From Metropolitan Shadow to Territorial Autonomy: A Spatial and Strategic Assessment of the Tourism Ecosystem in North-Holland

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Abstract. In North Holland, the main tourism spot is represented by Amsterdam, one of Europe's major tourism destinations. Around it, within the province, surrounding areas show a strong tourism dependence on the metropolitan core. However, the pheripheral areas of the province is also characterized by an emerging tourism specialization increasingly linked to the identity of local places, including windmills, farmsteads, canal landscapes, agricultural fields, ports, and tulip landscapes.

This study investigates the tourism ecosystem of North Holland through the STESY framework, a spatially oriented interpretative framework aimed at identifying territorial imbalances and supporting more sustainable tourism development strategies. The methodology combines the identification of tourism destination areas with the application of indicators, including the Balanced Tourism Supply Index (BTSI), the Diversity Reachability Index (DRI), and the Attraction Potential Index (API), in order to support the assessment of the territorial tourism structure.

The results reveal both weaknesses and potentialities within the tourism system. At the same time, the analysis highlights how targeted interventions can strengthen local identity and support the transition from peripheral day-trip destinations linked to Amsterdam toward more autonomous and alternative forms of stay. Based on these findings, the paper proposes an integrated strategy structured around hard and soft measures. The proposed framework contributes to the development of planning-oriented approaches for strengthening territorial sustainability in metropolitan regions affected by overtourism and uneven tourism distribution.

Keyword: Sustainable tourism planning; · spatial analysis; · cluster analysis

1 Introduction

Sustainable tourism becomes more and more a core argument in territorial development debate defining local multi-stakeholders' perspectives and global framework for innovation and better management of such complex phenomena [1, 2]. Today tourism is recognized as a dominant driver of economic growth in coastal and heritage destinations, yet its rapid expansion has also generated critical spatial and temporal imbalances

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[3]. In the perspective of the authors, tourism opens to relevant debate in urban and regional planning research as the decision making process connected with tourism management represent a comprehensive framework in which sustainable urban regeneration and transformation, landscape protection actions, economic development issues interacts generating an effective environment to apply sustainable urban development principles, methods and agendas for short term and strategic territorial design [4–8]. Those applications are also oriented to improve the competences of students in academic curricula dealing with territorial design professionals, and this paper comes as a result of a studio in architectural classes following the research tradition [9–14] of sustainable urban planning and design at UNIBAS [15–18].

Tourism as a spatial phenomenon is a multidisciplinary domain where spatial dimension represents a robust analytical dimension for managing information and designs, applying collaborative approach for strategic planning [19–25].

This perspective is particularly relevant in metropolitan regions where the presence of a dominant urban pole tends to organize the broader territory through asymmetrical relationships of attraction and dependency [26].

In such contexts, tourism is rarely distributed in a balanced way [24]. It often concentrates in highly visible and accessible nodes, while nearby landscapes, settlements, and infrastructures remain functionally secondary despite possessing significant cultural, environmental, or experiential value. The resulting imbalance is not simply quantitative; it affects the way territories are perceived, used, and strategically positioned within wider destination systems.

North-Holland provides a paradigmatic case of this condition. The province contains one of the most globally recognized urban destinations in Europe, Amsterdam, while simultaneously encompassing a much broader territorial structure made up of coastal landscapes, dune systems, historic villages, agricultural polder morphologies, infrastructural corridors, and northern port environments. Yet the image, functionality, and tourism logic of the region remain strongly centered on the metropolitan core. As a consequence, Amsterdam acts both as an attractor and as a territorial shadow: it concentrates demand, services, and symbolic capital, while the rest of the province often remains relegated to a supporting role, functioning largely as a space for short excursions or peripheral leisure consumption [27].

This condition produces a double distortion. On the one hand, the concentration of tourism demand in and around the metropolitan core reinforces congestion, short-duration visitation, infrastructural stress, and a progressive loss of territorial balance. On the other hand, the wider province remains structurally under-activated, not because it lacks resources, but because its assets are fragmented, weakly integrated, and insufficiently recognized as part of a coherent tourism system. In this sense, the challenge is not simply to divert visitors away from saturated areas, but to reinterpret the territorial structure of tourism itself.

This paper aims to develop a spatially informed planning framework capable of supporting the transition from a short-duration, high-pressure tourism model toward a more balanced system based on extended stays and territorial redistribution. The study proposes an integrated methodological approach combining spatial analysis, cluster-based interpretation, and policy-oriented design strategies in compliance with NUA

principles. The contribution lies in bridging analytical diagnosis and operational planning within a coherent framework transferable to similar tourism destinations.

Within this framework, the present paper proposes a spatial and strategic reading of North-Holland as a potentially autonomous and polycentric tourism ecosystem. Rather than treating the province as a residual geography surrounding Amsterdam, the study investigates its internal territorial logic through an integrated diagnosis of attractions, services, accessibility, and performance. The objective is to identify where tourism potential is currently concentrated, where it remains latent, and how different territorial configurations can support differentiated development trajectories. In doing so, the paper contributes to the field of sustainable tourism planning by linking spatial diagnosis with strategic design and by demonstrating how territorial interpretation can inform more balanced and place-sensitive tourism policies.

2 Study Area

The study area identified in this research is the Province of North-Holland, a territory that can be considered one of the economic and symbolic cores of the Netherlands, yet currently marked by a profound internal dichotomy between the metropolitan area of Amsterdam and its wider peripheral landscapes. This territorial condition makes North-Holland particularly relevant for investigating the spatial imbalances of contemporary tourism systems nearby EU capital cities.

From a morphological point of view, the study area extends from the northern urban edge of the capital to the northern tip of Den Helder and can be interpreted through the coexistence of two major territorial systems.

The first is the western coastal system, composed of dunes, beaches, and leisure-oriented settlements, which functions as a major outlet for recreational demand but is also strongly exposed to seasonal pressure.

The second is the inland historical-productive system of the polders, where the landscape has been radically shaped by an ordered matrix of canals, reclaimed land, and agricultural plots. This inland structure reflects a highly constructed territorial identity, where the preservation of productive landscapes and the valorization of small historic settlements represent key spatial values.

Considering the overall of tourism precence within the different regional contexts, Greater Amsterdam clearly emerges as the dominant tourism pole, concentrating by far the largest share of tourist presence within the provincial system (Fig. 1). This confirms its structural role as the main attractor and the primary gateway of tourism demand in North-Holland. Outside the metropolitan core, the territorial distribution of tourism presence becomes significantly weaker and more fragmented. Among them, Kop van Noord-Holland, Alkmaar and its surroundings, Agglomeration of Haarlem and the Agglomeration of Leiden and Bollenstreek stand out as the most relevant secondary contexts, while, IJmond, Zaanstreek, show comparatively lower levels of tourism presence.

Concerning tourism intensity, Greater Amsterdam remains the most exposed area, confirming not only its quantitative dominance but also the strong territorial burden generated by tourism in relation to local inhabitants (Fig. 2).

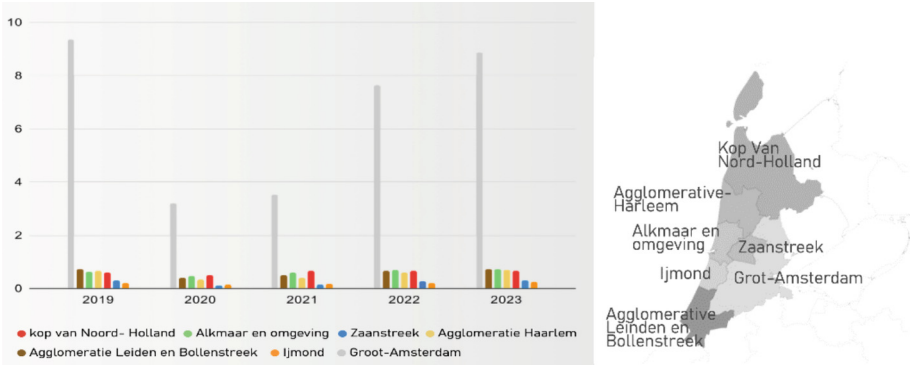

Fig. 1. Annual visitor volumes across the main regional contexts of North-Holland (in millions). Source: personal elaboration of EU data - https://tourism-dashboard.ec.europa.eu/

At the same time, the northern part of the province, particularly Kop van Noord-Holland, also records high relative values, indicating that tourism pressure can become highly significant even in areas that are less central in absolute terms.

By contrast, Zaanstreek, IJmond, remain comparatively more balanced, showing lower levels both in terms of tourism presence and relative pressure.

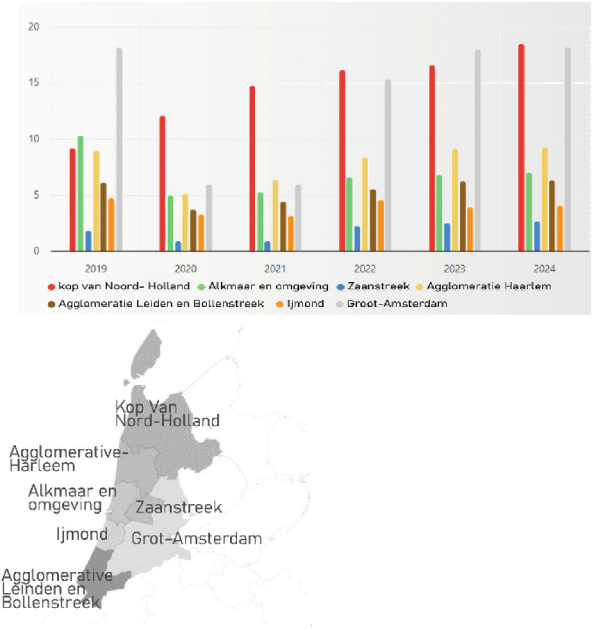

Fig. 2. Tourism intensity across North-Holland regions (2019–2024), expressed as the ratio between total overnight stays and resident population. Source: personal elaboration of EU data - https://tourism-dashboard.ec.europa.eu/

The temporal distribution of tourism demand in North-Holland reveals a markedly seasonal structure, characterized by a strong concentration of flows within a limited period of the year (Fig. 3). The monthly pattern shows a progressive increase in tourism activity from early spring, reaching a pronounced peak during the summer months, particularly in July and August, before declining rapidly in the autumn period.

A secondary rise can be observed in the spring period, corresponding to the flower season of tulips. The most critical transition occurs in the autumn months, when tourism demand drops sharply, falling below the average level and marking the end of the main tourism cycle.

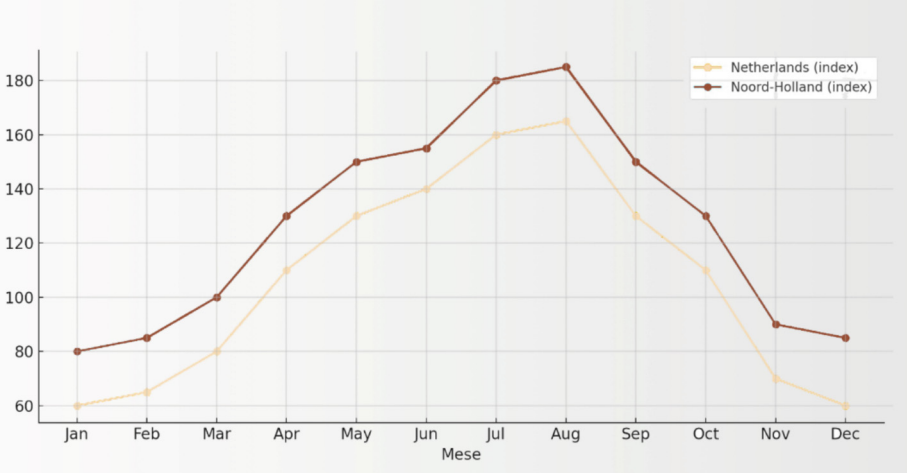

Fig. 3. Monthly tourism concentration in North-Holland compared with the national average. Source: personal elaboration of EU data - https://tourism-dashboard.ec.europa.eu/

3 Territorial Analysis

The approach adopted in this study is based on the STESY framework [28] conceived as an integrated analytical and interpretative tool for the identification of territorial imbalances and the support of evidence-based planning strategies.

The first phase consists of a contextual analysis of the study area, focusing on the identification and classification of key georeferenced components (PoIs) of the tourism system, including attractors, services, and reachability. The attractors are windmills, tulip fields, and agri-food and craft-related sites, which collectively define a landscape-based tourism specialized value chain rooted in local rural heritage and symbolic imagery. Iconic nodes such as Zaanse Schans further reinforce this configuration by concentrating multiple expressions of rural identity within a single destination.

This specialization is supported by a highly reachability and diffuse territorial structure, where cycling infrastructure plays a central role in enabling slow and immersive forms of landscape exploration. At the same time, a widespread precence of services, including accommodation, restaurants, and information points, ensures the functionality of the system (Fig. 4).

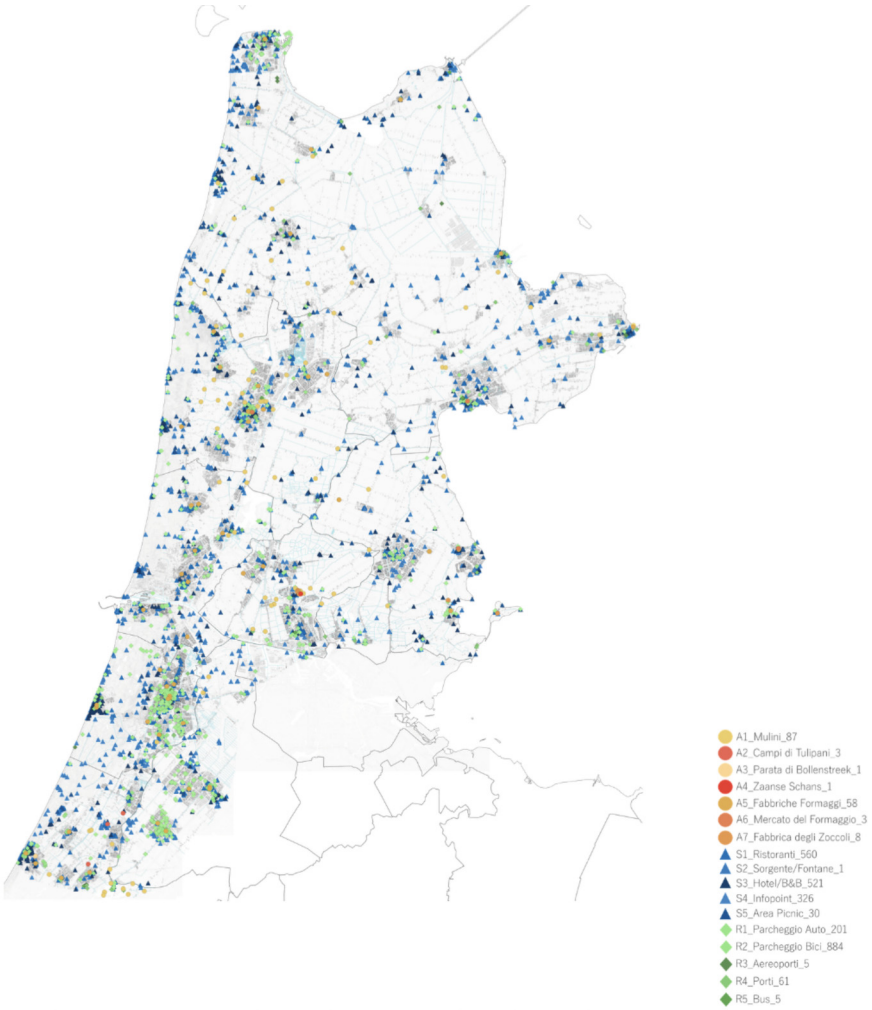

Fig. 4. Distribution of Attractors, services and reachability.

The second phase involves the spatial interpretation of these components through a cluster-based approach in order to identifying the Destination Areas of the tourism system in the case study. The territorial system is divided into homogeneous clusters using GeoDA software [29] aimed at identifying distinct spatial patterns. The optimal number of clusters is determined through the application of the Elbow Method [30], ensuring a balance between analytical detail and interpretative clarity (Fig. 5).

The spatial interpretation of these dynamics leads to the identification of four destination areas corresponds to the clusters.

This cluster 1 is considered as consolidated destination area, where the concentration of attractors is the highest within the entire tourism system.

It is characterized by a dense territorial structure supported by a solid base of accommodation and food-related services.

The cluster 2 represents the historical-cultural destination area of the system, characterized by the highest density of services and a well-developed, capillary reachability network. It concentrates the major landmark attractions, including *Zaanse Schans* and the historic windmills, thus configuring a highly attractive area. However, this centrality is also associated with significant phenomena of spatial congestion.

The cluster 3 corresponds to a fringe destination area where the natural landscape of dunes and polders predominates. Its specialization is associated with a slower and more landscape-oriented form of hospitality, in which the protection of environmental and scenic value constitutes the primary planning constraint.

The cluster 4 exhibits the greatest unexpressed destination area potential within the system. Despite the presence of high-quality services and primary transport infrastructure, the area shows a marked identity deficit due to the limited presence of attractors. It can therefore be interpreted as a serving territorial fabric that is functionally efficient but lacking in symbolic and tourism-generating centralities.

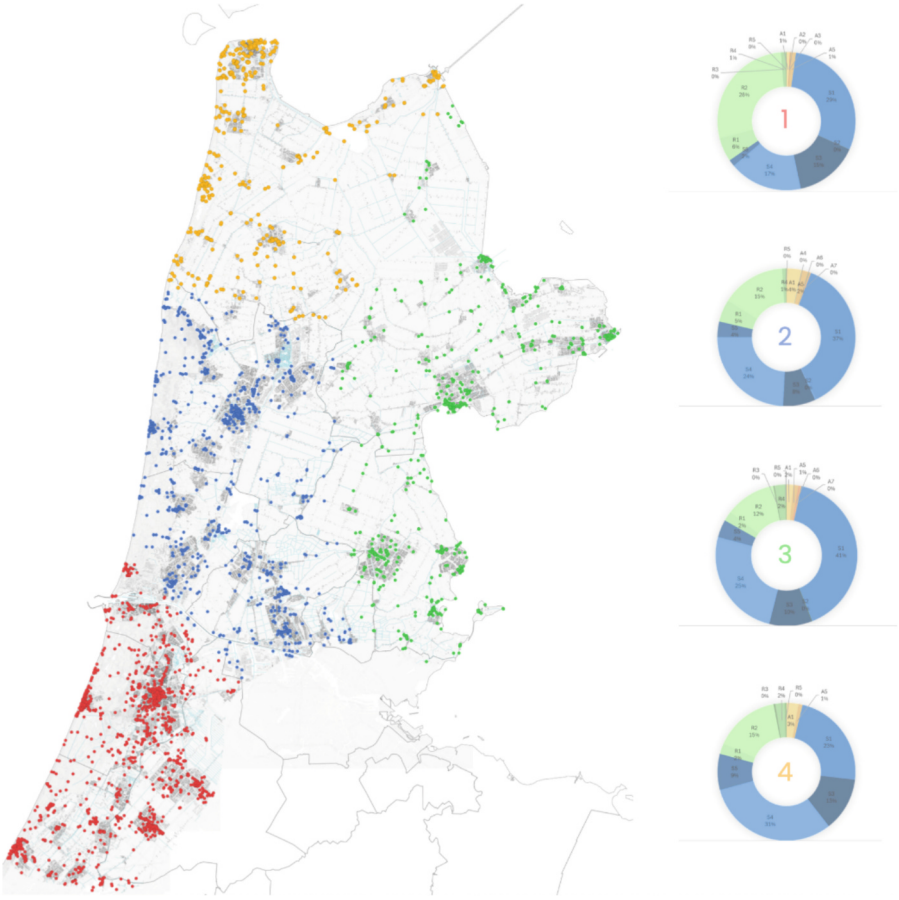

Fig. 5. Clusters identified of Attractors, services and reachability.

To quantify the characteristics of each cluster, three composite indicators are employed (Fig. 6). The Balanced Tourism Supply Index (BTSI) measures the relationship between accommodation capacity and consumption services, distinguishing between overnight-oriented and day-trip-oriented areas. The Attraction Potential Index (API) evaluates the strength of attractors based on their relevance and scale, while the Diversity Reachability Index (DRI) assesses accessibility and intramodality within the transport system.

The BTSI reveals a highly mature system in the most central areas and weaker configurations elsewhere. The DRI confirms the overall efficiency of the transport infrastructure, indicating that reachability is not a limiting factor in the system. The API, on the other hand, emphasizes the uneven distribution of attraction potential, with strong concentrations in specific nodes and a significant deficit in peripheral areas.



Fig. 6. Indicators applied to each Cluster (Destination Area).

The transition from the assessment of the local context to the analysis of performance indicators was carried out through a high-resolution intra-provincial benchmarking, namely a comparative evaluation of the performances observed across the four clusters. This process made it possible to identify the main territorial criticalities and to interpret the internal structure of the tourism system in a more articulated way.

The four clusters reveal different territorial roles within the provincial tourism system. Cluster 1 emerges as a consolidated destination area with the highest concentration of attractors and a strong support base of tourism services. Cluster 2 represents the historical-cultural destination area, where reachability, service density, and landmark attractions converge, but where the most evident congestion effects also occur. Cluster 3 reflects a more landscape-oriented and environmentally sensitive fringe, characterized

by slower forms of tourism linked to dunes and polders. Cluster 4, despite its infrastructural and service endowment, shows the greatest latent potential, remaining functionally relevant but weak in terms of tourism identity and symbolic centrality.

Overall, the benchmarking highlights that the main structural weakness of the system lies in the fragmentation of the tourism offer, which configures the territory as a constellation of disconnected "islands of attractiveness" rather than as an integrated tourism ecosystem. This condition is further reinforced by a marked polarization of carrying capacity, with evident saturation and territorial concentrated in the most accessible nodes and in the areas closest to Amsterdam.

4 Discussion and Planning Strategy

The findings of the analysis support the development of a multi-scalar planning strategy aimed at transforming the existing tourism system. The downscaling of NUA [31, 32] compliance assessment supports the definition of spatial strategies aimed at enhancing the sustainability of the territorial system. The proposed approach is based on the combination of soft measures and hard interventions, designed to influence both visitor behavior and spatial organization.

The proposed strategy identifies three strategic nodes to be transformed into Identity Districts, with the aim of increasing accommodation capacity without additional land consumption, operating through the adaptive reuse of existing built heritage.

Within Cluster 2 (Koedijk), the intervention addresses the mismatch between high landscape value and limited accommodation supply. The proposed "Green-Canal District" is based on the conversion of agricultural warehouses and granaries into water-oriented lofts, following a diffuse hospitality model. This approach preserves the local morphological and cultural identity while integrating services aligned with international tourism demand.

In Cluster 3 (Purmerend), the "Post-Modern Design District" reinterprets the satellite city through a retro-future narrative. The regeneration of 1970s–1980s terraced housing maintains the original architectural identity while enabling a form of immersive hospitality, allowing visitors to experience everyday Dutch life as a cultural asset.

Cluster 4 (Den Helder) represents the northern area most affected by the lack of contemporary attractors. Here, the "Port District" focuses on the regeneration of the former Royal Navy shipyard of Willemsoord. Existing port warehouses are repurposed into spaces for sports, craft breweries, and digital-oriented lofts, while reused shipping containers are introduced as flexible social and resting areas, reinforcing the maritime identity of the site.

To address pronounced seasonality, a travelling music festival is proposed as a territorial activation device. The event unfolds over four days, connecting multiple nodes across the province and encouraging visitors to extend their stay beyond the metropolitan core. By transforming landmarks and public spaces into temporary stages, the initiative activates a distributed network of places, including the Lange Jaap Lighthouse in Den Helder, the historical market square in Purmerend, the castle of Schagen, and the windmill landscapes of Koedijk. This strategy enhances spatial continuity and promotes a more balanced distribution of tourist flows (Fig. 7).



Fig. 7. Hard and Soft measures of strategic proposal.

The proposed vision can be interpreted as a territorial governance model aligned with the principles of the New Urban Agenda, translating international guidelines into spatially explicit and context-sensitive interventions. In particular, the regeneration strategies implemented in Koedijk and Purmerend demonstrate how cultural heritage preservation can act as a driver for zero land consumption urban regeneration, fostering an economic cycle based on the valorisation of local resources rather than their extraction.

At the same time, the creation of inclusive public and hospitality spaces, grounded in everyday Dutch life, contributes to ensuring that tourism development remains equitable and accessible. Within this framework, North Holland shifts from being a peripheral extension of Amsterdam to a system of interconnected districts, where residents' quality of life and visitors' experience converge within a shared trajectory of sustainable urban development.

5 Conclusions

This study has demonstrated how a spatially explicit and system-oriented approach can support the interpretation and reconfiguration of tourism dynamics in territories characterized by strong landscape identity and proximity to dominant metropolitan destinations. Through the application of the STESY framework, the analysis has highlighted how North Holland is structured as a functionally interconnected yet spatially unbalanced tourism system, where highly attractive nodes coexist with underutilized areas exhibiting significant latent potential.

The results reveal that the main structural weakness lies in the fragmentation of the tourism offer and in the polarization of carrying capacity, with congestion concentrated in the most accessible and symbolically dominant areas, particularly those gravitating around Amsterdam. At the same time, the analysis has shown that the territory possesses a rich and diversified asset base, rooted in rural landscapes, cultural heritage, and

local production systems, that remains only partially activated within current tourism dynamics [33].

The whole application is structured on the STESY framework [28, 34, 35]: a robust spatial analytical framework driving from the early stages the strategic design in sustainable tourism for a specific destination area. The framework had been applied in a number of local studies selected among major destinations (i.e. EU Capitals, UNESCO Sites, Environmental global attractors etc.) [36, 37], minor inland tourism areas (i.e. Vulture, Pollino national Park) [38, 39] and niche tourism sites (i.e. Islands) [40–42].

In this paper the main limitation comes from the lack of discussion with local stakeholders. In facts the research was fully development on desk and remotely. It is also relevant to point out how the STESY method effectively supported the process providing a guide to students to start with effective local analysis, to perform meaningful spatial interpretation of a complex phenomenon, to identify design options/solution for a strategic proposal compliant with NUA international principles [43–49].

The indicator dashboard included in the STESY platform allows to compare this application with other case study in a significant and effective way, supporting the decision making process in identifying intervention priority to better plan tourism sector locally benefitting of multi scale assessment options and accountability management of global objective for sustainable and climate responsive design [50–52].

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