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Abstract

Tourism is a complex system with multifaceted characteristics that concern a wide range of stakeholders. Furthermore, it uses multiple natural resources as a core element of its products and services. Moreover, in recent decades, we have been experiencing tourism growth in many countries across the globe. It is significant to understand how these rates of growth interact with the good ecological status of the natural environment. Consequently, it is important to discuss how all these parties and different tourism offerings can function smoothly and act in favor of environmental improvements and advanced performance levels. This approach is at the center of this study, which seeks a way to apply a systems theory approach to the tourism system. Practical implications of this attempt include effective management plans, for instance, environmental management and tourism marketing plans in the context of sustainable development.

Keywords: Tourism economy; natural environment; sustainable development; systems thinking.

JEL Codes: Q50; Q56: Z30; R11.

1. Introduction

The tourism industry seeks ways to expand its potential, increase market shares, receive economic benefits, and gain customer (e.g., visitor) satisfaction. Particularly, one issue of high importance is increasing tourism demand, satisfying visitors' needs and wants, and meeting their expectations, thus remaining competitive. In this effort, many parts should align their skills, expertise, knowledge, and experience to achieve results and meet the goals set. Undoubtedly, balance should be achieved between the supply and demand sides regarding the provision of a quality tourism experience with a long-term perspective.

Notably, the environmental dimension should dominate all efforts to preserve the natural environment. The goal is to achieve and establish sustainable tourism growth and safeguard the quality and quantity of the offered ecosystem services. These services are the benefits that nature grants to humans and society. As a result, it would be wise to highlight the heterogeneous nature of tourism and investigate how these tourism market segments of tourism's sub-sectors impact the environment. From this perspective, Halkos & Ekonomou (2023) examined how business and leisure tourism spending interrelate to lower environmental degradation levels, indicating that responsible patterns should characterize spending behavior in tourism.

Additionally, Ekonomou and Halkos (2024) evidenced that tourism growth can drive environmental improvements in the Eurozone economic space. Supportively, tourism competitiveness remains an issue of thorough research, since it relates dynamics, impacts, and causalities at the interface of socioeconomic and natural systems (e.g., environmental quality levels and tourism spending) (Ekonomou & Halkos, 2024). Thus, this high-leverage economic sector should be investigated as a

‘system’ that interconnects with environmental and social parameters and has the characteristics of a ‘learning organization’.

2. Systems Thinking

System thinking is an approach to operating an organization or an industry based on the well-functioning and good performance levels of its subsystems. It may be considered a core component of an industry-management approach or an element integrated into a company's organizational structure. This approach has broad applicability in the business ecosystem worldwide since it sheds light on parameters, factors, and dynamics that affect good performance.

As stated in the Introduction section, it is important to investigate socioeconomic systems by seriously considering their environmental dimension. This is evident since every socioeconomic system interacts or interrelates with natural resources and multiple ecosystem services. Hence, environmentalists and economists, managers and spatial planners, policy makers, and officials should no longer ignore or leave unobserved feedback material between their decisions and environmental quality.

Many environmental problems require a deep understanding of how the three dimensions of sustainability interact to make a whole, a ’system’, the performance of which impacts the good ecological status of natural resources. Identifying causal forces or “structures” that impact a system’s performance should be comprehensively investigated to gain feedback and exceed potential dysfunctions and discrepancies in the long run.

Supportively, social and ecological systems reveal multiscale dynamics and unexpected and nonlinear characters (Kinzig, 2001; Bennett et al., 2005; Scheffer, 2009). Recognizing such a situation, systems thinking, as an answer provider,

"encompasses a large and fairly amorphous body of methods, tools, and principles, all oriented to looking at the interrelatedness of forces and seeing them as part of a common process" (Senge et al., 1994, p.89). It concerns a way of thinking about topics, issues, matters, and situations in an integrated manner since it unifies knowledge.

Systems thinking unifies acquired knowledge across all fields (Senge, 1990; Sano, 2009). Thinking holistically, Mingers & White (2010) consider systems thinking as an approach that acknowledges a hierarchy across the parts of the system (sub-systems). Moreover, systems dynamics offer useful and practical tools to perceive the cause-and-effect linkages in complex systems profoundly (Newell et al., 2001). Behaving in an interdisciplinary manner, systems thinking calls for aligning and coordinating concepts, management styles, organizational structures, and knowledge from various sectors to effectively handle environmental concerns within intensive economic activities (e.g., tourism) and fierce competition (e.g., tourism competitiveness struggle).

Interestingly, systems thinking are empowered by system archetypes. Wolstenholme (1990) considers system archetypes formal and free-standing ways of categorizing (classifying) structures regarding generic patterns of behavior over time, principally counter intuitive behaviour. Systems archetypes are embedded in the system thinking culture and consist of patterns placed in systems, determined and identified by processing causal loop diagramming (Wells, 2011).

Richmond (1993) states that those who think systematically adopt diagramming languages to visually demonstrate the feedback structures of closed-loop relations recognized in the system. System archetypes are used to determine rapidly and slowly changing variables as well as stabilizing and destabilizing forces, whereas

they greatly assist efforts to go deeper into the systemic structure and investigate what creates the behaviors we observe, thus taking actions to change the structure (Kim, 2000; Bennett et al., 2005).

3. Systems Thinking and Tourism

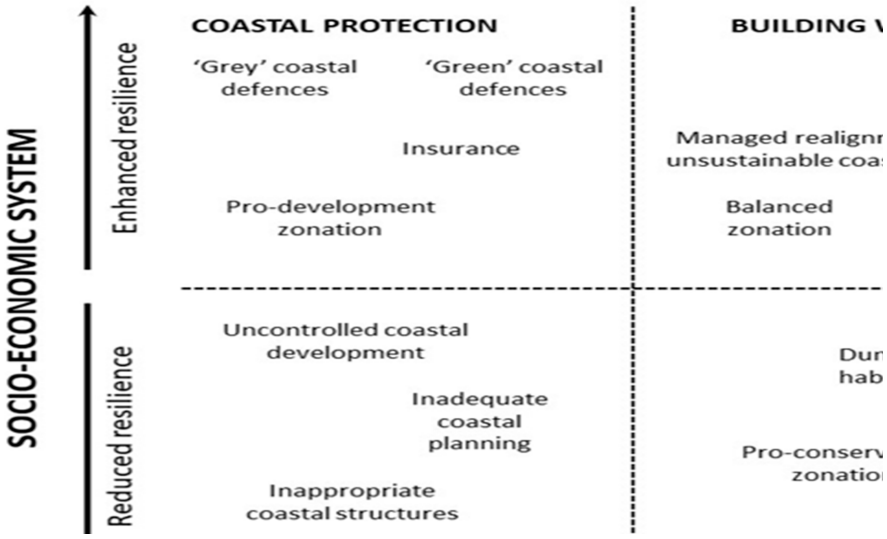
The tourism system, primarily the demand and supply sides, widely lead the efforts to consume natural resources and create growth in destinations. This interaction considers destinations and visitors within a broad system of organizations, investors, host communities, and the environment. Understandingly, it also concerns methodologies and marketing plans, projects, processes, policies, and strategies. These parts of the system should coordinate all their efforts towards sustainable growth with a long-term perspective. If this is not the case, then adverse effects will be experienced, market failure phenomena will become a reality, and negative externalities will increase environmental degradation.

Systems thinking offer an opportunity to go deeper into the interdependencies generated by the function of all tourism stakeholders and investing areas for further improvement. Ineffective sectoral policies lack cooperation among the interested parts of the system. Tourism can be considered as an inherently non-linear, complex, and dynamic system (McKercher, 1999). Systems thinking include a large and fairly amorphous body of methods, tools, and principles, all oriented to looking at the interrelatedness of forces and seeing them as part of a common process (Senge et al., 1994). Thus, systems thinking and the tourism systems can be thought of as 'fellow' travelers in the long-lasting journey towards sustainable growth.

To achieve effective destination management and wisely use natural resources, it is vital to recognize all the factors and core elements that form the relevant system. Then, adopting a holistic way of thinking, tourism stakeholders should integrate

processes and procedures that mitigate the pressures and risks exerted on environmental resources primarily generated by human intervention. Indicatively, Figure 1 presents the effect of coastal zone management on both socioeconomic and natural resilience (Masselink & Lazarus, 2019).[1] Coastal zones and coastal tourism represent fundamental research areas across the scientific community. Especially, systems thinking can be part of decision support systems regarding 'green growth' and 'blue growth' patterns in the context of tourism worldwide. Most importantly, climate change resilience in destinations concerning mitigation and adaptation pathways is of high importance since these approaches need thinking systematically and holistic points of view within interdisciplinary frameworks.

Figure 1: Socio-economic and natural systems within the coastal environment.



Source: Masselink & Lazarus (2019)

For instance, according to the European Environment Agency, the coastline in the European Union is 68,000 km long, namely more than three times longer than the

[1] The determinants of willingness to pay for coastal zone quality improvement and the economic values of the coastal zone can be found in Halkos and Galani (2016) and Halkos, G. & Matsiori, S. (2012; 2018a; 2018b).

coastline of the United States of America and almost twice that of Russia. Furthermore, the European Environment Agency notes that the European Union's public expenditures to protect the coastlines from the risks of erosion and flooding are expected to approach EUR 5.4 billion a year for the period 1990-2020.

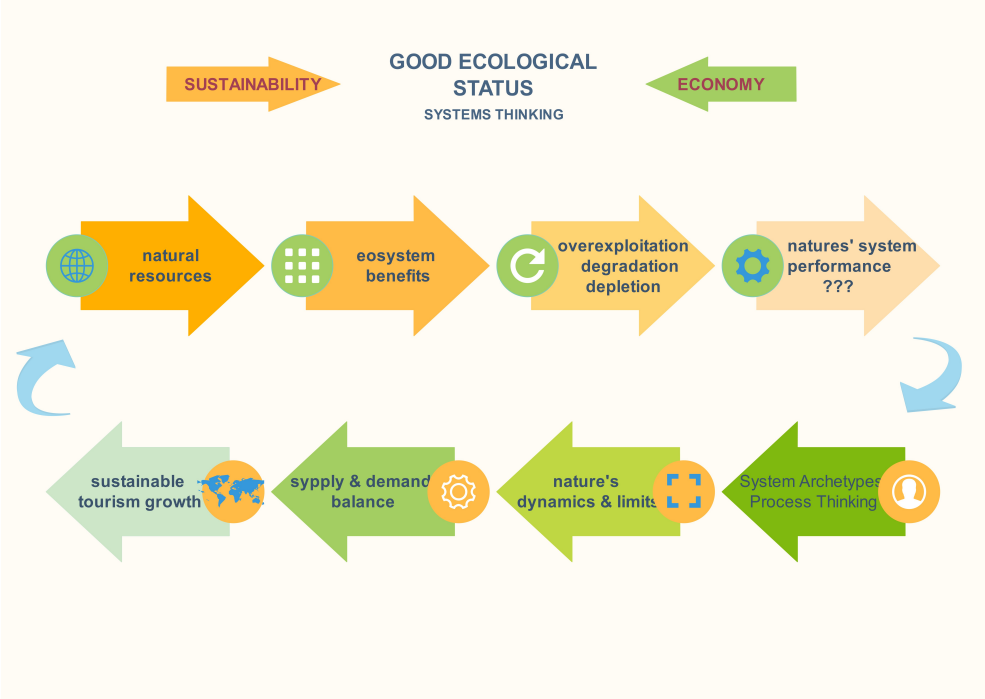
Additionally, Reimann *et al*. (2023) state that worldwide, in the near-coastal zone, they live 2.15 billion people, whereas in the low-elevation coastal zone, they live 898 million. Based on projections and relevant socioeconomic scenarios, these numbers can rise to 2.9 billion and 1.2 billion, respectively. Judging from these figures, the significance and importance of managing these resources and the economic activities that are accommodated in coastal zones in a systemic and sustainable manner can be perceived. Some additional tourism statistics raise the interest to act systemically.

According to Eurostat (2023), in 2022, European Union residents spent an estimated €474 billion on tourism trips, mostly on trips abroad (53%). In 2023 tourism's contribution to the global GDP accounted for approximately 9.9 trillion U.S. $. (Statista, 2023). Consequently, attention should be paid to all sub-systems that affect, positively or negatively, the overall performance of the tourism system.

In Figure 2, a logical sequence of events describes how system thinking and systems archetypes can be integrated into the tourism system. As noted above, systems thinking sees all aspects of performance determinants within the tourism system: demand and supply in connection to host society and environmental settings. To handle these concerns, system thinking and system archetypes can be adopted to define root causes that damage or constrain the smooth functioning of the tourism system. For instance, limits to growth archetype remain a valuable approach to identifying forces that contribute to resource depletion, creating chain reactions to the

good ecological status of nature. Also, the shifting burden archetype can be used to identify solid and effective solutions in the context of tourism and natural resource management.

Figure 2: The linkage of systems thinking and the tourism system (e.g. coastal destinations).



Source: Authors' elaboration

This approach helps to observe complex systems considering all of their parts. It is an integrated approach that benefits all the efforts to secure nature's processes and dynamics without losing the economic potential of the tourism industry. Relevant stakeholders should understand the necessity to sharpen their knowledge and broaden their potential regarding the systems thinking approach and analyze data, inputs, and insights by acting collectively. Fierce tourism competition should not constrain this approach. In contrast, destinations should compete with morals and try to grow sustainably. What differentiates system thinking from other approaches is that it sees things holistically rather than spending time and resources in isolated or remote sectoral policies that see only a limited sector's perspective.

As a result, for instance, in coastal zone management and coastal tourism development, the Integrated Coastal Zone Management Framework constitutes a good example of a systemic approach. If this framework is matched with the Drivers-Pressure-State-Impact-Response (DPSIR) model, then environmental improvement will be experienced in the long run without leaving behind economic pursuits within the tourism industry. Then, one can say that sustainable tourism growth is in front.

4. Conclusions

This study discusses the concept of system thinking in a tourism-oriented approach since the sector is considered one of the largest industries worldwide. System thinking remains an advantageous approach for safeguarding that modern trends will find all interested parties aligned, flexible, and determined to achieve high-performance rates. Adopting the systems thinking approach, dysfunctions and discrepancies between the parts of the tourism system will be identified. This is an approach for handling thorny problems and experiencing a win-win approach, creating mutual benefits. These benefits concern all stakeholders in terms of sustainable development, ecosystem services and growth in destinations.

One interesting point for further review is integrating the project management methodology and linking it with the system thinking and system archetypes concepts. Also, future research can be processed by investigating how high-impact tourism market segments impact socio-ecological under the system theory perspective. Furthermore, decision-making processes will become robust, seeing holistically the issues that need slide solutions with a long-term perspective. Feedback and lessons learned will advance all efforts of the tourism system to expand its potential embedding sustainability in future accomplishments.

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