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**Industrial Heritage Tourism: Inclusive Pathways and Sustainability Practices in the Mediterranean**


## Abstract

Purpose

This study investigates how Mediterranean industrial heritage destinations can move from sustainability-oriented practices toward highly satisfying and inclusive tourism development. Specifically, it examines how different configurations of environmental, economic, social and inclusivity dimensions shape inclusive and meaningful visitor experiences in post-industrial landscapes.

Design/methodology/approach

Drawing on data from 98 industrial heritage sites across six Mediterranean countries participating in the EU-funded SMITour initiative, the study employs fuzzy-set Qualitative Comparative Analysis (fsQCA) to identify multiple pathways leading to high visitor experience outcomes. The configurational approach captures causal complexity and equifinality across sustainability dimensions.

Findings

The results reveal that inclusivity functions as a necessary and core condition across all high-performing configurations. Three sustainability pathways emerge: eco-inclusivity, economic-inclusivity and socio-inclusivity. Rather than a single best-practice model, different combinations of sustainability practices support enriched, accessible and culturally meaningful visitor engagement. The findings demonstrate that high visitor satisfaction in Mediterranean industrial tourism is achieved when sustainability initiatives are structurally integrated with inclusive design, digital mediation and participatory heritage narratives.

Practical implications

The study highlights the importance of embedding inclusivity within destination governance, infrastructure planning and heritage interpretation strategies. Mediterranean policymakers and site managers can enhance resilience, reduce seasonal concentration and strengthen regional sustainable revitalization by adopting context-sensitive, inclusive sustainability configurations.

Originality/value

This research advances tourism theory by repositioning inclusivity as a structural driver of heritage-making rather than a peripheral accessibility concern. Methodologically, it demonstrates the value of configurational analysis for understanding complex sustainability transitions in Mediterranean tourism destinations.



**Keywords:**

Industrial tourism; Industrial heritage; Inclusivity; Mediterranean tourism; Visitor experience; fsQCA

## 1. Introduction

Mediterranean tourism is at a pivotal moment. Destinations long associated with coastal mass tourism are increasingly confronted with climate pressures, seasonality, regional inequality and post-industrial economic restructuring. In this shifting landscape, industrial heritage sites are emerging as strategic arenas for sustainability, offering pathways to diversify tourism economies, revitalise inland territories and reconnect communities with their socio-economic histories. Far from being static remnants of the past, industrial heritage landscapes have become critical spaces for negotiating cultural meaning, identity and memory in post-industrial societies.

Rather than functioning solely as visitor attractions, industrial heritage sites increasingly operate as socio-cultural platforms where labour histories, technological transitions and collective identities are reinterpreted through contemporary sustainability and regeneration agendas. The integration of inclusivity within these spaces aligns with broader global policy frameworks, including the United Nations Sustainable Development Goals. This reflects a shift toward heritage governance models that prioritise representational diversity, community participation and equitable access.

Previous scholarship has acknowledged the economic and sustainability potential of industrial heritage (Edwards & Llurdés, 1996; Frew, 2008; Otgaar, 2012), particularly in supporting regional revitalisation and destination branding. However, less attention has been devoted to understanding how sustainability practices, especially those centred on inclusivity, actively shape heritage interpretation and the quality of visitor engagement. Heritage experiences are influenced not only by conservation strategies or adaptive reuse initiatives, but also by how narratives are constructed, whose histories are foregrounded or marginalised and how accessible interpretive infrastructures are to diverse audiences. Inclusive sustainability therefore intersects directly with heritage-making processes, influencing perceived authenticity, emotional resonance and the relational connections visitors form with post-industrial landscapes.

Within a broader discourse of regenerative framing, visitor experience is not merely a performance indicator but a lens through which the socio-cultural impacts of sustainability strategies can be understood. Elements such as accessible pathways, multilingual interpretation, digital storytelling, affordability and culturally sensitive design shape how heterogeneous audiences engage with industrial heritage narratives (Cerdan Chiscano & Darcy, 2021; Qiao et al., 2024). Environmental interventions, including energy-efficient retrofitting and adaptive reuse, further contribute to perceptions of continuity between industrial pasts and sustainable futures (Frantál & Urbánková, 2014; Hidalgo-Giralt et al., 2021). Despite this growing recognition, inclusivity remains under-theorised in heritage research, particularly in Mediterranean contexts where sustainability requires balancing environmental stewardship, social equity and economic resilience. This study positions regenerative tourism not as an empirically measured outcome, but as a forward-looking theoretical lens through which sustainability practices in industrial heritage contexts can be reinterpreted. While sustainability has traditionally focused on balancing environmental, economic, and social dimensions, regenerative approaches emphasize the capacity of tourism systems to restore, renew, and enhance socio-cultural and ecological relationships (Hidalgo-Giralt et al., 2021). In this sense, the present study does not claim to directly measure regeneration, but rather examines how configurations of sustainability practices, particularly inclusivity, may support conditions aligned with regenerative development trajectories (Badia et al., 2024). By grounding the analysis in sustainability dimensions while engaging with regenerative discourse, the study contributes to

bridging an emerging conceptual gap between operational practices and transformative tourism paradigms (Qiao et al., 2024).

To enhance conceptual clarity, this study adopts a structured framework in which sustainability is operationalized through four interrelated dimensions, economic, environmental, social, and inclusivity, and linked to perceived visitor experience outcomes. Within this framework, inclusivity is conceptualized as a cross-cutting dimension that shapes how sustainability practices are accessed, interpreted, and experienced by diverse visitor groups (Cerdan Chiscano & Darcy, 2021). Rather than treating inclusivity solely as a component of accessibility, the study theorizes it as a mediating mechanism through which sustainability practices translate into perceived experiential value (Guo et al., 2023). This positioning aligns with recent work emphasizing the role of inclusive design, digital mediation, and cultural representation in shaping contemporary heritage experiences (Suanpang & Pothipassa, 2024a).

The adoption of fuzzy-set Qualitative Comparative Analysis (fsQCA) is directly connected to the theoretical logic of the study. If sustainability in industrial heritage tourism is understood as a multidimensional and context-dependent process, then visitor satisfaction is unlikely to result from the isolated effect of a single dimension. Instead, it is expected to emerge from specific combinations of economic, environmental, social, and inclusivity-related practices. This configurational logic is consistent with the complexity of tourism systems, where similar outcomes may be reached through different pathways depending on local resources, governance structures, and heritage contexts (Wang et al., 2022). Accordingly, fsQCA is not used merely as an analytical technique, but as a methodological expression of the study's theoretical assumption that sustainability operates through conjunctural and equifinal relationships (Song et al., 2025). This approach allows the study to examine how different sustainability configurations are associated with visitor satisfaction in industrial heritage settings (Badia et al., 2024).

Drawing on data from 98 industrial heritage sites across six Mediterranean countries participating in the EU-funded SMITour initiative, this research addresses two questions: (1) How are the economic, environmental, social and inclusivity dimensions of sustainability operationalised within Mediterranean industrial heritage contexts? (2) What configurations of these dimensions enable enriched, accessible and sustainable visitor experiences?

Building on this conceptual foundation, the study advances a configurational perspective by proposing that visitor-related outcomes in industrial heritage tourism are not the result of isolated sustainability dimensions, but of their combined and context-dependent interactions. Drawing on complexity-oriented approaches, the research assumes that multiple configurations of sustainability practices can lead to similar experiential outcomes, reflecting the principle of equifinality (Wang et al., 2022). This perspective responds to calls for moving beyond linear and variable-centric models in tourism research, particularly in contexts characterized by multi-stakeholder governance and layered socio-cultural meanings (Song et al., 2025). By demonstrating how different sustainability combinations are associated with perceived visitor satisfaction, the study contributes to a more nuanced understanding of how sustainability operates as a systemic and relational process in industrial heritage tourism (Nag & Mishra, 2024).

The study contributes to Mediterranean tourism scholarship in two important ways. First, it introduces a configurational model demonstrating that highly satisfying and inclusive heritage experiences emerge through multiple pathways, reflecting the plural and context-sensitive nature of industrial tourism development. Second, it positions inclusivity not as an auxiliary or compliance-based feature, but as a structural driver of heritage-making, shaping how individuals

access, interpret and emotionally connect with post-industrial landscapes in the Mediterranean region.

## 2. Literature Review

Industrial tourism has increasingly evolved from a niche heritage initiative into a strategic tool for sustainable tourism development, regional revitalization, and experiential innovation. While its economic and branding potential has been widely studied, recent scholarship is shifting toward its multi-dimensional and integrative sustainability potential, especially when aligned with Sustainable Development Goals and inclusive, community-centered heritage tourism practices (Badia et al., 2024; Edwards & Llurdés, 1996; Frew, 2008). This shift positions industrial tourism not only as a vehicle for preserving post-industrial landscapes but also as a platform for equitable, culturally relevant, and environmentally responsible experiences (Hidalgo-Giralt et al., 2021; Qiao et al., 2024; Cerdan Chiscano & Darcy, 2021). Nonetheless, the literature remains limited in evaluating these sustainability outcomes from the visitor's perspective, particularly how integrated sustainability strategies influence satisfaction, engagement, and emotional experience, which are emerging priorities in competitiveness-oriented tourism research (Çolak & Karakan, 2024; Liang & Li, 2023; Guo et al., 2023).

The following literature review has been structured to support the core objective of the study, namely the analysis of how sustainability dimensions relate to visitor satisfaction in industrial heritage tourism. The review focuses specifically on three interrelated areas: (1) sustainability dimensions in industrial heritage contexts, (2) inclusivity as a cross-cutting dimension shaping visitor experience, and (3) the relationship between sustainability practices and visitor-related outcomes. This ensures a closer alignment between the theoretical framework and the empirical model (Badia et al., 2024). It also responds to recent calls for more analytically selective literature reviews that directly support research design and methodological choices (Song et al., 2025). The literature is also used to support the development of a configurational perspective, highlighting the limitations of prior studies that have examined sustainability dimensions in isolation or through linear relationships. By integrating insights from sustainability, inclusivity, and visitor experience research, the review provides the theoretical basis for examining how different combinations of practices are associated with visitor satisfaction in industrial heritage settings (Wang et al., 2022). This approach ensures that the literature directly informs both the conceptual model and the choice of fsQCA as the analytical method (Guo et al., 2023).

### 2.1 Early Studies on Industrial Tourism

Research on industrial tourism initially focused on economic regeneration and site-based heritage preservation. Edwards and Llurdés (1996) categorized industrial tourism into production sites, transport infrastructure, and socio-industrial heritage attractions, highlighting its role in value creation. Frew (2008) extended this lens by exploring industrial tourism as a branding mechanism, enhancing loyalty through educational experiences and product engagement.

Otgaar (2012) and Vargas-Sánchez et al. (2008) emphasized governance, planning, and stakeholder involvement as essential to sustainability. Their findings illustrated how multi-sectoral partnerships contribute to long-term viability, while top-down exclusion of communities often hinders meaningful outcomes (Ruiz-Ballesteros & Hernández-Ramírez, 2007). However, this early body of work largely emphasized macroeconomic and institutional dimensions, with limited insight into visitor experiences or the intersection of sustainability with inclusive design.

Recent studies have begun incorporating sustainability principles, such as environmental stewardship and participatory planning, into industrial tourism research (Badia et al., 2024; Frantál & Urbánková, 2014). Bibliometric reviews of heritage tourism literature also indicate a growing scholarly focus on inclusivity, digitalization, and resilience planning across post-industrial tourism contexts (Orts-Cardador et al., 2024). Yet there remains a conceptual and empirical gap in understanding how these practices influence visitor satisfaction outcomes, including emotional immersion, perceived authenticity, and repeat visitation (Guo et al., 2023; Trunfio et al., 2022; Beer et al., 2018). Moreover, evidence from EU-funded tourism initiatives in Southern Europe suggests that inclusive development remains a central, but unevenly implemented, priority in national project portfolios, particularly in regions like Greece (Meneghini & Tuzzi, 2025).

**2.2 Sustainability in Industrial Tourism**

The sustainability framework for industrial tourism now encompasses four interlinked dimensions: economic, environmental, social, and inclusive (Badia et al., 2024). Grounded in Stakeholder Theory (Andrade & Caamaño-Franco, 2018), this model promotes cross-sector collaboration among public agencies, tourism enterprises, and local communities.

Economic sustainability supports entrepreneurship, jobs, and regional resilience (Otgaar, 2012), but must be balanced with ecological safeguards (Beer et al., 2018). Environmental sustainability prioritizes adaptive reuse, energy efficiency, and carbon-conscious infrastructure (Hidalgo-Giralt et al., 2021). Social sustainability focuses on heritage revitalization and inclusive participation in decision-making (Ruiz-Ballesteros & Hernández-Ramírez, 2007).

Inclusivity, now emerging as a multidimensional and dynamic pillar, extends beyond physical and linguistic accessibility to encompass affordability, cultural sensitivity, digital inclusion, intergenerational relevance, and co-created visitor narratives (Cerdan Chiscano & Darcy, 2021; Foroughi et al., 2025; Nag & Mishra, 2024; Suanpang & Pothipassa, 2024a). Tools such as digital storytelling, smart tourism apps, inclusive signage, and adaptive interpretation frameworks enhance heritage accessibility for visitors across diverse mobility, language, and cultural backgrounds (Kasemsarn et al., 2023).

Despite its growing importance, inclusivity is often overshadowed by economic or environmental metrics, an imbalance this study directly addresses. By repositioning inclusivity as a structural element of sustainable tourism, the research aligns with participatory and co-creative heritage planning models (Qiao et al., 2024; Quang et al., 2024) and responds to recent calls for systemic, people-centered sustainability frameworks (Dias et al., 2024).

In the Italian context, for example, Coruzzolo et al. (2025) underscore how sustainability strategies in industrial tourism are increasingly shaped by local governance models and regional planning initiatives, particularly in historically industrialized areas.

To better evaluate such complex interactions, scholars have also advocated for hybrid performance frameworks, combining qualitative sustainability goals with quantitative decision-making models (Peng & Tzeng, 2019), which enable multi-criteria assessment of trade-offs in tourism systems.

Recent scholarship also highlights the need to conceptualize sustainability through hybrid indicator models that integrate environmental stressors, socio-technical resilience, and dynamic governance capacity (Kuzior et al., 2021; Qiao et al., 2024). These approaches complement traditional frameworks by acknowledging the temporal and systemic complexity of sustainability in tourism systems, particularly in the context of industrial heritage and regional regeneration.

Additionally, Montenegro et al. (2023) emphasize that competitiveness and long-term viability in industrial tourism hinge on aligning sustainability efforts with innovation ecosystems and strategic

management capabilities, an insight especially pertinent to operational firms seeking to balance heritage with performance metrics.

### 2.3 The role of inclusivity

In this study, inclusivity is conceptually distinguished from accessibility and participation, although it partly incorporates both. Accessibility refers primarily to the removal of physical, sensory, linguistic, or digital barriers that prevent visitors from engaging with tourism experiences (Cerdan Chiscano & Darcy, 2021). Participation, by contrast, concerns the involvement of communities and stakeholders in planning, interpretation, and governance processes (Ruiz-Ballesteros & Hernández-Ramírez, 2007). Inclusivity is broader than both concepts because it refers to the extent to which diverse visitor groups and local communities are enabled not only to access heritage spaces, but also to recognize themselves in the narratives, services, and interpretive practices offered by those spaces (Qiao et al., 2024).

Previous research has often treated inclusivity as a secondary component of accessibility or as an ethical requirement attached to sustainable tourism planning. This has produced an important limitation in the literature: while physical access, community involvement, and digital tools are frequently discussed separately, their combined role in shaping visitor experience remains under-theorized (Kasemsarn et al., 2023). In industrial heritage tourism, this limitation is particularly relevant because post-industrial sites are not neutral visitor attractions; they are spaces where labor histories, technological change, social memory, and territorial identity are interpreted and contested (Hidalgo-Giralt et al., 2021). Accordingly, inclusivity must be understood not only as access provision, but as a condition that influences whose histories are represented, how visitors engage with them, and how heritage value is experienced (Guo et al., 2023).

This study therefore conceptualizes inclusivity as a cross-cutting sustainability dimension that integrates accessibility, affordability, linguistic and cultural representation, and digital inclusion. The proposed conceptual model assumes that inclusivity does not replace environmental, economic, or social sustainability, but conditions how these dimensions are translated into visitor-related outcomes (Suanpang & Pothipassa, 2024a). This theoretical positioning responds to limitations in previous studies that have tended to examine sustainability dimensions separately or through linear relationships, overlooking the possibility that inclusivity may operate in combination with other sustainability practices (Wang et al., 2022). By treating inclusivity as part of a configurational model, the study provides a clearer theoretical justification for examining how different combinations of sustainability dimensions are associated with visitor satisfaction (Song et al., 2025).

### 2.4 Sustainability and Visitor Satisfaction in Industrial Tourism

Contemporary industrial tourism embraces experience-centric, circular economy, and SDG-aligned strategies (Badia et al., 2024). Environmentally conscious tourists increasingly seek destinations that not only communicate green values but also facilitate local engagement and regenerative practices (Frantál & Urbánková, 2014; Hidalgo-Giralt et al., 2021).

Visitor satisfaction has evolved into a multi-dimensional and affective concept, incorporating emotional resonance, cultural relevance, inclusivity, digital engagement, and place attachment (Çolak & Karakan, 2024; Liang & Li, 2023; Guo et al., 2023). While immersive technologies and multisensory formats have shown promise in enhancing heritage experiences (Guo et al., 2023;

Trunfio et al., 2022), their application in industrial tourism remains limited and warrants further research.

Inclusivity is increasingly recognized as central to perceived experience quality, especially for visitors with limited mobility, linguistic barriers, or cultural distance (Cerdan Chiscano & Darcy, 2021). Smart tourism technologies, such as VR/AR, multilingual apps, and decentralized access platforms, are now reshaping how visitors connect with industrial heritage (Chang et al., 2024; Suanpang et al., 2024b; Tavitiyaman et al., 2021). Recent work highlights that digital inclusion and co-created experiences significantly enhance visitor empowerment, satisfaction, and revisit intentions.

Studies by Nag and Mishra (2024) further underline how heritage tourism initiatives contribute not only to destination revitalization but also to emotional attachment and cultural continuity, reinforcing the dual role of satisfaction as both experiential and developmental.

Still, most existing studies treat sustainability variables as isolated predictors and rely on linear modeling techniques. This study addresses these limitations by applying fsQCA to identify the configurational combinations of sustainability dimensions that lead to high visitor satisfaction. The method responds to calls for complexity-sensitive, systems-oriented tourism research (Song et al., 2025; Wang et al., 2022), and enhances understanding of how industrial tourism can deliver economically viable, inclusive, and emotionally meaningful visitor experiences.

In addition, recent studies (e.g., Cerdan Chiscano & Darcy, 2021; Beer et al., 2018; Sousa & Kastenholz, 2015) further reinforce the need for holistic, community-driven approaches in heritage tourism that integrate accessibility, emotional engagement, and sustainability. This study contributes to that emerging body of work.

## 3. Methodology

### 3.1 Research Context and Data Collection

This study draws on empirical data from the Sustainable Mediterranean Industrial Tourism (SMITour) project, a cross-national initiative co-funded by the European Union to advance sustainable and inclusive tourism practices in post-industrial regions. The project integrates environmental, economic, social, and inclusivity goals with industrial heritage preservation, offering an ideal context to explore pathways to visitor satisfaction through sustainability practices.

The research was conducted across six Mediterranean countries, Italy, Spain, Portugal, Slovenia, Greece, and Croatia, which together represent a diverse spectrum of industrial tourism models, sustainability strategies, and heritage management systems. These countries were selected due to their common policy orientation toward sustainable regional development via tourism and their active participation in the SMITour initiative.

Site eligibility followed a three-step protocol: (1) sites had to be operational or recently converted for tourism use; (2) they had to explicitly demonstrate engagement with at least two of the four sustainability dimensions (economic, social, environmental, inclusivity); (3) inclusion required publicly available or internally validated documentation of sustainability practices (e.g., site certifications, accessibility audits, or community project descriptions).

A total of 98 valid responses were gathered between March and July 2024 using purposive sampling. Data collection targeted site managers, tourism directors, and sustainability coordinators, who were identified via project databases and national tourism networks. These informants were selected for their strategic oversight and operational familiarity with site-level tourism programs. Their perspectives provided informed evaluations of sustainability implementation and its effect on visitor satisfaction.

### 3.2 Survey Design and Validation

A structured questionnaire was developed to evaluate the sustainability management practices of industrial tourism sites and their perceived impact on visitor satisfaction. The design was informed by an extensive review of tourism sustainability literature and aligned with the requirements and recommendations of ISO 21902:2021 on accessible tourism for all (International Organization for Standardization [ISO], 2021). The final instrument consisted of five sections: four addressed the core sustainability dimensions (economic, environmental, social, and inclusivity), while the fifth assessed perceived visitor satisfaction outcomes across both instrumental and affective indicators. Survey development followed a multi-stage, expert-informed process to ensure methodological rigor and cross-context relevance. First, an expert panel of 15 professionals, including academics, policymakers, and tourism practitioners from the SMITour consortium, participated in two rounds of content evaluation. This process ensured content validity, terminological consistency, and cross-cultural sensitivity, particularly given the multilingual and regionally diverse nature of the Mediterranean research sites. Second, a pilot test was conducted at five industrial heritage sites (one each in Italy, Spain, Portugal, Slovenia, and Greece), selected for their variation in industrial typology, tourism maturity, and geographic location. These pilot cases included former mining sites, textile mills, and hydroelectric facilities. Based on pilot feedback, minor revisions were made to simplify terminology, eliminate ambiguity, and enhance contextual adaptability across different heritage environments.

To reduce potential common method bias, the questionnaire design explicitly distinguished between the reporting of sustainability practices and the reporting of visitor-related outcomes, which were based on independently collected monitoring systems within each site. Respondents were instructed to rely on documented visitor data rather than subjective evaluations, thereby minimizing perceptual bias and same-source inflation effects (Song et al., 2025). While the study acknowledges that site-level aggregation may introduce some degree of standardization across diverse measurement systems, this approach provides a pragmatic and methodologically consistent solution for cross-country comparative research in industrial heritage tourism (Nag & Mishra, 2024).

Reliability analysis confirmed the internal consistency of all four sustainability subscales, with Cronbach's alpha values exceeding 0.70. These results validate the instrument's measurement robustness and support its use in cross-national configurational analysis. Additionally, the survey incorporated open-ended prompts following each sustainability section to allow respondents to describe specific practices, innovations, or challenges related to implementation, enriching the data with qualitative nuance.

### 3.3 Measures

The operationalization of sustainability was grounded in established theoretical models and international policy frameworks related to sustainable tourism, inclusive heritage management, and regional development. Four interlinked sustainability dimensions, environmental, economic, social, and inclusivity, were assessed using a mix of policy-aligned indicators and empirically validated items drawn from prior tourism studies.

To enhance construct validity and conceptual precision, each sustainability dimension was operationalized as a reflective composite grounded in established tourism and sustainability literature. Economic, environmental, and social dimensions were measured using indicators

aligned with prior research on industrial tourism development, regional resilience, and heritage governance (Otgaar, 2012; Hidalgo-Giralt et al., 2021; Andrade & Caamaño-Franco, 2018). These dimensions capture distinct yet interrelated aspects of sustainability, reflecting investment and economic integration, ecological management practices, and community engagement processes, respectively. More specifically, environmental sustainability was evaluated through items measuring the use of recycled or sustainable construction materials, energy-efficient infrastructure, water-saving technologies, and structured waste management systems. These practices reflect efforts to minimize the ecological footprint of industrial tourism operations. Economic sustainability was assessed by examining investment in tourism infrastructure, employment generation, support for local small and medium-sized enterprises, and integration of regional heritage assets into site programming and branding. Social sustainability was measured by the presence of educational programs about industrial heritage, quality and preservation of cultural interpretation, efforts to strengthen local pride and identity, and community participation in planning, governance, and event co-production.

Inclusivity was operationalized as a multidimensional construct encompassing physical accessibility, affordability, cultural and linguistic diversity, and digital inclusion. While these elements represent heterogeneous aspects, they are theoretically unified through their shared role in enabling equitable access to heritage experiences and reducing barriers to participation (Cerdan Chiscano & Darcy, 2021). This approach is consistent with recent tourism research that conceptualizes inclusivity as a systemic dimension of experience design, integrating accessibility, representation, and engagement across diverse visitor groups (Suanpang & Pothipassa, 2024a). Rather than treating inclusivity as a fragmented set of attributes, the study conceptualizes it as an integrative dimension that conditions how sustainability practices are experienced and interpreted (Guo et al., 2023).

All indicators were rated on a five-point Likert scale, from “not implemented” (1) to “fully implemented” (5), allowing the research to capture degrees of implementation across diverse sites. All constructs were measured using multiple indicators and assessed for internal consistency, with Cronbach’s alpha values exceeding the recommended threshold of 0.70, confirming acceptable reliability. To provide a concise overview of the measurement model, Table 1 summarizes the operationalization of all constructs, including the number of items, example indicators, primary data sources, and reliability scores.

**Table 1.**
Measurement Model Summary

| Construct | Number of Items | Example Indicators | Data Source | Reliability (Cronbach's α) |
|---|---|---|---|---|
| **Environmental Sustainability** | 4 | Energy-efficient infrastructure; water-saving technologies; waste management systems. | Key Informant Survey (Site Managers) | 0.82 |
| **Economic Sustainability** | 5 | Tourism infrastructure investment; local SME support; employment generation. | Key Informant Survey (Site Managers) | 0.79 |

| | | | | |
|---|---|---|---|---|
| **Social Sustainability** | 4 | Community participation in planning; heritage educational programs. | Key Informant Survey (Site Managers) | 0.85 |
| **Inclusivity** | 4 | Physical accessibility; multilingual interpretation; digital inclusion tools. | Key Informant Survey (Site Managers) | 0.88 |
| **Visitor Satisfaction** | 1 | Described in table 2. | Consolidated Site-Level Monitoring Data | - |

The aggregation of indicators into composite dimensions follows established practices in tourism research, particularly in studies addressing complex and multidimensional phenomena such as sustainability and visitor experience (Liang & Li, 2023). While the use of composite constructs may involve some degree of abstraction, it provides a robust and parsimonious representation of multidimensional concepts, enabling their integration into configurational analysis (Song et al., 2025). This approach is particularly appropriate in fsQCA studies, where the focus lies on identifying meaningful combinations of conditions rather than isolating the effects of individual indicators.

Although key informants (site managers, tourism directors, and sustainability coordinators) participated in the survey, the measurement of visitor satisfaction does not rely on their subjective perceptions. Instead, respondents were asked to report consolidated visitor-related performance data routinely collected at the site level, including structured feedback systems, visitor surveys, and monitoring tools used within each industrial heritage destination. These data reflect aggregated and operationalized assessments of visitor satisfaction derived from actual visitor inputs rather than managerial opinion. This approach is consistent with prior tourism research that utilizes site-level reporting mechanisms to capture visitor experience outcomes in contexts where direct primary data collection across multiple locations is not feasible (Liang & Li, 2023). Moreover, the use of standardized indicators aligned with sustainability and experience frameworks enhances the comparability and validity of the reported outcomes across heterogeneous sites (Guo et al., 2023).

To address the inherent heterogeneity of site-level monitoring systems, specific harmonization procedures and minimum comparability criteria were applied. To be included in the analysis, sites were required to base their reported satisfaction scores on systematically collected visitor data from at least the preceding 12-month period, ruling out anecdotal or purely observational estimates. Because original internal metrics varied (e.g., 10-point scales, percentage-based indices, or 5-star online rating aggregates), site managers were instructed to map their consolidated internal scores onto the survey's standardized 1-to-5 scale. Where sites utilized multiple parallel tracking methods (e.g., combining on-site surveys with digital feedback), managers reported the triangulated average utilized in their internal reporting, which provided a degree of internal convergence.

To maximize construct transparency, Table 2. summarizes the primary data sources underlying the visitor satisfaction scores reported by the 98 sampled sites. While some degree of measurement standardization is unavoidable in cross-national heritage research, this distribution confirms that the outcomes are grounded in empirical visitor feedback rather than managerial perception.

**Table 2.**
Distribution of Primary Visitor Satisfaction Data Sources (N = 98)

| Primary Data Source | Description | Percentage of Sites (%) |
|---|---|---|
| **On-site Visitor Surveys** | Formal questionnaires administered at the end of the visit. | 42% |
| **Digital / Online Reviews** | Aggregated sentiment and ratings from major travel platforms or site apps. | 25% |
| **Internal Feedback Forms** | Comment cards, digital kiosks, or post-visit email feedback. | 18% |
| **Mixed / Triangulated Systems** | Formal internal indices combining surveys, reviews, and behavioral metrics. | 15% |

### 3.4 Data Analysis

To explore the complex and context-sensitive relationships between sustainability dimensions and visitor satisfaction, this study employed fsQCA, which is especially suited to small-to-medium-N studies characterized by causal complexity, equifinality, and conjunctural causation. The choice of fsQCA is grounded in the recognition that industrial heritage tourism outcomes may emerge from interactions among multiple interdependent conditions rather than from isolated net effects. In such contexts, traditional variable-oriented approaches, such as regression or structural equation modeling, do not directly identify alternative sufficient combinations through which similar outcomes can arise (Wang et al., 2022). fsQCA is therefore appropriate because it identifies multiple sufficient configurations and accommodates asymmetric relationships between conditions and outcomes (Song et al., 2025). This aligns with the systemic and relational nature of sustainability in tourism, where environmental, economic, social, and inclusivity dimensions interact dynamically rather than independently (Nag & Mishra, 2024).

Exploratory bivariate analysis showed moderate positive associations among the sustainability dimensions ($r = 0.41$ to $0.58$), but no evidence of high collinearity. The use of fsQCA was therefore not motivated by problematic multicollinearity; it was selected because the research objective concerns combinations of conditions associated with high visitor-related outcomes. Unlike regression-based approaches that estimate isolated net effects, fsQCA is designed to examine conjunctural causation, equifinality, and asymmetric associations, making it appropriate for the complexity of sustainability-performance linkages in heterogeneous tourism settings (Guo et al., 2023). The method is therefore consistent with the study's aim to explore how different sustainability pathways coexist and are associated with similar experiential outcomes.

Data analysis followed a structured four-stage protocol. First, survey responses were aggregated by sustainability dimension and standardized to account for national variation in implementation levels. Second, these normalized scores were calibrated into fuzzy-set membership scores ranging from 0 to 1. The calibration of raw data into fuzzy-set membership scores follows established methodological guidelines, combining theoretical reasoning with empirical distribution criteria. Thresholds for full membership, crossover, and full non-membership were defined based on both conceptual anchors and observed data patterns, ensuring that set membership reflects meaningful distinctions in the degree of sustainability implementation across sites (Ragin, 2008). To enhance robustness, alternative calibration thresholds were tested, and the resulting configurations remained stable, confirming that the findings are not sensitive to minor variations in calibration

parameters (Wang et al., 2022). Direct calibration was used, with full membership assigned to scores of 4.5 and above, full non-membership to scores of 2 or below, and a crossover point of 3 denoting maximum ambiguity. These calibration thresholds were guided by both theoretical benchmarks and empirical distribution patterns in the dataset, and are consistent with recent fsQCA tourism applications (Guo et al., 2023).

To ensure the robustness of calibration, thresholds were tested against alternative values (e.g., crossover points of 2.75 and 3.25), and the sufficiency configurations remained stable. The consistency threshold for the truth table was set at 0.796, based on the coverage-consistency balance for this medium-N study. The final solution exhibited a consistency of 0.716 and coverage of 0.634, as reported in Section 4.3 and Table 5. Given the moderate solution consistency, the configurations are interpreted as empirically relevant patterns of association rather than deterministic rules (Ragin, 2008).

Third, necessity analysis was conducted to determine whether any single sustainability dimension was consistently present in cases of high visitor satisfaction. A condition was considered necessary if its consistency exceeded the 0.90 threshold. Fourth, sufficiency analysis was performed using the truth table algorithm in fs/QCA software (version 4.1), with a frequency threshold of two and a consistency cutoff of 0.796. These parameters align with best practices for configurational analysis in medium-sized samples.

The fsQCA yielded three high-sufficiency configurations for visitor satisfaction, each demonstrating different combinations of sustainability practices. Notably, inclusivity appeared as a core condition across all successful configurations, reinforcing its strategic role in enhancing both the ethical and experiential dimensions of industrial tourism. This finding supports emerging literature that views inclusivity not as a peripheral accessibility concern but as a foundational element of sustainable experience design.

Robustness checks were carried out by recalibrating thresholds, comparing intermediate and parsimonious solutions, and running random case exclusion tests (10%) to confirm the stability of the results. All configurations remained consistent across these tests, confirming the empirical reliability and interpretative validity of the configurational findings.

## 4. Results and Discussion

### 4.1 Descriptive Statistics and Calibration Summary

Descriptive statistics were generated to evaluate the distributional characteristics of each sustainability dimension and visitor satisfaction prior to calibration. The mean implementation scores across the 98 industrial tourism sites reveal moderate-to-high engagement in sustainability practices, although notable variation exists across countries and dimensions. Table 3 presents the minimum, maximum, mean, and standard deviation for each of the five constructs (economic, environmental, social, inclusivity, and visitor satisfaction).

**Table 3.**

Descriptive Statistics of Sustainability Dimensions and Visitor Satisfaction (N = 98)

| Dimension | Min | Max | Mean | SD |
|---|---|---|---|---|
| Economic Sustainability | 2.00 | 5.00 | 3.86 | 0.71 |
| Environmental | 1.75 | 5.00 | 3.62 | 0.76 |
| Social | 2.25 | 5.00 | 3.74 | 0.68 |
| Inclusivity | 1.50 | 5.00 | 3.59 | 0.79 |
| Visitor Satisfaction | 2.00 | 5.00 | 3.91 | 0.65 |

The results indicate that economic sustainability had the highest mean score, reflecting robust infrastructure investment and regional integration across most sites. Inclusivity, by contrast, recorded the lowest mean and highest standard deviation, suggesting uneven implementation of accessibility and engagement strategies. This heterogeneity is especially relevant given that inclusivity emerged as a necessary condition in subsequent fsQCA analysis.

Consistent with the analytical rationale in Section 3.4, exploratory bivariate correlations among the sustainability dimensions were moderate ($r = 0.41$ to $0.58$), indicating related but empirically distinct dimensions rather than problematic collinearity. The configurational method was selected to address conjunctural causation and equifinality, not as a remedy for multicollinearity.

Prior to calibration, histogram analysis and boxplots were used to visualize score distributions, confirming sufficient variance within each dimension for fuzzy-set analysis. These descriptive diagnostics informed the direct calibration strategy, which used theoretical anchors to define thresholds (full membership $\geq 4.5$, crossover at 3.0, full non-membership $\leq 2.0$). This transparent calibration logic enhances replicability and aligns with best practices in sustainability-focused fsQCA research (Guo et al., 2023).

### 4.2 Necessity Analysis

The necessity analysis examines whether any single condition, among the sustainability dimensions, must be present for the outcome of high visitor satisfaction to occur. In fsQCA, a condition is considered "necessary" when it appears in nearly all configurations that produce the outcome, with a consistency threshold of $\geq 0.90$ (Ragin, 2008).

Table 4 reports the consistency and coverage values for each condition and its negation. Consistency values above the 0.90 threshold suggest a condition may be necessary, while coverage indicates the empirical relevance of that condition in accounting for observed cases.

**Table 4.**

Necessity Analysis Results for High Visitor Satisfaction (Threshold ≥ 0.90)

| Condition | Consistency | Coverage |
|---|---|---|
| Economic Sustainability | 0.832 | 0.741 |
| Environmental Sustainability | 0.794 | 0.701 |
| | | |
| Social Sustainability | 0.868 | 0.763 |
| Inclusivity | 0.912 | 0.786 |
| ~Economic Sustainability | 0.522 | 0.481 |
| ~Environmental Sustainability | 0.614 | 0.493 |
| ~Social Sustainability | 0.578 | 0.447 |
| ~Inclusivity | 0.368 | 0.311 |

Under the baseline calibration, inclusivity exceeds the conventional necessity-consistency threshold of 0.90 (consistency = 0.912; Ragin, 2008), suggesting that it may be treated as a necessary condition for high visitor satisfaction within the empirical scope of this study. Because this value clears the threshold by a narrow margin, the finding is interpreted cautiously and is not treated as evidence that inclusivity independently produces the outcome.

However, this result should be interpreted with caution. In configurational research, necessity does not imply causal sufficiency, nor does it indicate that a single condition independently produces

the outcome (Wang et al., 2022). Instead, it reflects a consistent empirical association within the observed configurations. In this study, the role of inclusivity is better understood as a foundational condition that operates in combination with other sustainability dimensions, rather than as an isolated causal driver.

This interpretation is reinforced by the sufficiency analysis, where inclusivity appears as a core condition across all identified configurations, but always in conjunction with environmental, economic, or social dimensions. Therefore, inclusivity can be interpreted as a structurally central and empirically consistent condition within the configurational model, while the achievement of high visitor satisfaction depends on its interaction with other sustainability practices (Song et al., 2025; Nag & Mishra, 2024).

To visualize the necessity pattern, Figure 1 plots the consistency scores for all four sustainability dimensions, clearly highlighting inclusivity's unique standing. These results also align with recent scholarship suggesting that inclusivity is not only a moral imperative but a strategic enabler of affective and experiential satisfaction in tourism. As visitor profiles diversify in the post-COVID landscape, equitable access and co-created narratives are proving essential to holistic visitor experiences.

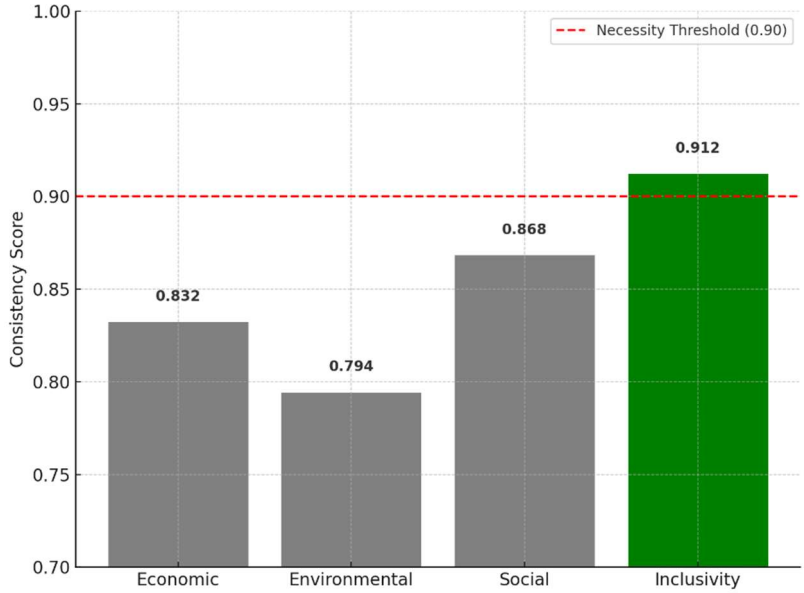


**Figure 1:** Necessity Analysis – Consistency of Sustainability Dimensions

### 4.3 Sufficiency Conditions Test

The overall solution consistency of 0.716 is within the acceptable range for fsQCA studies, particularly in medium-N samples characterized by high contextual and configurational complexity (Ragin, 2008). While this value is relatively close to the lower bound of commonly accepted thresholds, it reflects the heterogeneous nature of industrial heritage tourism systems across different national and institutional contexts. In such settings, greater diversity in sustainability practices and governance structures may lead to slightly lower consistency values, without undermining the substantive relevance of the identified configurations (Wang et al., 2022). While the overall solution coverage indicates meaningful explanatory power, the moderate overall consistency (0.716) suggests that these results should be interpreted with appropriate caution. Rather than capturing highly rigid rules or absolute explanatory distinctiveness, these

configurations reflect empirically relevant, albeit nuanced, patterns of association within a complex and context-dependent system (Song et al., 2025).

This analytical approach, rooted in fsQCA, enables the identification of multiple, equally effective pathways, termed configurations, through which combinations of sustainability dimensions contribute to desired tourism outcomes. Three empirically robust and theoretically meaningful configurations emerged, as shown in Table 5, each representing a distinct sustainability pathway to high satisfaction.

All three configurations indicate that inclusivity plays a fundamental role in achieving high visitor satisfaction, as it is present in every solution. This underscores inclusivity not merely as an ethical imperative but as a strategic driver of tourism experience quality.

Configuration 1 (C1) links environmental sustainability with inclusivity, suggesting that eco-friendly practices, when combined with accessible and inclusive visitor experiences, create conditions conducive to high satisfaction. This configuration reflects an "Eco-Inclusivity" model and is exemplified by a textile museum in Spain that incorporates green building features, waste recycling systems, and multilingual interpretation displays.

Configuration 2 (C2) associates economic sustainability with inclusivity, highlighting the importance of financial investment in local development and equitable access to tourism benefits in driving positive visitor perceptions. This "Economic-Inclusivity" pathway is observed at an energy plant visitor center in Italy, where local employment generation is paired with universally accessible infrastructure and pricing schemes.

Configuration 3 (C3) demonstrates that social sustainability, through heritage education, community engagement, and identity preservation, when supported by inclusive practices, fosters enriched and meaningful visitor experiences. A mining heritage park in Slovenia serves as an example of this "Socio-Inclusivity" configuration, offering co-created exhibitions, intergenerational storytelling, and guided tours in multiple languages.

**Table 5.**
Configurations for High Visitor Satisfaction

| Configuration | Core Conditions | Site Example | Raw Coverage | Unique Coverage | Consistency |
|---|---|---|---|---|---|
| C1: Eco-Inclusivity | Environmental + Inclusivity | Textile Museum (Spain) | 0.509 | 0.052 | 0.772 |
| C2: Economic-Inclusivity | Economic + Inclusivity | Energy Plant Visitor Center (Italy) | 0.498 | 0.010 | 0.761 |
| C3: Socio-Inclusivity | Social + Inclusivity | Mining Heritage Park (Slovenia) | 0.544 | 0.050 | 0.756 |

Solution consistency**:** 0.716
Solution coverage**:** 0.634

These results provide empirical evidence that there is no singular sustainability blueprint for achieving high visitor satisfaction in industrial tourism. Instead, different configurations demonstrate that satisfaction is co-constructed through various combinations of strategic sustainability practices, with inclusivity serving as the common foundation across all successful

pathways. The findings reinforce the necessity of multi-dimensional sustainability strategies that holistically integrate economic, social, and environmental elements to enhance the visitor experience.

Notably, these results extend prior tourism studies by demonstrating that satisfaction is not a linear outcome of isolated sustainability factors, but a result of synergistic interactions between them.

To further illustrate the relative strength of each configuration, Figure 2 presents a comparative bar chart of consistency scores, showing that the three pathways display comparable, moderate levels of consistency and should be interpreted as context-dependent strategic patterns rather than deterministic prescriptions.

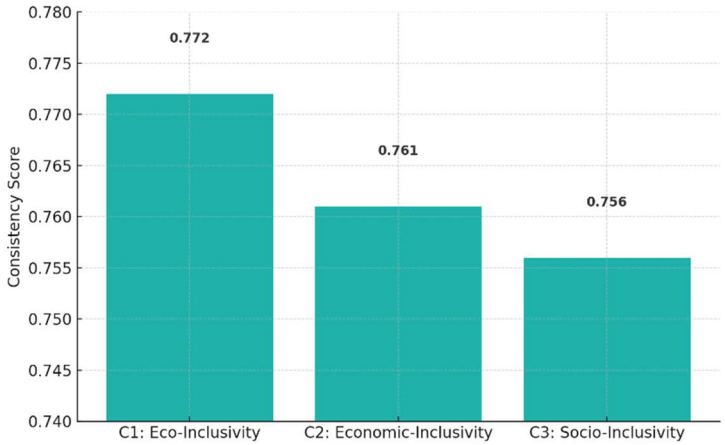


**Figure 2.** Consistency Scores for fsQCA Configurations

These findings deepen our understanding of how sustainability dimensions interact to shape visitor satisfaction in industrial tourism. The configurational analysis identified three distinct pathways, each revealing the pivotal role of inclusivity in tandem with another sustainability focus:

Configuration 1 (Eco-Inclusivity) underscores that environmentally responsible practices, such as renewable energy use, green infrastructure, and waste management, must be paired with accessibility to generate broad-based appeal (Frantál & Urbánková, 2014; Beer, Rybár, & Kaľavský, 2018).

Configuration 2 (Economic-Inclusivity) validates that investments in local employment, regional branding, and SME integration, when combined with equitable visitor access, can meaningfully improve tourist satisfaction (Badia et al., 2024; Otgaar, 2012).

Configuration 3 (Socio-Inclusivity) reflects how community-based tourism, heritage preservation, and cultural revitalization, in conjunction with inclusive services, enhance visitor immersion and emotional resonance (Ruiz-Ballesteros & Hernández-Ramírez, 2007; Hidalgo-Giralt et al., 2021).

These findings also carry significant managerial implications. First, industrial tourism site operators should tailor their sustainability strategies based on their core strengths, whether environmental, economic, or social, but ensure that inclusive practices are integrated across all domains. For example, destinations excelling in environmental performance must simultaneously address physical and informational accessibility to ensure positive experiences across diverse visitor segments. Second, regional tourism policymakers should promote supportive frameworks, such as financial incentives, accessibility standards, and community training programs, that encourage integrative sustainability practices.

Finally, the fsQCA approach reveals that a 'one-size-fits-all' model is insufficient. Instead, customizable sustainability configurations that align with a site's resources and stakeholder capacities are more likely to result in high levels of visitor satisfaction. These insights underscore the necessity of context-aware, inclusive, and strategically balanced sustainability initiatives in industrial tourism management, particularly in heritage-rich yet economically evolving regions such as Southern Europe.

### 4.4 Robustness and Sensitivity Analysis

To verify the credibility and consistency of the fsQCA results, a series of robustness and sensitivity checks were conducted. These tests help assess whether the identified configurations leading to high visitor satisfaction are not merely artifacts of the specific calibration thresholds or sample composition, but hold under varying analytical conditions.

First, alternative sufficiency-consistency thresholds were applied. The original sufficiency analysis used a threshold of 0.796. To test robustness, the analysis was repeated using a slightly higher threshold (0.82) and a lower bound (0.75). Across both alternative scenarios, the same three configurations re-emerged with minor variations in raw coverage, supporting the stability of the sufficiency solution. These tests do not independently confirm the necessity classification. Because inclusivity's baseline necessity consistency is 0.912, only slightly above 0.90, the necessity finding is reported as baseline-calibration evidence and interpreted cautiously.

Second, a random-case exclusion test was applied, where 10% of cases (n = 10) were randomly removed from the dataset. This stress test was repeated across three different random samples. In all three cases, the core conditions and pathways remained stable, reinforcing the internal reliability of the fsQCA solution and mitigating concerns about outlier sensitivity or case-dependent artifacts.

Third, intermediate and parsimonious solutions were compared using fsQCA software. Across all solution types, inclusivity remained a recurring core condition, and the overall structure of Eco-Inclusivity, Economic-Inclusivity, and Socio-Inclusivity pathways was preserved. This triangulation further strengthens the configurational interpretation and suggests theoretical robustness. Table 6 summarizes the results of these robustness checks:

**Table 6.**

Robustness and Sensitivity Check Summary

| Test Type | Applied Parameters | Outcome |
|---|---|---|
| Threshold variation | Consistency: 0.75 and 0.82 | Same 3 configurations re-emerged; minor changes in raw coverage |
| Random case exclusion (10%) | 3 randomized samples | Core conditions remained stable in all cases |
| Solution comparison | Intermediate vs. Parsimonious | Inclusivity remained in all solutions |

These checks confirm that the three sufficiency configurations are not artifacts of a single truth-table threshold, solution type, or case subset. They therefore strengthen confidence in the configurational findings. However, they do not independently establish that inclusivity remains above the 0.90 necessity threshold under alternative calibration anchors; accordingly, the necessity result is interpreted more cautiously than the sufficiency solution.

### 4.5 Discussion and Interpretation of Configurations

The findings of this study should be interpreted as evidence of empirically consistent associations between sustainability configurations and visitor-related outcomes, rather than direct causal effects. The configurational results indicate that high levels of visitor satisfaction are associated with different combinations of sustainability dimensions, reinforcing the idea that tourism performance emerges from interdependent and context-sensitive practices rather than isolated factors (Wang et al., 2022). This aligns with prior research emphasizing the systemic nature of sustainability in tourism, where outcomes are shaped by interactions among economic, environmental, and social conditions (Badia et al., 2024). In this sense, the study contributes to shifting the analytical focus from linear causality to configurational patterns of association (Song et al., 2025).

Inclusivity emerges as a recurring and empirically central condition across all identified configurations, suggesting that it plays a consistent role in shaping how sustainability practices are experienced by visitors. However, rather than interpreting inclusivity as an independent causal driver, the results indicate that its relevance lies in its interaction with other sustainability dimensions. This interpretation is consistent with research highlighting that accessibility, cultural representation, and digital inclusion function as enabling conditions that enhance the perceived value of tourism experiences (Cerdan Chiscano & Darcy, 2021). Therefore, inclusivity should be understood as a condition that amplifies or conditions the effects of other sustainability practices, rather than as a standalone determinant of visitor satisfaction (Guo et al., 2023).

The three identified configurations, eco-inclusivity, economic-inclusivity, and socio-inclusivity, illustrate distinct pathways through which sustainability practices are associated with visitor satisfaction. Rather than representing competing models, these configurations reflect alternative combinations of strengths across sites, consistent with the principle of equifinality (Wang et al., 2022). For example, environmentally oriented sites appear to rely on the combination of ecological practices and inclusive access to enhance visitor experience, while economically oriented sites leverage investment and local integration alongside inclusive strategies. Similarly, socially oriented sites emphasize community engagement and cultural interpretation, which, when combined with inclusivity, are associated with higher levels of visitor satisfaction. This comparative perspective highlights that different strategic priorities can lead to similar experiential outcomes when inclusivity is integrated into the overall sustainability approach (Nag & Mishra, 2024). While these configurations offer valuable strategic templates, the overall solution consistency (0.716) requires that the robustness and explanatory distinctiveness of these pathways be interpreted with a degree of restraint. Although the threshold is theoretically acceptable for complex, medium-N tourism samples, its moderate nature implies that these configurations represent empirically viable routes rather than mutually exclusive or deterministic models. Within these broad pathways, local contextual factors, unmeasured site-specific variables, and varying governance dynamics likely introduce additional variation in how sustainability practices translate into visitor satisfaction.

While the findings provide valuable insights into sustainability configurations, caution is required in extending these results to broader constructs such as emotional engagement, cultural meaning, or regenerative outcomes, which were not directly measured in this study. The use of aggregated visitor satisfaction indicators captures general experiential evaluations but does not fully reflect

the depth or qualitative dimensions of visitor experience. Therefore, interpretations related to deeper experiential or transformative outcomes should be considered as theoretically informed extensions rather than empirically validated conclusions (Liang & Li, 2023).

## 5. Conclusions and Implications

### 5.1 Theoretical Contributions

This study contributes to the industrial heritage tourism literature by advancing a configurational understanding of how sustainability dimensions relate to visitor-related outcomes. Rather than proposing a new sustainability paradigm, the study offers an integrative perspective that explains how economic, environmental, social, and inclusivity practices operate in combination to shape visitor satisfaction. This contribution lies not in introducing new dimensions, but in demonstrating how their interaction produces multiple, context-dependent pathways to similar outcomes (Wang et al., 2022). By applying a configurational approach to industrial heritage tourism, the study responds to recent calls for moving beyond linear models and provides empirical evidence of equifinality in sustainability-performance relationships (Song et al., 2025). In this sense, the novelty of the study is grounded in its methodological perspective and its integrative interpretation of sustainability practices, rather than in the introduction of new constructs (Badia et al., 2024).
To ensure conceptual and empirical alignment, the study focuses on sustainability dimensions and visitor satisfaction as its primary analytical constructs. Broader interpretive frameworks, such as regeneration, are treated as contextual perspectives rather than empirically tested outcomes. This distinction allows the study to maintain conceptual relevance while ensuring that its claims remain consistent with the scope of the data and analysis (Liang & Li, 2023).

### 5.2 Practical and Policy Implications

From a managerial perspective, the results suggest that industrial heritage sites should prioritize the integration of inclusivity within their dominant sustainability strategy, whether environmental, economic, or social. Rather than adopting a uniform approach, site managers can leverage their existing strengths while ensuring that accessibility, affordability, and inclusive communication are systematically embedded in their operations. For policymakers, the findings highlight the importance of supporting flexible and context-sensitive sustainability frameworks that allow destinations to develop differentiated pathways while maintaining a consistent emphasis on inclusive access (Hidalgo-Giralt et al., 2021). These implications remain grounded in the configurational nature of the findings and reflect actionable strategies that can be implemented across diverse heritage contexts (Badia et al., 2024).

### 5.3 Limitations and Future Research

This study provides a configurational perspective on how sustainability dimensions are associated with visitor satisfaction in industrial heritage tourism. Its primary contribution lies in demonstrating that multiple combinations of economic, environmental, social, and inclusivity-related practices are empirically associated with similar visitor-related outcomes, reinforcing the relevance of equifinality in tourism systems (Wang et al., 2022). Rather than introducing new constructs, the study advances understanding by showing how established sustainability dimensions operate in combination within a complex and context-dependent setting (Badia et al., 2024).

At the same time, the findings should be interpreted in light of several methodological and empirical limitations. First, although visitor satisfaction is based on aggregated data collected through site-level monitoring systems, the study relies on standardized reporting across heterogeneous contexts, which may involve differences in measurement practices and levels of precision (Liang & Li, 2023). Second, the use of cross-sectional data limits the ability to capture how sustainability configurations evolve over time or respond to external changes, such as policy shifts or technological developments (Song et al., 2025). Third, the aggregation of multidimensional constructs, particularly inclusivity, may simplify complex phenomena, potentially masking internal variations across its components (Cerdan Chiscano & Darcy, 2021).

Importantly, these limitations are directly related to the scope of the findings. The identified configurations should be interpreted as empirically consistent patterns within the analyzed sample rather than universally generalizable models. The results highlight how sustainability practices are associated with visitor satisfaction in specific institutional and geographical contexts, rather than establishing deterministic or causal relationships (Nag & Mishra, 2024).

Despite its strengths, fsQCA does not establish causality in the strict statistical sense and should be interpreted as identifying empirically consistent configurations rather than definitive causal relationships. The method is also sensitive to calibration choices and case selection, which may influence the resulting configurations. To address these limitations, the study incorporates robustness checks and explicitly acknowledges the scope conditions of the findings. Future research could complement configurational analysis with longitudinal or mixed-method approaches to further validate the identified pathways.

Future research can build on these findings in several ways. First, studies could disaggregate inclusivity into its core components (e.g., accessibility, affordability, digital inclusion) to examine their differentiated roles within sustainability configurations (Qiao et al., 2024). Second, longitudinal designs could be used to analyze how configurations change over time and how destinations adapt their sustainability strategies in response to evolving environmental and market conditions (Song et al., 2025). Third, future research could incorporate multi-source data, including direct visitor surveys and behavioral data, to complement site-level indicators and provide a more comprehensive understanding of visitor experience outcomes (Guo et al., 2023). Finally, comparative studies across different regions beyond the Mediterranean could assess the transferability of the identified configurations under varying governance and cultural conditions (Hidalgo-Giralt et al., 2021).

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