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Exploring the dynamics of well-being in tourism: A systems thinking approach

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ABSTRACT

This study aims to develop a systems-based understanding of how tourism activities influence the well-being of tourists, workers, and residents in high-density tourism destinations affected by sustained visitation pressure. Drawing on Systems Thinking and System Dynamics, a qualitative-conceptual research design was employed to construct a Causal Loop Diagram (CLD) grounded in a structured synthesis of tourism well-being literature. The resulting dynamic hypothesis integrates previously fragmented perspectives by modeling the reciprocal interactions among key stakeholder groups within a single tourism well-being system. The analysis identifies four interconnected feedback structures: a balancing loop associated with tourists' temporary restoration of life satisfaction, a reinforcing loop linking worker dissatisfaction to declining service quality, a balancing loop connecting overtourism to reductions in residents' quality of life, and an integrative loop that captures the systemic trade-offs between destination competitiveness, overtourism, and service quality. Together, these feedback mechanisms suggest that tourism systems may progressively generate suboptimal well-being conditions when destination growth exceeds social, organizational, and environmental capacities. The study contributes to tourism well-being research by moving beyond static and actor-specific approaches toward a dynamic representation of systemic interdependencies. As a theory-building contribution, the proposed CLD provides a transparent dynamic hypothesis and a conceptual foundation for future Stock-and-Flow simulation models, sensitivity analyses, and evidence-informed destination management strategies.

1. Introduction

Well-being has become a central performance criterion across public, organizational, and community decision-making contexts. International institutions have incorporated subjective quality-of-life indicators into public policy assessment frameworks through instruments such as the Better Life Index (OECD, 2020). Similarly, organizations increasingly adopt management practices aimed at improving employees' multidimensional well-being because of its effects on productivity, resilience, and social integration (Grant et al., 2007). At the community level, well-being frameworks emphasize residents' perceptions of local conditions, infrastructure, services, and social cohesion as key determinants of quality of life (Sirgy et al., 2010). Consequently, extensive research has explored both the antecedents of well-being and its implications for

health, social participation, citizenship, and human flourishing (Diener et al., 2018).

Tourism represents a particularly relevant context for the study of well-being because the industry's value proposition is fundamentally associated with experiences that enhance life satisfaction, leisure fulfillment, and social interaction (Bagheri et al., 2023). However, contemporary tourism research increasingly recognizes that destination success cannot be evaluated exclusively through economic indicators such as visitor growth, expenditure, or competitiveness (Berbekova et al., 2023). Instead, recent scholarship argues that tourism development should also be assessed according to its capacity to sustain the well-being of the multiple stakeholders involved in the tourism system, particularly tourists, workers, and residents (Dwyer, 2023; Uysal & Sirgy, 2019). This shift has become especially relevant in high-density

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tourism destinations and overtourism contexts, where the intensification of tourism activity often generates tensions between economic performance, social sustainability, environmental preservation, and quality of life.

Over the last decades, tourism well-being research has expanded considerably, particularly regarding tourists' subjective well-being (Vada et al., 2020), residents' quality of life (Uysal et al., 2016), and hospitality employees' job satisfaction and happiness (Han et al., 2022). Nevertheless, these dimensions have largely been examined as separate analytical domains. Existing studies frequently rely on cross-sectional and linear methodologies that isolate stakeholder groups and model relationships as static associations between predefined variables. While approaches such as structural equation modeling contribute to explaining causal relationships, they remain limited in their capacity to represent endogenous feedback processes, circular causality, temporal delays, and emergent system behaviors that characterize tourism destinations as complex adaptive systems (Garzón Vázquez et al., 2025). Consequently, current research is constrained not only by methodological fragmentation but also by a systemic limitation: the inability to conceptualize well-being as an evolving outcome emerging from reciprocal interactions among key tourism actors over time.

This limitation becomes particularly evident in overtourism and high-density destination scenarios. For instance, short-term increases in tourist satisfaction and destination competitiveness may simultaneously intensify work overload, infrastructure saturation, cultural commodification, and residents' social resistance. Beyond their economic implications, these processes directly affect the environmental and cultural resources that sustain destination identity and community well-being. In particular, infrastructure saturation reduces residents' access to public services and shared spaces, while the exclusion or commodification of local heritage weakens place attachment, cultural continuity, and community belonging—factors consistently associated with quality of life and support for tourism development (Lo & Mc Kercher, 2023).

Although these dynamics may initially reinforce visitation growth, their cumulative effects can progressively undermine worker well-being, community quality of life, and eventually tourist satisfaction itself. Such recursive and delayed effects are difficult to identify using static models because they depend on feedback structures operating across multiple actors and temporal scales. Therefore, understanding tourism well-being requires moving beyond isolated stakeholder analysis toward a systems-oriented perspective capable of capturing reinforcing and balancing dynamics within the destination ecosystem.

Within this context, System Dynamics offers a particularly suitable analytical framework because it enables the representation of non-linear interdependencies, feedback loops, accumulative effects, and temporal evolution in complex social systems (Sterman, 2000). More specifically, Causal Loop Diagrams (CLDs) provide a conceptual mechanism for formalizing the structure of dynamic systems by making explicit the reciprocal causal relationships among variables and identifying reinforcing and balancing feedback processes. In contrast to predictive statistical approaches, CLDs prioritize structural explanation rather than numerical estimation, functioning as theory-building devices that synthesize fragmented knowledge into an integrated systemic architecture. Consequently, the value of a CLD does not reside in forecasting exact outcomes but in revealing how interactions among system components may generate counterintuitive or suboptimal behaviors over time (Porter, 2018).

The dynamic hypothesis proposed in this study suggests that tourism destinations characterized by high tourism density tend to evolve toward suboptimal well-being states because short-term mechanisms that reinforce destination competitiveness simultaneously activate delayed balancing and reinforcing feedback loops that progressively erode worker satisfaction, residents' quality of life, and eventually tourist well-being itself. In this sense, destination well-being is conceptualized not as the isolated satisfaction of individual stakeholders but as an emergent systemic condition resulting from the interaction between economic

growth, social sustainability, environmental pressures, and tourism governance.

Accordingly, this study addresses a critical gap in tourism well-being research by conceptualizing tourists', workers', and residents' well-being as an interdependent, dynamic, and nonlinear system. The aim of this research is to develop a systems-thinking framework capable of explaining how tourism activities co-produce well-being outcomes across key actors in high-density tourism destinations. Specifically, the study pursues four objectives: (1) to identify the principal well-being dynamics affecting tourists, workers, and residents; (2) to formalize the reinforcing and balancing feedback structures linking these actors; (3) to synthesize fragmented tourism well-being theories into an integrative conceptual framework through a Causal Loop Diagram; and (4) to propose a dynamic hypothesis explaining how tourism systems may evolve toward suboptimal well-being conditions over time.

By integrating social, environmental, and experiential dimensions within a single systemic structure, this study contributes to tourism scholarship in several ways. First, it reconceptualizes destination well-being as an emergent property of interconnected stakeholder dynamics rather than as isolated individual outcomes. Second, it advances the application of systems thinking in tourism research by explicitly modeling feedback mechanisms, temporal trade-offs, and recursive interactions frequently overlooked in static approaches. Third, the resulting CLD establishes a conceptual foundation for future simulation-based research and policy experimentation (Ghaffarzadegan et al., 2011) aimed at identifying leverage points for improving destination sustainability, resilience, and long-term well-being equilibrium in overtourism and high-density tourism contexts.

The remainder of this paper is structured as follows. First, the methodology describes the systems-thinking approach, the literature-based variable selection process, and the procedures used to construct the dynamic hypothesis and the Causal Loop Diagram (CLD). The results section then presents the well-being dynamics of tourists, workers, and residents, providing the theoretical grounding, variable definitions, and feedback structures associated with each subsystem before integrating them into a comprehensive tourism well-being model. Subsequently, the study examines how reinforcing and balancing feedback loops interact to generate suboptimal well-being conditions in high-density tourism destinations, identifying key leverage points, delays, and systemic trade-offs. Finally, the discussion and conclusion sections consider the theoretical and methodological contributions of the model, its implications for destination governance and tourism planning, its limitations as a qualitative dynamic hypothesis, and future directions for simulation-based tourism well-being research.

2. Methodology

2.1. Research approach

This study adopts a qualitative, exploratory, and theory-building research design grounded in Systems Thinking and System Dynamics (SD) to address the complexity of tourism well-being in high-density tourism and overtourism contexts. Unlike traditional linear approaches that examine stakeholders independently and assume static relationships among variables, System Dynamics enables the representation of nonlinear interdependencies, endogenous feedback processes, cumulative effects, and temporal evolution within complex social systems (Sterman, 2000).

Within this perspective, tourism destinations are conceptualized as dynamic systems in which tourists, workers, and residents continuously interact through reciprocal causal mechanisms that co-produce destination-level well-being outcomes over time. Consequently, the analytical focus of this study shifts from isolated variables toward the structural architecture of the tourism system itself. The study therefore prioritizes structural explanation over predictive estimation, emphasizing how system behavior emerges from the interaction among

feedback structures (de Gooyert & Größler, 2018).

Consistent with previous methodological developments presented by Garzón Vázquez et al. (2025), this study employs Causal Loop Diagrams (CLDs) as conceptual modeling instruments designed to formalize the system's "dynamic hypothesis." In System Dynamics, a dynamic hypothesis represents a theoretically grounded explanation of how feedback structures generate recurring patterns of behavior within a system. Accordingly, the CLD developed in this study functions as a theory-building artifact that synthesizes fragmented tourism well-being literature into an integrated systemic framework capable of representing reinforcing and balancing mechanisms affecting tourists', workers', and residents' well-being.

The resulting framework is specifically intended for high-density tourism destinations and overtourism scenarios, where tourism growth intensifies social, environmental, labor, and governance pressures that recursively affect stakeholder well-being and destination sustainability.

2.2. Data collection and variable identification

The construction of the CLD was grounded in a structured literature synthesis process that treated existing tourism well-being research as the primary source of qualitative data. Building upon the scoping review conducted by Garzón Vázquez et al. (2025), the study employed a literature-based variable extraction strategy to identify the principal constructs, causal relationships, and systemic dynamics associated with tourism well-being.

The original review incorporated publications indexed in Scopus, Web of Science, EBSCO (host), and ProQuest between 2014 and 2024 using combinations of keywords related to tourism, tourist, well-being, wellbeing, model, assessment, measurement, outcome, overtourism, and sustainability. Inclusion criteria prioritized peer-reviewed studies addressing subjective well-being, tourism impacts, destination sustainability, stakeholder interactions, or systemic tourism dynamics. After screening and comparative analysis, 89 articles were retained for theoretical synthesis.

Following the principles of qualitative exploratory research, an open coding process was conducted to identify recurrent variables and emergent conceptual categories across the literature. The coding strategy organized the evidence into three analytical domains: (i) individual and experiential well-being drivers associated with tourists, (ii) organizational and labor conditions affecting tourism workers, and (iii) socio-environmental externalities influencing residents and destination sustainability.

Variables were selected according to four criteria: (1) conceptual relevance to tourism well-being outcomes, (2) recurrence across multiple studies, (3) theoretical capacity to explain systemic interactions, and (4) endogenous relevance within the tourism system boundary. Particular attention was given to variables associated with overtourism and high-density destination dynamics, including infrastructure saturation, work overload, social resistance, heritage exclusion, destination competitiveness, and environmental pressure.

2.3. CLD construction and data analysis

The construction of the CLD followed an iterative and theory-driven process based on established System Dynamics conventions (Sternan, 2000). Rather than statistically testing relationships, the objective of the analysis was to formalize the causal architecture underlying tourism well-being dynamics and to identify the feedback structures potentially generating suboptimal system behavior over time.

During the axial coding phase, the previously identified variables were systematically linked through directional cause–effect statements derived from theoretical arguments and empirical regularities found in the literature. This process transformed fragmented linear relationships reported in prior studies into an integrated systemic structure. While existing tourism research frequently models isolated relationships (e.g.,

increased tourist satisfaction improves destination loyalty), the present study focuses on how these causal relationships recursively interact and produce emergent system behavior.

Each causal relationship received a polarity assignment. Positive (+) polarity indicates that changes in the cause variable produce changes in the same direction in the effect variable, whereas negative (–) polarity indicates an inverse relationship, *ceteris paribus*. These polarity assignments were grounded in dominant theoretical interpretations reported in the literature rather than statistical coefficients. To strengthen transparency and traceability, the methodological grounding of variables, causal links, and polarities is documented in the corresponding methodological support tables presented in the Results section.

Subsequently, the causal relationships were aggregated into feedback loops by tracing closed chains of causality within the emerging system structure. Loops were classified as reinforcing (R) when cumulative effects amplified change over time and as balancing (B) when they counteracted change and generated stabilizing dynamics or systemic limits. The identification of these loops enabled the formulation of a dynamic hypothesis regarding how tourism systems may evolve toward suboptimal well-being conditions under high-density tourism pressures.

The CLDs were constructed and refined using Vensim®PLE (Version 10.4.0), a systems mapping and visualization platform widely used for qualitative systems analysis and causal architecture modeling. The software facilitated the iterative visualization of causal relationships, polarity structures, and feedback loops while ensuring diagram consistency and structural readability.

2.4. Internal consistency and structural validation

To enhance methodological rigor and structural validity, the CLD underwent repeated cycles of refinement and internal consistency assessment. Following recommendations from System Dynamics literature, validation in this study was understood not as empirical verification but as an evaluation of theoretical coherence and structural plausibility.

The refinement process involved four complementary procedures. First, the authors iteratively reviewed the coherence of causal chains to eliminate redundant relationships and contradictory polarities. Second, the resulting loops were cross-checked against established tourism dynamics reported in the literature, particularly those associated with overtourism, destination competitiveness, labor precarity, infrastructure saturation, and resident social resistance. Third, the system boundary was continuously evaluated to ensure conceptual alignment between micro-level stakeholder well-being dynamics and macro-level destination outcomes. Finally, the authors examined whether the resulting feedback structures adequately represented the dynamic hypothesis proposed in the study.

Because this research constitutes a qualitative and conceptual modeling exercise, the CLD does not provide predictive simulation, weighted relationships, or empirical parameter estimation. Instead, the study prioritizes structural validity and theoretical integration, establishing a replicable conceptual foundation for future quantitative System Dynamics modeling, simulation experiments, participatory validation processes, and policy scenario analysis.

Consequently, the present study should be interpreted as a preliminary systems-thinking framework intended to formalize the dynamic interdependencies underlying tourism well-being rather than as a predictive model of tourism outcomes. The resulting CLD therefore functions as a foundational analytical structure capable of supporting future Stock-and-Flow operationalization, sensitivity analysis, and simulation-based policy experimentation in high-density tourism destinations.

3. Findings and systemic insights

This section presents the causal structures identified for each

stakeholder group and subsequently integrates them into a systemic representation of tourism well-being dynamics in high-density tourism destinations. Consistent with the dynamic hypothesis proposed in the introduction, the findings illustrate how reinforcing and balancing feedback structures recursively shape tourists', workers', and residents' well-being over time, potentially generating suboptimal systemic outcomes under overtourism conditions.

Following the methodological logic described previously, the findings are grounded in a structured synthesis of tourism well-being literature treated as qualitative data. To reduce conceptual bias and strengthen boundary adequacy, the reviewed literature included diverse tourism contexts, such as urban overtourism destinations, coastal tourism regions, cultural heritage cities, hospitality labor environments, community-based tourism settings, and sustainability-oriented destinations across Europe, Asia, Latin America, and North America. This diversity allowed the resulting CLD to incorporate heterogeneous well-being drivers and systemic pressures rather than reflecting a single regional or tourism-sector perspective.

Table 1 summarizes the original conceptual categories identified through open coding and comparative literature analysis for each stakeholder group. These categories functioned as the primary conceptual inputs for the development of the dynamic hypothesis and the subsequent construction of the CLD. To ensure structural coherence during model construction, several original categories were theoretically refined, aggregated, or operationalized into dynamic variables compatible with System Dynamics conventions. In some cases, additional intermediary variables were incorporated to represent latent mechanisms required to close feedback structures and preserve causal continuity across the system.

Importantly, the variables included in the CLD do not represent isolated statistical indicators but conceptually bounded system states, processes, or accumulative pressures operating within the tourism ecosystem. Consequently, each variable was defined according to a specific unit of analysis to maintain dimensional consistency across the causal structure. For example, "Overtourism" is conceptualized as a continuous systemic condition characterized by tourism demand exceeding the social, environmental, and infrastructural carrying capacity of the destination rather than as a binary event. Similarly, "Economic and environmental pressure" represents a composite systemic condition integrating resource overuse, infrastructure stress, environmental degradation, and increased socio-economic demands generated by tourism intensification. It should be noted that Although Table 1 presents the original conceptual categories identified during open coding, several categories were subsequently operationalized into dynamic system variables during CLD construction. Consequently, some constructs were reformulated as system states, accumulative pressures, or recursive processes to ensure dimensional consistency and compatibility with System Dynamics conventions.

To improve transparency and reproducibility, the CLD variables were classified into three conceptual levels: (i) experiential and psychological states affecting tourists (e.g., life satisfaction, destination loyalty, post-trip happiness), (ii) organizational and labor dynamics affecting tourism workers (e.g., work overload, managerial resources, workplace well-being), and (iii) socio-environmental and community-level processes affecting residents (e.g., infrastructure saturation, sociocultural impacts, erosion of local social dynamics, community resistance). This classification ensured conceptual consistency between the literature-derived categories and the dynamic feedback structures represented in the model.

Additionally, each causal relationship incorporated into the CLD was theoretically grounded in prior empirical or conceptual literature. Therefore, the findings section includes methodological grounding tables accompanying each subsystem to document the relationship between variables, polarity assignments, theoretical justification, and supporting references. These tables function as a variable dictionary and structural traceability mechanism, enabling future researchers to

Table 1

Literature-derived categories by key stakeholder.

Stakeholder	Category	Short definition	Sources
Tourist	Work-family Imbalance	Interference of work with family life	Greenhaus and Beutell (1985)
	Existential Authenticity	Temporary release from the inauthenticity of everyday life	Brown (2013)
	Tourists' Satisfaction	Judgment about services determined by expectations, perceived performance, and assessed value.	Saayman et al. (2018)
	Destination competitiveness	Factors that influence tourists in their decision to visit other countries	Dwyer and Kim (2003)
	Destination loyalty	Favorable attitude toward a destination expressing intention to revisit or recommend	Yoon and Uysal (2005)
	Life Dissatisfaction	Constant feeling of inadequacy, exhaustion and existential emptiness	Han (2015)
	Post-trip Happiness	Absence of a post-trip happiness difference between vacationers and non-vacationers	Nawijn et al. (2010)
Worker	Job Satisfaction	How good an individual feels about both the intrinsic and extrinsic aspects of their job	Zopiatis et al. (2014)
	Service Quality	Overall cognitive and emotional assessment made by tourists of a service, comparing expectations with perceptions	Wang and Tseng (2019)
	Managerial Resourcefulness	Affective, intellectual, and action-oriented competencies that provide successful managerial performance	Ersoy and Ehtiyar (2021)
	Workplace Well-being	Fusion of the physical, psychological, social and relationship aspects of employees' working lives	DiPietro et al. (2020)
	Working Conditions	Employment, environmental, physical, mental, psychosocial, safety and risk-related conditions that influence the different attributes of work activity	Ariza-Montes et al. (2019)
	Work Overload	Condition where the volume of tasks assigned to an individual exceeds their capacity to complete them	Ariza-Montes et al. (2019)
Resident	Overtourism	Systemic condition in which tourism intensity persistently exceeds the social, environmental, and infrastructural carrying capacity of a destination	Pham et al. (2024)
	Environmental Impacts	The increased usage of resources, infrastructure, facilities, and/or touristic sites that generates environmental damage	Pham et al. (2024)
	Economic Impacts	Changes in the costs and benefits experienced by a destination due to increased demand for tourism services and facilities	Pham et al. (2024)
	Sociocultural Impacts	Changes to the social structures, and cultural values of a host community	Pham et al. (2024)

(continued on next page)

Table 1 (continued)

Stakeholder	Category	Short definition	Sources
	Erosion of Local Social Dynamics	resulting from increased demand and visitation at destinations Increase in crime and disorder within a neighborhood resulting from tourism activities, along with the inhibition of local social organization	Ke et al. (2021)
	Quality of Life	Residents' overall life satisfaction, happiness, and wellbeing	Ramkissoon (2020)
	Communal Resistance	Rational response by residents against tourism and its institutions, stemming from the feeling that their community has been devalued by excessive visitation	Duignan et al. (2022)

replicate, adapt, or operationalize the proposed framework in simulation-based studies.

The CLD operates at the dynamic hypothesis formulation stage of System Dynamics analysis. Accordingly, the following subsections examine the tourism well-being dynamics associated with each stakeholder group—tourists, workers, and residents—before integrating them into a systemic representation of destination well-being. Each subsection first establishes the theoretical foundations of the subsystem, then presents a variable dictionary specifying the operational meaning, unit of analysis, causal polarity, and theoretical grounding of the variables included in the loop. Subsequently, the corresponding reinforcing and balancing feedback structures are explicated through a narrative pathway analysis that details the causal mechanisms linking system components.

To enhance reproducibility and transparency, all variables are linked to their supporting literature and assessed in terms of boundary adequacy. In addition, a qualitative sensitivity assessment identifies structurally influential variables based on their connectivity and role within the feedback architecture, highlighting potential leverage points without assigning quantitative effect sizes. Finally, each subsystem is evaluated in terms of structural validity, ensuring that the proposed feedback loops are theoretically coherent, causally consistent, and appropriate representations of the dynamic processes operating within high-density tourism destinations.

3.1. Tourist well-being dynamics (B1)

Existing scholarship draws upon distinct theoretical traditions to explain how tourism contributes to individual well-being. The Experience Economy (Pine & Gilmore, 1999) argues that tourism extends beyond the consumption of services toward the co-creation of memorable experiences capable of generating personal value. Likewise, the Reasonable Person Model (Kaplan & Kaplan, 2003) suggests that environmental design influences human behavior and well-being by facilitating restoration, competence, and meaningful engagement. These perspectives converge with theories of psychological well-being (Ryff & Keyes, 1995), authentic happiness (Seligman, 2002), and self-determination (Deci & Ryan, 1985), which collectively emphasize the importance of both hedonic and eudaimonic dimensions of tourism experiences. Finally, Horizontal Spillover Theory (Wilensky, 1960) proposes that positive experiences generated in one life domain may extend to other domains, suggesting that tourism can temporarily improve overall life satisfaction.

Based on these theoretical foundations, the dynamic hypothesis for this subsystem, termed the Temporal Balance of Life Dissatisfaction,

proposes that tourism operates as a compensatory mechanism through which individuals temporarily offset accumulated dissatisfaction generated by everyday life conditions. Rather than representing isolated events, the variables included in this subsystem correspond to dynamic psychological states, behavioral outcomes, and destination-level conditions that evolve over time. Table 2 formalizes these variables, their operational meanings, systemic roles, theoretical foundations, and boundary assumptions, thereby providing the methodological grounding of the balancing feedback structure (B1).

Building upon the variable structure summarized in Table 2, Loop B1 illustrates how tourism generates a self-regulating process that temporarily reduces dissatisfaction while simultaneously creating the conditions for its eventual re-emergence. Contemporary sociological theory argues that individuals operating within a "burnout society" frequently experience chronic dissatisfaction associated with work-family conflict, excessive performance pressures, and difficulties regulating persistent stressors (Greenhaus & Beutell, 1985; Han, 2015). Within this context, tourism functions as a restorative mechanism capable of fostering existential authenticity, self-discovery, psychological recovery, and temporary relief from routine demands (Brown, 2013).

As dissatisfaction accumulates, individuals become increasingly motivated to seek restorative tourism experiences (Chen & Petrick, 2013). Positive tourism experiences subsequently increase destination satisfaction when perceived services and experiences align with prior expectations (Saayman et al., 2018). Higher satisfaction contributes to destination competitiveness by strengthening the destination's perceived value proposition and market attractiveness (Dwyer & Kim, 2003). In turn, increased competitiveness promotes destination loyalty, expressed through revisit intentions and recommendations to others (Yoon & Uysal, 2005). This sequence of relationships constitutes the compensatory pathway through which tourism consumption temporarily counteracts the original accumulation of life dissatisfaction.

The balancing nature of Loop B1 emerges through the incorporation of the fade-out effect. As time passes after the tourism experience, the psychological benefits generated during the trip progressively diminish, leading individuals to return toward their pre-vacation baseline levels of well-being (Nawijn et al., 2010). Consequently, the variable "Distance from Vacation" functions as a temporal decay mechanism that reconnects the tourism experience with renewed dissatisfaction, thereby closing the balancing loop. The resulting structure suggests that tourism does not permanently resolve dissatisfaction but rather provides cyclical and temporary relief from it.

From a systems perspective, the subsystem operates primarily through moderate-effect feedback relationships. Although the current CLD does not assign quantitative weights to causal links, the literature suggests that certain variables exert greater leverage over system behavior than others. In particular, life dissatisfaction, tourist experience, and the fade-out effect appear to function as dominant variables because they directly regulate both the activation and termination of the compensatory process. By contrast, destination competitiveness and destination loyalty mainly amplify the tourism pathway without fundamentally altering the balancing nature of the subsystem.

A qualitative sensitivity assessment further suggests that small changes in the fade-out effect could substantially modify system behavior. If post-trip well-being gains persist for longer periods, the recurrence of dissatisfaction may be delayed, reducing the frequency of compensatory tourism consumption. Conversely, rapid erosion of tourism-generated well-being would accelerate the return to dissatisfaction and strengthen the cyclical dependence on tourism experiences as a coping mechanism. Therefore, the temporal persistence of tourism benefits emerges as a potentially influential leverage point within the subsystem.

Finally, to ensure the structural validity of Loop B1, the model adopts a parsimonious boundary strategy focused on endogenous mechanisms linking tourism and well-being. Exogenous influences such as macroeconomic volatility, weather conditions, disposable income constraints,

Table 2

Balancing loop (B1): Temporal balance of life dissatisfaction.

Variable	Operational Meaning	Polarity	Theoretical Source	Role in the System	Boundary Adequacy (Exclusions)
Life Dissatisfaction	Persistent perception of inadequacy, exhaustion, and reduced life fulfillment generated by everyday stressors. Treated as a dynamic psychological state.	(+)	Han (2015)	Primary stock-like driver that activates compensatory tourism behavior.	Individual personality traits, clinical mental health conditions
Work-Family Imbalance	Degree of interference between work demands and family or personal life. Treated as a chronic stress-generating condition.	(+)	Greenhaus and Beutell (1985)	Amplifies life dissatisfaction and motivates escape-oriented consumption.	Labor contract arrangements and household composition
Tourist Experience (Existential Authenticity)	Perceived opportunity for recovery, self-discovery, and temporary escape from routine. Treated as a tourism-generated experiential process.	(+)	Brown (2013); Chen and Petrick (2013)	Converts dissatisfaction into restorative tourism experiences.	Travel logistics and disposable income constraints
Destination Satisfaction	Cognitive and affective evaluation resulting from the comparison between expectations and actual experience.	(+)	Saayman et al. (2018)	Translates tourist experiences into positive destination evaluations.	Weather conditions and pre-trip idiosyncratic expectations
Destination Competitiveness	Relative ability of a destination to attract and retain visitors through superior value propositions. Treated as a destination-level systemic condition.	(+)	Dwyer and Kim (2003)	Reinforces attractiveness and future visitation potential.	Exchange-rate fluctuations and national macroeconomic policies
Destination Loyalty	Intention to revisit and recommend the destination. Treated as a behavioral outcome.	(+)	Yoon and Uysal (2005)	Sustains tourism demand through repeat visitation and advocacy.	Social media trends and short-term marketing campaigns
Distance from Vacation (Fade-Out Effect)	Progressive erosion of post-trip well-being gains as time elapses after the tourism experience. Treated as a temporal decay process.	(+)	Nawijn et al. (2010)	Returns individuals toward pre-trip dissatisfaction levels, closing the balancing loop.	Major life events and long-term psychological resilience
Loop Effect (B1)	Temporal reduction of life dissatisfaction through tourism consumption, followed by gradual return to baseline well-being levels.	Balancing (B)	Integrated from subsystem literature	Stabilizes the system through recurring compensatory tourism behavior.	

major life events, and individual psychological traits are intentionally excluded because they do not modify the fundamental feedback architecture represented in the subsystem. This boundary definition prioritizes structural explanation over contextual variation, thereby improving the internal consistency of the dynamic hypothesis and facilitating future simulation-based analysis of tourism well-being dynamics.

3.2. Worker dissatisfaction dynamics (R1)

Existing scholarship explains tourism worker well-being through complementary theoretical perspectives (Saito et al., 2025). First, resource-based frameworks posit that the high demands of tourism work deplete physical and psychological resources, necessitating preservation (Conservation of Resources Theory), recovery (Effort-Recovery Model), and equilibrium (Job Demands–Resources Model). Second, interactionist perspectives emphasize the subjective interpretation of social exchanges in both emotional terms (Affect Theory of Social Exchange) and cognitive terms (Cognitive Appraisal Theory). Consequently, the presence of recognition and reciprocity enhances well-being, whereas threats or imbalances diminish it. Finally, organizational theories examine how the work environment modulates well-being, either by fostering motivation and capabilities (Self-Determination Theory) or by clearly delineating roles and task boundaries (Role Theory). Consequently, tourism worker well-being can be understood as an emergent organizational outcome shaped by the interaction between service performance, managerial practices, and workplace conditions.

Based on these theoretical foundations, the dynamic hypothesis for this subsystem, termed “Decreasing Job Satisfaction Among Tourism Workers,” proposes that tourism organizations may become trapped in a self-reinforcing cycle in which deteriorating employee well-being progressively undermines service performance and organizational effectiveness. Table 3 formalizes the variables, operational meanings, causal polarities, and system roles that support this reinforcing structure (R1).

Building upon the relationships synthesized in Table 3, the following analysis details the mechanistic dynamics of loop R1. Unlike the balancing tourist subsystem, this structure operates as a reinforcing

feedback process in which organizational deficiencies accumulate over time. Importantly, the variables represented in the loop are conceptualized as system states and organizational processes rather than isolated events.

Tourism employees confront multifaceted challenges, including intense service interactions, atypical working hours, emotional labor requirements, and limited recovery opportunities, all of which contribute to lower job and life satisfaction (Zopiatis et al., 2014). Because emotional regulation, self-efficacy, and organizational support are fundamental antecedents of service performance (Wang & Tseng, 2019), increasing employee dissatisfaction tends to reduce service quality. Within the system, service quality functions as the principal transmission mechanism through which worker well-being affects organizational outcomes.

As service quality deteriorates, customer complaints increase, generating signals that reveal operational deficiencies (Batista et al., 2014). Under favorable organizational conditions, these complaints could initiate corrective managerial actions. However, when managerial capabilities are insufficient, complaints instead contribute to managerial inefficiency through ineffective communication, poor leadership, inadequate support systems, and weak problem-solving capacities (Ersoy & Ehtiyar, 2021; Jamieson & Jamieson, 2019). In the CLD, managerial inefficiency therefore operates as a critical leverage variable linking customer-facing outcomes with internal organizational conditions.

Managerial inefficiency subsequently contributes to the deterioration of working conditions, including inadequate compensation, insufficient training opportunities, physical discomfort, and psychosocial risks (DiPietro et al., 2020). As these conditions worsen, employees face increasing work demands without corresponding resource support, resulting in greater work overload (Ariza-Montes et al., 2019). This overload further intensifies employee dissatisfaction, thereby closing the reinforcing feedback loop. The cumulative effect is a self-perpetuating process in which declining worker well-being progressively undermines service quality and organizational resilience.

From a systems perspective, the loop suggests that managerial inefficiency and work overload constitute the most influential leverage points within this subsystem because they occupy structurally central

Table 3
Reinforcing loop (R1): Decreasing Job Satisfaction Among Tourism Workers.

Variable	Operational Meaning	Polarity	Theoretical Source	Role in the System	Boundary Adequacy (Exclusions)
Employee Dissatisfaction	Accumulated reduction in employees' cognitive and affective evaluation of their work experience, including low engagement, emotional exhaustion, and reduced job fulfillment.	(-)	Zopiatis et al. (2014); Wang and Tseng (2019)	State variable representing the overall well-being condition of tourism workers and the initiating driver of the reinforcing loop.	Individual personality traits, psychological capital, and personal resilience resources.
Service Quality	Perceived quality of interactions and services delivered to tourists relative to expected standards.	(-)	Wang and Tseng (2019); Batista et al. (2014)	Performance variable through which worker well-being affects organizational outcomes.	Automated service technologies and technical competencies not directly related to worker well-being.
Customer Complaints	Frequency and intensity of customer dissatisfaction signals generated by service failures or unmet expectations.	(+)	Baista et al. (2014); Ersoy and Ehtiyar (2021)	Feedback signal indicating declining service performance and triggering managerial responses.	Customer mood fluctuations and price-sensitivity variations.
Managerial Inefficiency	Deficiencies in communication, support, emotional leadership, conflict resolution, and operational decision-making.	(+)	Ersoy and Ehtiyar (2021); Jamieson & Jamieson, 2019	Leverage variable translating service-related problems into organizational deterioration.	Corporate governance structures and external quality auditing systems.
Poor Working Conditions	Deterioration of physical, psychosocial, contractual, and safety-related conditions experienced by workers.	(+)	DiPietro et al. (2020); Ariza-Montes et al. (2019)	Accumulated organizational pressure affecting employee well-being.	National labor legislation, collective bargaining arrangements, and sector-wide regulations.
Work Overload	Perceived mismatch between workload demands and workers' available physical, emotional, and temporal resources.	(+)	Ariza-Montes et al. (2019); Zopiatis et al. (2014)	Amplifying pressure variable that closes the reinforcing loop and accelerates dissatisfaction.	Temporary labor availability, technological process optimization, and peer-support mechanisms.
Loop Effect (R1)	Self-reinforcing deterioration of worker well-being and service performance.	Reinforcing (R)	Synthesized from literature	Generates cumulative decline in employee satisfaction, service quality, and organizational resilience.	

positions linking multiple causal pathways. Although the present CLD does not assign quantitative weights to causal relationships, the literature consistently identifies these variables as recurrent antecedents of employee dissatisfaction and service deterioration (Ariza-Montes et al., 2019; DiPietro et al., 2020; Ersoy & Ehtiyar, 2021). Consequently, future simulation studies may benefit from testing the relative strength of these variables to determine whether interventions targeting management practices or workload reduction generate greater systemic improvements in worker well-being.

A qualitative sensitivity assessment further suggests that small changes in managerial effectiveness may produce disproportionately large system-wide effects. Improvements in leadership capabilities could simultaneously reduce customer complaints, improve working conditions, and mitigate work overload. Conversely, increases in workload during seasonal peaks may rapidly accelerate dissatisfaction and amplify the entire reinforcing structure. These observations do not constitute empirical effect sizes but identify plausible high-leverage variables for future quantitative modeling and policy experimentation.

Finally, to ensure the structural validity of the Decreasing Job Satisfaction loop (R1), this study adopts a parsimonious boundary strategy that prioritizes endogenous organizational mechanisms. Variables such as psychological capital, personality traits, labor market regulations, collective bargaining arrangements, and national employment policies were intentionally excluded from the model boundary. While these factors may influence the magnitude of individual relationships (Darvishmotevali & Ali, 2020), they do not alter the fundamental feedback architecture represented in the CLD. By focusing on organizational drivers that are directly influenced by tourism management practices, the model maintains conceptual coherence while identifying potential leverage points for future simulation-based interventions in high-density tourism destinations.

3.3. Resident quality-of-life dynamics (B3)

Regarding the third key stakeholder, Social Exchange Theory posits that residents experience well-being when the perceived benefits derived from tourism exceed the associated social, environmental, and economic costs (Thibaut & Kelley, 2017). Consequently, assessing resident well-being requires understanding how tourism development affects multiple forms of community capital, including natural, cultural, human, political, financial, and built assets (Moscardo et al., 2017). More recently, growing concerns regarding overtourism and destination sustainability have stimulated the adoption of normative frameworks that advocate responsible destination management and long-term community well-being as central objectives of tourism governance (Mihalic, 2016).

Based on these theoretical foundations, the dynamic hypothesis for this subsystem, termed "Decline in Residents' Quality of Life," proposes that resident well-being operates within a balancing feedback structure in which excessive tourism growth generates socio-environmental pressures that progressively erode community well-being and eventually activate social resistance mechanisms. Table 4 formalizes the variables, operational definitions, causal polarities, and system roles that support this balancing structure (B3).

Building upon the relationships synthesized in Table 4, the following analysis details the mechanistic dynamics of loop B3. Unlike the worker subsystem, which is characterized by self-reinforcing deterioration, this loop represents a balancing process in which community responses emerge to counteract the negative externalities generated by tourism growth. Importantly, the variables included in this subsystem are conceptualized as continuous system states and accumulative pressures rather than discrete events.

The systemic pursuit of tourism growth can generate overtourism when visitor volumes exceed the social and environmental capacities of a destination (Pham et al., 2024). Within the model, overtourism functions as the principal driving variable, initiating the accumulation of

Table 4
Balance loop (B3): Decline in residents' quality of life.

Variable	Operational Meaning	Polarity	Theoretical Source	Role in the System	Boundary Adequacy (Exclusions)
Overtourism	Continuous condition in which tourism demand exceeds the social, environmental, and infrastructural carrying capacity of a destination.	(+)	Pham et al. (2024)	Driving state variable that initiates the accumulation of pressures within the resident subsystem.	Global inflationary trends and large-scale climate change phenomena.
Socio-environmental Pressure	Accumulated economic, environmental, and social externalities generated by excessive tourism activity, including congestion, pollution, housing pressure, and resource competition.	(+)	Pham et al. (2024); Bertocchi and Visentin (2019)	Pressure variable translating tourism growth into community-level impacts.	General urban population growth and national public investment cycles.
Infrastructure Saturation	Degree to which transport systems, public services, utilities, and public spaces operate beyond their functional capacity.	(+)	Bertocchi and Visentin (2019)	Accumulation variable reflecting the physical manifestation of tourism pressure.	Changes in UNESCO status and national heritage conservation legislation.
Heritage Degradation	Progressive deterioration, commodification, or exclusion of residents from cultural, historical, and community assets.	(+)	Lo and McKercher (2023); Ke et al. (2021)	Structural deterioration variable linking physical and cultural impacts with social outcomes.	Pre-existing political instability and unrelated regional crime trends.
Social Unrest and Violence	Increase in social tensions, conflicts, disorder, and community disruption associated with perceived tourism externalities.	(+)	Ke et al. (2021); Ramkissoon (2020)	Social response variable indicating deterioration of community cohesion and trust.	Household-level dynamics, personal health conditions, and unrelated employment factors.
Quality of Life Deficit	Accumulated reduction in residents' subjective well-being, place attachment, satisfaction with local conditions, and perceived community benefits.	(+)	Ramkissoon (2020); Tam et al. (2023)	State variable representing the well-being condition of residents.	Institutional barriers to civic participation and levels of digital activism.
Social Resistance	Collective actions, opposition movements, and community responses aimed at limiting or regulating tourism growth.	(−)	Duignan et al. (2022)	Corrective feedback variable that closes the balancing loop and constrains tourism expansion.	Global tourism demand fluctuations and airline market dynamics.
Loop Effect (B3)	Community resistance emerges as a systemic response that counteracts the negative externalities of overtourism.	Balancing (B)	Synthesized from literature	Generates self-regulating pressure to restore social and environmental carrying capacity.	

socio-environmental pressures such as congestion, housing affordability problems, resource competition, pollution, and spatial degradation. As these pressures intensify, infrastructure saturation emerges through the overload of transportation systems, public services, utilities, and public spaces (Bertocchi & Visentin, 2019).

Simultaneously, the expansion of tourism-related activities may contribute to the degradation or exclusion of local heritage assets. Beyond physical deterioration, heritage degradation encompasses the progressive commodification of cultural resources and the displacement of residents from spaces that traditionally support community identity and social cohesion (Lo & McKercher, 2023). As access to these cultural and social assets declines, the community's ability to maintain collective norms and social organization weakens, increasing vulnerability to conflict, disorder, and social unrest (Ke et al., 2021).

The accumulation of these negative externalities ultimately generates a quality-of-life deficit among residents. Within the model, this variable represents a systemic decline in subjective well-being, place attachment, community satisfaction, and perceived fairness in the distribution of tourism benefits and costs (Ramkissoon, 2020). As quality-of-life deficits become more pronounced, residents increasingly perceive tourism development as unfavorable, reducing support for continued growth and encouraging collective forms of opposition (Tam et al., 2023).

At this stage, social resistance emerges as the key balancing mechanism within the subsystem. Manifested through public protests, anti-tourism movements, demands for regulatory intervention, and community mobilization, social resistance acts to constrain tourism growth and reduce overtourism pressures (Duignan et al., 2022). Consequently, the loop functions as a self-regulating structure in which deteriorating resident well-being generates corrective social responses that seek to restore equilibrium between tourism development and community carrying capacity.

From a systems perspective, overtourism, infrastructure saturation,

and heritage degradation appear to be the most influential leverage variables within this subsystem, given their central position connecting tourism growth with resident well-being outcomes. Although the CLD does not assign quantitative effect sizes to individual relationships, the literature consistently identifies these variables as recurrent antecedents of resident dissatisfaction across different tourism contexts (Bertocchi & Visentin, 2019; Lo & McKercher, 2023; Pham et al., 2024). Future simulation models could therefore assess whether interventions targeting carrying-capacity management, infrastructure investment, or heritage preservation generate greater improvements in system performance.

A qualitative sensitivity assessment further suggests that relatively small increases in overtourism may produce disproportionate downstream effects due to the cumulative nature of socio-environmental pressures. Similarly, heritage degradation may function as a high-leverage variable because it simultaneously affects place attachment, community identity, and social cohesion. Conversely, strengthening heritage protection and participatory governance mechanisms may attenuate the progression of quality-of-life deficits before social resistance reaches disruptive levels. These observations should be interpreted as dynamic hypotheses rather than quantified effects and provide guidance for future simulation-based analysis.

Finally, to ensure the structural validity of the Decline in Residents' Quality of Life loop (B3), this study adopts a parsimonious boundary strategy that isolates tourism-induced externalities from broader socio-urban dynamics. Variables such as macroeconomic crises, demographic transitions, climate-change impacts, national political conflicts, and unrelated crime trends were intentionally excluded from the model boundary. Although these factors may shape the broader context in which tourism operates, they do not alter the endogenous feedback structure linking overtourism, socio-environmental pressure, resident well-being, and social resistance. By emphasizing these endogenous mechanisms, the model maintains theoretical coherence while

identifying leverage points relevant for tourism governance in high-density tourism destinations.

3.4. Insights from the model: explaining suboptimal well-being

Having delineated the feedback structures associated with tourists, workers, and residents, the analysis now expands to the integrated system architecture. From a System Dynamics perspective, the resulting Causal Loop Diagram (CLD) should be interpreted as a dynamic hypothesis that synthesizes theoretical relationships identified in the literature into a coherent explanation of how well-being emerges from the interaction among key tourism actors. Rather than predicting numerical outcomes, the model reveals the feedback structures, delays, and leverage points that may generate persistent patterns of behavior in high-density tourism destinations. The integrated architecture consists of four interconnected feedback loops: B1 (Temporal Balance of Life Dissatisfaction), R1 (Decreasing Job Satisfaction Among Tourism Workers), B3 (Decline in Residents' Quality of Life), and B2 (Systemic Well-being Trade-off), which serves as the principal coupling mechanism among subsystems.

As illustrated in Loop B1 (Fig. 1), the balancing structure termed “Temporal Balance of Life Dissatisfaction” regulates tourism demand through the relationship between work-family imbalance and dissatisfaction with life. Increasing work-family imbalance intensifies the motivation to seek tourism experiences that provide recovery, authenticity, and temporary relief from daily routines (+). Positive tourism experiences increase destination satisfaction (+), which contributes to destination competitiveness (+) and subsequently strengthens loyalty and recommendation intentions (+). Through the spillover of positive experiences into other life domains, destination loyalty contributes to reducing dissatisfaction with life (−). As dissatisfaction declines, the perceived need for compensatory tourism temporarily diminishes, thereby closing the balancing loop. However, this equilibrium is constrained by the well-documented fade-out effect (Nawijn et al., 2010). As temporal distance from the vacation increases, the restorative effects of tourism gradually dissipate, allowing dissatisfaction to re-emerge. Consequently, Loop B1 suggests that tourism acts as a temporary corrective mechanism rather than a permanent solution to chronic dissatisfaction. From a sensitivity perspective, destination satisfaction and destination competitiveness appear to be particularly influential variables because they connect individual well-being outcomes with broader destination dynamics.

The model introduces an additional balancing structure, Loop B2, specifically designed to explain the systemic trade-offs generated by tourism growth. As illustrated in Fig. 2, this loop formalizes the reciprocal relationship between destination competitiveness, overtourism, and service quality. Higher destination competitiveness attracts greater

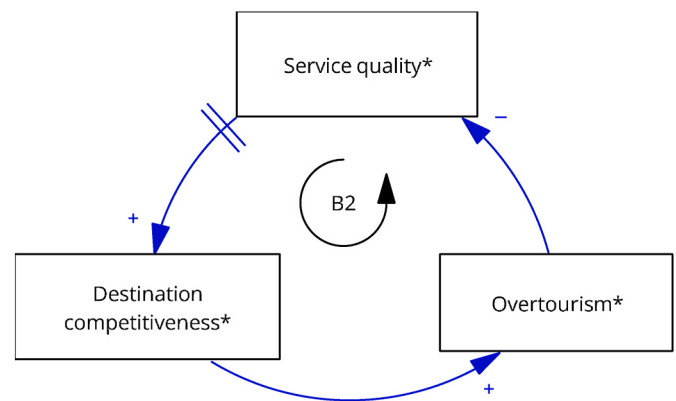


Fig. 2. Balancing loop: Systemic Well-being Trade-off.

tourist demand and contributes to increasing levels of overtourism (+). As visitor volumes accumulate beyond the destination's carrying capacity, service quality deteriorates due to congestion, resource constraints, and organizational strain (−). Reduced service quality subsequently weakens destination competitiveness (+), thereby limiting future demand growth and closing the balancing loop.

Unlike the stakeholder-specific loops, B2 functions as the principal coupling mechanism linking the well-being of tourists, workers, and residents. The variables included in rectangular boxes—Destination Competitiveness, Overtourism, and Service Quality—are not stocks in the formal Stock-and-Flow sense but rather strategic state variables that concentrate multiple feedback influences across the system. Their central position indicates a high degree of structural sensitivity. In particular, overtourism emerges as a critical leverage variable because it simultaneously connects tourism demand with resident well-being (B3) and worker well-being (R1). The time delays represented in the loop suggest that the negative consequences of excessive tourism growth are not immediately visible. Consequently, destinations may continue pursuing competitiveness strategies long after carrying-capacity thresholds have begun to be exceeded, thereby amplifying system-wide deterioration before corrective mechanisms become effective.

As illustrated in Loop B3 (Fig. 3), the balancing mechanism termed “Decline in Residents' Quality of Life” explains how community responses emerge to counteract the externalities generated by overtourism. Increasing visitor volumes intensify socio-environmental pressure (+), generating congestion, resource competition, pollution, and housing pressures. These accumulated pressures contribute to

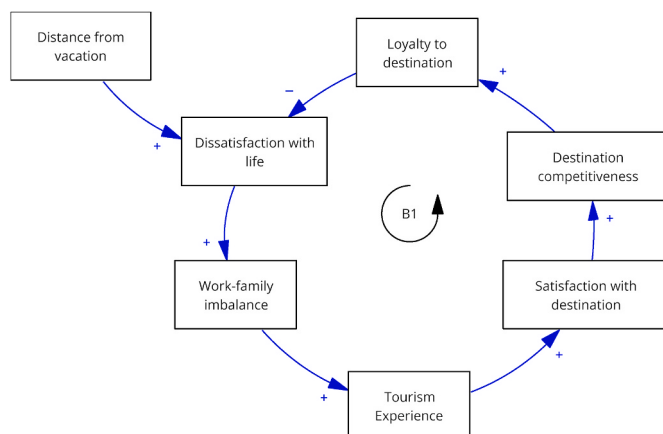


Fig. 1. Balancing loop: Temporal Balance of Life Dissatisfaction.

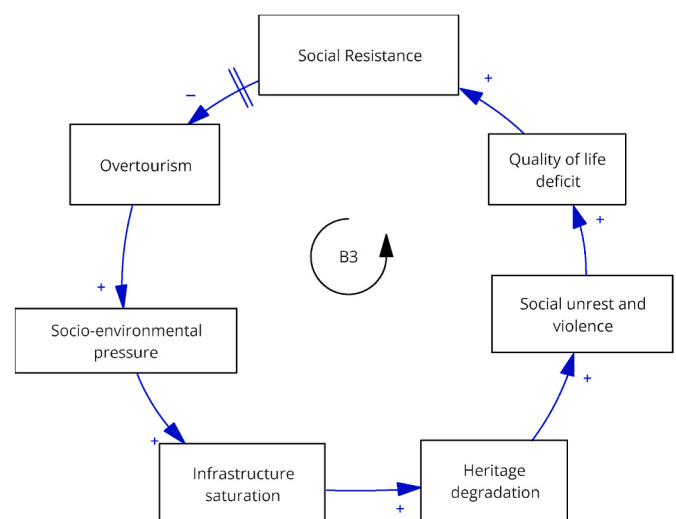


Fig. 3. Balancing loop: Decline in Residents' Quality of Life.

infrastructure saturation (+), which subsequently accelerates heritage degradation (+). In this model, heritage degradation encompasses not only physical deterioration but also the exclusion of residents from cultural and community assets that sustain local identity and social cohesion.

As heritage degradation intensifies, social unrest and violence increase (+), generating a quality-of-life deficit among residents (+). Declining well-being ultimately stimulates social resistance (+), expressed through collective mobilization, opposition movements, and demands for stricter tourism regulation. This resistance acts as a corrective force that seeks to reduce overtourism (−), thereby closing the balancing loop. However, the delay associated with collective mobilization implies that corrective actions often occur only after substantial deterioration has already taken place. Sensitivity analysis suggests that overtourism and heritage degradation function as particularly influential leverage variables because they affect multiple downstream processes simultaneously. Consequently, Loop B3 reveals how social carrying capacity operates as a long-term constraint on destination growth.

As illustrated in Loop R1 (Fig. 4), the reinforcing mechanism termed “Decreasing Job Satisfaction Among Tourism Workers” explains how organizational pressures can generate cumulative deterioration in worker well-being. Declining service quality increases customer complaints (−), which place additional pressure on management systems. When managerial responses are ineffective, managerial inefficiency increases (+), contributing to poorer working conditions (+). These conditions intensify workload (+), which subsequently increases employee dissatisfaction (+). As dissatisfaction accumulates, service quality deteriorates further (−), reinforcing the original problem and closing the loop.

Unlike the balancing structures described previously, Loop R1 generates self-reinforcing dynamics that amplify deterioration over time. From a systems perspective, managerial inefficiency and workload constitute the most influential leverage variables within this subsystem because they connect multiple organizational processes simultaneously. Although the model does not quantify the relative strength of these relationships, the literature consistently identifies these variables as central determinants of worker well-being and service performance. Consequently, Loop R1 suggests the existence of a potential burnout trap in which tourism organizations progressively lose human capital and service capacity through cumulative organizational failures.

The individual dynamics previously described do not operate independently; rather, they form an integrated architecture that explains

how tourism destinations may gradually converge toward suboptimal well-being outcomes. Fig. 5 synthesizes these interactions into a unified dynamic hypothesis. Structural analysis indicates that system behavior emerges from the simultaneous interaction of the four feedback loops and, more importantly, from the coupling variables that connect them. Destination competitiveness drives tourism demand through B1, overtourism transmits pressure from tourism growth to residents through B3, and service quality links worker well-being to destination performance through R1. Loop B2 integrates these relationships by connecting competitiveness, overtourism, and service quality into a single feedback structure.

The integrated model suggests that tourism systems may become trapped in a structural trade-off. In the short term, competitiveness and tourism growth generate benefits for tourists and destinations. However, as overtourism accumulates, resident well-being deteriorates and worker dissatisfaction increases. These effects eventually reduce service quality and weaken destination competitiveness, thereby limiting the sustainability of future growth. The model therefore proposes that suboptimal well-being does not emerge from a single actor or isolated variable but from the interaction of multiple feedback structures operating across different temporal scales.

Importantly, the qualitative sensitivity assessments conducted in the previous sections converge around a common finding: overtourism, service quality, managerial inefficiency, and heritage degradation appear to function as the system's primary leverage variables. Small changes in these variables may produce disproportionately large consequences because they occupy structurally central positions linking multiple loops. Similarly, the delayed nature of social resistance and the gradual deterioration of worker well-being suggest that destinations may systematically underestimate emerging risks until negative outcomes become difficult to reverse.

In conclusion, the integrated architecture reveals how tourism activities, while initially generating value and well-being, may simultaneously create the conditions for their own deterioration. Loop B1 provides temporary restoration for tourists but contributes indirectly to destination growth. Loop R1 demonstrates how organizational pressures may progressively undermine worker well-being and service quality. Loop B3 reveals how the social and cultural costs of overtourism eventually trigger corrective community responses. Finally, Loop B2 connects these dynamics into a broader system-wide trade-off. Collectively, the model advances a dynamic explanation of tourism well-being by suggesting that long-term destination sustainability depends not only on attracting visitors but also on preserving the well-being of the residents and workers who sustain the tourism ecosystem.

4. Discussion

4.1. Interpretation of the integrated well-being dynamics

The integrated causal structure developed in this study suggests that tourism well-being in high-density destinations cannot be adequately understood through isolated stakeholder perspectives. Instead, the CLD indicates that well-being emerges from the interaction of multiple feedback mechanisms linking tourists, workers, and residents over time.

The dynamic hypothesis represented in Fig. 5 suggests that temporary improvements in tourist well-being, formalized in Loop B1, may unintentionally contribute to the expansion of destination competitiveness and visitation. While this process initially generates value for destinations, the model indicates that continued growth may increase systemic pressures on labor systems and local communities. Through the interaction of Loops R1 and B3, these pressures progressively affect service quality and residents' quality of life, generating indirect consequences that ultimately feed back into tourists' experiences.

This interpretation extends previous tourism well-being research, which has predominantly examined tourists, residents, or workers as separate analytical units (Uysal & Sirgy, 2019; Vada et al., 2020). Rather

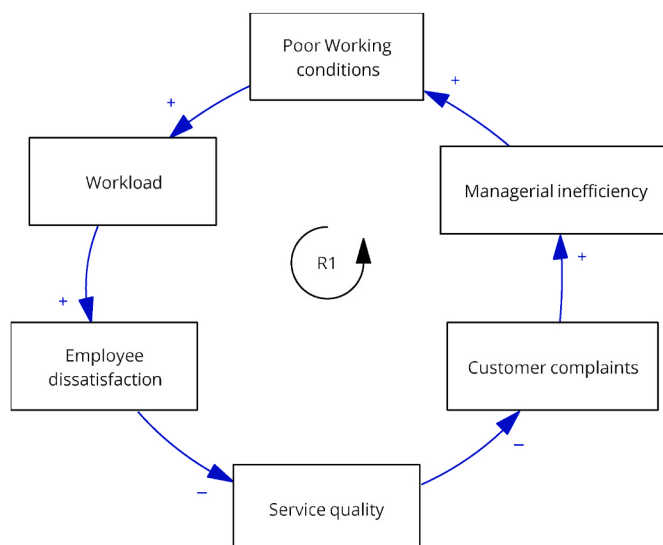


Fig. 4. Reinforcing loop: Decreasing Job Satisfaction Among Tourism Workers.

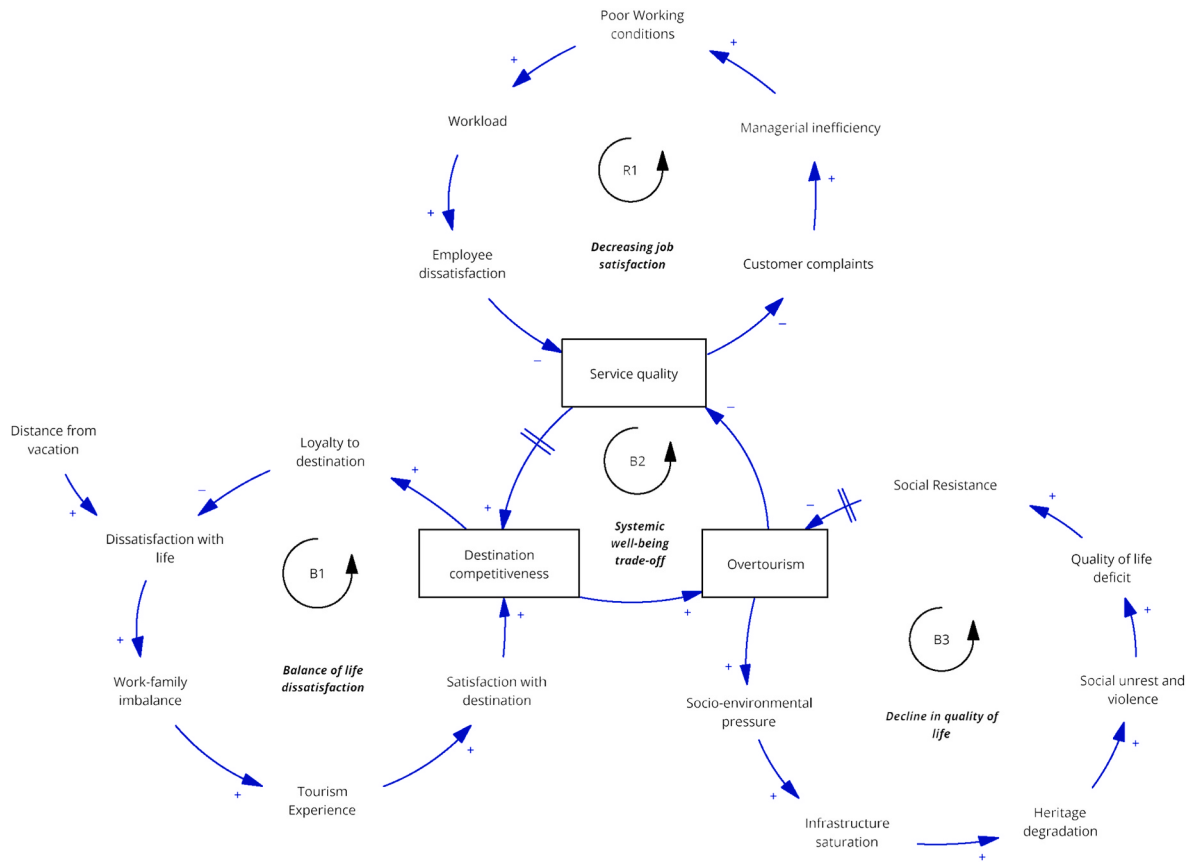


Fig. 5. Integrated causal loop diagram: Dynamics of well-being among key tourism actors.

than conceptualizing well-being as a collection of independent outcomes, the model suggests that destination well-being may be understood as an emergent systemic property arising from reciprocal interactions among stakeholders. In this sense, the quality of life experienced by residents, the working conditions of employees, and the satisfaction of visitors become mutually dependent components of a single destination system.

The findings are also consistent with recent calls to move beyond growth-oriented destination management (Dwyer, 2025). The CLD suggests that competitiveness, service quality, and overtourism operate as accumulative systemic states whose evolution determines the long-term viability of destinations. Consequently, tourism growth may simultaneously generate benefits and create pressures that gradually erode the very social and organizational foundations upon which destination competitiveness depends.

This interpretation resonates with the arguments advanced by Croes (2024), who contend that tourism development should not be evaluated solely through economic growth indicators but through its capacity to improve broader social well-being. His framework emphasizes that tourism outcomes emerge from interactions among economic, social, institutional, and community processes. Similarly, the present model suggests that tourism-generated value cannot be sustainably maintained when the well-being of residents and workers deteriorates. From a systems perspective, social exclusion, labor precarity, and declining quality of life are not merely negative externalities but structural mechanisms capable of undermining destination performance itself.

Importantly, the model does not claim that these dynamics occur uniformly across all destinations. Rather, it proposes a theoretically grounded explanation of how feedback structures may generate sub-optimal well-being outcomes in contexts characterized by sustained tourism growth and high visitor density. The resulting contribution is therefore explanatory rather than predictive, providing a conceptual

basis for future empirical testing and simulation.

4.2. Theoretical and methodological implications

Theoretically, this study contributes to tourism well-being research by integrating multiple strands of literature into a coherent systems framework. Existing studies have successfully identified antecedents and consequences of well-being for individual stakeholder groups, yet they rarely explain how these outcomes influence one another over time. By translating concepts derived from the Experience Economy (Pine & Gilmore, 1999), Self-Determination Theory (Deci & Ryan, 1985), Social Exchange Theory (Thibaut & Kelley, 2017), and workplace well-being research into interconnected feedback structures, this study proposes a new theoretical lens for understanding destination performance.

The principal theoretical contribution lies in conceptualizing destination well-being as an emergent phenomenon rather than an aggregate indicator. The model suggests that tourism systems are characterized by nonlinear interactions, delayed effects, and recursive causality, features that remain difficult to capture through conventional linear approaches. Consequently, the CLD extends previous frameworks that aggregate stakeholder outcomes without explicitly modeling the mechanisms through which these outcomes interact.

The findings also contribute to ongoing debates regarding sustainable tourism development. Much of the literature treats economic performance, visitor satisfaction, community well-being, and employee welfare as partially independent objectives. The dynamic hypothesis developed here suggests that these dimensions are structurally interconnected. As a result, interventions targeting only one stakeholder group may generate unintended consequences elsewhere in the system.

Methodologically, this study demonstrates the value of System Dynamics as a theory-building approach in tourism research. Consistent

with [Stermann \(2000\)](#), the purpose of the CLD is not to estimate effect sizes or predict future behavior, but to formalize causal assumptions and identify potential feedback mechanisms. Unlike PLS-SEM and related variance-based approaches ([Do Valle & Assaker, 2016](#)), which estimate relationships among latent variables at a single point in time, CLDs allow researchers to represent feedback, delays, circular causality, and system boundaries explicitly.

The revised methodological framework further strengthens transparency by documenting variable definitions, operational meanings, literature sources, and boundary adequacy criteria. This level of specification improves conceptual reproducibility and provides a foundation for future Stock-and-Flow formalization. In this regard, the CLD functions as a boundary object ([de Gooyert & Größler, 2018](#)), facilitating dialogue among researchers, policymakers, destination managers, workers, and residents by making structural assumptions visible and open to scrutiny.

Finally, the study contributes to the growing use of qualitative System Dynamics in tourism research by demonstrating how literature itself can serve as a systematic source of evidence for model construction. Rather than relying exclusively on stakeholder workshops or expert elicitation, the present approach synthesizes theoretical and empirical findings accumulated across multiple tourism contexts to formulate a dynamic hypothesis suitable for subsequent validation.

4.3. Strengths and contributions of the model

Several contributions emerge from the proposed model.

First, the principal contribution of this study lies in conceptualizing tourism well-being as an integrated system rather than a collection of independent stakeholder outcomes. While previous tourism well-being studies have predominantly examined tourists, workers, or residents as separate analytical domains, the present model explicitly captures the reciprocal feedback relationships among these actors. By integrating these traditionally disconnected perspectives into a single causal structure, the study advances a systemic understanding of destination well-being in which changes affecting one stakeholder group propagate throughout the broader tourism ecosystem. This emphasis on systemic interdependency represents a significant theoretical advancement over siloed approaches that overlook cross-stakeholder feedback effects.

Second, the study contributes methodologically by extending tourism well-being research beyond static analytical approaches. Conventional methods such as Structural Equation Modeling (SEM) and Partial Least Squares Structural Equation Modeling (PLS-SEM) are highly effective for identifying statistically significant relationships among constructs at a specific point in time. However, they provide limited insight into how those relationships evolve through feedback, delays, and cumulative effects. In contrast, the Causal Loop Diagram developed here formalizes the dynamic structure through which stakeholder well-being co-evolves over time. Consequently, the model does not merely identify whether variables are related; it explains how those relationships may generate reinforcing or balancing system behaviors that shape long-term destination trajectories.

Third, the model provides a theoretically grounded dynamic hypothesis that serves as a foundation for future simulation-based research. Following the System Dynamics tradition ([Stermann, 2000](#)), the CLD functions as a qualitative blueprint that identifies the causal architecture governing tourism well-being in high-density destinations. Although the present study does not estimate effect sizes or predict future states, it establishes the structural conditions necessary for future Stock-and-Flow formalization, scenario testing, and policy experimentation. In this sense, the model should be understood as a precursor to evidence-based simulation rather than a stand-alone explanatory framework.

Fourth, the explicit identification of reinforcing and balancing feedback loops constitutes a major analytical contribution. The model reveals how destination outcomes emerge from the interaction of four

interconnected feedback structures rather than from isolated variables. More importantly, the identification of loops B1, B2, B3, and R1 enables the recognition of leverage points—areas where relatively small interventions may generate substantial system-wide improvements. Variables such as service quality, destination competitiveness, overtourism, and social resistance emerge as structurally sensitive elements because they connect multiple feedback processes simultaneously. While future quantitative studies are required to assess their relative influence, the present model provides a theoretically informed basis for sensitivity analysis and policy design ([Ghaffarzadegan et al., 2011](#)).

Fifth, the model demonstrates the diagnostic and anticipatory value of qualitative System Dynamics. By revealing the feedback mechanisms linking tourism growth to stakeholder well-being, the framework allows policymakers and destination managers to visualize potential unintended consequences before they become observable outcomes ([Porter, 2018](#)). For example, policies aimed exclusively at increasing destination competitiveness or tourist loyalty may inadvertently accelerate overtourism, intensify resident resistance, and undermine service quality. Consequently, the model functions as a strategic blueprinting tool that supports proactive rather than reactive destination governance.

Sixth, the study broadens the scope of tourism well-being research by explicitly integrating physical, environmental, and cultural dimensions into the analysis. Unlike many well-being frameworks that focus primarily on psychological or subjective outcomes, the proposed model incorporates infrastructure saturation, socio-environmental pressure, and heritage degradation as core system variables. This integration highlights how the well-being of residents, workers, and tourists is inseparable from the condition of the physical and cultural environment in which tourism activities occur. As a result, the model bridges an important gap between tourism well-being scholarship and sustainable destination management.

Seventh, the explicit inclusion of worker well-being addresses an important omission in the tourism literature. As noted by [Berkbekova and Uysal \(2021\)](#), tourism research frequently prioritizes visitor satisfaction and resident perceptions while paying comparatively less attention to employees. The reinforcing dissatisfaction loop identified in this study suggests that deteriorating labor conditions are not merely organizational concerns but systemic mechanisms capable of undermining destination competitiveness and long-term sustainability.

Finally, the visual structure of the model enhances its practical utility for stakeholder engagement and collaborative governance. Because Causal Loop Diagrams communicate complex causal relationships in an accessible format, they can function as boundary objects that facilitate dialogue among researchers, policymakers, tourism businesses, workers, and local communities. By making feedback structures, delays, and trade-offs visible, the model provides a shared platform for discussing competing priorities and collectively identifying pathways toward sustainable well-being outcomes. In line with [Croes \(2024\)](#), the framework therefore positions tourism well-being not merely as a psychological or marketing outcome, but as a strategic governance challenge requiring coordinated action across multiple stakeholder groups.

4.4. Limitations and future research pathways

Several limitations should be considered when interpreting the findings.

First, the model represents a qualitative dynamic hypothesis derived from literature synthesis rather than an empirically calibrated simulation. Consequently, the polarity of relationships reflects theoretical consistency reported in prior studies, but the relative strength of those relationships remains unknown. While the CLD identifies plausible causal mechanisms, it cannot determine which loops dominate system behavior under specific conditions ([Bala et al., 2017](#)).

Second, the model was intentionally designed for high-density tourism destinations where overtourism pressures are visible and sustained. Therefore, the prominence of specific feedback structures may

differ in low-density, rural, emerging, or highly regulated destinations. Future studies should examine whether the same mechanisms operate across different tourism contexts and governance arrangements.

Third, although considerable effort was devoted to defining variables, specifying boundaries, and documenting theoretical sources, all CLDs necessarily simplify reality. Several multidimensional concepts—including service quality, destination competitiveness, and socio-environmental pressure—are represented as single variables to maintain analytical clarity. Future research may disaggregate these constructs into more detailed structures.

Fourth, the model does not estimate effect sizes, elasticities, or thresholds. Consequently, the sensitivity discussion presented in this study remains structural rather than numerical. Variables identified as leverage points are theoretically central because they connect multiple loops, but their actual influence should be tested through quantitative simulation and empirical validation.

Future research should therefore proceed toward Stock-and-Flow modeling and simulation. Building upon the dynamic hypothesis presented here, researchers could parameterize the identified variables, estimate delays, and conduct formal sensitivity analyses to determine which mechanisms exert the greatest influence on destination well-being trajectories. Group Model Building approaches (Tourais & Videira, 2021) could further refine the model by incorporating stakeholder knowledge and contextual expertise.

Potential intervention scenarios include regulating carrying capacity to mitigate overtourism, strengthening labor protections to interrupt reinforcing dissatisfaction cycles, diversifying tourism products to reduce concentration pressures, and promoting community participation in destination governance. Such simulations would allow researchers and policymakers to compare alternative development pathways and evaluate their long-term implications for stakeholder well-being.

Ultimately, the present study should be viewed as a theory-building contribution. By formalizing the feedback structures connecting tourists, workers, and residents, it provides a transparent foundation upon which future empirical and simulation-based research can build. The transition from qualitative causal mapping to quantitative dynamic modeling represents the next necessary step for advancing tourism well-being research.

5. Conclusion

This study developed a Causal Loop Diagram (CLD) to formulate a dynamic hypothesis explaining how tourism activities influence the well-being of tourists, workers, and residents in high-density tourism destinations exposed to sustained visitation pressure. Rather than identifying isolated determinants of well-being, the model proposes that destination outcomes emerge from the interaction of reinforcing and balancing feedback structures that operate simultaneously across multiple stakeholder groups.

The principal contribution of the study lies not in demonstrating that tourism affects stakeholder well-being—a conclusion already well established in the literature—but in revealing how these effects become structurally interconnected through feedback mechanisms. Whereas previous studies have generally examined tourists, workers, or residents as separate analytical units, the proposed CLD integrates these traditionally disconnected domains into a single well-being system. Consequently, the model suggests that well-being should be understood as an emergent systemic property rather than the simple aggregation of individual outcomes.

The dynamic hypothesis indicates that tourism demand is initially driven by the balancing mechanism represented in Loop B1 (“Temporal Balance of Life Dissatisfaction”). Consistent with theories of psychological well-being (Ryff & Keyes, 1995), authentic happiness (Seligman, 2002), self-determination (Deci & Ryan, 1985), and existential authenticity (Brown, 2013), tourism experiences temporarily alleviate

dissatisfaction associated with daily routines and work–family imbalance. However, the CLD suggests that this restorative effect is inherently transient due to the fade-out process identified by Nawijn et al. (2010). Consequently, tourism demand is continually regenerated through recurring efforts to restore well-being.

The model further proposes that the expansion of destination competitiveness may unintentionally activate systemic pressures associated with overtourism (Alsharif et al., 2025). Through the integrative balancing loop B2 (“Systemic Well-being Trade-off”), increasing destination competitiveness stimulates tourism growth, which, beyond certain carrying-capacity conditions, contributes to overtourism and subsequent deterioration in service quality. Unlike a traditional literature review that merely reports associations among these variables, the CLD reveals how they become embedded in a self-regulating structure in which the drivers of growth may ultimately undermine the very conditions that sustain competitiveness.

The resident subsystem (B3) suggests that tourism growth may generate cumulative socio-environmental pressures, infrastructure saturation, heritage degradation, and reductions in quality of life. A particularly important insight emerging from the model concerns the role of heritage. The CLD suggests that heritage preservation is not merely a cultural or conservation objective; rather, it constitutes a functional component of destination well-being. Heritage degradation weakens community identity, contributes to social tensions, and accelerates the emergence of social resistance. Consequently, preserving cultural and territorial assets may serve not only symbolic purposes but also systemic ones by helping maintain resident support for tourism development and reducing the likelihood of destabilizing feedback processes.

Similarly, the worker subsystem (R1) suggests that tourism labor conditions may be governed by a reinforcing mechanism in which dissatisfaction, declining service quality, customer complaints, managerial inefficiencies, and workload mutually reinforce one another. The significance of this finding resides in the identification of a potential “burnout trap.” Rather than viewing worker dissatisfaction as a stand-alone outcome, the CLD proposes that it may function as a self-reinforcing process that increases the system’s resistance to simple managerial interventions. This insight could not be derived from isolated actor-based analyses because it emerges specifically from the feedback structure represented in the model.

Taken together, the four feedback structures provide a theoretical explanation for the emergence of suboptimal well-being conditions. In the context of this study, suboptimality does not imply the absence of benefits from tourism. Rather, it refers to a systemic configuration in which the balancing and reinforcing loops prevent the destination from simultaneously maintaining high levels of tourist satisfaction, worker well-being, resident quality of life, and destination competitiveness over time. The CLD suggests that while Loop B1 temporarily improves tourist well-being, the cumulative pressures generated through Loops B2, B3, and R1 progressively erode the social, cultural, and organizational conditions upon which tourism ultimately depends.

From a System Dynamics perspective, the model further suggests that different feedback structures may become dominant under different conditions. During early growth stages, the restorative dynamics represented by Loop B1 and the competitiveness dynamics embedded in Loop B2 may dominate system behavior. However, under sustained high-density tourism conditions, the delayed effects associated with resident resistance (B3) and worker dissatisfaction (R1) may gradually exert greater influence. Although the present qualitative model cannot determine loop dominance empirically, it proposes the dynamic hypothesis that the long-term effects of resident quality-of-life deterioration and workforce instability may eventually offset the benefits generated through destination competitiveness. Testing this proposition constitutes an important avenue for future quantitative simulation.

The study also highlights the practical value of CLDs as strategic diagnostic tools (Ghaffarzadegan et al., 2011). While the present

research does not evaluate specific interventions or simulate policy outcomes, the model provides a blueprint that allows policymakers and destination managers to visualize potential unintended consequences before implementing actions (Porter, 2018). For example, initiatives designed exclusively to increase tourist loyalty may inadvertently accelerate overtourism, infrastructure saturation, heritage degradation, or social resistance if broader system interactions are ignored. Therefore, any policy implications derived from this study should be interpreted as hypotheses for future simulation rather than evidence of policy effectiveness.

As a theory-building contribution, the proposed CLD constitutes a foundational dynamic hypothesis for future Stock-and-Flow modeling. The framework identifies candidate leverage points—including service quality, destination competitiveness, overtourism, heritage preservation, working conditions, and social resistance—that may play critical roles in shaping long-term destination trajectories. Future research should parameterize these relationships, estimate delays, evaluate loop dominance, and formally test intervention scenarios through simulation (Naugle et al., 2024).

Finally, the study acknowledges that the current degree of integration among stakeholder subsystems remains limited by the state of existing tourism well-being research. Although the model advances beyond traditional siloed approaches by connecting tourists, workers, and residents within a common framework, several interdependencies remain only partially specified. Consequently, the most important frontier for future research lies not only in quantifying the identified feedback structures but also in deepening the understanding of the reciprocal interactions that connect stakeholder well-being across tourism systems. In this sense, the proposed CLD should be interpreted as a transparent and theoretically grounded dynamic hypothesis that provides a foundation for future empirical validation, participatory modeling, and simulation-based tourism policy design.

CRedit authorship contribution statement

David Esteban Garzón Vázquez: Writing – original draft, Visualization, Investigation. **Alfredo Guzmán Rincón:** Writing – review & editing, Funding acquisition. **Favio Cala-Vitery:** Supervision, Conceptualization.

Data availability statement

The data supporting the findings of this study are openly available at <https://doi.org/10.6084/m9.figshare.29867486.v1>.

Ethics statement

Ethical approval is not applicable to this manuscript.

Declaration of generative AI and AI-assisted technologies in the writing process

The authors declare that no generative AI tools were used in the writing, editing, or preparation of this manuscript. All content was developed solely by the authors.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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