

IDENTIFICATION OF KEY VARIABLES FOR THE DEVELOPMENT OF HERITAGE TOURISM IN DENPASAR CITY BASED ON SUSTAINABLE CULTURE AND ENVIRONMENT: MICMAC ANALYSIS

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Abstract

This study aims to identify key variables influencing the development of heritage tourism in Denpasar City based on sustainable cultural and environmental principles. Denpasar, as the cultural heart of Bali, faces challenges in balancing urban modernization and cultural preservation. Using a qualitative descriptive approach supported by the MICMAC (Matrice d'Impacts Croisés Multiplication Appliquée à un Classement) method, this study maps the relationships and dependencies among twelve strategic variables gathered from literature studies and expert judgments involving academics, cultural leaders, and local government representatives. The analysis shows that zoning regulations and heritage protection policies (REG_ZONING) and stakeholder participation (STAKE_GOV) are the main driving variables shaping the sustainability of Denpasar's heritage tourism. Meanwhile, variables such as pedestrian infrastructure, public transport integration, and creative economy vitality act as linkage variables, connecting policy with community-level implementation. The results indicate that sustainable heritage tourism in Denpasar can be achieved through integrated spatial regulation, collaborative governance, and local cultural revitalization rooted in the Tri Hita Karana philosophy.

Keywords: Denpasar, Heritage Tourism, MICMAC, Sustainable Culture, Tri Hita Karana.

A. INTRODUCTION

Since the early 2000s, Denpasar has been positioned as a hub of cultural tourism that represents the richness of Bali's heritage. The city possesses a wide range of heritage assets, including temples, palaces, museums, monuments of struggle, urban subak landscapes, and living traditional neighborhoods that persist amid the pressures of urbanization and mass tourism. The Denpasar City Government subsequently curated these historical traces into themed tour packages such as the Denpasar Heritage Track and the Sanur Heritage Track, linking sites including the Puputan Badung Monument, the Bali Museum, Puri Jero Kuta, Pura Maospait, and other historical locations in Sanur. This program was designed to strengthen Denpasar's image as a cultural tourism destination while increasing tourist arrivals to the capital of Bali Province.

However, a number of studies on cultural and landscape conservation indicate that Denpasar's historic character has been degrading due to population growth, commercial development, and extensive land conversion. This situation calls for creative strategies capable of integrating the roles of government, the private sector, and local communities in safeguarding the city's identity without constraining tourism development. At the same time, the development of heritage tourism in core areas such as Jalan Gajah Mada and its

surroundings has been shown to play a dual role: stimulating the urban economy while supporting the preservation of local identity. Conceptually, sustainable tourism rests on a balance among three main pillars cultural resilience, environmental conservation, and economic well-being. To achieve this balance, the Denpasar City Government has implemented various spatial-planning regulations and heritage conservation programs to maintain the authenticity of cultural heritage amid the dynamics of modernization (Suriani, Darma, & Wibawa, 2020).

Several previous studies have examined the management of cultural tourism in Bali from different perspectives. Suriani et al. (2020) investigated strategies for developing culture-based tourism in Denpasar and identified substantial local potential; however, their analysis remained limited to a descriptive SWOT approach and therefore was not able to map hierarchical relationships or dynamic interactions among variables. Wardi (2021) emphasized the importance of conserving heritage assets to support the economic sustainability of local communities, yet did not elaborate in depth on the linkage between economic sustainability and the stability of the urban environment. Meanwhile, Putra and Artisa (2022) highlighted the importance of stakeholder collaboration in tourism governance, but did not succeed in identifying specific variables that structurally function as the primary drivers (driving power) in a complex public policy system.

The gaps across these studies suggest the absence of an analytical approach that can precisely measure levels of influence and interdependence among variables within the heritage tourism development system. Much of the existing scholarship remains linear and partial, and thus has not been able to reveal which factors are most critical to prioritize in public policy. As a result, although Denpasar's cultural tourism potential is widely acknowledged and various conservation policies have been implemented, the systemic complexity among policy, social, and environmental elements has not been clearly mapped. This has led heritage tourism development to be understood as a collection of separate activities for example, a focus on physical restoration of buildings or destination promotion without recognizing how these components interrelate within the city as an integrated system.

From a public administration perspective, the lack of clarity regarding structural interactions among strategic variables such as zoning policy, participation of krama adat (customary community members), tourism waste management, and architectural integrity constitutes a major constraint in formulating urban development policy. The absence of a clear identification of which variables function as "driving variables" as opposed to those that are merely "dependent variables" often results in policy interventions that are reactive and fail to address root causes. Without an accurate structural map, public policy tends to tackle surface-level symptoms rather than the sources of imbalance in Denpasar's cultural tourism system. Therefore, this study is conducted to fill this gap by applying the MICMAC structural analysis method (*Matrice d'Impacts Croisés Multiplication Appliquée à un Classement*). This approach is used to identify and classify key variables in heritage tourism development based on sustainable culture and environment in Denpasar City, according to their driving power and degree of dependence. The findings are expected to provide a more accountable and evidence-based framework for public policymakers in formulating intervention priorities that are effective, measurable, and sustainable.

Accordingly, this study not only contributes to enriching the literature on heritage tourism development in Denpasar, but also offers a quantitative analytical framework that can be replicated for other cities facing similar challenges namely, balancing tourism growth, cultural preservation, and environmental sustainability within a dynamic local governance context.

B. LITERATURE REVIEW

Sustainable Cultural Heritage Tourism

Sustainable cultural heritage tourism frames heritage destinations as social–ecological systems that should generate economic benefits without eroding cultural values or degrading the environment. This framework emphasizes balance across dimensions and intergenerational equity, meaning that management should not merely pursue growth in visitor numbers, but also safeguard carrying capacity and minimize degradation risks. In practice, sustainability requires protecting authenticity (meanings, practices, and cultural landscapes) through policies that both preserve cultural rights and practices and steer industry behavior. Cultural policy can function as a safeguard for cultural practice, a driver of organizational behavior change, and a catalyst for ecological citizenship that supports local sustainability agendas. Accordingly, this perspective provides a conceptual justification for assessing whether regulations, visitor management, and destination governance genuinely reduce impacts while strengthening community well-being and conserving heritage assets (Sharpley, 2000; Duxbury et al., 2017).

Indicators:

- Conservation of heritage assets/cultural landscapes
- Cultural authenticity and integrity
- Community well-being and benefits for local residents
- Fair distribution of benefits (inclusiveness)
- Control of environmental impacts (waste, water, energy)
- Visitor management and carrying capacity
- Compliance with spatial planning/zoning

Collaborative Governance

Collaborative governance describes a governance arrangement in which public actors directly engage non-state stakeholders to formulate decisions and carry out collective action. Its orientation goes beyond consultation, emphasizing joint deliberation that typically occurs in formal forums governed by agreed rules of engagement. Collaborative processes rest on dialogue, trust-building, and commitment, enabling conflicts of interest to be managed through social learning and the search for workable common ground. Integrative frameworks further propose that collaboration is shaped by system context and drivers, and then operates through principled engagement, shared motivation, and capacity for joint action. This theory is therefore relevant for evaluating how effectively cross-actor coordination is translated into coherent policy and consistent implementation (Ansell & Gash, 2008; Emerson et al., 2012).

Indicators:

- Cross-sector actor involvement (inclusiveness)
- Routine dialogue and deliberation forums
- Rules and institutional arrangements for collaboration (SOPs, MoUs)
- Information transparency and data sharing
- Shared trust and commitment
- Conflict-resolution mechanisms
- Clear resource-sharing and role allocation
- Joint monitoring and evaluation

Tri Hita Karana

Tri Hita Karana (THK) is a Balinese philosophy of the “three causes of well-being,” linking spiritual, social, and ecological harmony as the foundation of collective life. THK maps this harmony into *parahyangan* (human–God relations), *pawongan* (human–human relations), and *palemahan* (human–nature relations), thereby offering a normative lens for cultural tourism. Within destination governance, THK functions as a values-based device for judging the legitimacy of development for example, whether projects preserve sacred spaces, distribute benefits fairly, and avoid ecological pressures. The literature also suggests that THK can

become a site of contestation, where different actors invoke the same values to justify contrasting development trajectories, meaning its implementation should be read as both a cultural and political practice. For that reason, THK can be operationalized as a local, context-sensitive set of indicators to assess the quality of customary community engagement and environmental ethical compliance in heritage management (Adityanandana & Gerber, 2019; Wibisana & Dewi, 2023).

Indicators:

- Parahyangan: protection of sacred sites/rituals; ethics of sacred space
- Pawongan: participation of residents/customary villages; mutual cooperation; fairness of benefits
- Palemahan: environmental conservation; waste/effluent management; safeguarding carrying capacity
- Compliance with local customary norms (awig-awig/perarem)
- Social harmony: minimal conflict; deliberation mechanisms function effectively

C. RESEARCH METHODOLOGY

This study employs a sequential explanatory design, a research strategy intended to explain and interpret quantitative findings through subsequent qualitative data collection and analysis (Creswell, 2009). The data are derived from primary sources collected via Focus Group Discussions (FGDs). The FGDs involved regulators, academics, customary/traditional leaders, tourism practitioners, and environmental experts. The insights generated from the FGDs were then used as the foundation for the data analysis process.

The study applies a prospective structural analysis technique. Structural analysis is an effective approach for supporting decision-making, operational planning, identifying the impacts of a strategy, and formulating alternative evaluation scenarios for the future, operationalized in the form of a matrix (Ariyani et al., 2019). The structural analysis was conducted in three stages. The first two stages were carried out during the FGDs, while the third stage was completed with the support of MICMAC software (Serrano et al., 2015). The sequence of these stages is presented in Figure 1.

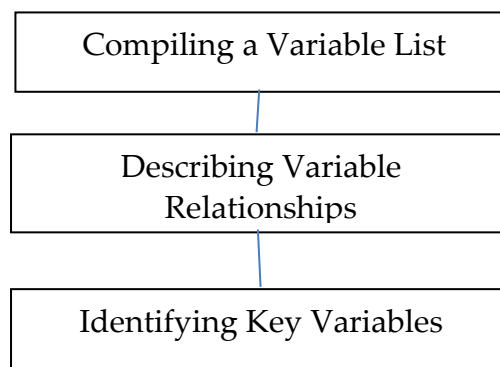


Figure 1. Stages of Structural Analysis
Source: Processed by Researchers, 2026

MICMAC analysis is essentially a variable system analysis based on direct classification, in which interrelationships among variables are identified and evaluated by experts or stakeholders through Focus Group Discussions (FGDs) (Wijaya et al., 2020). In the MICMAC

approach, these variables are then classified into four quadrants according to their levels of dependence and influence, as illustrated in Figure 2. Influence variables located in Quadrant I represent variables with a very high level of influence but low dependence. Therefore, variables in this quadrant are highly critical within the system and function as key variables. Meanwhile, variables in Quadrant II are categorized as relay variables those that exhibit both high influence and high dependence so they are often regarded as indicators of instability within a system.

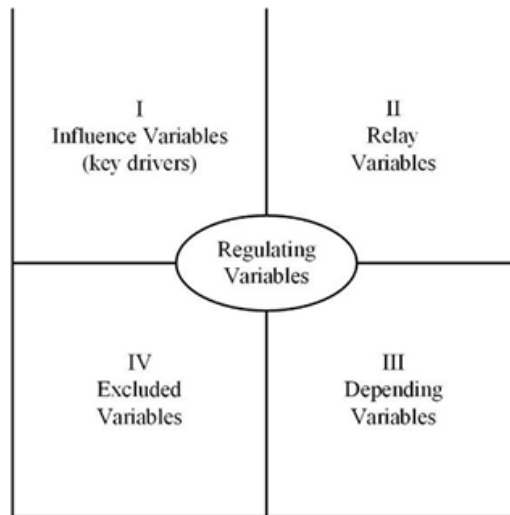


Figure 2. Mapping in MICMAC
Source: Processed by Researchers, 2026

D. RESULT AND DISCUSSION

Identification of Variables for the Development of Heritage Tourism in Denpasar City

Based on the results of a Focus Group Discussion (FGD) with experts including academics, tourism practitioners, palace officials, and officials from the Denpasar City Tourism Office, 12 strategic variables were identified that influence the development of heritage tourism based on sustainable culture and the environment in Denpasar City. These variables encompass policy, socio-cultural, creative economy, and environmental aspects, as detailed in Table 1 below.

Table 1. Identification of Variables for the Development of Heritage Tourism in Denpasar City Based on Sustainable Culture and the Environment

<i>Category</i>	<i>Variable</i>	<i>Code</i>
Policy and Governance	Zoning Regulations & Cultural Heritage Protection	REG_ZONIN G
Socio-Cultural	Continuity of Ritual Activities in Public Spaces	RIT_ACTIV
Socio-Cultural	Support for Traditional Institutions (Traditional Villages & Palaces)	ADAT_SUPP
Creative Economy	Education & Historical Interpretation	HIS_EDUC
Environment	Vitality of Locally Based Creative Industries	LOC_CREAT
Environment	Waste Management & Urban Sanitation	WASTE_MGT
Infrastructure	Air Quality & Noise Pollution Control	AIR_QUAL
Infrastructure	Provision of Green Open Spaces (RTH)	GREEN_SPC
Governance	Pedestrian Infrastructure Convenience	PEDEST_IN

Cultural Heritage	Integration of Public Transportation & Parking	TRANS_MGT
Policy and Governance	Stakeholder Participation (Governance)	STAKE_GOV
Socio-Cultural	Preservation of Vernacular & Colonial Architecture	ARS_HERIT

Source: Processed by Researchers, 2026

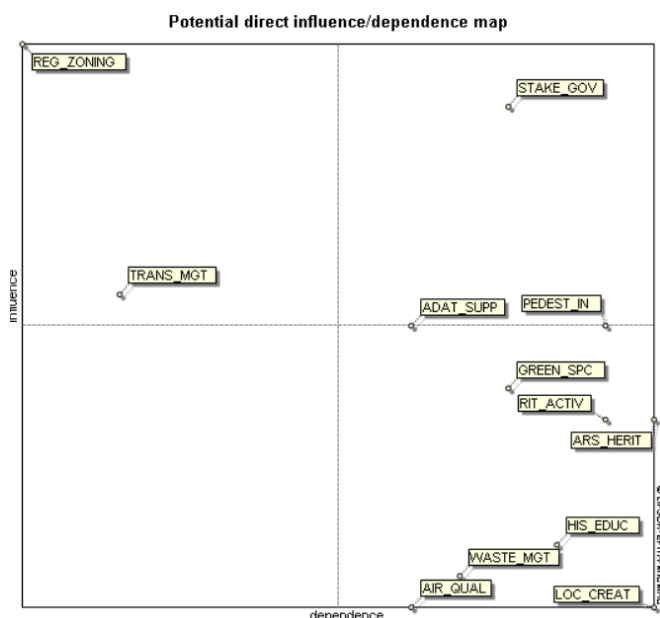


Figure 3. Direct Influence/Dependence Map of Heritage Tourism Development Variables in Denpasar City

Source: Processed by Researchers, 2026

Figure 3 presents the direct influence/dependence map generated from the Matrix of Direct Influence (MDI). Based on this mapping, the variables Zoning Regulation and Cultural Heritage Protection and Stakeholder Participation (Governance) fall within Quadrant I as influence variables or key drivers. These variables exhibit a very high level of influence with relatively low dependence, thereby functioning as the primary determinants within the heritage tourism development system of Denpasar City. The dominance of the regulatory factor indicates that the success of conserving and utilizing heritage areas is strongly conditioned by the robustness of spatial planning policies and the legal protection afforded to cultural assets. Meanwhile, the strong influence of governance underscores the importance of collaboration among the municipal government, *desa adat* institutions, business actors, and local communities in safeguarding cultural and environmental continuity.

In Quadrant II, the variables are categorized as relay variables, comprising Support from Customary Institutions (Desa Adat and Puri), Pedestrian Infrastructure Comfort, Provision of Green Open Space, and Integration of Public Transport and Parking. These variables display both high influence and high dependence, suggesting that they may reflect system dynamics and potential instability if not managed in an integrated manner. The positioning of customary institutions as relay variables implies that, although they exert significant influence in sustaining cultural values, their role is also strongly shaped by regulatory frameworks, governance arrangements, and urban development policies. Similarly, pedestrian infrastructure, transport integration, and green space provision are highly dependent on policy direction while simultaneously shaping the quality of sustainable heritage tourism experiences.

Quadrant III contains the depending variables, namely conservation of vernacular and colonial architecture, continuity of ritual activities in public spaces, education and historical interpretation, and vitality of locally based creative industries. These variables are characterized by high dependence and function as outcome variables. In other words, the success of preserving heritage buildings, sustaining ritual practices, and strengthening local creative industries is largely determined by the effectiveness of regulation, governance, customary support, and the availability of supporting infrastructure. These variables are also sensitive to shifts in influence and relay variables, thereby representing the tangible outcomes of heritage tourism development strategies.

Quadrant IV is occupied by excluded or autonomous variables, namely air quality and noise pollution control. These variables show relatively low levels of both influence and dependence within the system structure. Nevertheless, they remain relevant as enabling environmental prerequisites, even though they do not directly operate as either key drivers or primary outcomes in the heritage tourism development system.

Further analysis using the Matrix of Indirect Influence (MII) indicates a strengthened position of the key variables once indirect effects are taken into account. Zoning Regulation and Cultural Heritage Protection remains the most influential variable, followed by Stakeholder Participation. This reinforces the argument that, over the medium to long term, the sustainability of heritage tourism in Denpasar City depends heavily on policy consistency and the quality of collaborative governance. Figure 4 presents the network of direct effects among variables, highlighting strong direct influence relationships between regulation, governance, customary institutions, and urban infrastructure

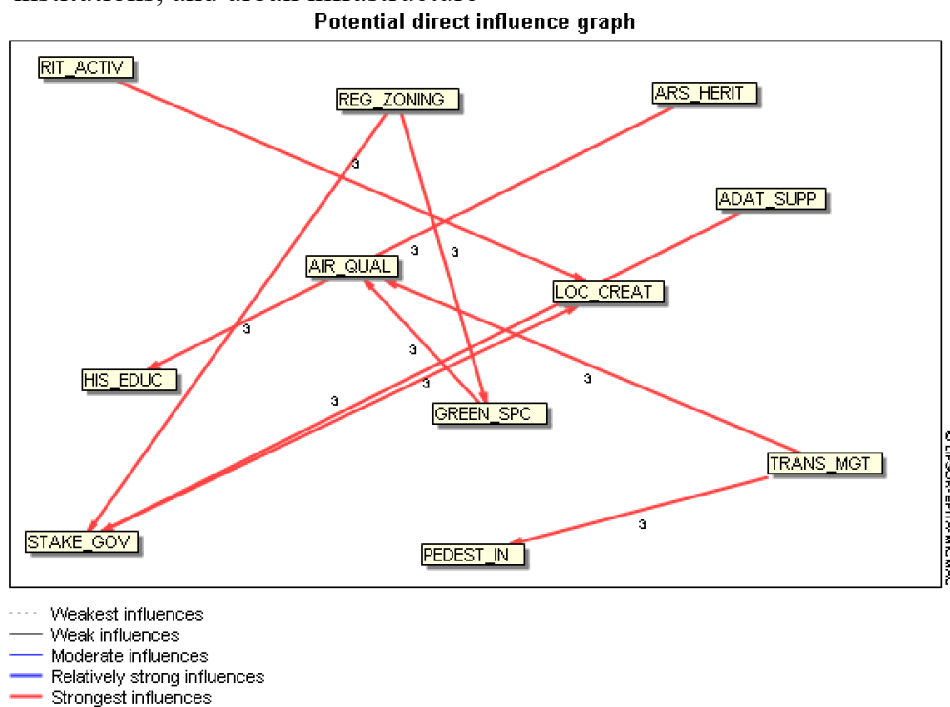


Figure 4. Direct Effects Between Variables in Heritage Tourism Development in Denpasar City

Source: Processed by Researchers, 2026

Furthermore, Figure 5 depicts indirect effects which show how the influence of policies and governance spreads systemically to impact cultural preservation, ritual activities, and strengthening the local creative economy.

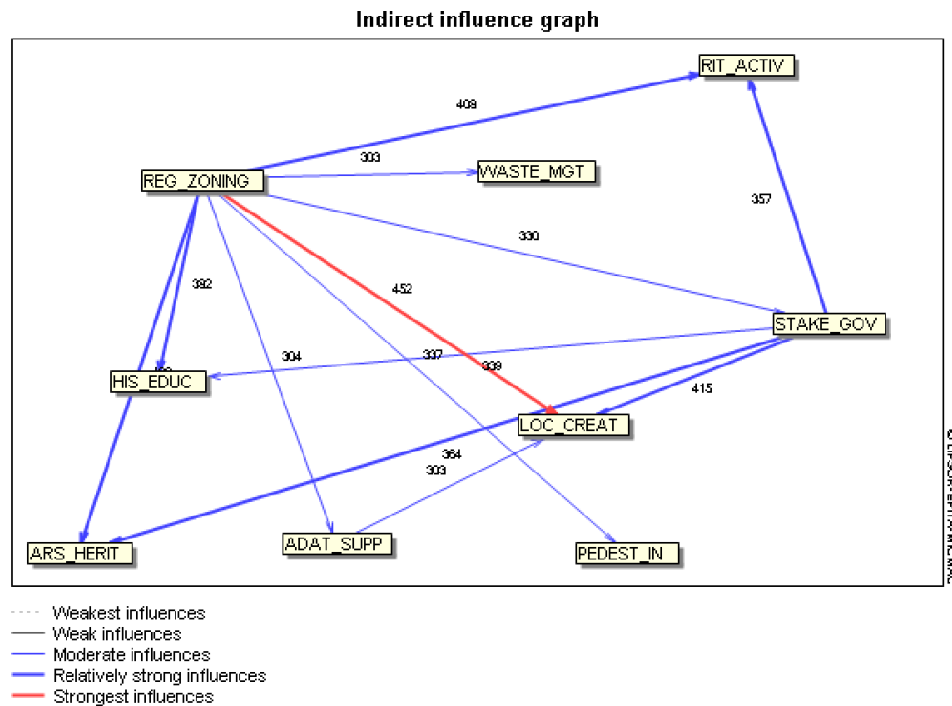


Figure 5. Indirect Effects Between Variables in Heritage Tourism Development in Denpasar City

Source: Processed by Researchers, 2026

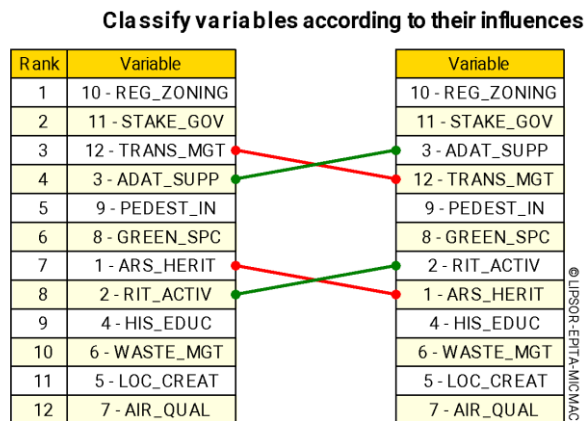


Figure 6. Based on Influence
Source: Processed by Researchers, 2026

Figure 6 shows the change in variable ranking based on influence from the initial MDI (direct) condition to the condition after the MII iteration (indirect). In the direct influence (MDI), the most influential variable is Zoning Regulation & Cultural Heritage Protection (row total = 24), followed by Stakeholder Participation (Governance) (22), and Public Transportation & Parking Integration (16).

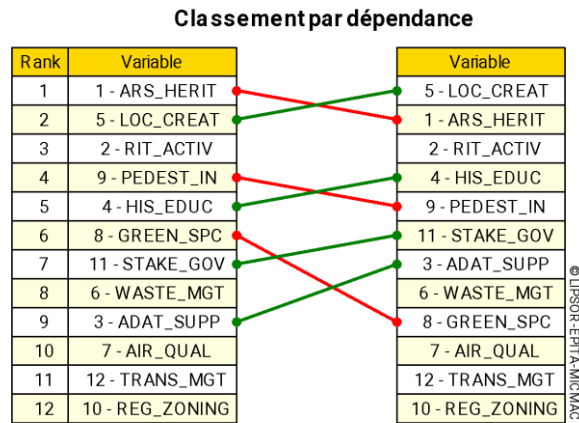


Figure 7 Dependence

Source: Processed by Researchers, 2026

Meanwhile, Figure 7 displays the ranking of variables based on dependence. In the MDI (direct), variables with high dependence are seen in the Preservation of Vernacular & Colonial Architecture and the Vitality of Locally Based Creative Industries (both column totals = 17), as well as the Continuity of Ritual Activities in Public Spaces and the Convenience of Pedestrian Infrastructure (column total = 16). This pattern confirms that the main outputs of heritage tourism development physical preservation, ritual dynamics, and strengthening the creative economy are highly dependent on driving variables such as regulation and governance.

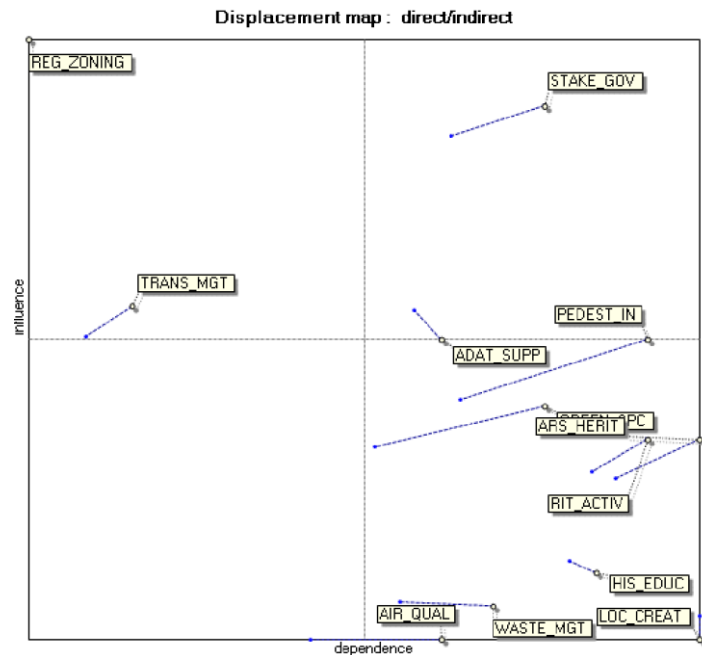


Figure 8. Displacement Map Between Variables from Direct Effect to Indirect Effect

Source: Processed by Researchers, 2026

Figure 8 presents a displacement map depicting the shift in the position of variables from the direct influence/dependence map to the indirect influence/dependence map. Conceptually, the displacement line indicates the change in the variable's "role" when the indirect effect begins to dominate.

The REG_ZONING variable appears relatively stable and remains in the area of high influence with low dependency. This confirms its position as a consistent key driver, both in

terms of direct and indirect effects. Meanwhile, STAKE_GOV experienced a shift toward stronger influence, indicating that the role of governance and stakeholder collaboration is strengthened when systemic interactions are taken into account.

The TRANS_MGT and PEDEST_IN variables exhibited moderate shifts, indicating their role as relay variables. This shift reflects that transportation and pedestrian comfort policies are not only influenced by regulations but also contribute to channeling policy impacts to other variables in the heritage tourism system.

On the dependency side, the ARS_HERIT_PC, RIT_ACTIV, and HIS_EDUC variables shifted more toward high dependency. This confirms that the preservation of heritage architecture, the sustainability of ritual activities, and historical education are outcome variables heavily influenced by driver and relay variables. A similar shift was also seen in LOC_CREAT, indicating that the vitality of locally based creative industries is increasingly dependent on the performance of the overall system.

Meanwhile, AIRQUAL and WASTEMGT remain in the low influence and dependency areas with minimal shifts. This indicates that these two environmental variables are relatively autonomous within the system structure, functioning as supporting factors but not as primary determinants of the dynamics of heritage tourism development in Denpasar City.

E. CONCLUSION

Developing heritage tourism in Denpasar is not just about physical preservation or increasing tourist visits, but also encompasses an integrated socio-cultural and ecological governance system. The MICMAC model emphasizes that heritage tourism sustainability can only be achieved if public policy balances regulation, participation, infrastructure, and cultural education.

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