www.ggb.gr/el/node/1274 last accessed 2025/02/25
70. Regional Development Fund of Central Macedonia: Study to investigate the possibilities of remediation and organization of informal industrial concentrations in the Region of Central Macedonia. Deliverable No P1 "Action Plan for the spatial reorganization and reform of the Informal Industrial Concentrations (IICs) of the Region of Central Macedonia" (contractors: Samaras and Partners S.A., CONSORTIS, and DIKTYO S.A.) (2022)
71. Hellenic Federation of Enterprises (SEV): Business Parks ad the key for industrial reconstruction of the economy and attracting investment, Special Report (12) (2017). (in Greek). https://www.sev.org.gr/Uploads/Documents/50520/special_report_27_9_2017.pdf last accessed 2025/02/25
72. Asprogerakas, E.: Strategies of integrated interventions in Greece: tools and governance schemes. Planning Practice & Research 35 (5), 575–588 (2020). doi: https://.org/10.1080/02697459.2020.1794664
73. Preza, E., Asprogerakas E.: Applying integrated, spatial tools in the framework of EU cohesion policy (2014-2020). European Journal of Spatial Development 19(6), 1–22 (2022). doi: https://.org/10.5281/zenodo.7386416
74. Preza, E., Asprogerakas, E.: Integrated spatial development within the framework of the 2014-2020 Cohesion Policy: The case of Greece. Aeihoros: Essays on Spatial Planning and Development (35), 5–41 (2022a). (in Greek). doi: https://.org/10.26253/heal.uth.ojs.aei.2022.1596

75. Gourgiotis A., Tsilimigkas, G.: A new approach to spatial planning in Greece. Aeihoros: Essays on Spatial Planning and Development (26), 103–122 (2016). (in Greek). doi: https://.org/10.26253/heal.uth.ojs.aei.2016.428
76. Asprogerakas, E., Tasopoulou, A.: The role of spatial planning policies in fostering regional economic resilience in Greece. In International Conference on Changing Cities IV: Spatial, Design, Landscape & Socio-economic Dimensions. p.p. 1027–1039. Chania, Greece (2019)
77. Serraos, K., Asprogerakas, E.: Typologies of Bottom-Up Planning in Southern Europe: The Case of Greek Urbanism During the Economic Crisis. In: Arefi, M., Kickert, C. (eds) The Palgrave Handbook of Bottom-Up Urbanism. Palgrave Macmillan, Cham. (2019). doi: https://.org/10.1007/978-3-319-90131-2_11
78. Lazoglou, M., Linaki E., Asprogerakas, E., Serraos, K., Koutsopoulou, A.: Public participation in Planning: experiences from Athens, Greece. In: Othengrafen, F., Herrmann, S., Pencic, D., Lazarevski, S. (eds): Social Cohesion and Resilience through Citizen Engagement, pp. 91–100. Edward Elgar Publishing, Cheltenham (2024)
79. Starrett, D.: Market allocations of location choice in a model with free mobility. In: Journal of Economic Theory 17(1), 21–37. (1978). doi: https://doi.org/10.1016/0022-0531(78)90120-5

# The multifaceted role of spatial planning in the sustainable development of Greek tourist destinations: challenges, observations, and proposed directions in today's era of continuous crises and shifting conditions

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**Abstract.** The article analyzes the multifaceted role that spatial planning must play in supporting the sustainable development of Greek tourist destinations in an era of continuous crises and rapid change. It focuses on five key functions of spatial planning: regulating tourism development, promoting sustainable investments, creating attractive destinations, enhancing resilience, and coordinating the involved stakeholders. Through a systematic review of the literature and an evaluation of applied policies in Greece, it records the dominant typologies of tourism development and highlights critical weaknesses such as the fragmented implementation of policies and the lack of strategic coherence in the spatial planning of tourist destinations.
The article proposes the formulation of a national strategy with an emphasis on the redesign of mature destinations, landscape management, and the adoption of ecosystem-based approaches, aiming to achieve a balance between competitiveness, environmental protection, and social welfare.

**Keywords:** Spatial planning, sustainable tourism development, Greek tourist destinations.

## 1 Introduction

Spatial planning plays a pivotal role in achieving sustainable tourism development, particularly within a society striving for the long-term rational organization and preservation of environmental, social, and cultural balance. Despite the wide variety of planning traditions across countries, it is widely acknowledged that spatial planning in relation to tourism has primarily functioned as a regulatory mechanism, providing a framework for balancing competing land uses. However, the increasing complexity of social phenomena, the rapid technological transformations, and the urgent need to manage the impacts of climate change have exposed the limitations of such static, conventional approaches. Research on the relationship between spatial planning and tourism remains relatively limited [1-4] highlights common themes and concerns shared by scholars of both tourism policy and spatial planning, including governance structures,

sustainability challenges, and the understanding of tourism's multiple policy impacts. Recent scholarship in tourism planning emphasizes the tourism destination as the primary spatial unit for policy intervention. As several scholars have pointed out [1,5-7], a key contemporary challenge lies in effectively integrating spatial and development planning into destination management processes — a complex issue faced by planning systems worldwide.

This article aims to contribute to this debate by analyzing the multidimensional role that spatial planning must fulfill to support sustainable tourism development, focusing specifically on Greek tourism destinations. The research is based on a systematic literature review and an evaluation of applied spatial policies, examining the link between spatial planning and the patterns and types of tourism spatial development in Greece. Initially, it reviews the international literature on the spatial planning of tourism destinations, identifying four key roles that spatial planning must perform at the destination level to promote sustainable tourism: regulatory, promotional, creative, and coordinative.

The study then focuses on the Greek case, applying a methodology of documenting and mapping the spatial planning policies that have been implemented. This process involves recording the key typologies of tourism spatial organization and identifying the mechanisms that shaped them, while pinpointing critical periods and shifts in the objectives of spatial strategies and policies. Finally, a synthetic analysis categorizes the main challenges facing spatial planning in Greece and proposes strategic directions for more effective planning and sustainable tourism development of Greek destinations in today's era of continuous crises and rapidly changing conditions.

### 1.1 The Distinct Roles of Spatial Planning in Promoting Sustainable Tourism Development

Following the widespread acceptance of the initial definition of sustainability in the Brundtland Report (1987) and the global influence of the Rio Declaration (1992), the concept of sustainable development progressively dominated academic, business, political, and governance discourses. Over the past thirty years, an international dialogue has developed systematically around the principles that should guide sustainable tourism, through conferences, reports, and global declarations, such as the Charter for Sustainable Tourism (World Conference in Lanzarote, Canary Islands, Spain, 1995), the Agenda 21 for the Travel and Tourism Industry, the Global Code of Ethics for Tourism, and, more recently, the 2030 Agenda for the Sustainable Development Goals (SDGs). All these initiatives frame sustainability as a balance between economic growth, environmental conservation, and social ethics [8-10].

In the context of a rationally organized and well-governed society, spatial planning is considered a prerequisite for sustainable tourism development. Within this strategic goal, spatial planning is positioned as a complex and multifaceted process, encompassing economic, environmental, social, cultural, and political dimensions. A review of the relevant literature [2-4, 11-12] indicates that spatial planning can contribute to sustainable tourism development by assuming five key roles, which are analyzed below:

### 1.1.1 The Regulatory Role of Spatial Planning

Spatial planning assumes a regulatory role by promoting a balanced distribution of tourism activities and safeguarding the natural and cultural resources that underpin the long-term sustainability of tourism development. This approach emerged in the 1980s, notably through seminal works such as Butler's Tourism Area Life Cycle (TALC) [13] model which highlighted the adverse impacts of unregulated tourism expansion on local environments. In the following decades, spatial planning was increasingly recognized as a crucial mechanism for regulating tourism development to protect natural and cultural resources and to preserve the well-being of local communities [14]. This regulatory function was operationalized through tools such as zoning systems with graded levels of protection, land resource conservation measures, restrictions or controls on tourism development in specific areas, limits on the number of tourism beds, special building regulations, visitor management models, and tourism development monitoring indicators. Despite the diversity of planning traditions across different countries and destinations, the regulatory dimension consistently forms the foundation of destination planning, as it is essential for ensuring the long-term viability of local systems, of which tourism is a part. Regulation remains the fundamental policy instrument available to spatial planning systems, securing legal certainty and sustainability over time. Nevertheless, regulatory approaches to spatial planning have faced criticism for being overly rigid and static, often assuming an unrealistic level of public control over land use and development processes [15].

### 1.1.2 The Promotional Role of Spatial Planning in Supporting Healthy Tourism Entrepreneurship and Attracting Desired Investments

In this context, spatial planning assumes a promotional role, facilitating the development of desirable tourism patterns and the attraction of sustainable investments. Spatial planning can contribute by:

- Rationally distributing tourism infrastructure, based on investment performance evaluations and the sustainability of public-private partnerships.
- Protecting key tourism resources such as forests, archaeological sites, and beaches, ensuring the harmonious coexistence of tourism activities with competing land uses.
- Safeguarding the availability of public land resources suitable for tourism development.
- Creating an investor-friendly environment through mechanisms that support investors, simplify permitting and land-use procedures, and offer spatial, planning, and economic incentives for sustainable tourism investments.

The global financial crisis of 2008 prompted a reorganization of national spatial planning systems in several European countries, including Greece, to respond to the needs of an increasingly globalized economy and the promotion of tourism and real estate investments [16-17]. Regarding tourism entrepreneurship, spatial planning has focused on strengthening and promoting investment activity as a means of supporting economic recovery and enabling regions to capitalize on opportunities arising from the

crisis. However, planning must ensure that private investments serve the public interest and align with the goals of sustainable development.

According to the Allen Consulting Group [18] the facilitation of tourism investments should meet several conditions:

- Investments should address identified market failures and support national and local sustainable tourism development goals, such as spreading tourism demand and strengthening disadvantaged areas.
- Investments should represent a sound use of public funds, measured against their social and environmental benefits, with effectiveness evaluation mechanisms integrated into policy and program design.
- Private investors should bear an appropriate share of the risks associated with the proposed investments.
- Investment facilitation processes should be fair, equitable, and conducted transparently for all parties involved.

### 1.1.3 The Creative Role of Spatial Planning in Shaping Attractive and Competitive Tourism Destinations

This approach emphasizes the creative role that spatial planning can play in either creating new tourism destinations or enhancing the attractiveness of existing ones. Since the 1980s, strategies aimed at improving the competitiveness of mature[1] destinations or repositioning declining cities and regions in the global market have been developed under the broader framework of rejuvenation strategies [19-20]. A core element of such strategies involves interventions in urban planning, urban design, and landscape design, aiming to upgrade the built and natural environment and enhance the physical attractiveness of destinations. In the early decades of the 21st century, emphasis shifted towards strengthening the identity of destinations through placemaking and place shaping approaches [21]. In this context, spatial planning and place branding are closely interconnected, as the physical environment plays a critical role in shaping a destination's image. In the strategic objective of enhancing a tourism destination's attractiveness, modern spatial planning can contribute through mechanisms that support multiple goals, such as:

- Highlighting the destination's architectural heritage, including landmarks, buildings, and public spaces that contribute to its character and identity [22 - 23].
- Creating attractive and innovative public spaces by ensuring high-quality urban design in parks, squares, and upgrading the built environment through façade improvements or the removal of incompatible structures.

[1]The concept of a "mature tourist destination" is closely linked to the Tourism Area Life Cycle (TALC) model, as formulated by Butler (1980) and further developed by subsequent scholars. A mature destination is considered one that has completed a full cycle of tourism development and may be in a stage of stagnation, in a transitional post-stagnation phase, or even entering a new development cycle. In all cases, such destinations face complex strategic challenges that must be acknowledged and addressed through specialized and context-sensitive planning approaches.

- Facilitating the development of flagship urban projects, supporting flagship urban projects that can serve as symbols of a destination and strengthen its international image [24].
- Promoting accessible destinations, emphasizing the redesign of public spaces to improve pedestrian accessibility and encourage sustainable mobility [25].

### 1.1.4 Spatial Planning Must Contribute to the Creation of Resilient Tourism Destinations

Spatial planning serves as a key tool for enhancing the resilience of tourism destinations. While the concept of a resilient destination encompasses a broad interdisciplinary field, this article focuses on the role of spatial planning in adapting to natural disasters and the impacts of the climate crisis. This is achieved through three main approaches: preventive interventions that guide destination development, regulatory measures that control tourism activities, and strategic coordination that ensures stakeholder participation and policy convergence [26].

To address the challenges of climate change, spatial planning must incorporate uncertainties, anticipate risks and impacts, and provide mitigation and adaptation mechanisms to prevent or minimize damage. This necessity has led to the adoption of ecosystem-based planning approaches [27-29], such as the Green Infrastructures framework, which has gained prominence in planning theory and policy over the past decades [30]. Ecological restorations represent one of the primary strategies for promoting Green Infrastructures [31]. Investments in Green Infrastructures are believed to enhance the image of a destination by attracting and retaining high-value facilities, new businesses, and skilled workers, while strengthening the cultural and historical landscape identity of a tourism destination. At the same time, the promotion of Green Infrastructures can create unique opportunities for attracting new visitors to the city.

Moreover, in recent years, research has increasingly focused on addressing sea-level rise (SLR) in coastal and island areas. The Shoreline Adaptation Plan (SAP) provides a comprehensive framework, including vulnerability mapping, risk analysis, and the development of adaptation measures to mitigate the impacts of these phenomena [32].

### 1.1.5 Spatial Planning as a Coordinating Mechanism in Tourism Development Governance at National, Regional, and Local Levels

In this approach, spatial planning can enable a variety of interest groups—representing different sectors, stakeholders, and levels of governance—to engage in dialogue on issues of sustainable tourism development within a specific space and time [2]. Consultation is a critical aspect of spatial planning, aiming to identify solutions that address the needs and priorities of local communities. Such consultations, typically organized by municipal authorities or planning bodies, are conducted at various stages of the tourism planning process. Depending on the level of participant engagement in the participatory planning process and the intended outcomes (e.g., capturing opinions or achieving consensus), consultation mechanisms can involve various forms of communication [4, 33-35].

In the early decades of the 21st century, new forms of governance and collaboration between the state, local authorities, and the private sector have emerged within the framework of strategic spatial planning. The role of spatial planning is to promote the involvement of the private sector and to ensure the integration of environmental dimensions across all levels—national, regional, and local. It is important to highlight that, although consultation procedures are embedded within spatial planning systems in all democratic states, in practice, spatial planning often becomes an additional arena for conflicts rather than serving as an effective coordinating mechanism [4].

Depending on the identified problems and articulated objectives, spatial planning may place greater emphasis on one or more specific goals. However, it is important to stress that comprehensive spatial planning should balance all the needs of a tourism destination: enhancing its competitiveness and attractiveness, protecting its resources, and ensuring the prosperity of the local community. The five key roles highlighted in the international literature are not merely theoretical guidelines; they have been institutionally established through contemporary national and transnational spatial planning frameworks. A comparison of European spatial planning systems reveals that in most cases, sectoral planning for tourism has been integrated—at varying degrees—into regional spatial planning, with the notable exceptions of Greece and the Czech Republic [36].

## 2 The Characteristics of Greek Tourism Destinations as a Result of Applied Spatial Planning

The Greek tourism space has historically been characterized by uneven spatial distributions, with five coastal and island regions (Crete, South Aegean, Central Macedonia, Ionian Islands, and Attica) receiving 84% of the total number of inbound tourists and concentrating 79% of the country's hotel beds as of 2023 (Bank of Greece, 2024), while also displaying significant geographical differentiation.

The regional distribution of tourism activity has been shaped by the interaction of endogenous and exogenous factors. During the first period of tourism development (1965–1990), the shift toward the heliotropic model, reinforced by tour operator policies, generated strong concentrations of demand and supply in specific coastal and island areas [37-38]. Efforts to achieve better regional dispersion—through incentives (e.g., development laws) or disincentives (e.g., spatial regulatory measures such as "saturated areas" and Zoning Ordinances, ZOE)—were applied inconsistently and failed to substantially transform the dominant spatial patterns.

A structural feature of Greek tourism destinations is closely linked to the fragmentation of land ownership, stemming both from specific historical and socio-economic conditions and from the spatial policies implemented over time [39]. As a result, Small and Very Small Tourism Enterprises dominate the Greek tourism landscape, following a "craft-based" tourism model.

The term "craft-based" refers to the organizational characteristics (i.e., small, family-run establishments), rather than the intensity of tourism activity, which can be very high. Tourism has been "industrialized" only in a few areas (e.g., Rhodes, Kos, Crete,

Corfu, Halkidiki, Athens), where large-scale tourism facilities coexist with a significant number of small/family-run units. The average size of hotel capacity in Greece is 82 beds (41 rooms), while approximately 80% of the country's hotel beds belong to establishments with up to 50 rooms. Hotels with over 200 beds represent only 7.8% of the total stock. The average size of all tourist accommodation facilities (including non-hotel types) is even smaller, reaching approximately 31 beds (15 rooms) [40].

An additional characteristic of Greek tourism destinations is the blending of second-home and tourism uses. More than half of the tourism beds in Greece operate in typical or informal accommodation units originally designated as residential buildings. In several regions, hotel beds are either comparable to or fewer than those found in secondary or informal accommodation [41].

### 2.1 Key Typologies of Tourism Spatial Development in Greece and the Spatial Mechanisms That Shaped Them

From the analysis of the spatial development of tourism in Greek destinations [42] three dominant typologies of tourism development have been identified. The 2nd and 3rd types represent the most typical models of spatial development, mainly in coastal and island destinations, shaping an endogenous "artisan-like" organizational model, often of high intensity, and sometimes coexisting with the 1st type:

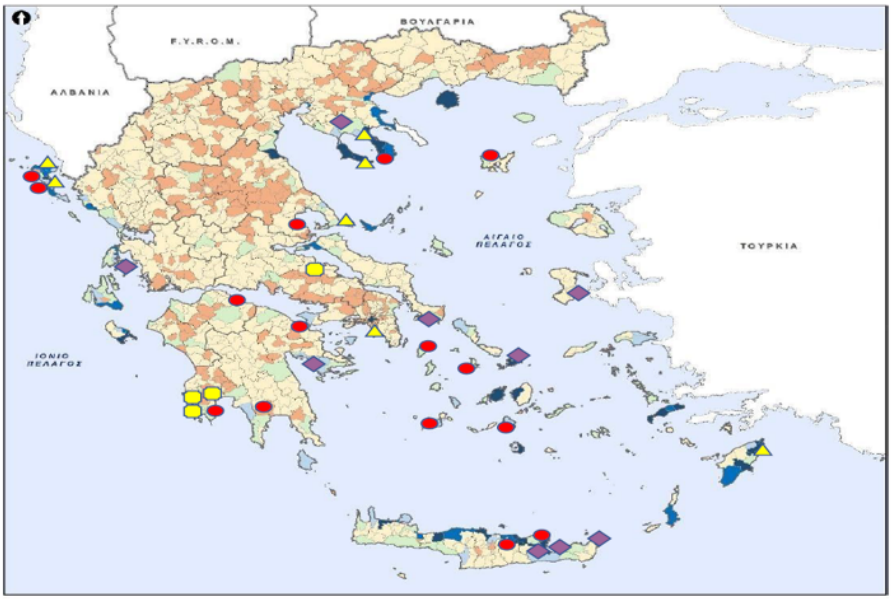
*Type 1: Focused development of medium and large hotel complexes outside urban plans at the edges of settlements, in coastal or forest areas.*

Type 1 is always associated with the implementation of specific favorable policies for large tourism investments, which consistently combine financial facilities and spatial privileges, such as the ability to exploit prime locations (coastal zones, forest areas), the compulsory expropriation of public and private land for the establishment or expansion of hotel units, and construction exemptions allowing especially advantageous terms for exploiting tourism plots. These policies encouraged the creation of large, high-category hotel enterprises.

This type is mainly found in destinations that developed during the initial period of tourism growth in Greece (1960–1980), such as Attica, Rhodes, Halkidiki, and Corfu.

During the 1990s, policies promoting larger tourism investments were also implemented, though rather fragmented, targeting specific areas (such as Crete).

In the more recent period of the greek economic crisis 2010-2019 (2010–2019) in Greece, a new spatial and developmental framework was shaped, promoting the introduction of new tourism real estate products and the attraction of major tourism investments. This framework was supported by the policies of the bailout agreements (memoranda) [43]. These new investments are mainly oriented towards emerging tourist areas where sufficient land is still available, such as Messinia, Laconia, Thessaly, Kea, and Milos, or in already developed tourist areas where land reserves with special status existed (e.g., ecclesiastical land, Natura 2000 areas in Crete, etc.) [44-45] (see Fig. 1).




| | STK ● | ESXASE ◆ | ESXADA △ | POTA ▢ |
|---|---|---|---|---|
| in operation | | | | 1 |
| at various stages of licensing and construction. | 15 | 9 | 7 | 1 |

**Fig. 1.** Figure 1 Integrated Tourism Development Projects in Greece, 2022.
Source: Tsartas & Sarantakou 2022,
STK: Mixed-use tourist accommodations established by Law 4002/2011
POTA: Integrated Tourism Development Areas, a planning mechanism of an entrepreneurial nature established by Law 2545/1997
ESXASE: Special Spatial Development Plans of Strategic Investments established by Law 4179/2013
ESXADA: Special Spatial Development Plans of Public Estates established by Law 4179/2013

*Type 2: Focused, dense development of small formal and informal tourism units within the boundaries of newer settlements.*

During the second period of tourism development (1980–1990), tourism in Greece grew at a very rapid pace and underwent a qualitative transformation, as a cheaper mass tourism model became dominant. In this critical period of tourism expansion, a spatial and developmental policy was implemented that favored the dominance of a small and medium-sized model. Gradually, Type 2 prevailed: a focused, dense development within new settlements created through the delimitation of coastal areas. Type 2 represents a "typical" model of spatial development in many coastal areas of Greece and is associated with endogenous "artisan-like" high-intensity tourism.

*Type 3: Unplanned, extensive development of tourism and vacation uses, largely along coastal and roadside areas at the edges of settlements on agricultural land.*

The third type concerns the unplanned, extensive development outside urban plans and settlement boundaries, largely along coastal and roadside areas, and has appeared dynamically from the 1990s to the present. Type 3 is largely characterized by the mixing of vacation and tourism uses in properties built under residential construction regulations.This type is linked to the significant building allowances outside city and settlement plans, the absence of defined land uses, and often very small minimum plot sizes [46-47].

## 2.2 Evaluation of the Role of Spatial Planning in Greek Tourist Destinations During the Period 1980–2025

Since the late 1980s, spatial planning in Greece has primarily had a regulatory role regarding tourism, with uneven medium-term results. This effort began with the regulation of "saturated areas," which imposed restrictions on the entry of new businesses. At the end of the 1990s, an integrated spatial planning system was established (Laws 2508/97 and 2742/99). Based on this system, from 2005 onward, spatial plans were drafted that set general development guidelines. The regulatory logic of "saturated areas" was maintained within the framework of the Residential Control Zones (ZOE), which essentially constituted the main spatial tools applied to tourist destinations up until the 2010s [48]. A maximalist and "strict" spatial planning model was developed, aiming at environmental protection and the upgrading of the tourism product, but it was accompanied by a weak enforcement mechanism, leading to results opposite to those expected [42]. The first Special Spatial Framework for Tourism in 2009 aimed to establish a national strategy for the spatial organization of tourism but was heavily criticized by stakeholders. In 2013, a revised version was approved. Subsequently, however, the Council of State (Decisions 3632/2015 and 519/2017, Section E) annulled both versions of the framework [37]. Additionally, regulations from the EU structural funds created a parallel, unofficial system [49].

Due to the absence of a targeted spatial tourism policy, no comprehensive rejuvenation and upgrading strategies were implemented for mature Greek destinations. Instead, fragmented upgrading policies at the business and infrastructure levels were applied, yielding moderate effectiveness [50]. In conclusion, the 2010–2020 period aimed at regulating and upgrading Greek tourism qualitatively, but the lack of coherence, the involvement of multiple bodies without a common vision, and constant administrative changes limited the effectiveness of these policies [51].

During Greece's economic crisis (2010–2019), under the pressure of the country's bailout obligations, a radical revision of the spatial planning philosophy regarding tourism investments occurred [52-54]. A strongly pro-investment framework was established, with a specific focus: the introduction of new tourism products emphasizing tourism real estate and the attraction of large-scale tourism investments, which were notably lacking in Greece. This new model was supported by the creation of a special fast-track licensing mechanism for large-scale investments ("Strategic Investments") and the introduction of new flexible urban planning tools for the creation of large-scale

tourism developments, featuring special provisions [43]. These new spatial tools have successfully attracted larger integrated tourism development projects (Figure 1). However, the absence of a strategic special framework for the spatial and developmental organization of tourism at the national level during the critical period of its recent second growth (2013–2025) reduced the ability to manage the increased demand rationally. As a result, regional inequalities, historically characteristic of the Greek case, have been further exacerbated. The doubling of tourist arrivals (+102%) during the 2012–2019 period was not matched by a corresponding increase in hotel beds, which grew by only 11.5% by the end of the period [55]. This means that the significant growth in tourism largely fueled the expansion of informal and essentially unregulated tourism accommodation through sharing economy platforms [44].

The issue of accessibility in Greek tourist destinations has only been seriously addressed in the last decade. At the urban planning level, initiatives for drafting Sustainable Urban Mobility Plans (SUMPs) with European funding were developed, but implementation remains limited [55]. Examples of good practices include Kos, Rethymno, and Komotini, which was awarded at the 2021 European Access City Awards. Despite the provision for accessible destinations in the legal framework (Articles 52–54, Government Gazette A250/2021), the relevant initiative has not yet been fully implemented [57].

Today, the resilience of Greek destinations represents the most critical challenge for sustainable development. Climate crisis management was introduced into spatial planning mainly in general terms towards the end of the previous decade. For instance, the new Special Spatial Framework for Tourism (EXPT), which was put to public consultation in July 2024, refers to climate change adaptation only at a general objective level, without incorporating operational actions. Provisions for the protection of coastal zones have not been effectively implemented, while Protocol 7 of the Barcelona Convention has not been ratified by Greece [58]. Finally, during the period 2022–2024, the evaluation of Carrying Capacity was introduced into Local and Special Urban Plans (Article 64 of Law 4964/2022 and Government Gazette 200D/2024), aiming at assessing the maximum tolerable pressures in sensitive areas. Despite its early stage of implementation, this development represents an important step towards more resilient and sustainable spatial planning.

## 3 Conclusions: Challenges and Directions for the Spatial Planning of Tourism in Greece in the Current Period

This article contributes to the ongoing discussion regarding the analysis of the multidimensional role that spatial planning must serve in the direction of the sustainable development of tourist destinations, focusing on the case of Greece.

From the longitudinal analysis presented earlier, it emerges that spatial planning implemented in Greece has mainly served two successive and contradictory roles: strongly promotional during certain periods and strictly regulatory—sometimes even hostile—toward large investments in others, depending on the objectives of the political leadership at the time. Spatial planning tools were applied fragmentarily, with limitations, and

with significant delays [48-49].Due to the lack of planning, small property ownership and endogenous small-scale entrepreneurship were greatly favored. At the same time, the state displayed tolerance, and sometimes even impunity, toward various forms of irregularities and poor entrepreneurial practices [16-59]. Since 2011, there has been a shift toward a flexible spatial development model aimed specifically at attracting large-scale, integrated tourism investment projects through urban planning procedures [60-61].

In reality, spatial planning in Greece did not constitute the basis for tourism and development processes but instead lagged behind developments with considerable delay. The lack of political will to implement spatial planning meant that the profound transformations of the Greek tourism landscape during both the first (1970–1995) and the second growth periods (2013–2025) occurred largely outside the scope of spatial planning.

By the mid-2020s, the need to establish a national strategy for the spatial planning of tourist destinations becomes urgent, capable of managing the rapid transformations of tourism activity under conditions of successive crises such as the financial crisis and the COVID-19 pandemic. Within this framework, the following challenges emerge:

- *The proven difficulty of achieving a consensual approach to spatial governance of tourism in Greece.*

Sustainable tourism requires open and participatory spatial governance processes and promotes bottom-up tourism development. During the period of the Greek economic crisis 2010-2019 (2010–2019), a relatively structured policy among competent ministries was formed, positively received by professional tourism bodies. However, these emergency-driven policies did not secure broad consensus among scientific and environmental organizations. A notable example is the Special Spatial Framework for Tourism (approved in 2013, Government Gazette B' 3155/2013) which was annulled by the 3632/2015 decision of the Council of State for violating essential consultation procedures. Analysis of the 13 Regional Spatial Frameworks [51] highlights the lack of coherent policy for tourism development and entrepreneurship, with particularly contentious issues being the siting of large investments and unregulated building outside town plans. Environmental and scientific organizations have criticized the Strategic Investments framework as abusive when it does not serve national and local goals for sustainable tourism development, such as the dispersal of tourist demand and the strengthening of disadvantaged areas.

- *The need for rapid adaptation to rapidly changing global circumstances, such as the COVID-19 pandemic or global warming.*

Flexibility in spatial planning allows authorities to adapt regulations to new opportunities and challenges in tourism, such as the development of new forms of tourism or the incorporation of sustainable practices. Greece's spatial planning system, shaped since the late 1990s, remains centralized and of limited maturity due to the lack of evaluation and control processes, making it rigid and static [62]. Efforts to revise the system between 2010–2020 aimed to shorten plan approval times, manage conflicts between planning levels, and promote entrepreneurship. According to the ESPON COMPASS [36]. project, the adaptability of the Greek system improved from "weak" to

"moderate," mainly through new urban planning tools based on development initiatives rather than predefined land use plans [60, 63-64]. Nevertheless, environmental and scientific organizations have pointed out risks, criticizing the new framework for favoring large investments at the expense of integrated planning. Achieving a balance between legal certainty and flexibility is critical for dynamic activities like tourism. This requires a combination of flexible institutional arrangements with strong transparency and consultation mechanisms to meet developmental, social, and environmental demands.

- *Strengthening the participatory and coordinating role of spatial planning.*

Sustainable tourism development depends on open, participatory spatial governance processes. There is a persistent risk that difficulties in achieving consensus may result in an inability to make decisions and take responsibility. Therefore, it is essential to establish stable participation structures to cultivate a culture of dialogue and consensus [65]. Strengthening the coordinating role of spatial planning can be achieved through the emergence of strong bodies for integrated governance at the regional and local levels, in cooperation with private and public stakeholders. Destination Management Organizations (DMOs) could play this role, provided they are granted appropriate responsibilities. It is also crucial to integrate monitoring mechanisms into the tourism, developmental, and spatial planning processes through Tourism Observatories in collaboration with academic institutions and professional bodies.

- *The need to redesign mature Greek destinations to enhance their competitiveness and resilience.*

In the post-pandemic period, destinations that used the crisis period to redesign their tourism products have taken the lead. Most Greek tourist destinations are "mature." To maintain or regain their competitiveness, they must be redesigned to become attractive, sustainable, accessible, and resilient. This restructuring requires significant funding and the synergy of tourism and spatial planning, alongside strong incentives to restore investments in the tourism sector. Greek destinations must offer tourists high-quality experiences throughout their journey, from entry points to accommodation and mobility within urban and rural spaces. For this purpose, introducing place-shaping strategies is necessary, combining spatial planning tools with tourism product development to transform destinations into attractive experience spaces.

Spatial planning can ensure the appropriate density of points of interest, create thematic and multi-thematic networks, contribute to the upgrading of degraded built environments, and strengthen local identity. Spatial and developmental planning must meaningfully integrate key issues increasingly important for sustainable development, such as landscape management [66-67]. A shift toward an ecosystemic approach in spatial planning is becoming necessary [68-69] and ecological urban regeneration projects can serve as a strategic advantage for Greece’s green marketing, showcasing environmental responsibility as a competitive edge.

## References


1. J. Almeida, C. Costa, and F. Nunes da Silva, "A framework for conflict analysis in spatial planning for tourism," Tour Manag Perspect, vol. 24, pp. 94–106, Oct. 2017, doi: 10.1016/J.TMP.2017.07.021
2. B. King and M. Pearlman, "Planning for tourism at local and regional levels: Principles, practices and possibilities," in The SAGE Handbook of Tourism Studies, 2009. doi: 10.4135/9780857021076.n23
3. B. Hayllar, T. Griffin, and D. Edwards, City spaces – tourist places: Urban tourism precincts. Oxford: Butterworth Heinemann, 2008
4. A. Chettiparamb and H. Thomas, "Tourism and spatial planning," Journal of Policy Research in Tourism, Leisure and Events, vol. 4, no. 3, pp. 215–220, 2012
5. P. Mason, Tourism impacts, planning and management: Third edition. 2015. doi: 10.4324/9781315781068
6. C. Costa, "Tourism planning: a perspective paper," Tourism Review, vol. 75, no. 1, 2020, doi: 10.1108/TR-09-2019-0394
7. F. Brandão, C. Costa, and D. Buhalis, "Tourism System," in Encyclopedia of Tourism Man-agement and Marketing, D. Buhalis, Ed., 2022, pp. 484–487
8. E. Fayos-Solà and C. Cooper, "Conclusion: The future of tourism-innovation for inclusive sustainable development," in The Future of Tourism: Innovation and Sustainability, 2018. doi: 10.1007/978-3-319-89941-1_18
9. H. Coccossis and P. Tsartas, Sustainable Tourism Development and the Environment. Athens: KRITIKI, 2019
10. Y. Farsari, R. Butler, and P. Prastacos, "Sustainable tourism policy for Mediterranean desti-nations: issues and interrelationships," International Journal of Tourism Policy, vol. 1, no. 1, 2007, doi: 10.1504/IJTP.2007.013898
11. H. Coccossis, "Study on tourism and spatial planning," Athens, 2015
12. E. Sarantakou, "Tourism Spatial Planning," in Encyclopedia of Tourism Management and Marketing, Edward Elgar Publishing, 2022. doi: 10.4337/9781800377486.tourism.spatial.planning
13. Butler R., "The concept of a tourist area life-cycle of evolution: implications for management of resource," Canadian Geographer, vol. 24, pp. 5–12, 1980
14. E. Inskeep, "Tourism Planning: An integrated and sustainable development approach van nosttrand reinhold," 1991
15. OECD, "Land-use Planning Systems in the OECD Country," Paris, 2017
16. G. Giannakourou and G. Kaikalas, "Re-examining spatial planning in times of crisis: neces-sity, content and conditions for reform," in Competitiveness for Development: policy pro-posals, M. and G. C. Masourakis, Ed., Athens: Hellenic Bank Association, 2014, pp. 511–522
17. E. Sarantakou and P. Tsartas, "A critical approach to the new framework for creating tourism investment during the current period of economic crisis 2010-2014," Greek Economic Outlook, vol. 26, pp. 46–55, 2015
18. Allen Consulting Group, "Framework Guide to Facilitate Tourism Investment," Melbourne, 2011
19. S. Agarwal, "Restructuring seaside tourism: The resort lifecyle," Ann Tour Res, vol. 29, no. 1, 2002, doi: 10.1016/S0160-7383(01)00002-0
20. C. N. J. Sampol and M. Peters, "Guest Editorial: Destination rejuvenation strategies," 2009

21. P. Healey, Making better places. The planning project in the twenty-first century. Basingstoke: Palgrave Macmillan, 2010
22. S. Gholitabar, H. Alipour, and C. M. M. da Costa, “An empirical investigation of architectural heritage management implications for tourism: The case of Portugal,” Sustainability (Switzerland), vol. 10, no. 1, 2018, doi: 10.3390/su10010093
23. M. Costa and M. J. Carneiro, “The influence of interpretation on learning about architectural heritage and on the perception of cultural significance,” Journal of Tourism and Cultural Change, vol. 19, no. 2, 2021, doi: 10.1080/14766825.2020.1737705
24. A. Gospodini, “Aspa Gospodini — Culture-led Regeneration in European Cities: The Question of Sustainability and Critical Parameters of Culture and Leisure Epicentres,” disP - The Planning Review, vol. 53, no. 2, pp. 66–67, Apr. 2017, doi: 10.1080/02513625.2017.1340712
25. European Commission, “Access City Award 2017: Examples of best practice in making EU cities more accessible,” 2017
26. M. Papageorgiou, “Spatial Planning for Tourism Destinations Resilient to Climate Change,” Tourism and Hospitality, vol. 6, no. 1, p. 8, Jan. 2025, doi: 10.3390/tourhosp6010008
27. European Commission, “Building a Green Infrastructure for Europe,” Luxembourg, 2013
28. R. Papa et al., “Green Infrastructure and climate change adaptation,” TeMA - Journal of Land Use, Mobility and Environment, vol. 9, no. 1, 2016
29. T. Matthews, A. Y. Lo, and J. A. Byrne, “Reconceptualizing green infrastructure for climate change adaptation: Barriers to adoption and drivers for uptake by spatial planners,” Landsc Urban Plan, vol. 138, 2015, doi: 10.1016/j.landurbplan.2015.02.010
30. T. S. Terkenli et al., “Tourist perceptions and uses of urban green infrastructure: An explora-tory cross-cultural investigation,” Urban For Urban Green, vol. 49, p. 126624, Mar. 2020, doi: 10.1016/J.UFUG.2020.126624
31. S. R. Grădinaru and A. M. Hersperger, “Green infrastructure in strategic spatial plans: Evidence from European urban regions,” Urban For Urban Green, vol. 40, pp. 17–28, Apr. 2019, doi: 10.1016/J.UFUG.2018.04.018
32. C. Wigand et al., “A Climate Change Adaptation Strategy for Management of Coastal Marsh Systems,” Estuaries and Coasts, vol. 40, no. 3, 2017, doi: 10.1007/s12237-015-0003-y
33. S. Konsti-Laakso and T. Rantala, “Managing community engagement: A process model for urban planning,” Eur J Oper Res, vol. 268, no. 3, 2018, doi: 10.1016/j.ejor.2017.12.002
34. A. Stratigea, “Participatory policy making in foresight studies at the regional level: A meth-odological approach,” Regional Science Inquiry, vol. 5, no. 1, 2013
35. A. Stratigea and V. Katsoni, “A strategic policy scenario analysis framework for the sustainable tourist development of peripheral small island areas – the case of Lefkada-Greece Is-land,” European Journal of Futures Research, vol. 3, no. 1, 2015, doi: 10.1007/s40309-015-0063-z
36. ESPON / COMPASS, “Comparative Analysis of Territorial Governance and Spatial Planning Systems in Europe / Final Report,” 2018
37. P. Tsartas and E. Sarantakou, Greek Tourism Development and Policy. Athens: KRITIKI, 2022
38. S. Avgerinou, “Spatial dynamics of tourism in Greece (1961-1991),” in Proceedings of the Panteion University-CNRS Conference., 2000
39. E. Sarantakou, “Spatial planning and tourism development-The case of Greece,” Journal of Regional & Socio-Economic Issues, vol. 7, no. 1, pp. 59–69, 2017
40. INSETE, "An overview of the tourism sector in the 13 regions of the country," 2019

41. E. Sarantakou and T. S. Terkenli, "Non-Institutionalized Forms of Tourism Accommodation and Overtourism Impacts on the Landscape: The Case of Santorini, Greece," Tourism Planning and Development, 2019, doi: 10.1080/21568316.2019.1569122
42. E. Sarantakou, "Spatial planning and tourism development-The case of Greece," Journal of Regional & Socio-Economic Issues, vol. 7, no. 1, pp. 59–69, 2017
43. K. Stamatiou, "Bridging the Gap between Tourism Development and Urban Planning: Evidence from Greece," Sustainability, vol. 16, no. 15, p. 6359, Jul. 2024, doi: 10.3390/su16156359
44. D. Oikonomou, S. Tsakiris, A. Kotzampopoulos, and D. Argyropoulos, "New Special Spatial Framework for Tourism, Deliverable A, Stage I," 2019
45. E. Sarantakou and N. Karachalis, Planning and management of tourist destinations Strategic and spatial approaches (in Greek). Athens: KRITIKI, 2024
46. A. Gourgiotis, "Spatial planning in Greece: developments, challenges, problems, prospects. The position of organised civil society," in Spatial planning and challenges. New spatial thinking in Greece and France, Legal Library., 2021
47. G. Tsilimigkas and E. T. Derdemezi, "Unregulated built-up area expansion on Santorini Island, Greece," European Planning Studies, vol. 28, no. 9, 2020, doi: 10.1080/09654313.2019.1687656
48. K. Lalenis and Σ. Vezyriannidou, "Spatial planning and related attempts for institutional re-forms in Greece in the period of economic crisis: an assessment of necessities and outcomes," Aeihoros: Essays on Spatial Planning and Development, no. 31, pp. 94–118, 2020
49. D. Oikonomou, "Spatial planning system: the Greek reality and international experience," Social Research Review, vol. 101, no. 101, p. 3, Jan. 2000, doi: 10.12681/grsr.993
50. Sarantakou, "Approaches to the sustainable regeneration of mature tourist destinations," in Tourism, tourism development: contributions of Greek scientists, Papazisis Publications, P. Tsartas and P. Lytras, Eds., Athens, 2017, pp. 201–213
51. A. Gourgitis, E. Sarantakou, F. Stefanis, and M. Haidarli, "Spatial planning and tourism entrepreneurship: the case of Regional Spatial Frameworks," Aeichoros, vol. 35, pp. 42–72, 2022
52. M. Papageorgiou, "Spatial planning in transition in Greece: a critical overview," European Planning Studies, vol. 25, no. 10, pp. 1818–1833, Oct. 2017, doi: 10.1080/09654313.2017.1344194
53. A. Tasopoulou, "Shifts in planning tradition amid an economic crisis and in light of a planning reform: the case of Greece," Planning Practice & Research, pp. 1–20, Aug. 2024, doi: 10.1080/02697459.2024.2389748
54. A. Vitopoulou and A. Yiannakou, "Public land policy and urban planning in Greece: Diachronic continuities and abrupt reversals in a context of crisis," Eur Urban Reg Stud, vol. 27, no. 3, 2020, doi: 10.1177/0969776418811894
55. G. Petrakos, Chr. Beneki, and S. Panousi, Greek Hotels during the Crisis, 2008-2018. Published by the Hellenic Chamber of Hotels, Athens, 2020
56. A. Trampa, "Sustainable Urban Mobility Plans (SUMs) and Coordination with Spatial and Urban Planning: european and greek reality," Aeihoros: Essays on Spatial Planning and Development , no. 31, pp. 145–170, 2020
57. INSETE, "Travel without exclusion | Diversity, Equality and Inclusion in Tourism (in Greek)," 2023
58. E. Asprogerakas, A. Gourgiotis, P. Pantazis, A. Samarina, P. Konsoula, and K. Stavridou, "The gap of cultural heritage protection with climate change adaptation in the context of spa-tial planning. The case of Greece," IOP Conf Ser Earth Environ Sci, vol. 899, no. 1, p. 012022, Nov. 2021, doi: 10.1088/1755-1315/899/1/012022

59. E. Sarantakou and P. Tsartas, “A critical approach to the new framework for creating tourism investment during the current period of economic crisis 2010-2014,” Greek Economic Outlook, vol. 26, pp. 46–55, 2015
60. V. Nadin, A. M. Fernández-Maldonado, M. Dąbrowski, and D. Stead, “Reform of European spatial planning systems: integration, adaptation and participation,” in Spatial Planning Systems in Europe, Edward Elgar Publishing, 2024, pp. 148–171. doi: 10.4337/9781839106255.00018
61. E. Klampatsa, "Space planning as a means of crisis management in Greece," in 3rd Panhellenic Conference on Urban Planning, Spatial Planning, and Regional Development, Volos, Greece, 2012
62. SEV, “National Spatial Planning System from an Entrepreneurship Perspective,” 2015
63. V. Nadin, D. Stead, M. Dąbrowski, and A. M. Fernandez-Maldonado, “Integrated, adaptive and participatory spatial planning: trends across Europe,” Reg Stud, vol. 55, no. 5, pp. 791–803, May 2021, doi: 10.1080/00343404.2020.1817363
64. B. Ioannou, L. Nicolaou, K. Serraos, and G. Spiliopoulou, “Large Urban Developments as Non-Planning Products: Conflicts and Threats for Spatial Planning,” Urban Plan, vol. 4, no. 4, pp. 31–42, Nov. 2019, doi: 10.17645/up.v4i4.2266
65. T. S. Terkenli and V. Georgoula, “Tourism and Cultural Sustainability: Views and Prospects from Cyclades, Greece,” Sustainability, vol. 14, no. 1, p. 307, Dec. 2021, doi: 10.3390/su14010307
66. R. Krönert, M. Volk, and U. Steinhardt, “Introduction: Landscape balance and landscape assessment,” in Landscape Balance and Landscape Assessment, Berlin, Heidelberg: Springer Berlin Heidelberg, 2001, pp. 1–22. doi: 10.1007/978-3-662-04532-9_1
67. A. A. Lew, C. M. Hall, A. M. Williams, and T. S. Terkenli, “Landscapes of Tourism. The Place of Landscape in Tourism Geography: A Critical Assessment,” in The Wiley Blackwell Companion to Tourism, 2014
68. E. Asprogerakas and A. Tasopoulou, “Climate change and green networks. Spatial planning provisions at the Greek metropolitan areas,” IOP Conf Ser Earth Environ Sci, vol. 899, no. 1, p. 012053, Nov. 2021, doi: 10.1088/1755-1315/899/1/012053
69. M. Lazoglou, “Strengthening the Resilience of Coastal Cities against Climate Change through Spatial Planning: Evidence from Greece,” Current Urban Studies, vol. 10, no. 04, pp. 639–654, 2022, doi: 10.4236/cus.2022.104038

# Spatial Planning and Tourism Development of Serifos: Towards a Framework for Sustainable Development

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**Abstract.** This study investigates the complex interplay between tourism development and spatial planning on Serifos, a Cycladic island undergoing rapid transformation under seasonal visitor pressure. Drawing from the principles of sustainable development, the paper presents an integrated analytical approach combining geospatial diagnostics, empirical indicators, and policy evaluation. Using building footprint data and short-term rental distributions, the analysis identifies spatial stress zones, development conflicts, and regulatory gaps, especially in non-designated urban areas and protected environmental zones. The findings demonstrate that over 50% of the built surface lies outside statutory boundaries, exacerbating infrastructure strain and landscape fragmentation. A composite zoning strategy and thematic interventions are proposed, culminating in a spatial framework aligned with the island's ecological thresholds and cultural assets. The paper concludes with legal recommendations and a proposal for establishing a permanent monitoring mechanism (DMMO) to ensure adaptive and participatory governance.

**Keywords:** Spatial Planning, Tourism, Building, Small islands, Sustainable development

## 1 Introduction

Tourism is widely acknowledged as a cornerstone of Greece's macro-economic performance and a principal catalyst of regional development, especially in island territories endowed with pronounced geomorphology and a layered cultural palimpsest such as the Cyclades. Over the last two decades the national strategy has, either tacitly or explicitly, prioritised visitor-led growth as a vehicle for job creation and infrastructural modernisation. Yet the very landscapes that attract visitors are also among the most ecologically fragile and socially complex.

Serifos epitomises this tension. The island's dramatic relief, semi-arid ecosystems and distinctive industrial-heritage landscape have propelled it into the international tourism gaze, leading to a steep rise in arrivals each summer. Notwithstanding the

attendant economic dividends, the accelerated transformation of land, water and socio-ocultural practices risks eroding the very qualities that constitute Serifos's comparative advantage. Unplanned tourism can push local ecosystems towards tipping points, inflate land rents, destabilise demographic structures and displace traditional livelihoods.

Against this backdrop, this paperdeliberately places sustainable development -understood as the indivisible triad of environmental stewardship, social justice and economic viability- at the analytical centre. Drawing on the Brundtland Commission's emphasis on inter-generational equity and subsequent elaborations within the Sustainable Development Goals (SDGs), the paper adopts the normative stance that development trajectories in small-island contexts must be evaluated not only in terms of contemporaneous gains but also through the lens of their legacy for future residents and visitors. The island's natural capital and cultural assets are treated as non-substitutable commons held in trust for succeeding generations.

The study pursues three interrelated objectives-. First, it synthesises the theoretical and institutional underpinnings of sustainability oriented spatial planning in Greece, with a view to identifying- levers that can translate abstract principles into enforceable policy instruments. Second, it operationalises a suite of quantitative and qualitative indicators designed to reveal Serifos's developmental thresholds across critical sectors -energy, water, waste, mobility, landscape integrity and community acceptance-thereby providing an empirical basis for anticipatory governance. Third, it formulates a portfolio of strategic interventions that collectively sketch a resilient 2030 horizon: a vision in which the island retains its traditional character and unspoilt landscape while cultivating gradually a year-round tourism economy capable of distributing benefits broadly and fairly among residents.

Serifos is not simply a case study; it is a test bed for policy innovation. Its limited capacity concerning frastructure, pronounced seasonality and heterogeneous settlement pattern render it acutely sensitive to incremental shocks, making the cost of inaction disproportionately high. At the same time, its manageable scale and strong place identity furnish fertile conditions for participatory planning experiments that can be monitored, evaluated and subsequently transplanted to other Aegean islands.

By interweaving normative commitments with empirically grounded diagnostics, the study aspires to offer a replicable template for place-based planning that privileges inter-generational justice in tourism-dependent economies.

The article proceeds as follows. Section 2 develops the theoretical and institutional foundations of carrying capacity within the framework of sustainable development, while examining its legal codification and planning deficits in the Greek context. Section 3 outlines the methodology, detailing the geospatial indicators, datasets, and analytical models employed for diagnosing tourism-induced spatial pressures on Serifos. Section 4 presents the empirical findings, identifying stress zones, regulatory mismatches, and development conflicts across protected and urban areas. Section 5 articulates a strategic vision for the island's spatial development, proposing zoning strategies, thematic interventions, and institutional mechanisms aligned with sustainability objectives. The final section synthesises key insights and formulates policy recommendations at three levels: operational governance, spatial planning for small islands, and

long-term monitoring through a dedicated Destination Management and Monitoring Organisation (DMMO).

## 2 Theoretical Framework

### 2.1 Reframing Carrying Capacity within the Paradigm of Sustainable Development

The concept of carrying capacity (CC) has emerged as a foundational instrument for evaluating a destination's resilience to tourism-induced stress. As articulated by Coccossis [1] CC represents the highest level of tourism activity that can be accommodated without compromising the natural, social or economic substrate of an area. In the case of the Greek islands-characterised by acute seasonality, geomorphological fragility and pronounced institutional asymmetries in spatial planning-CC assumes particular analytical and policy relevance.

CC is typically disaggregated into four interlocking dimensions: physical, social, economic and perceptual [1,2,3]. Contemporary scholarship operationalises these dimensions through multi-criteria decision analysis (MCDA), spatial models embedded in Geographic Information Systems (GIS) and composite indicators such as the Carrying Capacity Development Index [4] and the Social-Ecological System Carrying Capacity (SES-CC) framework [5].

The concept continues to evolve through state-of-the-art applications that integrate GIS, ontological frameworks and decision-support systems to assess land suitability for complex tourism uses [6]. Methodological innovations employing Geographically Weighted Regression (GWR) have further elucidated the spatial heterogeneity of CC [7]. In parallel, evidence increasingly highlights the critical role of Destination Management and Marketing Organisations (DMMOs) and the institutionalisation of locally grounded coordination mechanisms in facilitating a transition towards more resilient tourism models [8].

Collectively, these advances underscore that carrying capacity is not a static threshold but a dynamic, context-responsive construct—one that must be continually re-calibrated to support the overarching goal of sustainable, inter-generationally equitable development.

Recent scholarship further problematises the notion of a single, optimum threshold and instead advocates for adaptive CC-a moving envelope adjusted through iterative monitoring and stakeholder deliberation [9,10]. This perspective aligns CC with complementary paradigms such as Limits of Acceptable Change (LAC) and the Tourism Area Life Cycle (TALC), thereby embedding it within a broader repertoire of sustainability-assessment tools.

Technological advances since 2022 have markedly enhanced the granularity and temporal resolution of CC diagnostics. High-frequency data streams from mobile-phone location services, atmospheric sensors and remote-sensing platforms are now integrated via machine-learning algorithms to generate near real-time pressure indices [11].

Climate change adds an additional layer of complexity by altering baseline resource conditions-especially freshwater availability and energy reliability-upon which CC computations rest [12]. In arid Cycladic islands, for instance, diminishing aquifer recharge rates necessitate more conservative water-based CC thresholds, underscoring the need for scenario-based planning that couples hydrological projections with tourism-demand forecasts.

Finally, a growing body of evidence highlights the efficacy of participatory governance in recalibrating CC to local values and aspirations. Co-design workshops involving residents, businesses and municipal authorities in Naxos and Paros have resulted in jointly agreed sustainability indicators and a shared monitoring platform [13]. Such inclusive processes not only enhance the legitimacy of planning decisions but also foster a collective stewardship ethos, thereby reinforcing the social dimension of carrying capacity.

### 2.2 The Greek Experience: Jurisprudence, Planning Deficits and Operational Practice

At the national level, the Hellenic Council of State (CoS) has repeatedly underscored the constitutional obligation to respect carrying capacity as an integral facet of environmental protection [14,15]. In its settled interpretation of Article 24 of the Constitution, the CoS calls for stringent scrutiny of development activity against CC thresholds, particularly in land- and seascapes designated under the Natura 2000 network or already heavily saturated by tourism.

Yet operational performance remains weak Tsilimigkas et al. [16] document the chronic failure to apply supporting indicators, while Gourgiotis et al. [17] highlight a fragmented allocation of competences that privileges investment logics over sustainability objectives, perpetuating the long-standing disconnect between spatial planning and tourism policy. Kiousis & Papadopoulou [18] further observe that fast-track investment schemes frequently outpace plan-making procedures, reinforcing a culture of 'permissive exceptionality'.

Empirical reviews since 2022 bring three structural deficiencies into sharp relief:

- **Governance fragmentation** between central and local tiers inhibits integrated decision-making and blunts accountability chains [19]
- **Enforcement deficits** vitiate the deterrent effect of statutory limits; sanctions for CC breaches remain rare and largely symbolic
- **Absence of mandatory CC assessments** in statutory planning instruments: Environmental Impact Assessments (EIAs) occasionally reference CC metrics, yet these are neither standardised nor binding, limiting their regulatory bite

A potential inflection point is the ongoing spatial-planning overhaul launched under the "Konstantinos Doxiadis" programme. For the first time, the under development Local Spatial Plans (LSPs) and Special Spatial Plans (SSPs) mandate the preparation of a Carrying Capacity Assessment Report for every delineated planning unit. Early pilot studies in the South Aegean reveal that embedding CC thresholds within zoning ordinances can dampen speculative land-value spirals and facilitate phased infrastructure upgrades [20].

Nevertheless, the translation of procedural advances into substantive outcomes hinges on three enabling conditions: (i) detailed methodological guidelines, (ii) targeted capacity-building at municipal level and (iii) a transparent, digital monitoring architecture that links CC indicators directly to permitting decisions. Absent these safeguards, there is a clear risk that CC assessments will devolve into formalistic appendices lacking regulatory traction.

Greece's trajectory evidences a gradual-though uneven-transition from rhetorical acknowledgement of carrying capacity towards its procedural institutionalisation. The critical tests ahead concern the standardisation of metrics, the resourcing of municipal enforcement capacities and the embedding of CC into fiscal and investment conditionalities.In summary, while the Greek jurisprudential framework robustly acknowledges the principle of CC, persistent planning gaps and implementation deficits hamper its effective deployment as a sustainability lever in tourism-intensive island regions.

### 2.3 Tourism Carrying Capacity and the Built Environment

Applied studies in Sifnos, Amorgos and Santorini illustrate how CC can be spatially operationalised [21,22,23]. In Santorini, institutional gaps in parking, water, sewerage and building control critically erode resilience; Athens-municipality research [24] links the boom in Short-Term Rentals (STRs) to urban congestion. A spatial impact-and-resilience index [25] recommends integrating STR data into statutory plans, yet no pilot indicators have been codified so far.

STR proliferation poses an acute CC challenge. Kardoulia [26] shows that Airbnb growth distorts property markets and strains infrastructure; fiscal laws (4446/2016, 4472/2017) tackled taxation but not spatial limits, allowing clustering and legal grey zones. European literature confirms STRs as accelerants of overtourism [27]; Koliotasi et al. [28] link waste-management deficits to image degradation; Di Feliciantonio et al. [28] trace social polarisation under tourism pressure. Papageorgiou [13] calls for adaptive-capacity design tools.

Spatial regression by Iliopoulou et al. [7] finds STR prices in Athens driven by location, host profile and infrastructure, with rising rents displacing vulnerable groups-patterns echoed in Thessaloniki [30].

Building-height exemptions under Law 4838/2021 intensify skyline congestion, eroding experiential value [31]. Conversely, GIS-guided infill on Syros cuts landscape fragmentation by 23% while absorbing forecast demand [32].

Digitally enabled governance is emerging: the Smart Aegean Planner (live since 2024) overlays real-time utility consumption with permit data, flagging applications that would push a micro-zone beyond 90% of weekly CC. Initial results show a 12% drop in ad-hoc variances and a 17% faster permit turnaround [33].

Taken together, STR impacts and built-form pressures call for geo-spatial regulatory instruments, participatory design and legally embedded CC thresholds. Proposals span geofenced permit caps and infrastructure levies earmarked for capacity upgrades [34].

# 3 Case study area

## 3.1 Serifos: Contextual Rationale

The selection of Serifos as the locus for assessing the adequacy of the existing spatial-planning regime rests on a combination of comparative advantages and multi-layered challenges. These challenges stem from insularity, environmental sensitivity, pronounced seasonality in tourism demand and the limited ability of the current institutional framework to embed binding sustainability tools.

Serifos presents a distinctive ensemble of natural, cultural and settlement assets that confer high aesthetic and symbolic value-attributes that make the island particularly attractive for tourism exploitation while simultaneously rendering it prone to overload. Administratively, the island forms a single municipality within the South Aegean Region and covers c. 75 km².

According to the 2021 census, its permanent population stands at 1.241 residents-an 8.1% decline from 2011-yet the island receives an estimated 110.000 visitor-nights between June and September, implying a peak-season population multiplier of ~6.5. Such seasonality amplifies pressure on finite resources, notably potable water, which is procured through a hybrid system of limited well abstraction and reverse-osmosis desalination. Desalination already accounts for 62% of summer demand, raising both fiscal costs and carbon intensity.

The island has been designated a Landscape of Outstanding Natural Beauty and hosts Natura 2000 sites, subjecting new development to strict control.

Tourist activity is spatially diffuse, avoiding excessive concentration in the main settlements of Livadi and Chora. Livadi's port-hinterland and the Chora–Koutalas axis are exceedance zones, guiding priority interventions.

Diffusion helps to relieve pressure on settlement cores yet, in the absence of a functional management framework, it fragments the landscape and complicates service provision. Tourism demand has also shifted land-use patterns, with holiday homes and short-term rentals proliferating in peripheral locations, thereby amplifying infrastructure stress and environmental pressures.

**Spatial planning and Governance.** The island falls under the multi-layered Greek planning hierarchy. Key instruments include:

- **Special Spatial Framework for Tourism** (SSF-Tourism)-currently under development. The draft SSF-Tourism divides the national territory into three qualitative land-allocation categories (Zones A, B, C). Serifos is placed in **Zone B**, labelled a *developing island municipal unit*. This second-tier designation—below "developed" areas and above "areas to be encouraged"—applies to islands with a sizeable yet not saturated visitor economy; any further expansion is permissible only if stringent sustainability safeguards are met. For Zone B islands the draft SSF-Tourism stipulates:
  - **High-quality accommodation only.** New tourist construction is limited to 3-, 4- and 5-star establishments, with minimum plot sizes set regionally

  - **Mandatory carrying-capacity proof.** A Tourism Carrying-Capacity Assessment (TCCA) must accompany every major planning instrument (Local or Special Spatial Plan, organised reception area, large resort) before approval
  - **Control of short-term rentals.** Municipalities may impose an upper limit on short-term-rental beds, expressed as a percentage of total capacity, where crowding can be evidenced
  - **Heritage-compatible and soft tourism.** Regeneration of traditional or listed buildings and low-impact products (hiking, geo-tourism, mining-heritage trails) receive priority
  - **Performance-linked incentives.** Grants or tax relief for off-grid energy, water efficiency and circular-waste systems are conditional on full compliance with the island's carrying-capacity thresholds

- **Regional Spatial Plan of the South Aegean (RSP–SA, 2022).** The 2022 revision of the RSP–SA classifies Serifos as a *Type II small-island destination*—an island of moderate visitor volume and heightened landscape sensitivity. The Plan accords priority to "mild, spatially dispersed tourism" that capitalises on cultural heritage and low-impact outdoor activities. To this end, it advocates graduated density ceilings, whereby permissible plot coverage and building height diminish progressively with distance from settlement cores, and identifies the historic mining corridor from Megalo Livadi to Koutalas as a flagship cultural itinerary eligible for EU funding. These provisions, however, are advisory rather than prescriptive; their transposition into local zoning instruments remains optional, and systematic monitoring mechanisms have yet to be established at municipal level.
- **Sustainable Urban Mobility Plan (SUMP, 2021).** The SUMP, endorsed by the Municipal Council in 2021, outlines a ten-year mobility strategy centred on a 5.6 km electrified minibus loop linking the port of Livadi with Chora, the Koutalas junction and principal beaches. Complementary measures include the complete pedestrianisation of the upper nucleus of Chora (with time-restricted service deliveries), the installation of 120 e-bike docking stations and the introduction of an on-demand water-taxi service to peripheral coves. Scenario modelling indicates potential reductions of 18 % in summer automobile entries to Livadi and 22% in road-traffic $CO_2$ emissions by 2031. Notwithstanding these projected benefits, implementation is contingent upon securing approximately €4.8 million in capital expenditure and upgrading the local electricity grid to accommodate vehicle-charging infrastructure—both prerequisites currently unfunded.
- **Regional Climate-Adaptation Plan (PESPKA, 2019–2027).** The PESPKA designates Serifos as **Drought-Risk Class A3**, the highest regional category. It prescribes a 15% reduction in potable-water demand by 2027 through leak-loss mitigation, smart metering and tiered pricing, and sets a renewable-energy target of 3 MWp of rooftop photovoltaics—equivalent to approximately 40% of peak summer electricity load. Additional actions include rehabilitating nineteen traditional cisterns and piloting grey-water reuse schemes in two hotel complexes. Progress remains uneven: only 17% of ageing water mains have been replaced since the 2022 leakage audit; photovoltaic deployment is stalled at 0.6 MWp owing to grid-

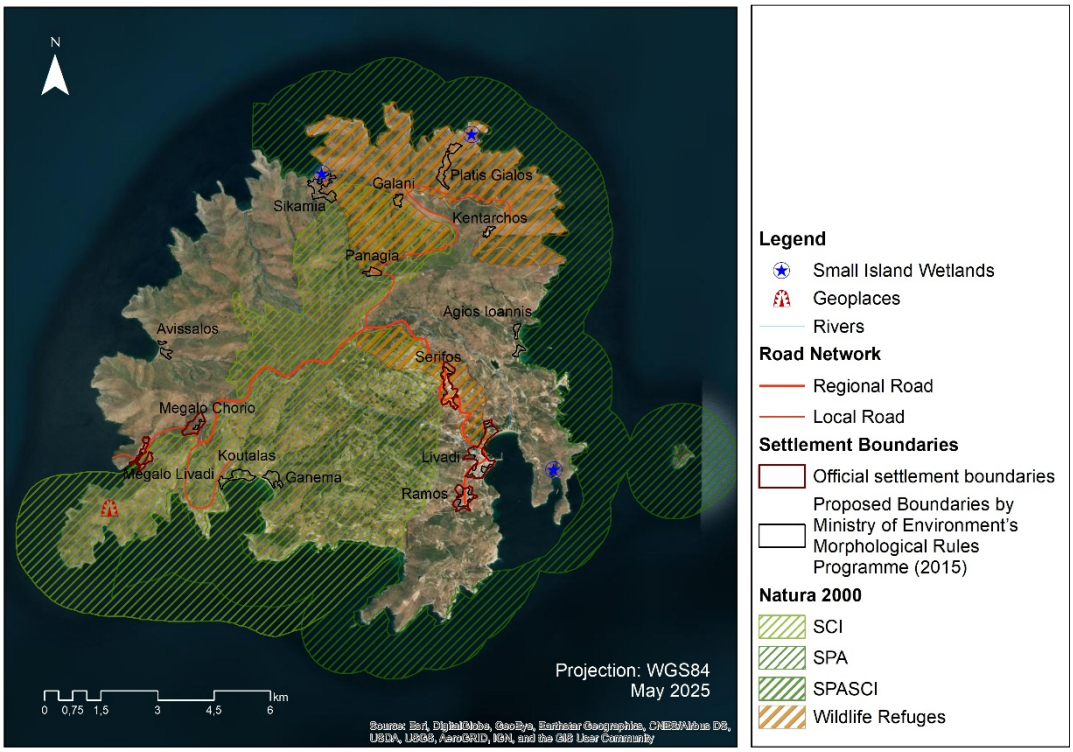
congestion curtailment orders; and the cistern-restoration programme awaits heritage-conservation approval and dedicated financing.

- **Integrative assessment.** Collectively, these instruments furnish an ostensibly coherent strategic framework-spatial vision (RSP–SA), modal-shift agenda (SUMP) and resource-resilience pathway (PESPKA). Their practical efficacy, however, is circumscribed by the absence of binding performance indicators and secure funding streams. Embedding enforceable targets from all three plans within the forthcoming LSP, and linking project approvals to a rigorous TCCA, will be indispensable to translating strategic intent into verifiable sustainability outcomes for Serifos.
- Administrative capacity is constrained not only by limited human resources but also by deeper structural dysfunctions in the governance system. The enforcement of building regulations and STR licensing depends on an under-resourced Single Property Authority office based on the neighbouring island of Milos. These deficiencies reflect broader administrative pathologies, including fragmented responsibilities, inconsistent inter-agency coordination, and limited monitoring capability, all of which hinder the effective implementation and adaptive revision of spatial plans.

**Natural and Environmental Baseline**

- **Land-use mosaic**: Only 1.4% of the island ($\approx$1.05 km²) is formally urbanised; dryland pasture occupies 57%, maquis shrubland 21%, and fallow terrace agriculture 11%. Two discrete Natura 2000 sites (GR4220009, GR4220029) envelope 38% of the landmass.
- **Topography**: Relief ranges from sea level to 585m at Mt. Troulos; slopes >25% cover 41% of the territory, complicating infrastructural expansion and heightening erosion risk under extreme-rainfall events.
- **Heritage fabric**: The island hosts 117 listed vernacular structures and an extensive mining-heritage ensemble (late-19th-century loading bridge, adits and inclined planes), designated as a Monument Complex of National Significance.

**Fig. 1.** Environmental and Cultural Baseline Map of Serifos




A comparison between observed peak-day values and the sustainable thresholds reveals a mixed resilience profile for Serifos. Potable-water demand reached 1.620 $m^3$ $day^{-1}$, or 93% of the island's safe-yield limit (1.750 $m^3$ $day^{-1}$). Although the system did not breach its threshold, the narrow margin underscores the island's vulnerability to inter-annual drought variability and to even modest increments in visitor numbers. Priority should therefore be accorded to demand-side management—smart metering, tiered tariffs and accelerated leak-loss reduction-coupled with supply diversification beyond reverse-osmosis desalination, which is both capital- and carbon-intensive.

The electricity network exhibited a similarly tight buffer, with the peak load of 6.9 MW utilising 92% of the installed capacity (7.5 MW). Projected uptake of electric mobility and air-conditioning suggests that without grid reinforcement or rapid deployment of distributed photovoltaics plus storage, the system could be forced into load-shedding during forthcoming peak seasons. In contrast, two indicators already exceed their design thresholds. Solid-waste generation stood at 48 $t.week^{-1}$, surpassing the engineered landfill capacity (40 $t\ week^{-1}$) by 20%; continued overshoot will compress the facility's lifespan and heighten contamination risk. Likewise, daily vehicular arrivals at the port (790 entries) exceeded the functional limit of 650 vehicles by 22%, contributing to congestion, emissions and queuing at the waterfront interface.

The most pronounced over-capacity relates to cruise tourism: 1.150 passengers were disembarked on the reference day, 28 % above the quay-throughput threshold of 900 passengers. This episodic influx overwhelms public spaces and surface-transport links, eroding visitor experience and resident well-being. Temporal staggering of berthing slots and a congestion-indexed port fee would internalise these externalities while preserving high-value calls.

In synthesis, three of the five indicators-solid waste, vehicular inflow and cruise arrivals-already breach sustainable limits, while the remaining two (water and electricity) operate within precariously narrow safety margins. The findings validate the TCCA's function as an early-warning system and justify embedding its quantitative triggers into the forthcoming LSP. A dual strategy is required: (i) technical interventions-circular-waste infrastructure, smart-mobility deployment, decentralised renewables and water-efficiency retrofits-and (ii) regulatory measures-upper caps on cruise berths and short-term rentals, dynamic road-pricing and conditional project approvals linked to real-time capacity dashboards. Only through this integrative approach can Serifos avoid a trajectory toward structural over-saturation and secure a resilient, inter-generationally equitable tourism economy.

**Strategic Relevance.** Serifos should be regarded not merely as a case study but as a laboratory for policy innovation. Its constrained infrastructure, pronounced seasonality, and fragmented settlement structure heighten its vulnerability to incremental shocks, thereby magnifying the consequences of inaction. Simultaneously, the island's manageable scale and robust sense of place offer an advantageous setting for participatory planning interventions whose outcomes can be systematically monitored, evaluated, and subsequently transferred to other islands in the Aegean.

### 3.2 Tools, Indicators and Analytical Models

The analytical framework employed in this study integrates spatial indicators, geospatial diagnostics, and decision-support methodologies to assess tourism-induced pressures and guide sustainable spatial planning on Serifos. Central to this approach was the spatial analysis of built form and short-term accommodation patterns, using a combination of validated spatial datasets and GIS-based techniques.

Building footprint data were sourced from Microsoft's **Global ML Building Footprints** dataset (https://github.com/microsoft/GlobalMLBuildingFootprints), which provides polygon vector data of global coverage derived from the processing of high-resolution satellite imagery (2014) through machine learning and deep neural networks. The dataset exhibits high positional and thematic accuracy, with European validation reporting 94.3% positional accuracy, 85.9% information retrieval, 65.1% precision in footprint overlap, a polygon rotation error of 10.28 degrees, and a 1.4% misclassification rate based on a 5,000-building sample.

To improve spatial reliability, the footprint geometries were cross-validated using ESRI basemaps and Google Earth Pro. Built-up areas were then calculated separately for land parcels located within and beyond the statutory boundaries of settlements. However, given that only five settlements on Serifos possess formally established urban limits, the analysis adopted the **morphological boundaries** defined by the Ministry of

Environment's Morphological Rules Programme, specifically from the regional unit study of the Cyclades. GIS-based delineation employed the "Select by Location" function with the "Intersect" criterion, meaning any building partially or fully intersecting the designated morphological boundary was classified as falling within the effective settlement area.

This spatial disaggregation enabled precise quantification of the built environment both inside and outside the urban planning framework, offering a basis for analysing urban sprawl, development pressure, and exposure to infrastructure limitations.

In parallel, tourism-specific spatial diagnostics were carried out using **STR** data. Listings were manually extracted from the Airbnb platform for the South Aegean region, filtered for relevance, and geocoded into a point dataset. To model the spatial intensity of tourism pressure, **Kernel Density Estimation (KDE)** was applied. KDE is a non-parametric interpolation method that estimates the density of point-based phenomena over a continuous surface, generating higher values at the location of the points and gradually decreasing with distance. It is widely used in spatial planning and tourism studies to visualise hotspots and clustering patterns [35,36].

In this study, KDE was implemented both for Airbnb listings and the total building footprint dataset, producing high-resolution raster surfaces that reveal patterns of tourism concentration, built density, and spatial fragmentation. These diagnostic layers contributed to identifying pressure zones, sprawl trajectories, and candidate areas for policy intervention.

### 3.3 Use of Geospatial Data and Decision Support

Geospatial data constituted the empirical foundation of this study's CC framework and scenario modelling. All spatial layers-ranging from cadastral boundaries and topography to utility networks and STR points-were harmonised within a geodatabase. This allowed for consistent geoprocessing and integration of environmental, infrastructural, and socio-economic variables.

Key spatial analysis and decision-support techniques employed include:

- **Overlay and proximity analysis**, to assess interaction between tourism infrastructure and environmentally sensitive zones;
- **Zonal statistics**, to compute infrastructure pressure indices by administrative or ecological unit;

A core focus of the spatial analysis was the **visualisation of spatial mismatch** between the official urban structure and actual development trends. Building footprints-previously validated and quantified-were spatially cross-referenced against both the official urban boundaries and the **"real" settlement extents** delineated by the Ministry of Environment's Morphological Rules Programme. This overlay revealed that a **slight majority (≈53%) of the building stock lies outside statutory limits**, providing visual confirmation of diffuse urbanisation and regulatory leakage.

Outputs were compiled into a spatial dashboard format to support scenario-based planning, enabling local authorities to simulate the cumulative impact of land use changes and to link permitting thresholds with carrying capacity exceedances. However, geospatial reliability is partly constrained by the STR dataset: listings from Airbnb

are often geolocated to approximate positions rather than actual property coordinates, especially in small-island contexts where address standardisation is weak.

### 3.4 Limitations and Assumptions

The study is subject to several limitations that may influence the interpretation and replicability of results:

**(a) Building data and temporal lag**

Footprint data are based on satellite imagery from circa 2014–2017. While cross-validated against more recent basemaps, newer developments may be undercounted, particularly outside settlement cores.

**(b) Non-statutory settlement boundaries**

Only five settlements in Serifos have official urban boundaries. The use of morphological boundaries from the Ministry of Environment's typological study, although spatially accurate, lacks regulatory status, limiting enforceability in land-use planning.

**(c) STR data reliability**

Short-term rental data were manually extracted from the Airbnb platform for the South Aegean region. This approach introduces two key limitations:

- Listings are often pinned to **approximate or anonymised map locations**, which reduces geolocation precision and may distort KDE outputs;
- The dataset reflects a **single temporal snapshot** (2024 high season), precluding longitudinal trend analysis or off-platform STR detection (e.g., Booking.com, private sites)

**(d) Threshold generalization**

CC thresholds are derived from standardised methodologies and infrastructure design limits, which do not fully account for future efficiency gains or behavioural adaptation.

**(e) Uniform KDE bandwidth**

KDE was performed with a consistent spatial bandwidth. This generalisation may obscure intra-island differences in topography, accessibility, or settlement morphology that influence development pressure.

**(f) Institutional limitations**

Scenario simulations and policy recommendations assume a minimum level of municipal enforcement capacity, which is not currently met on Serifos. This gap may hinder the operationalisation of regulatory proposals, including STR limits or smart permitting frameworks.

In sum, while the applied methodology offers a detailed spatial diagnostic of tourism intensity and resource pressure, results must be interpreted as indicative rather than definitive. The framework is intended as a decision-support tool to inform iterative

planning processes and adaptive governance, rather than as a static zoning or threshold-setting mechanism.

# 4 Findings and Empirical Analysis

## 4.1 Spatial Patterns and Stress Zones

**Spatial Patterns of Settlement Intensity and STRs.** Analysis of the built-up surface confirms a pronounced development pressure in non-designated zones, with approximately 53% of total building footprint located outside the statutory urban boundaries. This spatial dispersion-illustrated in **Figure 2** - reflects a persistent trend of informal expansion facilitated by the absence of binding perimeter controls in most settlements on Serifos.

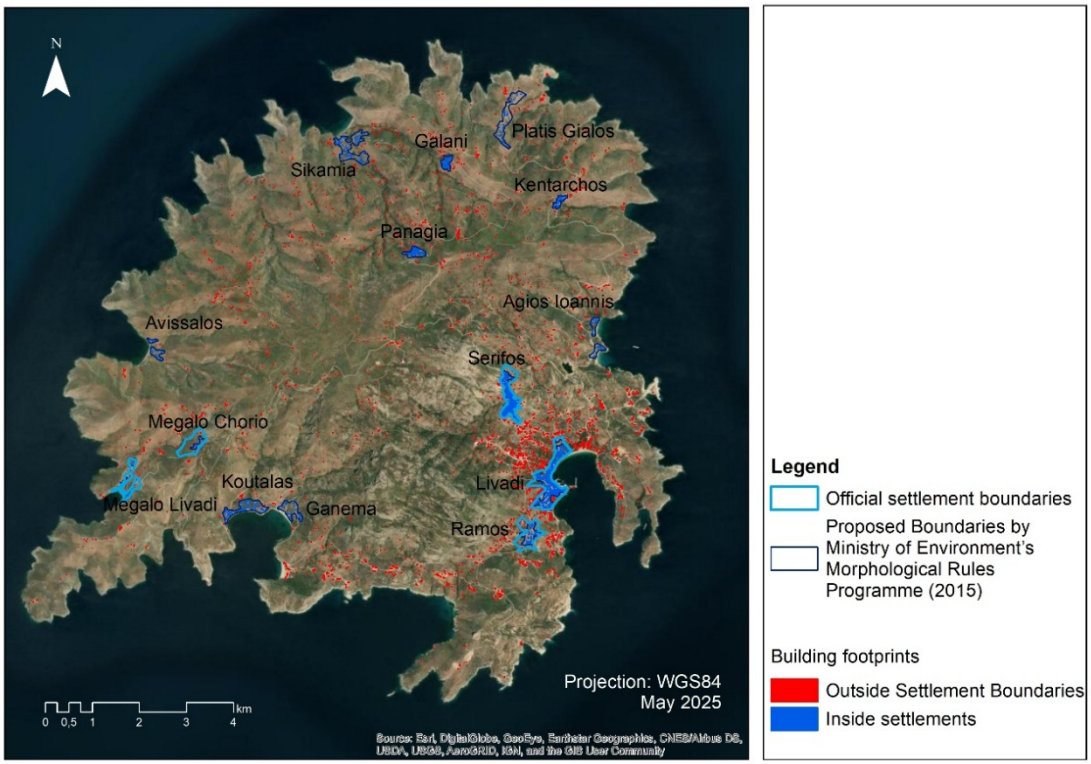



**Fig. 2.** Built-up Area Inside and Outside Settlements

Kernel density analysis (Figure 3) reveals spatial clustering in and around key settlements, including Chora, Livadi, and Ramos, but also identifies emerging high-density zones in the south and southeast of the island. Particularly concerning is the linear development along the Chora–Livadi corridor, where construction intensity suggests a gradual merging of historically separate settlements. This trend of spatial contiguity may compromise zoning coherence and intensify pressure on shared infrastructure.

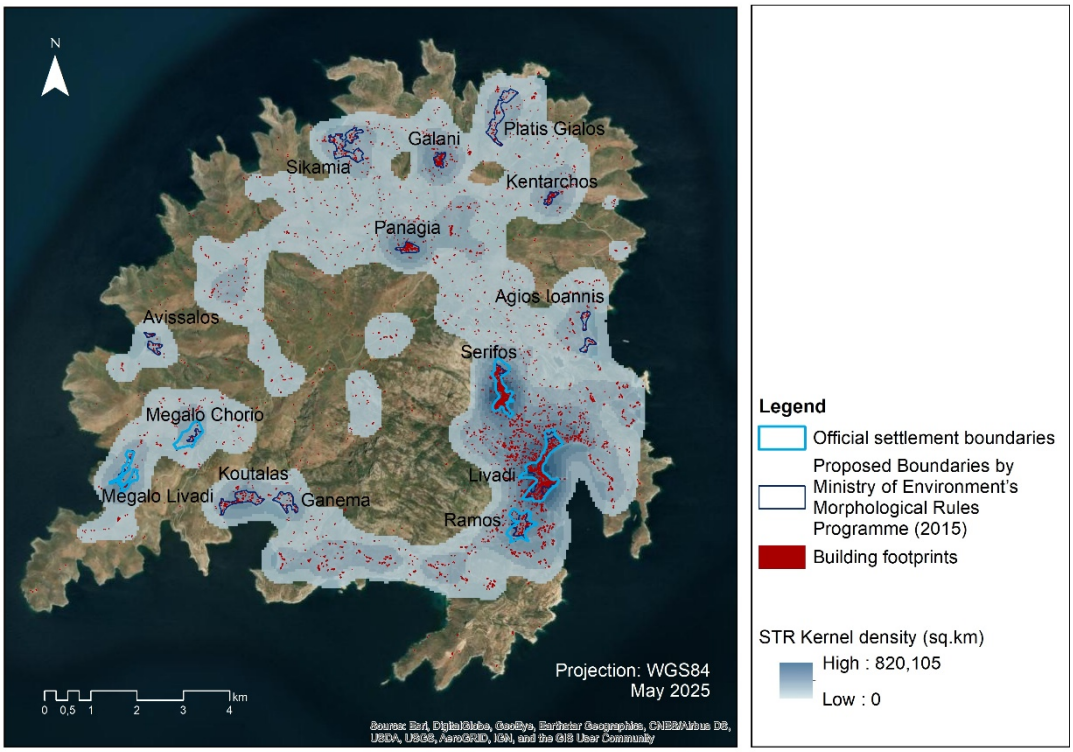



**Fig. 3.** Kernel Density of Building Footprints

The spatial footprint per resident further illustrates these dynamics. Settlements such as Gánema (1,168.79 m²/capita) and Koutalas (603.79 m²/capita) exhibit disproportionately high built-up areas relative to their population, indicative of low-density, high-impact development-likely driven by demand for second homes and STRs. By contrast, traditional upland villages such as Kéntarchos (78.20 m²/capita) and Megálon Choríon (130.79 m²/capita) maintain more compact, demographically consistent forms.

In proportional terms, the largest shares of the island's total constructed area are concentrated in Sérifos (28%), Livádi (21%), Galaní (16%), Panagía (15%), and Megálon Livádion (12%), as presented in Table 1. These percentages reflect both their demographic weight and their role as tourism-driven development nodes.

**Table 1.** Settlement Analysis Table

| | Pop 2011 | Pop 2021 | STRs | Buildings | area (sq.m) | built-up area (sq.m) | built-up area/ total area | Built-up area per capita (sq.m) |
|---|---|---|---|---|---|---|---|---|
| Serifos Municipality | 1414 | 1241 | | | 75207000 | 510463 | 1% | 411,33 |
| Serifos, Chora | 357 | 333 | 78 | 479 | 243499,03 | 67259,10 | 28% | 201,98 |
| Avyssalos | 24 | 15 | 0 | 28 | 61007,14 | 2575,58 | 4% | 171,71 |
| Agios Ioannis | 33 | 10 | 0 | 38 | 84623,89 | 4174,79 | 5% | 417,48 |
| Galani | 71 | 45 | 0 | 77 | 53972,34 | 8503,38 | 16% | 188,96 |
| Ganema | 13 | 4 | 2 | 44 | 116260,90 | 4675,17 | 4% | 1168,79 |
| Kentarchos | 46 | 58 | 2 | 44 | 41371,50 | 4535,57 | 11% | 78,20 |
| Koutalas | 23 | 17 | 0 | 88 | 172653,45 | 10264,40 | 6% | 603,79 |
| Livadi | 537 | 505 | 69 | 512 | 408825,40 | 87841,07 | 21% | 173,94 |
| Megalo Livadi | 52 | 45 | 4 | 74 | 75467,19 | 9198,14 | 12% | 204,40 |
| Megalo Chorio | 24 | 10 | 0 | 19 | 30069,55 | 1307,94 | 4% | 130,79 |
| Panagia | 102 | 69 | 6 | 89 | 69812,76 | 10422,93 | 15% | 151,06 |
| Platis Gialos | 29 | 26 | 1 | 49 | 204728,49 | 4802,10 | 2% | 184,70 |
| Ramos | 67 | 79 | 10 | 85 | 115455,02 | 13258,15 | 11% | 167,82 |
| Sykamia | 34 | 22 | 2 | 69 | 242273,75 | 8736,82 | 4% | 397,13 |

This spatial differentiation is further substantiated in **Table 1**, which compiles demographic, land use, and building stock metrics at the settlement level. The data reveal marked disparities in building density, total coverage, and STR intensity. For instance:

- **Ganema** exhibits the **highest built-up area per capita** (1,168.79 m²/resident), a figure significantly above the island-wide average, suggesting either sparse habitation or speculative second-home development
- **Koutalas** also demonstrates a disproportionately high land consumption rate per resident (603.79 m²), despite having minimal STR presence, reinforcing the trend of fragmented construction in low-density zones
- Conversely, compact traditional settlements like **Kentarhos** (78.20 m²/resident) and **Megalo Chorion** (130.79 m²/resident) maintain low per capita footprints, reflecting a more sustainable pattern
- **Chora, Livadi, and Galani** collectively account for over 65% of the island's total built surface, echoing their role as central hubs in the tourism and service economy

This granular data substantiates spatial inequalities in development intensity and demographic load, underscoring the need for differentiated planning responses across the island.

**STR Concentration.** STR activity-derived from geocoded listings scraped directly from the InsideAirbnb platform—is heavily concentrated in Chora, Livadi, and Ramos, as illustrated in **Figure 4**. KDE was used to smooth out discrete listing points and reveal underlying spatial patterns, with hotspot intensities peaking around the port area and peri-urban fringes.

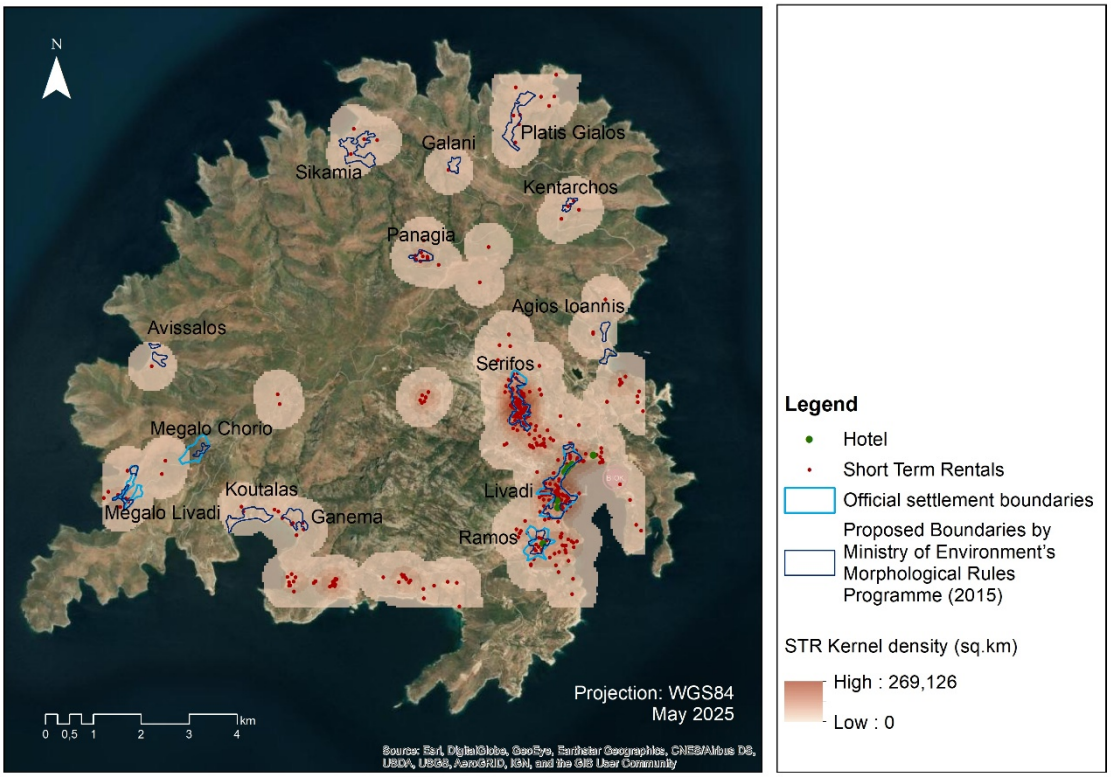



**Fig. 4.** STR Kernel Density and Settlement Distribution

It is important to note a limitation of the dataset: many listings lack precise geolocation, introducing an inherent positional uncertainty. Nonetheless, the aggregate distribution clearly indicates that the proliferation of STRs is not confined to traditional settlement cores, but rather extends into semi-rural zones and unregulated development areas.

This expansion of STRs exacerbates multiple sustainability concerns, including infrastructure overuse, land-use fragmentation, and weak fiscal oversight. In ecologically sensitive zones, the spatial overlap between STR clusters and protected landscapes also poses risks to conservation goals. These pressures highlight the need for inclusion of STR density thresholds and permit caps in the LSP.

### 4.2 Development Conflicts in Protected Areas

Serifos hosts multiple protected zones, including three two Natura 2000 sites (GR4220009 and GR4220029) and extensive areas designated as Landscapes of Outstanding Natural Beauty (Government Gazette 1176/B/2000). Overlay analysis between development patterns and these zones indicates that while formal construction remains limited within strictly protected perimeters, fringe development is encroaching upon buffer zones.

The most sensitive interfaces include:

- The hinterlands surrounding Koutalás and Gánema, where proximity to mining heritage zones and biodiversity corridors raises conservation concerns
- Eastern slopes near Megalon Livadion, where isolated buildings approach the boundaries of Natura zones
- Cliffside zones east of Livadi, where topographic constraints, visual impact, and ecological fragmentation coincide

The current regulatory framework does not yet provide sufficient enforcement to prevent encroachment. Without stricter demarcation, monitoring, and permit-linked carrying capacity assessments, these peri-protected zones risk irreversible degradation.

## 5 Strategic Development Proposals for Serifos

This section articulates a coherent vision and a set of specialised strategic objectives for the long-term spatial development of Serifos. Building upon the analysis of current conditions and identified challenges, it proposes a series of institutionally grounded and operationally applicable interventions.

### 5.1 Vision

The Serifos of 2030 is envisioned as a model small island where tourism coexists harmoniously with the natural environment and the local community. It is a place that retains its traditional character and unspoiled beauty, while simultaneously offering high-quality experiences to visitors year-round and ensuring prosperity for its residents. At the core of this vision lies balanced development, environmental sustainability, social cohesion, and economic resilience.

### 5.2 Strategic Objectives

Achieving the above vision presupposes the formulation of a network of strategic objectives that embed the principles of sustainability, participation, and resilience.

The protection of the natural environment and the sustainable management of natural resources form the foundation of all development efforts. Preserving landscape integrity, enhancing biodiversity, and rationalising water and energy use require institutional safeguards for environmentally sensitive areas and the adoption of green technologies-especially in fragile insular ecosystems such as that of Serifos.

In parallel, the promotion of cultural heritage and local identity must contribute to the development of a high-quality and differentiated tourism product. Traditional

settlements, the island's industrial heritage (e.g. the historic mining infrastructure), and local cultural events can serve as key pillars for enhancing the authenticity of the visitor experience, while their conservation ensures the intergenerational transmission of cultural identity.

The upgrading of essential infrastructure and services is of critical importance for the well-being of both residents and visitors. Ensuring water sufficiency through desalination units, implementing effective solid waste management via new biological treatment facilities, and strengthening public transport and health services are pressing priorities to support sustainable tourism development.

The promotion of a polycentric spatial development model can enhance social cohesion and contribute to a more equitable distribution of the benefits of tourism. The development of agritourism in northern settlements and the positioning of Megalo Livadi as a historical and cultural hub are examples of decentralised strategies.

Extending the tourism season and relieving peak-period pressure requires the enrichment of the tourism offering through alternative forms of tourism, such as cultural, educational, and nature-based tourism. The creation of tailored experience packages for spring and autumn, collaboration with specialised tour operators, and thematic diversification enhance the island's resilience to seasonal fluctuations.

Finally, the establishment of a sustainability performance monitoring mechanism-using indicators such as water consumption per visitor or infrastructure load-is a key institutional tool for evidence-based decision-making. The adoption of a "smart threshold" policy would empower the Municipality to assess and, if necessary, limit further expansionary initiatives.

### 5.3 Spatial Zoning Strategy

The implementation of a holistic and functional zoning strategy can provide clear direction for spatial planning on the island and prevent the emergence of unregulated and unsustainable development. Serifos could be structured into distinct zoning categories, based on the particular characteristics and needs of each area.

In zones designated for residential and tourism development-primarily centred around Livadi and adjacent areas-priority should be given to planned urbanisation with explicit regulatory frameworks. This includes the delineation of street grids, provision of public spaces, and strict adherence to established building codes.

At the same time, areas such as Megalo Livadi, which possess significant historical and cultural value, should be classified as zones of special intervention. These zones would benefit from the implementation of integrated revitalisation plans that preserve existing building shells, highlight cultural heritage, and enable mixed-use development that supports low-impact tourism.

The northern and less developed parts of the island are particularly suitable for the promotion of agritourism and ecotourism activities. These areas could benefit from the cultivation of local products, the renovation of traditional homes, and the establishment of new small-scale productive enterprises.

By contrast, areas of high ecological value-particularly those included in the Natura 2000 network-should be placed under strict protection zones. These would involve a

total prohibition of new construction, while allowing for soft enhancement interventions such as ecological trails and designated nature observation points.

Special attention must also be given to the port area, which serves as the primary entry point to the island. Planning in this zone should focus on improving port functionality and safety, alongside the development of facilities for the mooring of small recreational vessels. These interventions would support the growth of low-impact maritime tourism, aligned with the island's broader sustainability objectives.

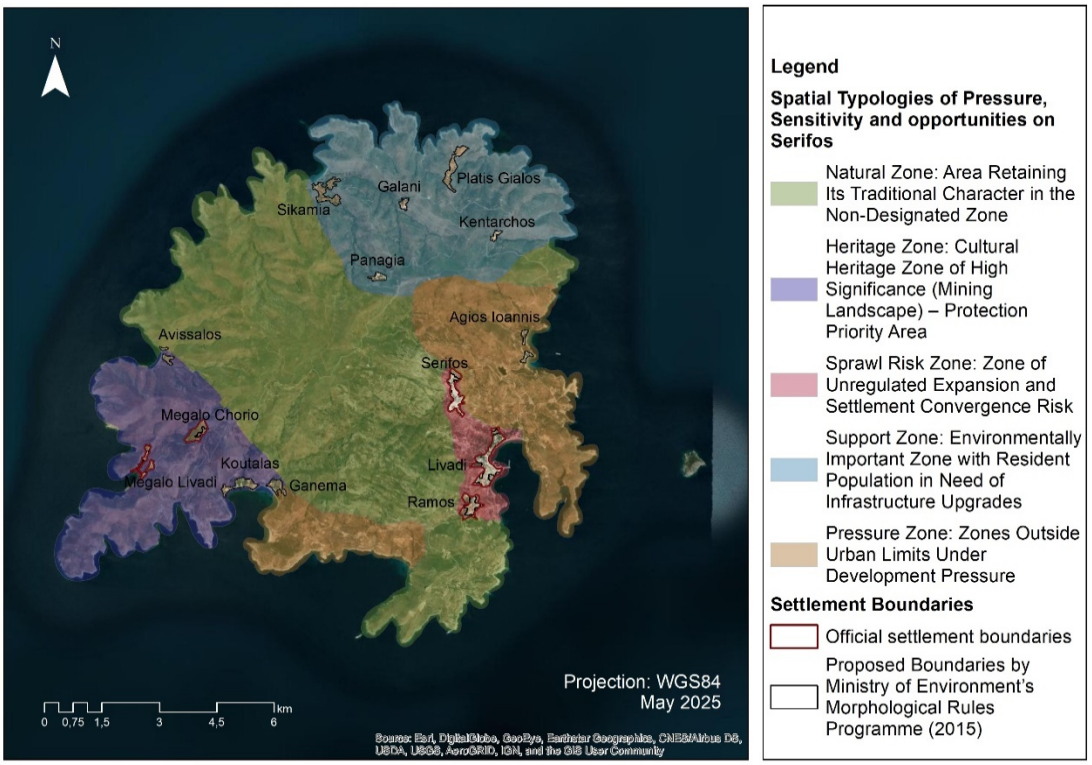



**Fig. 5.** Spatial Typologies of Planning Pressure and Sensitivity on Serifos

The composite map delineates five key spatial typologies relevant to land-use regulation, cultural protection, and infrastructure prioritisation.

**First**, it identifies **areas retaining their traditional character outside statutory urban boundaries**, where the landscape remains largely intact despite the absence of formal planning controls. These serve as benchmarks for visual identity preservation and minimal-impact development.

**Second**, it maps the **zone of special cultural protection** in **Megalo Livadi**, home to nationally significant mining heritage and industrial-era remnants.

**Third**, it highlights **non-designated areas under intense development pressure**, reflecting accelerated and often informal spatial expansion in need of regulatory intervention.

**Fourth**, it delineates a **zone of excessive sprawl and settlement convergence risk**, particularly between Chora and Livadi, where development threatens the functional distinction between settlements and strains shared infrastructure.

**Fifth**, it defines a **zone of ecological value and rural settlement support**, encompassing sparsely built areas with permanent residents and active agricultural production. These areas require coordinated investment in public infrastructure and offer high potential for soft tourism and sustainable livelihoods.

Collectively, these spatial typologies serve as a diagnostic framework for assigning functional zoning categories and regulatory designations in the forthcoming LSP for Serifos.

### 5.4 Thematic Interventions

Thematic interventions constitute a critical component of the island's development strategy, as they aim to enhance the functionality, aesthetics, and sustainability of the insular space. Urban design interventions are foremost among these, focusing on improving accessibility and circulation within traditional settlements. In Chora, it is proposed to establish a municipal parking facility on the settlement's periphery, combined with the introduction of a small-scale municipal vehicle transport system. In Livadi, pedestrianisation of part of the coastal zone and the development of a parking hub at the entrance to the settlement are expected to reduce strain on the residential fabric and enhance the visitor experience. Concurrently, the undergrounding of waste containers at central locations is anticipated to improve both the visual quality and sanitary condition of public space.

In terms of environmental infrastructure, priority should be given to energy-efficient desalination systems powered by renewable energy sources, the upgrading of the main wastewater treatment plant or the creation of decentralised systems for remote settlements, and the development of a local recycling network. The installation of smart water meters for high-consumption users will facilitate monitoring and control of use, thereby supporting resource conservation.

Diversification of the local economy is identified as a necessary strategic direction, involving the promotion of local products such as Serifos honey and aromatic herbs, the encouragement of start-up agricultural entrepreneurship, and the strengthening of small-scale fisheries. Visitor management also emerges as a critical challenge, which can be addressed through measures such as limiting the number of rental vehicles, promoting alternative transport modes like bicycles and electric vehicles, and introducing a municipal circular transit service during the tourism season. Furthermore, for sensitive or low-capacity attractions, the introduction of reservation systems or controlled entry schedules may be necessary to regulate visitation levels.

The implementation of these thematic interventions is intended to complement the spatial planning framework and enhance the internal coherence of the island's strategic development vision, ensuring Serifos's resilience to development pressures and the protection of its distinctive natural and cultural assets.

### 5.5 The Role of the Special Urban Plan (SUP)

The development policy of Serifos for the coming decades is expected to be shaped substantially by the forthcoming SUP, which must incorporate existing scientific studies and strategic datasets, including the findings of the present research. As part of the national spatial planning programme "Konstantinos Doxiadis," the SUP-alongside LUP-is tasked with formulating new regulatory frameworks for approximately 70% of the national territory. This effort aims to modernise land uses, construction parameters, and spatial functionality regulations.

Serifos is included in an integrated SUP that also covers four neighbouring islands (Milos, Kimolos, Sifnos, and Kythnos). Delays in the commissioning of this plan have already raised concern, as irreversible interventions-particularly in tourism development-are progressing in the interim, such as the widely criticised projects in Sarakiniko, Milos. It is therefore essential that the new SUP establishes, as a fundamental principle, the containment of unregulated tourism expansion, primarily through limiting bed capacity-especially in the form of short-term rentals and rented rooms operating under residential construction permits.

Priority should be given to permitting new accommodation capacity exclusively in professionally managed tourist establishments, particularly in mid- to high-quality categories such as hotels and upscale serviced apartments. Simultaneously, there is an urgent need to delineate and progressively discourage construction outside designated planning zones, as such activity contributes to residential sprawl and the proliferation of informal tourist accommodations.

An alternative strategy-focused on strengthening tourism activity outside the peak season-offers greater sustainability potential. Extending the season into the shoulder months of May, June, and September can be achieved through the targeted promotion of thematic tourism products, experiential offerings, and the enhancement of the island's cultural and natural identity. The use of digital tools, such as virtual tours, online experience bookings, and storytelling-based content dissemination, can enhance place branding and foster emotional connections with visitors.

Successful implementation of this strategy depends on achieving social consensus, ensuring active resident participation, and aligning infrastructure with development goals. Sustainability hinges on the adequacy of essential resources-water, waste management, infrastructure-and on institutional clarity in land-use regulation. A significant threat to this vision lies in large-scale strategic investments, which, through mechanisms of private urbanisation, risk generating new residential enclaves in environmentally vulnerable areas.

Given Serifos's designation as a Landscape of Outstanding Natural Beauty (Government Gazette 1176/B/2000) and its inclusion in two Natura 2000 sites (GR4220009 and GR4220029), the prevention of such scenarios is imperative. The new SUP must convert the above considerations into binding policy directions and channel development within existing settlements, in full respect of the island's natural and cultural heritage.

### 5.6 Development of Thematic Forms of Tourism

The promotion of thematic forms of tourism in Serifos can serve as a key lever for diversifying the local tourism offer and alleviating peak-season pressures. A first strategic direction is the development of geotourism, anchored in the island's mining history and distinctive geological formations. The area of Megalo Livadi, with its remnants of historical mining infrastructure and its unique geomorphological landscape, can be transformed into an open-air museum of geological heritage. The creation of thematic routes, the installation of appropriate interpretive signage, and the use of digital storytelling tools can enhance the appeal of the area for visitors with environmental and cultural interests.

**Agritourism and Ecotourism.** Despite the relatively modest scale of the island's primary sector, agritourism and ecotourism can serve as complementary pathways for sustainable tourism development. Organised visits to small-scale agricultural production units, along with the promotion of local products such as Serifos honey and aromatic herbs, may be combined with experiential activities including tastings and harvest participation. In environmentally protected or currently underutilised natural areas, low-impact ecotourism products can be developed-such as birdwatching, guided flora interpretation walks, and thematic trails led by specialists in botany and ecology.

**Wellness Tourism.** Wellness tourism represents another promising niche, centred on the thermal spring of Almyros, near Megalo Livadi. Although currently operating informally, this site could be upgraded through modest access improvements, interpretive infrastructure, and sustainable environmental management, establishing it as a destination for visitors seeking relaxation and well-being in an authentic natural setting. In addition, the favourable climatic conditions of spring and autumn support the development of wellness programmes and yoga retreats.

**Cultural Tourism.** Cultural tourism constitutes a central pillar for differentiation and strengthening of Serifos's tourism identity. The island is home to a significant architectural and monumental heritage, both in the historic core of Chora and in the post-industrial mining landscape of Megalo Livadi. In parallel, its intangible cultural heritage-including local festivities, traditional festivals, and customary practices-comprises a multidimensional cultural fabric capable of offering authentic and immersive experiences to visitors. The valorisation of these resources can be organised through thematic cultural itineraries, the creation of local museums and exhibition spaces, and the adoption of innovative digital storytelling technologies, such as augmented reality applications and interactive media. By enhancing the "tourist memory" and emotional engagement of the visitor, cultural tourism can contribute meaningfully to season extension, the reinforcement of local identity, and the advancement of a sustainable tourism model that prioritises authenticity over massification.

**Yachting.** Tourism via recreational vessels (yachting) represents a particularly favourable form of low-impact tourism for small-scale islands such as Serifos. The island's natural harbour at Livadi, as well as the presence of small, sheltered coves around the coastline, provide ideal conditions for the reception of sailing yachts and small craft. Upgrading port infrastructure, ensuring access to water, electricity, and basic services, and aligning with environmental safeguards (e.g. avoiding overconcentration) are

critical prerequisites for supporting this activity. Small-scale maritime tourism is associated with high per-capita expenditure, minimal environmental disturbance, and high flexibility for visitors—thereby enhancing the diversity and resilience of the island's tourism product.

# 6 Conclusions

This section synthesises the key findings of the study and formulates recommendations on three levels: institutional-operational insights, spatial planning directions for small island municipalities, and the establishment of a permanent monitoring mechanism to ensure implementation continuity and adaptive governance.

## 6.1 Institutional and Operational Conclusions

The empirical analysis of Serifos confirms the existence of critical mismatches between formal planning instruments and actual development dynamics. Despite the presence of strategic frameworks such as the RSP, the SUMP, and the PESPKA, the absence of enforceable metrics and local enforcement capacities undermines their effectiveness. Key takeaways include:

- The need to translate sustainability principles into binding land-use designations and enforceable carrying-capacity thresholds within LSPs
- Persistent regulatory leakage in non-designated areas highlights the urgency of reforming the statutory boundary system and establishing clear urban-rural delineations
- The proliferation of STRs and speculative housing in unregulated zones is symptomatic of the limited operational capacity of municipal services, particularly in monitoring and permitting
- Infrastructure deficits, especially in water, waste and mobility, act as systemic constraints on sustainable tourism and require not only capital investment but coordinated governance

## 6.2 Planning Proposals for Small Island Municipalities

Small island municipalities face unique spatial and demographic pressures. To achieve sustainable development in such contexts, the following planning principles are proposed:

- **Polycentric Development**: Promote development across multiple nodes rather than concentrating growth in a single urban centre. This reduces congestion, distributes economic benefits more equitably, and supports smaller settlements at risk of depopulation
- **Thematic Zoning**: Implement functional zoning that reflects environmental sensitivity, tourism intensity, and local livelihoods. For example, combining strict protection zones (e.g. Natura 2000) with rural development zones focused on agritourism or ecological restoration

- **Context-sensitive Infrastructure Planning**: Design infrastructure systems (e.g., transport, waste, water) to reflect topographic constraints, population seasonality, and climate vulnerabilities
- **Integrated Heritage Management**: Recognise built and intangible cultural heritage not only as conservation priorities but also as anchors for tourism differentiation and place-based identity

### 6.3 Proposal for a Permanent Monitoring Mechanism (DMMO)

To ensure continuity in planning implementation and responsiveness to emerging pressures, this study recommends the institutionalisation of a **Destination Management and Monitoring Organisation (DMMO)** at the municipal level. Its key functions would include:

- **Integrated Monitoring**: Consolidate data from water, energy, mobility, accommodation and waste sectors to track sustainability indicators and flag threshold breaches
- **Permitting Alignment**: Link construction and STR licensing decisions to real-time spatial diagnostics and carrying-capacity dashboards
- **Participatory Oversight**: Establish an advisory board with representatives from residents, businesses, technical experts, and civil society to foster transparency and legitimacy
- **Scenario Testing**: Use dynamic modelling tools to simulate the impact of new developments or policy changes on resource consumption and spatial configuration
- **Capacity Building**: Act as a knowledge hub for local officials, providing training and technical support in the use of spatial planning tools and sustainability metrics

The DMMO model represents a departure from reactive, project-based planning toward a system of continuous observation, participatory adaptation, and evidence-based decision-making. As such, it could serve as a prototype for other Cycladic islands facing similar pressures.

### 6.4 Strategic Vision Recap and Transferability

The strategic vision and proposals developed for Serifos are oriented toward establishing a resilient, inclusive, and territorially coherent model of insular tourism development. This vision is grounded in the principles of sustainability, cultural heritage preservation, infrastructural adequacy, and transparent, participatory governance. Its foundational pillars encompass a polycentric spatial structure that redistributes development beyond primary coastal nodes; a diversified thematic tourism portfolio that leverages local identity and environmental assets; strengthened basic services aligned with peak-season needs; and the institutionalisation of carrying-capacity thresholds to guide decision-making within ecologically and socially acceptable limits.

Although these strategies are derived from Serifos's unique geophysical, socio-economic, and regulatory characteristics, they are of broader relevance to other small island municipalities across the Aegean and Mediterranean. Such territories-often marked by

seasonal tourism dependency, insufficient urban planning tools, limited building-code enforcement, and unregulated expansion-face parallel dilemmas in managing tourism-induced spatial pressure. The Serifos framework, through its emphasis on functional zoning, development containment, tourism diversification, and community integration, offers a transferable model that can support the elaboration of effective LSPs and SUPs.

The planning challenges faced by Serifos are echoed in similarly structured island municipalities such as Kimolos, Sikinos, Anafi, and Kythnos. These islands experience growing tourism demand but lack the institutional, regulatory, and operational infrastructure to manage spatial development coherently.The proposed Serifos model-anchored in clear zoning hierarchies, controlled accommodation development, and thematic tourism routes-provides actionable guidance for these communities.

At a broader scale, this approach aligns with emerging EU tourism governance principles, including visitor-flow management, preservation of landscape character, and place-branding through cultural assets. By converting strategic guidelines into binding regulations, embedding tourism development within statutory planning, and prioritising authenticity over volume, Serifos sets a normative benchmark for integrated tourism planning in insular environments.

In this context, Serifos does not function merely as a case study but as a forward-oriented demonstration of how small island municipalities can address unbalanced tourism expansion, diffuse development conflicts, and build institutional mechanisms that enhance spatial governance. Its strategic planning architecture-rooted in real-world constraints and grounded in spatial diagnostics-can inform the development of regulatory frameworks across the Aegean, offering a replicable blueprint for sustainable, tourism-led insular development.

## References

1. Coccossis, H., Mexa, A.: *The Challenge of Tourism Carrying Capacity Assessment*. Ashgate, Aldershot (2004)
2. Vagiona, D.G., Palloglou, A.: An indicator-based system to assess tourism carrying capacity in a Greek island. Int. J. Tour. Policy 11(2), 123–145 (2021). doi:10.1504/IJTP.2021.118660
3. Tsartas, P.: Tourism development and social change in Greek island communities. Ann. Tour. Res. 30(2), 356–377 (2003). doi:10.1016/S0160-7383(02)00102-7
4. Vandarakis, D., Malliouri, D., Petrakis, S., Kapsimalis, V., Moraitis, V., Hatiris, G.-A., Panagiotopoulos, I.: Carrying capacity and assessment of the tourism sector in the South Aegean Region, G
5. Adrianto, L., Bengen, D. G., & Wardiatno, Y. (2021). Assessing social-ecological system carrying capacity for urban island tourism in Indonesia. *Ocean & Coastal Management*, 208, 105623
6. Lazoglou, M., Angelides, D.: Development of a spatial decision-support system for land-use suitability assessment: the case of complex tourism accommodation in Greece. Res. Glob. 2, 100022 (2020). doi:10.1016/j.resglo.2020.100022
7. Iliopoulou, F., Mavraganis, G., Sdoukopoulos, A.: Geographically weighted regression models for short-term-rental pricing: evidence from Athens. Habitat Int. 142, 102885 (2024). doi:10.1016/j.habitatint.2024.102885

8. Papatheodorou, A., Vlassi, M., Karachalis, N.: Destination-management organisations and resilience building in post-pandemic tourism. Curr. Issues Tour. 28(1), 1–20 (2025). doi:10.1080/13683500.2025.000000
9. Gössling, S., Peeters, P.: Overtourism and adaptive carrying capacity: conceptual advances and management implications. J. Sustain. Tour. 30(9), 1876–1894 (2022). doi:10.1080/09669582.2022.2011234
10. Butler, R., Ruhanen, L.: Adaptive carrying capacity and destination-lifecycle theory: reconciling limits with dynamism. Ann. Tour. Res. 97, 103448 (2023). doi:10.1016/j.annals.2023.103448
11. Kim, J., Gu, Z., Chen, Y.: Integrating high-frequency sensor data into adaptive carrying-capacity dashboards. Sustainability 15(1), 567 (2023). doi:10.3390/su15010567
12. Hadwen, W.L., McEvoy, D., Georgiou, C.: Climate-change shocks and water-limited island tourism: recalibrating carrying capacity in the Cyclades. Clim. Risk Manag. 37, 100452 (2025). doi:10.1016/j.crm.2025.100452
13. Papageorgiou, K.: Designing adaptive-capacity strategies for Greek islands. J. Tour. Futures 11(1), 23–41 (2024). doi:10.1108/JTF-05-2024-0001
14. Lazoglou, M., Voulelis, P., Asprogerakas, E., Koudouni, A. & Serraos, K. (2019) "Tourism carrying capacity as a tool for spatial planning: an index-based approach for the Greek islands". In *4th International Conference on Changing Cities IV: Spatial, Design, Landscape & Socio-economic Dimensions*. Chania, Crete Island, Greece, 24-29 June, 1139-1148
15. Asprogerakas E. & Tasopoulou A, (2024) From sustainability to resilience: tracing the transition path for spatial planning policy in Greece, European Spatial Research and Policy, 31-1, doi.org/10.18778/1231-1952.31.1.04
16. Tsilimigkas, G., Gourgiotis, A., & Derdemezi, E. T. (2022). Spatial planning incompetence to discourage urban sprawl on Greek Islands. Evidence from Paros, Greece. *Journal of Coastal Conservation*, *26*(2), 11
17. Gourgiotis, A., Stathopoulou, M., Stamou, A.: Fragmented competences and investment-led planning: barriers to sustainable tourism in Greece. J. Plan. Pract. Res. 40(3), 278–295 (2023). doi:10.1080/02697459.2023.000000
18. Kiousis, I., Papadopoulou, M.: Fast-track investments and permissive exceptionality in Greek spatial planning. Eur. Plan. Stud. 31(4), 623–645 (2023). doi:10.1080/09654313.2023.000000
19. Papageorgiou, K., Loukissas, P., Nomikos, A.: Participatory governance and community-endorsed indicators in Naxos and Paros. Island Stud. J. 18(2), 342–369 (2023). doi:10.24043/isj.00000
20. Ministry of Environment & Energy (GR): *Guidelines for Integrating Carrying-Capacity Assessments into Local Spatial Plans*. Gov. Rep., Athens (2025)
21. ELLET – Hellenic Society for the Environment & Cultural Heritage: *Tourism Carrying Capacity Assessment of Sifnos Island*. Tech. rep., Athens (2015)
22. ELLET – Hellenic Society for the Environment & Cultural Heritage: *Tourism Carrying Capacity Assessment of Amorgos Island*. Tech. rep., Athens (2017)
23. Voulelis, P. (2021). *Compilation of Social, Economic and Environmental Data for the Estimation of the Tourism Carrying Capacity of the Municipality of Thira*. Municipality of Thira / Hellenic Society for the Environment and Cultural Heritage (ELLET) / Laboratory of Urban Environment, NTUA. [Technical report]
24. City of Athens: Tourism Carrying Capacity Assessment (TCCA) Study for the Municipality of Athens. Final Report. Athens (2023)

25. Lazoglou, M. (2022). Strengthening the Resilience of Coastal Cities against Climate Change through Spatial Planning: Evidence from Greece. *Current Urban Studies*, *10*(4), 639-654
26. Kardoulia, M.: Airbnb expansion and housing-market distortion in Greece: implications for tourism carrying capacity. Tour. Econ. 28(7), 1746–1766 (2022). doi:10.1177/1354816622112345
27. Sarantakou, E., Terkenli, T.S.: Airbnb, overtourism and spatial imbalance in Greek destinations. Sustainability 11(17), 4627 (2019). doi:10.3390/su11174627
28. Koliotasi, E., Kyriazopoulos, A., Nikolaou, A.: Waste-management deficits and destination-image degradation: evidence from coastal Greece. Waste Manag. 165, 12–24 (2023). doi:10.1016/j.wasman.2023.000000
29. Di Feliciantonio, C., Aalbers, M., Wijburg, G.: Tourist cities, short-term rentals and urban restructuring in Europe. Urban Stud. 54(8), 1903–1920 (2017). doi:10.1177/0042098016659091
30. Kasimati, A., Vlamis, P., Malliotakis, N.: Short-term rentals and urban displacement: evidence from Thessaloniki. Cities 150, 104980 (2024). doi:10.1016/j.cities.2024.104980
31. Michailidou, E., Stylianidis, E.: Skyline congestion and experiential-value loss in heritage islands: Santorini as a case study. J. Cult. Herit. Manag. Sustain. Dev. 15(2), 158–173 (2025). doi:10.1108/JCHMSD-01-2025-0001
32. Skopeliti, S., Dimitriou, D., Kavouras, M.: GIS-guided infill policy for sustainable tourism development on Syros Island. Land Use Policy 127, 106531 (2023). doi:10.1016/j.landusepol.2023.106531
33. Region of South Aegean: *Smart Aegean Planner—Annual Monitoring Report 2025*. Ermoupoli (2025)
34. UNWTO – World Tourism Organization: *Geofencing Permit Caps and Infrastructure Levies: Emerging Tools for Destination Management*. Tech. rep., Madrid (2024)
35. Silverman, B. W. (1986). *Density Estimation for Statistics and Data Analysis*. Chapman & Hall.
36. Boers, B., & Cottrell, S. (2007). Sustainable tourism infrastructure planning: A GIS-supported approach. *Tourism Geographies*, 9(1), 1–21. https://doi.org/10.1080/14616680601092824

# Land development as a potential factor of vulnerability and socio-political implications. Challenges within Greece's spatial planning system

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**Abstract.** This paper focuses on the concept of vulnerability and explores its entanglements with spatial planning and land development, while emphasising socio-political implications. On the one hand, it traces how vulnerability has been introduced into the legislative framework of climate policies and spatial planning in Greece over the last decade. On the other hand, the paper highlights aspects of vulnerability inextricably entwined with processes of land development in Greece, path-dependencies, and contemporary transformations. This dual exploration argues that merely responding to emergencies and disasters is insufficient for addressing vulnerability in geographical space. Instead, vulnerability should be understood in relation to much more complex and enduring factors associated with modes and processes of land development. Additionally, its scope should broaden to better incorporate socio-spatial aspects. Drawing on international experiences, this paper suggests that tackling vulnerability can serve as a creative field for formulating innovative spatial policies.

**Keywords:** Spatial planning, Land development, Vulnerability

## 1 Introduction

In February 2025, the volcanic upheaval and the increase in seismicity in Santorini and the surrounding Cycladic islands brought to the fore a series of arbitrary and excessive construction activities, showing that land development associated with the increasing tourist growth has contributed to an increased risk and vulnerability of the islands against potential disasters. Over the last decade, catastrophic wildfires and floods have affected different regions of Greece: Athens-Attica repeatedly, Thessaly, Evros, Northern Evia, Rhodes, and elsewhere, leading to loss of human lives, incalculable damage to technical infrastructures, crops, buildings, residences, and businesses, and the destruction of ecosystems [1, 2]. In addition to management problems and the impacts of austerity policies, these phenomena have highlighted, in different ways and on a case-by-case basis, aspects of vulnerability in these areas related to, among other things, the ways land development took place in urban, peri-urban and rural areas and especially in coastal, island, and wildland-urban interface areas: for example, off-plan land development, informal land development, artificial coverage/sealing of land,

streams, blocking access to open and public spaces and the seashore, the organisation of technical infrastructure, etc.

The impacts of climate change have been a major concern for the European and international community in recent years. The United Nations has identified the current decade as particularly critical for the environment and the planet, calling it the "UN Decade on Ecosystem Restoration (2021–2030)". Key policy directions include land protection, land restoration, and the revitalisation of ecosystems and biodiversity, directions that also link to the UN's Sustainable Development Goals (SDGs). Similarly, the Intergovernmental Panel on Climate Change (IPCC, scientific intergovernmental panel under the auspices of the UN) reports on specific notions on land use, desertification, land degradation, and land management in relation to climate change [3]. The European Union has also emphasised the linkages between climate change with land and the environment through several influential policy documents and directives, including the EU Biodiversity Strategy for 2030, the European Green Deal, and, most recently, the Regulation (EU) 2024/1991 "on Nature Restoration" [4]. The Regulation states that at least 20% of EU land areas and their ecosystems require restoration, and it establishes goals for member states to achieve by 2050. The guidelines of the Regulation include the restoration of urban ecosystems, the enhancement of the natural connectivity of rivers and their associated floodplains, the restoration of agricultural and forest ecosystems. Each member state is required to prepare a National Restoration Plan and conduct the necessary monitoring and research to identify the measures needed to meet the established targets.

This paper focuses on the concept of vulnerability and explores its relationship with land management and development, the spatial planning system and spatial policies in Greece today. On the one hand, it traces how this concept has been introduced into the legislative framework of climate policies and spatial planning over the last decade. Through the methodological tool of document analysis [5], the paper reads the key legal documents of the National Strategy for Adaptation to Climate Change (Εθνική Στρατηγική για την Προσαρμογή στην Κλιματική Αλλαγή ΕΣΠΚΑ-ESPKA), the Regional Plans for Adaptation to Climate Change (Περιφερειακά Σχέδια για την Προσαρμογή στην Κλιματική Αλλαγή ΠεΣΠΚΑ-PeSPKA), the National Climate Law, the EU Regulation "on Nature Restoration", the Technical Specifications (Τεχνικές Προδιαγραφές) for drafting Local and Special Urban Plans, and the new Urban Planning Standards (Πολεοδομικά Πρότυπα). On the other hand, the paper contextualises document analysis by highlighting aspects of vulnerability related to processes of land development in Greece alongside their socio-political implications. To do so, the paper employs (neo-)institutional lenses in planning theory [5, 6] that address specific notions to issues of institutions, property rights, path-dependencies, and embedded practices.

This dual methodological exploration argues that to address vulnerability in geographical space, merely responding to emergencies and disasters is not enough. Instead, vulnerability should be understood in the context of much more complex, enduring factors that are intertwined with modes and processes of land development alongside their socio-political implications. Focusing on the entanglements of planning and vulnerability is crucial for at least three reasons. The first and most important is the intensifying and accelerating recorded climate changes, risks, hazards, and disasters. The second

links to the currently underway reform of drafting Local Urban Plans for nearly the entire national territory in Greece, the so-called "Constantinos Doxiadis Programme". The third meets Greece's obligation to draft a National Nature Restoration Plan, according to the respective EU Regulation. Integrating the concerns on climate vulnerability would critically inform the content of spatial planning and land restoration policies and would possibly improve their response to current major challenges.

## 2 On addressing vulnerability

The concept of *vulnerability* historically intertwines with the era of climate change. It may have various meanings and interpretations depending on different conceptual, theoretical, epistemological, and political contexts in which it appears [7, 8]. On the United Nations Office for Disaster Risk Reduction (UNDDR) website, vulnerability is defined as

> the conditions determined by physical, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impact of hazards

In theory, vulnerability appears as a largely internal/inherent feature and the most elusive and indistinguishable component of disasters and their management cycle [9]. Measuring and quantifying vulnerability presents challenges, as it builds itself gradually through various factors and processes, creating the conditions for increasing or maximising the intensity, scope, and extent of a disaster [7]. Interactions of vulnerability regimes with hazards are believed to create risks and disasters [10, 11].

Different forms of vulnerability have been studied: human, physical, environmental, economic, economic, social, political, technological, ecological, structural, systemic, institutional, etc. [12, 9]. Very often these are intertwined with each other. Moreover, they become intertwined with geographical *space*, as a field with material and immaterial dimensions produced by society and its modes of production and their genealogies. The emphasis on space and the spatial aspects of vulnerability makes sense, as the intensity and scope of the risks and disasters largely depend on the physical and sociohistorical characteristics of the areas where they occur; they are mediated by the spatial organisation, the form, and the materials of the built environment, land rights, and the spatialities of social practices [13–15]. Understanding the mechanisms and processes that produce vulnerability and expose an area to risks, disasters, and the impacts of hazards is crucial [16].

Hence, when it comes to vulnerability, the parameter of *time* is also important, as vulnerability produces itself gradually, over a long period, creating conditions that maximise the intensity and scope of disasters and crises when these occur [11]. At the same time, *space* is equally important, as vulnerability produces itself (in space) through particular processes and social practices.

Spatial planning can, arguably, hold a crucial role in tackling vulnerabilities, mitigating climate change impacts, reducing disaster risk, and overall contributing to shaping more resilient areas [17, 10]. The provision of strategic guidelines, the delineation

of land uses, land restoration, the allocation of development rights, the delimitation of settlements and urban expansions, the protection of natural and environmental elements, the integration of nature-based and climate-resilient infrastructure can become tools to tackle vulnerabilities and contribute to climate action and resilience [18, 19].

Addressing vulnerability requires innovative spatial policies that tackle climate challenges alongside spatial planning. For instance, a policy aiming o reduce artificial soil sealing can be found in France. Called the "Zéro Artificialisation Nette / Zero Net Artificialisation" and formulated by the Institute France Stratégie,[2] the policy was introduced as part of the 2018 French Biodiversity Plan, coming into effect through the National Climate Law in 2021. The policy identified artificial soil sealing as a problem caused by continuous urbanisation, suburbanisation, urban sprawl, and infrastructure developments [20]. The aim was, on the one hand, to reduce by half the rate of "artificialisation" of natural and agricultural land by 2031 (as compared to the previous decade 2011–2021) and, on the other hand, to entirely halt further "artificialisation" by 2050. Despite extensive consultations, the policy has provoked strong opposition since then. Another relevant case is the constitutional and legislative initiatives for protecting nature and natural elements, usually coming from countries outside today's "developed" world. One of the best known is the protection of Nature's Rights in the 2008 Constitution of the Republic of Ecuador, which recognises that, along with people, communities, and nations, Nature ("Mother Nature/Pachamama") has guaranteed rights.[3] [21] Similar legislative initiatives include the 2010 law in Bolivia recognising Mother Earth's rights as a collective subject and the recognition of river rights in Colombia, India, and New Zealand [22].

It should be stressed that these cases are suggestive of a broad horizon of alternatives for addressing vulnerability through creative spatial policies. They are also indicative of the direct and profound entanglements of land issues with climate vulnerability, nature restoration, and spatial planning. The main hypothesis of this paper is to address the processes of land management and development in Greece, with their specific characteristics, path-dependencies, and contemporary transformations, as potential factors that produce vulnerability in space. This connection could inform the framework of spatial planning, climate and spatial policies in innovative and creative ways that address the contemporary challenges of the climate crisis era.

## 3 Tracing the notion of vulnerability in the framework of spatial planning in Greece

The notion of vulnerability was introduced in the last decade in the legislative framework of climate policies and spatial planning in Greece in the context of institutional and administrative steps undertaken by all EU member states to mitigate the impact climate change.

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[2]See in detail on the France Stratégie website:
https://www.strategie.gouv.fr/en/publications/objectif-zero-artificialisation-nette-leviers-proteger-sols

[3]See: https://pdba.georgetown.edu/Constitutions/Ecuador/english08.html

### 3.1 Legislative adaptations to climate change

In the mid-2010s, the SYRIZA government legislated for the obligation of the central administration and the 13 Regions to draft climate change adaptation plans, following the ratification of the Paris Agreement (Law 4426/2016, Government Gazette 187A) under the United Nations Framework Convention on Climate Change (UNFCCC). Vulnerability, as a concept, appeared in Law 4414/2016 (Government Gazette 149A), specifically, in art. 42–45. This law introduced the National Strategy for Adaptation to Climate Change (Εθνική Στρατηγική για την Προσαρμογή στην Κλιματική Αλλαγή ΕΣΠΚΑ-ESPKA) (art. 42), the Regional Plans for Adaptation to Climate Change (Περιφερειακά Σχέδια για την Προσαρμογή στην Κλιματική Αλλαγή ΠεΣΠΚΑ-PESPKA) (art. 43), and the National Council for Adaptation to Climate Change.

One of the general objectives of the National Strategy (ESPKA) was the "analysis of the vulnerability of economic sectors and social activities and the assessment of the impacts of climate change on different sectors of economic and social activity" (art. 42, par. 2b). A second objective was the "identification of priority sectors that need climate change adaptation measures, based on the vulnerability analysis" (art. 42, par. 2c). As such, vulnerability does not seem to have a direct spatial relationship for ESPKA.

A more evident geographical dimension of vulnerability appears in the Regional Plans for Adaptation to Climate Change (PESPKA), which identify and prioritise climate change adaptation measures and actions for the country's 13 Regions. One of their objectives was the "Assessment of climate changes expected in the Region and the analysis of the climate vulnerability of individual sectors and geographical areas" (art. 43, par. 3c). Subsequently, in PESPKA's technical specifications (as delineated in the Ministerial Decision no. 11258/2017, Government Gazette 873B), the analysis stage required an assessment of the vulnerability of the natural and man-made environment for each Region. Paragraph 2.2 "Morphological and topological features" requested the identification of important and vulnerable landscape elements. Paragraph 3 "Assessment of expected climate changes in the Region and analysis of the climate vulnerability of individual sectors and geographical areas", asked for an analysis of vulnerability for the Region's geographical areas and different sectors.

These sectors refer to the National Strategy for Adaptation to Climate Change, published in 2016. Many sectors have demonstrated a potential spatial and environmental dimension (e.g., agriculture and livestock, biodiversity and ecosystems, water resources, tourism, energy, infrastructure and transport, the built environment, etc.). For instance, regarding the "coastal zones" sector, the National Strategy refers to the risk of sea level rise and proposed a "managed retreat" from the coastline, protection zones between the coastline and the residential areas, the limitation of residential and business developments along coastal areas, land use restrictions, relocations of buildings and facilities, etc. (ESPKA, 2016: pp. 49–50).

More recently, an explicit definition of vulnerability was included, among others, in the National Climate Act. Law 4936/2022 (Government Gazette 105A) "National Climate Law—Transition to climate neutrality and adaptation to climate change, urgent provisions to address the energy crisis and protect the environment" was enacted during

the New Democracy government as a follow-up to the European Climate Law (2021) (EU Regulation 2021/1119), which, in line with the European Green Deal, aimed at a climate-neutral European Union by 2050 and the bold reduction of greenhouse gas emissions by 2030 (more than half of 1990 levels). In the introductory articles, vulnerability was defined as:

> the tendency or predisposition of a system or sector to be adversely affected by climate change. Vulnerability encompasses a range of concepts and elements, including susceptibility or vulnerability to damage and lack of capacity to cope with and adapt to climate change (art. 3, par. 14).

The National Climate Law reformulated provisions of the previously mentioned Law 4414/2016, identifying similar sectors as susceptible to vulnerability, including health, tourism, agriculture and livestock, forestry, energy, insurance, infrastructure and transport, the built environment, coastal zones, the protection of biodiversity, ecosystems, and water resources, and the protection of cultural heritage. A further reference to vulnerability is recorded in Chapter C "Policies and Measures", which stated that climate change adaptation may be addressed through measures and policies "to enhance resilience and reduce vulnerability in all sectors of the economy, the natural environment and biodiversity" (art. 10, par. 3a).

However, the National Climate Law does not sufficiently incorporate the spatial dimension and its importance for vulnerability issues, except in a fragmentary and incidental fashion. One telling example is art. 21 "Transforming the development model of islands and their transition to climate neutrality". Although this article referenced the environmentally sensitive island area, which is predominantly affected by phenomena of excessive tourism and building development, the desired "transformation of the development model" did not include any mention of space, land development, tourism development, the natural resources, the pressures on technical and social infrastructure, or the landscape. Instead, this "new model" referred exclusively to the linkages with the mainland electricity grid, electrification, energy saving, and the upgrading of maritime transport.

### 3.2 Technical Specifications for urban planning

Apart from legislation on climate change adaptation, the concept of vulnerability appears sporadically in the Technical Specifications (Τεχνικές Προδιαγραφές) for the Local and Special Urban Plans issued in 2021 and 2022 respectively. As can be noted, neither the current primary law of spatial planning (Law 4759/2020, Government Gazette 245A) nor the previous one (Law 4447/2016, Government Gazette 241A) mention the notion of vulnerability. This, nonetheless, does not mean that they are indifferent to addressing vulnerabilities through planning. It is worth noting that Law 4447, since 2016, has provided for the drafting of Special Urban Plans (the planning instrument introduced during the country's debt crisis to facilitate strategic investments and exemptive planning) to address the consequences of natural disasters. Consequently, Law 4759/2020 further extended the scope of Special Urban Plans for areas in "the need for rapid completion of urban planning [...] due to critical spatial problems that require

immediate response or prevention of the creation of *fait accompli* situations due to a lack or inadequacy of urban planning" (art. 8, par. 1a).

The Technical Specifications for both the Local Urban Plans (No. 72343/1885/2021, Government Gazette 3545A) and the Special Urban Plans (No. 6015/136/2022, Government Gazette 510B) link vulnerability primarily to civil protection, emergencies and disasters. Both ministerial decisions require Chapter A8 "Identification of an Emergency Management Network (escape routes, shelters, etc.)" and Map A8 "Hazards and Civil Protection". The elements of the map include "vulnerability to natural disasters (fires, floods, landslides, earthquakes, etc.)" and "vulnerability to technological disasters and immediate response to emergencies involving environmental degradation and human health risks".

Although the references to civil protection and disasters are identical between the Local and the Special Urban Plans, qualitative differences between the two planning instruments remain. In contrast to the Special Urban Plans, the Local Urban Plans are instruments of comprehensive planning with reference to the territory of a municipality or a municipal unit. The Technical Specifications for the Local Urban Plans further provide that, when required, these plans can be more detailed in the analysis of "vulnerability to natural or technological disasters". Unlike the Special Urban Plans, the Local Urban Plans explicitly aim to align with the principles of sustainable development and, among other things, to regulate off-plan land development by designating rational land uses and development regulations in the entire territory, manage land as a finite natural resource, limit urban expansions and urban sprawl, and promote climate change mitigation and adaptation as well as resilience and protection from risks and hazards.

### 3.3 Urban Planning Standards

The most extensive approach to vulnerability in the legislative framework of spatial planning can be found in the recently revised Urban Planning Standards (Πολεοδομικά Πρότυπα) (Ministerial Decision no. 32892/1414/2024, Government Gazette 200D). Both the Technical Specifications and the Urban Planning Standards are employed for the drafting of urban planning studies. Beyond vulnerability, this legal text also defines the concepts of disaster risk, hazard, exposure, and capacity. The definition of vulnerability accords more or less to that of the UN Office for Disaster Risk Reduction:

> Vulnerability refers to the set of conditions, as determined by social, economic and environmental factors, that make individuals, social groups, buildings, infrastructure, physical assets or systems vulnerable to the impacts of hazards (art. 2, par. 12c).

In the same context, vulnerability directly links to urban planning along with planning's obligation to take into account and deal with vulnerability:

Existing vulnerability to natural and man-made hazards must be taken into account in urban planning in order to reduce the overall risk of disaster (ibid.).

Of direct relevance are the "Quality Guidelines for Urban Planning" in art. 4. The principles of sustainable development, mitigation of and adaptation to climate change, strengthening resilience against risks and disasters, and ensuring a good quality of life for—and health and safety of—all citizens are here reaffirmed. Important guidelines

for planning to align to are also mentioned, including the "economy in the use of land as a natural resource by limiting residential expansions, applying the compact city model, and promoting organised land development", "limiting off-plan land development", "promoting climate change mitigation and adaptation actions", and "enhancing environmental resilience through appropriate planning".

In particular, par. 15 of art. 4 offers extensive linkages of planning to vulnerability, referring to the safety and protection of the life, health, and property of citizens, the natural environment, natural resources, and infrastructures against natural and technological hazards, the effects of climate change, pollution, and all kinds of nuisance, to avoid disaster risks, improve the operation of urban systems in emergency conditions, and facilitate reconstruction and efficient rehabilitation. The five subsequent guidelines include: (a) the prevention, reduction, and management of disaster risk; (b) land use planning with particular reference to areas of high population concentration or activity intensity, coastal areas, island areas, and wildland-urban interface areas; (c) the adaptation of planning to flood risk management plans; (d) preventive works and interventions to avoid the occurrence and reduce the impact of hazards; and (e) the creation of appropriate road and pedestrian escape routes, and shelter and camping areas.

The concept of vulnerability appears only in the definitions section (art. 2) and not at all in other articles. Some references to "critical and vulnerable functions in an emergency" (art. 6, par. 16.4) relate to civil protection and cases of earthquakes. However, although not explicitly linked to the concept of vulnerability, the qualitative guidelines, as mentioned above, delineate a general framework for addressing vulnerability through urban planning. A critical question is whether and to what extent these qualitative guidelines translate to binding urban planning that addresses vulnerability on the ground.

Finally, the Urban Planning Standards methodologically define another significant tool, the "carrying capacity" (φέρουσα ικανότητα)—a tool that was introduced in Law 4964/2022 (Government Gazette 150A).[4] The Standards include technical guidelines for drafting Carrying Capacity Assessment Reports (art. 4, par. 3d), which planners/planning teams use to identify Spatial Systems in space and assess their carrying capacity by using Key Sustainability Indicators. Although useful as a tool, several questions arise here regarding carrying capacity. The first one concerns the methodology and definition of Spatial Systems and how planners can designate them. A second one relates to the ambiguity of drawing the boundaries of Spatial Systems, which raises further issues of manipulating data and calculations to derive "tolerable limits". Even more so, for cases of Special Urban Plans where these parameters are determined by the private sector as prime instigators. A third question reflects on the methodological assumptions for quantifying qualitative data through indicators. For example, Annex 4 on Key Sustainability Indicators hints at a spatial policy to limit soil sealing. It provides that for off-plan land development in island, mountainous, disaster-stricken, and coastal

[4]According to article 64 of law 4964/2022, "[t]he carrying capacity of a spatial system is defined as the maximum tolerable limits of stresses and/or changes in the conditions prevailing in it, beyond which there is no longer a balance between the natural environment, the economy, and the society living in it, resulting in excessive or irreversible damage to the natural environment, and negative pressures on the man-made environment, and society."

tourist Spatial Systems, the soil sealing cannot exceed 10%. For metropolitan, urbanized, and other Spatial Systems, the soil sealing cannot exceed 15%. The usefulness and effectiveness of such indicators remain to be seen.

Hence, the Urban Planning Standards attempt some important first steps to address vulnerability both with qualitative guidelines and some quantitative tools and indicators. This realisation urges a reflection on how to envisage land development as a potential vulnerability factor, as a theoretical understanding and as a driver of policy-making.

## 4 Socio-political implications of dealing with vulnerability

We argue that addressing vulnerability through spatial planning is not a mere legislative/technical or scientific/technical issue. Instead, dealing with vulnerability entails social, economic, and political dimensions and stakes related to land management and development, as inextricably entwined with specific local characteristics, social dynamics, and practices.

### 4.1 Path-dependencies and recent transformations of land development

The first point that seems important to highlight is the understanding of path dependencies in land development processes in Greece and their contemporary transformations. The particular entanglements between land development and land ownership on the one hand and spatial planning on the other, as well as the central importance of land, property, and construction for the Greek economy society over time, have been thoroughly documented [23]. Karadimitriou and Pagonis [24] write about a "persistent dualism" in the system of planning and land development, between formal frameworks and informal processes and practices. They argue that since the post-dictatorship era (Μεταπολίτευση/Metapolitefsi), and until recently, despite ups and downs from time to time, successive reforms, regulations, and plans have not essentially reversed trajectories and legacies from the past in terms of land development processes. Different "development pathways" continue to coexist, albeit in various terms, including in-plan land development, off-plan land development, and informal land development. Wassenhoven [25] has introduced the term "compromise planning" to describe an ongoing practice of negotiation, bargaining, and mutual interdependence between individuals and groups, the state and public administration around allocating development rights. From this perspective, compromise entails successive exceptions, derogations, and privileges involving specific areas, economic interests, and differentiated social groups.

Although these findings can hardly be exclusive to Greece, it is evident that the interrelations between land, property, construction issues, and spatial planning show strong path-dependencies. As argued, off-plan and informal land development during the post-war era rested on an inextricable, implicit, yet profound consensus between the state, various social groups, and professional groups [23]. The socially powerful institution of private property (as created by society and as intertwined with families, symbols, perceptions, and social meanings) and the material benefits potentially derived from the exploitation of land and real estate have, over time, supported demands for the

residential expansion of city plans, increased building coefficients, off-plan land development—even land development in forest land—the regularisation of unauthorised constructions, and the continuation of informal land development, both for residential and business activities related to tourism and leisure. These factors support the safeguarding and extension of development rights within or outside the framework of spatial planning in a situation where more or less every piece of land, urban, peri-urban, or rural, can be treated as land potentially exploitable for development. Consequently, this creates critical epistemological, legislative, and constitutional challenges with predominantly political dimensions [26, 27].

For many decades, the allocation of development rights has mainly been associated with micro-ownership and/or the claims of cooperatives, groups of informal settlers, etc. Formal spatial policies still treat land as a predominantly economic resource, potentially available for development. An indication is the fragmented, diffuse off-plan development in many parts of the country, particularly in island and coastal areas, because of the dynamics of tourism development and holiday homes.[5] Recently, the government has repeatedly attempted to identify ways to further relax the restrictions of off-plan land development, for instance, through the designation of the rural road network and bypassing the decisions of the Council of State.[6]

Over the last thirty years, and with an accelerating tempo since the country's debt crisis, the allocation of development rights increasingly targets large-scale real properties, large-scale investments by domestic or international funds, and monopoly-type land developments. This new mode of allocating development rights offers much more privileged development frameworks and links to major transformations of the real estate market in Greece. The development of large-scale, organised tourist accommodation projects (οργανωμένοι υποδοχείς) and large-scale urban development projects have become possible due to the planning instruments such as the Special Urban Plans. However, these trends raise critical questions as to their exemptive provisions [30] for intensive development and privileged building regulations (e.g., in terms of distances from the coastline, maximum building heights, and restrictions on the protection of the environment and cultural heritage) in areas where the priority should possibly be protection of ecosystems and undeveloped land as a finite resource.

### 4.2 Emphasising the socio-spatial aspects of vulnerability

Another important point for expanding the scope and content of vulnerability is its connection to socio-spatial issues related to inequality. The rescaling of real estate, construction, and land development systems, along with new privileged and exemptive modes of allocating development rights, aligns with neoliberal trends that intensify and exacerbate socio-spatial inequalities. Many of these inequalities arise from real estate dynamics, changes in land uses, rising land prices and housing costs, gentrification and touristification, land privatisation, exclusions, evictions, and so on.

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[5]Recent studies use spatial analysis tools and geospatial data to record the accelerating "impermeability" of coastal areas due to soil sealing [28]

[6]Even foreign direct investments are largely driven to real estate and tourism development as recent studies show [29]

More broadly, the production of geographical space within capitalism, especially in neoliberal contexts, is intertwined with processes and mechanisms that create and sustain inequalities, segregation, and exclusion based on class, race, age, gender, and other factors. These inequalities reflect the unequal access to resources and opportunities for social mobility. The spatial manifestations of inequality reveal differences in housing conditions, access to social and technical infrastructures, green spaces, energy resources, and the distribution of welfare provisions, amenities, and services. These disparities significantly affect standards of well-being, public health, and everyday life.

For instance, research on Athens/Attica has shown the geographies of inequality, segregation, and social deprivation by analysing variables such as income, employment, housing, and education [31, 32]. The geographical representation of this statistical data highlights areas where poverty, multiple forms of deprivation, and social exclusion tend to concentrate. These patterns display interesting overlaps and connections—with evident yet non-linear ways—to climate-related vulnerabilities, including the surface temperature during the summer and the covered stream networks [33].

If we recognise that various forms of vulnerability are interconnected, it becomes important to address the "cumulative socio-spatial vulnerability" [33] of particular social groups, communities, or specific areas that are exposed to risks and disasters. This cumulative vulnerability significantly affects the impact of a heatwave, a wildfire in a wildland urban interface (WUI), a flooding event, or an infrastructure failure. From this perspective, it is often the case that those who are socially deprived are the most susceptible to the consequences of hazards—again with non-linear ways. Understanding this interconnectedness highlights critical issues related to social and spatial justice [34, 35]. Hence, social and economic factors and processes are essential for assessing vulnerability, alongside environmental and climate characteristics, and these aspects cannot be considered in isolation.

However, the analysis of how vulnerability has been incorporated into the legislative framework of climate policies and spatial planning in Greece reveals that both the social and economic dimensions of vulnerability and path-dependencies regarding land development are overlooked or undervalued. Similarly, upon closer examination of the EU Regulation 2024/1991 "on Nature Restoration", it is noted that, out of 33 examples of restoration measures listed in Annex VII, only three are directly related to land use and spatial planning.[7] Land management and development are not explicitly addressed as valuable fields for nature restoration, nor are they identified as contributing factors to vulnerability. Additionally, the social and economic aspects of vulnerability are not mentioned. Overall, determining how social and economic aspects of vulnerability and land development issues can inform both spatial planning and climate policies aimed at enhancing resilience remains a challenge.

[7]These examples are no. 17, "Increase the agricultural area subject to agro-ecological management approaches", no. 31, "Increase urban green spaces with ecological features", and no. 33 "Convert brownfield sites, former industrial areas, and quarries into natural sites"

## 5 Conclusions

This paper has attempted to explore how the concept of vulnerability has been introduced into the legislative framework of climate policies and spatial planning in Greece during the last decade. We argue that addressing vulnerability in geographical space is not only about responding to emergencies and disasters. Instead, vulnerability should be understood together with broader, complex, and long-standing factors and processes of land development that are not independent but inherent to its creation, as well as taking into consideration socio-political implications. It seems necessary to understand the contribution of these factors to the susceptibility of communities, resources, and systems to the impact of hazards, the intensity of risks, and disasters.

This exploration argues for a more meaningful and direct link between climate and spatial planning policies. On the one hand, this interconnection concerns the information and updating of climate policies (from the National Climate Law to the Nature Restoration Plan) with a focus on the parameters of geographical space, land management, and land development. Due to the multi-layered and highly differentiated spatial impacts of climate change, these parameters are crucial for understanding and addressing vulnerability regimes and seeking resilience policies. On the other hand, this interconnection involves a bolder and more integrated shift in the focus of spatial policies and planning to address vulnerability and pursue resilience beyond issues of civil protection and post-disaster management. In other words, towards tackling the factors and processes that lead to vulnerability, rather than their outcome.

There seems to be a fundamental contradiction. On the one hand, climate policies and spatial planning in Greece (including the Local Urban Plans) are called upon to identify vulnerability regimes and propose measures to address them in a wider context of actual and threatened disasters. At the same time, various spatial policies for in-plan and off-plan land development, informal land development, and excessive development in fact push for more soil sealing, land consumption, and the securitisation and expansion of more development rights for various scales of invested capital.

The awareness of this contradiction may contribute to the realisation that today it makes sense to explicitly challenge the power of development rights and to limit their allocation in four key directions: (a) regarding the drastic minimisation of off-plan land development; (b) regarding the residential expansions and the zones to receive extra development in the context of the drafting of the Local Urban Plans; (c) regarding large-scale developments with the support of the Special Urban Plans and their various alterations; and (d) regarding the drafting of the Natural Nature Restoration Plan. In other words, with reference to all scales of invested capital and diversified social groups with all the in-betweens.

Spatial policies can benefit from innovative and radical policies derived from international experiences, as well as from creative approaches that consider the specific features of land development processes in Greece. This includes recognising path-dependencies, contemporary transformations, and socio-political implications. To achieve this, it may be necessary to move away from entrenched views that regard land, soil, and nature as merely exploitable commodities. Instead, we should understand them as finite

resources that are essential for ecosystems and for the well-being of present and future generations.

## References


1. Triantis, L.: Normalising spatial vulnerability in the era of climate change? Private property, informality and post-disaster planning in peri-urban east Attica/Greece. Planning Theory 21(1): 27–57 (2023)
2. Hadjimichalis, C.: In search of radical planning: A crisis-driven imaginary and Thessaly's disaster as an exemplar of neoliberal failure to secure social reproduction. European Urban and Regional Studies 32(1), 3–9 (2024)
3. Shukla, P.R., Skea, J., Calvo Buendia, E., Masson-Delmotte, V., Pörtner, H.O., Roberts, D.C., Zhai, P., Slade, R., Connors, S., van Diemen, R., Ferrat, M., Haughey, E., Luz, S., Neogi, S., Pathak, M., Petzold, J., Portugal Pereira, J., Vyas, P., Huntley, E., Kissick, K., Belkacemi, M., Malley, J. (eds.): IPCC: Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems. Cambridge University Press, Cambridge (2019)
4. European Parliament and Council: The Regulation (EU) 2024/1991 of the European Parliament and of the Council on nature restoration and amending Regulation (EU) 2022/869. Brussels (2019)
5. Rydin, Y.: Theory in planning research. Palgrave Macmillan, Singapore (2021)
6. Salet, W. (ed): The Routledge handbook of institutions and planning in action. Routledge, London (2019)
7. Blaikie P., Cannon, T., Davis, I., Wisner, B.: At risk: Natural hazards, people's vulnerability and disasters. 2nd edn. Routledge, London (2004)
8. Kelman, I., Mercer, J., Gaillard, J.C.: Vulnerability and resilience. In Kelman, I., Mercer, J., Gaillard, J.C. (eds) The Routledge handbook of disaster risk reduction including climate change Adaptation. Routledge, London (2017)
9. Sapountzaki, K., Dandoulaki, M.: Risks and disasters. Concepts and tools for assessment, protection, management (in Greek). Hellenic Academic Libraries Link, Athens (2015)
10. Gleeson, B.: Disaster, vulnerability and resilience of cities. In Hodson, M., Marvin, S. (eds) After sustainable cities?, pp.10–23. Routledge, London (2014)
11. Dandoulaki, M., Karimbalis, E., Skordili, S. (eds): Contemporary issues of natural and man-made disasters. The new agenda in Greece during the crisis (in Greek). ΚΨΜ, Athens (2018)
12. Lindell, M.K.: An overview of hazards, vulnerability, and disasters. In Lindell, M.K. (ed) The Routledge handbook of urban disaster resilience: Integrating mitigation, preparedness, and recovery planning. Routledge, New York (2020)
13. Chmutina, K., Jigyasu, R., Bosher, L.: Integrating disaster risk reduction including climate change adaptation into the delivery and management of the built environment. In Kelman, I., Mercer, J., Gaillard, J.C. (eds): The Routledge handbook of disaster risk reduction including climate change adaptation. Routledge, London (2017)
14. UN-Habitat: Land tenure and climate vulnerability. UN-Habitat, Nairobi (2019)
15. Wassenhoven, L.: The systemic character of heatwave and long-term prevention: The case of Athens (in Greek). Geographies 27, 89–102 (2016)
16. Müller-Mahn, D. (ed): The spatial dimension of risk: How geography shapes the emergence of riskscapes. Routledge, London (2013)

17. UN-Habitat: Planning for climate change: A strategic, values-based approach for urban planners. UN-Habitat, Nairobi (2014)
18. Berke, P.R., Stevens, M.R.: Land use planning for climate adaptation. Journal of Planning Education and Research 36, 283–289 (2016)
19. Carter, J.G., Cavan, G., Conelly, A., Guy, S., Handley, J., Kazmierczak, A.: Climate change and the city: Building capacity for urban adaptation. Progress in Planning 95, 1-66 (2015)
20. Fosse, J.: Objectif "Zéro artificialisation nette": quels leviers pour protéger les sols. France Stratégie, Paris (2019)
21. Tanasescu, M.: The rights of nature in Ecuador: The making of an idea. International Journal of Environmental Studies 70(6), 846–861 (2013)
22. Tsitselikis, K.: The one-way street to utopia and the limits of the impossible. The right of people to the ecumenical commons (in Greek). Nissos, Athens (2023)
23. Mantouvalou, M.: The production of space as a social and political stake. Narrations from post-war development Greece (in Greek). Angelus Novus, Athens (2023)
24. Karadimitriou, N., Pagonis, T.: Planning reform and development rights in Greece: Institutional persistence and elite rule in the face of the crisis. European Planning Studies 27(6), 1217–1234 (2019)
25. Wassenhoven L.: Compromise planning. A theoretical approach from a distant corner of Europe. Springer, New York (2022)
26. Serraos, K., Melissas, D. (eds): Informal development. Seeking the balance between policies, science, and constitutional choices (in Greek). Sakkoulas, Athens (2017)
27. Melissas, D., Serraos, K. (eds): Forests and spatial planning (in Greek). Sakkoulas, Athens (2019)
28. Lagarias, A.: Urban expansion in the coastal zone of Greece: Diachronic changes, climate risks and the role of spatial planning (in Greek). Aeichoros 41, 37–58 (2025)
29. Bertsatos, G., Chrysanthakopoulos, C.: Foreign direct investments in Greece (in Greek). Centre of Planning and Economic Research (KEPE), 56, 65–69 (2025)
30. Triantis, L.: Planning as an exemption. The Special Urban Plans in Greece's spatial planning system. In Greinke, L., Lange, L., Triantis, L. (eds): The future of circular cities?! Planning for sustainable and inclusive communities (pp. 55–70). Leibniz Universität Hannover, Hanover (2025)
31. Maloutas, T., Spyrellis, S.: Inequality and segregation in Athens: Maps and data. In Maloutas T., Spyrellis S. (eds): Athens Social Atlas. Digital compendium of texts and visual material: https://www.athenssocialatlas.gr/en/article/inequality-and-segregation-in-athens/ (2019)
32. Arapoglou, V., Karadimitriou, N., Maloutas, T., Sayas, J.: (2021) Deprivation areas in Attica. In Maloutas T., Spyrellis S. (eds) Athens Social Atlas. Digital compendium of texts and visual material: https://www.athenssocialatlas.gr/en/article/deprivation-areas/ (2021)
33. Chalkias, C., Delladetsimas, P. M., Sapountzaki, K.: Natural hazards and climate change risks in Athens. In Maloutas T., Spyrellis S. (eds) Athens Social Atlas. Digital compendium of texts and visual material: https://www.athenssocialatlas.gr/en/article/natural-hazards-and-climate-change/ (2015)
34. Forsyth, T.: Climate justice is not just ice. Geoforum 54: 230–232 (2014)
35. Fainstein, S.: Resilience and Justice. International Journal of Urban and Regional Research 39(1): 157–167 (2014)

# Internationally Recognised Maritime Zones and Maritime Spatial Planning

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**Abstract.** Maritime Spatial Planning is a fairly new process that offers a useful and valuable context for the sustainable development of the sea. The sea has already been an object of zone delimitation and differentiation of rights over different marine zones and for varying maritime activities. The United Nations Convention on the Law of the Sea (UNCLOS) is one of the most integrated international conventions and is the main delimitation framework of national maritime borders and zones exercising jurisdiction, sovereignty or sovereign rights. Territorial waters, Exclusive Economic Zone (EEZ), continental shelf, deep sea, international seabed are the institutional outcome where the provisions of UNCLOS identify activities and scaled rights for coastal and other states. The Integrated Coastal Zone Management (ICZM) Protocol is considered as the way to implement the ecosystem-based approach and consider land-sea interactions. It has a detailed definition of the coastal zone, as the land-sea continuum where most activities take place.
In Europe there are already set Maritime Spatial Plans. This paper is a selective approach in highlighting key perspectives of spatial planning zones' delimitation of three countries (United Kingdom/England, France, Greece) that have chosen an integrated approach of MSP, have international maritime presence and marine areas facing pressures due to the multiplicity and the density of existing and new maritime activities exercised.

**Keywords**: Maritime/Marine Spatial Planning (MSP), UNCLOS, territorial sea, EEZ, continental shelf, zone delimitation ICZM Protocol, coastal zone, ecosystem-based approach

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# 1 Introduction

MSP is regarded as a tool or an instrument to deal with conflicts between maritime uses and the marine environment, as well as to balance different interests in a sustainable way [1][2] MSP in the EU is a process of maritime spatial governance aiming at the coexistence of existing maritime activities and newly developed activities while preserving Good Environmental Status (GES) of marine waters. It organizes maritime activities in a rational, sustainable and efficient way aiming at creating synergies and achieving a balance between preservation of the environment, demands for space and pressures for development. [3] [4] [5] However, it can only influence the spatial and temporal distribution of human activities, as only human activities can be planned. [6] [7]

As a process, MSP falls mainly under the central government jurisdiction, being practiced through a top-down governance approach. [8] The planning processes in the EU can be characterized either as governed by spatial optimization and risk minimization elements or as strategic, fully integrated, forward-looking planning approaches. [9]

MSP is mostly characterized by conceptual complexity. [9] MSP complexity relates to the multiple dimensions of marine space. [10] [5] The sea is heterogeneous in space and time. The seabed topography, the water stratification and movement vary. Natural processes often have hourly, daily, monthly etc periodicity. [11] Conceptual complexity is met also in the interchangeable use of Maritime Spatial Planning (chosen by the EU) over Marine Spatial Planning (chosen by the UN system). The EU has chosen Maritime Spatial Planning instead of Marine Spatial Planning, acknowledging that it is a tool for the accomplishment of Blue Growth, to achieve greater trust and safety for investments. [12] [13] However the practice of planning does not always confirm a semantic. [12] [14] Conceptual fragmentation refers to the diversity of MSP approaches and the differences in implementing MSP in different institutional contexts. Institutional fragmentation refers to the patchwork of institutions, policies and regulations. Additionally, the sea and the coastlines are shared between states, making MSP transboundary by nature. [15]

Traditional big sectors (shipping, fishery), ocean energy sectors (offshore wind, tidal and wave, oil and gas mining), other place-based maritime sectors (marine aquaculture, marine aggregates and mining) [16] as well as tourism and leisure, underwater cultural heritage, nature conservation, scientific research, military defense are the main maritime activities and uses. The EU MSP Framework Directive (MSPD) [17] names especially energy, maritime transport, fisheries, aquaculture, tourism, raw materials, marine environment, prioritizing economic activities. All these maritime activities connect with terrestrial activities via ports or landing points (e.g. cables and pipelines) but also are closely interrelated with the terrestrial economy (eg. energy can be produced in the sea but is consumed mainly in terrestrial activities). Spatial efficiency of MSP endorses the concept of multi-use. [18]

MSP has many differences with Terrestrial Spatial Planning (TSP): (a) there is no private ownership of the sea but only exploitation rights and zones with specific rights (such as EEZ), (b) there are neither habitants of the sea nor settlement development, (c) it is a 4-dimension planning exercise (sea surface, water column, seabed, subsoil, time),

(d) flows are not related to infrastructure or population density, (e) the sea is being governed by multiple international and transnational conventions. [3] [5] Additional differences are the inability to delimitate dangers for the marine environment and the continuous mobility of many maritime activities and species of ecosystems, [19], as well as the up-until-now sectoral and fragmented approach. MSP should incorporate all spatial planning principles, and the differences among MSP and TSP should be treated as specific planning parameters. [20]

TSP has mainly chosen the delimitation of planning areas following existing administrative boundaries (e.g. municipal, regional). Administrative boundaries (international, regional etc) follow geomorphological formations as the easiest way to make boundaries visible. However, this zone delimitation approach divides ecosystems, contrary to the call of the MSPD on Member States to apply an ecosystem-based approach in their Maritime Spatial Plans, since the ecosystem-based approach defines ecosystem integrity as a necessary precondition for the delimitation of the planning area. This problem results in borders being unable to follow biophysical characteristics and it should lead to more flexible management schemes. [3] Of course, each Maritime Spatial Plan is being drafted and implemented on an already delimited marine area of each country. Zone delimitation in the UK, France and Greece, countries with international maritime presence and large marine areas, could be an interesting field of UNCLOS and ICZM Protocol zone integration testing.

There are approaches of MSP stating that it is encompassed into UNCLOS, due to UNCLOS's establishment on zones with varying rights and obligations. [21] By 2030 one third of EEZs worldwide will be planned via Marine Spatial Plans. [14] Spatial distribution of sovereignty, which is the real function of UNCLOS, depends on the cooperation of states regarding management rules. [22] UNCLOS has already set the scene of ocean zone delimitation. Territorial Waters, Contiguous Zone, Exclusive Economic Zone, Continental Shelf, Deep Sea and International Seabed are the zones delimited under the provisions of UNCLOS. Moreover, the ICZM Protocol of the Barcelona Convention sets the coastal zone, both on sea (internal and territorial waters) and land. The relation of MSP to international regulation was one of the issues addressed during the legislative procedure of the MSPD. [23]

## 2 UNCLOS maritime zones

International conventions are important to maritime spatial arrangements [5] and UNCLOS is a key reference point for MSP, [24] [25] [26] stating in its preamble that issues relating to the use of ocean space are closely interrelated and need to be considered as a whole, making MSP a logical advancement. The MSPD [17] makes clear that, to ensure consistency and legal clarity, the competencies relating to maritime boundaries and jurisdiction, set by the UNCLOS, may not be altered and the geographical scope of MSP should be defined in conformity with the UNCLOS provisions. Nevertheless, it should be noted that the maritime zones' delimitation under the provisions of the UNCLOS provokes tensions in the bilateral and multilateral relations of the countries. [20]

UNCLOS was signed in Montego Bay in 1982, after a decade of international negotiations. *"Hailed as the Constitution of the Ocean"* [27] and *"conscious that the problems of ocean space are closely interrelated and need to be considered as a whole"*, as it clearly stated at the preamble [28], it aims at reconciling competitive interests, including rights of coastal states (that secured political and economic power, territorializing the sea [29]) and flag states [30], lying between the freedom of resource and navigation management and the allocation of rights. [31]

It is a highly integrated international convention containing rules and regulations for marine space, maritime uses and activities and marine resources, setting the framework for the delimitation of international borders as well as the delimitation of zones with different legal status and associated rights and sets obligations for the preservation of the marine environment and scientific research in the high seas. It also differentiates the legal status among coastal states, flag states, landlocked states, geographically disadvantaged states and archipelagic states. The main zones of UNCLOS are the internal waters, the territorial sea, the exclusive economic zone (EEZ), the continental shelf, high seas and the Area. The breadth of all zones is measured from the baselines, which are the lines delimiting internal waters with the territorial sea. However, only the territorial sea, the EEZ and the continental shelf are included into national Maritime Spatial Plans.

The territorial sea (sea surface, seabed, subsoil) extends seawards up to 12 nautical miles from the baselines. The only limitation of the sovereignty over the territorial sea is the right of innocent passage, enjoyed by foreign flagged ships [32] that can be managed by the coastal state through the designation of sea lanes and traffic separation schemes. The EEZ lies beyond and adjacent to the territorial sea and extends up to 200 nautical miles seawards from the baselines. The continental shelf (seabed and subsoil) extends beyond the territorial sea to the outer edge of the continental margin or up to 200 nautical miles from its baselines. Countries have sovereignty over their territorial seas, sovereign rights in the EEZs to conduct certain activities and rights to exploit certain resources of the continental shelf. [29]

In the EEZ there is a scalar approach to rights and jurisdiction. The fact that coastal states enjoy sovereign and jurisdictional rights, instead of sovereignty, makes the establishment of protection areas or even multiple use areas (e.g. specially protected marine areas) subject to legal obstacles and constraints. [33] [34] The sovereign rights exercised in the EEZ include the exploration, exploitation, conservation and management of living and non-living natural resources of the seabed and subsoil and the superjacent waters and the economic exploration and exploitation of the zone (eg. the production of energy from the water, currents and winds). The jurisdiction exercised in the EEZ includes the establishment and use of artificial islands, installations and structures, marine scientific research and the protection and preservation of the marine environment. Exclusive rights in the EEZ refer to the construction, authorization and regulation of the operation and use of artificial islands, installations and structures, providing for a 500-meter safety perimetric zone. Moreover, the coastal state shall take proper conservation and management measures for the maintenance of the living resources and the restoration of populations of harvested species. All states enjoy: (a) freedom of navigation, freedom of overflight, freedom to lay submarine cables and pipelines with due

regard to the rights and duties of the coastal state and in compliance with the laws and regulations adopted by the coastal state, (b) access to the surplus of harvested living resources.

Coastal states exercise over the continental shelf sovereign rights and exclusive jurisdiction for the exploration and exploitation of mineral and other nonliving resources of the seabed and subsoil together with living organisms belonging to sedentary species. However, the UNCLOS allocation of rights only on sedentary species does not follow the concept of biodiversity associated with ecosystems and not individual species, rising issues of inconsistency. [35] [36] On the continental shelf all states are entitled to lay submarine cables and pipelines, subject to the conditions established by the coastal state and especially the delineation being subject to the consent of the coastal state. The rights of the coastal state over the continental shelf must not infringe or result in any unjustifiable interference with navigation and other rights and freedoms of other states.

## 3 The ICZM Protocol coastal zone

The Mediterranean countries, but also the EU, have signed the Barcelona Convention for the Protection of the Mediterranean Sea against pollution. Its geographical coverage of the Mediterranean Sea includes gulfs and excludes internal waters, except if there is a different provision in its 7 protocols. The ICZM Protocol (the 7$^{th}$ Protocol of the Barcelona Convention) [37] brings the coastal zones of the Mediterranean Sea to the forefront as a common natural and cultural heritage that needs to be protected and used prudently for the benefit of current and future generations, stressing the pressures on coastal zones from climate change and human activities. The Protocol acknowledges a need for a specific integrated approach for all the Mediterranean coastal zones.

The Contracting Parties of the ICZM Protocol introduced in 2017 the Conceptual Framework for Marine Spatial Planning as a guiding document and a management tool to facilitate the introduction of MSP into the Barcelona Convention system. The Conceptual Framework considers MSP as the main tool for the implementation of ICZM in the marine part of the coastal zone and aims to provide a common framework for the implementation of MSP in the Mediterranean Sea. [38] [39] The ICZM Protocol along with the MSP Conceptual Framework provide for common principles and MSP steps in the Mediterranean Region. [40]

Coherence between MSP and other related processes, such as ICZM is a requirement outlined by the MSPD (2014/89) [17] and Land Sea Interactions (LSI) are a prerequisite of the MSPD that can be found in the core of ICZM. LSI are generally related to natural or bio-geochemical processes and to socio-economic activities. MSP acknowledges LSI as interconnections (flows and processes) between terrestrial and marine elements acting in an amphidromous way. [40] Maritime activities need support installations on land, while many coastal activities are either both terrestrial and maritime or affect the marine environment and visual imagery or other maritime activities. [41] [40] MSP and ICZM are considered to be complementary both in geography and their very essence, as MSP aims at the rational planning of human activities whereas ICZM aims at the

comprehensive management of human activities, being mainly a governance scheme. [10]

ICZM is a dynamic process for the sustainable management and use of coastal zones, considering at the same time, the fragile nature of coastal ecosystems and landscapes, the diversity of activities and uses, their interactions and their impact on land and sea. [41] It is an integrated management approach, acknowledging the coastal area as a whole system formed by both its land and sea components, with interdependent human uses and coastal resources. [39] It has a broad overall and long-term perspective, focusing on local specificity and involvement of all parties and all relevant administrative bodies concerned. [42]

The coastal zone, defined by the ICZM Protocol, is the geomorphological area either side of the seashore in which the interaction between the marine and land parts occurs in the form of complex ecological and resource systems made up of biotic and abiotic components coexisting and interacting with human communities and relevant socio-economic activities. The seaward limit of the coastal zones is the external limit of the territorial sea and the landward limit of the competent coastal units is up to the definition of the state.

In the Mediterranean context, there is an evident overlap of the geographical scope of ICZM, as defined by the Protocol on ICZM, and MSP as defined by MSPD. [17] The marine geographical scope of ICZM (territorial sea), coincides with the marine geographical scope of MSP in case a country hasn't claimed an EEZ. [39] From this perspective, MSP can be seen as one of the main tools for implementing ICZM in the marine part of the coastal zone. [39]

## 4 MSP zone delimitation practices in Europe

There is a diversity of MSP approaches and contexts in Europe. Countries have developed MSP in line with their own planning traditions and administrative structures. [43] There can be various groupings of the way the European countries have implemented MSP. Countries with an MSP tradition prior to the MSPD had already an advantage and have already revised their Maritime Spatial Plans at least once. Among the countries that initiated the MSP process following the MSPD initiation, some have integrated the implementation of the MSPD into the Marine Strategy Framework Directive (MSFD) implementation system and others into the Blue Growth implementation system. The integration of MSPD into the national spatial planning systems has being both an issue of national jurisdiction (mostly in federal countries) and of integration of the coastal zone as a land-sea continuum or not. There are approaches where MSP is a different process from TSP (either avoiding or pursuing their overlap) and approaches where MSP and TSP are encompassed into comprehensive spatial plans. However, there is a common approach on the spatial coverage of marine waters, since most European Maritime Spatial Plans cover the territorial sea, the EEZ, the seabed and the subsoil, with exceptions mainly concerning coastal waters. [43] The EC [44] has identified four groups of Member States regarding the establishment of Maritime Spatial Plans.

This paper is a selective approach in highlighting key perspectives of MSP zone delimitation in three countries (the United Kingdom/England, France and Greece), following a European North – South context, but also focusing on the Mediterranean Sea in an Eastern-Western context. The UK and France are countries with mature spatial planning systems, whereas Greece hasn't yet accomplished the revision of all the first generation Regional Spatial Frameworks. However, all three countries are countries with international maritime presence and large marine areas, facing pressures due to the multiplicity and the density of existing and new maritime activities exercised. They all have chosen an integrated approach of MSP. The United Kingdom, being an EU MS at that time, has started the MSP process early, implementing Marine Spatial Plans that overlap with Terrestrial Spatial Plans in the terrestrial part of the coastal zone. France has chosen to implement MSPD together with MSFD, into joint plans (Documents Stratégiques des Façades). Greece has integrated MSP into the general spatial planning system, excluding the terrestrial part of the coastal zone from Maritime Spatial Frameworks, but hasn't adopted a Maritime Spatial Framework yet. All three countries have chosen a two-level approach, adopting a strategy document at the first level and Maritime Spatial Plans at the second level. Since Greece is in the middle of the process and has just adopted the strategy document (National Spatial Planning Strategy for the Maritime Space), while England and France have already accomplished MSP and are implementing Marine Spatial Plans, research on the delimitation practices followed could clarify the way MSP is being considered.

### 4.1 MSP and zone delimitation in the United Kingdom and England

The United Kingdom started a new approach of the sea and the coasts with the Marine and Coastal Access Act in 2009 [45], setting the scene for an integrated approach of marine and coastal areas from planning to licensing, providing a framework for a new system of marine management [46]. In 2020 the Marine Policy Statement [47] came into force. It outlines all policies and issues that need to be considered during the elaboration of Marine Spatial Plans and sets the framework of elaboration and implementation of Marine Spatial Plans. Marine Spatial Plans support the implementation of both the MSFD and the Water EU Directive, as well as the ICZM principles.

Coastal areas and coastal activities are managed in an integrated and holistic way, in line with the ICZM principles, as set in the 2002 Recommendation of the European Parliament and Council [48] [47]: (a) a broad holistic approach, (b) taking a long-term perspective, (c) adaptive management, (b) specific solutions and flexible measures, (d) working with natural processes, (e) participatory planning, (f) support and involvement of all relevant administrative bodies, (g) use of a combination of instruments. [48]

The UK marine area consists of the internal waters, the territorial sea, the EEZ and the continental shelf, including the bed and the subsoil. The landward limit of the UK marine area includes any area submerged at mean high water spring tide and the waters of every estuary, river, or channel, so far as the tide flows at mean high water spring tide. It also includes any area artificially closed, permanently or not, against the regular action of the tide and any area into which or from which seawater is caused or permitted to flow continuously or from time to time. There is also the provision for a temporal (seasonal, occasional or time-limited) form of spatial planning. [49] This creates a

geographic overlap of MSP and TSP at the inter-tidal zone, creating the potential to streamline the process for securing consent for development in the inter-tidal zone. [50] [51] The Marine Policy Statement clearly states that *this overlap will help organizations to work effectively together and ensure that appropriate harmonization of plans is achieved*. [47]

The 2009 Act divides UK waters into marine spatial plan areas with inshore areas (extending from 0 to 12 nautical miles, except for estuaries of tidal rivers, where the inshore areas extend some miles inland) and offshore areas (extending from 12 to 200 nautical miles). The English marine area has been divided into 11 marine spatial plan areas using information, expert advice and stakeholder views, including both coastal and marine areas: North East Inshore, North East Offshore, East Inshore, East Offshore, South East Inshore, South Inshore, South Offshore, South West Inshore, South West Offshore, North West Inshore, North West Offshore. However, the Marine Management Organisation may make specific local modifications to boundaries if the proposed boundaries could lead to unnecessary difficulties. [47]

### 4.2 MSP and zone delimitation in France

In 2009 France initiated an ambitious and long-term process regarding the management of marine and littoral waters. [52] Grenelle de la Mer, recognized as one of the most advanced policies of public participation in the formulation of maritime policy, [54] updated the provisions of the Environmental Code with a new section on marine and coastal areas [55]. The outcome of Grenelle de la Mer was a blue book on its engagements and a blue book on the sea and the ocean [56]. Grenelle de la Mer and Loi Grenelle 1, the law on the National Maritime Strategy, have been the milestone of Maritime Spatial Planning in France. Loi Grenelle 2, the law on ICZM and Marine Strategy, connected MSP to ICZM and Marine Strategy.

The French Marine Spatial Planning System consists of a National Strategy for the Sea and the Littoral and Sea Basin Strategic Documents. The National Strategy for the Sea and the Littoral, adopted in 2017 and revised in 2024, constitutes the framework for the protection of the marine environment, the valorization of marine resources and the integrated and concerted management of maritime and coastal activities. [57] It is the national strategic document for the protection of the marine environment, as well as the integrated management of maritime and coastal activities, setting the framework for achieving GES of marine waters and the sustainable use of marine resources, while considering the interactions of public policies on both coastal and marine areas, in an LSI approach. Marine Spatial Plans are specific sections of the Sea Basin Strategic Documents, linking the protection of the marine environment with the integrated management of maritime and coastal activities. Sea Basin Strategic Documents implement both MSFD and MSPD.

The French marine area consists of the internal waters, the territorial waters, the exclusive economic zone, and the continental shelf, including the seabed and the subsoil. The landward boundary corresponds to littoral administrative areas, where there are activities affecting the sea. The seaward limit is the outer limit of the EEZ on the water surface, the water column and the seabed. The littoral in the French MSP approach defines both coastal and transitional waters. Coastal waters are defined as marine waters

from the baselines and up to 1 nautical mile from the baseline, whereas transitional waters are defined as lagoons and brackish sea water in proximity to estuaries and affected by fresh river water. [58]

Sea basins have been identified by hydrologic, oceanographic, biogeographic, socio-oeconomic and cultural characteristics of the areas concerned. [59] However, even though the Sea Basin Strategies implement both MSFD and MSPD, there is a differentiation in the delimitation of marine planning areas. Both in the Manche Sea and the Atlantic Ocean, the areas defined for the implementation of the Marine Strategy follow the ecosystem-based approach, while the areas defined for the implementation of MSP follow the regional administrative boundaries, raising issues of added complexity in the process and risk of cohesion loss [52] The French continental marine area has been divided into 4 Sea Basins, including both coastal and marine areas, that is territorial waters and Exclusive Economic Zone: Eastern Manche – North Sea, North Atlantic – Western Manche, South Atlantic, Mediterranean.

### 4.3 MSP and zone delimitation in Greece

Greece encompassed MSP into the existing national spatial planning system setting as key objectives: (a) sustainable development and territorial cohesion, (b) the rational and comprehensive spatial development of maritime activities, (c) preservation, protection and enhancement of the environment. The initial transposition of MSPD [60] had encompassed ICZM into the Greek MSP approach. The following amendment of the transposing law [61] disconnected MSP from ICZM. The terrestrial part of the coastal zone was excluded from MSP, in order to avoid overlaps. However, it acknowledges that MSP must consider both LSI and the need for policies coordination regarding maritime spatial impacts [5]. The legal clarification of the relationship of Maritime Spatial Frameworks with Terrestrial Spatial Frameworks cannot overcome the absence of a process or a tool for the cooperation of MSP with TSP in the coastal zone in an LSI approach.

The Greek Maritime Spatial Planning System consists of the National Spatial Strategy for Maritime Space [62] and Maritime Spatial Frameworks. The National Spatial Strategy for Maritime Space is an integral part of the National Spatial Strategy as a visionary policy document setting the framework and the strategic guidelines for selected maritime activities and uses at the national level. Maritime Spatial Frameworks are aligned to the Regional Spatial Planning level but can be of trans-regional, regional or sub-regional level to serve best the ecosystem-based approach. The integration of MSP into Greece's hierarchical spatial planning system has resulted in Sectoral Spatial Frameworks of national scale prevailing over Maritime Spatial Frameworks. In addition, there is a prioritization of sectoral specific legal framework of maritime activities (offshore wind farms, oil and gas exploitation) over comprehensive MSP, promoting a fragmented approach.

The Greek marine area consists of the territorial sea, the EEZ, including the seabed and the subsoil, and the continental shelf. The landward limit is defined by the baselines and the seaward limit is the external border of the Exclusive Economic Zone. The baselines are chosen as the landward limit, to fully exclude the terrestrial part of the coastal zone and internal waters from MSP to avoid conflicts with TSP. [63] However, since

Greece hasn't ratified the ICZM Protocol yet and there is no national legal framework to plan and manage the coastal zone, it is not clear how LSI will be integrated into the Maritime Spatial Frameworks. It should be mentioned that the exclusion of the terrestrial part of the coastal zone raised many reactions during the public consultation of the amending law. Moreover, the terrestrial part of the costal zone is already fragmented in a zoning approach that prevents comprehensive planning.

The 2025 Ministerial Decision divides the Greek marine area into 4 Marine Spatial Units (MSUs): MSU1 (North Aegean Sea), MSU2 (South Aegean Sea, Levantine Sea and Cythera Sea), MSU 3 (marine areas around Crete) and MSU 4 (Ionian Sea). [64] [65] The criteria for the delimitation of Marine Spatial Units depend mainly on characteristics, pressures, functional relations and the interrelation of MSUs with national strategic choices.

## 5 Conclusion

The UNCLOS provisions form the basis of MSP. They define zones and jurisdictions for different activities and uses that all signing countries need to comply with. The UK seems to have fully considered the different legal status of the UNCLOS zones, by dividing its marine area for MSP purposes into inshore and offshore marine areas - that is areas of jurisdiction, sovereignty and sovereign rights. France and Greece do not consider this differentiation of rights in the division of marine areas and both the territorial sea and the EEZ as a single marine area.

The ICZM Protocol coastal zone definition is fully considered in the terrestrial part of the French zone delimitation. England, besides the fact that it is not a Contracting Party to the Barcelona Convention, follows the ecosystem-based approach in a similar to the ICZM Protocol way, for: (a) the delimitation of the terrestrial part of all marine zones, (b) the identification of marine borders between two adjacent marine spatial planning areas. Greece has excluded the terrestrial part of coastal waters, as well as the internal waters from marine spatial planning areas.

Since both England and France have already accomplished MSP, the evaluation of the implementation will assess whether the zone delimitation already applied has been successful. In the case of Greece, that adopted the National Spatial Planning Strategy of the Maritime Space and delimitated MSUs a few days ago (April 2025), the elaboration of Maritime Spatial Frameworks should clarify the way LSI will be considered, since neither an LSI process has been adopted nor the ICZM protocol has been ratified.

## References

1. Douvere F.: The Importance of Marine Spatial Planning in Advancing Ecosystem-based Sea Use Management. Marine Policy, 32, pp. 762-771 (2008) https://doi.org/10.1016/j.marpol.2008.03.021
2. Douvere, F. and& Ehler C.: New Perspectives on Sea Use Management. Initial Findings from European Experience with Marine Spatial Planning. Journal of Environmental Management, 90, pp. 77-88 (2009) https://doi.org/10.1016/j.jenvman.2008.07.004

3. Coccossis H. & Beriatos E.: Spatial Development and Planning, Marine Spatial Planning and Integrated Coastal Zone Management. (in Greek) Aeichoros – Special Issue on MSP, 23, pp. 4-11 (2016) https://journals.lib.uth.gr/index.php/aeihoros/article/view/365
4. Wassenhoven, L.: Maritime Spatial Planning. Europe and Greece. (in Greek), University of Crete, Herakleion (2017)
5. Melissas D. & Asprogerakas E.: Maritime Spatial Planning and Wind Energy. (in Greek) Sakkoulas, Athens – Thessaloniki (2025)
6. Douvere F.: Marine Spatial Planning. Concepts, Current Practice and Linkages to other Management Approaches. Ghent University, Belgium. (2010)
7. Ehler, C. & Douvere, F.: Marine Spatial Planning a Step-by-Step Approach toward Ecosystem-Based Management. Intergovernmental Oceanographic Commission, Paris, (2009) https://unesdoc.unesco.org/ark:/48223/pf0000186559
8. Papageorgiou, M., Pozoukidou, G., Istoriou, T., & Kostopoulou, T.: Inclusive Maritime Spatial Planning. Stakes at the Regional Level. Sustainability, 16, (2024) https://doi.org/10.3390/su162210148
9. Kyvelou S.: Maritime Spatial Planning as Evolving Policy in Europe. Attitudes, Challenges, and Trends. EQPAM, 6 (2017)
10. Asprogerakas E., Lazoglou M.: Marine Spatial Plans as instruments of the Greek spatial planning system. (in Greek) Proceedings of the 5th Panhellenic Conference on Spatial Planning and Regional Development: Modern Concerns about Spatial Planning and Development, Volos, pp.465-476 (2019)
11. Crowder, L., & Norse, E.: Essential Ecological Insights for Marine Ecosystem-Based Management and Marine Spatial Planning. Marine Policy, 32, pp. 772–778 (2008) https://doi.org/10.1016/j.marpol.2008.03.012
12. Platias, Ch., Rampavila, M.: Maritime Spatial Planning. Environmental Concerns and Demands for Policy and Governance. (in Greek) 16th Conference for ERSA-GR Strategies for local and regional development: modern challenge, Athens, (2018)
13. Lukic, I., Schultz – Zehden, A., Fernandez, X., Pascual, M., Nigohosyan, D., Maarten de Vet, J.: Maritime Spatial Planning for Blue Growth – Technical Study. Publications Office of the European Union, Luxembourg (2018) https://doi.org/10.2826/04538
14. Ehler Ch., Zaucha J., Gee K: Maritime/Marine Spatial Planning at the Interface of Research and Practice. In: J. Zaucha, K. Gee (eds) Maritime Spatial Planning: Past, Present, Future. Palgrave Macmillan, Cham. pp. 1-22 (2019) https://doi.org/10.1007/978-3-319-98696-8
15. van Tatenhove, J. P. M.: Transboundary Marine Spatial Planning. A Reflexive Marine Governance Experiment? Journal of Environmental Policy & Planning, 19, pp. 783–794 (2017) https://doi.org/10.1080/1523908X.2017.1292120
16. Schultz-Zehden A., Weig B., Lukic I.: Maritime Spatial Planning and the EU's Blue Growth Policy: Past, Present and Future Perspectives. In: Zaucha, J., Gee, K. (eds) Maritime Spatial Planning. Palgrave Macmillan, Cham. pp. 121-150 (2019)
17. European Commission: Directive 2014/89/EU of the European Parliament and of the Council of 23 July 2014 Establishing a Framework for Maritime Spatial Planning. (2014) https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0089&from=EN
18. Papageorgiou, M., & Kyvelou, S.: Considering LSI in MSP in Greece: Updates and Challenges. Global NEST International Conference on Environmental Science & Technology (2021)
19. European Commission/ Directorate General of Maritime Affairs and Fisheries: Socio-economic Studies in the Field of the Integrated Maritime Policy of the European Union - Legal Aspects of Maritime Spatial Planning. Summary report. Office for Official Publications of the European Commission, Luxembourg (2009) https://op.europa.eu/en/publication-detail/-/publication/f8a0f34e-f158-4ce2-8768-2078b03dd11c

20. Rampavila, M., Avgerinou – Kolonias, S.: Conceptual Approaches of Maritime Spatial Planning. Principles and Planning Parameters. In: Book of papers of Aesop Conference: Planning for Transition, 32, Venice, pp. 4295-4304, (2019) https://proceedings.aesop-planning.eu/index.php/aesopro/issue/view/4/4
21. Kuokkanen, T.: Marine Spatial Planning in International Law before MSP. In: D. Hassan, T. Kuokkanen & N. Soininen (eds) Transboundary Marine Spatial Planning in International Las. Routledge, Oxford, pp. 23-41 (2015)
22. Rampavila, M.: Overview of International and Regional Framework for Zone Delimitation and Ecosystem-based Approach on MSP. (in Greek) (to be published)
23. Zervaki A.: Introducing Maritime Spatial Planning Legislation in the EU: Fishing in Troubles Waters. Maritime Safety and Security law Journal, 1, pp. 95-114 (2015)
24. Kidd S., Jones H., Jay S.: Taking Account of Land-Sea Interactions in Marine Spatial Planning. In: Zaucha, J., Gee, K. (eds) Maritime Spatial Planning. Palgrave Macmillan, Cham. pp. 245-270 (2019)
25. Maes Fr.: The International Legal Framework for Marine Spatial Planning. Marine Policy, 32. pp. 797-810 (2008) https://doi.org/10.1016/j.marpol.2008.03.013
26. Soininen N., Hassan D.: Marine Spatial Planning as an Instrument of Sustainable Ocean Governance. In: Hassan D, Kuokkanen T, Soininen N (eds) Transboundary marine spatial planning and international law. Routledge, London, pp 3–20 (2015)
27. Werle, D., et al: International Ocean Governance and Capacity Development: Editor's Preface and Acknowledgements. In: D. Werle, et al, (eds). International Ocean Governance and Capacity Development. Brill Nijhoff, Leiden and Boston. pp. xxi-xxiii (2018) https://brill.com/edcollbook-oa/title/36420
28. Watson-Wright, W. & Luis Valdes, J.: Fragmented Governance of our Global Ocean. In: D. Werle et al (eds). The Future of Ocean Governance and Capacity Development. Leiden and Boston: Brill Nijhoff, pp. 16-22. (2018) https://brill.com/edcollbook-oa/title/36420?srsltid=AfmBOor6e4N1eLUKUo-SijfaXetbLmEa1m15x-8BI2edKxahorZPQptI
29. Gee K.: The Ocean Perspective. In: J. Zaucha, K. Gee (eds) Maritime Spatial Planning: Past, Present, Future. Palgrave Macmillan, Cham. pp. 23-45 (2019) https://doi.org/10.1007/978-3-319-98696-8
30. Hassan, D. & Soininen, N.: United Nations Convention on the Law of the Sea. In: D. Hassan, T. Kuokkanen & N. Soininen (eds). Transboundary Marine Spatial Planning and International Law. Routledge, Oxford, pp. 60-84 (2015)
31. Pyc D.: The role of the Law of the Sea in Marine Spatial Planning. In: Zaucha, J., Gee, K. (eds) Maritime Spatial Planning. Palgrave Macmillan, Cham. pp. 375-396 (2019)
32. Dupuy, R. - J., 1991: The Sea under National Competence. In R. - J. Dupuy and D. Vigues, A Handbook on the new Law of the Sea. Vl I, pp. 247-314, Dordrecht, Martinus Nijhoff Publishers, ISBN 978-960-08-0643-4
33. Dux, T.: Specially Protected Marine Areas in the Exclusive Economic Zone (EEZ). The Regime for the Protection of Specific Areas of the EEZ for Environmental Reasons under International Law. LIT Verlag Münster. (2011)
34. Czbulka, D., Bosecke, T.: Marine Protected Areas in the EEZ in light of International and European Community Law – Legal Basis and Aspects of Implementation. In: von Nordheim, H., Boedecker, D., Krause, J.C., (eds) Progress in Marine Conservation in Europe, Springer, Berlin, Heidleberg, pp. 27-46 (2006) https://doi.org/10.1007/3-540-33291-X_3
35. Mossop, J.: The Relationship between the Continental Shelf Regime and a new International Instrument for Protecting Marine Biodiversity in Areas Beyond National Jurisdiction. ICES Journal of Marine Science, 75, pp. 444-450, (2018) https://doi.org/10.1093/icesjms/fsx111

36. Alencar Mayer Feitosa Ventura, V.: Legal Basis of Coastal States' Environmental Jurisdiction on the Continental Shelf. Environmental Jurisdiction in the Law of the Sea. Springer, (2020) https://doi.org/10.1007/978-3-030-50543-1_7
37. UNEP(DEPI)/MED IG.18.: Protocol on Integrated Coastal Zone Management in the Mediterranean. Conference of Plenipotentiaries. Madrid, (2008) https://www.unep.org/unepmap/node/20874
38. UNEP(DEPI)/MED IG.23/23.: Conceptual Framework for Marine Spatial Planning" in the Mediterranean Sea. 20th Ordinary Meeting of the Contracting Parties to the Barcelona Convention, Tirana (2017) https://www.unep.org/unepmap/meetings/cop-decisions/cop20-outcome-documents
39. Ramieri, E., Bocci, M., Markovic, M.: Linking Integrated Coastal Zone Management to Maritime Spatial Planning: The Mediterranean Experience. In: Zaucha, J., Gee, K. (eds) Maritime Spatial Planning. Palgrave Macmillan, Cham. pp. 271-294 (2019)
40. Bocci M., Markovic M., Mlakar A., Stancheva M., Borg M., Carella F., Barbanti A., Ramieri E.: Land-Sea-Interactions in MSP and ICZM. A Regional Perspective from the Mediterranean and the Black Sea. Marine Policy, 159, (2024) https://doi.org/10.1016/j.marpol.2023.105924
41. Avgerinou – Kolonias, S., Rampavila, M.: Coastal Urbanization as a Result of the Absence of an Integrated Maritime Spatial Planning Approach. Proceedings of the International Conference on Changing Cities III: Spatial Design, Landscape and Socio-economic Dimensions, Syros – Delos – Mykonos, pp. 2135-2147 (2017)
42. Asprogerakas E., Serraos K., Sofianopoulos D.: Policies for the replanning of urban coastal areas. The case of Athens. Comparisons with Hamburg. XXI AESOP Conference Proceedings., Naples (2007) https://doi.org/10.1007/978-3-319-98696-8_12
43. Zaucha J., et al: Implementing the EU MSP Directive. Current Status and Lessons Learned in 22 EU Member States. Marine Policy, 171. (2025) https://doi.org/10.1016/j.marpol.2024.106425
44. European Commission: Report from the Commission to the European Parliament and the Council Outlining the Progress Made in Implementing Directive 2014/89/EU Establishing a Framework for Maritime Spatial Planning. Brussels, COM (2022) 185 final (2022) https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52022DC0185
45. United Kingdom Parliament: Marine and Coastal Access Act. (2009) https://www.legislation.gov.uk/ukpga/2009/23/contents
46. Slater, A. - M., Claydon, J.: Marine Spatial Planning in the UK. A Review of the Progress and Effectiveness of the Plans and their Policies. Environmental Law Review, 22, pp. 85-107 (2020)
47. United Kingdom Parliament: The UK Marine Policy Statement. (2011) https://assets.publishing.service.gov.uk/media/5a795700ed915d042206795b/pb3654-marine-policy-statement-110316.pdf
48. European Commission: Recommendation of the European Parliament and of the Council Concerning the Implementation of Integrated Coastal Zone Management in Europe. (2002) https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52007 DC0308
49. United Kingdom, Department for Environment, Food and Rural Affairs: A Description of the Marine Planning System for England. London (2011) https://assets.publishing.service.gov.uk/media/5a7aef8bed915d670dd7fa39/110318-marine-planning-descript.pdf
50. Turner, J., Essex, S.: Integrated Terrestrial and Marine Planning in England's Coastal Inter-tidal Zone. Assessing the Operational Effectiveness of the Coastal Concordat. Marine Policy, 72, pp. 166-175 (2016) https://doi.org/10.1016/j.marpol.2016.07.014

51. Casimiro, D. and Guerreiro, J.: Trends in Maritime Spatial Planning in Europe: An Approach to Governance Models. Journal of Environmental Protection, 10, pp. 1677-1698, (2019) https://doi.org/10.4236/jep.2019.1012100
52. Cudennec, A.: Integrated Coastal Zone Management in France: Some Perspectives. In: A. Chircop, F. Goerlandt, C. Aporta & R. Pelot, (eds) Governance of Arctic Shipping: Rethinking Risk, Human Impacts and Regulation. Halifax, Springer, pp. 301-311 (2020) https://doi.org/10.1007/978-3-030-44975-9_16
53. Trouillet, B., Guineberteau, T., de Caqueray, M., Rochette, J.: Planning the Sea. The French Experience. Contribution to Marine Spatial Planning Perspectives. Marine Policy, 35, pp. 324-334 (2011) https://doi.org/10.1016/j.marpol.2010.10.012
54. République Française/ Ministère de l'Environnement, de l'Energie et de la Mer: Stratégie Nationale pour la Mer et le Littoral. (2017) https://www.dirm.memn.developpement-durable.gouv.fr/IMG/pdf/strategie_nationale_mer_littoral_20172023.pdf
55. République Française : Le Livre Bleu des Engagements du Grenelle de la Mer. (2009) https://www.vie-publique.fr/rapport/30608-le-livre-bleu-des-engagements-du-grenelle-de-la-mer-10-et-15-juillet-2
56. Trouillet, B.: La Planification de l'Espace Maritime. In: Desse, M., Herbert, De la Gestion des Zones côtières (GIZC) à la Planification Spatiale Maritime (PSM). Dunod, Paris, pp. 435-446 (2024) https://hal.science/hal-04649668v1
57. Queffelec, B.: Planification de l'Espace Maritime et Approche Écosystémique en Contexte Transfrontalier. Illustration franco-belge. Vertigo, 18 (2013) https://journals.openedition.org/vertigo/14282?lang=pt
58. République Française/ Ministère de la Transition Ecologique et Solidaire: Document Stratégique de Façade Méditerranée (2019) https://www.dirm.mediterranee.developpement-durable.gouv.fr/document-strategique-de-facade-mediterranee-r335.html, https://www.dirm.mediterranee.developpement-durable.gouv.fr/la-strategie-de-facade-maritime-est-adoptee-a2892.html
59. Morand – Deviller, J.: Stratégie Politique et Droit Souple. La Stratégie Nationale pour le Milieu Marin. Cahiers du GRIDAUH, 2, pp. 229-242 (2015) https://droit.cairn.info/revue-cahiers-du-gridauh-2015-2-page-229?lang=fr
60. Hellenic Republic/ Government: Law 4546/2018 Transposition into Greek Law of the 2014/89/EC Directive "Establishing a framework for maritime spatial planning" and other. (in Greek) Official Journal no 101A'/2018. (2018) https://search.et.gr/el/fek/?fekId=569332
61. Hellenic Republic/Government: Law 4759/2020 Modernization of Spatial Planning and Urban Planning Legislation and other. (in Greek) Official Journal no 245A'/2020. (2020) https://search.et.gr/el/fek/?fekId=600002
62. Hellenic Republic/ Ministerial Council Act: National Spatial Strategy for Maritime Space. (in Greek) Official Journal no 227D'/2025. (2025) https://search.et.gr/el/fek/?fekId=780316
63. Gourgiotis, A., Yannakou, A. & Salata, K. - D.: Marine Spatial Planning in Greece. The Approach of the first Marine Spatial Planning Framework for the Wider North Aegean Region (Marine Spatial Unit 1). (in Greek) Aeihoros, Essays on Spatial Planning and Development, 37, pp. 30-66 (2023) https://doi.org/10.26253/heal.uth.ojs.aei.20.23.1797
64. Yannakou, A., Gourgiotis, A., Salata, K.D.: Marine Spatial Planning in Greece. Issues Raised from the Preparation of the Marine Spatial Framework for the North Aegean Region. Planning Practice & Research, pp. 1-19 (2024) https://doi.org/10.1080/02697459.2024.2365516
65. Hellenic Republic/ Ministry of Environment and Energy Ministerial Decision: Delimitation of Spatial Areas for Maritime Spatial Plans. (in Greek) (2025) https://diavgeia.gov.gr/doc/ΨΙΚ64653Π8-ΕΦΨ?inline=true

# Maritime Spatial Planning in Greece: Assessing the balance between energy infrastructure and marine protection

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**Abstract**. This paper examines the challenges and contradictions of Maritime Spatial Planning (MSP) in Greece, focusing on the tension between energy infrastructure development and marine conservation. Through an analysis of legislative frameworks, energy projects, and marine protected areas (MPAs), it highlights how Greece's pursuit of blue growth and energy hub status has led to the privatization and fragmentation of marine spaces. The study critiques the prioritization of hydrocarbon extraction, LNG infrastructure, and offshore renewable energy investments over environmental protection, emphasizing the risks posed to marine ecosystems and local communities. It further explores governance deficiencies within Greece's MSP framework, particularly delays in adopting regulatory tools, illustrating how the existing regulatory landscape facilitates economic exploitation at the expense of conservation, resulting in fragmented and politically driven spatial planning. Drawing on recent critical literature, the paper argues for a shift toward a truly ecosystem-based approach that prioritizes environmental sustainability and community resilience. It concludes by advocating for more adaptive, dynamic conservation strategies, such as flexible MPAs, that respond to ecological needs rather than rigid economic planning.

**Keywords:** Greece, Maritime Spatial Planning (MSP), ocean grabbing, energy infrastructure, marine conservation, hydrocarbon extraction, governance

## 1 Introduction

As European countries increasingly rely on natural gas as a transitional energy source to meet climate targets, the adoption of "blue growth" policies by international forums and organizations has intensified the exploitation and privatization of coastal and marine spaces. This paper examines the concept of the "Blue Fix" as described by Brent et al. (2020), which argues that the discourse surrounding blue growth facilitates new opportunities for capital accumulation. Through an in-depth document analysis, this study explores the legal framework governing maritime space, with a particular focus on energy infrastructure, including hydrocarbon extraction, floating LNG installations, and renewable offshore energy projects.

The transnational and multi-scalar nature of hydrocarbon extraction and blue growth policies has contributed to the increasing enclosure of marine and coastal areas, exerting considerable pressure on ecosystems. Numerous scholars in human geography, as well as international organizations, have documented the environmental and socio-political consequences of such activities, often referring to them as instances of "ocean grabbing" (UN, 2020; Agardy, 2020; Barbesgaard, 2018; Bennett et al., 2015; Pedersen et al., 2014; De Schutter, 2012) and "ocean privatization" (Schlüter et al., 2020; Ertör & Hadjimichael, 2020).

This article critically examines the environmental and governance challenges associated with Maritime Spatial Planning (MSP) in Greece, particularly in relation to:

1. The legal framework enabling hydrocarbon extraction projects, which have already been ratified by the Greek state
2. The development of Floating Storage and Regasification Units (FSRUs), with one already operational and four others in various stages of permitting and development
3. The development of offshore wind farms and floating photovoltaic installations

In light of these developments, the article addresses the following research questions:

1. To what extent does Greece's maritime spatial planning framework accommodate or challenge the dominance of energy infrastructure over marine conservation?
2. How do existing legal and governance frameworks enable or constrain the spatial overlap between extractive concessions and Marine Protected Areas?
3. What are the implications of this overlap for ecological integrity and spatial justice in coastal and marine areas?

Three key themes emerge from this analysis:

First, the Greek state actively promotes blue growth by emphasizing the vast, untapped energy potential of the marine space. This approach has led to the delegation of marine space management to private entities through state-owned companies such as the Hellenic Hydrocarbons and Energy Resources Management Company (HEREMA)[9].

Second, the Greek state employs legal frameworks designed to facilitate capital circulation and resource control, ensuring that powerful economic actors maintain their influence over marine space governance.

Lastly, privatization processes span multiple domains. For example, the establishment of private rights over hydrocarbon exploitation is not merely a spatial issue but also a matter of governance. The extractive industry not only acquires the right to extract resources but also assumes authority over determining the suitability of various energy or other installations within specific marine areas. Consequently, extractive

[9]Hellenic Hydrocarbon Resources Management S.A. (the precursor of HEREMA) was established by Law 4001/2011 as the competent authority responsible for managing and overseeing the licensing process for hydrocarbon prospecting, exploration, and production rights on behalf of the Greek state. Its creation aimed to facilitate a more favorable investment environment for large-scale offshore hydrocarbon energy projects.

corporations exercise significant control over marine spaces, shaping their governance according to corporate interests rather than environmental sustainability or public benefit.

This study adopts a qualitative research design grounded in critical policy analysis. Primary sources include Greek legislation on environment and energy, spatial planning documents, and EU-level strategies such as the EU Biodiversity Strategy for 2030 and the Ecosystem-based Approach in Maritime Spatial Planning. The paper also draws on scholarly literature on blue growth, ocean governance, and MSP, drawing from Greek, Mediterranean, and broader international contexts. To support the analysis, visual data are included: a geospatial map showing the overlap between hydrocarbon blocks and designated MPAs, and a table summarizing these overlaps. A case study of the Ionian Sea and the marine corridor stretching from western Peloponnese to south Crete illustrates the spatial overlap between energy development zones and biodiversity protection areas (e.g., Natura 2000 sites and the proposed Ionian Marine Park). The analytical framework emphasizes regulatory gaps, contradictions between energy and environmental policy, and spatial justice concerns.

By critically assessing the intersection of blue growth policies, energy infrastructure expansion, and maritime spatial governance, this study aims to highlight the tensions between economic development and marine conservation in Greece's MSP policies.

Chapter 2 provides an overview of the legislative and policy framework governing MSP in Greece, highlighting the challenges of reconciling energy development with environmental protection. It explores the evolution of maritime spatial policies, and examines the role of EU directives and international agreements in shaping Greece's approach to MSP.

Chapter 3 delves into the impacts of MSP policies on Marine Protected Areas (MPAs). It examines governance challenges, including delays in management plan approvals and the subordination of conservation priorities to economic zoning. Through pilot case studies from the Greek Seas, the chapter illustrates how regulatory loopholes and political pressures undermine the integrity of MPAs.

Chapter 4 critically assesses the broader implications of Greece's MSP strategy, highlighting its alignment with the expansion of offshore energy infrastructure, including hydrocarbon exploration, LNG terminals, and offshore renewable energy investments. It discusses how Greece's spatial planning has been shaped by industrial and energy-sector imperatives, resulting in fragmented governance and the marginalization of conservation efforts. The discussion extends to alternative MSP models, such as ecosystem-based management, that could provide a more adaptive and sustainable approach to marine governance.

Chapter 5 synthesizes the study's findings, emphasizing the need for a shift toward an ecosystem-based approach to MSP. It argues that without significant policy reforms and stricter environmental safeguards, Greece's marine and coastal environments will continue to face increasing degradation. The chapter calls for a re-evaluation of hydrocarbon licensing, and advocates for a more holistic approach that fosters sustainable marine governance, ensuring that marine protection is not an afterthought but a fundamental pillar of a viable marine environment, prioritizing local community needs over energy infrastructure expansion.

## 2 Different Approaches and Challenges in Maritime Spatial Planning

In recent years, there has been a growing global interest in the development of maritime spatial plans by coastal nations. A recent review of the international literature (Frazão Santos et al., 2018) indicates that the vast majority of coastal states are actively engaging in MSP initiatives, drafting maritime spatial plans for their marine and coastal zones. Today, MSP has become an increasingly significant field, both scientifically and politically, on a global scale. As of 2021, over forty-five countries worldwide are either implementing or approving marine spatial plans, with dozens more laying the groundwork [10]. According to UNESCO-IOC, 126 countries and territories are engaged in MSP initiatives, ranging from early stages (such as establishing pilot projects and MSP working groups) to the revision and adaptation of existing plans [11].

Given that MSP is a relatively new and inherently broad field, a significant concern that has emerged is its predominant focus on the economic exploitation of marine resources. This approach often prioritizes the use of marine spaces for industrial activities such as fisheries, energy extraction, and large-scale tourism infrastructure, rather than adopting a holistic perspective that balances economic, social, and environmental dimensions.

Relevant literature has raised concerns regarding the protection of marine ecosystems and the safeguarding of traditional land and sea uses (Portman et al., 2013) in light of the increasing expansion of large-scale, high-impact industries in marine spaces. Within this context, there is a growing risk that MSP primarily serves as a tool to mitigate conflicts between large industrial users rather than as a mechanism that benefits the diverse groups who share the commons of the seas (Agardy, 2020).

In recent years, the promotion of "blue growth" has gained significant interest, contributing to the further exploitation of coastal and marine spaces alongside other energy infrastructure projects, such as hydrocarbon extraction and floating LNG platforms. Over a decade since the European Union formalized blue growth as a policy framework (European Commission, 2012), it has become nearly impossible to engage with marine governance or development without encountering this concept. However, the precise nature of the blue economy's promise for sustainable ocean development remains persistently unresolved, with various stakeholders advancing divergent, and at times conflicting, visions of what sustainable ocean development should look like, how it should be achieved, and whom it should serve.

The critical literature surrounding blue growth (Barbesgaard, 2018; Ertör & Hadjimichael, 2020; Mallin & Barbesgaard, 2020; Brent et al., 2020) frames it as an economic strategy aimed at securing growth in marine spaces, where emerging industries seek opportunities for resource exploitation. Within the EU, blue growth is officially described as "the long-term strategy to support sustainable growth in the marine and maritime sectors as a whole," portraying the seas as "a driver for the European

[10]https://maritime-spatial-planning.ec.europa.eu/practices/mspglobal-international-guide-marinemaritime-spatial-planning-0
[11]https://www.mspglobal2030.org/msp-roadmap/msp-around-the-world/

economy with great potential for innovation and growth" (European Commission, 2019). The five key sectors prioritized under this strategy include marine aquaculture, coastal and maritime tourism, marine biotechnology, ocean energy, and seabed mining.

According to Bennett et al. (2019), the intensive global focus on developing the "blue economy" frequently overlooks principles of social equity and environmental sustainability, posing risks to both marine ecosystems and human well-being. Therefore, bold policies and institutional actions are required, as the unregulated expansion of new economic activities at sea coupled with the further intensification of existing ones, threatens to exacerbate pressures on already vulnerable marine ecosystems.

The impacts of seabed extraction on marine ecosystems can be devastating, including the loss of unique species and the destruction of sensitive deep-sea habitats. According to Vanreusel et al., (2016) and Danovaro et al., (2017), other significant impacts include the generation of massive sediment plumes that threaten marine life, noise pollution, vibrations, and light pollution from extraction machinery and seismic surveys, which affect sensitive ecosystems and marine mammals, as well as the disruption of submarine carbon pipelines. In response to these risks, the aforementioned studies propose stringent precautionary measures to mitigate these negative impacts. These include a strict zoning of protected areas based on the current biodiversity of these habitats. This must occur before extraction begins, allowing scientists to proactively identify at-risk species rather than retroactively documenting extinctions. Additionally, they advocate a moratorium on new exploration licenses for hydrocarbons and seabed minerals in the deep sea until a network of protected habitat zones is established. Moreover, careful monitoring of the intensity and scale of disturbances caused by seabed extraction is necessary, with immediate cessation of activities if any failures are detected.

Uncontrolled economic development in marine spaces can result in economic inequality, benefiting only large industrial investors while causing devastating social and cultural impacts. This may expose vulnerable social groups to pollution and displace local populations (Bennett et al., 2019). Social movements and environmental organizations argue that “ocean grabbing” (analogous to “land grabbing”) occurs as marine space is enclosed and privatized for the benefit of large industrial sectors (Bennett et al., 2015), such as extraction, energy installations, transportation, and aquaculture. Bennett et al. (2021) underline how increasing competition over marine space has led to the exclusion of small-scale fishers (SSF), Indigenous communities, and other marginalized users. In the U.S., for instance, marine renewable energy development has triggered space-use conflicts between SSF and government agencies, with fishers holding little power in decision-making. In Scotland, Canada, New Zealand, and Australia, blue growth projects, such as offshore wind farms, have jeopardized marine tenure rights of Indigenous communities (Kerr et al., 2015). Global discussions highlight the need for achieving social equity and “blue justice” in contrast to the problematic policy framework of the “blue economy” that dominates current marine policies and governance (Schutter et al., 2021).

At a broader policy level, the risks are compounded when MSP fails to adequately anticipate the spatial demands of future sectors or assess trade-offs between uses. Galparsoro et al. (2025), assessing MSP in Spain and France, found that current national plans often derive from EU requirements but lack foresight in anticipating spatial

conflicts. Their evaluation, conducted through the Ecosystem-Based Marine Spatial Planning (EB-MSP) assessment tool, identified major gaps in cross-sector trade-off analysis, such as energy expansion versus fishing ground preservation. Failure to consider these factors, they warn, could result in ecological degradation and social unrest.

In this context, the role of MSP as a policy tool for regulating and organizing marine and coastal spaces is examined. The effectiveness of MSP depends on whether its planning proposals are adopted or undermined through either the absence of planning or the fragmentation of marine spaces into "marine plots" and development zones. For MSP to be effective and equitable, special attention must be given to the fair representation and participation of vulnerable social groups and users in decision-making processes. New approaches to more inclusive and socially conscious governance should be adopted, along with increased awareness of how new boundaries, property rights, and activities can affect the rights, livelihoods, and food security of local communities (Bennett et al., 2019) that depend on the preservation of the marine environment.

By adopting an ecosystem-based approach in MSP, there is potential to reverse detrimental policies that privatize marine spaces and exclude or prohibit the most vulnerable uses and users. According to the relevant literature (Frazão Santos et al., 2018), in various countries where the ecosystem-based approach is implemented, MSP places less emphasis on economic growth and instead focuses on achieving the sustainability of marine space uses and the equitable distribution of benefits among users. In such cases, MSP can identify areas in need of protection and regulate protected zones within a marine spatial plan that prioritizes the conservation of marine areas and their ecosystems. This approach centers on the preservation of marine ecosystems while strengthening traditional values and uses (Gissi et al., 2018; Portman et al., 2013).

The European Union's Directive 2014/89/EU[12], which sets the framework for MSP across the 22 coastal member states, explicitly emphasizes the importance of an ecosystem-based approach. This approach aims to ensure

> "that the collective pressure of all activities is kept within levels compatible with the achievement of good environmental status and that the capacity of marine ecosystems to respond to human-induced changes is not compromised, while contributing to the sustainable use of marine goods and services by present and future generations."

While the Directive mandates member states to establish MSP frameworks, the real challenge lies in balancing the expansion of energy infrastructure with the conservation of marine biodiversity. According to Borja et al. (2024), cumulative pressures from maritime transport, seabed extraction, and infrastructure development are already degrading ocean health and undermining human well-being. The authors call for urgent action to monitor these pressures, arguing that MSP should incorporate the principles of the UN Decade of Ocean Science and the Sustainable Development Goals (SDGs) to maintain the resilience of marine ecosystems. New legislative developments at the

[12]European Commission, Report on the implementation of the Marine Strategy Framework Directive, Brussels, 25.6.2020, https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593613439738&uri=CELEX:52020DC0259

EU level, such as the Nature Restoration Law (Hering et al., 2023), underscore the need to adapt existing MSP frameworks. These initiatives require integrated assessments of future ecological and socio-economic conditions. Yet, as Galparsoro et al. (2025) demonstrate, many national plans still lack the flexibility and foresight required for long-term adaptive management. In summary, the promise of MSP to deliver sustainable and equitable marine governance hinges on its ability to genuinely balance industrial expansion with biodiversity protection, social equity, and long-term ecosystem health.

This paper examines how Greece is addressing these challenges, particularly in terms of policy development and the resolution of spatial allocation conflicts. However, the recent discovery of underwater mineral deposits introduces additional risks and challenges for MSP, particularly in safeguarding the Mediterranean's fragile ecosystems and unique marine biodiversity. These developments underscore the urgency of implementing robust and precautionary planning measures to prevent irreversible environmental degradation.

## 3 The Overlapping of Offshore Energy Infrastructures with Marine Protected Areas as a Threat to Marine Conservation

The Mediterranean Sea, as the broader spatial unit encompassing Greece's marine territory, provides a critical lens for examining the complex interactions and conflicts associated with recently discovered mineral resources. This region spans over 20 countries across three continents, characterized by multiple geopolitical tensions, large (and growing) populations, extensive coastal development, and the overexploitation of natural resources. These factors collectively pose significant threats to biodiversity conservation.

While marine protected areas (MPAs) coverage in the Mediterranean more than doubled to 12.3% between 2012 and 2022 efforts must intensify significantly to meet the EU Biodiversity Strategy's target of protecting at least 30% of EU seas by 2030[13]. Moreover, the mere designation of protected areas is insufficient without ensuring their effective management and enforcement, a challenge that remains unresolved. Current trends suggest that achieving this target is unlikely under existing governance frameworks.

These data underscore a broader governance dilemma. While MSP is intended to coordinate competing maritime uses, the absence of explicit restrictions on energy infrastructure within or near protected areas reveals a critical inconsistency in its implementation. The spatial overlap of extractive and renewable energy infrastructures with designated MPAs threatens to erode ecological resilience and undermines the core principles of marine conservation. This regulatory ambiguity is reinforced by high-level EU guidance, which, while nominally promoting sustainability, often frames ocean space as a flexible asset to be optimized for industrial development. For instance, the *Guidelines for implementing an Ecosystem-based Approach in Maritime Spatial Planning*

[13]https://www.eea.europa.eu/en/analysis/indicators/marine-protected-areas-in-europes-seas

(European Commission, 2021), alongside the *EU Biodiversity Strategy for 2030* (European Commission, 2020), illustrate this tension. The former acknowledges "space-sharing and spatial exclusion conflicts" arising from offshore wind farm proposals and Natura 2000 Special Areas of Conservation, suggesting that "the designation of multiple-use areas in crowded seas may provide one opportunity for sustainable use and for freeing marine space for future blue economy developments while meeting conservation requirements." Similarly, the Biodiversity Strategy explicitly "prioritises solutions such as ocean energy and offshore wind," even within the broader commitment to protect 30% of EU seas.

The European Environment Agency (2024) further emphasizes that "considering trade-offs and implementing maritime spatial planning are crucial to align the EU's ambitions for offshore renewable energy growth with the protection of the marine environment," noting that MSP can enable "co-existence between clean energy, the protection of seas and adequate space for other uses of the marine environment, including transportation, fishing and recreation." By framing spatial conflicts as opportunities and promoting multi-use zones, these strategies implicitly legitimize the encroachment of energy infrastructure into ecologically sensitive areas under the banner of the sustainable blue economy. This discourse risks diluting conservation priorities and subordinating them to growth-oriented policy agendas. Addressing these tensions requires not only improved legal clarity and robust environmental safeguards, but also a fundamental reorientation of MSP from its current function in enabling energy development toward an ecosystem-based and conservation planning paradigm.

Only a few conservation initiatives in the Mediterranean have explicitly acknowledged that oil and gas exploration and production could undermine conservation priorities and objectives (Mazor et al., 2018). This means that even within marine protected areas, there is no de facto explicit prohibition of energy infrastructure. Similarly, a recent study (Lloret et al., 2023) highlights the complex interplay between offshore wind energy development and marine conservation in the Western Mediterranean, describing the overlap or proximity of offshore wind energy zones to Natura 2000 protected areas as "remarkable" and urging "caution." Conducted by researchers from the University of Girona (UdG), the Institut de Ciències del Mar (ICM-CSIC), the University of Barcelona (UB), the International University of La Rioja (UNIR), and the Polytechnic University of Catalonia (UPC), the study reveals that nine offshore wind energy zones and one pilot project either overlap or border marine protected areas within the Natura 2000 Network. The study underscores the need to safeguard these protected areas from the potential adverse effects of offshore wind infrastructure, particularly floating turbines, which represent an emerging technology with limited data on their ecological impacts. The authors argue that, as a general principle and priority, offshore wind energy development in the Mediterranean should be excluded from Natura 2000 sites, other marine protected areas, and their adjacent zones. This precautionary approach is essential to ensure the preservation of marine biodiversity and ecosystem integrity while balancing the growing demand for renewable energy.

Further underlining the need for precaution, Sovinc and Kržič (2025) analyze the IUCN system of protected areas, which comprises six categories based on primary and secondary management objectives. Categories I a (Strict Nature Reserves) and I b

(Wilderness Areas), as well as Category II (National Parks), define 'strict protection' zones—purely natural ecosystems in which human exploitation of resources is either highly restricted or entirely prohibited. In Category I a zones, even anchoring is disallowed; in Category II, all types of extractive use, including recreational fishing, are considered incompatible with conservation objectives. Thus, offshore oil and gas activities or even renewable infrastructure such as wind turbines are fundamentally at odds with the core principles of these protection levels. Yet, most Mediterranean MPAs do not currently fall under these strict categories, enabling legal ambiguities and spatial conflicts to persist.

A particularly illustrative example of these challenges is the Cetacean migration corridor in the Spanish Mediterranean coast[14]. Declared a Marine Protected Area by the Government of Spain in June 2018 and covering approximately 46,385 km², this corridor is used by 10 species of threatened marine mammals. Until its official designation, the corridor was subjected to intense human pressures including maritime traffic, fishing activity, and offshore oil and gas exploration and exploitation. These activities generate noise pollution and vibrations detrimental to cetacean communication, navigation, and overall well-being. The establishment of this MPA - under the Barcelona Convention - represents a landmark step toward cross-border marine conservation in the Western Mediterranean but also exemplifies the delayed recognition of threats posed by industrial encroachment on vital ecosystems.

The overlapping of energy infrastructure with MPAs thus highlights a broader governance challenge. While MSP aims to balance competing uses of marine spaces, the lack of explicit prohibitions on energy infrastructure within protected areas undermines conservation goals. Bridging this gap will require the EU and its member states to clarify legal protections for strictly protected zones, harmonize conservation and energy policies, and recalibrate MSP to prioritize ecological integrity over sectoral optimization.

# 4 Marine legislative framework, offshore energy infrastructures and marine protected areas: The case of Greece

## 4.1 Marine legislative framework

The marine legislative framework in Greece has evolved significantly in recent years, shaped by both European Union directives and national policies, reflecting a complex interplay of environmental, economic, and geopolitical interests. Over the past decade, research initiatives such as the SUPREME (2017-2018) and THAL-HOR 2 (2018-2023) projects have played a pivotal role in advancing the understanding and implementation of MSP and Integrated Coastal Zone Management (ICZM) in Greece.

The SUPREME project (case studies: Inner Ionian-Corinthian Gulf, and the Myrtoon Sea) focused on supporting the implementation of the EU MSP Directive in Eastern Mediterranean Member States, fostering cross-border MSP initiatives. Aligned with the Barcelona Convention Strategies and Protocols, it advanced the ecosystem-based

[14]For further reference: https://rac-spa.org/node/1679

approach at regional and sub-regional levels while addressing local and transboundary MSP challenges. The project also highlighted risks associated with hydrocarbon extraction and transportation, such as potential accidents that could threaten the unique Mediterranean coastline and the water quality of this semi-enclosed sea. Meanwhile, the THAL-HOR 2 project (case study: wider North Aegean region) emphasized a balanced approach to blue economy development, integrating energy, tourism, fisheries, aquaculture, and transport activities while protecting the natural and cultural environment. This project promoted the coexistence of activities, conflict mitigation, and the minimization of ecological footprints, aiming to enhance socio-economic conditions and resilience in coastal communities (Yiannakou et al., 2024). However, the Greek state appears to have undermined these academic efforts, despite its participation in drafting pilot MSP plans that proposed regulated, synergistic, and environmentally conscious MSP.

MSP was formally incorporated into the Greek spatial planning with the enactment of Law 4546/2018 (later amended by Law 4759/2020). This legislation introduced two primary planning instruments: the National Marine Spatial Strategy (NMSS), integrated into the national spatial strategy, and Marine Spatial Frameworks (MSFs), which replaced Marine Spatial Plans (MSPlans) following Law 4685/2020. MSFs operate at a regional or inter-regional scale, setting strategic guidelines for the spatial allocation and use of marine space.

However, the legislative framework has faced criticism for its contradictions and delays. While Articles 4 and 8 of Law 4546/2018 emphasize the harmonious coexistence of activities and climate resilience, they also include provisions for hydrocarbon extraction, framing it as an economic activity contributing to an integrated marine spatial development. This inclusion has raised concerns about the prioritization of economic interests over environmental protection, particularly given the planned allocation of marine zones for future oil and gas exploration and infrastructure development.

Between 2020 and 2022, four key legislative amendments have shaped Greece's marine spatial planning framework:

1. Law 4685/2020 modernized Greece's environmental legislation, promoting renewable energy projects, even within marine protected areas
2. Law 4759/2020 introduced significant changes to spatial planning regulations, removing coastal zones from the scope of MSP, favoring sectoral over ecosystem-based approaches, and prioritizing economic interests over integrated maritime governance
3. Law 4964/2022 simplified environmental licensing procedures and established a framework for offshore wind farm development, while weakening protections for Natura 2000 sites to accommodate oil and gas infrastructure
4. April 2022 saw the restructuring of the Hellenic Hydrocarbons Company into the Hellenic Hydrocarbons and Energy Resources Management Company (HEREMA) expanded its portfolio, granting it authority over licensing and managing energy resources, further prioritizing energy sector interests

Despite the EU's requirement for member states to adopt national MSPs by March 31, 2021, Greece failed to comply, leading to a condemnation by the European Court of Justice on February 27, 2025. The court rejected Greece's defense, which cited

geopolitical tensions in the Eastern Mediterranean, legislative complexities, and the country's extensive coastline and insular geography as justifications for the delay. The ruling emphasized that Greece's failure to implement MSP cannot be attributed to unresolved maritime boundary disputes, reaffirming that national MSP obligations are independent of Exclusive Economic Zone (EEZ) delineations[15]. This decision highlights the Greek government's persistent reluctance to institutionalize MSP in a manner that balances economic development with marine conservation. This ruling underscored Greece's systemic failure to implement a coherent MSP framework, instead favoring ad hoc regulatory adjustments that facilitate capital-intensive energy investments at the expense of environmental sustainability and communities interests.

The Greek government's approach to marine spatial governance appears to rely on two key policy tools: (1) non-planning, which deliberately postpones regulatory interventions to maintain a legal vacuum that benefits specific economic sectors, and (2) selective planning, which prioritizes industry-driven spatial allocations over comprehensive, ecosystem-based management.

In conclusion, while Greece has made nominal progress in integrating MSP into its legal framework, its implementation remains heavily skewed toward facilitating energy sector interests. The continued regulatory delays and sectoral favoritism suggest a deliberate strategy that undermines sustainable marine governance. The following section will examine the licensing and spatial allocation of offshore energy infrastructures, shedding light on how Greece's MSP policies have been shaped to accommodate specific economic and geopolitical agendas.

### 4.2 Offshore energy infrastructures

Since 2019, Greece has actively pursued hydrocarbon exploration in its marine areas, seeking to integrate fossil fuel extraction into its national energy model. This move aligns with the broader blue growth agenda, which prioritizes the expansion of the energy sector and treats marine spaces as a new frontier for energy development. Offshore energy infrastructures -encompassing both fossil fuel extraction and renewable energy installations- have become a central component of Greece's evolving MSP strategy. These policies are designed to maximize the utilization of marine spaces, often at the expense of environmental and social considerations.

This approach has led to distinct patterns of marine space appropriation and privatization Schlüter et al., 2020; Ertör & Hadjimichael, 2020), as spatialized legislation seeks to accommodate multiple uses of marine areas, capitalizing on the blue growth narrative. Greece's ambition to position itself as a regional energy hub underscores its geopolitical aspirations. To achieve this, the country has facilitated numerous energy projects, particularly in liquefied natural gas (LNG), hydrocarbon exploration, and, more recently, offshore wind farms. Several factors support this objective.

On September 18, 2019, Greece's parliament ratified four offshore hydrocarbon exploration and exploitation contracts, covering maritime zones adjacent to Crete and the Ionian Sea. These agreements were formalized through Laws 4628/2019 (Southwest Crete), 4629/2019 (Ionian Sea), 4630/2019 (Ionian Block 10, Kyparissia Gulf), and

[15]Point 38 of the condemnatory decision

4631/2019 (West Crete). In April 2022, hydrocarbon projects were further elevated to projects of national importance, drastically accelerating licensing procedures and streamlining government approvals. The active contract portfolio now includes the Katakolon field, currently in the development phase with a proven oil and gas discovery, as well as five offshore blocks in the exploration phase[16]. These concessions span vast maritime areas, covering nearly all of western Greece, the Ionian Sea, and extending offshore from the western Peloponnese to southeastern Crete.

Recent updates in 2025 indicate renewed investment interest in hydrocarbon exploitation, particularly from the US oil giant Chevron, alongside ExxonMobil, which already controls the two offshore Crete blocks (West of Crete and Southwest of Crete). Chevron, in a joint venture with HELLENiQ ENERGY, has acquired seismic data for offshore blocks 'Block A2' and 'South of Peloponnese.' The Greek Ministry of Environment and Energy has announced an international tender for two offshore blocks covering more than 11,000 km², with a 25-year lease term and a seven-year exploration period. In January and March 2025, the Greek government accepted Chevron's expressions of interest for hydrocarbon exploration in two offshore areas—one spanning from southwest of the Peloponnese to west of Crete, and another south of Crete—covering a combined area of approximately 46,000 km². The tender process appears tailored to Chevron's strategic goals, reinforcing natural gas's role as a transitional fuel under the EU's green transition framework (Widuto, 2023). However, this strategy has been widely criticized for contradicting climate commitments by perpetuating fossil fuel dependency.

These four concessions are the latest additions to Greece's hydrocarbon portfolio, with HEREMA advising the Greek State on their acceptance (HEREMA, 2025).[17]

Alongside hydrocarbon investments, Greece is advancing two additional fields of offshore energy infrastructure development as policy priorities. First, the country is expanding its FSRU network, integrating these facilities with the national gas transmission system. The Revithoussa LNG terminal, Greece's first LNG import facility, has been operational since 2000. More recently, the Alexandroupoli FSRU began operations, marking the country's first FSRU-based facility. By 2025–2026, four additional FSRUs are expected to become operational[18], further solidifying Greece's role as a gas

[16]Katakolon is in the development phase, while five concessions are in the exploration phase: three offshore blocks located in the Ionian Sea (Block 2, Block 10, and the Ionian Block), two blocks offshore Crete (West of Crete and Southwest of Crete). For further reference: https://herema.gr/upstream-oil-gas-exploration/

[17]Map of the hydrocarbon concession is available at: https://herema.gr/start-of-licensing-process-for-new-concessions-for-hydrocarbon-exploration/

[18]The four new FSRUs: 1. Alexandroupolis LNG Terminal: Following the launch of operations at the Alexandroupolis LNG terminal, Gastrade has announced that it has received regulatory approval for a second FSRU, which will be installed offshore in the same area. 2. Dioryga Gas in the Gulf of Agioi Theodoroi: Another LNG import project, led by Greek refiner Motor Oil, is planned for Corinth. This project, called 'Dioryga LNG', is currently in development. 3. Thessaloniki FSRU: Elpedison has its own project, the Thessaloniki FSRU, which is expected to become operational in 2025. This facility will also utilize a floating platform. 4. Mediterranean Gas in Volos: The Company has not yet begun operations, as it is still in the process of

hub for Southeastern Europe and the Balkans. These facilities are anticipated to serve as new supply gateways, strengthening Greece's energy export capabilities and geopolitical influence.

Second, a notable policy advancement is taking shape in the domain of offshore wind energy. In October 2023, HEREMA unveiled the Draft National Programme for Offshore Wind Energy. This strategic initiative delineates 25 Organized Development Areas (ODAs), covering approximately 2,712 km². These areas, primarily suitable for floating wind technologies, are located in maritime zones such as Eastern Crete, Southern Rhodes, the central Aegean, the Evia–Chios axis, and the Ionian Sea (HEREMA, 2023b). Licensing has already begun for two pilot offshore wind farms[19] and floating photovoltaic installations[20]. In January 2025, a partnership between Motor Oil and Terna Energy (with UAE-based Masdar) announced Greece's first full-scale offshore wind farm: a 600 MW installation located south of Alexandroupolis, expected to become operational by 2030[21].

This marks a strategic shift towards integrating offshore wind farms, energy pipelines, and storage infrastructure under Greece's broader energy framework. The CEO of HEREMA has explicitly linked this strategy to regional stability, stating that the company's vision is to ensure national energy security while contributing to peace in the region (HEREMA, 2023a). However, the increasing demand for new energy resources—whether renewable or non-renewable—has extended the frontier of exploitation to marine environments.

While the emergence of a structured national framework signals significant progress, critical challenges remain in terms of spatial planning, ecological impact, and regulatory coherence. Consequently, the fragmentation of maritime space into geopolitical spheres of influence, mining blocks, and energy infrastructures is closely linked with its ongoing privatization, which has rapidly evolved since 2019. Legislative amendments have accelerated this process, reshaping geopolitical dynamics and intertwining energy disputes with broader international and regional power politics. However, this vision is fraught with contradictions. Offshore oil and gas exploration in the Eastern Mediterranean has intensified geopolitical competition rather than fostering stability. The prioritization of sectoral investments through legislative measures—including offshore renewables under Law 4964/2022—alongside geopolitical and energy market-driven expansions, defines the broader framework governing Greece's offshore energy exploitation.

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conducting studies and obtaining permits for its business plan, the 'Argo FSRU'. For further reference:

- Balkan Green Energy News: Launch of works on Alexandroupolis LNG terminal in Greece heralds reduced dependence on Russian gas for the Balkans
- Greek News Agenda: Greece as an LNG Hub

[19]For further reference: https://www.terna-energy.com/deltio-tipou/ekdosi-adeias-ereynas-gia-pilotika-er/ & https://herema.gr/issuance-of-the-first-2-research-licenses-for-offshore-wind-farm-pilot-projects/

[20]For further reference: https://energyin.gr/2025/03/12/

[21]For further reference: https://www.trade.gov/market-intelligence/greece-offshore-wind-projects

Recent Greek scientific literature highlights the critical role of MSP as an evolving governance tool aiming to address the challenges posed by the intensification of offshore energy infrastructure and other competing maritime uses. As Gourgiotis, Coccossis, and Tsilimigkas (2023) underscore, MSP in Greece must operate as a dynamic and adaptive process capable of adjusting to rapid geopolitical, environmental, and technological changes while remaining grounded in long-term strategic choices. The National Spatial Strategy for the Maritime Space aspires to harmonize ecological protection with economic development, offering a clear spatial framework to both preserve sensitive marine ecosystems and create conditions conducive to sustainable investment. As Gourgiotis et al. (2024) note in a case study of the Northern Aegean, maritime space is becoming increasingly congested due to the cumulative pressures of offshore energy infrastructure (e.g. FSRUs and future wind farms), growing maritime transport linked to port expansion and LNG trade routes, the spatial demands of aquaculture and fisheries, and the dual role of coastal zones as tourism hotspots and biodiversity repositories. Strategic infrastructure, such as the ports of Thessaloniki, Kavala, and Alexandroupoli, is transforming into energy and logistics hubs, thereby increasing the intensity of maritime activity. At the same time, the push for offshore renewables (especially in light of the war in Ukraine and the shift to LNG) raises urgent questions about spatial compatibility, ecological thresholds, and equity among uses. While new MSP instruments aim to provide a coordinated framework, many current developments, such as FSRU deployments, have proceeded in the absence of an approved marine spatial plan. This regulatory lag underscores the need for robust participatory processes, integrated land-sea governance mechanisms, and a clear articulation of carrying capacities to ensure the equitable and ecologically sound distribution of maritime uses.

The rapid deployment of LNG and FSRU facilities underscores a trajectory favoring fossil fuel infrastructure, a trend extensively critiqued for its climate, environmental, and social impacts. Kieninger et al. (2024) highlight the risks of locking into fossil gas pathways, emphasizing their long-term incompatibility with climate mitigation targets. Their study outlines how "a lock-in of fossil gas now means a pathway for even more fossil fuel infrastructure in the future […] supporting the exact opposite of what is needed to mitigate catastrophic climate change." This paradox has been analyzed in numerous studies (e.g., UN, 2020; Agardy, 2020; Barbesgaard, 2018; Bennett et al., 2015; Pedersen et al., 2014; De Schutter, 2012; Schlüter et al., 2020; Ertör & Hadjimichael, 2020), which critique the EU's promotion of natural gas as a transitional fuel while simultaneously undermining its climate goals.

The commodification of marine space for energy extraction is not a novel development; rather, it has evolved over decades. The 1973 initiation of the United Nations Convention on the Law of the Sea (UNCLOS) laid the groundwork for exclusive economic zones (EEZs) and state jurisdiction over marine resource exploitation. The 1982 UNCLOS established EEZs (UNCLOS, 1998), granting coastal states rights to exploit marine resources within 200 nautical miles of their shores (Brent et al., 2020). This framework has facilitated the blue growth agenda, which focuses on emerging industries such as offshore wind energy and deep-sea mining to extract minerals critical for renewable energy technologies (Childs & Hicks, 2019; Childs, 2022). However, the oil and gas industry has remained dominant, accounting for nearly 34% of the total value

of ocean-based industries in 2010 (OECD, 2016). This underscores the difficulty of promoting a sustainable blue growth agenda without confronting the entrenched interests of the fossil fuel sector.

The ongoing privatization and appropriation of maritime areas for energy purposes reflect broader patterns of ocean grabbing and blue growth-driven industrialization. The tension between marine conservation and energy expansion remains central to Greece's evolving MSP framework, raising fundamental questions about the sustainability of its offshore energy strategy. The following chapter will examine the implications of these developments for marine protected areas (MPAs) and the broader marine environment.

### 4.3 Marine protected areas

In Greece, the framework for the protection of both terrestrial and marine protected areas remains fragmented, leading to significant challenges in their effective management. The Natura 2000 sites were formally designated under Law 4519/2018, which established Management Bodies for Protected Areas. This legislative step provided a crucial opportunity to safeguard and promote areas of outstanding natural and cultural significance. However, this progress was soon undermined by Law 4685/2020, which significantly weakened protective measures for coastal and marine environments. This law reflects a policy stance that perceives environmental regulations as obstacles to economic development, while simultaneously prioritizing unrestricted business activity within protected areas.

One of the most controversial provisions of Law 4685/2020 is Article 44, which allows for the licensing of mining and hydrocarbon extraction activities within protected Natura 2000 areas, posing an immediate threat to marine ecosystems. Furthermore, Article 110 removes the authority of local governments to provide input on extraction projects within their jurisdiction, thereby centralizing decision-making and reducing local oversight. The overall effect of the law is to elevate the interests of the fossil fuel industry to a strategic national priority, providing incentives and regulatory tools to facilitate extraction. As a result, the spatial footprint of hydrocarbon activities is expanding offshore, at the expense of other valuable resources, such as Greece's rich marine biodiversity. The intensification of sectoral conflicts in marine space is a direct consequence of this selective economic prioritization, which disregards cultural and non-commercial values, as well as non-industrial actors in marine governance.

Approximately seven months after the enactment of Law 4685/2020, the European Court of Justice issued a ruling (C-849/19), which condemned Greece for its failure to comply with EU biodiversity conservation laws. The court found that Greece had systematically neglected its obligations under the Habitats Directive, with violations affecting all Sites of Community Importance (SCIs). Specifically, 81.5% of Special Areas of Conservation (SACs) within the country's 239 SCIs lacked any conservation measures, while the remaining 18.5% were subject to incomplete and fragmented protective measures that failed to ensure meaningful protection (Articles 80-82 & 86)[22]. Notably, Article 86 of the ruling explicitly criticizes the inadequacy of conservation

[22]For further reference: https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX:62019CJ0849

efforts for marine habitats and species, emphasizing that the so-called protective measures do not effectively safeguard marine ecosystems.

The push for energy infrastructure has drawn significant criticism from environmental organizations. WWF Greece has denounced the government's approval to grant hydrocarbon exploration licenses to Chevron and HELLENiQ Energy in the Ionian Sea and south of the Peloponnese, arguing that deep-sea mining is fundamentally incompatible with the proclaimed green transition. The organization has specifically denounced the government's decision to alter the boundaries of the planned Ionian National Marine Park to accommodate new hydrocarbon concessions, characterizing this approach as inconsistent with conservation objectives. The Chevron licensing case epitomizes this contradiction, as the designated mining blocks now overlap with areas that were originally intended for environmental protection.

This contradiction becomes particularly tangible when examining the spatial configuration of hydrocarbon concessions in relation to designated or proposed MPAs. A prominent case lies in the Ionian Sea and the marine corridor stretching from the western Peloponnese to south Crete, where exploration blocks granted to multinational corporations (ExxonMobil, Chevron, and HELLENiQ Energy) overlap significantly with existing Natura 2000 sites and the announced Ionian Marine Park. Notably, the Ionian exploration zones lie in close proximity to the planned Ionian Marine Park, raising significant concerns about potential conflicts with conservation objectives. These zones host high marine mammal diversity, including critical habitats for cetaceans, deep-sea corals, and other vulnerable marine species, yet they have been targeted for high-impact industrial activities. This spatial overlap is not incidental; it is enabled by Greece's MSP framework, which lacks explicit exclusion zones for extractive industries in ecologically sensitive areas.

As of 2024, Greece's MPAs cover 22,796 km²—18.3% of national marine waters. To meet the 30% target by 2030, mandated by Law 5037/2023, the government has announced two new marine national parks, including the Ionian Marine Park[23]. Spanning over 14,000 km², it encompasses the Ionian segment of the Hellenic Trench and supports rich biodiversity, including endangered whales, dolphins, monk seals, sea turtles, Posidonia oceanica meadows, and deep-sea coral habitats[24]. While this initiative was presented as a commitment to marine biodiversity protection, it has been overshadowed by the state's failure to meet its existing regulatory obligations for MPAs. A comprehensive evaluation report published by nine Greek environmental organizations in 2024[25] highlights significant shortcomings in MPA governance, primarily caused by extensive delays in implementing required Presidential Decrees and Management Plans. The report further points to systemic understaffing and lack of coordination, leaving all protected areas in a state of legal uncertainty. Moreover, much of the

[23]In April 2024, during the 9th Our Ocean Conference held in Athens, the Greek government announced plans to establish two new extensive Marine Parks—one in the Aegean Sea, covering approximately 45 uninhabited rocky islets and their surrounding marine zones, and one in the Ionian Sea.

[24]For further reference: https://sdgs.un.org/partnerships/enlargement-marine-protected-areas-network-greece-meet-30-target

[25]For further reference: https://wwfeu.awsassets.panda.org/downloads/mpasesen.pdf

proposed park overlaps with active hydrocarbon concessions, further illustrating the incoherence of spatial governance and the subordination of conservation priorities to industrial and geopolitical interests.

| Region | Hydrocarbon Concession Blocks | Block Size (Km2) | Licensees | Overlapping Protected Areas | Latest developments / Key facts | Key Biodiversity Features | Notable Events / Advocacy |
|---|---|---|---|---|---|---|---|
| Ionian Sea: Corfu Region | Block 2 | 2,422.10 | Energean Hellas Ltd. (75% and Operator) and HELLENiQ Upstream West Kerkyra Single Member S.A. (25%) | Proximity to Hellenic Trench IMMA, adjacent Natura 2000 sites | March 2024: Block 2 license granted 12-month extension | Ionian Archipelago IMMA | February 2022: 3 Cuvier's beaked whales stranded on Corfu's beaches coinciding with seismic exploration activities. OceanCare and other NGOs urged the Greek government to halt oil and gas exploration. |
| | Ionian Block | 6,671.13 | HELLENiQ Upstream Ionian Single Member S.A. (100%) | | July 2023: Launch of 2nd exploration phase in the offshore areas of Ionian block & Block 10 | | |
| Ionian Sea & Crete: Hellenic Trench | Block 10: Kyparissiakos Gulf | 3,420.60 | HELLENiQ Upstream Kyparissiakos Gulf Single Member S.A. (100%) | Natura 2000 sites, Proposed Ionian Marine Park, overlapping with Hellenic Trench IMMA | | Hellenic Trench IMMA | May 2019: over 100 scientists organizations called on the Greek Prime Minister for immediate protection of the Hellenic Trench from hydrocarbon exploration. |
| | Block A2 | 826 | Chevron Balkans Exploration B.V. and HELLENiQ | | January 2025: Greek government accepted Chevron's expression of interest for hydrocarbon exploration in this area. The block lies near the proposed Ionian Marine National Park and overlaps with ecologically sensitive areas, triggering criticism from environmental NGOs regarding spatial planning inconsistencies. | | |
| | South of Peloponnese | 10,211 | Chevron Balkans Exploration B.V. and HELLENiQ | | | | |
| | West of Crete | 20,058.40 | ExxonMobil Exploration & Production Greece B.V. (70% and operator) and HELLENiQ Upstream West Crete Single Member S.A. (30%) | Proximity to proposed Ionian Marine Park, overlapping with Hellenic Trench IMMA | October 2024: 2nd phase of surveys conducted by the ExxonMobil/HELLENiQ ENERGY joint venture officially started | | |
| | Southwest of Crete | 19,868.37 | ExxonMobil Exploration & Production Greece B.V. (70% and operator) and HELLENiQ Upstream SouthWest Crete Single Member S.A. (30%) | | | | |
| | South of Crete 1 | 13,347 | Chevron Balkans Exploration B.V. and HELLENiQ | overlapping with Hellenic Trench IMMA | March 2025: Greek government accepted Chevron's expressions of interest for these two offshore zones, together covering more than 35,000 km$^2$. These blocks intersect with the Hellenic Trench IMMA, prompting renewed concerns about cumulative impacts on deep-sea habitats and marine mammals. | | |
| | South of Crete 2 | 21,805.00 | Chevron Balkans Exploration B.V. and HELLENiQ | | | | |

**Fig. 1.** Spatial overlaps between Hydrocarbon Concessions and Marine Protected Areas in Greece

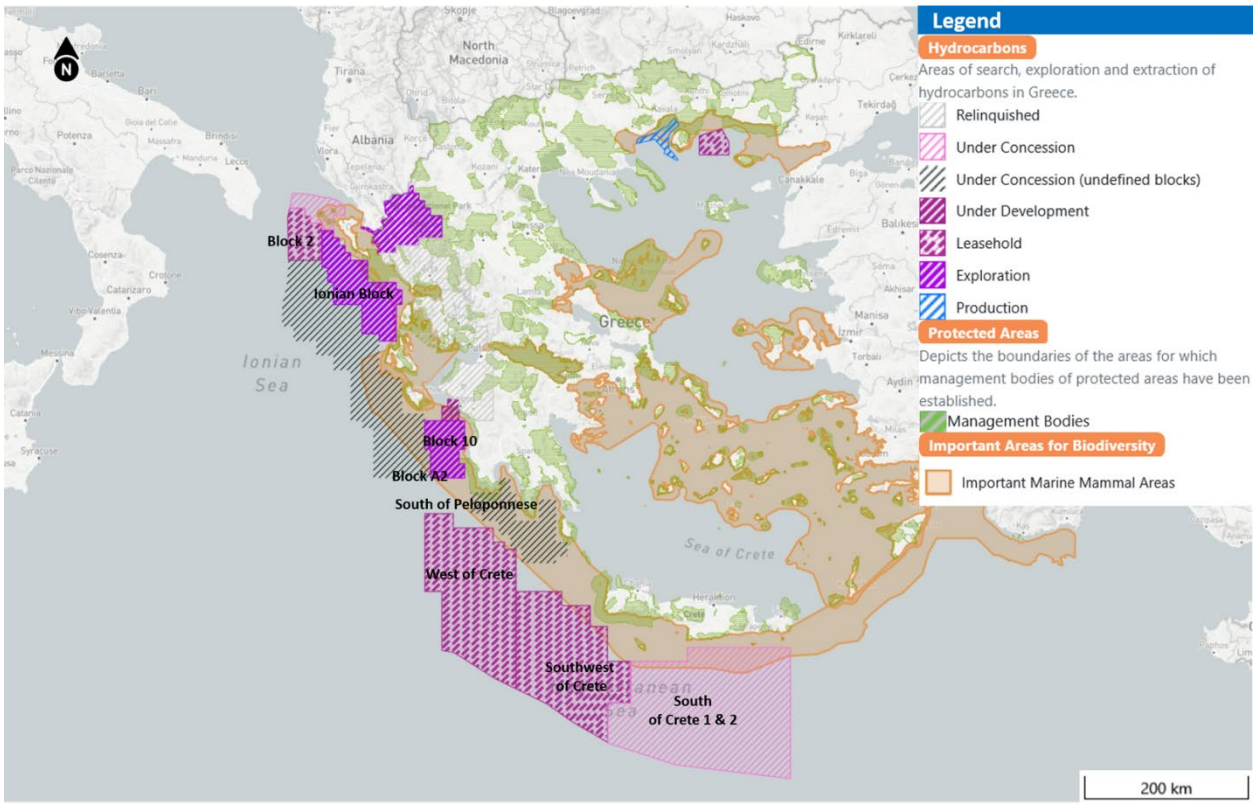


**Fig. 2.** Hydrocarbon Concessions vs. Marine Protected Areas in Greece (with oikoskopio.geodiv.page base map)

Drawing on the analysis of Klampatsea (2023)[26], the prevailing political approach to spatial planning in Greece has been characterized by "non-planning" - a pattern of delayed or incomplete regulatory frameworks that enable inconsistent development patterns. This dynamic is particularly evident in marine and coastal areas, where the lack of governance protection enables the unregulated expansion of industrial activities, particularly those related to energy exploitation. Under this framework, MPAs are treated not as conservation priorities but as areas subject to technocratic zoning, where economic interests dictate the extent and nature of protection. The zoning imposed by Law 4685/2020 exemplifies this trend, as it subordinates natural capital and biodiversity to the overarching logic of economic development.

This approach aligns with broader trends in Greece's energy strategy, where FSRUs and new hydrocarbon extraction initiatives serve both commercial and geopolitical objectives. At the same time, the state actively promotes new energy infrastructure under the umbrella of *blue growth*, further entrenching extractive industries in Greek waters.

[26] For further reference: https://helios.ntua.gr/pluginfile.php/251246/mod_label/intro/klabatsea-krisi%20xorotaxias%2024-10-2023%20skitsa-b.pdf (in Greek)

Beneath the rhetoric of energy security and resource utilization lies a broader framework of vested interests. The apparent contradiction between environmental protection measures and large-scale energy projects reflects the geopolitical priorities and economic interests at play. HEREMA, now responsible for licensing both fossil fuel and renewable energy projects, embodies this contradiction, demonstrating how state policy serves to facilitate specific corporate interests under the guise of energy transition.

Within this policy landscape, marine conservation remains a secondary concern, and the designation of new MPAs in the Ionian and Aegean Seas appears to prioritize symbolic over a substantive marine conservation policy. The fragmented and politically motivated nature of these initiatives underscores the broader reality that marine protection in Greece continues to be treated as a political maneuver rather than an integrated governance priority.

## 5 Conclusions

The spatial allocation of installations and activities in marine and coastal areas must ensure the prevention of pollution, the protection and conservation of marine and coastal ecosystems, and the avoidance of disturbances to adjacent uses and activities. This study has shown that the current spatial planning model in Greece systematically prioritizes economic and industrial objectives, particularly energy infrastructure, over environmental protection and marine conservation. Based on the methodology and research focus adopted, specific findings have emerged regarding the regulatory framework, spatial allocations, and the governance gaps that shape marine planning in Greece. The empirical analysis, drawing on legal texts, national planning documents, spatial data, and a focused case study in the Ionian Sea, reveals a recurring pattern of extractive expansion into ecologically sensitive marine zones. Despite formal commitments to sustainability and ecosystem-based planning, the Greek MSP framework reinforces sectoral fragmentation, limited environmental safeguards, and the subordination of marine conservation to energy development imperatives.

The overlap between hydrocarbon concessions and designated or proposed Marine Protected Areas (MPAs) exemplifies these tensions. Facilitated by legal and administrative mechanisms that favor extractive industries, this spatial convergence undermines ecological integrity and raises concerns about spatial justice, particularly for local communities reliant on coastal and marine ecosystems. The risk of accidents or spills further threatens not only environmental quality but also the long-term viability of other productive sectors. This article contributes to ongoing debates on how MSP can be disentangled from fossil fuel dependency while prioritizing the most vulnerable uses of marine space.

Furthermore, the development of LNG and FSRU facilities along with offshore renewables - though framed as part of the green transition or blue growth - continues to follow a business-led model that reproduces many of the governance weaknesses seen in fossil fuel planning. Without stronger environmental enforcement, transparent evaluation mechanisms, and a shift away from cumulative industrial zoning, marine ecosystems remain at risk of irreversible degradation.

As indicated in the paper, a growing literature on MSP reveals that various national policies often create risks for MPAs. Despite the widespread adoption of blue growth rhetoric, MSP frameworks often undermine the sustainable coexistence of activities in marine spaces**.** In recent years, an emerging body of critical literature (Hadjimichael, 2018; Agardy, 2020; Brent et al., 2020; Ertör & Hadjimichael, 2020; Mallin & Barbesgaard, 2020; Lloret et al., 2023) has highlighted the failure of many MSP initiatives to promote sustainable or equitable uses of marine and coastal environments.

To achieve more equitable and sustainable marine governance, Greece must adopt a more integrated and adaptive MSP approach aligned with ecosystem-based principles outlined in EU directives and international best practices. This includes reassessing hydrocarbon licensing, improving the coherence of spatial planning legislation, and embedding marine conservation as a central component of planning frameworks. Effective MSP framework must address both marine-based and land-based drivers of degradation, while also fostering transboundary cooperation and improved management of shared marine resources. MSP processes should go beyond regulating economic activity to also safeguard the rights and needs of local communities whose livelihoods are directly affected by large-scale maritime industries.

As global climate change and political pressures continue to shape marine conservation, there is an urgent need for adaptive, forward-thinking approaches to MPAs. One such approach is the concept of "flexible MPAs"—dynamic, responsive conservation areas that adjust their boundaries and regulations based on ecological and environmental needs rather than rigid, static zoning models (De Santo, 2024). Given the current trajectory of MSP in Greece, the challenge remains to transition from business-driven policymaking to a truly ecosystem-based approach that values marine biodiversity and integrates conservation into national and regional planning strategies.

Ultimately, the study highlights the need to rethink how marine space is governed in Greece, ensuring that planning frameworks prioritize ecological resilience, the public interest, and the long-term viability of marine and coastal systems over short-term industrial gain.

## References

1. Agardy, T. (2020). Will the Siren Call of the Blue Economy Lure Us to Our Demise? *World Ocean Forum*, https://medium.com/world-ocean-forum/will-the-siren-call-of-the-blue-economy-lure-us-to-our-demise-52c45a5a73f8 (accessed on 15 March 2025)
2. Barbesgaard, M. (2018). Blue growth: Savior or ocean grabbing? The Journal of Peasant Studies, 45(1), 130–149. https://doi.org/10.1080/03066150.2017.1377186
3. Bennett, N. J., Blythe, J., White, C. S., & Campero, C. (2021). Blue growth and blue justice: Ten risks and solutions for the ocean economy. Marine Policy, 125, 104387. https://doi.org/10.1016/j.marpol.2020.104387
4. Bennett, N.J., Cisneros-Montemayor, A.M., Blythe, J., Silver, J.J., Singh, G., Andrews, N., Calò, A., Christie, P., Di Franco, A., Finkbeiner, E.M., Gelcich, S., Guidetti, P., Harper, S., Hotte, N., Kittinger, J.N., Le Billon, P., Lister, J., López de la Lama, R., McKinley, E., Scholtens, J., Solås, A.-M., Sowman, M., Talloni-Álvarez, N., Teh, L.C.L., Voyer, M., Sumaila, U.R., (2019). Towards a sustainable and equitable blue economy. Nature Sustainability 2, 991–993. https://doi.org/10.1038/s41893-019-0404-1

5. Bennett, N.J., Govan, H., Satterfield, T., (2015). Ocean grabbing. Marine Policy 57, 61–68. https://doi.org/10.1016/j.marpol.2015.03.026
6. Brent, Z. W., Barbesgaard, M., & Pedersen, C. (2020). The Blue Fix: What's driving blue growth? Sustainability Science, 15(1), 31–43. https://doi.org/10.1007/s11625-019-00777-7
7. Borja, A., Elliott, M., Teixeira, H., Stelzenmüller, V., Katsanevakis, S., Coll, M., Galparsoro, I., Fraschetti, S., Papadopoulou, N., Lynam, C., Berg, T., Andersen, J. H., Carstensen, J., Leal, M. C., & Uyarra, M. C. (2024). Addressing the cumulative impacts of multiple human pressures in marine systems, for the sustainable use of the seas. Frontiers in Ocean Sustainability, 1. https://doi.org/10.3389/focsu.2023.1308125
8. Borja, A., White, M. P., Berdalet, E., Bock, N., Eatock, C., Kristensen, P., Leonard, A., Lloret, J., Pahl, S., & Parga, M. (2020). Moving toward an agenda on ocean health and human health in Europe. Frontiers in Marine Science, 7, 37
9. Childs, J. (2022). Geographies of deep sea mining: A critical review. The Extractive Industries and Society, 9, 101044. https://doi.org/10.1016/j.exis.2022.101044
10. Childs, J. & Hicks, C. C., (2019) "Securing the blue: political ecologies of the blue economy in Africa", Journal of Political Ecology 26(1), 323-340. https://doi.org/10.2458/v26i1.23162
11. Danovaro, R., Aguzzi, J., Fanelli, E., Billett, D., Gjerde, K., Jamieson, A., Ramirez-Llodra, E., Smith, C.R., Snelgrove, P.V.R., Thomsen, L., Dover, C.L.V., (2017). An ecosystem-based deep-ocean strategy. Science 355, 452–454. https://doi.org/10.1126/science.aah7178
12. De Santo, E.M. (2024). Securitizing Marine Protected Areas: Geopolitics, Environmental Justice, and Science (1st ed.). Routledge. https://doi.org/10.4324/9781003190523
13. De Schutter O., (2012). "Ocean-grabbing" as serious a threat as "land-grabbing" -UN food expert, https://www.reuters.com/article/business/u-n-urges-foreign-fishing-fleets-to-halt-ocean-grabbing-idUSL5E8LTFGR/ (accessed on 15 March 2025)
14. Ertör, I., & Hadjimichael, M. (2020). Editorial: Blue degrowth and the politics of the sea: Rethinking the blue economy. Sustainability Science, 15(1), 1–10. https://doi.org/10.1007/s11625-019-00772-y
15. European Commission (2019) Blue growth, https://ec.europa.eu/maritimeaffairs/policy/blue_growth_en (accessed on 12 March 2025)
16. European Commission, (2012). Blue Growth opportunities for marine and maritime sustainable growth, https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52012DC0494 (accessed on 12 March 2025)
17. European Commission, (2020). Report on the implementation of the Marine Strategy Framework Directive, Brussels, https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1593613439738&uri=CELEX:52020DC0259 (accessed on 12 March 2025)
18. European Commission, (2020). EU biodiversity strategy for 2030: Bringing nature back into our lives (COM (2020) 380 final). Publications Office of the European Union. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0380
19. European Commission, (2021). Guidelines for implementing the ecosystem-based approach in maritime spatial planning: Report of the expert group on the implementation of the MSP Directive. Directorate-General for Maritime Affairs and Fisheries. https://oceans-and-fisheries.ec.europa.eu/publications/guidelines-implementing-ecosystem-based-approach-maritime-spatial-planning_en (accessed on 8 May 2025)
20. European Union. (2024). Regulation (EU) 2024/1991 of the European Parliament and of the Council of 24 June 2024 on nature restoration and amending Regulation (EU) 2022/869. Official Journal of the European Union. https://eur-lex.europa.eu/eli/reg/2024/1991/oj/eng

21. European Environment Agency, (2024). Harnessing offshore wind while preserving the seas. Publications Office of the European Union. https://www.eea.europa.eu/en/analysis/publications/harnessing-offshore-wind-while-preserving-the-seas
22. Frazão Santos, C., Agardy, T., Andrade, F., Crowder, L.B., Ehler, C.N., Orbach, M.K., (2018). Major challenges in developing marine spatial planning. Marine Policy. https://doi.org/10.1016/j.marpol.2018.08.032
23. Galparsoro, I., Montero, N., Mandiola, G., Menchaca, I., Borja, Á., Flannery, W., Katsanevakis, S., Fraschetti, S., Fabbrizzi, E., Elliott, M., Bas, M., Barnard, S., Piet, G., Giakoumi, S., Kruse, M., McAteer, B., Runya, R. M., Lukyanova, O., Morato, T., … Stelzenmüller, V. (2025). Assessment tool addresses implementation challenges of ecosystem-based management principles in marine spatial planning processes. Communications Earth & Environment, 6(1), 55. https://doi.org/10.1038/s43247-024-01975-7
24. Gissi, E., McGowan, J., Venier, C., Carlo, D.D., Musco, F., Menegon, S., Mackelworth, P., Agardy, T., Possingham, H., (2018). Addressing transboundary conservation challenges through marine spatial prioritization. Conservation Biology 32, 1107–1117. https://doi.org/10.1111/cobi.13134
25. Gourgiotis, A., Koutsi, D., Krommyda, V., & Stratigea, A. (2024). Spatial and Developmental Policy Directions Affecting Marine Spatial Planning in the Northern Aegean Sea, Greece. Oceans, 5(3), 522–546. https://doi.org/10.3390/oceans5030030
26. Gourgiotis, A., Coccossis, H., & Tsilimigkas, G. (2023). Maritime Spatial Planning in Greece: methodological and implementation issues. Maritime Spatial Planning in the Mediterranean: Challenges, perspectives and priorities (pp. 212–226). Retrieved from https://www.researchgate.net/publication/370264694
27. Hadjimichael, M. (2018). A call for a blue degrowth: Unravelling the European Union's fisheries and maritime policies. Marine Policy, 94, 158–164. https://doi.org/10.1016/j.marpol.2018.05.007
28. Hering, D., Schürings, C., Wenskus, F., Blackstock, K., Borja, A., Birk, S., Bullock, C., Carvalho, L., Dagher-Kharrat, M. B., Lakner, S., Lovrić, N., McGuinness, S., Nabuurs, G.-J., Sánchez-Arcilla, A., Settele, J., & Pe'er, G. (2023). Securing success for the Nature Restoration Law. Science, 382(6676), 1248–1250. https://doi.org/10.1126/science.adk1658
29. HEREMA, (2023a). Press Release: Transformation and New Corporate Identity of the Hellenic Hydrocarbons & Energy Resources Management Company, https://herema.gr/wp-content/uploads/2023/01/PR_REL_250123_EN.pdf (accessed on 15 March 2025)
30. HEREMA, (2023b). Press Release: The Draft National Programme for Offshore Wind Energy, unlocking a natural wealth for clean energy and billions of euros investments, https://herema.gr/the-draft-national-programme-for-offshore-wind-energy-unlocking-a-natural-wealth-for-clean-energy-and-billions-of-euros-investments/ (accessed on 14 May 2025)
31. HEREMA, (2025). Press Release: Start of licensing process for new concessions for hydrocarbon exploration, https://herema.gr/wp-content/uploads/2025/01/PR_REL_22_01_25.pdf (accessed on 15 March 2025)
32. Kerr, S., Colton, J., Johnson, K., & Wright, G. (2015). Rights and ownership in sea country: Implications of marine renewable energy for indigenous and local communities. Marine Policy, 52, 108–115. https://doi.org/10.1016/j.marpol.2014.11.002
33. Kieninger, F., Robb, E., Philippot, L., Roche, C., DeAngelis, K., Jones, M., Myers, M., Gater, F., (2024). LNG: the liquid path to climate chaos. 10 reasons why liquefied fossil gas is the wrong choice for Europe, https://www.foodandwatereurope.org/wp-content/uploads/2022/05/1760-Liquefied-Natural-Gas-campaign_Report_final.pdf (accessed on 12 March 2025)

34. Klampatsea, I. (2023). The crisis of spatial planning and the spatial planning of the crisis in Greece… "The restoration of normality" in spatial planning: Modernization or anachronism? Part 2. Presentation at the Interdisciplinary Postgraduate MSc "Urban Planning and Spatial Planning", School of Architecture NTUA, Athens, Greece. (in Greek) https://helios.ntua.gr/pluginfile.php/251246/mod_label/intro/klabatsea-krisi%20xorotaxias%2024-10-2023%20skitsa-b.pdf (accessed on 15 March 2025)
35. Lloret, J., Wawrzynkowski, P., Dominguez-Carrió, C., Sardá, R., Molins, C., Gili, J. M., Sabatés, A., Vila-Subirós, J., Garcia, L., Solé, J., Berdalet, E., Turiel, A., & Olivares, A. (2023). Floating offshore wind farms in Mediterranean marine protected areas: A cautionary tale. ICES Journal of Marine Science, fsad131. https://doi.org/10.1093/icesjms/fsad131
36. Mallin, F., & Barbesgaard, M. (2020). Awash with contradiction: Capital, ocean space and the logics of the Blue Economy Paradigm. Geoforum, 113, 121–132. https://doi.org/10.1016/j.geoforum.2020.04.021
37. Mazor, T., Levin, N., Brokovich, E., Kark, S., (2018). Conservation challenges in the face of new hydrocarbon discoveries in the Mediterranean Sea. Offshore Energy and Marine Spatial Planning. https://doi.org/10.4324/9781315666877-15
38. OceanCare. (2023). Oil exploration linked to stranding of whales. https://www.oceancare.org/en/stories_and_news/oil-exploration-linked-stranding-whales/
39. OECD (2016). The Ocean Economy in 2030, OECD Publishing, Paris. https://doi.org/10.1787/9789264251724-en
40. Pedersen, C., Feodoroff, T., Reuter, R., Franco, J., Buxton, N., Barbesgaard, M. C., & Vervest, P. (2014). The global ocean grab: A primer. The Netherlands: Transnational Institute, Masifundise, Afrika Kontakt and World Forum of Fisher Peoples, Amsterdam, https://www.tni.org/en/publication/the-global-ocean-grab-a-primer (accessed on 15 March 2025)
41. Portman, M. E., Notarbartolo-di-Sciara, G., Agardy, T., Katsanevakis, S., Possingham, H. P., & Di-Carlo, G. (2013). He who hesitates is lost: Why conservation in the Mediterranean Sea is necessary and possible now. Marine Policy, 42, 270–279. https://doi.org/10.1016/j.marpol.2013.03.004
42. Schutter, M. S., Hicks, C. C., Phelps, J., & Waterton, C. (2021). The blue economy as a boundary object for hegemony across scales. Marine Policy, 132, 104673. https://doi.org/10.1016/j.marpol.2021.104673
43. Sovinc, A., & Kržič, A. (2025). Overview of Marine Protected Areas and Sites of Particular Biodiversity Value in the Adriatic—Ionian Region (EUSAIR). Diversity, 17(2), Article 2. https://doi.org/10.3390/d17020131
44. UNCLOS (1998). United Nations Convention on the Law of the Sea - key provisions, https://www.un.org/Depts/los/convention_agreements/convention_historical_perspective.htm#Key%20provisions (accessed on 15 March 2025)
45. United Nations (2020). Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, Para. 46 of A/75/161, https://documents.un.org/doc/undoc/gen/n20/184/48/pdf/n2018448.pdf (accessed on 15 March 2025)
46. Vanreusel, A., Hilario, A., Ribeiro, P. A., Menot, L., & Arbizu, P. M. (2016). Threatened by mining, polymetallic nodules are required to preserve abyssal epifauna. Scientific Reports, 6(1), 26808. https://doi.org/10.1038/srep26808
47. Widuto, A., (2023). Energy transition in the EU, EPRS | European Parliamentary Research Service, https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/754623/EPRS_BRI(2023)754623_EN.pdf (accessed on 15 March 2025)

48. WWF Greece et al. (2019). Resolution: Call for the immediate and full protection of the Hellenic Trench. https://www.contentarchive.wwf.gr/images/pdfs/Resolution_text_ENG.pdf
49. WWF, (2023). Assessing the balance between nature and people in European seas: Maritime spatial planning in the Mediterranean sea, https://maritime-spatial-planning.ec.europa.eu/media/document/14949 (accessed on 28 February 2025)
50. WWF, (2024). Marine Protected Areas Management In Greece, Assessment Report - Executive Summary, https://wwfeu.awsassets.panda.org/downloads/mpasesen.pdf (accessed on 28 February 2025)
51. Yiannakou, A., Gourgiotis, A., & Salata, K. D. (2024). Marine spatial planning in Greece: Issues raised from the preparation of the Marine Spatial Framework for the North Aegean region. Planning Practice & Research, 1–19 https://doi.org/10.1080/02697459.2024.2365516

# Interactions between coastal cities and adjacent protected ecosystems. The case of Preveza and the Amvrakikos Gulf

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**Abstract.** The coastal area of Preveza, like much of the country, is under intense pressure from urban development, seasonal housing, tourism, and other land-based and marine activities, including those related to the primary sector. The city lies in close proximity to a unique and environmentally sensitive ecosystem: the Amvrakikos Gulf. Its wetland complex positions it as one of the largest and most ecologically significant wetlands in Greece and in Southern Europe. The city aims to pursue economic growth by leveraging the nearby environmental asset, while simultaneously safeguarding the adjacent ecosystem.
Within this context, the present article focuses on the relationship of coexistence and the examination of the interactions between the development trajectory of Preveza and the preservation of the protected wetland area of the Amvrakikos Gulf. The research objective is to determine whether a method can be recognized that, by considering the protected ecosystem as a local resource for the settlement, can substantiate conditions that promote the sustainable development of this particular duality.

**Keywords:** coastal area, environmental resource, legislative framework, protected ecosystem, sustainable development

## 1 Introduction

The trend of population concentration in Mediterranean coastal areas is related both to the general increase in the global population and to the systematic population movement from inland areas to coastal ones, in search of economic opportunities and better living conditions. This is because most Mediterranean coastal cities (Fig. 1) are linked to the presence of ports, which facilitate the easier and more economical transportation of goods, imports, and exports, encouraging the development of industry and trade in the broader area. Due to these conditions, a large portion of coastal areas is being allocated and repurposed.

Greece possesses the longest coastline among European countries, with thirty-three percent of the Greek population residing in coastal settlements situated 1-2 km from

the shore [1]. Eighty percent of industrial activities, ninety percent of tourism and recreational activities, thirty-five percent of agricultural land (usually of high productivity), fisheries and aquaculture (representing 10% of the total aquaculture in the 25 EU member countries), as well as a significant portion of infrastructure, are located in the coastal zone [2].

The coastal zone of the municipality of Preveza has been characterized in recent years by the efforts of local authorities for sustainable tourism development, maritime transport, and diverse activities in the primary sector, gathering significant potential of sustainable development. This zone includes a large natural port at the entrance to the Amvrakikos Gulf. The port of Igoumenitsa, the Egnatia Highway, but primarily the Ionian Highway and the connection of the city with the underwater tunnel of Aktio, represent the four largest infrastructure projects in the Epirus Region, which are linked to the coastal zone via the Amvrakia Road (Fig. 2). The contact with the Ionian Sea to the west and the Amvrakikos Gulf to the east (Fig. 2) increases the multimodality in the dynamics of the city, combining a semi-touristic and semi-agricultural economy, a large portion of which involves aquaculture and fishing.

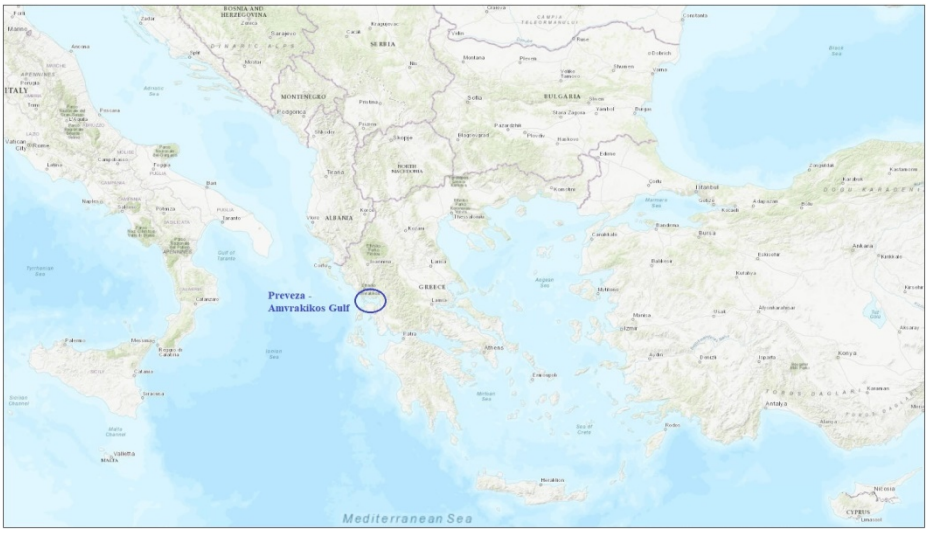


**Fig. 1.** Location of Preveza and the Amvrakikos Gulf in the Mediterranean area (Map sources: ESRI, OpenStreetMap, GIS User Community etc.)

Wetlands hold a significant position in the hierarchy of coastal biodiversity elements. Worldwide, they cover an area of 8.6 million km², or 6.4% of the Earth's surface [3]. In mainland Greece, 1,390 wetlands and nine wetland complexes with an area of 2,350,000 st. have been documented, while 805 were recorded on islands. Of these, 371 wetland ecosystems are fully or partially included in protected areas, covering an area of 1,963,700 st. [4]. They contribute to half of the global ecosystem services, including flood control and regulation, as well as the reduction of erosion phenomena [5]. However, in recent decades, wetlands have been dramatically decreasing due to human pressures and the climate crisis. Approximately 50% of the world's wetlands have been lost

since 1900, with 35% of them disappearing after 1970, at a rate three times faster than that of forests. In Europe, it is estimated that 17% of mammals are threatened with extinction, as well as 13% of birds, 40% of freshwater fish, and 58% of endemic trees [6]. Only 1-3% of the forests in Western Europe can be considered undisturbed by humans. Seas and coastal ecosystems are among the most threatened but also among the least protected, as marine protected areas internationally make up no more than 5.1% of national waters [7].

It is well known that the Greek coastal zone hosts important habitats, contributing to the survival of the biogenetic reserves of flora and fauna. Additionally, the coastal area contributes to the creation and maintenance of microclimates. The presence of coastal forests and wetlands helps minimize floods, erosion, and other natural disasters, providing valuable regulatory and supporting ecosystem services. The threats to the Greek coastal and marine environment stem on the one hand from natural hazards such as coastal erosion [8] and climate change, but primarily from human-induced pressures, such as urbanization, overexploitation of natural resources, and pollution. As a result of the intense pressures faced by the coastal zone, conflicts arise due to competing interests, and there is a growing threat of depletion of coastal environmental resources.

The pursuit of a golden mean among ecosystem services, with sustainability as a central focus, constitutes a field of research aimed at preserving and/or improving the state of the environment and ensuring sustainable and environmentally responsible development. Adequate environmental protection is an essential factor both for human well-being and for the enjoyment of fundamental human rights.

### 1.1 Research objective

Within this context, the objective of the present article is to analyze the interactions between the trajectory of development of a coastal urban residential area and the preservation of a neighboring, unique, protected ecosystem. The research objective is to identify, through the investigation of the temporal interactive relationship between the two entities, the terms and conditions under which coastal settlements can be linked in the context of sustainable development and coexist in balance with neighboring protected ecosystems. Specifically, the goal is to determine whether a method can be recognized that, by considering the protected ecosystem as a local resource [9] for the settlement, can substantiate conditions that promote the sustainable development of this particular duality. This is pursued through a case study focusing on the city of Preveza, whose eastern front borders the protected area of the Amvrakikos Gulf.

## 2 Dynamics of Coastal Space

According to Article 2 of the Protocol concerning Integrated Coastal Zone Management of the Mediterranean, the coastal zone is defined as 'the geomorphological area on both sides of the coastline, where the interaction between the marine and terrestrial components takes the form of complex systems of ecological elements and resources consisting of biotic and abiotic components that coexist and interact with human communities and the related social and economic activities'. Meanwhile, Article 2 of the

Special Framework for Spatial Planning and Sustainable Development for the Coastal Zone and Islands defines the coastal area or coastal space as 'the geomorphological area on both sides of the coastline where the relationship between the marine and terrestrial components is dynamically manifested through complex ecological systems that include biotic and abiotic components'. In general terms, the coastal area can be defined as the section of land and sea that is in direct contact with the coastline and within which various terrestrial and marine activities take place. It serves as the transitional environment from the sea to the land, giving it distinct natural as well as socio-economic characteristics.

The combination of elements that constitute the coastal zone results in a highly heterogeneous environment, which hosts a significant portion of the human population and a wide range of human activities, while also is encompassing a considerable number of ecosystems with rich biodiversity [10]. The significant importance of the coastal zone, at environmental, social, and economic levels, has resulted in continuous and intense conflicts between land uses and anthropogenic activities, which lead to the degradation of the relevant environment. This threatens critical environmental elements, even those under protection, such as wetlands, contributes to the extinction of rare biological species, the deterioration of coastal water quality, the decline in the tourism value of large portions of the coastal zone, the alteration of coastal landscapes, and ultimately, the degradation of the quality of life for coastal inhabitants. Over the last few decades, the coastal zone has gained an additional, paramount environmental value, as coastal areas serve as crucial habitats and act as a protective barrier against rising sea levels and flooding [11].

### 2.1 Contemporary urban conditions

The ongoing concentration of population in urban environments and the continuous demand for improved living conditions, social functions, and economic opportunities have resulted in the creation of environmental, social, and economic problems, such as social degradation, the depletion of available natural resources, traffic congestion, air pollution, inadequate infrastructure and networks [12], and even the climate crisis. Consequently, climate change, the protection of natural resources, quality of life, ethical governance, circular economy, as well as gender equality, education, fair trade, etc., represent current challenges for organized urban settlements. These challenges test the resilience of contemporary cities, which can be categorized into environmental, social, economic, and technological aspects.

In several areas of the Greek coastal zone, significant land-use conflicts are observed between tourism, primary sector activities, residential expansion, and protected areas. These conflicts often result in local overdevelopment, leading to the degradation of both the natural and built environment, as well as the depletion of natural resources. At the same time, in many cases, the lack of infrastructure—such as water supply and sewage networks, wastewater treatment plants, waste disposal facilities, flood protection works, etc.—exacerbates pollution problems in coastal areas. Additionally, coastal cities face specific risks associated with the climate crisis, including coastal erosion and sea level rise, the latter of which leads to land loss.

Particularly regarding the tourism product, the Mediterranean environment, and especially that of the European Mediterranean coastal zone, constitutes a dominant component of development models at the local, regional, and national levels, due to the combined comparative advantages it offers over other developmental parameters. This is because the environment of tourist destinations (natural, built, cultural, and social) is an integral part of the tourist experience. The quality of both the tangible elements (buildings, infrastructure, natural resources) and the intangible components (atmosphere, landscape, culture) that make up the tourism product affects both its competitiveness and its attractiveness. Due to this specificity, tourism development is considered a key parameter of the pressures faced by coastal cities and local ecosystems, such as wetlands. As a result of these pressures, negative impacts are recorded, which are related to the degradation of the natural environment (atmosphere, water, soil), the landscape, flora, and fauna, as well as changes in the built environment (urban planning, architectural). There are also impacts related to the depletion of natural resources and the exceeding of the carrying capacity of local ecosystems. The increase in the number of tourists to a destination results in a corresponding rise in the negative consequences for the local community and the environment, defining a threshold of visitors beyond which these consequences can no longer be accepted by either the locals or the tourists.

Coastal protection strategies adopted by cities facing high levels of risk have primarily focused on safeguarding the built environment through coastal protection infrastructure [13]. In contrast, even today, the protection of urban communities through the preservation of the ecosystem services provided by coastal ecosystems is often given limited consideration within these strategies [14]. Coastal protection works play a key role in protecting vulnerable urban coastal areas from erosion and flooding, just as coastal ecosystems contribute significantly to the overall sustainability and resilience of cities and urban populations by supporting coastal protection. These ecosystems demonstrate remarkable resilience to long-term disturbances, as well as adaptive capacity in the face of both urban stressors [15] and climate change [16]. Therefore, the preservation of coastal wetland complexes through management interventions aimed at enhancing ecosystem resilience is a critical issue. Maintaining coastal ecosystems and maximizing their resilience ensures that coastal urban communities can continue to benefit from the services they provide and improve their adaptive capacity in facing adverse future impacts [17].

### 2.2 Contemporary wetland conditions

As previously mentioned, wetland ecosystems provide half of all ecosystem services globally. Among other functions, they maintain water quality and supply [18], protect coastlines, preserve unique native species, and offer cultural, recreational, and educational resources [19], making them among the most valuable terrestrial ecosystems [20]. They act as natural filters for pollutants and sediments [21], contribute to the regulation of atmospheric gases, and help moderate the temperature of riparian zones [22]. They provide space and refuge for species and can be key factors in climate change adaptation strategies [23], while also helping to mitigate the impacts of natural disasters and the risks posed by harmful organisms and diseases [24]. Beyond their ecological values, wetlands offer numerous direct benefits to society. Their contribution to the

primary production sector, hydrological balance, and the overall environmental quality of adjacent lands is well-established. They constitute an ideal area for the practice of fishing, aquaculture, and livestock activities, as well as a distinctive environment for recreation, ecotourism, and scientific research.

While wetlands provide significant and vital ecosystem services, they are under constant and increasing pressure. Humanity has been destroying them for centuries [25]. Globally, many wetlands were lost and degraded during the 20th century due to anthropogenic activities [26], while in recent decades, their decline has been further exacerbated by climate change. The loss of wetlands, as well as the degradation of their services, is driven by key factors such as the expansion of agricultural land [27] alongside the intensification of agriculture, activities which are the main causes of their loss [28]. This also includes the intensification of industrial production [29], the ongoing evolution of urbanization [30], and the expansion of built-up areas. Furthermore, the development of infrastructure, the construction of dams, and changes in water use and availability [31], climate change, disease control, and aquaculture activities [32], as well as the intensification of the tourism industry, contribute to their degradation.

While economic growth, environmental exploitation, and social progress have proven to be significantly negative for wetland conservation, effective management of these areas can play a crucial role in their preservation, thus ensuring the continued provision of their valuable benefits, while also serving as the cornerstone for the maintenance and promotion of sustainable development. Moreover, in wetland areas, resource management is implemented at the ecosystem level, playing a key role in their sustainable use and consequently in their conservation, enhancing their resilience. The pursuit of the golden ratio by ecosystem services, with a central focus on sustainability, should constitute a field of research within the framework of the conservation and/or improvement of wetland ecosystems [33] and, by extension, the environment. This includes ensuring sustainable and environmentally sound development, as appropriate environmental protection is a crucial factor for human well-being and the enjoyment of fundamental human rights.

Reducing pressures from human activities is a fundamental prerequisite for enhancing the adaptive capacity of wetlands to climate change [34], in order to ensure their preservation. However, the concept of absolute protection—specifically, the total prohibition of all human activities within a wetland—should not be regarded as the foundational strategy for its conservation [22]. Such an approach would not only be practically unfeasible, but also contrary to the lessons of international experience, as in certain cases a discreet human presence and low-impact activity can contribute to this, promoting sustainable development without significant environmental burden.

## 3 Interactions between Preveza and the Amvrakikos Gulf

### 3.1 The City of Preveza

Preveza (Fig. 2) is a city that, like many contemporary coastal urban centers, experiences multifaceted economic, social, and environmental challenges, albeit of relatively low intensity. The recent economic and fiscal crisis has led to a downturn in local

economic activity, resulting in operational difficulties for businesses and increased pressure on the labor market. Existing challenges with long-term implications for the city, such as resilience to climate change, the need for sustainable and balanced spatial planning, the reduction of the energy footprint of buildings and infrastructures, the revitalization of the local economy and the enhancement of outward-looking strategies, the strengthening of social cohesion, and the mitigation of inequalities and exclusions, were intensified during the pandemic period and came to the forefront of urban discourse, introduced new parameters and requirements for both the urban environment and its inhabitants. An additional risk threatening Preveza is the coastal erosion and morphological instability of its shoreline, driven by the impacts of climate change.

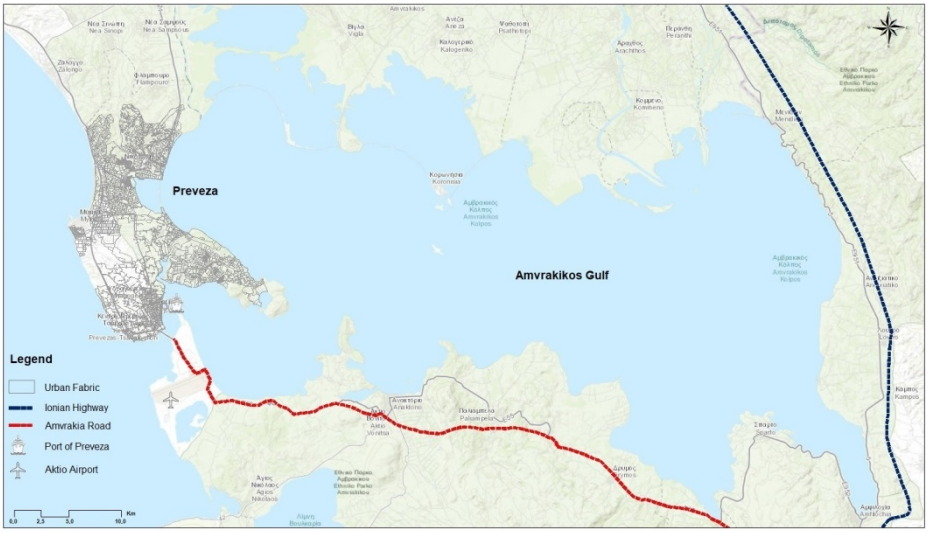


**Fig. 2.** Geographical Correlation of Preveza and Amvrakikos Gulf
(Cartographic base map: ESRI, OpenStreetMap, GIS User Community etc.)

The position and role of Preveza within the Region of Epirus is documented through the study of the revised in 2018 Regional Spatial Planning Framework (RSPF). According to this, Preveza constitutes a second-level settlement network as the center of the Regional Unit and is considered, in its entirety, a "touristically developing area." The goal for the city of Preveza should be to increase tourism activities and support the Ionian tourism corridor. Preveza maintains its character as an agricultural-livestock and manufacturing center. This, however, does not undermine its tourist orientation; instead, it provides opportunities for the development of supportive synergies between the primary sector and tourism. Priorities include the protection of agricultural land (especially irrigated land) from incompatible uses (mainly urban development) and the modernization of agricultural production through the regulation of fertilization, pesticides, etc.

The RSPF recommends that intensification through fertilizers and pesticides, as well as monoculture farming, constitute problems. Addressing these issues requires both strengthening scientific and technical support actions and enhancing control and

certification processes for high-quality final products. It is recommended to rationally manage water resources, gradually concentrate production units in organized hubs, and orient agricultural production towards high-quality products. The goal is to retain the agricultural population and support it through better organization of agricultural holdings and livestock production, as well as promote agrotourism. It is also recognized that the coexistence of irrigated agricultural land with land used for intensive poultry farming, along with the fact that both activities place a burden on the Amvrakikos Gulf, constitutes a problem in the organization of land uses. Thus, it is necessary for the underlying planning to foresee these specific land uses, establish restrictions to prevent the spread of production units, and expedite the processes for the establishment, creation, and operation of designated hubs. The habitat of the Amvrakikos Gulf, like other lagoonal, fishing, and diving tourism resources, can be utilized through appropriate promotion, contributing to tourism development. At the same time, it is emphasized that the area of the Amvrakikos Gulf is not suitable for the development of infrastructure such as accommodations, dining, etc., except within the existing coastal settlements of the gulf. Moreover, even in these settlements, the potential for locating accommodations is limited due to the protection regime.

The main directions of the RSPF regarding other technical infrastructure focus on the completion and modernization of the water supply and sewage systems in the tourist settlements of the coastal area, with the sensitive ecosystem of the Amvrakikos Gulf being the receiving environment. The RSPF, therefore, recognizes the value of protecting the Gulf from terrestrial human activities, addressing it as a unified receptor for areas of organized aquaculture development, and promoting its gentle highlighting and utilization as a valuable ecosystem. A key direction focuses on the protection of the ecosystem and its mild tourism development, avoiding interventions that would require construction. It also proposes the prohibition of construction at the river mouths along the Amvrakikos Gulf, through the establishment of Special Protection Area Zones, and the implementation of environmental measures that contribute to the drastic reduction of pollution load from industrial and agricultural waste in the water receptors of the Gulf.

The urban planning of the Municipality of Preveza has been regulated in recent years through the provisions of the General Urban Planning Scheme of 2009, which remains in effect to this day, and outlined the division of the city into nine Urban Planning Units. Preveza is not a typical example of a coastal city that develops linearly, along the coastline, in direct continuation and connection with its maritime space. The city's relationship with the sea has also determined the way in which the relevant land uses were organized. The urban planning schemes that have been applied over time have allowed for a gentle urban diffusion, as an extension of the development of the city's historic center, where the urban fabric is compact, as a result of the regulatory framework for construction within its boundaries. The expansion of the discontinuous urban fabric of the city center occurred parallel to the southwestern part of the western peninsula on the side of the Ionian Sea, as well as on the eastern peninsula towards the side of the Amvrakikos Gulf. In both sides, a gentle densification is observed in the locations of the settlements, as the residential expansion in these areas is governed by clear construction regulations that respect the environment. Recently, the Special Urban

Planning Scheme (SUPS) for the Coastal Front of Epirus is being developed, which includes Preveza. It appears, therefore, that the prevailing urban and spatial planning model advocates for balanced coastal urban diffusion, which has taken place in a relatively moderate manner—evident from the absence of pronounced urban sprawl. This planning approach has contributed, on the one hand, to the relatively sustainable preservation of a compact urban fabric and, on the other hand, to the upgrading of the transitional peri-urban zone. The eastern coastal frontage, where the port and the Preveza Marina are located, plays a significant role in the recent development model adopted by the municipal authority, while investment interest is also directed towards the western coastal frontage, along the Ionian Sea, for the establishment of hotel facilities.

In relation to the sectors of economic activity, the agricultural sector is particularly developed in the wider region of Preveza. In the area located between the Louros and Arachthos rivers, both of which discharge into the Amvrakikos Gulf, there are land improvement infrastructure serving cultivated areas, which have been progressively decreasing over time (between 2015 and 2021, a reduction of approximately 50% in these areas was observed). The impacts of agricultural production are widespread and highly dispersed throughout the protected area of the Amvrakikos Wetlands National Park (AWNP). It should be noted that the critical control points for agricultural impacts pertain to inputs of nutrients (organic and chemical fertilizers, growth hormones, etc.) and plant protection products, as well as the outputs of residues from the aforementioned elements [35]. The livestock sector is also significantly developed in the Regional Unit of Preveza. The majority of the related operations are located in the plain area, with their units appearing to potentially impact the ecosystemic balance of the Amvrakikos Gulf. In the past decade (2011-2021), populations of cattle, sheep and goats, pigs, and poultry have increased by between 31.30% and 317,000% [36]. In addition, the city relies heavily on economic activities such as fishing, aquaculture, and the processing of fishery products. It boasts extensive fishing grounds along its coastlines, both in the Amvrakikos Gulf and the Ionian Sea, as well as a rich network of inland waters.

Preveza is a coastal city where tourism has never been a monoculture. The recent attempt to gradually intensify tourism activities, starting when the city decided to develop through tourism as well, has not yet resulted in issues regarding carrying capacity [37]. The period of economic and fiscal crisis that affected Greece from 2009 appears to have impacted Preveza until 2014. After 2012, when the lowest visitor arrivals and overnight stays were recorded, a positive trend in tourism influx to Preveza was observed. Between 2010 and 2020, the arrivals of foreign tourists increased by 187.25%, making it crucial to plan for a holistic approach to the tourism product [38].

### 3.2 The Amvrakikos Gulf

It is one of the most important wetland areas in the country, with its ecological richness attracting attention at both the national and international levels. In addition to the marine ecosystem of the Gulf, wetland ecosystems surrounding it cover an area of over 220,000 st., making it one of the most complex wetland complexes, at least in Greece [39]. The significant biological, ecological, aesthetic, scientific, geomorphological, and educational value of the area has been internationally recognized through its inclusion in the Ramsar Convention's list of wetlands of international importance, its designation

as a "special protected area" under the Barcelona, Bern, and Bonn Conventions, and the delineation of four areas within the Natura 2000 Network. The diversity of habitats found in the Amvrakikos Gulf is shaped by the deltas of the Louros and Arachthos rivers, which flow into the northern part of the gulf. The ecological, economic, and cultural significance of the Gulf's ecosystems has both necessitated the understanding of their structure and dynamics and, as a particularly important ecological complex, led to its inclusion under a national protection regime, in the context of numerous conventions and decisions. Indicatively, the following are mentioned: Laws 2742/1999 (207/A'), 3044/2002 (197/A'), 4519/2018 (25/A'), 4685/2020 (92/A') and 4964/2022 (150/ A'), as well as the Joint Ministerial Decisions 30027/1193/1990 (194/B') and 11989/2008 (123/D').

Pollution phenomena in the Gulf were officially identified and documented for the first time during the 1970s, primarily as a result of waste discharges from livestock farming units transported via the Louros and Arachthos rivers, as well as the direct disposal of untreated urban wastewater. Concurrently, elevated concentrations of phosphates were first detected at the estuaries of these rivers and associated streams, a consequence of the intensification of agricultural practices. In recent decades, the degradation of water quality in the Gulf has intensified. Over 50% of its surface area is now characterized by oxygen-deficient water masses (hypoxic or anoxic zones). At depths below 20 meters, oxygen concentrations are critically low, rendering the environment inhospitable to most aquatic organisms [40]. At present, the ecological condition of the Gulf is classified as poor [41]. Furthermore, it has been demonstrated that the widespread decline in fish production is due to the combined effects of increasing fishing pressure and the ongoing environmental degradation of coastal ecosystems—most notably, the spatial and temporal expansion of the anoxic zone. All of this is occurring within a highly sensitive and ecologically significant area that has been designated as a National Park and benefits from substantial institutional protection.

Human activities have contributed significantly both to the shaping of the Gulf's landscape and to its current environmental condition. In the name of development, a series of public and private projects were carried out in the area. However, several of these actions were implemented without proper planning, in an uncoordinated manner, and without consideration for sustainability or the protection of the Gulf's rare ecosystems. The pressures currently exerted on the Amvrakikos Gulf can be broadly categorized into three main groups: pollution; disruption of the hydrological balance—both of the Louros and Arachthos Rivers and of the Gulf itself; and a range of anthropogenic activities, either legal or illegal, occurring in the wider region (within both the Gulf and its surrounding coastal zone).

Indicative factors contributing to environmental degradation include urban expansion, agricultural intensification, mismanagement of water bodies discharging into the Gulf, and the implementation of various infrastructure projects (e.g., port works, road construction, drainage systems, land reclamation), all of which contribute to the fragmentation and degradation of the natural landscape, intensifying ecosystem disturbance. In addition, several activities occurring outside the legal framework further deteriorate the environment. These include unauthorized road construction and illegal infilling of wetland areas, encroachments along riverbanks, operation of illegal landfills,

unregulated sand extraction and dumping of construction debris, livestock units operating without functional wastewater treatment systems, overgrazing, illegal logging of riparian forests, and improper disposal of agrochemical substances such as pesticides and fertilizers. Moreover, unregulated and excessive hunting and fishing activities degrade and alter the composition of local fauna by disrupting the food web and ecological balance of the Gulf's habitats.

## 4 Context of interaction

In 1872, the first regime for the protection of a sensitive ecosystem prioritized humans over the protected entity itself, while environmental protection was initially excluded from the policy framework of the former European Economic Community (EEC), which, in its founding act—the Treaty of Rome in 1957—set as its sole objective the economic cooperation among its member states. Environmental protection was recognized for the first time as an objective of the European Union only in 1972, during the Paris Summit, as it gradually became clear that economic development could not be pursued independently of environmental policy, nor without a clear social and ecological orientation. Until then, political and economic systems, often in conflict with ecological principles, regarded environmental resources as inexhaustible.

In this context, the Amvrakikos Gulf has historically been perceived as an inexhaustible source of economic wealth. However, its ecological distinctiveness—particularly the vulnerability of its wetland complex—only began to receive systematic attention in the 1980s, primarily triggered by the observed decline in catch. The environmental degradation of the Gulf resulted from unregulated anthropogenic activities such as pollution and the overexploitation of its ecosystem resources. Environmental protection was formally established as an autonomous field of action within the European Community in 1986. In 1987, in an effort to address and resolve the then-ongoing environmental crisis, the United Nations' World Commission on Environment and Development introduced the concept of sustainable development, which became associated with the imposition of stricter environmental protection standards. It was not until 1997 that the Community addressed environmental protection independently of economic growth, while the principle of sustainable development was officially articulated and later ratified by Greece in 1999.

The revisions of the Greek Constitution in 1986 and 2001 incorporated the principle of sustainability as a legal norm, from which obligations, commitments, and restrictions arise for the legislative power, public policies, and private activities. Law 1650/1986, in conjunction with its amending Laws 3937/2011 and 4685/2020, set the national framework for the protection of the environment and biodiversity. These laws defined, among other things, the categories of protected areas and the procedures for their designation. The amendments introduced by the 2020 environmental law concerning already protected areas under Articles 18–21 of Law 1650/1986 primarily aimed to align Greece with EU directives regarding the biodiversity protection of environmentally sensitive zones. The law clarified procedures for the inclusion (or exclusion) of areas in the Natura 2000 network. Specifically, Law 4685/2020 sought to streamline the

issuance of Presidential Decrees under Article 21 of Law 1650/1986 by requiring the preparation of a Special Environmental Study (SES) as a prerequisite, along with a Management Plan (MP). These instruments are intended to define the permitted land uses within the designated protection zones on a case-by-case basis. However, this process is largely not implemented in practice.

The protective measures that have been implemented were often perceived by the local population, to some extent, as impediments to regional development. Crucially, when ecosystem conservation efforts are decoupled from the productive functions of the landscape, they tend to result in superficial, short-term preservation initiatives. Concurrently, local economic development strategies often revolve around the formulation of growth plans which, within the constraints of the prevailing regulatory framework, amount to fragmented and poorly coordinated interventions. Such approaches have long-term adverse implications for both the natural environment and human systems. Therefore, the environmental degradation of the Amvrakikos Gulf can be interpreted as a gap in local development planning, as the relevant local authorities had, until recently, failed to recognize the Gulf's significance as a local development factor. Simultaneously, the lack of public awareness led residents to view the natural environment as a hindrance rather than a contributor to the development process.

Although the criteria for designation and the principles governing the protection of National Parks throughout the country were established in 1986 (Law 1650), the Amvrakikos Gulf was not officially designated as a National Park until 2008. Over time, several weaknesses have been identified within the relevant Greek legislative framework. The first of these weaknesses concerns the absence of management plans. In 1986, the Greek regulatory framework stipulated the establishment of administrative and operational regulations for the management units, as well as the preparation of management plans (MPs) for the protected areas in question, following the completion of a Special Environmental Study (SES). Since then, only one SES was carried out in 2004, as a prerequisite for the designation of the Amvrakikos Gulf as a National Park in 2008. Although the legislation provides that MPs should be periodically revised and updated through new SESs, in accordance with extensive and qualitative changes observed within protected zones—so as to substantiate the significance of the protected object and the necessity of the proposed conservation measures—a new SES was not commissioned by the Ministry of Environment and Energy (YPEN) until 2019. Furthermore, longitudinal analysis of the regulatory framework governing permissible land uses within protection zones indicates a gradual intensification of allowable projects and activities, the implementation of which may be authorized within these areas, albeit subject to specific conditions and requirements. Additionally, over time, provisions have been introduced allowing for exceptions and derogations from protective regulations for certain projects and activities within protected areas, which may contribute to the degradation of the associated ecosystems.

The management units were initially designed to be governed by administrative boards comprising, among others, representatives of the respective first and second level local government authorities as well as productive organizations active within the area of the protected site. However, according to the 2020 Environmental Law, the newly established Board of the Natural Environment and Climate Change Agency no

longer includes representation from either local authorities or local productive stakeholders. This shift reflects the adoption of a centralized governance model for sensitive areas, through the abolition of the institutional autonomy previously granted to the Protected Areas Management Units (PAMUs), effectively marginalizing local self-government.

Pursuant to recent environmental legislation, Protected Areas Management Bodies (PAMBs) are mandated, among other responsibilities, to generate revenue through the imposition of fines in cases where violations of protection measures are identified, and to conclude programmatic agreements with competent authorities for the surveillance and enforcement within their jurisdiction. However, the exercise of these competencies is effectively hindered due to fragmented and/or conflicting legal frameworks that do not provide the necessary institutional clarity and support for their implementation. Moreover, although the legislator has, albeit subjectively, defined threshold values aimed at preventing the exceedance of the ecosystem carrying capacity for elements of biodiversity and ecosystem resources, the relevant regulatory provisions are not universally applied, as a significant portion of society does not comply with them. Nevertheless, even these exceptions are sufficient to cause environmental degradation, due to the inherent vulnerability and sensitivity of protected ecosystems.

Within the ever-changing environment they inhabit, coastal settlements are required to monitor changes, protect themselves, adapt, and survive. In essence, they are called upon to pursue resilience—safeguarding their citizens, their activities, and the adjacent ecosystems. An essential ally in this effort can be an integrated planning approach, which should aim to promote the sustainable management of coastal areas by leveraging the natural features and character of coastal zones. At the level of the European Union (EU), the integrated management of coastal zones in the Mediterranean Sea region (as defined in Article 1 of the Convention) constitutes an integral component of the EU's Integrated Maritime Policy, which was endorsed by the European Council in Lisbon in December 2007. In this context, the Protocol on Integrated Coastal Zone Management (ICZM) in the Mediterranean, or the ICZM Protocol, which constitutes the seventh Protocol of the Barcelona Convention, is recognized as an international legal instrument for the sustainable management, use, and development of coastal zones, with the aim of preserving coastal ecosystems, landscapes, and natural resources. The Protocol promotes a participatory and collaborative framework between the public and private sectors, including civil society and various economic stakeholders, through more coordinated and integrated approaches that take into account the transboundary nature of the environmental issues to be addressed [42]. Member States are required to develop action plans and to incorporate into their national strategies, among other things, the protection and sustainable use of coastal zones, the safeguarding of the characteristics of specific coastal ecosystems, the recognition of the natural and cultural value of coastal landscapes, and the preservation of local natural resources from certain economic activities. For this reason, effective governance and the participation of relevant stakeholders must be ensured, along with the implementation of awareness-raising, training, education, and research activities.

The Amvrakikos Gulf has the potential to enhance the dynamics of Preveza through both primary sector activities and tourism. This interaction, however, must be

characterized by mutual respect—particularly from the contemporary urban center, which constitutes the dominant partner within this interdependent nexus. The productive activities developed by residents within the AWNP must be aligned with the preservation of nature and landscape. Preveza has the capacity to coexist harmoniously with the Amvrakikos Gulf. Their interaction can yield mutual benefits. However, the city must demonstrate genuine respect for and actively protect this sensitive ecosystem. The city stands to gain considerably more from a healthy and balanced relationship. To achieve this, regulatory provisions and measures should be established for all activities before they pose a threat. Pressures should be addressed holistically rather than individually, adopting small solutions for large-scale problems. Moreover, in Greece, it may not be necessary to establish new laws, but rather to improve existing ones by eliminating conflicting provisions within the current legislation and ensuring strict adherence to the existing legal framework. At the same time, effective supervision and enforcement of the terms and regulations set forth in the environmental protection regulatory framework must be implemented, while the development of environmental awareness among residents is an essential and possibly primary prerequisite.

## 5 Conclusion

In Greece, legislative initiatives aimed at addressing the protection and conservation of ecologically sensitive areas appear to have fallen short of achieving both the required level of environmental safeguarding and the effective promotion of their significance in advancing sustainable development. The underlying causes are multifaceted, including inadequate regulatory frameworks, administrative shortcomings, lack of coordination—and potentially, lack of interdisciplinary approaches—limited public participation, weak environmental monitoring, and insufficient financial resources to implement the measures arising from the terms and restrictions imposed by protective regimes. It is a fact that, despite the existence of legal tools, binding commitments, and clearly defined obligations for environmental protection available to the competent authorities, scientific evidence and observations do not indicate a reduction in environmental pressures. Many of the regulatory provisions related to environmental protection have been revised periodically, ostensibly to enhance protection through the modernization of environmental legislation. However, due to the procrastination of central authorities and the lack of an integrated legislative approach to the issue, the work of Management Units has been hindered—reducing them to mere observers and recorders of adverse events affecting the protected areas, rather than active agents of conservation. Consequently they did not provide significant assistance in the conservation—and certainly not in the improvement—of the protected ecosystems. Moreover, relevant laws and regulatory provisions are often enacted after significant delays, and their implementation may not take effect until long after their formal adoption.

In countries with a multi-tiered system of governance the local level is the one most directly connected to the challenges and opportunities of the coastal zone. Local authorities have a vested interest in, and are significantly affected by, the ecological integrity and economic viability of coastal areas. They are also among the primary entities

impacted by insufficient development and environmental degradation, as many coastal stakeholders are embedded within the structure of local governance. Therefore, it is imperative that local authorities are fully engaged and systematically integrated into the framework of integrated coastal zone management. A key prerequisite for success is the acceptance of the management plan by the local population, which may require compensatory investments to offset potential short-term income losses resulting from restrictions on the unrestricted exercise of certain economic activities. Additionally, the establishment of a management body is essential—one that includes, on the one hand, representatives of the state apparatus responsible for biodiversity-related issues and members of the scientific community, and on the other, primarily local stakeholders and representatives who articulate the local development vision in alignment with the protection and conservation of the area's distinct ecosystems.

Among all global ecosystems, wetlands present some of the most contentious, complex, and politically sensitive contemporary environmental challenges. Their future appears to be predominantly influenced by the trajectories of economic, social, and political development, as well as by the resolution of conflicts emerging from the administrative and legislative framework. However, their ecosystem services hold significant value for society, which can be expressed in economic terms. Consequently, the preservation of wetland biodiversity elements, combined with the sustainable development of interacting urban systems, should be the primary goal of managing any relevant dipole, ensuring that local communities are not marginalized and their economic prosperity is not jeopardized. There is an urgent need for the implementation of cohesive and integrated management frameworks, moving away from isolated and disconnected services and actions. An integrated approach should focus on innovation and targeted actions towards desired development, while simultaneously enhancing the resilience of all factors that need to be protected, namely the environment, the economy, and society.

## References

1. Moutzouris, K.I.: Coastal Zone Management in Greece within the Framework of Directive 2000/60/EC. In: Conference: Directive 2000/60/EC – Alignment with the Greek Reality. NTUA, Athens (2001). (in Greek)
2. Committee for the Study of Climate Change Impacts (CSCCI): The environmental, economic, and social impacts of climate change in Greece. Bank of Greece, Athens (2011). (in Greek)
3. Development Assistance Committee (DAC): Sustainable use of wetlands. Guidelines on aid and environment. OECD (1996).
4. Fytoka, E., Tompoulidou, M., Hatziiordanou, L., Apostolakis, A.: Wetlands in Mainland Greece: Number, Area, and Spatial Distribution. Goulandris Natural History Museum – Greek Biotope/Wetland Centre, Thermi (2020). (in Greek)
5. Myers, S.C., Clarkson, B.R., Reeves, P.N., Clarkson, B.D.: Wetland management in New Zealand: Are current approaches and policies sustaining wetland ecosystems in agricultural landscapes? Ecological Engineering, 56, 107-120 (2013)
6. International Union for Conservation of Nature (IUCN): Annual Report 2019. https://portals.iucn.org/library/sites/library/files/documents/2020-025-En.pdf, last accessed 2025/5/12.

7. Coad, L., Burgess, N., Fish, L., Ravillious, C., Corrigan, C., Pavese, H., Granziera, A., Besançon, Ch.: Progress towards the Convention on Biological Diversity terrestrial 2010 and marine 2012 targets for protected area coverage. Parks: the international journal for protected area managers 17(2), 35-42 (2010)
8. Velegrakis, A.: THALES Research Proposal: Assessing the Impacts of Sea Level Rise on Insular Coastal Zones in the Aegean Sea. University of the Aegean, School of Environmental Studies, Department of Marine Sciences (2010). (in Greek)
9. Klabatsea, I.: Local development of small islands with intense specialization in tourism: Cost and benefits in the framework of sustainable development. WIT Transactions on Ecology and the Environment, 98, 205-214 (2006)
10. Commission of the European Communities (EEC): Communication from the European Commission to the Council and the European Parliament on Integrated Coastal Zone Management: A Strategy for Europe. COM (2000) 547 Final. Brussels (2000)
11. Kenanidou, Ch.: Management of Marine Flooding Risks in the Coastal Zone. Master's Thesis. Aristotle University of Thessaloniki, Department of Civil Engineering. Thessaloniki (2017). (in Greek)
12. Washburn, D., Sindhu, U.: Helping CIOs Understand "Smart City" Initiatives. Forrester Research (2010)
13. Oppenheimer, M., Glavovic, B.C., Hinkel, J., van de Wal, R., Magnan, et al.: Sea level rise and implications for low-lying islands, coasts and communities (Chapter). In: Oppenheimer, M., Glavovic, B.C., Ghosh, T., Special Report on the Ocean and Cryosphere in a Changing Climate, 321-445. Cambridge University Press, Cambridge, UK and New York, NY, USA (2019)
14. Powell, E.J., Tyrell, M.C., Milliken, A., Tirpak, J.M., Staudinger M.D.: A review of coastal management approaches to support the integration of ecological and human community planning for climate change. Journal of Coastal Conservation, 23, 1-18 (2019)
15. Todd, P.A., Heery, E.C., Loke, L.H.L., Thurstan, R.H., Kotze, D.J., Swan, C.: Towards an urban marine ecology: Characterizing the drivers, patterns and processes of marine ecosystems in coastal cities. Oikos, 128(9), 1215-1242 (2019)
16. Borchert, S.M., Osland, M.J., Enwright, N.M., Griffith, K.T.: Coastal wetland adaptation to sea level rise: Quantifying potential for landward migration and coastal squeeze. Journal of Applied Ecology, 55, 2876-2887 (2018)
17. Nguyen, N., Friess, D., Todd, P., Mazor, T., Lovelock, et al.: Maximising resilience to sea-level rise in urban coastal ecosystems through systematic conservation planning. Landscape and Urban Planning, 221(104374), 1-12 (2022)
18. Koutrakis, M.: Selected Issues in Environmental Management: The Case of Greek Wetlands. Goulandris Natural History Museum – Greek Biotope/Wetland Centre, Thermi (1996). (in Greek)
19. Millennium Ecosystem Assessment: Ecosystems and human well-being: wetlands and water synthesis. A Report of the Millennium Ecosystem Assessment. World Resources Institute, Washington, DC (2005)
20. Woodward, R.T., Wui, Y-S.: The economic value of wetland services: a meta-analysis. Ecological Economics, 37, 257-270 (2001)
21. Barbier, E.D., Acreman, M., Knowler, D.: Economic valuation of wetlands: A guide for policy makers and planners. Ramsar Convention Bureau, Gland, Switzerland (1997)
22. Gerakis, P.A.: Wetlands. Goulandris Natural History Museum – Greek Biotope/Wetland Centre, Thermi (1993). (in Greek)
23. Tzatzaki, V.: Adapting the legal framework of natural marine resources management to climate disruption: The case of Greece. Arctic Review on Law and Politics, 9, 359-376 (2018)

24. European Commission (EC): The European Green Deal. COM (2019) 640 Final. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. Brussels (2019)
25. Davidson, N.C.: How much wetland has the world lost? Long-term and recent trends in global wetland area. Mar. Freshw. Res. 65(10), 934-941 (2014)
26. Tiner, R.W.: Watershed-based Wetland Planning and Evaluation: A Collection of Papers from the Wetland Millennium Event. August 6–12, 2000; Quebec City, Canada. Association of State Wetland Managers, Inc., Berne, NY (2002)
27. Reis, V., Hermoso, V., Hamilton, S.K., Ward, D., Fluet-Chouinard, E., et al.: A global assessment of inland wetland conservation status. Bioscience 67(6), 523-533 (2017)
28. White, E.E., Ury, E.A., Bernhardt, E.S., Yang, X.: Climate change driving widespread loss of coastal forested wetlands throughout the North American coastal plain. Ecosystems 25(4), 812-827 (2022)
29. Ballut-Dajud, G.A., Sandoval Herazo, L.C., Fernandez-Lambert, G., Marín-Muniz, J.L., Lopez Mendez, M.C., Betanzo-Torres E.A.: Factors affecting wetland loss: a review. Land 11(3), 434 (2022)
30. Seifollahi-Aghmiuni, S., Kalantari, Z., Egidi, G., Gaburova, L., Salvati, L.: Urbanisation-driven land degradation and socioeconomic challenges in peri-urban areas: insights from Southern Europe. Ambio 51(6), 1446-1458 (2022)
31. Niu, Z., Zhang, H., Wang, X., Yao, W., Zhou, et al.: Mapping wetland changes in China between 1978 and 2008. Chinese Science Bulletin 57(22), 2813-2823 (2012)
32. Duan, H., Yu, X., Xia, S., Zhang, G.: Waterbird habitat loss: fringes of the Yellow and Bohai seas along the East Asian–Australasian Flyway. LDD 32(15), 4174-4182 (2021)
33. Geneletti, D., Scolozzi, R., Esmail, B.A.: Assessing ecosystem services and biodiversity tradeoffs across agricultural landscapes in a mountain region. International Journal of Biodiversity Science, Ecosystem Services & Management 14(1), 188-208 (2018)
34. Greek Biotope/Wetland Centre and Attica Region: Climate Change Vulnerability Assessment of Wetlands in the Attica Region and Strategic Action Plan. Goulandris Natural History Museum – Greek Biotope/Wetland Centre, Athens (2014). (in Greek)
35. Karras, G, Manos, G., Ifanti, P., Mparouhas, P., Patakioutas, G., et al.: The Hypoxic Zone of the Amvrakikos Gulf: Mapping, Impacts, and Management. Subproject 5 – Reports B and C: Qualitative and Quantitative Analysis of the Drainage Canal Inputs to the Amvrakikos Gulf and Their Contribution to the Development of the Hypoxic Zone. Technological Educational Institute (TEI) of Epirus, Arta (2017). (in Greek)
36. Payments and Control Agency for Community Support Schemes and Guarantees: Aggregate Data of Single Exploitation Applications: Database related to the evolution of plant and animal capital for the period 2011-2021. OPEKEPE, Athens (2023). (in Greek)
37. Tzoumas, V.: Coastal residential complexes in the vicinity of protected ecosystems. Interactions in the Preveza - Amvrakikos gulf dipole. Master's Thesis. NTUA, School of Architecture. Athens (2023). (in Greek)
38. Institute of the Greek Tourism Confederation (INSETE Intelligence): Region of Epirus: Annual Report on Competitiveness and Structural Adjustment in the Tourism Sector for the Year 2020. December 2021. Athens (2021). (in Greek)
39. Amvrakikos Gulf – Lefkada Management Unit (ALMU): Amvrakikos, a Rich and Generous Nature. Preveza (2020). (in Greek)
40. Hellenic Centre for Marine Research (HCMR): Oceanographic study of Amvrakikos Gulf. Ministry of Environment, Physical Planning and Public Works, Athens (1989). (in Greek)
41. Albanis, T.: Pollution problems of Amvrakikos Gulf. University of Ioannina, Department of Chemistry, Ioannina (n.d.). (in Greek)

42. The Council of the EU: Council Decision of 4 December 2008 on the signing, on behalf of the European Community, of the Protocol on Integrated Coastal Zone Management in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (2009/89/EK). Official Journal of the European Union (2009)

# The unique features of Greek cities as catalysts for implementing a polycentric city model for urban sustainability

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**Abstract.** Greek cities exhibit unique characteristics that can serve as catalysts for implementing the polycentric city model as a means to enhance urban sustainability. This paper explores how Greece's urban structure, historical development, and land-use patterns create both challenges and opportunities in adopting this model. While Greek non-rural cities, inherently possess mixed-use neighborhoods, which align with the core principles of polycentricity, persistent urban issues such as inefficient mobility networks, fragmented governance, and limited public participation hinder progress.

The study examines global case studies, particularly the 15-minute city model implemented in Paris, and assesses its applicability within the Greek context. Key factors, including mobility strategies, land-use policies, and citizen engagement, are analyzed to determine their feasibility in Greek central cities. Furthermore, the research highlights the importance of fostering local adaptation rather than direct replication of international models.

Findings indicate that while Greece has a comparative advantage in certain aspects of polycentric urbanism, targeted interventions are required to address existing urban shortcomings. These include strengthening sustainable mobility infrastructures, preserving the diversity of urban functions, and fostering public participation in planning processes. Ultimately, the study advocates for a strategic, context-specific approach to integrating polycentric principles into Greek urban environments, ensuring resilience, sustainability, and improved quality of life for residents.

**Keywords:** Polycentric city model, urban sustainability, Greek polycentric city

## 1 Introduction

In economic science, the term "comparative advantage" was first formulated by theorist David Ricardo in 1817 to describe the inherent, distinguishing feature of a system that makes it more efficient and gives it a competitive edge over other systems. This concept emerged at a time when economic theory began to recognize the natural environment as an integral part of the system - a finite and directly impacted component of economic activity. A system can be described as the sum of characteristics that we define as resources, which apart from the environment includes both economic and social

variables. Similarly, in urban planning, a city is viewed as a system composed of various characteristics, including the built environment, the natural environment, history, economy, social dynamics, and, crucially, its users. Based on this theoretical framework, urban planning can also assess the comparative advantage or superiority of one region over another in implementing a theoretical model.

Historically, Greece has been characterized by numerous particularities, especially concerning land ownership, public property, housing production, and rural land management. These features have largely constituted a comparative disadvantage. The challenges stemming from these issues, extensively documented in the literature over the past decades (see: M. Mantouvalou, 2023 [7], D. Karydis, 2008 [6] , G. Sarigiannis, 2000 [9]), have collectively contributed to problematic urban development, inadequate environmental protection, weak legislative enforcement, and a fragmented institutional framework. These persistent issues necessitate immediate intervention to enable Greek cities to withstand the growing pressures for sustainable and resilient urban environments, particularly in the face of climate change and the energy crisis.

Amidst this already challenging reality, the COVID-19 pandemic forced the world to slow down and reevaluate multiple aspects of daily life, including economic, social, and commercial activities. More importantly, within the scope of this study, the pandemic served as a turning point in redefining how urban users interact with the city. The rapid transformations imposed not only on economic and social sectors but also on urban daily life prompted major cities worldwide to reconsider their operational frameworks under these new conditions. Simultaneously, the increasing demand for action against climate change has intensified research into the optimal functional model for contemporary cities, reassessing daily mobility, communication networks, and transportation needs.

## 2 The Emergence of the Model

The polycentric city model has re-emerged in scientific and political discourse as a potential response to these challenges. Its contemporary iteration incorporates new technologies and a user-oriented approach to fostering greener, environmentally friendly urban spaces that help combat climate change. Given the urgent need to transition toward a more sustainable environment and a user-friendly urban structure aligned with the principles of sustainable development, a polycentric urban layout - with mixed-use zones and extensive connectivity - can create a new urban landscape tailored to 21st-century environmental requirements.

Cities worldwide, each with unique characteristics, are moving in this direction. Notable examples include Melbourne, Australia [1]; Ottawa, Canada [2]; Shanghai, China [3]; and Bogotá, Colombia [4]. In Europe, Barcelona, Milan, and Paris are a few of the cities that have also initiated similar projects. Paris specifically represents a particularly significant case study in promoting the polycentric "15-minute city" concept. Since 2019, under the leadership of Mayor Anne Hidalgo and urban planner Carlos Moreno - the concept’s primary proponent - the city has been rapidly redesigning its public spaces to prioritize sustainable mobility and environmentally friendly transportation.

The implementation of this model in Paris has provided valuable insights into both the successes and challenges of its application, which can serve as valuable input for strategy formation in other cities [5].

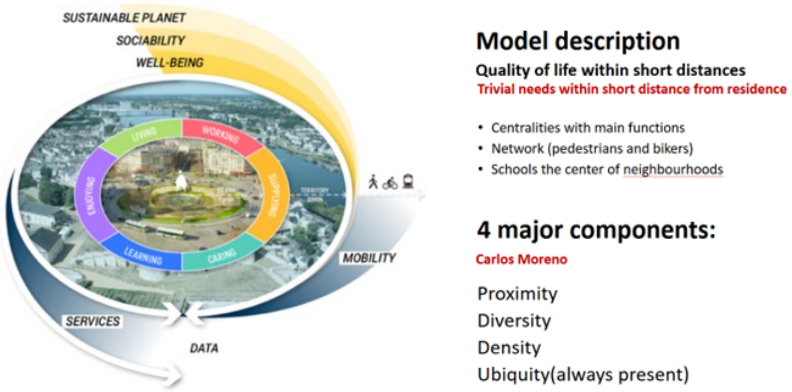



**Fig. 1**. Moreno's representation of the 15-minute city principles [8]

Moreno's strategy is structured around two key axes: Mobility and Services, aiming to achieve the triad of sustainability - social cohesion - well-being. His approach suggests that rather than focusing solely on eco-friendly transportation, efforts should be directed toward reducing the need for mobility altogether. This principle is operationalized by ensuring that essential daily needs can be met within short distances from residential areas, focusing on the concept of travel time. Moreno identifies six fundamental everyday needs that should be accessible within close proximity: residence, work, commerce, healthcare, education, and leisure, arguing that one's residence should be a within walking distance of less than 15 minutes from each of them.

As demonstrated by both empirical evidence and Moreno's own advocacy, the 15-minute city model - designed to enhance urban quality of life - must be adapted to the unique socio-economic, cultural, and spatial characteristics of each city [10]. The Parisian model, while a compelling prototype, cannot be directly replicated in every urban setting. Flexible and adaptive approaches are required to account for local particularities and priorities.

The fundamental principles of the model envision the creation of "walkable" cities that enable residents to meet their predefined daily needs within close proximity. To achieve this, the primary challenges that must be addressed include the development of safe routes and the concentration of land uses that accommodate essential functions such as education, commerce, employment, leisure, and (potentially) administration in a central and easily accessible location.

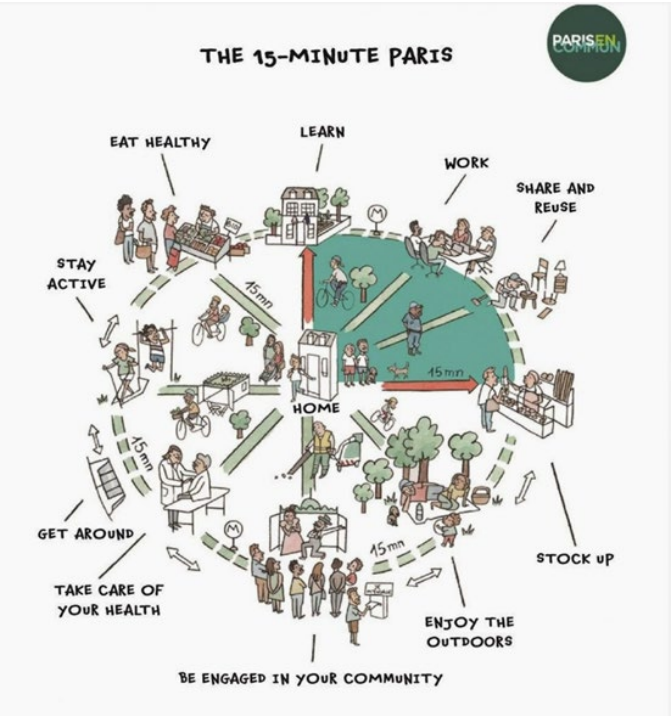



**Fig. 2.** Paris Strategy [11]

The common focal point and central axis of the strategy adopted by major European cities seeking to implement this model is the creation of centralities through the enhancement of multifunctionality and the encouragement of mixed land uses. In several cases, such as Paris, emerging new centers are proposed to be structured around educational institutions, as their spatial distribution has already taken into account both population density as well as the city's needs within a small radius. Attracting, establishing, or strengthening diverse land uses within local centers is a complex goal and a significant challenge for all cities. It requires the implementation of strategies with a strong social dimension to prevent gentrification and the creation of social inequalities. In this regard, the specific actions, objectives, and outcomes of the strategies followed by both Paris and other major cities have not yet been clearly documented. Specifically for Paris, certain individual strategies have been identified that aim to strengthen neighborhoods and engage citizens in the proposal development process. However, these strategies have not been explicitly linked to the broader 15-minute city framework.

Beyond meeting essential needs (services), mobility is the second key pillar of the strategy. The objective is to connect urban functions by creating safe routes to and from neighborhood centers, with a strong emphasis on promoting sustainable mobility principles. Taking Paris as an example once again, the traffic-related changes introduced during the pandemic - when car usage was already reduced - have been reinforced and now constitute the city's primary urban planning strategy.

On the other hand, the Parisian experience showed that partially implementing the strategy creates the possibility of misunderstanding the scope of the program. The actions taken need to be clearly related to each other in order to avoid fragmented application and poor results. Finally, it also showed that there needs to be clear communication of the objectives of the strategy. People's inclusion appears to be crucial throughout both the planning and implementation process [5].

## 3 The Greek Experience

Applying this experience to Greek cities necessitates an assessment of the model's core objectives and their feasibility in Athens. For the purposes of this paper the examination focuses on a typical suburb of Metropolitan Athens. This means that, similarities to the central area of Athens in terms of proximity, mixed uses and urban density are still present, however there are no special factors such as historical or touristic aspects that need to be taken into account.

### 3.1 Services

A central goal of the first strategic pillar is the establishment of multifunctional urban cores within small-scale neighborhoods. Greek cities inherently possess this small-scale, mixed-use characteristic, a byproduct of land development processes in the past century. During Greece's urban expansion, the absence of a coordinated city planning strategy allowed small landowners to develop their properties autonomously, leading to the mosaic of land uses and ownership seen today. This characteristic - considered an advantage in adopting the 15-minute city model - is a major challenge for many European cities designed under modernist planning principles that emphasize strict zoning. The core principles of Moreno's model - proximity, diversity, density, and ubiquity - are already partially fulfilled in Greek cities, offering them a competitive edge in integrating the 15-minute city strategy.

However, certain aspects require further investigation, such as the reinforcement of declining urban functions and the protection of existing land-use diversity from the pressures of tourism-driven monocultures, which are increasingly affecting both major cities and islands in Greece. Addressing this issue is essential for the country not only for implementing this strategy but also for broader social, environmental, and economic reasons.

### 3.2 Mobility

The second strategic axis, which focuses on connectivity and the creation of safe routes to local centers, is crucial for reducing travel time. Despite the seemingly straightforward and cost-effective implementation of sustainable mobility strategies, this remains a significant challenge in Greek cities due to limited public space, fragmented planning, and poor infrastructure maintenance. Establishing a comprehensive and safe pedestrian and cycling network requires a well-integrated plan rather than piecemeal interventions - something that is currently difficult in Greece, due to spatial constraints, planning inefficiencies, and -often- a lack of political commitment.

As a result, Greece - a country with an excellent climate for walking and non-motorized transportation for most of the year - fails to capitalize on this comparative advantage. A study on vehicle usage, conducted by the University of Thessaly with the supervision of prof. G. Koutedakis, revealed that 82% of surveyed drivers use their private cars for round-trip distances of less than four kilometers, while only 18% travel longer distances [12]. Round trips of under four kilometers fall within the influence radius of a neighborhood unit, and this percentage could be significantly reduced if a safe alternative route for non-motorized transportation were available.

## 4 …With a twist

Delving deeper into the need to reduce commuting, as emphasized by Carlos Moreno's core principles, one might expect that the mixed-use nature of Greek cities would naturally lead to decreased travel within major urban centers. However, this is not the case. Beyond Athens' already limited public transportation network compared to other European metropolises, car use remains a dominant aspect of daily life. According to Eurostat data from 2023, the car ownership rate in Greece was slightly above 0.5 vehicles per capita, while the average number of passengers per vehicle barely exceeded one person per car [13]. Despite a slight decline in car usage during the economic crisis (2007–2017), it gradually returned to pre-crisis levels after 2018 and surged even more during the COVID-19 pandemic, as people sought to avoid crowded public spaces. The trend has remained high despite the significant increase in fuel costs.

According to 2023 Eurostat data, 44% of car trips are related to commuting to and from work. When factoring in trips related to accompaniment - such as transporting children to activities - this figure approaches nearly half of all car trips.

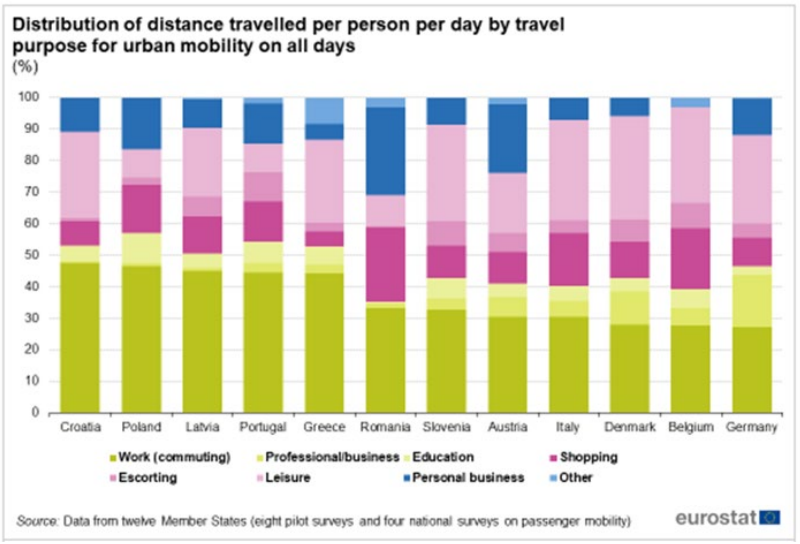
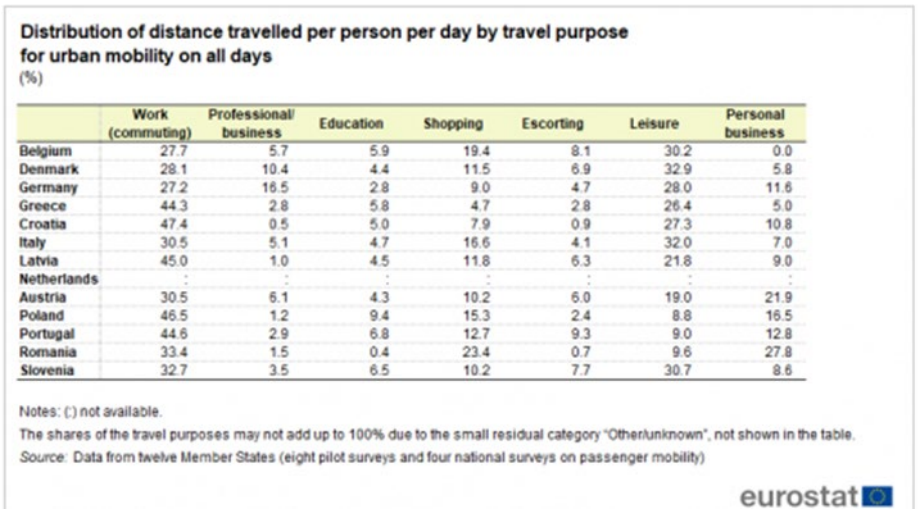



**Fig. 3.** Distribution of distance travelled per person per day by travel purpose for urban mobility [13]



**Distribution of distance travelled per person per day by travel purpose for urban mobility on all days**
(%)

| | Work (commuting) | Professional/ business | Education | Shopping | Escorting | Leisure | Personal business |
|---|---|---|---|---|---|---|---|
| Belgium | 27.7 | 5.7 | 5.9 | 19.4 | 8.1 | 30.2 | 0.0 |
| Denmark | 28.1 | 10.4 | 4.4 | 11.5 | 6.9 | 32.9 | 5.8 |
| Germany | 27.2 | 16.5 | 2.8 | 9.0 | 4.7 | 28.0 | 11.6 |
| Greece | 44.3 | 2.8 | 5.8 | 4.7 | 2.8 | 26.4 | 5.0 |
| Croatia | 47.4 | 0.5 | 5.0 | 7.9 | 0.9 | 27.3 | 10.8 |
| Italy | 30.5 | 5.1 | 4.7 | 16.6 | 4.1 | 32.0 | 7.0 |
| Latvia | 45.0 | 1.0 | 4.5 | 11.8 | 6.3 | 21.8 | 9.0 |
| Netherlands | : | : | : | : | : | : | : |
| Austria | 30.5 | 6.1 | 4.3 | 10.2 | 6.0 | 19.0 | 21.9 |
| Poland | 46.5 | 1.2 | 9.4 | 15.3 | 2.4 | 8.8 | 16.5 |
| Portugal | 44.6 | 2.9 | 6.8 | 12.7 | 9.3 | 9.0 | 12.8 |
| Romania | 33.4 | 1.5 | 0.4 | 23.4 | 0.7 | 9.6 | 27.8 |
| Slovenia | 32.7 | 3.5 | 6.5 | 10.2 | 7.7 | 30.7 | 8.6 |

Notes: (:) not available.
The shares of the travel purposes may not add up to 100% due to the small residual category "Other/unknown", not shown in the table.
*Source:* Data from twelve Member States (eight pilot surveys and four national surveys on passenger mobility)



**Fig. 4.** Distribution of distance travelled per person per day by travel purpose for urban mobility [13]

The inability to introduce strong incentives to encourage the use of public transportation - whether due to the limited network, low reliability, or poor service quality - creates a persistent challenge in Greece when it comes to reducing private car usage. Addressing this issue requires long-term, consistent planning. While such planning is essential given the urgent need for more sustainable urban environments, it must also be accompanied by short- and medium-term solutions.

However, within the framework of the 15-minute city strategy, integrating workplaces into the set of essential services that should be available within close proximity to residents is entirely feasible. The COVID-19 pandemic demonstrated that a significant portion of the workforce can operate remotely. By establishing neighborhood-based remote work hubs, commuting by private car can be significantly reduced for those who can work without physical presence, while also making travel more efficient for those whose professions require them to be on-site. Both outcomes contribute to environmental protection and an improved quality of life, as studies have shown a direct link between commuting time and psychological well-being. Their research shows that individuals with longer commutes tend to report reduced levels of well-being [12].

Specifically, providing the option for remote work outside the home helps mitigate several risks that became evident during the pandemic, such as the transfer of work-related costs to employees, sedentary lifestyles, isolation, and procrastination. It also ensures access to well-equipped workspaces for those who lack suitable conditions at home. At the same time, it enables the creation of multifunctional neighborhood hubs that, beyond offering workspace, can also support complementary uses tailored to the specific needs of each community. The operation of these hubs can be funded through a combination of public and private sector investments, utilizing an appropriate reciprocity and exchange model between the two.

## 5 Plus: People Inclusion

As with all urban planning strategies, this approach requires strong public participation to ensure both effective design and broad acceptance. Meaningful engagement of stakeholders guarantees that interventions reflect the diverse needs, aspirations, and perspectives of local communities and residents, fostering a sense of ownership and inclusivity.

The experience of Paris has highlighted the significance of this factor. Despite the municipality's expertise in public consultation and urban policy communication, many aspects of the strategy were pre-determined - often inadequately communicated - and implemented through a top-down approach. As a result, the model did not receive the level of public support it might have otherwise garnered [5].

Moreover, the Parisian case demonstrated the crucial role of governance structures and the political framework in advancing transformative urban initiatives. Effective and coordinated communication and collaboration between municipal authorities, regional governments, and other administrative bodies are essential for balancing diverse interests, mobilizing resources, and overcoming bureaucratic hurdles.

Unfortunately, Greece has little positive experience to contribute in terms of public consultation and civic participation. It is common for such processes to be carried out only as a formality to meet regulatory requirements, without genuine efforts to engage with stakeholders. Even when users collectively attempt to participate by providing input, there is a strong likelihood that their contributions will not be seriously considered in the final planning outcome. This lack of meaningful engagement is further exacerbated by a weak culture of participation and public dialogue among users themselves. Compared to other European cities, resident communities in Greece often struggle to organize effectively and find appropriate channels to express their needs and demands.

## 6 Conclusions

As cities worldwide confront mounting challenges such as climate change, social inequality, and inefficient urban structures, adopting sustainable urban planning strategies becomes increasingly essential. The polycentric city model, particularly as exemplified by the 15-minute city concept, presents a viable framework for creating resilient and inclusive urban environments.

In the Greek context, the existing mixed-use nature of cities offers a strong foundation for polycentric urbanism. However, to fully realize the benefits of this model, several critical interventions are necessary. First, enhancing sustainable mobility infrastructure - such as expanding pedestrian pathways, cycling networks, and reliable public transportation—must be prioritized to reduce dependence on private vehicles. Second, urban policies should aim to protect land-use diversity, ensuring that local economies and social structures are not disrupted by tourism-driven gentrification. Third, a paradigm shift is needed in urban governance, fostering a culture of civic engagement and participatory planning to create more inclusive and community-driven urban transformations.

Furthermore, this study underscores the importance of flexibility in policy implementation. While international examples provide valuable insights, direct replication of models such as the Parisian 15-minute city may not be suitable for Greece without significant adaptations to local economic, cultural, and spatial realities. Instead, Greek cities should leverage their inherent characteristics - compact urban forms, vibrant neighborhood economies, and established land-use patterns -to develop tailored solutions that align with contemporary sustainability goals.

Ultimately, integrating polycentric principles into Greek urban planning requires a coordinated, long-term strategy that bridges the gap between policy vision and practical implementation. A holistic approach - encompassing improved mobility, strategic land-use planning, and active citizen participation - can enable Greek cities to transition toward more sustainable, efficient, and livable urban environments.

## References


1. Plan for Victoria, Department of Transport and Planning https://www.planning.vic.gov.au/guides-and-resources/strategies-and-initiatives/20-minute-neighbourhoods
2. Engage Ottawa, https://engage.ottawa.ca/the-new-official-plan/news_feed/15-minute-neighbourhoods
3. Shanghai action guidance of 15-minute community life circle, https://ghzyj.sh.gov.cn/cmsres/3a/3a52297af92f43a29899e3d61e4c5cc2/36def90629a5427faec623ed7f2b4dbb.pdf
4. The Bogota Post, https://thebogotapost.com/going-local-15-minute-cities-is-bogota-one/51097/
5. Christoforaki, K. (2024) Towards a sustainable urban Future: The 15-minute city approach in Paris, France, *Sustainable Development, Culture, Traditions Journal*, https://sdct-journal.com/index.php/2015-10-18-22-23-19/2024-volume-2-a/532-towards-a-sustainable-urban-future-the-15-minute-city-approach-in-paris-france)
6. Karydis, D. (2008), *Τα επτά βιβλία της πολεοδομίας*, Papasotiriou
7. Mantouvalou, M. (2023), *Η παραγωγή του αστικού χώρου ως κοινωνικό και πολιτικό διακύβευμα,* Angelus Novus
8. Moreno, C. The 15 minutes-city: for a new chrono-urbanism! https://www.moreno-web.net/the-15-minutes-city-for-a-new-chrono-urbanism-pr-carlos-moreno/
9. Sariyannis, G. (2000), *Athens 1830-2000*, Symmetria,
10. Vasilopoulou, T. (2024), Η Αθήνα «πόλη των 15 λεπτών»; Ο Κάρλος Μορένο το πιστεύει, *Καθημερινή,* 9/2/2024 https://www.kathimerini.gr/society/562875292/i-athina-poli-ton-15-lepton-o-karlos-moreno-to-pisteyei/ (τελ. ανάκτηση 10/2024).
11. Resistire Project, https://resistire-project.eu/better-stories/paris-as-a-15-minute-city/
12. Athens – Macedonian News Agency, https://www.amna.gr/home/article/872296/To-82-ton-Ellinon-odigoun-gia-apostaseis-mikroteres-ton-4-chiliometron---Poies-einai-oi-sunepeies---Milaei-sto-APE-MPE-o-omotimos-kathigitis-G-Koutentakishttps://ec.europa.eu/eurostat/statistics-explained/index.php?title=Passenger_cars_in_the_EU
13. Eurostat, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Passenger_mobility_statistics
14. Euronews, https://www.euronews.com/next/2024/09/25/these-are-europes-longest-and-shortest-commutes-to-work-how-does-your-country-compare

# Evaluation of healthy historic centers: The case of Chania

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**Abstract.** This paper explores the concept of healthy cities, emphasizing the need for urban environments that promote health, well-being, and sustainability. It highlights the challenges posed by rapid urbanization, environmental degradation, and social inequalities. The World Health Organization's definition of a healthy city is outlined, emphasizing the integration of physical and social environments to enhance quality of life. The paper reviews existing evaluation frameworks and certifications and proposes a toolkit for assessing the health of historic urban centers, incorporating factors like cultural heritage preservation, tourism, and social equity. The historic center of Chania which is used for the application of the proposed evaluation framework is characterized by moderate preservation, with signs of deterioration in some buildings and limited adaptive reuse. Environmental quality is relatively good, but noise pollution and low green space coverage are concerns. Accessibility for people with disabilities and public transportation services are inadequate, while cycling infrastructure is poorly developed. Climate resilience is weak, and sustainable tourism efforts are insufficient, leading to overcrowding and strain on infrastructure. Proposals for improvement include enhancing heritage preservation, expanding sustainable transport, increasing green spaces, and strengthening climate resilience. These measures aim to improve accessibility, livability, and sustainability for both residents and visitors.

**Keywords:** Healthy cities, evaluation frameworks, historic center, Chania

## 1 Introduction: The concept of healthy cities

Urbanization has accelerated rapidly over the last few decades, fundamentally transforming lifestyles and living environments in cities. Particularly in megacities, rapid population growth has intensified a host of urban challenges including deteriorating air and water quality, overcrowded housing, rising social inequalities, insufficient public spaces, the proliferation of informal settlements, traffic congestion, and inadequate waste management systems. These challenges were further magnified during the COVID-19 pandemic, which exposed the fragility of urban systems and redefined the essential requirements for urban development by emphasizing the need for equitable access to health, safety, and basic services. In response to these challenges, the concept of "Healthy Cities" has gained renewed relevance. The World Health Organization (WHO), in collaboration with Health Canada, formally introduced the Healthy Cities initiative in 1986 through the Ottawa Charter for Health Promotion, which stated:

"Health is created and lived by people within the settings of their everyday life; where they learn, work, play, and love" [1].

This was further refined in WHO Europe's definition: "A Healthy City is one that is continually creating and improving those physical and social environments and expanding those community resources which enable people to mutually support each other in performing all the functions of life and in developing to their maximum potential" [2]. Over time, this concept has evolved. For instance, Barton et al. (2015) emphasized the integration of planning and health in achieving sustainable urban development [3], while Amri (2022) argued for the alignment of Healthy Cities with broader governance frameworks such as Health in All Policies [4]. These developments show a shift from a purely public health perspective to a multidisciplinary and policy-oriented approach involving urban planning, equity, and sustainability.

Table 1 presents a comparative overview of key definitions of Healthy Cities, highlighting similarities, differences, and their evolution over time.

**Table 1.** Comparative Overview of Key Definitions of Healthy Cities

| Source | Core Focus | Key Concepts | Evolutionary Features | Multidisciplinarity |
|---|---|---|---|---|
| WHO & Health Canada (1986) | Health in everyday settings | Health is created in daily life settings: where people live, learn, work, play, and love | Initial framing of health beyond healthcare; foundation of Healthy Cities idea | Primarily public health focus |
| WHO Europe (1990s–2000s) | Physical, social, and community environments | Continual improvement of environments and community resources to support full human potential | Broadens focus to urban environments and mutual community support | Health + urban social environment |
| Barton et al. (2015) | Urban planning and sustainable development | Integration of health with urban planning for long-term sustainable outcomes | Marks the shift toward urban sustainability and planning integration | Strong urban planning dimension |
| Amri (2022) | Governance and policy coherence | Alignment with Health in All Policies; intersectoral and governance-driven approaches | Emphasizes policy frameworks and institutional integration | Cross-sectoral governance, equity, sustainability |

Developing healthy cities requires strong urban functions and infrastructure to ensure good living conditions. This aligns with 12 sustainable development goals, including: (i) promoting healthy lifestyles, (ii) fostering social cohesion, (iii) ensuring quality housing, (iv) expanding employment access, (v) improving facility accessibility, (vi) supporting local and healthy food, (vii) enhancing safety, (viii) advancing equity, (ix) creating a clean and pleasant environment, [x) ensuring water quality and sanitation,

(xi) conserving land and resources, and (xii) reducing climate-threatening emissions [5].

Today, the World Health Organization's Healthy Cities strategy places health at the center of the social and political agenda of cities and strives to build a strong movement for public health at the local level [6]. Healthy Cities is a dynamic concept that evolves with time and the accumulation of new evidence and experience, as well as the emergence of new priorities and political developments.

In recent decades, the growing recognition of urban environments' influence on public health and well-being has led to the development of numerous evaluation frameworks and certification systems aimed at evaluating and promoting healthier cities. These frameworks—such as BREEAM, LEED, the Active Design Guidelines, and the WHO Healthy Cities Toolkit—focus on diverse elements ranging from environmental sustainability and infrastructure to social equity and urban mobility. However, while these tools provide valuable insights into how cities can support healthier living, they often reflect divergent priorities and definitions of what constitutes a "healthy" urban environment. Most notably, they are rarely tailored to the unique spatial, cultural, and environmental characteristics of historic urban areas. Historic city centers, which embody cultural heritage and traditional urban forms, face distinct challenges such as tourism pressure, limited green space, aging infrastructure, and social inequalities. Assessing these areas requires a more nuanced, multidimensional approach that integrates heritage preservation with public health, environmental quality, social inclusion, and economic vitality. This paper builds upon an extensive review of existing urban health evaluation frameworks to propose a comprehensive framework specifically designed for historic city centers. Using Chania's historic center in Crete as a case study, the research highlights the need for context-sensitive tools that bridge the gap between sustainability goals and cultural heritage conservation.

## 2 The existing evaluation frameworks systems and certifications for healthy cities

Since the 1990s, numerous evaluation frameworks, systems, and certification frameworks have emerged to support sustainable development in the built environment. Initially focused on individual buildings, these systems progressively evolved to encompass entire communities and cities [7]. Among the earliest holistic approaches was the Blue Zones initiative (2008–2021), developed by Blue Zones, LLC. This initiative emphasized long-term policy and environmental change, particularly in promoting healthier lifestyles through improvements in public spaces, enhancing walkability, and encouraging social connections. Central to this framework was the concept of the "Life Radius," which targeted the improvement of daily living conditions within a five-mile radius of residents' homes. This involved municipal policies aimed at improving road safety, green infrastructure, and restricting the promotion of unhealthy behaviors, such as junk food marketing and smoking [8].

The BREEAM Communities International Technical Standard represented another key certification system for large-scale urban development. It assessed urban

performance across several categories, namely governance, social and economic well-being, resource and energy efficiency, land use and ecology, and transport and movement. Its holistic approach aims to ensure both environmental sustainability and social inclusiveness in new developments [9]. The LEED v4.1 Cities and Communities certification expanded upon prior versions by providing a comprehensive framework for evaluating sustainability and quality of life in urban areas [10]. This program evaluated performance using nine thematic categories: integrative process, natural systems and ecology, transportation and land use, water efficiency, energy and greenhouse gas emissions, materials and resources, quality of life, innovation, and regional priority. Its strength lies in its broad applicability and standardized metrics for tracking improvements over time. The Active Design Guidelines, introduced in 2010 by the New York Department of Design and Construction, emphasized urban design strategies that promote physical activity and healthy living. The guidelines identified five foundational dimensions—density, diversity, design, destination accessibility, and distance to transit—while recommending design interventions such as land-use mix, improved street connectivity, recreational spaces, and bicycle infrastructure [11].

In 2015, the Urban Land Institute introduced the "Building Healthy Places Toolkit," which identified ten principles for creating health-promoting urban environments. These included prioritizing people in planning, enhancing access to green and recreational spaces, encouraging mixed land uses, improving air quality, and supporting infrastructure for walking and cycling [12]. Simultaneously, the World Health Organization (WHO) Western Pacific Region published the "Healthy Cities Toolkit," which offered a series of actionable strategies for local governments to develop health-enabling environments. These included enhancing street-level amenities such as benches, bicycle lanes, public transport networks, smoke-free spaces, and access to healthy foods and community healthcare services [13].

Another influential contribution came from the Gehl Institute's "Inclusive Healthy Places" framework in 2018, which proposed a participatory and context-sensitive methodology for the design and evaluation of inclusive, health-promoting public spaces. The framework outlined four dimensions: context, process, design and program, and sustainability, with an emphasis on civic participation, inclusivity, and long-term resilience [14]. Similarly, ISGlobal's "5 Keys to Healthier Cities" report highlighted strategies to improve air quality, reduce noise, enhance access to nature, promote physical activity, and control urban temperatures [15].

In 2020, the Healthy Cities Generator tool provided an integrative framework that emphasized equity, sustainability, active living, social connectivity, safety, access to nutritious food, and environmental health. It supported health integration into urban planning and emphasized community empowerment and policy coordination [16]. The same year, the DGNB System for Districts was developed, offering a detailed certification system organized into five assessment areas: environmental quality, sociocultural and functional quality, technical quality, process quality, and economic quality. Its metrics included pollutant management, infrastructure functionality, governance mechanisms, and participation [17]. Finally, the UN-Habitat and WHO Sourcebook on "Integrating Health in Urban and Territorial Planning" (2020) offered an evidence-based and equity-driven approach aligned with the New Urban Agenda. This

framework focused on four overarching health-oriented planning objectives: avoiding health risks, reducing unhealthy environments, promoting healthier lifestyles, and capturing long-term health benefits through inclusive planning in areas such as housing, transportation, and energy [18].

A comparative review of these tools reveals that although each framework addresses the interface between urban form and public health, they vary significantly in scope and emphasis. While some systems, such as LEED and BREEAM, offer detailed metrics for environmental and energy performance, others, like the Gehl Institute or the WHO toolkits, emphasize participatory planning and social inclusion. Most frameworks incorporate elements of active mobility, access to green spaces, and the integration of health-promoting infrastructure. However, their differing interpretations of core concepts such as "health" and "sustainability" can lead to inconsistencies in assessment outcomes. For instance, some systems privilege environmental criteria—focusing on carbon emissions or energy use—while others stress social determinants like access to healthcare, inclusivity, or food security. This divergence underscores the need for a clear conceptual foundation when developing and applying certification systems. The WHO's definition of a healthy city is instructive in this context. It conceptualizes a healthy city as one that not only mitigates environmental and health risks but also actively fosters well-being through physical and social environments that promote health-oriented behavior. It distinguishes between health protection—minimizing exposure to pollutants, unsafe infrastructure, and disease vectors—and health promotion, which involves creating conditions that enable and encourage healthy choices and lifestyles. Importantly, many certification systems tend to emphasize one of these aspects, either protection or promotion, while failing to integrate both. This gap suggests that for urban development certification systems to fully support the creation of healthy cities, they must align more closely with WHO's holistic perspective. Only then can they contribute meaningfully to urban environments that enhance quality of life, equity, and resilience for all residents.

The data analyzed from the above frameworks indicate that most evaluation frameworks link healthy urban environments primarily with mobility, active design, and transport infrastructures, often guided by different understandings of public health (Table 2). Future efforts should aim to systematize these frameworks under unified evaluation criteria. Such criteria, drawn from conceptual analysis and validated by comparative methods, should address environmental quality, social inclusivity, health infrastructure, mobility, public participation, and governance, ensuring consistency and relevance across diverse urban contexts.

**Table 2.** Comparison of Healthy City Assessment Frameworks

| Framework / Tool | Health Focus | Participation | Environmental Quality | Equity & Inclusion | Mobility & Activity | Public Space | Governance |
|---|---|---|---|---|---|---|---|
| Active Design Guidelines (NYC) | ✓ | – | ✓ | – | ✓ | ✓ | – |
| Gehl Inclusive Healthy Places | ✓ | ✓ | – | ✓ | ✓ | ✓ | ✓ |
| WHO Western Pacific Toolkit | ✓ | – | ✓ | ✓ | ✓ | ✓ | ✓ |
| ISGlobal 5 Keys | ✓ | – | ✓ | – | ✓ | – | – |
| Healthy Cities Generator | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| UN-Habitat & WHO Sourcebook | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| LEED v4.1 Cities and Communities | Partial | ✓ | ✓ | Partial | ✓ | ✓ | ✓ |
| BREEAM Communities | Partial | ✓ | ✓ | Partial | ✓ | ✓ | ✓ |
| DGNB Districts Criteria Set | Partial | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## 3 Methodology: Defining a tool for the evaluation framework for healthy historic centers

As historic urban areas are defined the groups of buildings, structures and open spaces including archaeological and paleontological sites, constituting human settlements in an urban or rural environment, the cohesion and value of which, from the archaeological, architectural, prehistoric, historic, aesthetic, or sociocultural point of view are recognized. Historic urban areas, large and small, include cities, towns and historic centers or quarters, together with their natural and man-made environments. Beyond their role as historical documents, these areas embody the values of traditional urban cultures.

The Historic Urban Landscape (HUL) is defined by UNESCO (2011) as:

*"The urban area understood as the result of a historic layering of cultural and natural values and attributes, extending beyond the notion of 'historic centre' or 'ensemble' to include the broader urban context and its geographical setting"* [19].

This approach goes beyond preserving individual monuments or buildings and emphasizes the integration of cultural heritage conservation with the goals of sustainable urban development. HUL includes a combination of elements such as the physical form and design of the urban environment (buildings, open spaces, infrastructure), social and cultural practices and values, the economic processes and spatial organization of the

city, and the natural environment (topography, hydrology, vegetation). The HUL approach advocates for a dynamic and integrated approach to managing change in historic cities, ensuring that urban development respects and sustains their historical significance, identity, and community values while addressing contemporary needs such as housing, mobility, and climate resilience. [19].

Evaluating the health of historic urban areas requires a comprehensive framework that balances cultural heritage preservation with public health promotion. To develop a robust evaluation framework, this research analyzed existing frameworks—such as the WHO's Urban Health Index, UNESCO's Historic Urban Landscape (HUL) approach, and sustainable development metrics—and identified key criteria pertinent to historic centers. The following selected groups of criteria are based on their relevance to urban health, environmental sustainability, and socio-spatial equity in historic areas.

1. Cultural Heritage Preservation: Cultural heritage forms the backbone of historic urban identities and supports social cohesion, economic development, and placemaking [20]. Assessing the conservation status of historic buildings and the extent of adaptive reuse ensures the integration of heritage into modern urban life while preventing decay or inappropriate development [20] Adaptive reuse contributes to sustainability by extending building life cycles and reducing resource consumption [21].
2. Environmental Quality: Assesses factors such as air quality, noise pollution, and green space coverage which are determinant of physical and mental health, especially in dense historic environments [22]. These areas often face increased exposure due to traffic congestion and tourism intensity [23]. Green infrastructure, even in limited forms such as pocket parks, contributes to climate regulation and psychological well-being [24].
3. Public Health and Well-being: Access to healthcare services and community spaces is essential for promoting health equity in urban areas. In historic centers, infrastructure constraints may limit access to primary care or inclusive public spaces, affecting vulnerable groups such as older adults or lower-income residents [25]. Community spaces also play a critical role in reducing loneliness and fostering social inclusion [26].
4. Mobility and Accessibility: Mobility within historic urban centers affects access to services, social participation, and economic opportunities. Evaluating walkability, bike infrastructure, and inclusive design is crucial to ensure accessibility for all users, particularly people with disabilities and the elderly [27]. Public transport accessibility also reduces reliance on cars, contributing to environmental and health benefits [28].
5. Climate Resilience and Sustainability: Historic urban areas are increasingly vulnerable to climate-related hazards, including heatwaves, floods, and sea-level rise. Integrating criteria such as energy efficiency, disaster preparedness, and renewable energy helps evaluate resilience while respecting heritage constraints [29]. Retrofitting historic buildings for energy efficiency is particularly critical in reducing emissions and improving thermal comfort [30].
6. Economic and Social Vitality: Historic centers thrive when they support both residents and visitors in a balanced, sustainable manner. Monitoring the ratio of

residents to tourists, particularly in peak seasons, helps identify overtourism risks and community displacement [31]. The health of local businesses is also vital for socio-economic resilience and cultural continuity [32].

7. Governance: Effective and participatory governance is a cornerstone of equitable urban development. Assessing the inclusiveness of decision-making processes and the availability of reliable data ensures accountability and fosters trust between authorities and citizens [33]. In the context of heritage management, participatory governance supports long-term stewardship and adaptive strategies [34].

These criteria collectively reflect the complex and interrelated challenges that historic urban centers face today. Their integration into a health-oriented evaluation framework allows for a nuanced, place-sensitive approach that safeguards heritage while promoting urban resilience, inclusivity, and sustainability.

Each indicator is supported by quantitative and qualitative data sources, including air pollution levels, noise readings, public transportation availability, and resident surveys. A five-level scale (Very Poor-Low, Poor-Low, Moderate, High, Very High) is employed to assess the attainment of each indicator, providing a nuanced understanding of urban health conditions. This type of ordinal scaling allows for a more refined classification of performance, enabling decision-makers to identify priority areas and tailor interventions accordingly. Multi-level evaluation frameworks are widely used in urban health and sustainability evaluations, as they facilitate the translation of complex, multidimensional data into actionable insights [35]. Moreover, graded scales help capture gradations in health-related determinants, supporting comparative analyses across spatial and temporal contexts [36].

The criteria and the indicators used for the current research are shown in Table 3.

**Table 3**. The proposed evaluation framework for historic centers as healthy areas

| **1. Cultural Heritage Preservation** | | |
|---|---|---|
| **Conservation Status of well-preserved historic buildings and sites** [37] | **Very Poor** | Buildings or sites are at risk of collapse or have collapsed. Historical value is significantly diminished due to neglect or inappropriate interventions. No evident efforts to preserve or maintain the site |
| | **Poor** | Major changes compromise the historical authenticity. Original materials are largely lost or severely damaged. Neglect leads to accelerated deterioration |
| | **Moderate** | Alterations are evident and may affect the historical character. Significant portions of materials have been replaced or are deteriorated. Occasional Maintenance occurs but may not be comprehensive |
| | **Good** | Some modifications exist but do not detract from the historical value. Most original materials are preserved, with minor replacements. Consistent upkeep addresses minor issues promptly |
| | **Very good** | Buildings and sites maintain their original structural components without significant alterations. Original materials are intact and have been meticulously conserved. Regular and proactive maintenance ensures the longevity of the structure |

| | | |
|---|---|---|
| **Adaptive Reuse** [38] | **Very Low Adaptive Reuse** | Minimal Repurposing of Historic Buildings. Few historic buildings have been adapted for contemporary use. Many structures remain unused or continue their original functions without modernization |
| | **Low Adaptive Reuse:** | Some historic buildings have been converted for modern purposes, but such cases are infrequent. A considerable portion of historic structures are either vacant or underutilized |
| | **Moderate Adaptive Reuse** | A mix of well-preserved historic buildings and those adapted for modern use exist. Adaptive reuse projects are undertaken based on specific criteria, such as location or architectural significance |
| | **High Adaptive Reuse:** | Many historic buildings have been thoughtfully adapted for contemporary functions. Adaptive reuse is a key component of urban development strategies, balancing preservation with modernization |
| | **Very High Adaptive Reuse** | Adaptive reuse is the norm, with most historic buildings serving modern purposes. Historic structures are seamlessly incorporated into the modern urban fabric, reflecting a strong commitment to sustainability and cultural preservation |
| **2. Environmental Quality** | | |
| **Air Quality index** [39] | **Very poor** | >150 AQI |
| | **Poor** | 101–150 AQI |
| | **Moderate** | 51–100 AQI |
| | **Good** | 21-50AQI |
| | **Very good** | 0-19 AQI |
| **Noise Pollution dB levels [40]** | **Very low** | >85dB-Very high decibel levels that are dangerous to health. |
| | **Low** | 75–85 dB -High decibel levels which affect |
| | **Moderate** | 60–70 dB- Moderate decibel levels which have some effect on health. |
| | **High** | 50–60 dB -Low decibel levels that affect health for sensitive groups. |
| | **Very high** | 40 – 50 dB-Low decibel levels that have little effect on health. |
| **Green Space Coverage** (%Percentage of green space compared to the total built-up urban area) | **Very low** | less than 5% |
| | **Low** | 6-10% |
| | **Moderate** | 10-15% |
| | **High** | 16-20% |
| | **Very high** | More than 20% |

| | | |
|---|---|---|
| **3. Public Health and Well-being** | | |
| **Distance from healthcare services** | **Very low** | >10 km |
| | **Low** | 5000–9.900 m |
| | **Moderate** | 1.000-4.999 m |
| | **High** | 250-999 m |
| | **Very high** | 0-250 m |
| **Existence of community spaces** [41] | **Very Low** | No designated public or community spaces. Encroachments or privatization of former public spaces. No accessible green or open areas for gathering |
| | **Low** | Few public spaces exist, but they are poorly maintained. Lack of inclusive design, making them inaccessible to certain groups |
| | **Moderate–** | Presence of some community spaces, such as plazas, parks, or halls. Issues of accessibility, maintenance, or adaptive reuse. Conflicting interests between tourism, conservation, and local needs |
| | **High** | Multiple community spaces exist and serve various groups. Adaptive reuse of historic buildings for social or cultural activities. Spaces are maintained but may face pressure from urbanization |
| | **Very High** | A well-distributed network of community spaces supporting social life. Historic areas actively foster engagement through public spaces. Strong policies ensure preservation, accessibility, and multifunctionality |
| **4. Mobility and Accessibility** | | |
| **Walkability** [42] | **Very Low Coverage** | Absence or Scarcity of Sidewalks. No dedicated pedestrian pathways.<br>Pedestrians share space with vehicular traffic, leading to safety concerns. Frequent interruptions in pedestrian paths, making navigation challenging |
| | **Low Coverage** | Sidewalks are present in certain areas but missing in others. Sidewalks are too narrow for comfortable use. Obstructions like poles or signage impede pedestrian movement |
| | **Moderate Coverage** | Sidewalks are available but vary in width and condition. Some areas are well-connected, while others lack continuous pathways |
| | **High Coverage** | Sidewalks are present on most streets with adequate width. Well-maintained surfaces with minimal obstructions. Designed to accommodate all users, including those with disabilities. Features like seating, lighting, and landscaping enhance the pedestrian experience |
| | **Very High Coverage** | Continuous, wide sidewalks on all streets, ensuring uninterrupted pedestrian flow. Features such as seating, adequate lighting, landscaping, and accessibility of accommodation enhance the pedestrian experience |

| | | |
|---|---|---|
| **Cycling Infrastructure Conditions of bike-friendly routes in historic zones** [43] | **Very Low Coverage** | Historic zones lack designated cycling paths, compelling cyclists to share narrow streets with motor vehicles and pedestrians, leading to safety concerns. There is a lack of cycling-specific signage, bike racks, or support facilities, discouraging cycling within these areas |
| | **Low Coverage** | Presence of a few short, non-continuous bike lanes that do not form a coherent network, making navigation challenging for cyclists. Cyclists must share roads with significant vehicular traffic, with minimal traffic calming measures in place |
| | **Moderate Coverage** | Several bike-friendly routes exist but lack full connectivity, leading to gaps that require cyclists to merge distributed across the historic zone. Basic Signage and Facilities: Some cycling signage and facilities are available, but they are limited and not uniformly |
| | **High Coverage** | A well-connected network of bike lanes and paths covers most of the historic zone, providing safe and direct routes for cyclists. Clear signage, ample bike parking, and support facilities enhance cycling experience |
| | **Very High Coverage** | Cycling routes are fully integrated into the historic zone, respecting and complementing the area's cultural and architectural heritage. High-Quality Infrastructure and Services: High-quality, well-maintained cycling infrastructure, along with comprehensive services such as bike-sharing stations and repair facilities, encourage widespread cycling |
| **Public Transport Availability** [44] | **Very Low Availability** | Limited public transport routes, with large areas lacking access. Long intervals between vehicles, leading to inconvenience |
| | **Low Availability** | Some routes exist but fail to cover significant portions of the district. Services operate at intervals that may not meet residents' and visitors' needs |
| | **Moderate Availability** | Public transport covers most key areas but may miss fewer central locations. Services run at acceptable intervals, though improvements could enhance convenience |
| | **High Availability** | Coverage with Frequent Services. Public transport reaches nearly all parts of the historic district. Short intervals between vehicles, catering well to user needs |
| | **Very High Availability** | All areas, including peripheral ones, are well-served by public transport. Services operate at very short intervals, ensuring minimal waiting times |

| | | |
|---|---|---|
| **Accessibility for People with Disabilities** [45] | **Very Low Accessibility** | Few heritage sites have been modified to accommodate visitors with disabilities. Many sites lack essential features like ramps, elevators, or accessible restrooms |
| | **Low Accessibility** | Some sites have incorporated accessible features, but these are not widespread. Visitors with disabilities may encounter difficulties navigating between sites or within site premises |
| | **Moderate Accessibility** | Certain high-traffic or prominent heritage sites offer accessible features, while others do not. The quality and extent of accessibility features differ among sites, leading to inconsistent experiences for visitors with disabilities |
| | **High Accessibility** | A significant majority of heritage sites have incorporated accessible features, including ramps, lifts, and designated rest areas. Visitors with disabilities can expect a consistent and accommodating experience across most sites |
| | **Very High Accessibility** | All heritage sites are designed or retrofitted to be fully accessible, adhering to universal design principles. Features such as tactile guides, audio descriptions, and specialized signage are standard, ensuring an inclusive experience for all visitors |
| **5. Climate Resilience and Sustainability** | | |
| **Energy Efficiency of Historic Buildings- Retrofit Level** [46] | **Very Low:** | Historic buildings remain largely unmodified, with few or no energy-efficient features integrated. These buildings often exhibit poor thermal performance, leading to elevated energy demands for heating and cooling |
| | **Low** | Some buildings have undergone basic retrofitting measures, such as adding internal thermal insulation or upgrading windows |
| | **Moderate** | A range of retrofitting strategies, including enhanced insulation, energy-efficient heating systems, and renewable energy installations, are implemented |
| | **High** | Urban districts and clusters of historic buildings are retrofitted using standardized methods that harmonize energy efficiency with conservation goals |
| | **Very High** | State-of-the-art technologies and materials are employed to achieve near-zero energy consumption while fully preserving the building's historical and cultural significance. These retrofitted buildings serve as benchmarks, demonstrating best practices and influencing policies and standards in historic preservation and energy efficiency |

| | | |
|---|---|---|
| **Flood and Disaster Preparedness. Integration of Climate Resilience** | **Very Low Adaptation** | Few historic sites have incorporated climate adaptation strategies, leaving them vulnerable to flooding and other climate-related disasters. There is a lack of comprehensive planning addressing the unique challenges of preserving historic structures while mitigating disaster risks |
| | **Low Adaptation** | Some historic buildings have undergone basic adaptations, such as installing barriers or reinforcing foundations, but these efforts are not widespread. Adaptation strategies are implemented on a case-by-case basis without a cohesive framework, leading to inconsistent protection levels |
| | **Moderate Adaptation** | Balanced Integration with Ongoing Improvements. A range of adaptation strategies, including flood-resistant materials and landscape modifications, are applied to historic sites |
| | **High Adaptation** | Historic areas benefit from integrated adaptation strategies, such as advanced flood defenses and adaptive reuse of spaces for flood management. Well-developed plans address the complexities of protecting cultural heritage while enhancing disaster resilience, with clear roles and resources allocated |
| | **Very High Adaptation** | Historic sites feature state-of-the-art adaptations, including nature-based solutions like green roofs and floodable parks, seamlessly blending preservation with resilience. Comprehensive strategies holistically address disaster risks and heritage conservation, serving as models for other regions |
| **Renewable energy integration in historic districts**. [47] | **Minimal** | Historic districts exhibit negligible implementation of renewable energy technologies. Preservation concerns dominate, leading to resistance against energy projects |
| | **Limited** | Selective implementation of renewable energy solutions, such as discreet solar panels or biomass heating, in a limited number of buildings. Pilot projects initiated to assess feasibility within heritage contexts |
| | **Moderate** | A significant portion of buildings incorporate renewable technologies, such as solar thermal systems or geothermal energy, with careful consideration of aesthetic and structural integrity. Collaborative efforts between preservationists and energy experts lead to tailored solutions |
| | **Extensive** | Comprehensive strategies result in widespread adoption of renewable energy across the district, including community-wide initiatives like district heating powered by renewables. Policies and incentives actively encourage residents and businesses to participate in sustainability programs |
| | **Full** | Historic district achieves a net-positive energy status, producing more renewable energy than it consumes annually. Innovative technologies are seamlessly integrated, serving both functional and educational |

| **6. Economic and social vitality and sustainable tourism** | | |
|---|---|---|
| **Sustainable Tourism Impact** [48] | **Very low** | Tourism development is largely unsustainable, with high environmental degradation and social disruption. Overtourism leads to pressure on local infrastructure, cultural heritage, and ecosystems. Minimal community involvement or benefits from tourism; the local economy is highly dependent on external investors. Lack of sustainability policies or regulations; weak enforcement of existing laws |
| | **Low** | Some sustainable practices exist, but they are limited in scope and implementation. Partial environmental policies are in place but not strictly enforced. Tourism development is largely market-driven rather than community-led. Some initiatives promote local cultural heritage, but risks of commercialization and loss of authenticity remain. Awareness of sustainability is growing, but businesses and tourists are not fully engaged |
| | **Moderate** | Sustainability is recognized as important, and moderate efforts are made to balance tourism with environmental protection. Local businesses are beginning to integrate sustainable practices. The local community benefits from tourism revenue, but there is still some economic leakage. Visitor management is improving, with initial steps to address over-tourism and seasonality issues |
| | **High** | Sustainability is an integral part of tourism policies and planning; eco-friendly infrastructure is widely implemented. Strong governance ensures environmental, social, and economic sustainability. Well-managed carrying capacities prevent over-tourism; local stakeholders are actively involved in decision-making. A significant proportion of tourism businesses are eco-certified or follow circular economic principles. Visitor awareness campaigns successfully promote responsible behavior |
| | **Very high** | Fully integrated circular economy model: zero waste, renewable energy, carbon neutrality goals. Tourism contributes positively to biodiversity conservation and cultural heritage protection. High levels of community participation; economic benefits are equitably distributed. Smart technology enhances sustainability efforts |
| **Ratio of residents to tourists in peak seasons** [49] | **Extreme Tourism Pressure** | Severe over-tourism: Tourists outnumber residents 5:1 or more in peak seasons. Heavy strain on local infrastructure, housing, public services, and environment. Rising real estate and living costs due to short-term rentals. High social tension between tourists and locals is due to overcrowding and cultural erosion. Governance struggles to regulate tourism's negative impacts |
| | **High Tourism Pressure** | Tourists outnumber residents 2:1 or more in peak seasons. Noticeable congestion in public spaces, transport, and local services. Seasonal economic reliance on tourism, with some diversification efforts. Increasing pressure on housing and rental markets. Some regulation efforts exist, but they are not always enforced effectively |
| | **Moderate Tourism Pressure** | Tourists and residents are nearly equal in number during peak seasons. Tourism is well-integrated into the local economy, but risks of over-tourism exist. Some seasonal overcrowding, but mitigation |

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| | | measures) help manage flows. Housing and local services remain accessible, though some seasonal pressures persist. Tourism revenue benefits the community, but further regulation may be needed |
| | **Balanced Tourism** | Tourism is well distributed across seasons, avoiding extreme peaks. The local economy is diversified, reducing dependence on tourism. Infrastructure and services are designed to accommodate visitors without disrupting residents' daily lives. Sustainable tourism policies effectively prevent overcrowding and maintain quality of life. Strong community involvement in tourism decision-making |
| | **Sustainable & Community-Led Tourism** | Tourists never exceed 20% of the local population, even in peak seasons. Strong focus on slow tourism, eco-tourism, and cultural tourism. Residents actively participate in shaping tourism policies. Tourism complements the local way of life without disrupting housing, transport, or public services. Year-round tourism strategies help maintain balance |
| **Local Business Sustainability** [49] | **Low Local Business Sustainability** | Dominance of international chains, franchises, and corporate-owned businesses. Severe loss of local character and cultural authenticity due to commercial gentrification. High rent prices force small businesses to close or relocate. Profits largely leave the local economy, benefiting external corporations rather than local communities. Tourism-dependent economy with little support for local entrepreneurs |
| | **Moderate Local Business Decline** | Significant presence of chain stores, international brands, and souvenir shops targeting tourists. Some local businesses survive, but they struggle due to high rent and competition from large retailers. Cultural authenticity is at risk, as local artisan shops and family-owned businesses decline. Some municipal efforts to protect local businesses, but with limited impact. Profits from tourism are partially reinvested in the local economy, but corporate interests dominate |
| | **Balanced Business Landscape** | Mix of independent businesses and commercial chains, but local entrepreneurs still have a significant presence. Local businesses benefit from tourism but face challenges in long-term financial sustainability. Some regulations exist to protect historic center businesses, such as rent control policies or commercial zoning laws. Moderate success in preserving cultural identity while accommodating tourism-driven businesses. Community-led initiatives promote buying locally, but economic pressures persist |
| | **Strong Local Business Sustainability** | Majority of businesses in historic centers are locally owned and operated. Strong governmental and municipal policies actively protect small businesses from displacement. Local economic benefits are significant, as profits largely stay within the community. Tourism is integrated into the local economy without overwhelming small businesses. Independent businesses are supported through grants, tax incentives, and cultural heritage initiatives |
| | **Exemplary Local Business Sustainability** | Historic centers are almost entirely composed of independent, locally owned businesses. Strong municipal efforts and community-driven initiatives ensure that local entrepreneurs thrive. High public awareness and preference for local businesses over commercial chains. Strict regulations prevent commercial gentrification and protect |

| | | |
|---|---|---|
| | | historic business identity. Tourism directly supports local businesses, rather than disrupting them |
| **7. Governance** | | |
| **Levels of participation** | **Very low** | Non-participation |
| | **Low** | Local government, in limited partnership with the health sector, provides information about public services |
| | **Moderate** | Local government, in partnership with the health sector, provides information |
| | **High** | Local government and the health sector work directly with citizens throughout the process to ensure that public concerns are consistently understood and considered |
| | **Very high** | Citizens are involved in the decision-making process by partnering with the public or other private entities from different fields |
| **Open Data and Information** | **Very Low** | Non-existing or Existing with legal barrier |
| | **Low** | Low -Partially Accessible |
| | **Moderate** | Moderate Accessibility – Valid – No variety |
| | **High** | Highly Accessible – Valid – limited variety |
| | **Very high** | Very highly Accessible – Valid -wide variety |

## 4 Results of the criteria and indicators application in Chania's historic center

The city of Chania is a historic city (see Fig. 1) located on the northwest coast of Crete, Greece, serving as the capital of the Chania regional unit, which as of the 2021 census, has a population of 111,375 inhabitants [50]. Today, the historic center remains a vital part of Chania, which continues to expand beyond its original boundaries, with tourism driving its economy. Some of its degraded areas are home to low-income immigrants, while well-preserved sections attract affluent tourists. In recent years, the rising number of tourists—driven by lower travel costs and digital communication platforms—has led to growing discontent among residents, who are increasingly affected by uncontrolled tourism. This frustration has been exacerbated by platforms such as Airbnb, which contribute to the decline in residents' quality of life and intensify conflicts over public space usage between locals and visitors.

**Fig. 1.** The city of Chania, *Source: Google Earth*

Tourism in Chania is largely concentrated along the coastal zone, generating noise and traffic congestion during the summer. However, in the winter, the area becomes inactive as most tourist-oriented businesses close. Meanwhile, residential areas are concentrated in more degraded sections, forming segregated zones for low-income inhabitants. The few remaining residents in the western part of the historic center lack essential services, while the western and eastern moats act as barriers, limiting connectivity with the rest of the city due to inadequate infrastructure.

The evaluation of the historic center of Chania is based on data from the Municipality's GIS webpage, the Greek Census for population and buildings of 2021 for the area of the historic center [50], the "Evaluation of environmental noise in the context of the implementation of directive 2002/49/EC for urban areas urban complexes of Heraklion – Chania final report – phase B" technical report [51], the Weather Channel Site [52], the Sustainable Urban Mobility plan [53], the Sustainable Urban Development Strategy of Chania [55], Tourism study on the visitor experience in Chania 2024 [56] and on-site building, land uses, mobility conditions, survey conducted by the author in March 2025 [57].

The methodology integrates diverse data sources including municipal GIS data, the 2021 Greek Census, environmental noise reports, tourism studies, sustainable mobility and urban development plans, and an on-site survey conducted by the author. It assesses key indicators across multiple urban dimensions such as cultural heritage preservation, environmental quality, public health, mobility and accessibility, climate resilience, economic vitality, and governance. Quantitative data like air quality indices, noise levels, green space coverage, and tourism statistics are combined with qualitative evaluations based on field observations and stakeholder inputs. Each indicator is rated to reflect

current conditions, highlighting areas of moderate to high concern or strength. Spatial and statistical analyses are used to identify patterns, interactions, and impacts within the historic center's urban fabric.

The evaluation framework of the historic center is presented in Table 4.

**Table 4.** The application of the proposed evaluation framework in the historic center of Chania

| | | |
|---|---|---|
| **Cultural Heritage Preservation** | | |
| **Conservation Status of well-preserved historic buildings and sites** | **Moderate** | Many buildings in Chania's historic center show visible alterations that threaten its authenticity. Original materials are often replaced or degraded, compromising heritage value. Maintenance is sporadic, lacking a cohesive preservation plan, which accelerates the area's decline [57] |
| **Adaptive Reuse** | **Moderate Adaptive Reuse** | Chania's historic center features a mix of preserved heritage buildings and others adapted for modern uses. Many retain original forms reflecting Venetian, Ottoman, and Neoclassical influences. Others have been repurposed—mainly in tourist areas—into hotels, cafes, or homes. Adaptive reuse depends on location and architectural value, aiming to balance function with heritage conservation [57] |
| **Environmental Quality** | | |
| **Air Quality index** | **Good** | 21-50 AQI [52] Chania's sea breezes improve air quality by dispersing pollutants. Despite seasonal traffic peaks, low vehicle density keeps $NO_2$ and $O_3$ emissions relatively limited |
| **Noise Pollution dB levels** | **High** | 50–60 dB Chania's Spring and summer tourism brings constant background noise from cafes, events, and tours. While not loud, it can cause stress and sleep issues for residents near busy areas [51] |
| **Green Space Coverage%** | **Low** | 6-10% Limited green space in Chania's dense historic center affects biodiversity, microclimate, and access to recreation. Its compact layout, shaped by Venetian and Ottoman planning, prioritized defense over greenery [57] |
| **Public Health and Well-being** | | |
| **Distance from healthcare services** | **Moderate** | 1.000-4.999 m [57]. In 2020, a new Urban Health Centre opened 2 km from Chania's center, providing primary care, diagnostics, and health promotion services |
| **Existence of community spaces** | **Moderate** | Some culturally important community spaces in Chania's center face poor access and upkeep, as tourist-focused development sidelines local needs [57] |

| **Mobility and Accessibility** | | |
|---|---|---|
| **Walkability** | **High Coverage** | A recent project is rebuilding 35,000 m² of sidewalks in Chania's center, improving utilities, adding greenery, and enhancing accessibility and urban vitality [57] |
| **Cycling Infrastructure** | **Low Coverage** | Chania is still car-focused, with a limited cycling network and heavy traffic making cycling feel unsafe. This discourages riders and creates challenges due to shared roads and few traffic calming measures. [53] |
| **Public Transport Availability** | **Very Low Availability** | Bus service in Chania is often irregular, especially off-peak and on weekends, causing long waits. Lack of real-time schedule info complicates travel planning for residents and tourists. [53] |
| **Accessibility for People with Disabilities** | **Very Low Accessibility** | A survey of tourists with disabilities in Crete showed Chania has made some accessibility improvements, but much more is needed to make all heritage sites and public spaces fully inclusive [56] |
| **Climate Resilience and Sustainability** | | |
| **Energy Efficiency of Historic Buildings-Retrofit Level** | **Low** | Few buildings in Chania use internal insulation and double-glazed windows to boost energy efficiency without altering façades. Ongoing retrofitting is vital [57] |
| **Flood and Disaster Preparedness. Integration of Climate Resilience** | **Very Low Adaptation** | Chania's coasts face rising erosion and landslides worsened by heavy rain. By 2050, sea levels may rise 1.5 meters, flooding about 2.83% of the city center. The historic area lacks comprehensive coastal protection, relying on ad hoc mitigation [54] |
| **Renewable energy integration in historic districts** | **Minimal** | Chania's historic center has limited renewable energy use due to preservation priorities. Protecting architectural and historical authenticity often blocks such projects. Although sustainability goals exist, the city's strategy lacks clear plans for renewables in this area. [55] |

| | | |
|---|---|---|
| **Economic and social vitality and sustainable tourism** | | |
| **Sustainable Tourism Impact** | **Low** | The municipality prioritizes collective action and citizen input for sustainable development. While promoting local heritage, challenges like commercialization risk authenticity. Supporting handmade crafts helps preserve culture and lessen environmental impact. [55] |
| **Ratio of residents to tourists in peak seasons** | **High Tourism Pressure** | Short-term rentals in Chania rose sharply—from 2,639 in Dec 2023 to 3,738 in June 2024—making up about 11.8% of housing. This surge drives rents up by as much as 100%, worsening affordability for locals, students, and seasonal workers. [56] |
| **Local Business Sustainability** | **Balanced Business Landscape** | Chania's seasonal tourism pressures resources and infrastructure. Regulations exist to protect historic businesses but are unevenly enforced. Community initiatives support local buying, yet large commercial forces persist [57] |
| **Governance** | | |
| **Levels of participation** | **Moderate** | The Municipality of Chania, in collaboration with the health sector, provides comprehensive information and services to residents and visitors, ensuring accessible healthcare and social support [55] |
| **Open Data and Information** | **Moderate** | While Chania has made significant strides in providing open data and information, there are areas for improvement, such as enhancing the variety and accessibility of datasets, particularly those related to tourism and public health [55] |

The application of the proposed evaluation framework has revealed that the historic center of Chania demonstrates a moderate level of preservation. While a few buildings remain largely intact, retaining key architectural features reflective of the area's Venetian and Ottoman heritage, a significant portion have undergone visible alterations. These changes—ranging from façade modifications and material replacement to structural interventions—have, in several cases, compromised the historical integrity of the built environment. Observations indicate varying degrees of material degradation, including erosion of stone surfaces, deterioration of wooden elements, and corrosion of metallic features (Fig. 2), underscoring the urgent need for systematic and proactive conservation strategies.

**Fig. 2.** The deteriorated buildings of Neoria in the center of the coastal zone,
*Source: Google Earth*

Maintenance activities are sporadic and largely reactive rather than preventive. Although some preservation efforts are visible, such as the reinforcement of façades or roof repairs, these tend to occur in isolated instances and do not follow a district-wide maintenance strategy. The absence of a coordinated and consistent conservation plan has resulted in gradual yet steady deterioration of urban fabric. To safeguard the architectural authenticity and ensure the long-term survival of heritage structures, a more structured and regularly implemented maintenance framework is essential.

In terms of adaptive reuse, the transformation of historic buildings for contemporary functions is present but remains at a moderate level. This process has introduced a mix of well-preserved buildings functioning as museums, boutique accommodations, and cultural venues, alongside others converted into commercial spaces or private residences. However, these interventions are unevenly distributed and are typically guided by selective criteria such as proximity to major tourist corridors, commercial potential, or the architectural prominence of the building. While some adaptive reuse projects successfully balance preservation and modernization, others risk undermining the district's historical authenticity by prioritizing economic gain over cultural value.

Environmental quality in the district is generally satisfactory. The air quality index, measured at approximately 30, remains within acceptable health standards and does not currently pose a threat to public well-being. Nevertheless, noise pollution continues to be a significant issue. Noise levels fluctuate between 50 and 60 decibels, exceeding the

thresholds recommended for residential comfort, and particularly affecting sensitive groups such as children, the elderly, and individuals with health vulnerabilities.

The availability of green spaces within the historic center is notably limited, with green coverage estimated at only 6–10%. This scarcity restricts the district's capacity to provide recreational, aesthetic, and ecological functions—factors that are crucial to urban livability and climate mitigation. Moreover, access to healthcare services is classified as moderate. Most medical facilities are located at distances ranging between 1,000 and 4,999 meters from the historic core, potentially impeding timely access for residents, especially those with limited mobility or urgent healthcare needs.

Mobility infrastructure within the district shows mixed results. Pedestrian conditions are favorable, with most sidewalks and footpaths being well-paved and integrated into the urban layout, thereby supporting high walkability. However, infrastructure for non-motorized transport, particularly cycling, is underdeveloped. Bike lanes are sparse, poorly connected, and often intersect with vehicular traffic without adequate safety measures. This undermines the viability of cycling as a safe and sustainable transport option. Public transportation availability is also critically low. The limited number of routes, infrequent service, and extended waiting times make it difficult for residents and visitors alike to navigate the district efficiently, increasing dependence on private vehicles and contributing to traffic congestion.

Accessibility remains a pressing concern. Many heritage sites and public spaces in the district lack essential features for people with disabilities, such as ramps, elevators, tactile paving, or accessible public toilets. This deficiency restricts access for individuals with mobility impairments and poses a barrier to inclusive tourism, civic engagement, and equal participation in public life.

In terms of climate resilience, the historic center shows considerable weaknesses. Most heritage buildings have low energy performance due to outdated construction methods, poor insulation, and limited ventilation systems. Additionally, the district exhibits minimal preparedness for climate-related hazards such as heatwaves or extreme weather events. The integration of renewable energy sources, such as solar panels or energy-efficient lighting, remains minimal due to regulatory constraints and preservation concerns, which often prioritize aesthetic and material authenticity over sustainability.

Efforts toward sustainable tourism management are currently inadequate. The district experiences a high concentration of tourists, especially during peak travel months. At times, the number of visitors can exceed the local population by a ratio of at least 2:1. This seasonal surge results in overcrowding, increased strain on infrastructure, overuse of cultural sites, and heightened environmental pressures, including waste generation and noise. Although local businesses retain a strong presence, with a relatively balanced mix of independent retailers and larger commercial entities, the long-term financial sustainability of smaller enterprises is under threat. Rising operational costs, coupled with shifts in consumer patterns driven by mass tourism, challenge the economic resilience of locally owned shops and services (Fig. 3).

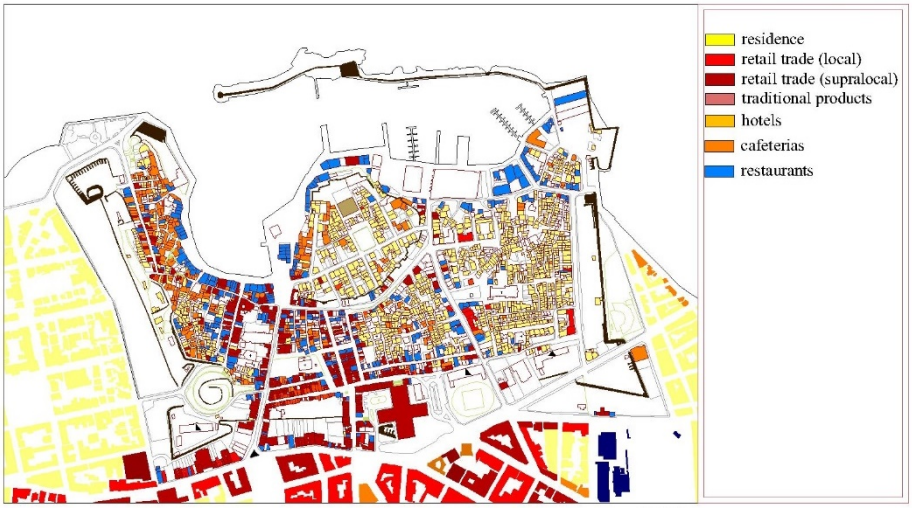


**Fig. 3.** The spatial distribution of uses related to tourism, *Source: author, based on 2025 data*

Public participation in the planning and governance of the historic district is currently moderate. While some initiatives have been introduced by local authorities to disseminate information and invite feedback—such as public meetings or consultation platforms, these efforts often lack depth, continuity, or transparency. Many residents remain disengaged from formal decision-making processes, leading to a democratic deficit in urban development and heritage management.

In conclusion, the historic center of Chania possesses significant cultural and architectural value, but faces numerous challenges related to preservation, accessibility, environmental sustainability, and inclusive governance. Addressing these issues through integrated, participatory, and context-sensitive strategies is essential for safeguarding the district's heritage while ensuring its long-term resilience and livability.

The comprehensive evaluation of Chania's historic center reveals a moderate level of advancement in key domains such as environmental quality, pedestrian accessibility, and the resilience of local businesses. These areas exhibit a foundational level of development and hold substantial potential for further enhancement through the implementation of targeted urban policies and strategic investments. Environmental criteria, including air quality and walkability, reflect a generally favorable condition conducive to public well-being. Similarly, the presence of a diverse mix of locally owned businesses contributes to the economic vitality of the district, although these enterprises remain vulnerable to tourism-driven market fluctuations.

Despite these positive aspects, the evaluation also identifies several critical deficiencies that demand immediate and coordinated intervention. In particular, the challenges related to urban mobility, accessibility for people with disabilities, climate resilience, and the management of sustainable tourism pose significant risks to the district's livability and long-term preservation. Mobility within the historic center is hindered by a limited and inefficient public transportation network, coupled with inadequate cycling infrastructure. Expanding and modernizing transport services is essential not only for

reducing dependence on private vehicles and alleviating congestion, but also for enhancing the district's connectivity for both residents and tourists.

The lack of accessibility features across many public and heritage sites represents a major barrier to inclusion. Addressing these shortcomings by incorporating universal design principles—such as installing ramps, elevators, accessible pathways, and restrooms—would foster a more inclusive urban environment and align with contemporary standards of equity and human rights. In terms of climate resilience, most historic buildings remain ill-equipped to cope with modern environmental pressures. Integrating renewable energy technologies that are compatible with heritage preservation—such as discreet solar systems or energy-efficient retrofitting—offers a viable path to improving energy performance without compromising architectural authenticity.

Tourism management also requires urgent reform. The seasonal influx of visitors places considerable strain on local infrastructure, exacerbates environmental degradation, and contributes to the displacement of residents through the proliferation of short-term rentals. A more sustainable tourism model should be pursued, including measures to regulate tourist accommodation, promote off-season visitation, diversify tourist activities, and enforce environmental protection regulations. These actions would help achieve a more balanced relationship between economic development and heritage conservation.

In conclusion, while Chania's historic center demonstrates encouraging progress in certain domains, a holistic and inclusive approach to urban planning and heritage management is necessary. Strengthening climate adaptation, promoting accessibility, and aligning tourism with sustainability principles are essential steps toward enhancing the district's resilience, cultural integrity, and overall quality of life for all users.

## 5 Conclusions

The paper advances the understanding of healthy cities by focusing specifically on the underexplored context of historic urban environments. While existing literature on healthy cities predominantly addresses modern urban planning and infrastructure, our study highlights how the unique spatial, morphological, and cultural characteristics of historic centers require adapted tools and approaches. The key contribution of this paper lies in its proposal for a context-sensitive evaluation framework that integrates environmental, spatial, and socio-economic criteria tailored to the constraints and opportunities of heritage urban areas.

The current approach emphasizes the necessity of balancing heritage preservation with contemporary urban health and sustainability goals. By applying the evaluation framework to historic districts, this research fills a critical gap in the healthy cities discourse—bridging the domains of urban heritage management and health-oriented urban evaluation. Furthermore, the paper demonstrates how multidimensional criteria—such as accessibility, green space distribution, building conditions, and urban mobility—can be systematically analyzed to support integrated planning in historic contexts. The findings show that such tools not only provide diagnostic insights but also serve as strategic guides for more inclusive, resilient, and adaptive urban development. It underscores

that historic cities require specialized methodologies that account for their physical and cultural specificity, especially when designing strategies that align with sustainability, livability, and spatial equity. The research contributes to expanding the scope of the healthy city concept by incorporating heritage-sensitive planning into its core principles. It offers practical and conceptual innovations that support cities in navigating the complex intersection between historical continuity and contemporary urban health imperatives. The paper contributes new knowledge to the evolving discourse on healthy cities by expanding its scope to historic urban centers—an area frequently underexplored in urban health literature. By employing an integrated evaluation framework, the study demonstrates how the concept of a healthy city can be meaningfully adapted to the specific spatial, cultural, and regulatory conditions of heritage environments. In doing so, it bridges the gap between public health, environmental sustainability, and cultural preservation, offering a replicable methodology for urban researchers and policymakers concerned with advancing health and sustainability objectives in historically sensitive contexts.

The historic center of Chania embodies substantial cultural and architectural value, yet it faces persistent challenges related to preservation, accessibility, mobility, climate resilience, and inclusive governance. The application of the proposed multidimensional evaluation framework revealed a moderate level of advancement across several key domains—such as environmental quality, pedestrian infrastructure, and the vitality of locally owned businesses. These areas present a strong foundation for further development through strategic planning and targeted policy interventions. Nevertheless, the study also identified critical deficiencies that demand urgent attention. The lack of accessible infrastructure, insufficient public transport options, underdeveloped cycling networks, and minimal integration of climate-adaptive measures represent significant threats to both the livability and long-term sustainability of the district. Furthermore, the pressure exerted by mass tourism—particularly during peak seasons—exacerbates environmental degradation, strains local infrastructure, and undermines the affordability and inclusivity of urban life. The findings from Chania center address the importance of integrating heritage preservation with principles of sustainability, health equity, and participatory governance. Strengthening universal accessibility through inclusive design, promoting renewable energy retrofitting in alignment with conservation guidelines, and reforming tourism management strategies are essential steps toward building a more resilient and inclusive urban fabric.

## References

1. WHO & Health Canada. Ottawa Charter for Health Promotion. Geneva: Ottawa WHO, 1986
2. World Health Organization. WHO European Healthy Cities Network. s.l.: World Health Organization, 2022
3. Barton, H., et al. The Routledge Handbook of Planning for Health and Well-Being: Shaping a sustainable and healthy future (1st ed.). s.l.: Routledge, 2015
4. Amri, M. Healthy governance for cities: Synergizing Health in All Policies (HiAP) and Healthy Cities approaches. Journal of Urban Health. 2022, pp. 231–234
5. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. s.l.: United Nations, 2015

6. WHO. Healthy Cities: Effective approach to a rapidly changing world. s.l.: World Health Organization, 2020
7. Lind, J. Designing a certification system for sustainable urban areas - key considerations and their implications for the development of Citylab Post-Construction. Licentiate thesis. Stockholm: KTH Royal Institute of Technology, 2020
8. Blue Zones. Blue Zones Project®. Life Radius®. [Online] 2025. [Cited: 02 12, 2025.] https://www.bluezones.com/
9. BRE Building Research Establishment Ltd. BREEAM Communities technical manual. SD202. Watford: s.n., 2012
10. 10.U.S. Green Building Council. LEED v4.1 Cities and communities plan and design. s.l.: U.S. Green Building Council, 2021
11. Department of Design and Construction. Active Design Guidelines. New York: Department of Design and Construction, 2010
12. 12.Urban Land Institute. Building Healthy Places Toolkit: Strategies for Enhancing Health in the Built Environment. Washington, DC: Urban Land Institute, 2015
13. World Health Organization. Healthy cities: good health is good politics: toolkit for local governments to support healthy urban development. s.l.: WHO Regional Office for the Western Pacific, 2015
14. Gehl Institute. Inclusive Healthy Places A Guide to Inclusion & Health in Public Space: Learning Globally to Transform Locally. s.l.: Gehl Institute, 2018
15. ISGLOBAL. 5 Keys to Healthier Cities. s.l.: ISGLOBAL, 2019
16. van Herk, S. and Aivalioti, S. Healthy cities from planning to action Integrated action planning report. 2022
17. DGNB. Schnittstellen Quartier – Gebäude. s.l.: DGNB, 2020.
18. United Nations Human Settlements Programme and World Health Organization. Integrating health in urban and territorial planning: a sourcebook. s.l.: United Nations Human Settlements Programme, World Health Organization, 2020
19. UNESCO. Recommendation on the Historic Urban Landscape, including a glossary of definitions. Paris: UNESCO, 2011
20. Feilden, B. M. (2003). Conservation of Historic Buildings (3rd ed.). Oxford: Architectural Press
21. Bullen, P. A., & Love, P. E. D. (2011). Adaptive reuse of heritage buildings. Structural Survey, 29(5), 411–421. https://doi.org/10.1108/02630801111182439
22. Nieuwenhuijsen, M. J., Khreis, H., Verlinghieri, E., Mueller, N., & Rojas-Rueda, D. (2017). Transport and health: A marriage of convenience or an absolute necessity. Environment International, 108, 179–190. https://doi.org/10.1016/j.envint.2017.03.010
23. García-Palomares, J. C., Gutiérrez, J., & Mínguez, C. (2015). Tourism and urban development in historic cities: The case of Toledo (Spain). Cities, 49, 1–11. https://doi.org/10.1016/j.cities.2015.06.005
24. 24.Tzoulas, K., et al. (2007). Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. Landscape and Urban Planning, 81(3), 167–178. https://doi.org/10.1016/j.landurbplan.2007.02.001
25. Dempsey, N., Bramley, G., Power, S., & Brown, C. (2011). The social dimension of sustainable development: Defining urban social sustainability. Sustainable Development, 19(5), 289–300. https://doi.org/10.1002/sd.417
26. Kweon, B.-S., Sullivan, W. C., & Wiley, A. R. (1998). Green common spaces and the social integration of inner-city older adults. Environment and Behavior, 30(6), 832–858. https://doi.org/10.1177/001391659803000605
27. Litman, T. (2017). Evaluating accessibility for transportation planning. Victoria Transport Policy Institute. https://www.vtpi.org/access.pdf

28. Gössling, S., Choi, A., Dekker, K., & Metzler, D. (2019). The social cost of automobility, cycling and walking in the European Union. Ecological Economics, 158, 65–74. https://doi.org/10.1016/j.ecolecon.2018.12.016
29. Sharifi, A., & Yamagata, Y. (2016). Principles and criteria for assessing urban energy resilience: A literature review. Renewable and Sustainable Energy Reviews, 60, 1654–1677. https://doi.org/10.1016/j.rser.2016.03.028
30. Bullen, P. A., & Love, P. E. D. (2010). The rhetoric of adaptive reuse or reality of demolition: Views from the field. Cities, 27(4), 215–224. https://doi.org/10.1016/j.cities.2009.12.005
31. Colomb, C., & Novy, J. (Eds.). (2016). Protest and Resistance in the Tourist City. Routledge
32. Russo, A. P., & van der Borg, J. (2002). Planning considerations for cultural tourism: A case study of four European cities. Tourism Management, 23(6), 631–637. https://doi.org/10.1016/S0261-5177(02)00020-X
33. Fung, A. (2006). Varieties of participation in complex governance. Public Administration Review, 66(s1), 66–75. https://doi.org/10.1111/j.1540-6210.2006.00667.x
34. Schofield, J. (2014). Who needs experts? Counter-mapping as participatory heritage. In Who Needs Experts? Counter-mapping Cultural Heritage (pp. 1–15). Routledge
35. Barton, H., & Grant, M. (2006). A health map for the local human habitat. The Journal of the Royal Society for the Promotion of Health, 126(6), 252–253. https://doi.org/10.1177/1466424006070466
36. Galea, S., Freudenberg, N., & Vlahov, D. (2005). Cities and population health. Social Science & Medicine, 60(5), 1017–1033. https://doi.org/10.1016/j.socscimed.2004.06.036
37. Ornelas, C., et al. Monitoring and Assessment Heritage Tool: Quantify and classify urban heritage buildings. Cities, Volume 137. 2023
38. Cucco, P., Maselli, G. and Nesticò, A. An evaluation model for adaptive reuse of cultural heritage in accordance with 2030 SDGs and European Quality Principles. Journal of Cultural Heritage. 2023, pp. 202-216
39. World Health Organization. WHO global air quality guidelines: particulate matter (PM2.5 and PM10), ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide. s.l.: World Health Organization, 2021
40. Hrithik, N., et al. Assessment of index-based traffic noise annoyance level at major road intersections in a tourist city: A case study towards environmental sustainability. Heliyon. Mohammad Iqbal Hossain, Abdulla Al Mamun, 2024
41. World Health Organization (WHO). (2017). Urban green spaces: A brief for action. WHO Regional Office for Europe
42. https://www.euro.who.int/__data/assets/pdf_file/0010/342289/Urban-Green-Spaces_EN_WHO_web3.pdf
43. Huang, X., et al. et al. Comprehensive walkability assessment of urban pedestrian environments using big data and deep learning techniques. Sci Rep 14, 26993 (2024). Scientific Reports volume. 2-24, p. Article number: 26993 (2024)
44. Pearson, L., et al. Designing for the Interested but Concerned: A qualitative study of the needs of potential bike riders. Journal of Transport & Health, Volume 35. 2024, pp. 1-12
45. Wang, J., Fan, W. and You, J. Evaluation of tourism elements in historical and cultural blocks using machine learning: a case study of Taiping Street in Hunan Provinc. Heritage Science volume 13, Article number: 30. 2025
46. Pasikowska-Schnass, M. Access to cultural life for. s.l.: European Parliament, European Union, 2019
47. Herrera-Avellanosa, D., et al. Heritage. Evaluating the Implementation of Energy Retrofits in Historic Buildings: A Demonstration of the Energy Conservation Potential and Lessons Learned Upscaling. 2024, pp. 997-1013

48. Neumann, H., et al. Qualitative Assessment Methodology for Positive Energy District Planning Guidelines. Sustainability in Energy and Buildings. s.l.: Springer Nature, 2021, pp. 507-517
49. Font, X., et al. The impact of sustainable tourism criteria on destination competitiveness: the European Tourism Indicator System. Journal of Sustainable Tourism. 2021, pp. 1608–1630
50. European Parliament. Overtourism: impact and possible policy responses. s.l.: TRAN Committee, Policy Department for Structural and Cohesion Policies, 2018
51. Hellenic Statistical Authority. Population Census. Athens: Hellenic Statistical Authority, 2021
52. ADK, Evaluation of environmental noise in the context of the implementation of directive 2002/49/EC for urban areas urban complexes of Heraklion – Chania final report – phase B, Ministry of Energy and Climate Change, 2013
53. The Weather Channel. (2025). Air Quality Forecast for Chania, Crete, Greece. Retrieved March 14, 2025, from https://weather.com/forecast/airquality/l/Chania%2BCrete%2BGreece?canonicalCityId=230fabe27c5edd11b0f56ccaf2e96d2d9f493bf82f7d1b8258b31322f7183b35
54. Municipality of Chania. (n.d.). Sustainable Urban Mobility Plan (SUMP) of Chania. Retrieved February 24, 2025, from http://svak4chania.gr/el/index-en
55. Dimelli D. Planning resilient cities: The case of Chania, UPLanD - Journal of Urban Planning, Landscape & Environmental Design, 5(2),2021
56. 55.Municipality of Chania. (n.d.). Sustainable Urban Development Strategy of Chania. Retrieved March 21, 2025, from https://baa.chania.gr/en/
57. Cretetip.com. (2024). Tourism study on the visitor experience in Chania 2024. Retrieved April 12, 2025, from https://www.cretetip.com/tourism-study-on-the-visitor-experience-in-chania-2024/
58. Dimelli, D. (2025). On-site qualitative and quantitative urban analysis of Chania historic center (March 2025) [Unpublished research]. Chania, Greece

# Perceptions of Residents, Entrepreneurs and Visitors on Issues of Historicity of the City Centre. The case of the Historic Commercial Triangle (Emporiko Trigono) of Athens

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**Abstract.** The historicity of a city district is mainly a network of relationships between the district and its people. The human factor, in the process of protecting the historical heritage of the city district, concerns 'people of the city', politicians and technocrats, also residents, entrepreneurs, and visitors, whose actions, views, beliefs, and perceptions influence its planning and implementation.
To survey the perceptions of the historicity of the Commercial Triangle (Emporiko Trigono) of Athens, a questionnaire was administered to a random sample of residents, entrepreneurs, and visitors of the district. Through the study of the results, findings are presented, some of which confirm, and others do not support the research hypotheses:

1. The district has a historic physiognomy that favors certain kinds of business activity
2. One of the most characteristic elements of this physiognomy is its historic buildings
3. The overall evolution of this historic physiognomy over time is generally considered negative
4. The problem of degradation of the center of Athens through vacant and abandoned properties highlights the priority of the reuse of historic buildings
5. The protection institutional framework of the Commercial Triangle (Emporiko Trigono) of Athens is considered satisfactory but needs to be implemented
6. One of the main reasons for preserving historic districts of cities is that they have unique architecture

**Keywords:** Historicity of the city, Historic preservation, Perceptions on historicity, Opinion survey.

# 1 Theory

## 1.1 About Historicity of Cities

From 25 to 31 May 1964, the 8th resolution was adopted by the 2nd International Congress of Architects and Engineers of Historic Monuments, held in Venice, under the auspices of UNESCO. That resolution was the request for the protection and revival of historic centers, a text that constituted the starting point for the adoption of policies for the protection and restructuring of historic cities. In the twenty years that followed, ICOMOS utilized, of the Venice Charter's principles, the debate on the theory and practice of protecting and conserving monuments and sites, along with the first documents of the International Committee of Historic Towns and Villages / Comité International des Villes et Villages Historiques (CIVVIH). In 1987, following consultation with ICOMOS's National and Scientific Committees, adopted the 'Charter for the Conservation of Historic Towns', which, while not a REIT (Real Estate Investment Trust) of UNESCO's 'Recommendation concerning the Preservation and Contemporary Role of Historic Areas' (Warsaw-Nairobi, 1976), contains both its philosophical perspective and its practical objectives (Avgerinou-Kolonias 2014: 1373).

Each city has a particular identity and a unique historical physiognomy, which bears witness to a distinct culture, to such an extent that it can be said that in the city 'history is present everywhere' (Avgerinou-Kolonias 2002: 380). As, therefore, 'cities have history and cultural heritage', the enhancement of their historical elements is considered a necessity that aims, among other things, at strengthening their identity (Aravantinos 1997/2007: 603). It is in this spirit that the preamble of the International Charter for the Protection of Historic Cities and Urban Areas (Washington, 1987) was formulated: 'All urban communities, whether they have developed gradually over time or have been created deliberately, are an expression of the diversity of societies throughout history'.

Historicity is not only a property of the city, with objective features inherent in it. It's mainly a network of relationships between the city and the people (residents, visitors, businessmen, potential investors, local entities). The city's historic resources, which are as limited as natural resources, require a contract between local authorities on the one hand, and residents, business people and visitors to the city, on the other hand (Olmo: 64). Both 'people related to economic activity', as the OECD puts it, and 'people of the city', including politicians and technocrats directly involved in the planning of the city center, as well as residents, workers, business people, and visitors, whose opinions, views, beliefs, and perceptions also influence its planning and implementation, are considered human factors in the process of protecting the historical heritage (Aravantinos 2002: 18). Public opinion is important in the field of historic preservation, especially where it insists on preservation contrary to the opinion of experts (Shao: 16-31). As can be seen from the bibliographic overview of the concept of historicity, man tends to identify with his history, while what may be more important is the living history of collective memory and not the official, objectified history of historians, which may not be, to some extent, conscious. Thus, the issue of its investigation may concern both historicity as a self-existent property, with objective validity (conception), based on the evidence and material remains of the past, and the consciousness of

historicity that people have (perception), city residents, entrepreneurs, visitors, and institutions.

Moreover, the human factor that lives and acts in the city plays an important role in the feasibility of urban planning and the effectiveness of the policies implemented. In addition to investigating the degree of awareness of the historicity of the city center under reconstruction, an interesting research subject is also whether this awareness concerns a theoretical position only or whether it also constitutes a commitment to mobilize and undertake similar action. Wells (2015) notes that the field of cultural heritage conservation is flooded with many unfounded assumptions, such as that 'most people appreciate the historical context', a largely arbitrary, rather anecdotal claim. For the Greek experience, Bouras (2010) refers to a relevant survey by the magazine Zygos in 1965, in which 'relevant and irrelevant people respond, without anyone assuming any responsibility'. Bouras acknowledged that, after the restoration of democracy in 1974, new information opportunities helped inform and raise people's awareness of natural heritage, but when it comes to 'appreciation of cultural heritage, most people... remain in the rhetoric of unqualified praise, based on a lack of knowledge'.

The term 'historicity' has emerged within anthropology to refer to cultural perceptions of the past and to discover the ways in which people, in the West and elsewhere, perceive and interpret the historical past (Stewart 2016). Studies of historicity in various societies, from the Pacific to North America, are concerned with the different ways in which people perceive their past, devise their future, and shape their present in global societies (Hirsch and Stewart 2005).

The different perceptions of the historicity of the city, of different groups, residents, businessmen, visitors, as well as the preferences of the public, regarding the occupation or use of historic buildings or historic areas of cities, cannot be ignored, in an effort to improve the effectiveness of the framework of historic preservation. Jeremy C. Wells, assistant professor of historic preservation at Roger Williams University, Rhode Island, who specializes in using social science research methods to improve the ways in which the historic environment can be preserved, argues that we can create a better condition for historic preservation if we make a better effort to understand how audiences value, perceive and behave in historic environments (Wells, 2015). He acknowledges that such efforts have been made by built heritage organizations, including the National Trust for Historic Preservation, which has, for years, contracted with marketing firms to conduct public opinion surveys. Related studies show that, in terms of the scale of the city, people tend to prefer the historic cores of cities to suburban areas (Galindo and Hidalgo, in Wells: 46) and in terms of buildings, when maintenance is of equal degree, there is a clear preference for older buildings, otherwise, new buildings are preferred (Herzog and Gale, in Wells: 50). Research by Wells records a general desire for neotraditional design elements in new construction, but when given a choice, people prefer original old buildings, provided they retain to a certain degree and quality the 'patina of time' (Wells and Baldwin, in Wells: 52).

G. Waitt (2000) had examined tourists' perceptions of the historical authenticity of "The Rocks", in Australia, a heritage district fashioned by the Sydney Cove Redevelopment Authority. Gender, income, education level, position in lifecycle, place of residence, and previous visitations to the historic district were explored to identify how

these variables might shape tourists' perception of historicity. The overall uncritical "consumption" of the commodified version of history as "authentic" heritage is regarded as a matter for concern.

### 1.2 About the Reuse of Historic Buildings

As life is identical with change and continuous evolution, when stagnation and consolidation are rather characteristics of death, the tendency for change and constant transformation cannot but characterize the architectural work, with its consideration as a 'vessel of life' (Konstantinidis). The use of the architectural work over time is logical to evolve and change, while the new use may also dictate a change in the architectural work. This may also concern a modern building, which, for various reasons, is not considered to be destructible; therefore, it needs to be reused, but of course, it also concerns Historic Buildings in a privileged way. The preservation of a Historic Building in itself simultaneously raises the issue of Reuse (Fatouros: 13). And it poses it as an 'obvious consequence of preservation', since as life progresses, even its same, old use now returns with new requirements and specifications to the Historical Building, so that it is never the same but always new, but also as a 'complementary and reinforcing request' along with preservation, since by discovering a possibility of using the Historic Building, the pursuit of its preservation is strengthened.

At least five key texts of the international institutional framework for the Protection of Architectural Heritage, formulated over a period of five decades (1964-2018), include provisions for encouraging the Reuse of Historic Buildings, linking it to the perspective of their preservation. Specifically: in 'The Venice International Charter for the Conservation and Restoration of Monuments' (1964), article 4, it is stated that 'the conservation of monuments is always favored by their suitability to be used for some purpose beneficial to society', in 'The Declaration of Amsterdam' (1975), it is clarified that: 'the policy of conservation also means the integration of the architectural heritage into social life. The evaluation for the conservation of buildings should not be based only on their cultural value but also on their value of use.

'The Granada Convention for the Protection of the Architectural Heritage of Europe' (1985), article 11, states that 'with respect for the architectural and historical character of the heritage, each contracting party is obliged to encourage: the use of protected properties, taking account the needs of modern life, the adaptation, when possible, of old buildings to new uses'. Similarly, 'the continued adaptation and use of industrial buildings avoids unnecessary energy loss and contributes to sustainable development. Industrial heritage can play an important role in the economic revitalization of declining or languishing areas. The continuity that reuse ensures can provide psychological stability to communities facing the sudden disappearance of long-term sources of employment', according to article 5e of the 'Nizhny Tagil Charter for the Industrial Heritage' (2003). Finally, the most recent (2018) 'Leeuwarden Declaration for Adaptive Reuse of the Built Heritage' highlights the multiple benefits (cultural, social, environmental, and economic) of re-using built heritage.

However, today, the Historic Building's historical value is frequently ignored out of 'convenience', ignorance, or indifference depriving it of its fundamental function as a carrier of collective memory. This often results in the preservation of the building shell

alone, stripped of its use and its symbolism, and occasionally to an awkward coexistence with a new uncomfortable use that it cannot accommodate due to qualitative incompatibility. In some not-so-distant times, this practice was not explained by indifference or ignorance but was conscious, integrated into a perception of poorly understood 'modernization', which was set out to eliminate every living evidence of the past, present in everyday life, such as the Historic Building. When he could no longer eliminate it, he chose to 'disguise it to render it unrecognizable' - in some extreme cases by completely 'removing its entrails' - and install a new use in a 'completely new building structure'. Today, this non-functional, disguised 'preservation' of the Historic Building is effectively supported by its Reuse with the most modern functions, but also by the use of cutting-edge materials and intervention techniques. This postmodern 'counter-perception' of the reuse of the historical shell adopts a strongly contrasting coexistence of old and new, initially charming and interesting, which, however, when it exceeds the limit of breakage, acquires characteristics of assimilation or even disappearance of the Historical Building by a new competitive architecture, in an attempt to 'disguise the old into an evergreen new, which is legitimized by the loss of its historicity' (Filippidis: 23).

The view has been expressed that the preservation of only the facades of the historic building, with the simultaneous destruction of its interior and its replacement with a new modern construction, a practice characterized by the term 'facadism' (Theologidou), can only be tolerated as an exceptional act. However, it could hardly be 'described as an act of protection of architectural heritage', as it leads to the definitive loss of much information and messages of which the architectural heritage, as a material testimony of the past, is the carrier, while it constitutes, by definition, an abolition of the 'authenticity' of the architectural monument. The so-called 'adaptive reuse', is ultimately regarded as 'an intervention very positive for the preservation of cultural heritage' (Mallouchou-Tufano: 242), despite all the legitimate objections to extreme destructive practices. This is because, ~~as~~ over time, the fate of the historical building depended on its ability to respond to new uses and in a later era, when the architectural monument was no longer serving, its preservation was deemed unnecessary and it was either abandoned to its fate or demolished to make way for a new building in its place (Gazzola in Karadedos: 8).

## 2 Methodology

Public opinion surveys among locals and visitors to the city regarding its historicity are governed by several methodological limitations. The philosophy of history has attempted to assess the place of individuals' consciousness in the evolution of human assemblages in which they participate. The consciousness of individuals of their actions has been a key issue in the differentiation of important philosophical theories of history. It has also been theorized that the assumption that individuals are conscious of their actions, that is, that they know what they are doing at any given time and why they are doing it, does not necessarily mean that they can express themselves about it in a discursive way. Giddens distinguishes 'practical consciousness' from 'discursive

consciousness', noting the difference between what is done and what can be said (Stamos: 135). One of the weaknesses, according to Bourdieu, of the 'most damaging results' of public opinion surveys is precisely that people are asked questions that they do not wonder about (Panayotopoulos: 145). And, of course, there is the question of defining the questions that are considered 'askable' by all respondents, since the fact that everyone is entitled to an opinion does not mean that everyone has an opinion (Champagne: 125).

The problem even starts with what can be defined as 'opinion', hence as 'public opinion', hence what it is that the relevant research can ultimately capture. Bourdieu (Panayotopoulos: 151) points out that there is a problem when opinions are summarised by groups mobilised around a system of interests explicitly articulated on the one hand, and simple feelings on the other, which by definition do not constitute an opinion that can be justified by any claim to coherence. And this can be particularly evident in the issue of the preservation of architectural heritage, when among the respondents there may be owners of historic buildings or people who have linked their business interests to the historic district, as well as ordinary residents of the city who may never have been particularly concerned with the issue. And while Bourdieu concludes that 'public opinion does not exist', it is also argued (Champagne: 122) that surveys do not ultimately capture 'public' opinion, but the statistical sum of the private opinions communicated. The additional difficulty with the question of historicity is that it is not only a property of the city, but also a relationship between the city and the people, a relationship that sometimes does not exist but is experienced as something that should exist, as a duty or as an externally imposed necessity, as an ideal desirable state or as a habit.

## 3 Field Research

### 3.1 Public Opinion Survey on the Historicity of the Commercial Triangle (Emporiko Trigono) of Athens

The Commercial Triangle (Emporiko Trigono) of Athens is the central district and one of the oldest areas of the city, with its historically shaped urban fabric and an interesting architectural heritage, the result of a construction process that lasted about 200 years and therefore today includes a wide variety of architectural forms and buildings that vary in age and size. It has been rightly argued (Zitouni-Petrogianni et al.: 15) that the historic character of the shopping triangle is based on 'coexistence': 'the coexistence of a ground floor shop next to a six-storey office building, the coexistence of a neoclassical two-storey house with a shop on the ground floor next to a modern multi-storey building with a gallery at the entrance...'. In this paper, it is found that an economic disparity is leading to the partial decline of the area and the abandonment of many buildings, as large shopping centers, leisure activities and hotels have replaced traditional uses, small shops, craft shops and residences. In contrast, this current situation combined with the age and characteristics of historic buildings makes adaptive reuse of these buildings more difficult.

The problem of vacant and abandoned properties and the degradation of the centre of Athens is urban, economic, social and environmental; it leads to the gradual

marginalisation and ghettoisation of parts of the city centre that could be the most attractive for both residential and tertiary sector activities, it deprives the city and property owners of valuable economic resources, and it degrades the lives of its residents or takes them away from it (Triantafyllopoulos).

As the human factor that lives and acts in the city could play a crucial role in the goal setting of urban planning and the effectiveness of the policies implemented, an opinion survey was conducted among residents, business people, and visitors on issues of historicity. To carry out the survey, a questionnaire was administered to a random sample of 80 residents, 40 entrepreneurs, and 80 visitors of the Commercial Triangle (Emporiko Trigono) of Athens. The field research was carried out by University of Thessaly students Dimitra Spyropoulou and Giorgos Koumbias in the summer of 2020, using the face-to-face method, and they are going to repeat it this summer as part of their graduate thesis.

## 3.2 Results of the Questionnaire

Questions 1-9 concerned the characteristics of the respondents. The statistical correlation ($x^2$) did not work to show that perceptions on issues of historicity of Commercial Triangle (Emporiko Trigono) of Athens relate to some of the characteristics of the interviewed residents, entrepreneurs and visitors. Gender, age, occupation, level of education, and kind of business activity do not differentiate the answers.

As for Question 10: ‘To what extent do you believe that the Commercial Triangle (Emporiko Trigono) of Athens has a particular historical physiognomy’ the 40 entrepreneurs of Commercial Triangle answered 'YES' at a rate of 100%, while at equally high rates the other two groups, the 80 residents (99%) and the 80 visitors (99%), answered 'YES'.

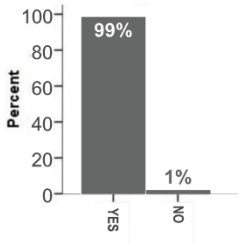
To Question 11: ‘In your opinion, what this particular historical physiognomy is due to’ the residents answered: ‘The maintenance of the use of buildings’ at 36% (visitors 28%, entrepreneurs 25%), while the entrepreneurs answered: ‘The image of streets (stores, etc.)’ at 40% (residents 30%, visitors 20%). The answer ‘Old historic buildings’ had unexpectedly low percentages (residents 9%, visitors 11%, entrepreneurs 3%), while the answer ‘New buildings, replicas of historic buildings’ accounted for higher percentages (residents 19%, visitors 24%, entrepreneurs 27%).

Concerning Question 12: 'How would you describe the evolution of this historical physiognomy over time', there are significant differences between the responses of residents and visitors on the one hand, and entrepreneurs of the Commercial Triangle on the other. So: As for the surveyed visitors to the city, 62% believe that historical physiognomy is 'Altered for the worse', 29% that 'Remains unchanged', and only 9% that it is 'Transformed for the better'. Almost the same percentages were answered by residents (60% is 'Altered for the worse', 29% 'Remains unchanged', and 11% is 'Transformed for the better'), while according to the same hierarchy of responses, but with significantly differentiated percentages, there responded entrepreneurs (47% is 'Altered for the worse', 28% 'Remains unchanged', and 25% is 'Transformed for the better').

**Tables 1., 2., 3.,** and **Graphs 1., 2., 3.:** Residents', Visitors', and Entrepreneurs' answers to Question 10: 'To what extent do you believe that the Commercial Triangle (Emporiko Trigono) of Athens has a particular historical physiognomy?'

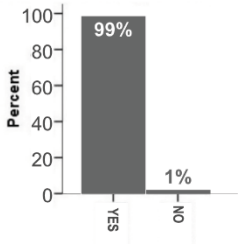
**HAS THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS A HISTORIC PHYSIOGNOMY? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | YES | 79 | 99 |
| | NO | 1 | 1 |
| Total | | 80 | |



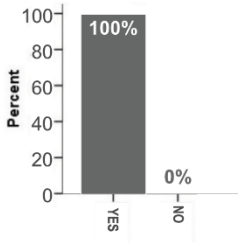

**HAS THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS A HISTORIC PHYSIOGNOMY? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | YES | 79 | 99 |
| | NO | 1 | 1 |
| Total | | 80 | |




**HAS THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS A HISTORIC PHYSIOGNOMY? : ENTREPRENEURS**

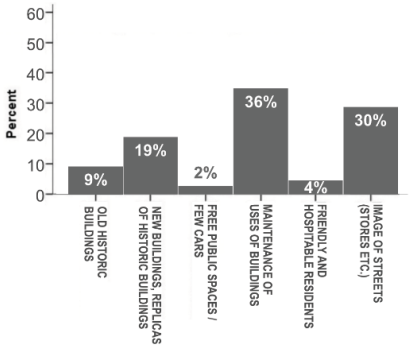
| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | YES | 40 | 100 |
| | NO | 0 | 0 |
| Total | | 40 | |



**Tables 4., 5., 6.,** and **Graphs 4., 5., 6.:** Answers of the three groups of respondents to Question 11: 'In your opinion, what this particular historical physiognomy is due to?'

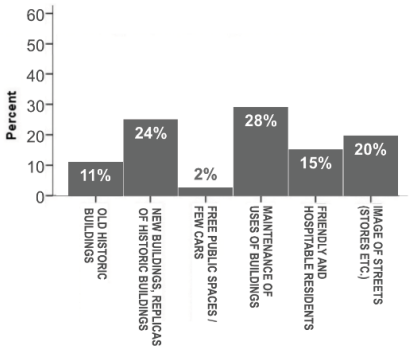
**WHAT THIS PARTICULAR HISTORICAL PHYSIOGNOMY IS DUE TO? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | OLD HISTORIC BUILDINGS | 7 | 9 |
| | NEW BUILDINGS, REPLICAS OF HISTORIC BUILDINGS | 15 | 19 |
| | FREE PUBLIC SPACES / FEW CARS | 2 | 2 |
| | MAINTENANCE OF USES OF BUILDINGS | 29 | 36 |
| | FRIENDLY AND HOSPITABLE RESIDENTS | 3 | 4 |
| | IMAGE OF STREETS (STORES ETC.) | 24 | 30 |
| Total | | 80 | |



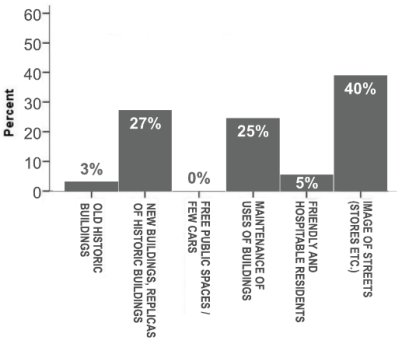

**WHAT THIS PARTICULAR HISTORICAL PHYSIOGNOMY IS DUE TO? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | OLD HISTORIC BUILDINGS | 9 | 11 |
| | NEW BUILDINGS, REPLICAS OF HISTORIC BUILDINGS | 19 | 24 |
| | FREE PUBLIC SPACES / FEW CARS | 2 | 2 |
| | MAINTENANCE OF USES OF BUILDINGS | 23 | 28 |
| | FRIENDLY AND HOSPITABLE RESIDENTS | 12 | 15 |
| | IMAGE OF STREETS (STORES ETC.) | 15 | 20 |
| Total | | 80 | |




**WHAT THIS PARTICULAR HISTORICAL PHYSIOGNOMY IS DUE TO? : ENTREPRENEURS**

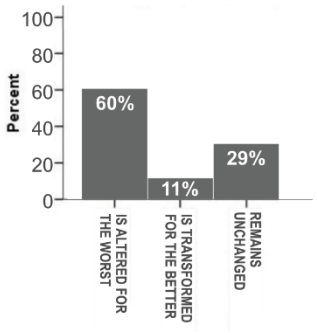
| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | OLD HISTORIC BUILDINGS | 1 | 3 |
| | NEW BUILDINGS, REPLICAS OF HISTORIC BUILDINGS | 11 | 27 |
| | FREE PUBLIC SPACES / FEW CARS | 0 | 0 |
| | MAINTENANCE OF USES OF BUILDINGS | 10 | 25 |
| | FRIENDLY AND HOSPITABLE RESIDENTS | 2 | 5 |
| | IMAGE OF STREETS (STORES ETC.) | 16 | 40 |
| Total | | 40 | |



**Tables 7., 8., 9.,** and **Graphs 7., 8., 9.:** Answers of the three groups of respondents to Question 12: 'How would you describe the evolution of this historical physiognomy over time?'

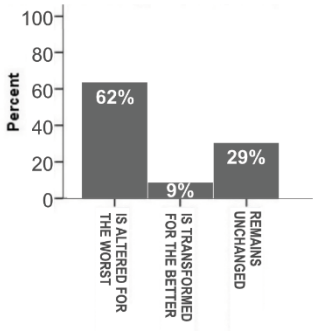
**HOW WOULD THEY DESCRIBE THE EVOLUTION OF THIS HISTORICAL PHYSIOGNOMY OVER TIME? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IS ALTERED FOR THE WORST | 48 | 60 |
| | IS TRANSFORMED FOR THE BETTER | 9 | 11 |
| | REMAINS UNCHANGED | 23 | 29 |
| Total | | 80 | |



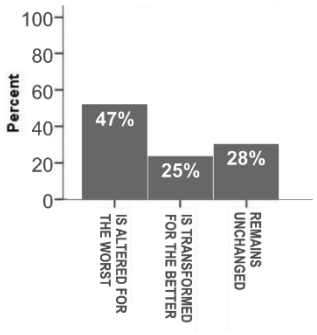

**HOW WOULD THEY DESCRIBE THE EVOLUTION OF THIS HISTORICAL PHYSIOGNOMY OVER TIME? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IS ALTERED FOR THE WORST | 50 | 62 |
| | IS TRANSFORMED FOR THE BETTER | 7 | 9 |
| | REMAINS UNCHANGED | 23 | 29 |
| Total | | 80 | |




**HOW WOULD THEY DESCRIBE THE EVOLUTION OF THIS HISTORICAL PHYSIOGNOMY OVER TIME? : ENTREPRENEURS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IS ALTERED FOR THE WORST | 19 | 47 |
| | IS TRANSFORMED FOR THE BETTER | 10 | 25 |
| | REMAINS UNCHANGED | 11 | 28 |
| Total | | 40 | |




In Question 13: 'Where do you find this deterioration' those who believe that historical physiognomy is 'Altered for the worse' (48 out of 80 residents surveyed, 50 out of 80 visitors, 19 out of 40 entrepreneurs), in a remarkable unanimity of all three groups of respondents, answered that they find this deterioration mainly 'In the free space

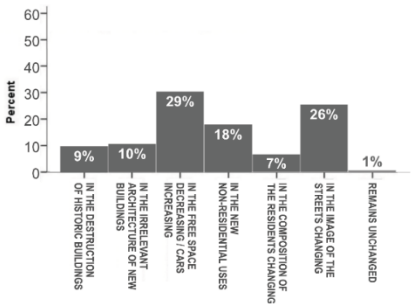
decreasing and cars increasing' (residents 29%, visitors 32%, entrepreneurs 30%), but significant differences are shown in the ranking of the second and third answers, with residents and entrepreneurs answering 'In the image of the streets changing' (26% and 30% respectively) and 'In the new non-residential uses' (18% and 20% respectively), while visitors answer 'In the irrelevant architecture of new buildings' and 'In the destruction of historic buildings' (16% and 14% respectively). In the responses of residents and entrepreneurs, the options 'In the destruction of historic buildings' and 'In the irrelevant architecture of new buildings' are below 10%.

In Question 14: 'In your opinion, which is the main cause of the destruction of old historic buildings', all three groups of respondents rank 'The lack of state funding' as the main reason for destruction.

**Tables 10., 11., 12.,** and **Graphs 10., 11., 12.:** Answers of the three groups of respondents to Question 13: 'If you believe that historical physiognomy 'Is altered for the worse' where do you find this deterioration?'

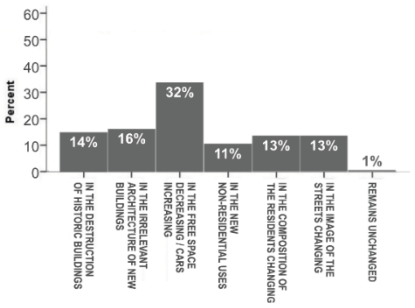
**WHERE DO THEY FIND THIS DETERIORATION? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IN THE DESTRUCTION OF HISTORIC BUILDINGS | 4 | 9 |
| | IN THE IRRELEVANT ARCHITECTURE OF NEW BUILDINGS | 5 | 10 |
| | IN THE FREE SPACE DECREASING / CARS INCREASING | 14 | 29 |
| | IN THE NEW NON-RESIDENTIAL USES | 9 | 18 |
| | IN THE COMPOSITION OF THE RESIDENTS CHANGING | 3 | 7 |
| | IN THE IMAGE OF THE STREETS CHANGING | 12 | 26 |
| | REMAINS UNCHANGED | 1 | 1 |
| Total | | 48 | |



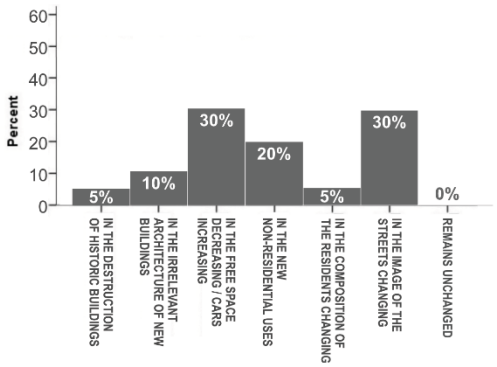

**WHERE DO THEY FIND THIS DETERIORATION? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IN THE DESTRUCTION OF HISTORIC BUILDINGS | 7 | 14 |
| | IN THE IRRELEVANT ARCHITECTURE OF NEW BUILDINGS | 8 | 16 |
| | IN THE FREE SPACE DECREASING / CARS INCREASING | 17 | 32 |
| | IN THE NEW NON-RESIDENTIAL USES | 5 | 11 |
| | IN THE COMPOSITION OF THE RESIDENTS CHANGING | 6 | 13 |
| | IN THE IMAGE OF THE STREETS CHANGING | 6 | 13 |
| | REMAINS UNCHANGED | 1 | 1 |
| Total | | 50 | |



**WHERE DO THEY FIND THIS DETERIORATION? : ENTREPRENEURS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IN THE DESTRUCTION OF HISTORIC BUILDINGS | 1 | 5 |
| | IN THE IRRELEVANT ARCHITECTURE OF NEW BUILDINGS | 2 | 10 |
| | IN THE FREE SPACE DECREASING / CARS INCREASING | 6 | 30 |
| | IN THE NEW NON-RESIDENTIAL USES | 3 | 20 |
| | IN THE COMPOSITION OF THE RESIDENTS CHANGING | 1 | 5 |
| | IN THE IMAGE OF THE STREETS CHANGING | 6 | 30 |
| | REMAINS UNCHANGED | 0 | 0 |
| Total | | 19 | |

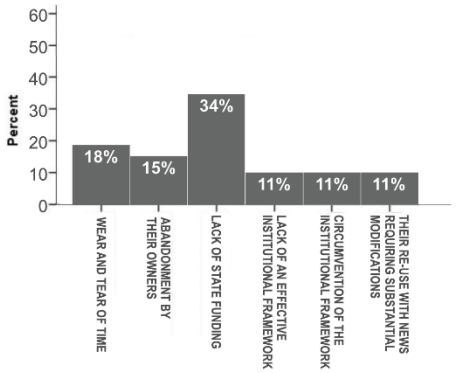



with similar percentages (residents 34%, visitors 32%, entrepreneurs 33%), with residents and visitors ranking 'The wear and tear of time' as the second reason (18% and 16%, respectively) and entrepreneurs 'The abandonment by their owners' (20%). All other choices are below 15%.

**Tables 13., 14., 15.,** and **Graphs 13., 14., 15.:** Answers of the three groups of respondents to Question 14: 'In your opinion, what is the main cause of the destruction of old historic buildings?'

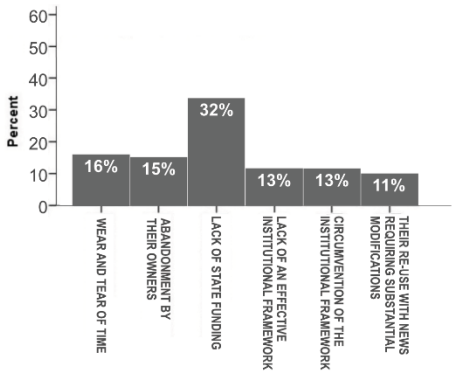
**WHAT IS THE MAIN CAUSE OF THE DESTRUCTION OF OLD HISTORIC BUILDINGS? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | WEAR AND TEAR OF TIME | 14 | 18 |
| | ABANDONMENT BY THEIR OWNERS | 12 | 15 |
| | LACK OF STATE FUNDING | 27 | 34 |
| | LACK OF AN EFFECTIVE INSTITUTIONAL FRAMEWORK | 9 | 11 |
| | CIRCUMVENTION OF THE INSTITUTIONAL FRAMEWORK | 9 | 11 |
| | THEIR RE-USE WITH NEW USES REQUIRING SUBSTANTIAL MODIFICATIONS | 9 | 11 |
| Total | | 80 | |



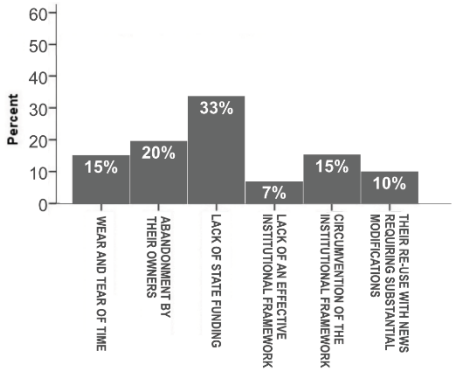
**WHAT IS THE MAIN CAUSE OF THE DESTRUCTION OF OLD HISTORIC BUILDINGS? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | WEAR AND TEAR OF TIME | 13 | 16 |
| | ABANDONMENT BY THEIR OWNERS | 12 | 15 |
| | LACK OF STATE FUNDING | 26 | 32 |
| | LACK OF AN EFFECTIVE INSTITUTIONAL FRAMEWORK | 10 | 13 |
| | CIRCUMVENTION OF THE INSTITUTIONAL FRAMEWORK | 10 | 13 |
| | THEIR RE-USE WITH NEW USES REQUIRING SUBSTANTIAL MODIFICATIONS | 9 | 11 |
| Total | | 80 | |




**WHAT IS THE MAIN CAUSE OF THE DESTRUCTION OF OLD HISTORIC BUILDINGS? : ENTREPRENEURS**

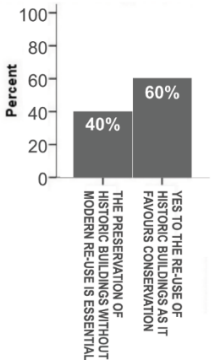
| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | WEAR AND TEAR OF TIME | 6 | 15 |
| | ABANDONMENT BY THEIR OWNERS | 8 | 20 |
| | LACK OF STATE FUNDING | 13 | 33 |
| | LACK OF AN EFFECTIVE INSTITUTIONAL FRAMEWORK | 3 | 7 |
| | CIRCUMVENTION OF THE INSTITUTIONAL FRAMEWORK | 6 | 15 |
| | THEIR RE-USE WITH NEW USES REQUIRING SUBSTANTIAL MODIFICATIONS | 4 | 10 |
| Total | | 40 | |



**Tables 16., 17., 18.,** and **Graphs 16., 17., 18.:** Answers of the three groups of respondents to Question 18: 'Do you believe that the preservation of historic buildings should be done with or without a modern reuse?'

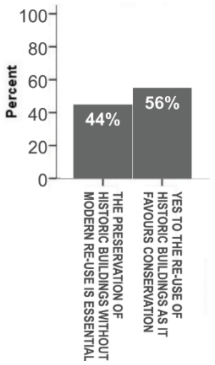
**HISTORIC CONSERVATION WITH OR WITHOUT MODERN RE-USE OF HISTORIC BUILDINGS: RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THE PRESERVATION OF HISTORIC BUILDINGS WITHOUT MODERN RE-USE IS ESSENTIAL | 32 | 40 |
| | YES TO THE RE-USE OF HISTORIC BUILDINGS AS IT FAVOURS CONSERVATION | 48 | 60 |
| Total | | 80 | |



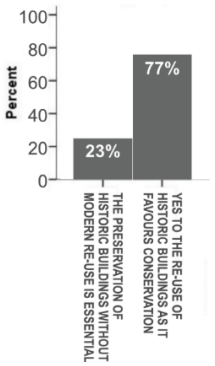

**HISTORIC CONSERVATION WITH OR WITHOUT MODERN RE-USE OF HISTORIC BUILDINGS: VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THE PRESERVATION OF HISTORIC BUILDINGS WITHOUT MODERN RE-USE IS ESSENTIAL | 35 | 44 |
| | YES TO THE RE-USE OF HISTORIC BUILDINGS AS IT FAVOURS CONSERVATION | 45 | 56 |
| Total | | 80 | |




**HISTORIC CONSERVATION WITH OR WITHOUT MODERN RE-USE OF HISTORIC BUILDINGS: ENTREPRENEURS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THE PRESERVATION OF HISTORIC BUILDINGS WITHOUT MODERN RE-USE IS ESSENTIAL | 9 | 23 |
| | YES TO THE RE-USE OF HISTORIC BUILDINGS AS IT FAVOURS CONSERVATION | 31 | 77 |
| Total | | 40 | |



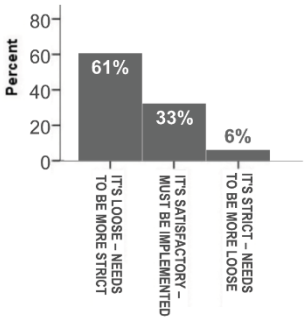
Regarding the dilemma 'historic buildings with or without a modern reuse' (Question 18), all three groups of respondents answer 'Yes to the reuse of historic buildings as it favors preservation', but with a notable difference in percentages. Entrepreneurs answer 'Yes' at 77%, with the percentages decreasing to 60% for residents and 56% for visitors.

In Question 20: 'What is your view of the institutional framework for the protection of the historical physiognomy of Commercial Triangle (Emporiko Trigono) of Athens?', all three groups of respondents answered 'It's loose and needs to be more strict' (61% residents, 54% visitors, 65% entrepreneurs), with the answer 'It is satisfactory, it must be implemented' taking second place. The answer, 'It's strict and needs.

**Tables 19., 20., 21.,** and **Graphs 19., 20., 21.:** Answers of the three groups of respondents to Question 20: 'What is your view of the institutional framework for the protection of the historical physiognomy of the Commercial Triangle (Emporiko Trigono) of Athens?'

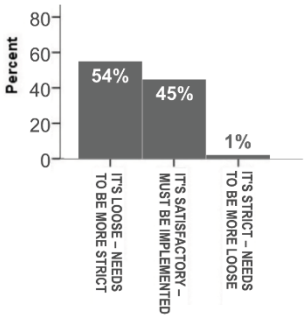
**WHAT IS THEIR VIEW OF THE INSTITUTIONAL FRAMEWORK FOR THE PROTECTION OF THE HISTORICAL PHYSIOGNOMY OF THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IT'S LOOSE – NEEDS TO BE MORE STRICT | 49 | 61 |
| | IT'S SATISFACTORY – MUST BE IMPLEMENTED | 26 | 33 |
| | IT'S STRICT – NEEDS TO BE MORE LOOSE | 5 | 6 |
| Total | | 80 | |



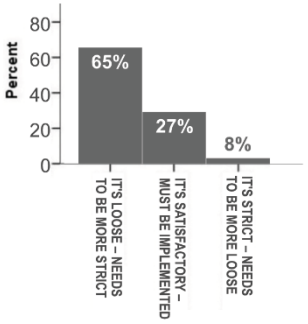

**WHAT IS THEIR VIEW OF THE INSTITUTIONAL FRAMEWORK FOR THE PROTECTION OF THE HISTORICAL PHYSIOGNOMY OF THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IT'S LOOSE – NEEDS TO BE MORE STRICT | 43 | 54 |
| | IT'S SATISFACTORY – MUST BE IMPLEMENTED | 36 | 45 |
| | IT'S STRICT – NEEDS TO BE MORE LOOSE | 1 | 1 |
| Total | | 80 | |



**WHAT IS THEIR VIEW OF THE INSTITUTIONAL FRAMEWORK FOR THE PROTECTION OF THE HISTORICAL PHYSIOGNOMY OF THE COMMERCIAL TRIANGLE (EMPORIKO TRIGONO) OF ATHENS? : ENTREPRENEURS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | IT'S LOOSE – NEEDS TO BE MORE STRICT | 26 | 65 |
| | IT'S SATISFACTORY – MUST BE IMPLEMENTED | 11 | 27 |
| | IT'S STRICT – NEEDS TO BE MORE LOOSE | 3 | 8 |
| Total | | 40 | |



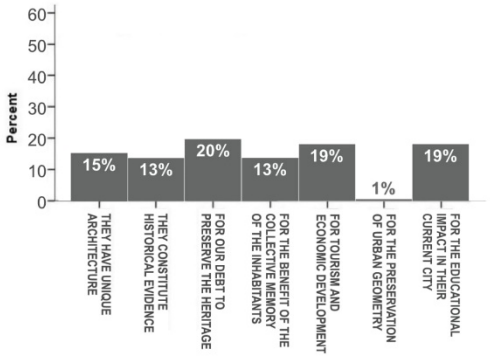

to be more loose' garnered small percentages among the three groups of respondents (6% residents, 1% visitors, 8% entrepreneurs).

In Question 21: 'Why do you think that historic districts of cities (such as the Commercial Triangle / Emporiko Trigono of Athens) should be preserved?', residents and visitors answered 'it is our duty to preserve the historical heritage' (20% and 21%, respectively), and the entrepreneurs responded with the same percentage (20%) to this option, while the answer that took first place was 'for tourism and economic development' (27%). This option had lower rates among residents and visitors (19% and 15%, respectively). The answer 'because they have unique architecture' garnered lower percentages (residents 15%, visitors and entrepreneurs 10%).

**Tables 22., 23., 24.,** and **Graphs 22., 23., 24.:** Answers of the three groups to Question 21: 'Why do you think that historic districts of cities (such as the Commercial Triangle / Emporiko Trigono of Athens) should be preserved?'

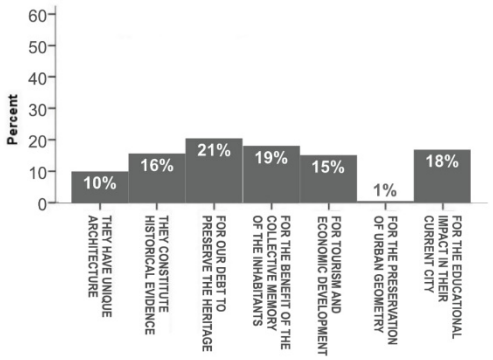
**WHY DO THEY BELIEVE THAT HISTORIC DISTRICTS OF THE CITIES SHOULD BE PRESERVED? : RESIDENTS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THEY HAVE UNIQUE ARCHITECTURE | 13 | 15 |
| | THEY CONSTITUTE HISTORICAL EVIDENCE | 10 | 13 |
| | FOR OUR DUTY TO PRESERVE THE HERITAGE | 16 | 20 |
| | FOR THE BENEFIT OF THE COLLECTIVE MEMORY OF THE INHABITANTS | 10 | 13 |
| | FOR TOURISM AND ECONOMIC DEVELOPMENT | 15 | 19 |
| | FOR THE PRESERVATION OF URBAN GEOMETRY | 1 | 1 |
| | FOR THEIR EDUCATIONAL IMPACT IN THEIR CURRENT CITY | 15 | 19 |
| Total | | 80 | |



**WHY DO THEY BELIEVE THAT HISTORIC DISTRICTS OF THE CITIES SHOULD BE PRESERVED? : VISITORS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THEY HAVE UNIQUE ARCHITECTURE | 8 | 10 |
| | THEY CONSTITUTE HISTORICAL EVIDENCE | 13 | 16 |
| | FOR OUR DUTY TO PRESERVE THE HERITAGE | 17 | 21 |
| | FOR THE BENEFIT OF THE COLLECTIVE MEMORY OF THE INHABITANTS | 15 | 19 |
| | FOR TOURISM AND ECONOMIC DEVELOPMENT | 12 | 15 |
| | FOR THE PRESERVATION OF URBAN GEOMETRY | 1 | 1 |
| | FOR THEIR EDUCATIONAL IMPACT IN THEIR CURRENT CITY | 14 | 18 |
| Total | | 80 | |




**WHY DO THEY BELIEVE THAT HISTORIC DISTRICTS OF THE CITIES SHOULD BE PRESERVED? : ENTREPRENEURS**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | THEY HAVE UNIQUE ARCHITECTURE | 4 | 10 |
| | THEY CONSTITUTE HISTORICAL EVIDENCE | 7 | 17 |
| | FOR OUR DUTY TO PRESERVE THE HERITAGE | 8 | 20 |
| | FOR THE BENEFIT OF THE COLLECTIVE MEMORY OF THE INHABITANTS | 5 | 13 |
| | FOR TOURISM AND ECONOMIC DEVELOPMENT | 11 | 27 |
| | FOR THE PRESERVATION OF URBAN GEOMETRY | 0 | 0 |
| | FOR THEIR EDUCATIONAL IMPACT IN THEIR CURRENT CITY | 5 | 13 |
| Total | | 40 | |

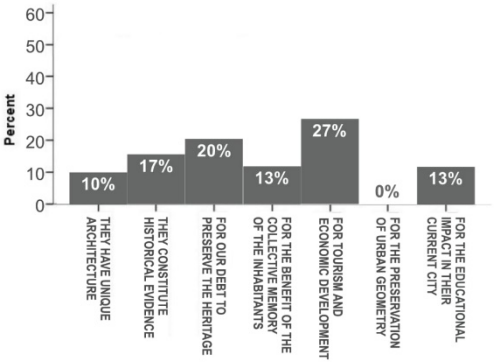
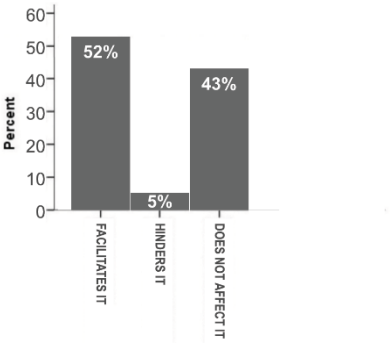


**Table 25.** and **Graph 25**.: Answers of the Entrepreneurs to Question 15 of the Questionnaire for Entrepreneurs: 'How does the historical physiognomy affect your business activity?'

**HOW DOES THIS HISTORICAL PHYSIOGNOMY AFFECT THEIR BUSINESS?**

| | | Frequency | Valid Percent |
|---|---|---|---|
| Valid | FACILITATES IT | 21 | 52 |
| | HINDERS IT | 2 | 5 |
| | DOES NOT AFFECT IT | 17 | 43 |
| Total | | 40 | |




**Tables 26.,** and **27.:** Answers of the Entrepreneurs per business activity. Statistical correlation (chi-square)'kind of business activity' * 'how the historical physiognomy affects business activity'. The kind of business activity did not show statistically significant differences between the answers of the 40 entrepreneurs

**KIND OF ACTIVITY * HOW DOES THIS HISTORICAL PHYSIOGNOMY AFFECT THEIR BUSINESS? Cross tabulation**

| KIND OF BUSINESS ACTIVITY | FACILITATES IT | HINDERS IT | DOES NOT AFFECT IT | Total |
|---|---|---|---|---|
| ACCESSORIES | 3 | 0 | 2 | 5 |
| BOOKS / STATIONARY | 1 | 0 | 1 | 2 |
| CAFE / CAFETERIA | 1 | 1 | 2 | 4 |
| CLOTHING / FOOTWEAR | 7 | 1 | 9 | 17 |
| COSMETICS | 0 | 0 | 1 | 1 |
| JEWELRY | 3 | 0 | 0 | 3 |
| PHARMACY | 1 | 0 | 0 | 1 |
| RESTAURANT / TAVERN | 3 | 0 | 2 | 5 |
| TECHNOLOGY PRODUCTS | 2 | 0 | 0 | 2 |
| Total | 21 | 2 | 17 | 40 |

**Chi-Square Tests**

| | Value | df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 12,239 | 16 | 0,727 |
| Likelihood Ratio | 14,052 | 16 | 0,595 |
| Linear-by-Linear Association | 1,575 | 1 | 0,209 |
| N of Valid Cases | 40 | | |

In Question 15 of the Questionnaire for Entrepreneurs: 'How does the historical physiognomy affect your business activity?', the 40 entrepreneurs surveyed answered, at a rate of 52%, that 'It facilitates it', with the answer 'It does not affect it' taking second place (43%), while the answer 'It hinders it' gathered a characteristically low percentage (5%).

The statistical correlation ($x^2$) did not show that the view of 'how the historical physiognomy affects business activity' is related to the 'kind of business activity' (p-value = 0.727 > 0.05). The kind of activity did not show statistically significant differences between the answers of the 40 entrepreneurs.

## 4 Consideration of the Results concerning the Hypotheses of the Survey - Discussion

The study of the results of the questionnaire reveals findings, some of which confirm and others do not support the research hypotheses:

1. The Commercial Triangle (Emporiko Trigono) of Athens, according to the perceptions of the vast majority (99%-100%) of residents, entrepreneurs, and visitors, has a particular historic physiognomy. This historic physiognomy favors most kinds of business activity, as the kind of activity did not show statistically significant differences between the answers of the 40 entrepreneurs. The entrepreneurs surveyed answered (at a rate of 52%) that this particular historic physiognomy facilitates their business activity, with the answer 'it does not affect it' taking second place, with a percentage of 43%.
2. The contribution of Historic Buildings to the shaping of the historical physiognomy of the Commercial Triangle (Emporiko Trigono) of Athens is not perceived by locals and visitors, while they believe that newer buildings, replicas of the originals, contribute to it, to some extent. According to the perceptions of residents and visitors, this particular historical physiognomy is due to the maintenance of the use of buildings, while the entrepreneurs identify it in the image of streets (stores, etc.).
3. The overall evolution of this historic physiognomy over time is generally perceived negatively by residents, visitors, and entrepreneurs (60%, 62%, and 47%, respectively). Those who believe that historical physiognomy is altered for the worse (48 out of 80 residents surveyed, 50 out of 80 visitors, and 19 out of 40 entrepreneurs) answered that they find this deterioration mainly in the free space decreasing and cars increasing (residents 29%, visitors 32%, and entrepreneurs 30%) and secondly in the image of the streets changing and in the new non-residential uses. The options 'In the destruction of historic buildings' and 'In the irrelevant architecture of new buildings' are below 10% in the responses of residents and entrepreneurs, while in visitors' answers, they garnered 16% and 14%, respectively. The relatively higher percentages are perhaps justified by the responses of visitors, who are looking for a more 'authentic' historical image to consume.
4. The re -use of historic buildings appears to be a solution to the problem of degradation of the center of Athens through vacant and abandoned properties, as the three groups of respondents answer 'yes to the reuse of historic buildings as it favors preservation' (77% entrepreneurs, 60% residents, and 56% visitors). All three groups of respondents rank 'the lack of state funding' as the main reason for the destruction of historic buildings with similar percentages (residents 34%, visitors 32%, entrepreneurs 33%), with residents and visitors ranking 'the wear and tear of time' as the second reason (18% and 16%, respectively) and entrepreneurs 'the abandonment by their owners' (20%).
5. The protection institutional framework of the Commercial Triangle (Emporiko Trigono) of Athens is perceived by all three groups of respondents as loose and

needs to be stricter (61% residents, 54% visitors, 65% entrepreneurs), although it is also judged by some who, by presumption, are unable to know it. This is an anecdotal perception that comes from the displeasure of the negative evolution of the historic physiognomy of the district over time. The answer 'it is satisfactory, it must be implemented' took second place (33% residents, 45% visitors, 27% entrepreneurs).

6. Regarding the main reasons for preserving historic districts of cities, residents and visitors answered 'it is our duty to preserve the historical heritage' (20% and 21%, respectively), and the entrepreneurs responded with the same percentage (20%) to this option, while the answer that took first place was 'for tourism and economic development' (27%). This option had lower rates among residents and visitors (19% and 15%, respectively). The answer 'because they have unique architecture' garnered lower percentages (residents 15%, visitors and entrepreneurs 10%).

It will be interesting to re-examine the range of the research hypotheses through the repetition of the field research this summer and to compare the new findings with the abovementioned, so that any changes to the perceptions of the historicity of the locals and visitors are brought up.

## References

1. Aravantinos, A. 2002. Dynamics and planning of the city centers for the following decades - towards centralised or decentralised schemes? Aeihoros 1 (1): 6-29
2. Avgerinou-Kolonias, S. 2002. Transformations of the modern Greek city. New uses and cultural heritage. Proceedings of the 10th Panhellenic Architectural Conference, Athens: TEE/SADAS/PEA, 379-386
3. Avgerinou-Kolonias, S. 2014. Charter for the Conservation of Historic Towns and Urban Areas (Washington 1987). In: Smith C. (eds) Encyclopedia of Global Archaeology, Springer, New York, pp.1372-1374
4. Bouras, C. 2010. The restoration of architectural monuments in Greece. Fifty years' cronicle: 1950-2000. In: Maintenance, Anastylose and Restoration of Monuments in Greece 1950-2000, eds. Charalambos Bouras and Panagiotis Tournikiotis, 29-72. Athens: The Piraeus Bank Group Cultural Foundation (PIOP)
5. Champagne, P. 2004. The construction of public opinion. Athens: Patakis
6. Cherchi, P. 2015. Adaptive reuse of abandoned monumental buildings as a strategy for urban live ability. Athens Journal of Architecture, 1(4), 253-270
7. Fatouros, D. 2006. Change, Duration and Identity or the Faces of Reuse. Architectural Transformations, vol. 1: Metropolitan Centers, 10-15. Athens: Melissa
8. Filippidis, D. 2006. Preface. Architectural Transformations, vol. 1: Metropolitan Centers, 8-9. Athens: Melissa
9. Hirsch, E. and Stewart, C., 2005, 'Introduction: Ethnographies of Historicity', History and Anthropology 16 (3), pp. 261-274
10. Konstantinidis, A. 1972/1987. 'Vessels of life' or 'The problem for a real Greek architecture'. About Architecture, 213-270. Athens: Agras
11. Mallouchou-Tufano, F. 2016. Protection and Management of Monuments [e-book] Athens: Association of Hellenic Academic Libraries (http://hdl.handle.net/11419/6466)
12. Misirlisoy, D., and Günçe, K. 2016. Adaptive reuse strategies for heritage buildings: A holistic approach. Sustainable cities and society, 26, 91-98

13. Olmo, C. 1992. The Aesthetics of Cities. Social Contract and Collective Vision. Tefchos (9): 62-65
14. Panayotopoulos, N., ed. 1999. Pierre Bourdieu: Sociology Essays. Athens: Stachy
15. Shao, Q. 2012. Citizens versus Experts: Historic Preservation in Globalizing Shanghai. Future Anterior 9 (1): 16-31
16. Stamos, G. 1994. A. Giddens: for the double interpretation and structuration. Dokimes, September, B΄: 129-150, http://pandemos.panteion.gr:8080/fedora/objects/iid:8457/datastreams/PDF1/content (accessed March 25, 2020)
17. Stewart, C., 2016, 'Historicity and Anthropology', Annual Review of Anthropology 45, October 2016, pp. 79-94
18. Theologidou, K. 2007. 'Facadism' and Modern Architectural Heritage, e-magazine Monumenta, (http://www.monumenta.org/article.php?IssueID=3&lang=gr&CategoryID=1&ArticleID=22)
19. Triantafyllopoulos, N. 2018. The problem of vacant and abandoned buildings in the centre of Athens. (https://www.dianeosis.org/2018/02/abandoned-buildings-athens/)
20. Waitt, G., 2000, Consuming heritage: Perceived historical authenticity. Annals of tourism research, 27(4), 835-862
21. Wells, J. C. 2015. Making a Case for Historic Place Conservation Based on People's Values. Forum Journal 29 (3): 44-62
22. Zitouni-Petrogianni, G., Paraschou, A., and Maistrou, H. 2022. Abandoned or degraded areas in historic cities: the importance of multifunctional reuse for development through the example of the historic commercial triangle (Emporiko Trigono) of Athens. Land, 11(1), 114

# Are Conservation Principles being implemented in Historic cities or not?

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**Abstract:** This paper recommends eleven criteria regarding the conservation of urban heritage, through a review of UNESCO and ICOMOS doctrinal texts for the protection of historic cities. When comparing these conservation principles with the current conditions of many historic cities, it seems that many of them have been already adopted in a haphazard manner. Therefore, a holistic reporting approach is required to demonstrate how efficiently Historic Urban Landscape is being preserved. This approach integrates also the heritage conservation into the sustainable urban development, preserving not only the quality of the built environment but also traditional productive resources and the daily lives of local residents. Furthermore, through a survey of one of the oldest cities in Europe, Argos in the Peloponnese has been chosen as a case study to implement a comprehensive conservation status report based on the aforementioned criteria. Listed monuments, archaeological sites, historic districts, vernacular architecture, and other components of both intangible and tangible urban heritage have been assessed and organized within this framework. Therefore, by identifying valuable characteristics of the city alongside signs of vulnerability, stakeholders from public services, civil society, and the private sector can be informed and involved in the policy-making process.

**Keywords:** Urban Heritage, Heritage Conservation, Spatial Planning, Historic Cities

## 1 Introduction

Since 1962, ICOMOS Charters and UNESCO Conventions and Recommendations have defined the standards for cultural heritage conservation. More specifically, in 2011 both the Valetta Principles [10] and the Historic Urban Landscape (HUL) Recommendation [9] proposed innovative methods to protect the historic areas. From the monument as a landmark inside the urban tissue to the historic quarter in strictly recognised boundaries, the landscape approach introduced the need for urban heritage conservation. Except of the monumental structures, urban heritage [9] consists of the non-

exceptional building stock in a relevant abundance, the open spaces as well as the infrastructures and activities that configure the distinct cityscape.

Although governmental institutions have already implemented many conservation policies for the historic cities, most of them are monument-oriented or focused on regeneration projects of city-centers. On the other hand, an effective policy making doesn't pay attention only to the rehabilitation of built environment, but also needs to convert threats and challenges of urban heritage into opportunities for the sustainable development. The impact of climate change coupled with natural disasters, the geopolitical instability, the rapid increase of urban population, globalization with widely accepted urban development standards and mass tourism should be mitigated [11].

Apart from the environmental and aesthetic deterioration, social and spatial fragmentation is emerging in historic cities. In particular, short-term lease not only forces property owners to renovate the buildings without taking into consideration the architectural attributes but also chase away the traditional urban population, due to the overpriced rental fees. Moreover, because of the housing relocation to the suburbs, historic quarters are transformed into ghettos for tourists or monofunctional areas, dedicated to leisure time activities or administrative services. Although, this short-run development model evolved in megacities due to the gentrification, worldwide, [11] many irreversible impacts such as the loss of long-standing activities or the destruction of historic buildings, followed.

**Fig. 1.** Old public garden behind the church of Saint Peter, Argos (Argolikos Archival Library of History & Culture)

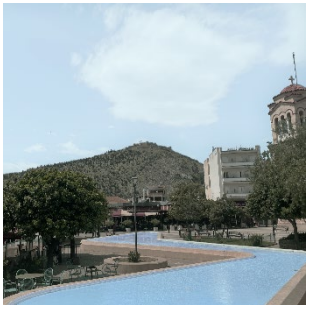

**Fig. 2.** New structures in the position of the public garden after regeneration project in 2014 (Archive of I. Kartsonakis)

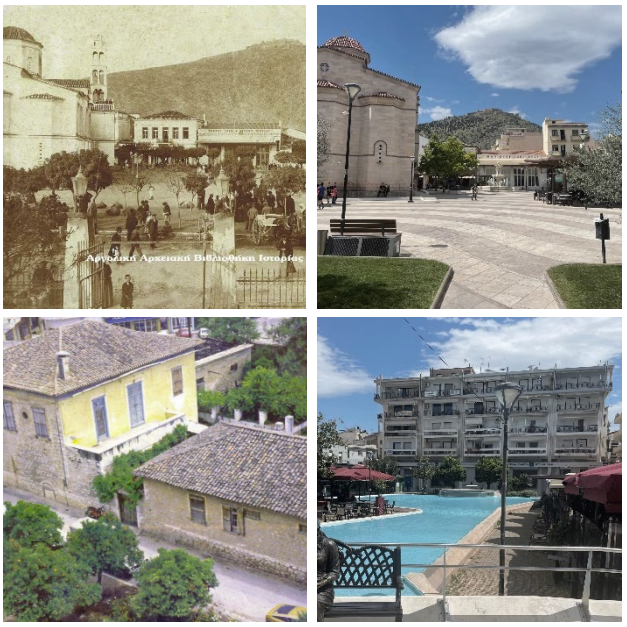

**Fig. 3.** (Left-up) Square of Saint Peter in early 20th century, Argos (Argolikos Archival Library of History & Culture) **Fig. 4.** (Right-up) Square of Saint Peter in April 2024 (Archive of I. Kartsonakis) **Fig. 5.** (Left-down) Old mansion behind the public garden, Argos (Argolikos Archival Library of History & Culture) **Fig. 6.** (Right-down) New four-storey building (Archive of I. Kartsonakis)

However, preserved historic areas may offer alternative development chances, based on the cultural tourism or traditional manufactures, supporting further the local communities. For instance, old pictures of historic buildings and outdoor public spaces in Argos (Fig.1-6), demonstrate the unquestionable aesthetic values, the eco-friendly design based on local resources and techniques, as well as the vivid social practices. On the contrary, the contemporary manmade structures have altered gradually these values. When public services or the civil society have not the jurisdiction or the initiative accordingly to protect them, the cityscape remains under an undetected danger.

Therefore, this research proposes an assessment methodology on how conservation principles are being implemented in many historic cities by different means at national or subnational level. This framework could present the weaknesses or the benefits of the current heritage conservation policies regarding their footprint on the socioeconomic, built and natural environment.

## 2 Review of UNESCO & ICOMOS doctrinal texts

The UNESCO and ICOMOS doctrinal documents may join three main groups; definitions and principles, measures and procedures, education and information (Fig.7).


**Fig. 7.** Diagram with the structure of the UNESCO & ICOMOS doctrinal documents, which are reviewed in order to propose an Assessment Methodology on whether conservation principles are implemented in historic cities (Archive of I. Kartsonakis)

Focused only on the conservation principles, this research presents eleven criteria (Fig.8a) that refer to the urban planning, the urban design, the urban fabric as well as the socioeconomic structure of historic cities (Fig.8b). At the level of urban planning, the applicable legislation is assessed for the recognised historic district, its buffer zone, the traditional land-uses patterns as well as the traffic control. Similarly, at the level of urban design, the balance between hard and soft landscaping, the harmonious integration of urban infrastructure as well as the traditional mobility model should be reviewed. Also, at the level of the buildings, maintenance and modern interventions in both historic and non-exceptional premises are assessed. This evaluation is not only limited to the architectural features of the premises. However, it is focused on the integration of appropriate functions, by preserving the relationships within the urban context and with other sections of the city. These relationships are configurated by the socioeconomic structure of historic cities. Therefore, apart from the material evidences,

through the identification of the local intangible heritage as well as the cultural diversity, these relationships could be proved further.

| Categories | Criteria |
|---|---|
| Urban Planning | **Criterion 1** \| Conservation of Historic District |
| | **Criterion 2** \| Designation of Buffer Zone |
| | **Criterion 3** \| Preservation of Traditional Land-uses patterns |
| Urban Design | **Criterion 4** \| Balance in Soft and Hard Landscaping |
| | **Criterion 5** \| Appropriate Urban Mobility Model |
| | **Criterion 6** \| Harmonized Urban Design |
| Urban Fabric | **Criterion 7** \| Conservation of Architectural Heritage |
| | **Criterion 8** \| Harmonious Integration of Contemporary Architecture |
| | **Criterion 9** \| Appropriate New Function in Historic Premises |
| Socioeconomic Structure | **Criterion 10** \| Preservation of Intangible Heritage |
| | **Criterion 11** \| Identification of Cultural Diversity |

**Fig. 8a.** List of eleven criteria for this assessment methodology, Archive of I. Kartsonakis


**Fig. 8b.** Four categories of the recommended assessment methodology; urban planning, urban design, urban fabric, socioeconomic structure, with the separate criteria: Archive of I. Kartsonakis (1) View of historic area in Cordoba, Spain, August 2024, (2) Urban landscape of Barcelona, Spain, November 2019, (3) Opera, Vienna, Austria 2022, (4) View of a tree line, Rome, Italy 2024, (5) Tram station in front of the Opera, Bordeaux, France 2023, (6) Local pavement materials in public space, Taormina, Italy, August 2023, (7) Sample of vernacular architecture, Nuremberg, Germany 2020, (8) Contemporary building inside the historic quarter, Samos, Greece 2024 (9) Retail store as a new function of an old Church, Saint Emilion, France, 2023, (10) Islamic architecture, Palermo, Italy 2022, (11- social practices) Street food market, Rome, Italy 2024 (11 – local crafts) Pottery craft, Skiros, Greece 2023.

## 2.1 Urban planning

**Criterion 1** | Conservation of Historic District

In the mid-20th century, following WWI and II as well as under the pretext of expansion or modernization, irrational demolition and dispensable reconstruction works caused irreversible damages to historic cities. As a result, governmental services identified the protected areas within the old urban tissue, due to their distinct patterns. This urban morphology can be distinguished by lots, the street grid and the relationship between buildings and open spaces, with or without vegetation [6]. Except of the geometrical features, at the scale of the historic areas, perspectives, views, focal points and visual corridors need to be preserved. In several cases, historic districts also include many listed buildings and monuments, which many times are combined with chronic land-tenure problems [10]. Therefore, large-scale conservation, restoration and

rehabilitation projects should be implemented, albeit their difficulty. Apart from these corrective actions, in protected areas a systematic interconnection between safeguarding and planning at all levels is required [5]. During private or public works, this procedure can prevent the reorganization of the lots as well as the change of volume, which could be harmful to the harmony of the whole [10].

**Criterion 2 |** Designation of Buffer Zone

Since protected historic areas are inseparable from their setting, a buffer zone as a peripheral belt needs to be incorporated into the over-all town planning [4]. This natural or man-made setting influences the static or dynamic way that the historic areas are perceived [5]. However, a growing universality of construction techniques and architectural forms create a uniform environment with a considerable increase in the scale and density of buildings [5]. Also, due to the certain technological developments, many modern activities contribute to various forms of pollution, such as noise, shocks, vibrations and light caused by machines and vehicles [5]. Therefore, authorizing restoration, modification, new construction, demolition and deforestation within the protected perimeter, historic district can be shielded from physical, visual, cultural and socioeconomic impacts of activities in its surroundings [5].

**Criterion 3 |** Preservation of Traditional Land-uses patterns

Characteristic civic, religious and social functions, that the town has acquired over time, need to be under protection. These symbolic functions represent values which characterize the urban life, for instance welfare facilities (hospitals, orphanages, retirement homes), entertainment venues (amphitheatres, movie-theatres, operas, cinemas) and education amenities (universities, libraries, foundations, museums). Moreover, traditional trades, crafts and industries have also be linked with the socioeconomic context of historic areas, therefore the relevant commercial premises and workshops need to be maintained. Alternatively, new activities should be compatible with the character of the historic town [6]. These activities should support the daily life of the local inhabitants and contribute to their well-being [9]. Particularly, new functions, such as services and tourism, could be important economic initiatives, if only residential function is maintained [9] and traffic congestion is avoided.

## 2.2 Urban Design

**Criterion 4 |** Balance in Soft and Hard Landscaping

The conservation of historic cities needs also to achieve the timeless balance between urban growth as well as the built and natural heritage. This interrelationship of geomorphology, spatial organization and transportation system configures the identity of historic areas. Apart from the manmade elements, a wider urban context includes also the site's topography, geomorphology, hydrology and natural features [9]. Gardens, parks and periurban forests are also important for the safeguarding of the local biodiversity, which includes fauna and flora. An inventory of public and private open spaces with their vegetation can be drawn up, not only to preserve them but also to foster the spread

and accessibility of green spaces. Meanwhile, these changes can also avoid further the urban heat islands [10] as well as to enhance the biodiversity evolution.

**Criterion 5** | Appropriate Urban Mobility Model

Nowadays, the wide spatial footprint of transportation has deteriorated aesthetically and functionally open spaces in the cities. Therefore, non-polluting public transport systems, instead of individual cars need to be introduced in historic towns. Also, the routing systems have to be redesigned to facilitate pedestrian traffic, linking them efficiently with the public transport [5]. Although traffic and parking issues are mostly regulated by town planning, parking facilities should preferably be remained outside protected zones [6]. In particular, any traffic infrastructures above and below ground, such as car parks and subway stations must be planned in ways that will not damage the historic or archaeological fabric or its environment [10]. Similarly, the construction of major motorways must not penetrate a historic town [6], even though their necessity both for commercial and passenger transport. Consequently, appropriate supply systems and services in urban life must be harmoniously introduced in historic areas.

**Criterion 6** | Harmonized Urban Design

Through the appropriate regulations, bill-posting, neon signs or other kinds of advertisement, erection of poles, electricity or telephone cables and placing of television aerials [4] should be prevented. For instance, electricity and other cables can be installed underground, coordinated easily with the integrated development of the road system [5]. Similarly, street pavements and furniture should be planned so that they fit harmoniously into the whole and prevent all forms of vandalism [5].

### 2.3 Urban Fabric

**Criterion 7** | Conservation of Architectural Heritage

Each historic area has a rich building stock from different historic periods and with distinct architectural features. Interior and exterior appearance of buildings is characterized by their scale, style, construction methods, materials, colors and decoration [6]. Therefore, public services through a participatory process, which engages the local community and multidisciplinary teams of architects, historians and engineers, should make an assessment of architectural heritage in the historic area. This procedure can determine which buildings must be preserved, which be preserved under circumstances and which might be expendable [6]. Meanwhile, any intervention by public or private sectors should be combined with a thorough documentation of existing conditions of the building and its surroundings [6]. Also, it's required that standards are defined for the work of maintenance and improvements [5].

**Criterion 8** | Harmonious Integration of Contemporary Architecture

Contemporary buildings at historic places must meet the aesthetic requirements in harmony of heights, colors, materials, forms of facades and roofs [5]. Concisely, new buildings should be adapted harmoniously to the spatial organization [5], such as the average proportions, sizes of the lots and their position inside the plot [10]. At the same time, new structures should express the architectural trends of its time and place [10]. Although, contemporary elements can contribute under circumstances to the enrichment of the historic area, major quantitative and qualitative changes should be avoided. Otherwise, these interventions should clearly result in the improvement of the urban environment, its cultural values and the well-being of its occupants [10].

**Criterion 9** | Appropriate New Function in Historic Premises

Historic premises with their traditional functions have characterized their surroundings as well as the whole district. Therefore, new function should be harmonized with the history of the building, to conserve its position within the urban fabric. Also, when new functions have to be introduced in historic buildings, major internal changes, which can remove or alter drastically their valuable features, should be avoided.

### 2.4 Socioeconomic Structure

**Criterion 10** | Preservation of Intangible Heritage

Historic towns, apart from their built wealth, provide to their inhabitants traditional living patterns [5]. Oral traditions, performing arts, rituals, festive events, expressions, knowledge and practices concerning nature and the universe constitute the intangible heritage of historic areas [7]. This interrelationship between the cultural and social practices and the place confirms how the spirit creates the space and at the same time how the space structures this spirit [10]. Also, knowledge and skills to produce crafts should be safeguarded, as the timeless productive resources in the region. Therefore, skilled workers or craftsmen need undergo training to conservation works and indispensable crafts techniques, in order to prevent threats due to the processes of industrialization [7].

**Criterion 11** | Identification of Cultural Diversity

In general, intangible cultural heritage is a mainspring of cultural diversity [7], as always safeguards the spiritual achievements of different societies throughout the history. Material and spiritual elements that express the historic character of the town, have already taken diverse forms across time and space [8]. The diversity of cultural, religious and social activities in the past [5] proves the historic layering [9]. Different communities that have inhabited historic towns over the course of time must be respected and valued [10]. Their cultural activities, goods and services convey identities, values and meanings. Therefore, they must not be treated as solely having commercial or expendable value, due to either ICTs development or unilateral promotion of living patterns from the richest countries [8]. On the other hand, the analysis of socioeconomic and cultural activities, ways of life, as well as social relationships, coupled with

demographic data [5], can show the plurality in historic cities as well as record the alterations about the social and functional diversity.

## 3 Methodology Implementation: Argos, Peloponnese

This assessment methodology includes the identification of urban heritage as well as the evaluation of current conditions based on the aforementioned criteria. Argos in North-East Peloponnese, which is one of the oldest cities in Europe, has been chosen as the case study.

### 3.1. Identification of Urban Heritage

Argos is located within less than 13km driving distance from the UNESCO World Heritage Property: Archaeological Sites of Mycenae and Tiryns. It is bounded from two rivers northeast; Charadros and Inachos and two hills west; Larissa and Aspida. In the periurban area, Erasinos river passes through the mountains westward and flows into the Argolic Gulf, where a wetland, named Roumani is configured in the south. On the west side, small settlements around agricultural field crops in the Argolid Plain have been developed.

Analyzing the city planning proposal of architect Rudolph de Borroczun in 1831, the modern city of Argos had distinct boundaries with three city-gates Nafplio, Korinthos and Tripoli (Fig.9), linked through a peripheral esplanade inside the riverbed of Charadros. This neoclassic approach is also distinguished through the street grid of orthogonal blocks southwest, the vegetated boulevards which connect the public spaces as well as the six-hectare park behind the old mosque with an elliptical square.

Regarding the public spaces, in the intersection between main city axes; Korinthou-Danaou in north-south direction and Karantza-Tsokri-Vassilisis Sofias in west-east, major religious, civic and social activities have traditionally been concentrated. The cathedral, the old town hall, the municipal agora, the public garden (Fig.1), historic hotels, cafes and retail stores as well as modern museums are located at these two squares of both Saint Peter (Fig.3) and 'Kapodistrian' barracks. Around this major public space (Fig.17), secondary local centers exist in the extension of the regional roads inside the urban tissue, which connect Argos with eight neighboring cities.

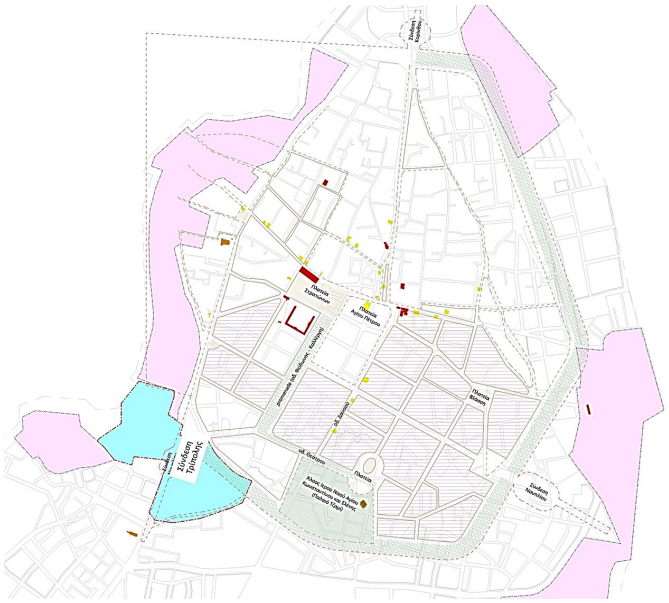

**Fig. 9.** Master plan of historic area in Argos, which includes the recognized protected district, the neoclassic quarter as well as the settlement at the foothills (Archive of I. Kartsonakis)

Moreover, many of the historic premises are characterized by the neoclassic architectural style, distinguished locally by their scale, layout, stone materials and colors. Most of them consists of old family residences (Fig.10,11,15) or served civic activities, such as the train station, the town hall, the municipal agora (Fig.21), barracks, schools, associations (Fig.14), hotels, cafes (Fig. 12) and retail stores (Fig.13). Meanwhile, indigenous morphological and structural elements and a distinct building's layout on the plot, from the pre-revolutionary era, have emerged in premises like the barracks; former agora or houses with wood-structured porches, surrounded the backyards.

**Fig. 10.** (Left-up) Tsokris' family residence (Archaiologia Online) **Fig. 11**. (Left-down) Trikoupis' family residence (Google Street View) **Fig. 12**. (Middle-up) Old café "Thivaiou" (Archive of I. Kartsonakis) **Fig. 13**. (Middle-down) Kostantopoulos' retail store (Archive of I. Kartsonakis) **Fig. 14.** (Right-up) "Danaos" mansion (Danaos Association) **Fig. 15**. (Right-down) Gordon's residence – French Archaeological School (Archaiologia Online)

### 3.2. Evaluation of Current Conditions

#### A. Urban Planning

According to the Greek Legislation of 1982 [20], the urban pattern with neoclassic characteristics is not included in the boundaries of the recognized historic district, which involves mostly the two major squares, the Tsokri street and the church of Saint Ioannis Prodromos with its surroundings. Moreover, no regulations about interventions in both private and public spaces in historic quarter are implemented today. Similarly, no buffer zone has been identified around the protected area, which is surrounded by archeological sites, such as the Ancient Theater, Agora and Larissa Castle southwest and modern neighborhoods. Specifically, on both sides of Korinthou street, new structures are not harmoniously integrated in historic spatial organization, where few open spaces with dead-end streets are observed. However, this densely development might prevent the urban sprawl inside the Argolid Plain. Nowadays, changes are imminent, due to industrial and wholesale activities at the brow of the city as well as suburbanization that pose an irreversible threat for the traditional agriculture. Despite their extended spatial footprint throughout three decades (Fig.16), since 2010 no further preventive regulations have been added in revised General Development Plan [21].

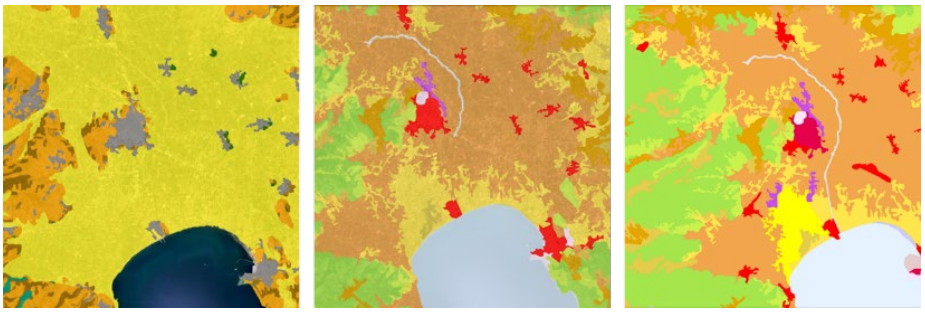

**Fig. 16.** The development in periurban area of Argos in 1987 (Left), 2000 (Middle) and 2018 (Right) through Corine Land Cover maps. Industrial areas are symbolized by purple hatch and settlements by red (WWF, 2023)

## B. Urban Design

In 2014, through a regeneration project of the historic center, new street pavements, furniture and permanently installed structures were added in two major squares, in contrast to their traditional character (Fig.17). In particular, a concrete-built water pit with a bridge as an extension of Danaou street (Fig.2,6,23) reverses the old public garden (Fig.1), whereas extravagant shade canopies instead of endemic trees were located (Fig.22). Paving finishes, drainage inlets, lighting fixtures, signages and benches are differentiated widely, with no attention to the whole design of public space in the historic area. Whereas the previously redesigned public square in front of the court of law, is characterized by balance between hardscapes and vegetated areas, finally the regeneration proposal neglected the existing features; colors, materials and style. Homogeneity is also disrupted around the traditional trade streets, called Venizelou and Tsaldari. In particular, arbitrary structures interrupt the visual relationship with the church of Saint Peter (Fig.24-25), in conflict with the group of listed buildings.

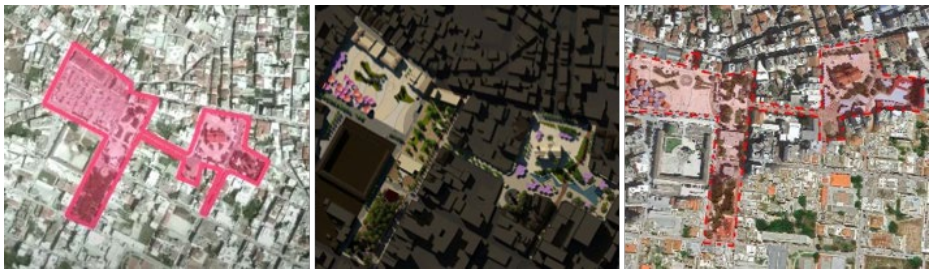

**Fig. 17.** Major public spaces before the interventions in 2014 (Left), based on the design proposal (Middle) and following the project implementation (Right) (Municipality of Argos-Mykines)

In general, most of the contemporary interventions include more impervious hardscapes instead of trees and flowerbeds planting with low irrigation needs. Given that the temperature of Argos ranges between 0-45ºC and the yearly precipitation is about 500mm, nature-based solutions already presented in old view images, have to be

reinstated. Due to the densely street grid and plot area coverage, greening of undeveloped spaces is difficult, therefore vegetation can be integrated mostly in archaeological sites, public spaces, private patios and front yards.

**Fig.18.** (Left-up) Visualization of regeneration proposal in front of the agora (Municipality of Argos-Mykines) **Fig.19-21** Views of the square around the agora (April 2024, Archive of I. Kartsonakis) **Fig 22-23** (Right- up & down) View of the square of Saint Peter, including shade canopies and the bridge above water pit (April 2024, Archive of I. Kartsonakis)

In proximity to the historic area eastward, many junctions have replaced former pedestrian spaces as a result of traffic control. For instance, in front of the historic building of "Vlassi" family, parked cars around the triangular island, split the public space down the middle. Similarly, many public and private spaces have been transformed into parking lots, such as the proposed neoclassic square behind the old mosque as well as the neighboring plot of listed building "Danaos" Association. Following the regeneration project of 2014, parking in front of the agora has been prohibited and two squares are connected with pedestrian roots. However, no alternative transportation modes, such as biking and walking, have been widely adopted. Access to Argos is feasible nowadays only by cars or interurban buses. Unfortunately, the historic trainline, which connected Peloponnese with Athens city-center in the past, has been ceased.

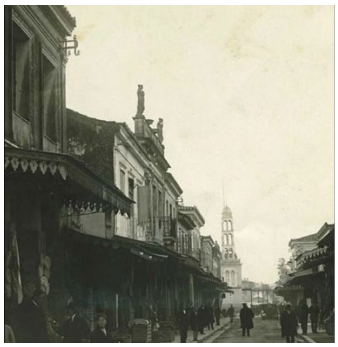


**Fig. 24.** View of Tsaldari street (Argolikos Archival Library of History & Culture)
**Fig. 25** Current conditions of Tsaldari street (Google Street View)

## C. Urban Fabric

Regarding the historic buildings in Greece, the Ministries of both Environment and Culture have the jurisdiction for their protection. Either at the list of "*preservable buildings*" or "*recent monuments*", only 45 premises have been inscribed in Argos, whereas 50% of them has both designations [23,24]. The majority of preservable buildings have been inscribed in 1982, at the same year with the historic district designation, while since 1997 no new inscriptions exist [24]. Other samples of vernacular architecture are observed at the foothills, which are not under protection even though they could be designated as a group of historic buildings. On the other hand, no regulations further have been implemented for the unique designated group of buildings in Venizelou and Tsaldari streets (Fig.24-25).

Through an inventory regarding the current conditions of listed buildings, only 46% of them has been restored, whereas 40% needs to be repaired and 7% is under demolition. Similarly, 31% of the premises is abandoned and only 51% serves functions. In particular, today the municipal agora and the train station are closed, whereas the old townhall as well as the old school behind that have lost their original uses. Unfortunately, the old cafes, called "Iraion" and "Thivaiou" (Fig.12) as well as historic hotels "Grand Hotel des Etrangers" and "Agamemnon", which surround the square of Saint Peters, today are also closed. Except of the impact in historic building conservation, the loss of traditional uses also affects the life in public spaces and main streets. Observing old images, with inhabitants on the way with retail stores on both sides of Tsokri street, a vivid public life is presented, however today, mostly abandoned stores, parked cars and badly-maintained premises exist.

Moreover, institutions and museums have been introduced in historic buildings, such as the Archaeological Museum of Argos in the residence of Dimitrios Kallergis, the Byzantine Museum of Argolis in "Kapodistrian" barracks as well as the residence of Thomas Gordon, which belongs now to the French Archaeological School (Fig.15). Also, "Danaos" Association, located in a neoclassic mansion, preserves its original mission (Fig.14), whereas other private residences have welcomed new activities, such as at the Argolis Chamber of Commerce and Industry. Similarly, historic family residences, including Tsokris (Fig.10), Trikoupis (Fig.11), Makrigrannis and

Kostantopoulos, could house cultural or administrative activities, as an opportunity for the socioeconomic progress in the region.

Apart from the restoration of historic properties as well as how compatible a new function should be, contemporary buildings must harmoniously have been integrated inside and around the historic district. However, concrete-built blocks of flats or mixed-uses properties have been erected, neglecting the surrounding of monuments or the homogeneity of the cityscape within the Tsokri street and the two major squares, designated as protected areas. These inappropriate structures disrupt further the coherence of spatial organization, due to their height, scale and land coverage. Similarly, when the structural system, enclave's materials, proportion of the openings and overhangs, the colouring as well as signages in new buildings don't fit harmoniously in the historic environment, they have tremendous impact on the conservation of its aesthetic values.

**D. Socioeconomic Structure**

The Municipality of Argos-Mykines has approximately 40 thousand inhabitants, that consists of the 6% of the population in the administrative region of Peloponnese. In particular, a network of small cities, including Tripoli, Kalamata, Nafplio and Sparti concentrates half the population of the region, in contrast with other regions in Greece, where urban population is based on one city, such as Ioannina, Patra, and Larisa. However, in relation to 2011, the number of inhabitants has been reduced approximately 5% by 2021. Concerning the educational attainment in Argos, statistics don't reflect inequalities in the situation of women and men, however differences between the national and municipal level are observed. In particular, 32% of the population has completed the primary education in Argos instead of 23% at the national level. Similarly, only 10% of the population in Argos reaches the level of post-secondary or tertiary education instead of 17% nationally. These indicators are important enough, not only for how to inform the local citizens about the heritage conservation, but also for the diagnosis of socioprofessional identity in Argos.

This city has a tradition in agriculture. Specifically, today crops per percentage of cultivated land by hectares are classified by olive groves (26%), citrus fruits (21%), stone fruits (4%), vineyards (1%) as well as vegetables (1%). Regarding citrus fruits, production is characterized by oranges (76%), clementines (11%), mandarins (7%) and lemons (2%). Similarly, about stone fruits, mostly apricots (85%), peaches and nectarines (7%) are cultivated. Generally, at regional level, Argolis provides the majority of vegetables' crops, whereas mostly fruits and oilseed crops are concentrated in Lakonia and Messinia.

This relationship between the agriculture and the food manufacturing is showcased through the industrial heritage of Argolis. For instance, "Kyknos" tomato canning factory, located in proximity to Argos, has been designated as recent monument, as demonstrates the evolution of this industry. Today, Argos maintains these productive resources [22] in the manufacturing of food products (26%), beverages (6%) and wearing apparel (6%) (Fig.26). Moreover, furniture making (17%) has been emerged as a new creative industry [22]. Assessing how important is the manufacturing for the productive sectors in Argos, based on the number of registered enterprises in the local Chamber, a sectoral analysis was applied. In particular, distributive trades (46%) have a dominant

role in enterprises of Argos (Fig.27), whereas construction (7.6%), accommodation and food services activities (7.5%), manufacturing (7.4%) as well as transport and storage (7.2%) have been developed at the same level [22].

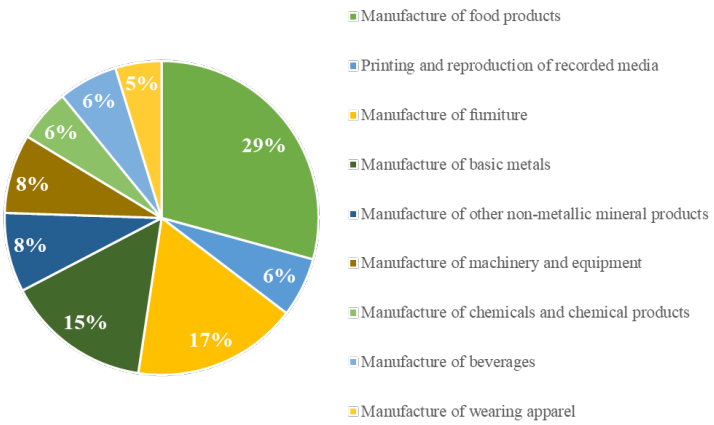


**Fig. 26.** Sectoral analysis of manufacturing with percentages per number of registered enterprises in the Argolis Chamber of Commerce and Industry, 2021 (Statistical graph by I. Kartsonakis)

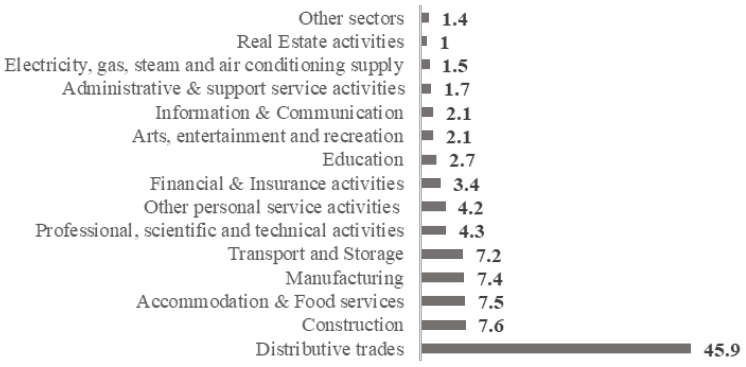


**Fig. 27.** Sectoral share of the number of enterprises, based on data of Argolis Chamber of Commerce and Industry, 2021 (Statistical graph by I. Kartsonakis)

Although this exemplary presence of local manufacturing, accompanied with the rich architectural heritage could encourage the cultural tourism in Argos, this potential is underrated, as observed by the low percentage of accommodation and food services activities (7.5%) in Argos [22], compared with both regional (15.3%) and national (12%) levels.

## 4 Conclusion

This assessment methodology can demonstrate the vulnerability signs for each criterion, in order to direct a more efficient and practice-oriented strategy for urban heritage conservation in Argos, Peloponnese. Taking into account the existing legislation and how applicable or restrictive is regarding the modern interventions, problems can be recorded. Within this framework, through participatory procedures, either preventative or corrective actions can be prioritized per criterion. Meanwhile, this criteria compliance, coupled with the procedures of land development and urban planning, can demonstrate opportunities for the regeneration of historic areas. Ultimately, only through the safeguarding of the integrity and authenticity of the historic environment can urban heritage, as an irreplaceable resource, contribute meaningfully to sustainable development in historic areas.

## References

1. Recommendation on the Safeguarding of the Beauty and Character of Landscapes & Sites, UNESCO (1962)
2. Recommendation on the Preservation of Cultural Property endangered by Public and Private Works, UNESCO (1968)
3. Convention concerning the Protection of the World Cultural and Natural Heritage, UNESCO (1972)
4. Recommendation on the Protection at National Level of the World Cultural & Natural Heritage, UNESCO (1972)
5. Recommendation on the Safeguarding the contemporary role of Historic Areas, UNESCO (1976)
6. Washington Charter: Conservation of Historic Towns and Urban Areas, ICOMOS (1987)
7. Convention concerning the Safeguarding of the Intangible Cultural Heritage, UNESCO (2003)
8. Convention concerning the Protection of the Diversity of Cultural Expressions, UNESCO (2005)
9. Recommendation on the Historic Urban Landscape, UNESCO (2011)
10. Valetta Principles: Safeguarding & Management of Historic Cities, Towns & Urban Are-as, CIVVIH (2011)
11. CULTURE URBAN FUTURE Global Report on Culture for Sustainable Urban Development, UNESCO (2016)
12. Loes Veldpaus, Julia Rey Perez, THE HUL GUIDEBOOK Managing heritage in dynamic and constantly changing urban environments, Ballarat & WHITRAP (2016)
13. New life for historic cities, the historic urban landscape approach explained, UNESCO (2013)
14. Resolutions of the International Symposium on the Conservation of Smaller Historic Towns, 4th ICOMOS General Assembly (1975)
15. Julia Rey Perez, 15The Application of the Recommendation on Historic Urban Landscape (HUL) in Cuenca – Ecuador. A new Approach to Cultural and Natural Heritage (2017)

16. Developing Historic Cities, Keys for understanding and taking action, A compilation of case studies on the conservation and management of historic cities, UNESCO (2014)
17. Sarah Al-Alawi, Robert Knippschild, Eva Battis-Schinker & Bettina Knoop, Linking Cultural Built Heritage and Sustainable Urban Development, Insights into Strategic Development Recommendations for the German-Polish Border Region, Informa UK Limited, trading as Taylor & Francis Group ETH, 2022
18. S. Avgerinou Kolonias, A. Gomez, Ferrer Bayo, Eleven years after the Valletta Principles, Thema & Collecta CIVVIH – ICOMOS Symposium (2022)
19. Greek Antiquities Law No 4858 "Protection of Antiquities and Cultural Heritage in general" (2021)
20. Presidential Decree – Urban Planning "Designation of historic quarter and preservable premises in Argos and building regulations" (1982)
21. Ministerial Decision No 1841 "Endorsement of General Development Plan in Municipality of Argos, Argolis Prefecture" (2010)
22. List of registered enterprises in Argos (commerce, manufacturing, services) – updated 2021, Argolis Chamber of Commerce and Industry (2023)
23. List of recent monuments under the jurisdiction of Ministry of Culture, Hellenic Republic, National Archive of Monuments, https://www.arxaiologikoktimatologio.gov.gr/en (2023)
24. List of preservable buildings under the jurisdiction of Ministry of Environment, Hellenic Republic (March, 2024)

# Athens as Symbolic Space: Spatial Representations and the Conceptualization of the City through Narratives and Urban Plans

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**Abstract.** This paper explores the dynamic interplay between urban narratives and spatial policies in shaping contemporary Athens' identity, tracing significant transformations from the early 2000s to the present. Drawing from Lefebvre's representational spaces and Barthes' myths, it illustrates how dominant narratives and spatial policies mutually construct and reshape each other, reflecting evolving political, economic, and social contexts.

Initially, Athens' identity aligned with the global aspirations symbolized by the 2004 Olympic Games, projecting the city as an international metropolitan center. The subsequent Greek financial crisis radically altered these narratives, recasting Athens as a space of decline, unrest, and socio-political activism. Movements such as the "Indignants" protests transformed public spaces into symbolic arenas of resistance and cultural expression, reshaping global perceptions of the city.

Since 2017, Athens experienced another narrative shift emphasizing cultural revival and increased touristification. International events like Documenta 14, and strategic media portrayals rebranded the city as resilient, creative, and culturally vibrant. These optimistic narratives, however, intensified urban inequalities and accelerated gentrification processes, highlighting tensions between symbolic representations and residents lived realities.

Strategic urban planning practices under neoliberal governance reinforced these narratives, shifting from state-centered managerialism to entrepreneurial frameworks prioritizing investment attraction and commodification of urban spaces. Despite the proliferation of participatory initiatives, governance practices became increasingly fragmented and less democratic, sidelining genuine social equity, inclusion, and spatial justice.

**Keywords:** Spatial Planning, Urban Narratives, Athens Identity, Urban Governance, Urban Policies

## 1 Introduction

Athens is considered a historic city with metropolitan characteristics and has historically functioned as a symbolic space where spatial representations and urban narratives shape and continually reshape its identity. The hypothesis being examined here is that

Athens' spatial policies have interacted with shifts in public discourse and have been shaped by austerity urbanism and neoliberalization (Koutrolikou et al., 2025).

This hypothesis is unfolding through three topics: i. how Athens' spatial policies and urban governance have evolved in reflection with historical turning points and events, ii. whether and how public discourse via media and dominant narratives influenced these policies and governance and iii. what dynamics were derived from those transformations.

By conducting a retrospective review of sources – including bibliography, policy documents, mass media, and legislation – this study explores whether, and how, spatial policies, strategies, dominant imaginaries, and public discourse collectively shape the city's identity both as spatial representation and as an image of the city that is communicated. In other words, this work explores how this identity materializes in real life through actual spatial reforms.

Drawing on Lefebvre's concepts of spatial representation and representational space (Lefebvre, 1991 [1974]), and Soja's notion of secondspace (Soja, 1996), this work aims to articulate the processes through which both urban imaginaries (Zukin et al., 1998) and spatial policies are constructed in post-Olympics Athens.

Transitioning from cities of production to cities of consumption (Jayne, 2005) new symbols are created beyond the material space of the city: the arts, food, fashion become key elements of the city's showcase "aestheticizing everyday life" (Featherstone, 1996) Consequently, cities are promoted as innovative, attractive and entertaining places.

Tangible and intangible symbols—such as a city's cultural heritage, iconic architecture, or landmark buildings—along with narratives about the city and its cultural expressions (e.g., residents' everyday life, local music, racial and cultural identities), are transformed into economic and commercial values. As a result, local cultures, identities, and specific characteristics are instrumentalized to serve the city's competitiveness and its efforts to attract investment. In this way, the collective symbolic capital, or the distinctive features of a place, act as a magnet for investment interest in global capital flows (Harvey, 2012).

We argue that throughout different historical phases—from Pericles' Golden Age to the contemporary urban metropolis—Athens has been consistently associated with specific myths. Based on Barthes (1979), these myths are not just stories that survive over years, but constitute semiological systems transforming reality into seemingly neutral, timeless narratives, detached from their historical context. Athens, in its recent history, has been extensively studied across various disciplines and literature has long engaged with the urban and socio-spatial transformations of Athens.

Key issues include post-war urbanization and internal migration (Burgel, 1976; Kyriazi-Alisson, 1998; Kapoli, 2014), the impact of reconstruction (Mantouvalou, 1985), and the distinct patterns of Athens' Mediterranean character as a metropolis (Leontidou, 1990). The decline of the city center and the suburbanization of the upper classes (Chorianopoulos et al., 2010; Maloutas, 2018), as well as the political dimensions of spatial planning (Maloutas et al., 2013). Furthermore, research has explored the dynamics of urban sprawl (Sayas, 2016) and the role of Athens as a gateway for refugees and

migrants, particularly since the 1990s (Maloutas and Karadimitriou, 2001; Kandylis et al., 2012; Papatzani and Knappers, 2020).

Each different context was grounded on the spatial field, always followed by a 'myth', an ensemble of signs, connotations, narratives and beliefs that construct its identity. Within this framework spatial policies, strategies, dominant imaginaries, and public discourse operate as myth-making mechanisms. Urban policies and planning documents, alongside media narratives and cultural productions, contribute to a system of meanings that encode specific values—such as modernity, creativity, or competitiveness—into the city's spatial form. These meanings are not neutral; they carry implicit connotations and power dynamics, framing what is visible, what is desirable, and what is excluded from the urban landscape (Barthes, 1979; Zukin, 2001).

Notably, the shift from urban vision and grandeur associated with the 2004 Olympic Games to the profound socio-economic crisis, the subsequent rise of cultural activism and to today's touristic storytelling have significantly altered the city's image and narratives. Strategic spatial planning in Athens has been critical in reinforcing and enabling these dominant urban narratives, making the city a representational space. Within the context of neoliberal urbanism, planning has undergone considerable transformation, rescaling the state's role and facilitating the emergence of new governance actors such as private and non-governmental actors.

This shift reflects a broader neoliberal reorientation, consistent with urban entrepreneurial strategies (Harvey, 1989), where cities transition from managerial approaches to more market-driven, competitive frameworks. This transition aligns closely with aspirations for global visibility of Athens, yet simultaneously raises issues related to social equity, policy fragmentation, accountability, and the commodification of urban spaces and experiences.

## 2 A Genealogy of 'Myths' for Athens

### 2.1 From the Olympic Vision to the State Bankruptcy

At the onset of the 21st century, Athens was on the threshold of preparing and hosting the 2004 Olympic Games[27]. Both policies and narratives revolved around the significance of the event as of "major national importance" figuring its double role in fostering economic growth and investing in the country's international profile, glow and attractiveness. The strategic objective explicitly and officially outlined Greece's competitive stance within the international, European, Mediterranean and Balkan contexts which positioned Athens as a metropolitan capital with metropolitan and European appeal, featured by high-quality services and leading business activities[28]. Indeed, the international and domestic press crafted Athens' profile as a city symbolizing the Olympic Games. Its global and European visibility was emphasized, while not neglecting

[27]"Athens in 2010 AD", To Vima, 02-05-1999, https://bit.ly/4cnVHHG

[28]*Law 2730/1999: "Planning, Integrated Development, and Execution of Olympic Projects and Other Provisions"*. Government Gazette of the Hellenic Republic, Issue A 130/25-6-1999, Article 1

references to concerns about escalating costs and potential long-term economic burdens from these extensive infrastructural projects[29].

Not many years after the Games, at the beginning of the global financial crisis, and following the police killing of a teenager (Vradis, 2009), Athens once again found itself in the center of international attention. The ensuing youth movement represented across international media as a generation actively demanding their "right to the city." For the first time the streets of Athens' inner city were transmitted globally, breaking into the international spotlight (Mavrommatis, 2015, p.435).

The 2010 Greek debt crisis period significantly reshaped Athens' image and spatial dynamics. International narratives portrayed Athens negatively, labeling it as the capital of an unreliable nation marked by economic mismanagement and inadequate governance[30]. The city's frequent social unrest was often depicted internationally as violent "riots" and disruptions, intensified perceptions of urban decline and disorder (Leontidou, 2012). At the same time, locally, dominant discourses stigmatized poverty and social exclusion as primary causes for urban degradation, shifting attention from deeper structural issues (Koutrolikou and Siatitsa, 2011).

### 2.2 Crises, Movements and Resistance

Between 2011 and 2017, Athens was associated with the deep dept crisis and social upheaval following Greece's inclusion in international bailout programs, while dominant narratives about poverty, marginalization, and social unrest gained momentum. Public spaces, notably Syntagma Square, transformed into symbolic arenas of mass demonstrations, grassroots activism, and radical political movements, with the "Indignants" protests at Syntagma square drawing millions in 2011 (Gaitanou, 2016). Concurrently, Athens witnessed the rise of self-organized solidarity networks, grassroots social initiatives, and an independent cultural scene. These movements challenged dominant narratives and reshaped urban public spaces from zones of protest into areas of community-building, resistance, and hope (Pettas & Daskalaki, 2022, p.11).

International media coverage during this period ranged from portraying Athens as a chaotic space of social disintegration to a vibrant center of creative resistance and cultural innovation. Street art and graffiti became core elements of Athens new image, embedding political critique and collective expression against austerity (Tulke, 2021; Tsilimpounidi and Walsh, 2011). Foreign press narratives transmitted this artistic explosion, framing Athens as "new Berlin," a hub for DIY culture and street art born out of socio-economic adversity (Legewie & Eichinger, 2017, p.16). Despite underlying

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[29]"Greece's Olympic bill doubles", BBC News, 12-11-2004,
http://news.bbc.co.uk/2/hi/business/4007429.stm
"Workers in peril at Athens sites", BBC News, 23-07-2004,
http://news.bbc.co.uk/2/hi/europe/3920919.stm

[30]"Greeks protest against austerity measures", CNN, 05-05-2010,
http://edition.cnn.com/2010/WORLD/europe/05/04/greece.bailout.protests/index.html,
"Greece presses "help" button, markets still wary", Reuters, 23-04-2010,
https://www.reuters.com/article/us-greece-idUSTRE63M1LV20100423,
"Athens, Berlin Spar as Bailout Takes Shape", Wall Street Journal, 24-02-2010,
https://www.wsj.com/articles/SB10001424052748704089904575093232431641628

social inequalities and urban challenges, these narratives significantly contributed to shaping Athens contemporary identity as a city characterized by resilience, creativity, and cultural revival amidst profound crises.

### 2.3 Alternative cultural scene and touristification

The period from 2017 to 2021 marked a significant shift in Athens urban narrative and identity, primarily shaped by two intertwined dynamics: the emergence of an alternative cultural scene and the intensification of touristification. Central to these developments was Documenta 14, titled "Learning from Athens," which took place in 2017, marking the first occasion the renowned international art exhibition was hosted outside Kassel, Germany. Positioned at the crossroads of Greece's ongoing economic austerity and the escalating refugee crisis, Documenta 14 aimed to symbolically engage with and artistically "heal" the city's socio-economic trauma, drawing parallels with Kassel's post-World War II devastation and reconstruction (Campbell & Durden, 2017). The exhibition attracted significant international attention, with over 300,000 visitors exploring artistic installations dispersed across public and private spaces within Athens. However, despite its ambitious goals, Documenta 14 faced critical scrutiny for what many saw as limited and surface-level engagement with Athens real socio-economic issues, inadvertently reinforcing narratives of exoticism and commodifying local struggles, thus fueling further gentrification in neighborhoods such as Exarcheia and Koukaki (Bolonaki, 2022; Dimitrakaki, 2017).

Subsequently, Athens began to gain publicity as an emerging alternative cultural and tourist destination, promoted as a city worth visiting for its cultural vibrancy, creativity and grassroots energy. International media narratives played an influential role in redefining Athens from a city marked by austerity and crisis to one characterized by creative resilience and cultural vibrancy. Renowned international publications, including The Guardian, The New York Times, and Vogue[31]—highlighted Athens as an exciting, culturally rich destination. These narratives celebrated Athens street art, grassroots initiatives, and independent cultural practices that emerged organically from the crisis environment. This portrayal significantly impacted tourism patterns, shifting the city's image from a troubled, marginalized capital to a revitalized urban hub ripe for cultural and touristic consumption (Gourzis et al., 2019; Pettas et al., 2021).

Consequently, Athens newfound cultural prominence, along with the accompanying surge in tourism, revealed deeper contradictions—between international branding strategies aimed at commodification of culture and economic revitalization which led to the exacerbation of local inequalities (Bolonaki, 2022; Pettas et al., 2021).

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[31]"Why Downtown Athens Is Basically Brooklyn by the Sea", Vogue, 06-06-2016, https://www.vogue.com/article/downtown-athens-brooklyn-hip-travel-guide
"Athens, Rising", The New York Times, 18-06-2018, nyti.ms/3W4JfqN
""Athens city guide: what to see plus the best bars, hotels and restaurants/ Tour classical sites with locals and discover the guesthouses, restaurants and bars being opened by young entrepreneurs in a city buzzing with creativity", The Guardian, 27-08-2018, https://www.inkl.com/news/athens-city-guide-what-to-see-plus-the-best-bars-hotels-and-restaurants

# 3 Representations of Athens through Urban Planning

## 3.1 The articulation of Myths and the neoliberalization of the Regulatory Strategic Spatial Planning

Under neoliberal institutional transformations, spatial planning went under significant shifts globally affecting planning methodologies, governance structures and tools (Hadjimichalis, 2019; Olesen, 2014; Peck et al., 2012). Beginning in the mid-1980s, a transition from managerialism to entrepreneurialism reshaped spatial policies, emphasizing decentralization and local economic competitiveness (Harvey, 1989). This institutional turn not only alternated the strategic character of planning but also redefined it as a tool for economic growth rather than a mechanism for spatial and economic redistribution. Brenner (2004) conceptualizes this transformation through the idea of governance "beyond the state," where planning responsibilities are increasingly shared among a diverse set of actors, including private and non-governmental actors. This shift implies a transformation from traditional state-centric governance towards collaborative, networked forms of decision-making and implementation, wherein multiple stakeholders negotiate and share authority, while considering cities and regions as key drivers to the economic development strategies.

In Greece, spatial planning historically emerged as reactive, primarily legitimizing pre-existing informal urban expansions such as post-war unauthorized construction or suburban sprawl driven by private micro-property reproduction (Mantouvalou, 1985). During this process, spatial planning acted as a follower of “faits accomplis", such as the “antiparochi” system (a form of private urban development) and the informal, unplanned expansion of the city. It was implemented at a central level, under bureaucratic terms, and in conditions that served smaller or larger vested interests (Alexandri, 2018).

Greece’s accession to the EEC and the need to align spatial policy with European standards transformed the model of spatial planning, which until then had been implemented exclusively at the level of central government. In 1985, the first Regulatory Metropolitan Athens Plan (Law 1515/1985) was enacted, with its main objectives being to curb the growth of economic activity in the capital (Asprogerakas, 2018), to reduce the size of the city, which was seen as disproportionately large compared to the rest of the country (Tsadari, 2019), and to promote the city centre through the qualitative upgrading of its neighbourhoods (Alexandri, 2014). The plan aimed to mitigate these issues by promoting decentralization, improving environmental conditions, and enhancing the historic and residential character of the city.

The plan established core objectives, including the revitalization of Athens historic identity, improvement of living conditions, and reduction of spatial inequalities. It emphasized the redistribution of economic activities in regional centers while maintaining the administrative and commercial significance of the historic core. The 1985 metropolitan plan also prioritized urban renewal, the expansion of green spaces, and the relocation of disruptive industrial and commercial activities outside residential areas.

From the 1990s the Greek planning system, influenced by international shifts, witnessed a gradual reconfiguration. Amendments, such as Law 1955/1991 and Law 2730/1999, introduced modifications to accommodate infrastructural projects,

including the new Athens International Airport and Olympic venues. The 1999 revisions reflected an increasing alignment of spatial planning with large-scale investment projects and urban development tied to international events, setting a precedent for market-driven planning interventions and planning "by exception" (Klabatsea and Tsampra, 2014).

The Greek planning system in which decision-making authority extended beyond state institutions to involve market-driven planning frameworks or even private planning. In Athens, this evolution became particularly evident during the 2004 Olympic Games, as planning practices embraced flexible regulatory frameworks and special investment-driven urban projects aimed at enhancing global competitiveness.

A major paradigm shift occurred with the enactment of the updated Metropolitan Athens - Attica Regulatory Plan (Law 4277/2014). This plan moved away from the previous focus on decongestion and environmental restructuring and adopted a growth-oriented model. The emphasis was placed on enhancing the international role of Athens, fostering economic competitiveness and attracting investment. The plan reinforced the city's branding as a global economic hub, advocating for strategic specialization in tourism, culture, and business clusters.

The shift in urban planning during the crisis extended beyond the integration of sustainability principles, urban resilience, and heritage conservation; it also reflected the broader neoliberal trend of using spatial planning as a mechanism for economic recovery. The abolition of key regulatory agencies such as the Organization for the Regulatory Plan of Athens (ORSA) marked a shift toward rescaling in planning, raising concerns about selective implementation and transparency (Vaiou, 2014; Iliopoulou and Mantouvalou, 2017).

It was within the framework of the crisis and the broader neoliberal shift that urban planning flexibility at the national level were introduced, transforming urban planning into a growth factor explicitly designed to attract investment (Chorianopoulos et al., 2014). This approach embedded market-driven, investment-oriented strategies, emphasizing deregulation, project-led development, and the facilitation of private-sector involvement in spatial governance. In this context, urban planning became less about balancing social and spatial equity and more about leveraging urban space as a vehicle for financialization, land valorization, and speculative development, reinforcing the role of Athens within globalized investment circuits.

The spatial planning reforms introduced under Greece's bailout programs aimed to facilitate private investment by simplifying and accelerating licensing procedures, enhancing flexibility in land use, and streamlining planning processes. These reforms were part of a broader strategy to improve the business environment and support a new growth model focused on investment and exports, rather than consumption. Overall, the crisis-context reforms positioned spatial planning as a key instrument for economic recovery, linking policy changes directly to market-friendly objectives (Giannakourou and Stamatiou, 2024).

A key element of this approach was the widespread adoption of "fast-track" planning tools at the national level (e.g. Special Spatial Development Plans of Strategic Investments in 2010 - in Greek: ΕΣΧΑΣΕ, Special Spatial Development Plans of Public Assets in 2011 – in Greek: ΕΣΧΑΔΑ, Special Urban Plans in 2014 – in Greek: Ειδικά

Πολεοδομικά Σχέδια)[32] facilitated targeted investments, but also led to the fragmentation of planning authority among multiple stakeholders, including ministerial, regional, municipal and private actors.

### 3.2 Representations of Athens through development planning

Athens urban development over the past decade has been shaped by a multiplicity of strategic frameworks, often developed in response to EU funding requirements rather than as part of a cohesive vision. These plans, including the Smart Specialization Strategy (RIS3)[33] or the Integrated Urban Intervention Plan - IUIP (in Greek: ΣΟΑΠ[34]), have operated in isolation, rarely complementing each other, forming an integrated strategy. Instead, they have largely functioned as preconditions for accessing funding, with short-term implementation periods and limited long-term impact.

A key example is the IUIP for central Athens officially approved in 2015. Rather than emerging from a comprehensive urban planning vision, IUIP was a reaction to the economic and social crises that intensified in the city center. It framed urban planning as a tool for crisis management, prioritizing security, investment incentives and cultural entrepreneurship while excluding public participation from the decision-making process. Urban policing and property market restructuring took precedence over inclusive planning, making IUIP more of an emergency stabilization tool than a framework for long-term urban transformation.

Similarly, the Athens Operational Programs (Municipality of Athens, 2012-2015 & 2015-2019) conveyed strategies and visions towards making Athens more attractive Athens. The "Re-launching Athens" initiative alluded to a renovated image of a city" that suffered a lot but now can be lived, visited, invested, despite or above the socio-economic crisis".

The shift towards a resilience narrative was further reinforced by the Athens Resilience Strategy 2030, supported by the Rockefeller Foundation's 100 Resilient Cities program (Municipality of Athens, 2017). While presented as an innovative approach to urban sustainability, the concept of resilience was largely appropriated as a vehicle for attracting investment. Rather than addressing structural inequalities, it functioned as a branding strategy, positioning Athens as a city that could adapt to crises while remaining open for business. Critics argue that resilience became a depoliticized buzzword reinforcing existing power dynamics (Kandylis, 2017).

The increasing role of private actors in shaping the urban agenda was evident in projects such as the Athens Partnership's "Adopt Your City" program, which encouraged corporate sponsorship of urban interventions (Koutrolikou et al., 2025; Kapsali, 2024; Πούλιος, 2020). This reliance on private funding for public projects, including the redesign of Omonia Square and the failed redevelopment of Strefi Hill, underscored the growing privatization of urban planning. Such initiatives frequently bypassed

[32]For a detailed review and documentation of the successive changes in Greece's spatial planning and the contradictions between regulation and development during the period of Europeanisation of the Greek planning legal framework, see also Karadimitriou and Pagonis, 2019; Papageorgiou, 2017

[33]Smart Specialization Strategy, Attica Region, 2015, https://bit.ly/4mwobVn

[34]Joint Ministerial Decision 1397/2015. Government Gazette B΄ 64/16.01.2015

democratic decision-making processes, raising concerns about transparency and accountability[35].

The Athens "Triangle" revitalization, funded by the Stavros Niarchos Foundation[36], exemplifies this trend. While aimed at improving the public realm through micro-interventions—such as graffiti removal and pedestrian-friendly redesigns, the project operated far off addressing structural urban challenges. It functioned as a short-term beautification effort aligned with the broader narrative of Athens as an attractive city hub.

The broader urban strategies of Athens increasingly positioned the city as a global tourism and business destination. The Athens 2020 Integrated Territorial Investment Strategy (ITI)[37], largely structured around EU funding priorities, funneled resources into tourism, cultural heritage, and business innovation. The 2021-2027 version[38] expanded to include climate adaptation and digital transformation yet retained a primary focus on investment attractiveness. Similarly, initiatives like "This is Athens" and the Athens Convention & Visitors Bureau further entrenched the city's image as a competitive metropolis, aligning with global trends in experiential tourism[39].

In order to trace all the dimensions that construct myths and narratives about Athens through policies, it is important to also focus on policies that were proposed but were either rejected or not implemented.

The "Rethink Athens" project[40] launched with grand aspirations, as a comprehensive effort to revitalize the city center, promising a green, accessible and vibrant urban core. It was funded by the Onassis Foundation after a 2012 Cooperation Agreement with the Ministry of Environment, facilitated by a legal amendment allowing private funding for public purpose studies. The project's core proposals—pedestrianization of Panepistimiou Street, the creation of shaded public spaces, and the activation of abandoned buildings into cultural hubs—were framed as essential steps toward making Athens a model metropolis. The rhetoric of resilience, accessibility, and cultural vibrancy dominated the project's narrative, yet its underlying mechanism relied on attracting private investments and high-end commercial activity. Ultimately, despite extensive promotional campaigns and public exhibitions, the European Commission rejected the funding request (Kalantidou, 2018) citing its status as a "showcase" project rather than an infrastructural priority. Nonetheless, "Rethink Athens" marked the first urban planning initiative in Greece that was driven by the private sector, while being supported and facilitated by the state.

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[35]'The "Adopt your city" program by the City of Athens is addressed to anyone who is interested to "adopt" a street, a tree, a park, a square, a playground, a sport facility, a neighborhood, to make them more luminous, greener and friendlier for citizens and visitors', 2022 https://adoptathens.gr/en/

[36]'The Commercial Triangle beats the heart of Athens: Here lie the most important buildings and monuments of our modern architectural and cultural heritage, here operate key institutions of the local economy and the tourism market, and here every street and corner is a piece of the city's living history.', https://www.cityofathens.gr/who/anavathmisi-emporikoy-trigonoy/

[37]ITI 2014-2020. 2018. *Athens 2020: Sustainable Development for Tourism, Culture, and Innovation*. https://bit.ly/3ZxOAbd

[38]ITI 2021-2027, 2018. *"Athens 2030",* https://athens2030.gr/o-ch-e-athina-2030/

[39]'This is Athens –Official visitors guide', https://www.thisisathens.org/

[40]'Rethink Athens', http://www.rethinkathens.org/eng/project

Following “Rethink Athens”, the so-called “Great Walk” (in Greek: Μεγάλος Περίπατος) was introduced in 2020 amid the COVID-19 pandemic[41]. Presented initially as a temporary health measure to facilitate pedestrian movement, it was later reframed as an ambitious urban intervention to reconnect Athens historic districts and improve public space. However, its abrupt implementation, lack of public consultation, and underdeveloped traffic management plans resulted in widespread criticism. Being supported by the activation of a Special Urban Plan (in Greek: Ειδικό Πολεοδομικό Σχέδιο), the initiative suffered from poor execution, prolonged delays, and strong public and institutional opposition. Due to the objections raised and the failure of the municipal authority that proposed it to be re-elected, the project was not completed and dismantled altogether.

Another paradigm of austerity urbanism and the rescaling of planning is reflected in the policies of the Greek state concerning Athens. It is crucial to examine how, during the crisis period, governmental policies were proposed and implemented in the city, aiming to suppress social protests and contestation, and to "sanitize" the urban center through measures of securitization and discipline in public space. In the post-crisis era, this shift paved the way for policies oriented towards the touristification of the city, promoting economic recovery through cultural branding, flagship projects and the commodification of urban space. The Greek state historically oscillated between selective large-scale urban interventions and ad hoc deregulation, fostering a duality in planning approaches (Karadimitriou and Pagonis, 2019).

In 2010, the Minister for the Environment, Energy and Climate Change, Tina Birbili, presented the “Athens-Attica 2014” plan, described as “a set of actions and interventions for the upgrading of the metropolitan area and the improvement of the quality of life of its residents,” aiming to continue an effort that had “remained suspended after the Olympic Games, as the developmental opportunity of the Games could not be fully utilized and completed” (Ministry for the Environment, Energy and Climate Change, 2010). The program, recognizing the major problems caused by the crisis (unemployment, business closures, a decline in tourism, etc.), “perceived” in Athens the potential to confront the crisis by leveraging its comparative advantages. Therefore, it proposed “investments in upgrading projects that act as catalysts for the mobilization of private capital while large-scale interventions became attractive for public-private partnerships” (ibid.).

Simultaneously enabling the privatization of public space while maintaining tight control over areas deemed in need of security measures exemplified by the 2011 “Pangalos Plan” (Deputy Prime Minister’s Office, 2011) which framed the city center as a security concern requiring policing and urban renewal incentives, so that Athens would become a “safe, sustainable, attractive, and vibrant” city (ibid.). In terms of urban planning specifically, the plan envisaged the “activation of existing and the establishment of new tools for the comprehensive restructuring of areas through the demolition of buildings or entire blocks, by formulating Special Integrated Programs, which will include the necessary measures, actions, interventions, guidelines, and procedures of an

[41] ‘The Great Walk of Athens: One of the largest urban interventions in the history of the capital begins’, May 2020. https://www.cityofathens.gr/o-megalos-peripatos-tis-athinas-mia-apo/

urban, social, residential, and special architectural character" (ibid, p.16), as well as the "legislative regulation for designating areas as 'Special Regeneration Zones', […] where in extreme areas suffering from severe social, economic, and environmental degradation, special economic provisions with tax and other incentives may be approved for a limited period. […] The objective was to retain the "healthy" population that remains, and attract new residents, while at the same time activating market mechanisms to ensure a functional system" (ibid).

In the post-crisis phase of "development," the governmental policies shift from austerity urbanism to a neoliberal, speculative spatial logic. These choices promoted the facilitation of investment, the touristification of central neighborhoods, and the reconfiguration of urban functions, often under the rhetoric of revitalization, modernization and sustainable growth.

The decision to relocate nine government ministries from central Athens to the former PYRKAL industrial site epitomizes a top-down, opaque decision-making process with profound urban implications (School of Architecture, NTUA, 2024). Presented as a flagship urban regeneration project, the relocation was justified in terms of "efficiency," "consolidation," and "revitalization" of underutilized industrial land. However, it triggered strong opposition from municipal authorities, local communities and scientific agencies[42] that denounced the lack of consultation, the disregard for the city's existing spatial dynamics and the potential hollowing out of the city center's institutional character. The relocation risked accelerating the expropriation of central urban functions and the displacement of public services, contributing to the transformation of the city center into a tourist and consumption-oriented space rather than a civic and administrative hub.

Similarly, the case of the Exarchia metro station – near the center of Athens serves as a telling example of contested urbanism (Apostolopoulou and Liodaki, 2025). Despite sustained local resistance, mass mobilizations, and expert warnings about the socio-spatial consequences of the project, the government pushed forward with the construction of the station, framing it as an accessibility and public transport improvement measure. For many, however, the metro station became a symbol of an imposed transformation designed to erase the neighborhood's counter-cultural identity and to pave the way for gentrification, commercial redevelopment and the sanitization of urban space in the service of tourism and real estate interests. The project exemplifies how state-led interventions, framed as "modernization" or "accessibility" improvements, often mask a deeper agenda of reconfiguration of urban space to fit into the post-crisis economic model of a touristified, consumption-driven city.

Ultimately, Athens urban policies reflect a cycle of ambitious yet disconnected interventions, driven more by political and financial imperatives than by a genuine commitment to cohesive urban development. Each new plan introduced grand narratives, or 'myths'—resilience, competitiveness, cultural vibrancy—but in practice, these

[42]"Government Park at PYRKAL, Municipality of Dafni-Ymittos: Evaluation Report on Urban Planning and Environmental Impacts", NTUA 2024, (GR), https://www.arch.ntua.gr/wp-content/uploads/2024/05/pub_40322_Pyrkal_Axiologiki_Ekthesi.pdf,
Announcement Following the Joint Press Conference on the Relocation of Nine Ministries from the Center of Athens to PYRKAL, Municipality of Dafni-Ymittos, https://bit.ly/4cOfyAe

projects actually served as vehicles for investment attraction rather than inclusive urban transformation. The city remained trapped in an ongoing cycle of planning announcements, incomplete interventions, and shifting governance frameworks that prevent a holistic, socially conscious urban future, from taking shape.

## 4 Conclusions: Myths and Reality

This concluding section reflects critically on the interplay between myths, narratives and spatial policies in Athens, arguing that the city's urban development has been shaped not merely by material interventions but also by the systematic construction and reproduction of selective spatial imaginaries. The relationship between narratives—whether in the press, official strategies or public discourse—and concrete policies is neither linear nor transparent; rather, it operates as a feedback loop where certain representations of the city are amplified, legitimized, and ultimately materialized in space. In the case of Athens, the construction of urban *myths*—such as the narrative of global appeal during the Olympic Games, the rhetoric of resilience during the crisis, or the image of the creative, tourist-friendly metropolis in the post-crisis years—has consistently served political and economic agendas. These *myths*, far from being neutral stories, constitute semiotic systems (Barthes, 1979) that frame and naturalize selective visions of the city while obscuring the social inequalities and contestations embedded in the urban fabric.

The analysis has demonstrated that spatial policies and governance frameworks in Athens have systematically adapted to these dominant narratives, producing a fragmented and often contradictory urban landscape. From the Olympic-led infrastructural boom of the early 2000s to the crisis-driven austerity measures and the recent strategies of resilience and tourism promotion, Athens has been repositioned in global flows of capital as a competitive, market-oriented and consumable city. This trajectory has been accompanied by significant governance shifts: the erosion of public planning institutions, the rise of private-led interventions, and the selective use of spatial planning tools by exception (such as Special Urban Plans for Strategic Investment Schemes) as mechanisms for facilitating investment and land valorization. The myth of "reclaiming the center" or "restarting Athens" has underpinned a cycle of incomplete, project-led interventions, often disconnected from broader social needs and implemented through top-down, non-transparent processes.

Each period in recent urban transformation of Athens—whether the Olympic vision of 1999–2009, the austerity urbanism of 2010–2017, or the post-crisis touristification and speculative development from 2018 onwards—has been marked by a dominant myth that justified and legitimized specific policies and spatial strategies. These myths operated as symbolic frameworks for attracting investment into key sectors aligned with Greece’s position in the global economy: tourism, real estate, cultural and creative industries. Narratives of cultural identity, lifestyle, and resilience have been instrumentalized to promote Athens as a competitive destination, often masking social dislocations, inequalities, and exclusions embedded in these processes.

The review of urban policies in Athens reveals a persistent pattern: rather than fostering a cohesive, democratic and socially inclusive vision for the city, spatial strategies have oscillated between selective large-scale interventions, deregulation, and ad hoc project-based planning. What began as planning "by exception" in the context of the Olympics and the crisis, has now been normalized as standard practice. The abolition of key institutions such as ORSA, the reliance on private and hybrid governance bodies (e.g., Athens Regeneration SA, Athens Partnership) and the use of legal instruments like Special Spatial Plans have collectively facilitated a mode of governance characterized by opacity, selective participation, and prioritization of economic interests over social equity.

In the post-crisis period, the state has shifted from austerity urbanism to a neoliberal, speculative logic: promoting investment-friendly policies, facilitating touristification in central neighborhoods, and reconfiguring urban functions under the guise of resilience and sustainable growth. Projects such as the relocation of ministries to the PYRKAL site, the Exarchia metro station, and the "Great Walk" illustrate how strategic planning continues to operate as a vehicle for transforming the urban fabric into a landscape of consumption, often at the expense of public services, civic functions, and local communities.

Ultimately, Athens urban development trajectory reflects a cycle of ambitious yet fragmented interventions, driven more by political imperatives and the pursuit of global visibility than by a coherent, socially grounded vision for the city. Each successive plan introduces new myths—resilience, competitiveness, creativity—but these remain largely disconnected from the lived realities of residents, reproducing a pattern where spatial policies serve as instruments for investment attraction rather than mechanisms for equitable urban transformation. The persistent gap between the symbolic narratives and the material outcomes of spatial planning in Athens underscores the need for a critical reassessment of urban governance, one that recognizes the contested nature of spatial imaginaries and prioritizes the collective right to the city over the commodification of urban space. Despite rhetorical commitments to preserving the cultural "DNA" of Athens, no substantial policy measures have been implemented to mitigate these effects, illustrating the persistent gap between strategic narratives and spatial realities.

## References

1. Alexandri, G., 2014. The processes of gentrification in the center of Athens during the crisis. Geographies, 39–52 (in Greek)
2. Alexandri, G., 2018. Planning Gentrification and the 'Absent' State in Athens. Int. J. Urban Reg. Res. 42, 36–50. https://doi.org/10.1111/1468-2427.12566
3. Apostolopoulou, E., Liodaki, D., 2025. Austerity Infrastructure, Gentrification, and Spatial Violence: A Ceaseless Battle over Urban Space in Exarcheia Neighbourhood. Antipode 57, 5–30. https://doi.org/10.1111/anti.13099
4. Barthes, R., 1979. Mythologies; Mathema: enarkteria paradose sten edra tes Philologikes Semiologias tes Logotechnias sto Coll??ge de France (7 tou Genare 1977). Rappa, Athena

5. Bolonaki, S., 2022. Rebranding Athens as the Creative City of European South. The Contribution of Documenta 14. A Critical Approach. Eur. J. Creat. Pract. Cities Landsc. 5, 186–203. https://doi.org/10.6092/issn.2612-0496/13537
6. Brenner, N., 2004. New State Spaces: Urban Governance and the Rescaling of Statehood, 1st edition. ed. Oxford University Press, Oxford New York
7. Burgel, G., 1976. Αθήνα: Η Ανάπτυξη μιας Μεσογειακής Πρωτεύουσας. Εξάντας, Αθήνα
8. Campbell, D., Durden, M., 2017. Exhibition Review: Crisis Aesthetics: Documenta 14 (Athens, 8 April–16 July, and Kassel, 10 June–17 September). J. Greek Media Cult. 3, 279–286. https://doi.org/10.1386/jgmc.3.2.279_5
9. Chorianopoulos, I., Pagonis, T., Koukoulas, S., Drymoniti, S., 2010. Planning, competitiveness and sprawl in the Mediterranean city: The case of Athens. Cities 27, 249–259. https://doi.org/10.1016/j.cities.2009.12.011
10. Chorianopoulos, I., Tsilimigkas, G., Koukoulas, S., Balatsos, T., 2014. The shift to competitiveness and a new phase of sprawl in the Mediterranean city: Enterprises guiding growth in Messoghia – Athens. Cities 39, 133–143. https://doi.org/10.1016/j.cities.2014.03.005
11. Dimitrakaki, A., 2017. Hospitality & Hostis: An Essay on Dividing Lines, Di-visive Politics and the Art Field. In: Botanova C, Chryssopoulos C, editors. Culturescapes Greece/Griechenland–Archaeology of the Future/Archäologie der Zukunft. Basel: Christoph Meran Verlag; 2017. p. 128–147
12. Featherstone, M., 1996. Consumer culture and postmodernism, Theory, culture & society. Sage, London
13. Gaitanou, E., 2016. Forms and characteristics of the social movement in Greece in the context of the economic and political crisis. PhD Thesis, King's College London, London
14. Giannakourou, G., and Stamatiou, K., 2024. Planning reform and change in times of economic crisis: lessons from the expansion of private-led planning in Greece. Plan. Pract. Res. 0, 1–21. https://doi.org/10.1080/02697459.2024.2383090
15. Gourzis, K., Alexandridis, G., Gialis, S., Caridakis, G., 2019. Studying the Spatialities of Short-Term Rentals' Sprawl in the Urban Fabric: The Case of Airbnb in Athens, Greece, in: MacIntyre, J., Maglogiannis, I., Iliadis, L., Pimenidis, E. (Eds.), Artificial Intelligence Applications and Innovations. Springer International Publishing, Cham, pp. 196–207. https://doi.org/10.1007/978-3-030-19909-8_17
16. Hadjimichalis, C., 2019. "New" Questions of Peripherality in Europe or How Neoliberal Austerity Contradicts Socio-Spatial Cohesion, in: Lang, T., Görmar, F. (Eds.), Regional and Local Development in Times of Polarisation: Re-Thinking Spatial Policies in Europe, New Geographies of Europe. Springer Nature, Singapore, pp. 61–78. https://doi.org/10.1007/978-981-13-1190-1_3
17. Harvey, D., 2012. Rebel cities: from the right to the city to the urban revolution. Verso, New York
18. Harvey, D., 1989. From Managerialism to Entrepreneurialism: The Transformation in Urban Governance in Late Capitalism. Geogr. Ann. Ser. B Hum. Geogr. 71, 3–17. https://doi.org/10.2307/490503
19. Jayne, M., 2005. Cities and Consumption. Routledge, London. https://doi.org/10.4324/9780203358733
20. Kalantidou, E., 2018. The historic centre of Athens: a tale of decomposition and resilience. URBAN Des. Int. 23, 22–33. https://doi.org/10.1057/s41289-017-0046-8
21. Kandylis, G., Maloutas, T., Sayas, J., 2012. Immigration, inequality and diversity: socio-ethnic hierarchy and spatial organization in Athens, Greece. Eur. Urban Reg. Stud. 19, 267–286. https://doi.org/10.1177/0969776412441109

22. Kapsali, M., 2024. 'Adopt your city': Post-political geographies and politics of urban philanthropy during austerity. Urban Stud. 61, 2290–2308. https://doi.org/10.1177/00420980241235374
23. Karadimitriou, N., and Pagonis, A., 2019. Integrated territorial investments and the 'Europeanization' of spatial planning and territorial development in Greece: weakening institutional dualism? Plan. Pract. Res. 0, 1–17. https://doi.org/10.1080/02697459.2024.2438555
24. Karanicolas, J.D., 2020. Art and Crisis on the Streets of Athens. PhD Thesis, University of Adelaide
25. Koutrolikou, P. (Panagiota), Papangelopoulos, A., Georgakopoulos, C., 2025. Athens's Philanthrocapitalist Landscape Within the Crisis–Austerity Conjuncture. Int. J. Urban Reg. Res. 49, 285–303. https://doi.org/10.1111/1468-2427.13302
26. Koutrolikou, P., Siatitsa, D., 2011. The construction of a "public" discourse for Athenscentre: media, migrants and inner-city regeneration. Presented at the International RC21 conference, Amsterdam
27. Lefebvre, H., 1991. The production of space. Blackwell, Oxford, OX, UK; Cambridge, Mass., USA
28. Legewie, H., Eichinger, G. (Eds.), 2017. Artists in Athens – City of Crisis. University Press of the TU Berlin
29. Leontidou, L., 2012. Athens in the Mediterranean 'movement of the piazzas' Spontaneity in material and virtual public spaces. City 16, 299–312. https://doi.org/10.1080/13604813.2012.687870
30. Leontidou, L., 1990. The Mediterranean City in Transition: Social Change and Urban Development. Cambridge University Press, Cambridge; New York
31. Maloutas, T., Karadimitriou, N., 2001. Vertical Social Differentiation in Athens: Alternative or Complement to Community Segregation? Int. J. Urban Reg. Res. 25, 699–716. https://doi.org/10.1111/1468-2427.00340
32. Mavrommatis, G., 2015. Hannah Arendt in the streets of Athens. Curr. Sociol. 63, 432–449. https://doi.org/10.1177/0011392114565948
33. Olesen, K., 2014. The neoliberalisation of strategic spatial planning. Plan. Theory 13, 288–303
34. Papageorgiou, M., 2017. Spatial planning in transition in Greece: a critical overview. Eur. Plan. Stud. 25, 1818–1833. https://doi.org/10.1080/09654313.2017.1344194
35. Papatzani, E. (Evangelia), Knappers, L., 2020. Negotiations of Socio-Spatial Coexistence through Everyday Encounters in Central Athens, Greece. Urban Plan. 5, 150–162. https://doi.org/10.17645/up.v5i3.2882
36. Peck, J., Theodore, N., Brenner, N., 2012. Neoliberalism Resurgent? Market Rule after the Great Recession. South Atl. Q. 111, 265–288. https://doi.org/10.1215/00382876-1548212
37. Pettas, D., Avdikos, V., Iliopoulou, E., Karavasili, I., 2021. "Insurrection is not a spectacle": experiencing and contesting touristification in Exarcheia, Athens. Urban Geogr. 0, 1–23. https://doi.org/10.1080/02723638.2021.1888521
38. Pettas, D., Daskalaki, M., 2022. Solidarity and collective forms of social reproduction: the social and political legacy of Syntagma Square, Athens. Soc. Cult. Geogr. 23, 1118–1134. https://doi.org/10.1080/14649365.2021.1901973
39. Sayas, J., 2016. Urban sprawl in the periurban coastal zones of Athens. Επι-θεώρηση Κοινωνικών Ερευνών 121, 71–104. https://doi.org/10.12681/grsr.9569
40. Soja, E.W., 1996. Thirdspace: Journeys to Los Angeles and Other Real-and-Imagined Places. Wiley-Blackwell
41. Stampoulidis, G., 2016. Rethinking Athens as Text: Sprogvidenskabelige Studenterkonference. J. Lang. Works - Sprogvidenskabeligt Stud. 1, 10–23

42. Tsilimpounidi, M., 2015. “If These Walls Could Talk”: Street Art and Urban Belonging in the Athens of Crisis. Lab. Журнал Социальных Исследований 7, 18–35
43. Tsilimpounidi, M., 2012. Athens 2012: Performances ‘in crisis’ or what happens when a city goes soft? City 16, 546–556. https://doi.org/10.1080/13604813.2012.709364
44. Tsilimpounidi, M., Walsh, A., 2011. Painting human rights: Mapping street art in Athens. J. Arts Communities 2, 111–122. https://doi.org/10.1386/jaac.2.2.111_1
45. Tulke, J., 2021. Figuring crisis: The performative politics of street art in contemporary Athens. City 25, 436–452. https://doi.org/10.1080/13604813.2021.1943218
46. Vradis, A., 2009. Greece’s winter of discontent. City 13, 146–149. https://doi.org/10.1080/13604810902770754
47. Zukin, S., 2001. Whose Culture? Whose City? The Paradoxical Growth of a Culture Capital
48. Zukin, S., Baskerville, R., Greenberg, M., Guthreau, C., Halley, J., Halling, M., Lawler, K., Nerio, R., Stack, R., Vitale, A., Wissinger, B., 1998. From Coney Island to Las Vegas in the Urban Imaginary: Discursive Practices of Growth and Decline. Urban Aff. Rev. 33, 627–654. https://doi.org/10.1177/107808749803300502
49. Αλεξανδρή, Γ., 2014. Οι διαδικασίες Gentrification στο κέντρο της Αθήνας στον καιρό της κρίσης. Γεωγραφίες 39–52
50. Αντιπροεδρία της Κυβέρνησης, 2011. Σχέδιο Δράσης για το κέντρο της Αθήνας, Αποφάσεις Υπουργικού Συμβουλίου
51. Ασπρογέρακας, Ε., 2018. Σχεδιάζοντας για την κλιματική αλλαγή: ένα πράσινο δίκτυο για την Αττική. Presented at the 5ο Πανελλήνιο Συνέδριο Πολεοδομίας, Χωροταξίας και Περιφερειακής Ανάπτυξης, ΤΜΧΠΠΑ, Πανεπιστήμιο Θεσσαλίας, Βόλος, 27 - 30 Σεπτεμβρίου 2018
52. Βαΐου, Ν., 2014. Ιδιωτικοποίηση του σχεδιασμού. ΑΡΧΕΙΟ ΕΝΘΕΜΑΤΩΝ 2010-852016. URL https://enthemata.wordpress.com/2014/02/22/dinva/ (accessed 7.7.24)
53. Δήμος Αθηναίων, 2017. Επαναπροσδιορίζοντας την πόλη, Στρατηγική Ανθεκτικότητας για την Αθήνα για το 2030, Pioneered by the Rockefeller Foundation - 100 Resilient Cities
54. Ηλιοπούλου, Ε., Μαντουβάλου, Μ., 2017. Ο Ρυθμιστικός Σχεδιασμός της Αθήνας και η κρίση. Αντλώντας από τις διαφορές μεταξύ του Σχεδίου Ρ.Σ.Α. 2011, του Νόμου Ρ.Σ.Α. 2014 και την ανατροπή στους μηχανισμούς διαχείρισής του. Presented at the ΑΤΤΙΚΗ ΣΕ ΚΡΙΣΗ, Συνέδριο Τμήματος Αττικής Συλλόγου Αρχιτεκτόνων (ΣΑΔΑΣ-ΠΕΑ) Μητροπολιτική Περιοχή της Αττικής: Όψεις της Κρίσης στην Πόλη και την Κατοικία και οι Αρχιτέκτονες. Μεταλλαγές στις Διαδικασίες Χωρικής Παραγωγής και Σχεδιασμού, ΕΜΠ
55. Κανδύλης, Γ., 2017. Αντέχεις ρε; Αγώνες αντοχής και συσσώρευσης στην πολιορκούμενη πόλη. Το Περιοδικό. URL https://www.toperiodiko.gr/αντέχεις-ρε-αγώνες-αντοχής-και-συσσώρ/ (accessed 7.13.24)
56. Καπώλη, Π., 2014. Η εσωτερική μετανάστευση στην Αθήνα (1950-1970) (Διδακτορική Διατριβή). Εθνικό και Καποδιστριακό Πανεπιστήμιο Αθηνών, Τμήμα Ιστορίας και Αρχαιολογίας, Αθήνα
57. Κλαμπατσέα, Ε., Τσάμπρα, Μ., 2014. Αστική ανάπτυξη στην εποχή της κρίσης: στρατηγικές, διαδικασίες και πρακτικές αναδιάρθρωσης της μητροπολιτικής Αθήνας. Presented at the 12ο Τακτικό Επιστημονικό Συνέδριο της Ελληνικής Εταιρείας Περιφερειακής Επιστήμης (ERSA-GR): Αστική και Περιφερειακή Ανάπτυξη: Σύγχρονες Προκλήσεις., Αθήνα
58. Κυβερνητικό Πάρκο στην ΠΥΡΚΑΛ Δήμου Δάφνης Υμηττού, Αξιολογική Έκθεση για τις πολεοδομικές και περιβαλλοντικές επιπτώσεις, 2024
59. Κυριαζή-Άλλισον, Ε., 1998. Εσωτερική μετανάστευση στην Ελλάδα του 1990: τάσεις-προβληματισμοί-προοπτικές. Επιθεώρηση Κοινωνικών Ερευνών 279–309
60. Μαλούτας, Θ., 2018. Η Κοινωνική Γεωγραφία της Αθήνας. Αλεξάνδρεια, Αθήνα

61. Μαλούτας, Θ., Κανδύλης, Γ., Πέτρου, Μ., Σουλιώτης, Ν. (Eds.), 2013. Το Κέντρο της Αθήνας ως Πολιτικό Διακύβευμα. Εθνικό Κέντρο Κοινωνικών Ερευνών, Αθήνα
62. Μαντουβάλου, Μ., 1985. Η Οικοδομή στην Αθήνα μετά τον Πόλεμο: Οικονομικές και Κοινωνικές Απόψεις μιας Ευκαιριακής Ανάπτυξης
63. Πούλιος, Δ., 2020. Όταν σβήσουν τα φώτα. Ιδρύματα, ιδιωτική πρωτοβουλία και δημόσιος χώρος στην Αθήνα [WWW Document]. Marginalia. URL https://marginalia.gr/arthro/otan-svisoyn-ta-fota-idrymata-idiotiki-protovoylia-kai-dimosios-choros-stin-athina/, https://marginalia.gr/arthro/otan-svisoyn-ta-fota-idrymata-idiotiki-protovoylia-kai-dimosios-choros-stin-athina/ (accessed 7.17.24)
64. Τσάδαρη, Σ., 2019. Αστικοί μετασχηματισμοί στην εποχή της κρίσης, με αφορμή τις μεταλλαγές των δραστηριότητων και των πολεοδομικών πολιτικών στον Ελαιώνα της Αθήνας (Διδακτορική Διατριβή). Εθνικό Μετσόβιο Πολυτεχνείο (ΕΜΠ). Σχολή Αρχιτεκτόνων Μηχανικών. Τομέας Πολεοδομίας και Χωροταξίας
65. Υπουργείο Περιβάλλοντος και Κλιματικής Αλλαγής, 2010. Αθήνα-Αττική 2014

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