

Spatial Dysfunction in the Revitalization of Traditional Markets from the Perspective of Sustainable Tourism Development in Surakarta

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Abstract. This research aims to know the effects of spatial dysfunction in a revitalized traditional market on sustainable tourism development in the city, which has potential local wisdom. Spatial dysfunction is defined as the inability of a space to function as intended up to the time of the research. The problem-based research method, with analysis on a multi-dimensional problem, was applied to several required sample case studies. The research findings explain that the spatial dysfunction within revitalized traditional markets is a barrier to developing local wisdom-based tourism. The spatial dysfunction has stimulated internal and external degradations of the building physically and non-physically, negatively impacting the efforts to defend and maintain the essential values of the local wisdom, which is urgent to develop sustainable tourism in the city, such as Surakarta. A redesign concept for spatial dysfunction by considering various aspects of local wisdom is suggested to significantly contribute to supporting sustainable tourism without any physical changes to the existing building.

Keyword: Spatial dysfunction, Traditional market, Revitalization, Local Wisdom, Sustainable Tourism

1. Introduction

The revitalization of traditional markets has become a phenomenon in many administrative regions in Indonesia. Several considerations are used since drafting the design concept and field execution. An important consideration commonly used is the arrangement and improvement of urban slum areas. Traditional markets are considered growth points for slum areas in line with the dynamics of the growth and development of the area components, which must be arranged and improved at a certain point in time for the sake of the internal interests of the market and the external interests of its surrounding environment.

In the following decades, one important issue regarding the revitalization of traditional markets was their connection to aspects of local wisdom contained within their surrounding areas. Traditional markets are an essential component in the spatial patterns of old cities in Java (Aliyah, 2017), making them a key part of areas with a background of morphological and historical development based on cultural heritage. Traditional markets are important historical traces in major cultural heritage areas, physically and non-physically. Traditional markets are commonly located in specific positions within the old city, strategic points in the city center, and major road intersections (Santoso, 2008). The pattern of activity in traditional markets manifests the essence of commercial behavior in the early days of the economic prosperity of various social classes in the past.

The next important aspect related to the revitalization of traditional markets is building resilience and sustainability in the process of interacting with other components of the region towards synergistic benefits. Tourism is one aspect that has the potential to synergize with traditional market revitalization products, especially those based on heritage values. Understanding sustainable tourism provides a glimpse of the great opportunities in building such synergistic interactions (Zhu et al., 2025). Traditional markets in areas based on cultural heritage values are an important part of the common thread of the area's heritage. The physical and non-physical essence within them is a potential embryo for building the sustainability and continuity of tourism and travel, which is currently aware of returning to local wisdom. The concept of locally-based design offers the opportunity to bring the essence of traditional markets into a synergistic integration between meeting the needs of thematic tourism and the needs of contemporary market trading mechanisms.

Space dysfunction/malfunction is commonly found in buildings that are part of the revitalization of traditional markets in Surakarta. This phenomenon began to be perceived as a problem when users began to feel the negative impact on their primary and secondary activities inside and outside the building, resulting in squalor and disorder as factors that degrade the quality of comfort and visual appeal. The impact of the polemic of spatial dysfunction on revitalized traditional market buildings in Surakarta needs to be further examined when linked to efforts to develop sustainable tourism based on respect for local values through innovation and the application of new elements/components introduced in the dynamics of contemporary tourist attractions. The focus of this research is on understanding and finding solutions as an effort to transform negative impacts into greater benefits for the present and the future.

2. Research Methods and Materials

This study applies a multiple-dimensional approach research method based on field phenomena in four main stages. The first stage is observing and identifying phenomena and field events that trigger problems with reading activities, recording physical and non-physical data related to space dysfunction in the case object. The second stage is building a theoretical understanding based on references, data, and relevant information to analyze and synthesize problems. This stage is a process of understanding the realization of spatial dysfunction in buildings in the context of sustainable tourism development in Surakarta. The third stage analyzes data and information gathered during the observation stage by applying a descriptive and illustrative theoretical framework. The fourth stage is drawing conclusions based on the indications of the analysis process, ending with research recommendations.

Several case study objects were determined based on the main criteria of location/position within the city of Surakarta in terms of radius and relevance to centers of culture and local wisdom, as well as centers of economic growth and modern commerce, namely the Kasunanan Surakarta Hadiningrat Palace, Puro Mangkunegaran, the Laweyan and Kauman Batik Industry Centers, the Gladak and Banjarsari areas.

3. Theoretical Framework

3.1 The Phenomenon of Traditional Market Revitalization in the Growth and Development of the Area

Cities in Indonesia have experienced degradation due to increasingly complex influencing factors as a consequence of accommodating human population growth over a long period. Non-physical degradation is related to population growth, which triggers an escalation in the complexity of human activities as individuals and groups. The dynamics of interactions between harmonious and disharmonious activities have resulted in changes in the atmosphere and ambiance of urban

areas. Chaos, discomfort, and pollution are the leading indicators of non-physical degradation in cities in developing countries. Physical degradation is related to the dynamics of changes in the composition of the morphological components of an area, both individually and collectively. Physical degradation is indicated by the visual clutter of uncontrolled building compositions in an area. Urban regeneration has been linked to cultural heritage tourism in the context of sustainable development (Boussaa & Madandola, 2024). Traditional markets based on local wisdom are traces of cultural heritage in various aspects. Traditional markets are a vehicle for interaction between social strata with different backgrounds and interests.

The physical and non-physical degradation of cities in Indonesia has become a serious problem when linked to several other missions/interests in the context of collective quality improvement efforts. One such program is the development of urban tourism, which eliminates slums through various activities. Traditional markets are an important target for improvement because they are closely associated with slums.

Traditional markets in Indonesia are an important component in the physical morphology of an area, along with the growth and development of human civilization, as the actors of the activities surrounding them. Traditional markets are the common thread in social, cultural, and economic dynamics. They are an important factor in building the resilience and sustainability of an area amid the diverse influences throughout human civilization, from its inception to the present. The significant values of the past can be used as a common thread to connect with present and future benefits (Mteti et al., 2025).



Figure 1. The atmosphere of traditional markets in Indonesia.



Figure 2. Traditional markets as a vehicle for interaction between diverse social strata.

Traditional markets allow social interaction among various groups based on commercial activities, ranging from simple to complex formats. The interaction of various community characteristics due to social class differences creates a specific atmosphere. This phenomenon makes traditional markets a place to form local wisdom with different identities in several places in Indonesia, with a background in forming several kingdoms that once experienced a golden age with vast territories. The chronology of traditional markets' morphology also forms specific internal and external components. Internal aspects are related to trade patterns, including mechanisms, types of commodities, and space. The external aspect is the interaction and correlation between the object and its surrounding components; for example, traditional markets usually occupy a very strategic position in the territorial area of a kingdom. The chronology of the growth and development of traditional markets becomes a weighting factor when traditional markets have cultural heritage value in terms of historical significance and synergistic benefits in various aspects for the present and the future.

One important aspect in observing the development of traditional markets is trade commodities, namely homogeneous and heterogeneous. Traditional markets with homogeneous commodities are those where the commodities traded are predominantly of a particular type, such as fabric markets, animal markets, secondhand goods markets, and furniture markets.

Traditional markets with heterogeneous commodities indicate diversity in trade objects and needs, both basic and supplementary.

Traditional markets manifest multi-dimensional synergistic interactions (Zhu et al., 2025), including social, economic, and cultural interactions. These interactions shape the expression and atmosphere of specific spaces, which ultimately form heritage value over time. This aspect is the embryo for forming enjoyment/interest to be presented in new objects with a sustainability mission. This mechanism manifests spatial characteristics and a model for restructuring cultural heritage areas in the context of cultural and tourism integration to benefit the past, present, and future (Zhang et al., 2024).

3.2. Sustainable Tourism as a Stimulus for Development based on multi-dimensional synergistic interaction

The tourism sector was one of the first to recover from the downturn caused by the COVID-19 pandemic from 2019 to 2022, despite experiencing extraordinary setbacks like other sectors. The early revival of the tourism sector began with the remaining potential that had been eroded by limitations and setbacks, which was then revived with the modest support of other sectors, making the tourism sector a stimulus for other sectors to rise together synergistically.

The tourism industry is a significant economic sector worldwide that has contributed significantly to job creation, community welfare, and national income (Torkabadi et al., 2025). The mechanism for sustainable tourism growth and development is formed by the synergistic interaction of many components in various dimensions and interests, including attractions, consumers, and tourism management. The development and growth of the tourism industry that ignores sustainability has caused complex problems in various aspects, including social, economic, and environmental aspects, which can be traced back to inappropriate policies.



Figure 3. One product of traditional market revitalization in a sustainable tourism corridor.



Figure 4. The essence of local wisdom in traditional markets is adopted in revitalizing traditional markets in the mission of sustainable tourism.

The mechanism for developing sustainable tourism must not ignore local culture because it hurts social, ecological, and environmental aspects (Gaonkar & Sukthankar, 2025). This phenomenon is the beginning of a disconnect in the common thread of sustainability between the wisdom of the past and the present and future, even though the benefits are different. A significant revival in tourism began in the 20th century, marked by synergistic interactions with other fields, with the primary goal of building resilience and sustainability in the face of current and future degradative factors. The awareness to respect the value of cultural heritage and local wisdom is a response to the degradation of various aspects under the pretext that the principles of contemporary life bring progress and significant changes to the lives of modern humans, which, in reality, is very contradictory (Wang et al., 2024). Due to modern methods and technology, global decline and destruction have occurred in various places and aspects of human life. The interpretation and application of technology have become uncontrollable due to human ambition,

triggering actions that are increasingly far from sustainability and continuity. The concept of tourism development that respects historical and

Cultural heritage values are ultimately also a process of preserving the region's ecology. One important criterion for sustainable tourism is having an embryo as its core and stimulus for sustainability, including the potential for local wisdom (Mteti et al., 2025). The strength of this aspect lies in its connection to important historical values in various forms in the past, with levels/gradations related to explicit and formal criteria/parameters in tracing, weighting, and classification. Traditional markets in a cultural history-based environment are a component with heritage value at various levels according to the intensity of interaction with the surrounding area, physically and non-physically. The physical aspect relates to buildings (composition, units, parts), the environment, and cities that are part of the morphological dynamics of the area. The non-physical aspect is a descriptive component of the historical growth and development of the area attached to the traditional market. Intangible cultural heritage is a potential component in developing sustainable tourism, such as traditional drama, making art objects, and traditional market activities (Zhao et al., 2024).

The cultural heritage value of traditional markets within a given area varies, but this aspect is an important factor in the conceptual plan and revitalization measures for sustainable tourism. Traditional markets based on local wisdom with high cultural heritage value are a potential embryo in shaping the sustainability of revitalization products with various synergistic benefits, namely area planning, business development, and dynamic preservation of cultural heritage that leads to sustainable tourism. The atmosphere of cultural heritage is not an obstacle in the dynamics of traditional market revitalization actions in building sustainability, but rather an inspiration for concepts and designs that maintain continuity between the past, present, and future.

One strategy for developing sustainable tourism is through mechanisms that interact with natural aspects or expressions and government policies (Sangnak, 2025). In various criteria, natural expressions are reflected in specific objects or landscapes, such as agricultural land, nature reserves, and specific and rare morphological features. The strength and accuracy of government policies in protecting community activities related to the existence and sustainability of specific activities are also aspects in ensuring the sustainability of tourism, such as support for MSMEs and cooperatives (Candeloro & Tartari, 2025).

Understanding sustainable tourism is also related to environmental economics and technological innovation (Sun & Chen, 2025). The term green credit refers to integrating the global economy with environmental awareness, and the tourism industry is a major driver of economic growth and sustainable development. Innovative mechanisms that integrate the concept of environmental protection into financial decision-making, such as financial support for projects that meet environmental and tourism standards. This is a manifestation of Synergistic interaction between the process of providing financing for improvement and environmental protection for the sake of sustainable tourism. Tourism development has high sustainability value when it has a synergistic mission of environmental improvement and preservation, which is also an effort to improve the quality of human life. Smart green tourism has utilized the latest technology in shaping tourism interests by respecting and adapting the authenticity of local natural and cultural values in building sustainability (Inmor et al., 2025). This mechanism has produced new expressions and appreciation in the revitalization of cultural heritage objects and elements for present and future interests and benefits.



Figure 5. Revitalization of traditional markets based on local wisdom as an effort to build sustainable tourism.



Figure 6. Spatial dysfunction formed in the revitalized traditional market building.

Sustainable development in the tourism sector highly respects natural potential and environmentally responsible behavior (Tang et al., 2025). Traditional buildings have one important essence in their formation process: they are manifestations of humans' wise response to the dynamics of nature, thereby forming a harmonious interaction between buildings and humans as their users. Adapting and applying local values in developing tourism is also a weapon in efforts to improve and strengthen sustainability that has been degraded by destructive crises such as the economic crisis caused by COVID some time ago (Mousavi, 2025). This mechanism can utilize digital tools and green tourism initiatives (Amin et al., 2025).

Synergistic multidimensional interactions in the development mechanism between tourism, economy, and environment can create green and resilient sustainability (Raihan et al., 2025). Tourism planning that considers effective and efficient energy consumption will maximize financial income and better control the environment.

3.3 Correlation of Space Dysfunction in Revitalized Traditional Market Buildings with the Process of Building Sustainable Tourism

Sustainable tourism is a dynamic activity that enjoys the essence of enjoyment and expression, generating positive energy that can consistently eliminate the degradation process of various factors experienced by humans as individuals and social beings over time. A multidimensional synergistic interaction approach is needed to build positive and flexible harmonization to obtain optimal solutions in various situations and conditions (Zhu et al., 2025).

One powerful strategy in developing sustainable tourism is the process of synergistic interaction with local wisdom. The essence of local wisdom in traditional markets in various forms is presented in the components that make up tourism: attractions, accessibility, amenities, and activities (Inskeep, 1991). The local value of traditional market activities lies in the buying and selling mechanisms and commodities that require spaces that create a specific atmosphere and aroma. This aspect can be an element in shaping attractions, amenities, and activities in the concept and design of traditional market revitalization with a mission of developing sustainable tourism based on local wisdom.

One phenomenon occurred in buildings resulting from the revitalization mechanism of several traditional markets in Surakarta. These spaces were not functioning after the buildings were inaugurated, even long after that period. Data shows that, on average, nearly 40% of the spaces in the eight traditional markets studied were not used at the time of this research. The impact of this problem was not felt in the first two years. However, in the following period, indications of the impact began to be felt, both physically and non-physically, which influenced each other in accordance with the understanding that the physical design of a building can influence/shape behavior patterns, or conversely, specific behavior patterns require certain dimensions. The spaces in the revitalization building design are not only based on traditional business mechanisms but also on other missions that are not proportionally considered. This

study does not focus on the causal factors but on examining the phenomenon from one perspective, namely sustainable tourism development, the results of which are used to find positive solutions that can eliminate negative impacts and create greater benefits for related parties now and in the future.

The impact of space dysfunction on the revitalization of traditional markets, both physical and non-physical, can be divided into two categories: internal and external. Internal impacts include the degradation of space components due to the market management's inability to carry out intensive maintenance because priority is given to functional spaces (Fig. 6). The high cost of maintaining spaces as a result of the spatial concept and changes in the character of the building into building units makes the rental price unaffordable for small traders. The addition of floor volume in the vertical direction does not support the activity patterns of users, both traders and buyers. The external impact is the emergence of unplanned and uncontrolled zones outside the building as facilities for traders who cannot afford the rent in the new market building (Figure 7). The internal and external effects are factors in the degradation of the comfort of activities and the atmosphere of the space due to the formation of clutter and disorder.

The phenomenon of dysfunctional spaces in buildings resulting from revitalization mechanisms ultimately degrades the essence of tradition and heritage value of traditional markets, which are potential aspects to be transferred to/within new concepts and buildings resulting from revitalization. This aspect is important in developing a sustainable tourism concept based on the strength of heritage values in cities with a strong cultural and historical background. This phenomenon can be seen in developed Western countries where tourism development using this strategy has a very high value of sustainability. The value of cultural heritage has raised consistent awareness in the face of degradative factors resulting from the advancement of human thought and civilization, which increasingly idolizes artificial abilities and logic. A renewed awareness of the dynamics of natural wisdom has led to concepts of synergistic interaction in many thoughts and actions, including tourism development.

Surakarta is one of the cities in Indonesia with a background of growth based on cultural history, political governance, and a specific people's economy within the local, regional, and national spheres during the pre-royal, royal, colonial, and independence periods. Traditional markets are part of the common thread of the local economy, along with centers of home-based batik and ethnic handicraft industries that once experienced a golden age and left important traces that are the embryo of sustainable tourism. The dysfunctionality of spaces within revitalized traditional market buildings has hindered efforts to create a recreational market atmosphere based on traditional markets as a stimulus for sustainability.

4. Discussion of Results

Analysis of the problem of space dysfunction in buildings resulting from the revitalization of traditional markets in Surakarta using a correlation framework between field data related to physical and non-physical morphological aspects resulting from space dysfunction and the dynamics of atmosphere change based on local wisdom as parameters of relevance and contribution to the formation of sustainable tourism. Six case objects are located in different locations related to local values: Jebres Market, Tanggul Market, Alfabet Market, Legi Market, Purwosari Market, and Jongke Market.

1. Ratio of spatial dysfunction/malfunction to building volume

The volume of spatial dysfunction in buildings resulting from the revitalization of traditional markets in Surakarta, which were the subject of this study, reached an average of 48%, with a distribution of approximately 30% on the ground floor and 70% on the upper floors. The impact on physical morphology was visible from various potential positions, with several cases indicating degradation of the primary materials and finishes.

Such a volume ratio of space dysfunction has created an impression of clutter in the internal and external visual range, which ultimately affects the quality of the spatial atmosphere (Fig. 8). The dysfunctionality of the interior spaces also triggers the squalor of the exterior spaces as a result of the transfer of activities from inside to outside the building (Fig. 8). The atmosphere of squalor is a factor that must be eliminated in relation to tourism and sustainable tourism, which highly values environmental awareness by maintaining cleanliness and environmental care.



Figure 7. Non-functional spaces are a factor that triggers visual degradation and expressions that lead to squalor.



Figure 8. Exterior clutter caused by the dysfunctionality of interior spaces.

2. The ratio of dysfunctional volume from the perspective of sustainable tourism growth and development

Conceptual planning and design decisions for revitalizing traditional markets in Surakarta prioritize contemporary commercial needs over other cross-sectoral missions, as highlighted in the case study, highlighting the importance of developing sustainable tourism. Indications of the possibility of spatial dysfunction in the concept and design of traditional market revitalization buildings can be seen based on three considerations: first, when the volume of space in the design exceeds the estimated capacity to accommodate the dynamics of user activities quantitatively and qualitatively. The design of traditional market revitalization buildings generally exceeds the volume of activity participants in terms of both number and intensity, so they remain dysfunctional for a considerable time after being put into use. Second, the design of vertical floor expansion is unfamiliar in traditional market design patterns (Fig. 10). This pattern creates movement patterns and spatial layouts that require time to adapt to. In the end, some fail to adapt. Third, the design of massive retail unit spaces is limited by walls, which is very different from traditional markets with massive or open-plan units (Fig. 9). This pattern hinders open communication between fellow traders and between traders and buyers, an important characteristic of traditional markets.

The factors causing spatial dysfunction in buildings resulting from the revitalization of traditional markets are the embryo of a cause-and-effect correlation with the mechanism of developing sustainable tourism in the city of Surakarta. These factors cumulatively impact physical and non-physical degradation over a long period of time. Physical aspects are indicated in the structure and finishing. In contrast, non-physical aspects are related to the partial and collective atmosphere of the space, namely dirtiness, clutter, and smell. These phenomena have a destructive influence on traditional markets' aesthetic value and essence as elements of local wisdom and cultural heritage, which are the foundation of sustainability in developing the tourism sector.



Figure 9. Spaces formed by concepts that are not rooted in local wisdom cause confusion in their use, creating chaos.



Figure 10. The non-functionality of space on vertical floors is related to traditional cultures unfamiliar with vertical movement.

5. Conclusion

Spatial dysfunction in buildings resulting from the revitalization of traditional markets in Surakarta City was formed because the target buildings' concept and design did not consider the number of actors involved in activities, such as traders, buyers, and tourists, but instead focused on top-down project policies. Other interests have been accommodated, but the process and implementation of the design concept were not synergistically processed from the outset.

Spatial dysfunction has direct and indirect negative impacts that lead to the degradation of factors contributing to sustainable tourism. The direct impact of spatial dysfunction in the long term is the degradation of the quality of visual expression at the case sites and nearby spaces, which stimulates visual and aromatic clutter in the interior space—the indirect impact results from the market's operational management procedures after revitalization. Traders originally in the market before the revitalization, who did not get a share and were financially unable to rent new retail space, occupied the remaining spaces on the ground floor around the building uncontrolled, forming a random spatial composition that triggered clutter and disorder.

The direct and indirect impacts of spatial dysfunction in the revitalization of traditional markets are factors that degrade the physical and visual comfort aspects of enjoying local wisdom in traditional markets, both in terms of the physical aspects of the buildings and their activities, which are the essence of sustainable tourism based on local wisdom.

A course of action must be recommended to restore the positive objectives of revitalizing traditional markets in Surakarta and other cities with a corridor character without significant changes to the existing physical design morphology. The central concept is to utilize spaces that are not functioning in the case object with activities, activity tools, and objects/items based on local wisdom, in a synergistic composition with the essence of traditional markets, thereby forming a unit of objects that is relevant to the mission of the market as a sustainable tourism object based on the local potential of Surakarta as a city of cultural history.

References

- [1] Aliyah, I. (2017). PEMAHAMAN KONSEPTUAL PASAR TRADISIONAL DI PERKOTAAN. *Cakra Wisata*, 18(2).
- [2] Amin, S. Bin, Khandaker, M. K., Samia, B. I., Khan, F., & Taghizadeh-Hesary, F. (2025). Fostering sustainable tourism through digital innovation and green tourism initiatives in Bangladesh. *Sustainable Futures*, 10. <https://doi.org/10.1016/j.sfr.2025.100841>
- [3] Boussaa, D., & Madandola, M. (2024). Cultural heritage tourism and urban regeneration: The case of Fez Medina in Morocco. *Frontiers of Architectural Research*, 13(6), 1228–1248. <https://doi.org/10.1016/j.foar.2024.04.008>
- [4] Caneloro, G., & Tartari, M. (2025). Heritage-led sustainable development in rural areas: The case of Vivi Calascio community-based cooperative. *Cities*, 161. <https://doi.org/10.1016/j.cities.2025.105920>

- [5] Gaonkar, S., & Sukthankar, S. V. (2025). Measuring and evaluating the influence of cultural sustainability indicators on sustainable cultural tourism development: Scale development and validation. *Heliyon*, *11*(4). <https://doi.org/10.1016/j.heliyon.2025.e42514>
- [6] Inmor, S., Na-Nan, K., Phanniphong, K., Jaturat, N., & Kůstka, M. (2025). The role of smart green tourism technologies in shaping tourist intentions: Balancing authenticity and sustainability in natural tourism. *Environmental Challenges*, *19*. <https://doi.org/10.1016/j.envc.2025.101171>
- [7] Inskeep, E. (1991). *Tourism Planning: An Integrated and Sustainable Development Approach*. John Wiley & Sons.
- [8] Mousavi, E. S. (2025). Sustainable tourism supply chain in economic recession: Analysis of government intervention using game theory approach. *Sustainable Futures*, *10*. <https://doi.org/10.1016/j.sfr.2025.100880>
- [9] Mteti, S. H., Mpambije, C. J., & Manyerere, D. J. (2025). Unlocking cultural tourism: Local community awareness and perceptions of cultural heritage resources in Katavi Region in southern circuit of Tanzania. *Social Sciences & Humanities Open*, *11*. <https://doi.org/10.1016/j.ssaho.2025.101295>
- [10] Raihan, A., Rahman, S. M., Sarker, T., Ridwan, M., Sahoo, M., Dhar, B. K., Roshid, M. M., Islam, S., Zimon, G., & Bari, A. M. (2025). Tourism-energy-economy-environment nexus toward sustainable and green development in Malaysia. *Innovation and Green Development*, *4*(4). <https://doi.org/10.1016/j.igd.2025.100257>
- [11] Sangnak, D. (2025). Sustainable tourism development in Thailand: The role of agricultural tourism and government support for SMEs. *Sustainable Futures*, *9*. <https://doi.org/10.1016/j.sfr.2025.100782>
- [12] Santoso, J. (2008). *Arsitektur kota Jawa: kosmos, kultur & kuasa*. Centropolis - UNTAR.
- [13] Sun, J., & Chen, D. (2025). Green credit, tourism technology innovation, and sustainable development of tourism. *International Review of Economics & Finance*, *99*. <https://doi.org/10.1016/j.iref.2025.104004>
- [14] Tang, Y., Liang, S., Bu, H., & Huang, R. (2025). Sustainable development in wetland tourism: The impacts of gratitude to nature and connectedness to nature on environmentally responsible behavior. *Journal of Hospitality and Tourism Management*, *63*, 460–477. <https://doi.org/10.1016/j.jhtm.2025.05.019>
- [15] Torkabadi, A., Mamoudan, M. M., Erdebilli, B., & Aghsami, A. (2025). A multi-objective game theory model for sustainable profitability in the tourism supply chain: Integrating human resource management and artificial neural networks. *Systems and Soft Computing*, *7*. <https://doi.org/10.1016/j.sasc.2025.200217>
- [16] Wang, S., Tian, Q., Chen, X., Zhang, Q., Deng, F., & Arif, M. (2024). Study of the evolving relationship between tourism development and cultural heritage landmarks in the eight Chengyang scenic villages in China. *Ecological Indicators*, *167*. <https://doi.org/10.1016/j.ecolind.2024.112702>
- [17] Zhang, Y., Zheng, Q., Tang, C., Liu, H., & Cui, M. (2024). Spatial characteristics and restructuring model of the agro-cultural heritage site in the context of culture and tourism integration. *Heliyon*, *10*(9). <https://doi.org/10.1016/j.heliyon.2024.e30227>
- [18] Zhao, X., Elahi, E., Wang, F., Xing, H., & Khalid, Z. (2024). Sustainable tourism development for traditional Chinese drama's intangible cultural heritage. *Heliyon*, *10*(3). <https://doi.org/10.1016/j.heliyon.2024.e25483>
- [19] Zhu, P., Chi, X., Ryu, H. B., & Han, H. (2025). Experience economy and authenticity in the heritage tourism sector: A multiple-dimensional approach. *Acta Psychologica*, *257*. <https://doi.org/10.1016/j.actpsy.2025.105118>