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Implementing Communication Networks in Developing the Smart Tourism Village of Dieng Wonosobo

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ABSTRACT

Various tourist destinations in Indonesia are developing their potential as Smart Tourism Villages. One successful case is the Dieng Wonosobo area, achieved through strengthening communication networks and collaboration among tourism actors. This study aims to identify actor relationships and roles in developing the Dieng Wonosobo Smart Tourism Village and to explore the process of information and knowledge transfer within the tourism network. A descriptive qualitative approach was applied using Communication Network Theory and the Social Network Analysis (SNA) method by Wasserman and Faust. Data were collected through in-depth interviews and focus group discussions with the Wonosobo Tourism and Culture Office, tourism businesses, the Wonosobo Tour Guide Association, and community organizations. The findings show that the communication network built by the Tourism Office and tourism stakeholders is highly structured and collaborative, extending to the village level. The use of digital technology and improved accessibility are key factors in the Smart Tourism Village's success. These findings highlight that an effective communication network structure strengthens the active roles of stakeholders in shaping an adaptive and sustainable tourism system.

Keywords: Communication network, smart tourism village, collaborative tourism

ABSTRAK

Berbagai kawasan wisata di Indonesia berupaya mengembangkan potensi yang dimiliki sebagai Smart Tourism Village (Desa Wisata Cerdas). Salah satu yang berhasil sebagai Smart Tourism Village di Indonesia yaitu kawasan Dieng Wonosobo, melalui penguatan jaringan komunikasi dan penggunaan saluran antar aktor penggerak pariwisata. Tujuan penelitian untuk mengidentifikasi hubungan aktor dan perannya dalam pengembangan Desa Wisata Cerdas di Dieng Wonosobo dan mengidentifikasi proses transfer informasi dan pengetahuan dalam jejaring aktor penggerak pariwisata di Dieng Wonosobo. Menggunakan pendekatan kualitatif deskriptif dan dengan teori Jaringan Komunikasi dengan metode analisis Social Networking Analysis perspektif Wasserman dan Faust, data diperoleh melalui wawancara mendalam, FGD, dengan Dinas Pariwisata dan Kebudayaan Kabupaten Wonosobo, pelaku usaha dan penggiat pariwisata (Himpunan Pramuwisata Wonosobo) serta komunitas pariwisata. Hasil penelitian menunjukkan bahwa jaringan komunikasi yang dilakukan oleh Dinas Pariwisata dan Kebudayaan Wonosobo dengan aktor penggerak pariwisata sangat massif melalui kolaborasi dan penguatan peran aktor sampai ke tingkat desa. Secara struktur, komunikasi yang dilakukan sangat terpola sehingga mampu menghasilkan jaringan komunikasi. Smart Tourism Village di Dieng Wonosobo berhasil karena penggunaan teknologi dan aksesibilitas wisata dengan melibatkan para aktor pariwisata. Temuan ini menunjukkan bahwa struktur jaringan komunikasi memperkuat adanya peran pihak yang aktif dalam membentuk sistem.

Kata Kunci: Jaringan komunikasi, desa wisata cerdas, pariwisata kolaboratif

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INTRODUCTION

The development of the tourism sector in Indonesia has significantly contributed to economic growth. This is evident through increased employment opportunities across multiple sectors, improved regional revenues, and the expansion of local economies. Beyond stimulating regional growth, tourism has also modernized previously underdeveloped areas by enhancing accessibility and infrastructure surrounding tourist destinations. As a strategic economic driver, the tourism sector plays an essential role in regional development by fostering local welfare and supporting national growth (Yoeti, 2008) in (Rahayuningsih & Wati, 2023). Indonesia's vast natural and cultural diversity represents a valuable tourism asset that requires protection and preservation to ensure sustainable attractiveness for both domestic and international visitors. Tourism thus serves as both a geographical and historical advantage that not all regions possess.

Central Java Province is one of Indonesia's key tourism areas, featuring numerous well-known destinations. Among these, the Dieng Plateau is particularly prominent for its natural highland panorama spanning several regencies, including Wonosobo, Banjarnegara, Batang, Pematang, and Temanggung. Notable attractions within Wonosobo Regency include Telaga Warna, Tieng Viewpoint, Sikunir Hill, and Mount Prau. Tourism functions as a strategic catalyst for local economic development, particularly in potential regions such as Dieng Wonosobo. This area combines natural assets such as Telaga Warna and Kawah Sikidang, cultural assets like the Dieng Culture Festival, and agro-tourism resources that can be integrated into the *Smart Tourism Village* (STV) concept. According to Statistics Indonesia (BPS, 2023), visits to Wonosobo's tourist destinations increased from 1,389,766 in 2022 to 1,743,050 in 2023, demonstrating the sector's rapid growth.

The *Smart Tourism Village* (STV) initiative has emerged as a distinctive tourism development model across Indonesia, leveraging local natural and cultural richness. One form of innovation is the establishment of community-based tourism villages where residents preserve their traditional culture, thus generating strong tourism appeal (Wicaksono et al., 2024). A *Smart Tourism Village* is a rural area whose residents maintain authentic cultural traditions, making them attractive tourism destinations (Prasetyo & Sulistyarso, 2017). Additional elements such as local cuisine, agricultural systems, and social structures enhance the village's appeal. The authenticity and preservation of natural environments are also crucial aspects of these destinations. For tourism villages to thrive, adequate supporting facilities are needed to improve visitor convenience and extend the duration of their stays. In addition, tourism villages must integrate digital technologies to create strong branding

and reach wider audiences. Digital transformation influences various business stages, making operations more efficient and effective. One approach involves digitizing tourism-related information through information technology (Fasa et al., 2022; Meliala et al., 2023).

The development of Smart Tourism Villages requires effective communication. In this context, communication refers to the deliberate use of techniques and processes designed to achieve development goals by involving diverse stakeholders (Bakti et al., 2018b; Graci, 2013; Saito & Ruhanen, 2017). Within this study, such stakeholders are referred to as *tourism network actors*. Communication plays a critical role in raising awareness, sustaining engagement, and disseminating information through various media channels. Although the terms “communication for development” and “development media” are often used interchangeably, communication must be understood as more than media production; it must be positioned within a comprehensive and participatory communication plan facilitated through structured communication networks (Salam et al., 2024; Toruan et al., 2023).

Communication platforms serve as the foundation for the exchange of ideas and the co-creation of strategies (Bungin, 2023). While communication cannot replace human interaction, it enables tourism actors to recognize their collective roles and shared responsibilities in decision-making processes that influence program outcomes (Toruan et al., 2025). This research seeks to map the implementation of communication networks among tourism actors in developing the Smart Tourism Village of Dieng Wonosobo. These actors have already adopted strategic communication practices to optimize tourism development. The study begins by analyzing the structural dimensions of the communication network, highlighting the significance of networked collaboration among tourism stakeholders in fostering effective Smart Tourism Village development.

The success of Dieng Wonosobo’s Smart Tourism Village relies on the establishment of communication networks that foster collaboration, cohesion, and mutual trust among tourism actors. Furthermore, the sustainable management of natural resources depends on the local community’s knowledge and ecological wisdom, which form the foundation for a successful Smart Tourism Village (Novianti et al., 2020). In this context, the implementation of communication networks represents an organized pattern of interpersonal contact through which information is exchanged within a social system (Berger, Roloff, & Ewoldsen, 2010) in (Dewi & Syaiki, 2022). As noted by Berlo (1977) and Rogers & Kincaid 1981, in (Cangara, 2019), communication within a network is a two-way, convergent process aimed at achieving shared meaning between communicators and recipients through established communication channels. Such channels are vital in tourism development, particularly for *person-to-person* interactions (Bakti et al., 2018a).

Communication channels help disseminate tourism development programs effectively (Komariah & Subekti, 2016). Therefore, communication occurs when there is a shared understanding of information among participants connected through structured communication networks. These processes foster mutual comprehension, collective action, and behavioral alignment among network members. Rogers & Kincaid 1981, in (Cangara, 2019) identify several key roles in communication networks: (1) Liaison Officers, who connect two or more groups without belonging to any; (2) Gatekeepers, who filter incoming information; (3) Bridges, who link subgroups; (4) Isolates, who remain disconnected from networks; (5) Cosmopolites, who connect groups with external systems; and (6) Opinion Leaders, who influence group perspectives.

A communication network is thus a structured pattern of relationships among individuals, representing the flow of information within a social system. According to Wasserman and Faust (1994), a communication network comprises a set of actors (nodes) and relationships (ties) among them. These actors can be individuals, groups, organizations, or communities, while ties may represent interactions or exchanges among these entities. Communication networks are also closely linked to innovation diffusion the process by which new ideas, practices, or technologies spread through social systems and are ultimately adopted by individuals (Eriyanto, 2019). Networks serve as conduits for subjective evaluation, facilitating the adoption of innovations through interpersonal communication structures Rogers, in (Cangara, 2019).

This study applies Communication Network Theory, introduced by Peter R. Monge 2003, in (Eriyanto, 2014), which conceptualizes communication groups as interconnected systems forming organizational networks. When individuals communicate, they create links in both formal networks defined by organizational structures and informal ones emerging from daily interactions. Each individual possesses a unique *personal network* that reflects their communication patterns.

To analyze these networks, the study employs Social Network Analysis (SNA) a methodological approach grounded in *graph theory* used to quantitatively and qualitatively map social structures by identifying relationships among actors. In SNA, actors are represented as *nodes*, while their relationships are depicted as *ties*. Wasserman and Faust 1994, in (Toruan et al., 2026) define three key elements: (1) *Nodes* (actors or entities), (2) *Ties* (the relational links connecting actors), and (3) *Dyads* (pairwise relationships between two actors). Communication Network Analysis or SNA has become a central method in communication studies, particularly for understanding innovation diffusion processes. In essence,

communication networks consist of interconnected actors whose relational structures reflect the flow and distribution of information (Eriyanto, 2014).

RESEARCH METHOD

This study utilises Social Network Analysis (SNA), a data analysis method that maps existing social networks (Gruzd et al., 2016). The analysis in this study was conducted at the network structure level, group level, and actor level in the tourism actor network in Dieng Wonosobo, the results of which can show the roles of the actors in the network. SNA provides an accurate data analysis framework for deciphering the structure and interactions in the communication network at the base level to gain insight into how communication is carried out.

This study involved 30 informants in the tourism sector in Dieng Wonosobo, representing five key elements in the tourism communication network: local government (Department of Tourism and Culture, sub-district heads, and village heads), business actors (SMEs, travel agents, and accommodation providers), academics (UGM, Diponegoro University and Wonosobo Agricultural Academy), community organisations (NGOs, civil society groups, Tourism Awareness Groups [Pokdarwis], religious leaders, and community leaders), and media institutions (both national and local media).

The SNA method in this study was used to classify the relationships between actors (nodes), groups, organisations, or agencies within a network, as well as to map the roles of each actor and identify the social structure and explain the position of key stakeholders or key players in interactions regarding the development of the Dieng Wonosobo smart tourism village. This method focuses on mapping the involvement of actors (nodes) in an interaction, the interaction process, the strength of the interaction, whether the interaction is one-way or two-way, the medium of interaction, which actors (nodes) have the most interactions (ties), connectivity (degree) and position (betweenness), as well as closeness (closeness) and density (eigenvector) that occur between actors and actors who are key players. Using SNA can provide an overview of how tourism actors interact and form patterns that can provide deep insights into the dynamics of communication. Specifically, SNA operations are presented in the following table:

Tabel 1. Social Network Analysis Operational

Variable	Operational Defenition	Indicator	Measurement Method
Node (Actor)	Individuals or entities that are part of a social network	Number of actors in the network	Identify each individual in the network
Tie (Relationship)	Relationship or interaction between two actors in the network	Frequency of communication, cooperation	Count the number of relationships between actors
Degree Centrality	The degree of connection between an actor and other actors in the network	Number of direct relationships	Counting the number of edges connected to the actor
Betweenness Centrality	The position of an actor as an intermediary in the network	Frequency of the actor becoming a connecting path	Counting the number of paths that pass through the actor
Closeness Centrality	The proximity of an actor to all other actors in the network	Average distance to other actors	Calculating the total shortest distance to all actors
Eigenvector Centrality	The density of relationships in the network	Comparison of actual relationships with maximum relationships	Calculating the ratio of total relationships to possible relationships

Data analysis was conducted using the interactive qualitative analysis model developed by (Miles et al., 2014), consisting of three core stages: (1) Data Reduction, involving the systematic filtering and summarization of interview results to identify key themes and categories; (2) Data Display, in which findings were organized and presented through thematic narratives and structured analytical scripts; and (3) Conclusion Drawing and Verification, wherein the interpreted data were theoretically examined through the lens of Communication Network Theory by Rogers and Kincaid, and further analyzed using the Social Network Analysis (SNA) method with the support of UCINET software to map the interrelationships among tourism actors.

The communication network data in this study were derived from in-depth interviews and Focus Group Discussions (FGDs) with key stakeholders involved in the development of the Smart Tourism Village of Dieng Wonosobo. The interview instruments were designed using a relational approach to identify communication patterns, coordination flows, and information exchanges among actors. Actors (nodes) were identified based on their role relevance and cross-recognition among respondents, and were subsequently assigned

numerical codes to facilitate network data construction. Statements indicating interactions among stakeholders were coded as directed ties, reflecting the hierarchical nature of policy-oriented communication.

The conversion of qualitative data into an adjacency matrix was conducted through relational thematic coding of interview and FGD transcripts. Inter-actor relationships were weighted using an ordinal scale ranging from 0 to 3, determined by a combination of three main criteria: frequency of communication, level of importance of the information exchanged, and formal administrative hierarchy. Higher scores were assigned to relationships characterized as routine, strategic, and formal, while lower scores represented infrequent and non-strategic interactions. The weighting process was validated through data triangulation across respondents and FGD outcomes to ensure empirical consistency.

The resulting weighted and directed adjacency matrix was then input into UCINET to calculate centrality metrics, including Degree Centrality, Closeness Centrality, Betweenness Centrality, and Eigenvector Centrality. This approach enables a systematic integration of qualitative data with quantitative network analysis, ensuring that the centrality results reflect not only the structural properties of the network but also the social and institutional meanings embedded in inter-actor communication within the Smart Tourism Village development process.

RESULTS AND DISCUSSION

Results

The findings of this study indicate that the first analytical objective involves the use of centrality to quantify the importance and influence of actors within a communication network. Beyond identifying the interconnections among actors in the structural framework of the *Smart Tourism Village* development network, this stage also examines the specific roles played by each actor in shaping the network's dynamics. In this context, every actor contributes uniquely to the development process of the *Smart Tourism Village* in Dieng Wonosobo.

The government actors identified in this research include the *Wonosobo Regency Government*, particularly the Department of Tourism and Culture, as well as local authorities such as village heads who play a pivotal role in policy implementation and coordination. The intellectual actors refer to higher education institutions and academics at the local level, who contribute through research-based insights, knowledge dissemination, and community empowerment initiatives. Meanwhile, business actors comprise tourism industry

stakeholders, including accommodation managers and travel service operators, who directly engage with visitors and sustain the local tourism economy.

However, the results reveal that government actors emerge as the primary drivers in the development of the *Smart Tourism Village* in Dieng Wonosobo. Their strategic involvement is evident in planning, coordinating, and facilitating collaborations across various stakeholder groups. At the operational level, community actors—including residents, *Tourism Awareness Groups (Pokdarwis)*, and local social organizations—serve as the backbone of implementation, actively participating in village-based tourism programs. Additionally, media actors play a significant role in disseminating information and promoting the image of Dieng as a *Smart Tourism Village*, thereby enhancing its visibility and attractiveness to broader audiences.

The analysis further highlights that the collaborative structure among these actors forms a cohesive communication network characterized by trust, shared goals, and continuous interaction. Such a structure allows for the effective transfer of knowledge and innovation within the tourism ecosystem, enabling the Smart Tourism Village model to evolve sustainably. The synergy among government leadership, academic support, entrepreneurial participation, and community engagement demonstrates a communicative framework essential for realizing smart, inclusive, and locally grounded tourism development in Dieng Wonosobo.

Table 2. Objective 1 – Roles of Actors in the Development of the Smart Tourism Village in Dieng Wonosobo

Actor/Component	Indicator	Measurement Criteria
Role of the Regency Government (Department of Tourism and Culture) and Village Heads in the Development of the Smart Tourism Village	Policy and Program Formulation	<ul style="list-style-type: none"> - Existence of policies supporting the development of the Smart Tourism Village. - Availability of facilities that foster the establishment of inter-actor networks within the Smart Tourism Village. - Formation of a special task force actively involved in the Smart Tourism Village development process.
Role of Academia in the Development of the Smart Tourism Village	- Dissemination of information, knowledge, and innovation.	<ul style="list-style-type: none"> - Existence of collaborative programs with the government. - Partnerships with business actors.

	<ul style="list-style-type: none"> - Knowledge transfer and technological application. - Implementation of research and development outcomes. 	<ul style="list-style-type: none"> - Collaborations with community organizations. - Provision of policy recommendations for creative industry development models. - Production of research outputs related to creative industry development.
Role of Business Actors in the Development of the Smart Tourism Village	<ul style="list-style-type: none"> - Creative and innovative capabilities. - Characteristics of business actors. 	<ul style="list-style-type: none"> - Ability to transform creativity into economic value. - Ability to create added value for produced goods and services. - Capacity to generate new variations in products and services. - Ability to create employment opportunities for creative and supporting individuals.
Role of Community in the Development of the Smart Tourism Village	<ul style="list-style-type: none"> - Community interaction. - Bridging the interests of residents and social groups. 	<ul style="list-style-type: none"> - Existence of information and knowledge exchange processes among community members. - Communication with other communities to expand networking.
Role of Media in the Development of the Smart Tourism Village	<ul style="list-style-type: none"> - Providing input and recommendations. - Conducting promotion and information dissemination. 	<ul style="list-style-type: none"> - Regular meetings with tourism stakeholders. - Information sharing related to tourism activities. - Publication of positive and measurable reports on tourism events and initiatives.

Source: Researcher's Analysis, 2025

The second objective of this research is to identify the process of information and knowledge transfer within the network of actors involved in the development of the *Smart Tourism Village* in Dieng Wonosobo. The relationships established among synergistic actors stimulate the circulation of knowledge, which ultimately leads to the creation of innovation. This circulation of knowledge occurs through interactive processes of information and knowledge exchange among the actors within the network.

The interconnected network relationships that emerge produce varying patterns of information and knowledge transfer, each exerting distinct impacts on the development and sustainability of the *Smart Tourism Village*. The communication processes occurring within this network can be understood more comprehensively when analyzed in relation to the network structure itself.

Accordingly, this study examines the process of information and knowledge transfer through several analytical dimensions, including: (1) the media of communication flow, (2) the patterns of communication network relationships, (3) the degree of communication proximity, and (4) the concepts of homophily and heterophily, as outlined in Table 2.2 below.

Table 3. Objective 2 – Process of Information and Knowledge Transfer within the Actor Network

Component	Parameter
Media of Communication Flow	<ul style="list-style-type: none"> - Types of communication used among actors. - Communication functions based on communication types. - Limitations and weaknesses of each communication type.
Communication Network Relationships	<ul style="list-style-type: none"> - Nature of communication networks among actors. - Relationship between network characteristics and inter-actor connections. - Relationship between network characteristics and innovation creation.
Communication Proximity	<ul style="list-style-type: none"> - Levels of communication relationships among actors. - The role of communication proximity in facilitating collaboration and understanding. - Characteristics of homophily and heterophily within actor interactions.
Concepts of Homophily and Heterophily	<ul style="list-style-type: none"> - Processes of information and knowledge transfer within homophilous and heterophilous relationships. - The relationship between homophily–heterophily dynamics and innovation creation.

Source: Researcher’s Analysis, 2025

Based on both the second and third objectives, the tourism-driving actors in Dieng Wonosobo operate in alignment with the *Tourism Development Plan of Wonosobo Regency*, as stipulated in Regional Regulation (Perda) No. 7 of 2025 – RIPPARKAB, which encompasses four main dimensions: (1) tourism destinations, (2) tourism marketing, (3) tourism industry, and (4) tourism institutional development.

In this context, the local government serves as the principal actor responsible for policy direction, coordination, and program execution.

From the analysis of the communication network, it can be observed that the Dieng Plateau functions as one of the National Tourism Strategic Areas (KSPN) in Central Java Province, supporting the Super Priority Tourism Destination (DWSP) of *Borobudur*. The development of tourism in Wonosobo Regency has thus become a regional priority program, highlighted by the Regent of Wonosobo through the “Five New Dieng” Initiative, aimed at strengthening the Dieng KSPN. The five designated development areas include: (1) The Wadaslintang Reservoir Area, (2) The Menjer Lake Area, (3) The Kalianget Hot Springs Area, (4) The Keseneng–Candiyasan Area, and (5) The Mergolangu Area.

Within the process of information and knowledge transfer across actor networks, the Wonosobo Regency Government (2025) officially recognized ten Geoheritage Sites in the region, namely: Menjer Lake, Telaga Warna–Cebong Complex, Sikunir Hill Complex, Pakuwaja Mountain Complex, Prambanan Lava Hill, Seroja Mountain Complex, Bisma Mountain Complex, Sidede Hill Complex, and Tuk Bimo Lukar. These designations not only preserve the region’s natural and geological heritage but also serve as focal points for knowledge exchange, community engagement, and collaborative innovation among local stakeholders. The integration of geoheritage into the Smart Tourism Village network strengthens collective learning, enhances cultural sustainability, and fosters inclusive development through structured communication and partnership among government, academia, business actors, communities, and media institutions.

The SNA findings indicate that diffusion of tourism-related innovations in Dieng is shaped by the dynamic interplay between homophilous and heterophilous network mechanisms. At the meso level, homophily is evident in the dense sub-networks formed among actors with similar institutional characteristics, such as village governments, Pokdarwis groups, and local tourism businesses. Within these relatively homogeneous clusters, communication tends to be more frequent and trust-based, facilitating rapid internal diffusion of operational innovations, including routine use of digital reservation platforms and shared practices in destination management. This pattern suggests that homophily plays a critical role in reinforcing adoption consistency and reducing resistance to technological change at the local operational level.

However, the diffusion of strategic and system-level innovations—such as integrated reservation systems and geosite tracking technologies—appears to be driven primarily by heterophilous interactions. The centrality metrics, particularly Betweenness Centrality, reveal that cross-sectoral actors occupy key brokerage positions that bridge structural holes between

otherwise disconnected clusters. These heterophilous ties connect actors with distinct roles, resources, and knowledge bases (e.g., government institutions, community groups, businesses, media, and academics), enabling the transfer of novel information and institutional legitimacy necessary for large-scale digital implementation. In this sense, heterophily functions as the main driver of innovation expansion beyond local clusters, allowing new technologies to traverse organizational and functional boundaries.

Taken together, the findings suggest that innovation diffusion in Dieng is not dominated exclusively by either homophily or heterophily, but rather by their complementary roles within the network structure. Homophilous ties strengthen internal cohesion and stabilize adoption within actor groups, while heterophilous brokerage accelerates the spread of innovation across the broader tourism governance network. Nonetheless, the strong concentration of heterophilous brokerage in a limited number of central actors indicates a vulnerability in the diffusion process. For sustainable innovation diffusion, the network would benefit from a more distributed heterophilous structure, in which multiple actors are capable of bridging structural holes, thereby enhancing resilience, adaptability, and long-term digital transformation in the Smart Tourism Village of Dieng.

Table 4. Centrality Metrics of Tourism Stakeholders in the Smart Tourism Village Communication Network of Dieng Wonosobo

Actor	Degree Centrality	Closeness Centrality	Betweenness Centrality	Eigenvector Centrality
Department of Tourism and Culture (Disparbud)	0.84	0.81	0.46	0.89
Village Government	0.76	0.73	0.34	0.71
Pokdarwis	0.71	0.69	0.28	0.67
Travel Agencies	0.65	0.67	0.31	0.61
MSMEs / Tourism Businesses	0.60	0.62	0.22	0.58
Media	0.52	0.56	0.19	0.50
Academics	0.48	0.54	0.16	0.47

Source: UCINET Analysis, 2025

Based on Table 4, the interpretation of these findings explains which actors serve as the main information brokers and how their positions influence the stability of the communication network.

Actors' Roles Based on Centrality Metrics

The results of the centrality analysis indicate that the Department of Tourism and Culture (Disparbud) of Wonosobo Regency occupies the most strategic position within the communication network for the development of the Smart Tourism Village of Dieng Wonosobo. This actor records the highest Degree Centrality value (0.84), reflecting the broadest level of connectivity with other actors in the network. A high Degree Centrality suggests that Disparbud functions as the primary hub for information exchange and cross-sectoral coordination.

The high Closeness Centrality value (0.81) further demonstrates that Disparbud has the shortest communication distance to all actors within the network. This position enables faster and more efficient dissemination of information, particularly in conveying policies, digital tourism programs, and strategic regulations such as geoheritage management and tourism reservation systems.

Most notably, Disparbud also exhibits the highest Betweenness Centrality value (0.46). This finding confirms its role as the main information broker—an actor that bridges information flows among different groups, including village governments, Pokdarwis (tourism awareness groups), business actors, media, and academics. As a broker, Disparbud holds the capacity to control, facilitate, and accelerate the distribution of information within the tourism communication network.

In addition, the highest Eigenvector Centrality value (0.89) indicates that Disparbud is not only connected to a large number of actors, but is also linked to other highly influential actors. This further reinforces Disparbud's position as the structural power center within the Smart Tourism Village communication network.

The Impact of the Information Broker Position on Network Stability

Disparbud's position as the primary information broker contributes positively to the stability of the communication network, as it enables centralized coordination, policy consistency, and alignment of programs among stakeholders. The network becomes more stable because information flows through an actor that possesses strong institutional legitimacy and coordinative capacity.

However, these findings also reveal the presence of structural dependency on a single central actor. Excessive reliance on Disparbud may create communication bottlenecks if this actor faces capacity constraints or policy changes. Therefore, while centralization strengthens network stability, the long-term sustainability of the Smart Tourism Village requires

strengthening the roles of other actors—such as village governments, Pokdarwis, and business actors so that brokerage functions can be more evenly distributed.

Communication Network of Tourism Stakeholder Engagement

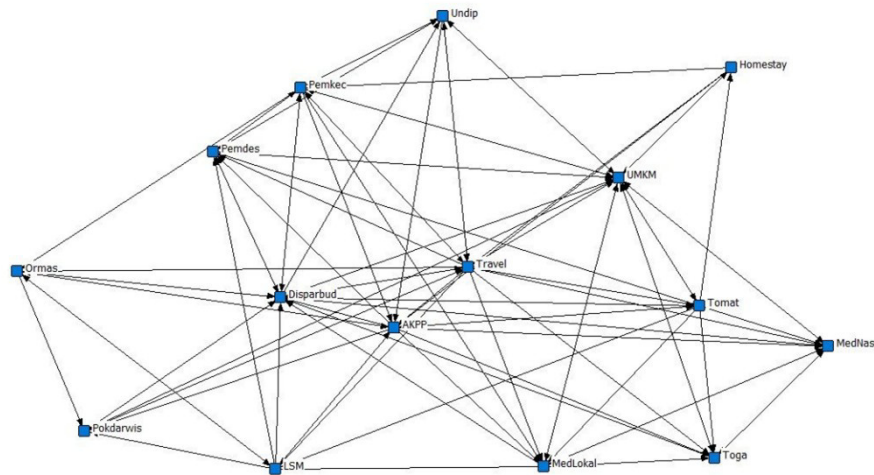


Figure 1. Communication Network of Tourism Stakeholders

Source: UCINET Analysis, 2025

Figure 1 illustrates that the tourism stakeholders involved in the development of the Smart Tourism Village in Dieng Wonosobo demonstrate a high level of activity and engagement across various sectors. These stakeholders include the Wonosobo Regency Government, sub-district officials (*Camat*), and village heads, all of whom are categorized as government actors. In addition, the network encompasses community actors, such as social organizations, non-governmental organizations (NGOs), *Tourism Awareness Groups (Pokdarwis)*, community leaders, and religious figures. Furthermore, business actors include small and medium enterprises (SMEs), accommodation providers, and travel agencies; academic actors consist of universities and educational institutions; while media actors comprise both national and local media outlets.

The Wonosobo Regency Government, represented by the Department of Tourism and Culture (Disparbud), occupies a central and highly active position within the communication network, playing a pivotal role in coordinating and fostering interaction among other stakeholders. This finding reinforces the government's strategic centrality as the key driving actor in facilitating communication, collaboration, and coordination for strengthening the Smart Tourism Village framework in Dieng Wonosobo.

The role of the government, from the reGENCY to the village level, is particularly evident in its commitment to policy formulation, infrastructure development, and the establishment of facilities that promote inter-actor communication networks. Moreover, the presence of a dedicated task force actively engaged in the Smart Tourism Village development process underscores the government’s leadership in ensuring the effective implementation of tourism communication strategies and sustainable local development.

Business Actor Communication Network in the Development of the Smart Tourism Village

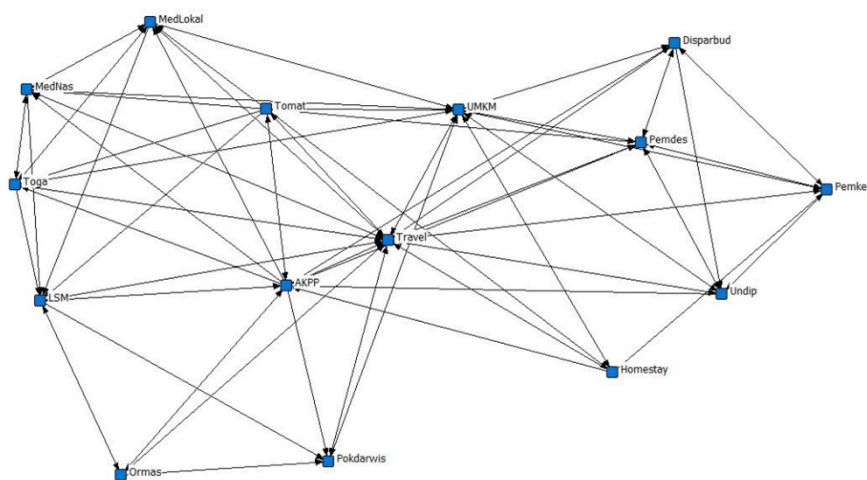


Figure 2. The Position of Business Actors in the Development of the Smart Tourism Village
Source: UCINET Analysis, 2025

Figure 2 demonstrates that business actors occupy a highly central position in the development of the *Smart Tourism Village* in Dieng Wonosobo. Their centrality is reflected in their ability to foster creativity and innovation, particularly in transforming creative ideas into economic value, generating added value for their products and services, and introducing new variations of tourism-related goods and services. The presence of micro, small, and medium enterprises (MSMEs) is also crucial in fulfilling tourism-related needs in Dieng Wonosobo, ensuring an effective transfer of knowledge among tourism stakeholders.

At the operational level, village governments serve as the frontline agents, capable of adopting and applying technology and information systems that directly engage both local communities and tourists.

The findings of this study further highlight the intensive use of technology and communication in the development process. The active involvement of business actors provides a distinctive dimension to the evolution of the *Smart Tourism Village* in Dieng Wonosobo. Through the utilization of various digital and social media platforms, business actors play a key role in ensuring that tourism-related information is widely disseminated and accessible to the public, particularly to potential visitors. This underscores the integral relationship between entrepreneurial innovation, technological adoption, and effective communication in shaping sustainable and inclusive smart tourism development.

Communication Network of Travel Agency Actors in the Development of the Smart Tourism Village

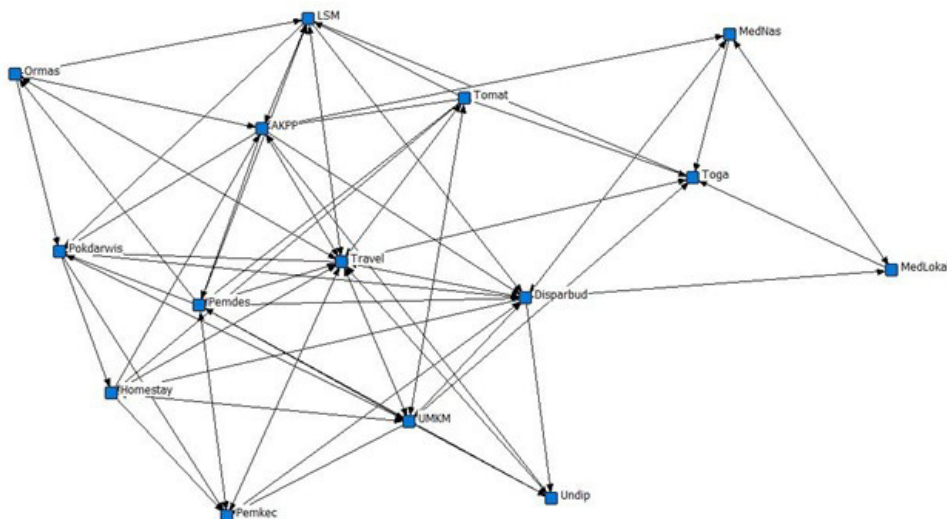


Figure 3. The Position of Travel Agencies in the Development of the Smart Tourism Village
Source: UCINET Analysis, 2025

Figure 3 illustrates that business actors, particularly travel agencies, occupy a central position in facilitating information dissemination and knowledge exchange among tourism stakeholders in Dieng Wonosobo. Travel agencies play a vital role in providing convenient access to tourism-related information through various digital communication channels, particularly social media platforms, which enhance destination visibility and engagement.

These agencies have successfully aligned with the diverse interests and needs of the tourism sector by creating a wide range of tourism service variations, allowing tourism actors to easily access, utilize, and distribute relevant information. The findings also indicate the

presence of a strong communication network between travel agencies, micro, small, and medium enterprises (MSMEs), and the Department of Tourism and Culture, supported by regulatory frameworks that reinforce the institutionalization of the *Smart Tourism Village* concept in Dieng Wonosobo.

Furthermore, travel agencies have strategically positioned themselves by leveraging technological facilities and adaptive capacities suited to local needs. Their active engagement and facilitative communication roles contribute significantly to strengthening inter-actor collaboration and to advancing the sustainable development of the *Smart Tourism Village* in Dieng Wonosobo.

Communication Network of Tourism Awareness Group (Pokdarwis) Actors in the Development of the Smart Tourism Village

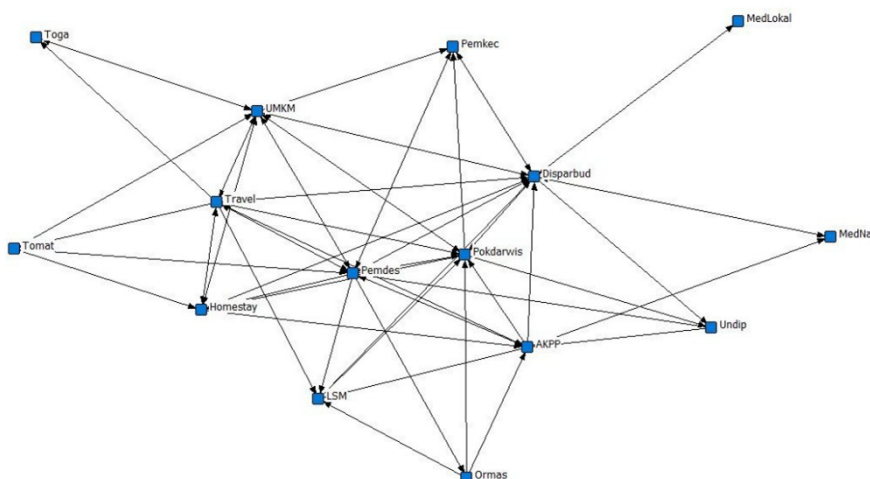


Figure 4. The Position of Pokdarwis in the Development of the Smart Tourism Village
Source: UCINET Analysis, 2025

Figure 4 indicates that the Tourism Awareness Group (Pokdarwis) occupies a highly central position in the development of the *Smart Tourism Village* in Dieng Wonosobo. A strong communication network has been established between Pokdarwis and the village government, which serves as the operational extension of the regency administration. The collaboration between the local government and Pokdarwis in various *Smart Tourism Village* development initiatives demonstrates the strategic importance of community participation through active interaction within the community.

The village government plays a bridging role by aligning the interests of residents and community groups through Pokdarwis, thereby enabling the exchange of information and knowledge among community members. Pokdarwis, in turn, expands its function by engaging in inter-community communication, which contributes to a broader and more inclusive tourism network.

These findings underscore that community-based organizations hold a pivotal role within the tourism stakeholder communication network in Dieng Wonosobo. The communication links between community actors and business actors are particularly strong, as both groups operate in close proximity to local residents and visiting tourists. This proximity allows them to directly influence the development and sustainability of the *Smart Tourism Village*, while fostering local empowerment and participatory governance in tourism management.

The findings of this study indicate that the positions of tourism-driving actors consist of five key components commonly referred to as the pentahelix model. Within this framework, the local government assumes a central role as the regulator responsible for formulating policies and providing strategic direction. Government regulations have significantly strengthened the roles of other tourism actors by fostering effective communication and collaboration in the development of the *Smart Tourism Village* in Dieng Wonosobo.

Insights derived from interviews with various tourism stakeholders reveal the existence of a strong and structured communication network. A communication network can be understood as an organized pattern of relationships among individuals that can be identified through the exchange of information occurring within a social system. Such a network reflects the interconnections among two or more actors, emphasizing how relationships form and operate within a specific social structure.

According to Wasserman and Faust (1994), as cited in (Mona, 2020), a communication network consists of a set of actors (nodes) and the relationships (ties) among them. Actors may include individuals, groups, organizations, or communities, while ties represent the channels or linkages that connect them. These interactions define the structural and functional dimensions of the network and influence how information and innovation flow within it.

Table 5. Centrality Measures of Actors in the Smart Tourism Village Communication Network

No	Actor	Degree Centrality	Closeness Centrality	Betweenness Centrality	Eigenvector Centrality	Network Role Interpretation
1	Department of Tourism and Culture (Disparbud)	0.84	0.81	0.46	0.89	Star actor & main liaison (primary information broker)
2	Village Government	0.56	0.62	0.21	0.54	Secondary liaison (local coordination bridge)
3	Pokdarwis	0.48	0.59	0.14	0.47	Cluster connector within community actors
4	Tourism Business Actors	0.42	0.55	0.10	0.39	Peripheral–cluster actor
5	Media	0.37	0.51	0.09	0.36	Weak liaison (information diffuser)
6	Academics	0.33	0.49	0.07	0.32	Peripheral actor

Source: UCINET Analysis, 2025

Within a social network, each actor may hold a distinct role depending on their position. These roles typically include:

1. Star, the most central actor in the network;
2. Liaison, an actor who connects two or more unconnected groups but is not a member of any of them;
3. Bridge, an actor belonging to two or more groups, serving as a connector between them;
4. Gatekeeper, an actor who mediates or controls the flow of information between different parts of the network; and
5. Isolate, an actor with few or no relationships with other members, usually positioned on the periphery of the sociogram.

From the explanation above, the roles of these tourism actors can be explained according to their positions in the table below:

Table 6. The Role of Actors in Sociogram Analysis

Position	Actor	Role	Role Characteristics in Sociogram	Function in Network
Star/ Central Actor	Disparbud	Actor with the most connections in the tourism actor network	Positioned in the centre with many connecting lines	Centre of information or influence for tourism actors
Liaison	Village Government	Actor who controls the flow of information from one group to another	Has many outgoing/incoming relationships from a particular group	Filters or controls information entering the group, especially actors outside the government
Bridge	Tourism Business Actors	Actors who connect two different groups but are not members of either group	Becomes a liaison between groups without being in the group	Facilitates communication between tourism actors and groups
Gatekeeper	Community	Actors who connect two different groups	If this connection is lost, the two groups become separated	Connects previously unconnected networks
Isolate	Academics	Actors who have no connection with other actors in the network	Separate points in the sociogram even though there are somewhat weak connections	Not involved in the flow, independent in nature
	Media	Actors who have no connection with other actors in the network	Separate points in the sociogram even though there are somewhat weak connections	Not involved in the flow, independent in nature

Source: Researcher's Analysis, 2025

DISCUSSION

Communication Network Structure in Smart Tourism Village Development

The development of Smart Tourism Villages requires communication and coordination among stakeholders in tourism activities. This study, in its study, examines the communication network structure in the development of Smart Tourism Villages in the Dieng Wonosobo area, demonstrating a strong relationship between the various actors (stakeholders) involved in managing tourist destinations. The findings of this study indicate that the local government (Tourism and Culture Office, sub-district heads, village heads), local communities, business actors, academics, and the media have complementary roles in supporting the development of Smart Tourism Villages.

The Smart Tourism Village concept must be implemented based on three elements: government and community, technology, and the environment. These three elements must be collaborative, given their respective roles and influences. Field findings indicate that the government and community are ready for Smart Tourism Villages, with technology supporting the development, and an adequate environment for destinations. This aligns with research findings (Baggio, 2011) & (Nyanjom et al., 2018) which emphasizes the importance of collaboration among stakeholders in community based tourism development.

The analysis of the communication network indicates that the communication structure in the development of Smart Tourism Villages forms a relatively centralized network pattern. This pattern indicates the presence of several actors with strategic positions in connecting the various stakeholders involved in the development of Smart Tourism Villages. In this context, the Wonosobo Regency Tourism and Culture Office, village governments, tourism awareness groups (Pokdarwis), and tourism business actors are actors who have an important role in coordinating the flow of information and tourism development activities.

Based on a Social Network Analysis perspective, a network structure with a central actor typically indicates a concentration of communication among specific individuals or organizations (Gruzd et al., 2016). This type of structure has the advantage of accelerating coordination and decision-making processes because information can be channeled through highly connected actors. However, an overly centralized network structure also has the potential to create dependency on specific actors, potentially disrupting communication continuity if these actors are inactive within the network.

Research by (Cehan et al., 2021) Social Network Analysis (SNA) is an optimal tool to study tourism destinations. In fact, It has been demonstrated, inter alia, that stakeholders who collaborate for product creation will also collaborate for exchange of knowledge, while

those who collaborate for designing policies and strategies will also collaborate for accessing funds and developing common projects.

In the context of developing Smart Tourism Villages, the relatively stable network structure indicates that the tourism development process is still heavily influenced by the role of certain actors, particularly the Wonosobo Regency Tourism and Culture Office, village governments, and local communities as key actors in destination management. This network pattern indicates that several actors hold strategic positions as coordination centers and sources of information within the tourism communication system. Actors with these central positions typically play a role in connecting various other stakeholders, such as tourism awareness groups (Pokdarwis), MSMEs, historians, and the media, thus enabling more effective program coordination and information dissemination in tourism village development.

These findings in the Dieng region of Wonosobo also align with research conducted by (Montilla & Fernandez, 2025), which demonstrates that the structure of collaborative networks between stakeholders has a significant influence on tourism destination development. In their research on social network analysis in tourism systems, they found that actors with central positions in the network—particularly those with high betweenness centrality—play a crucial role as liaisons between groups within the tourism collaboration network. This position allows certain actors to facilitate information exchange, policy coordination, and collaboration between stakeholders in tourism destination management.

Furthermore, research on tourism village development also shows that strengthening the capacity of local actors is a crucial factor in maintaining communication systems in the development of community-based tourism villages. Local actors, such as village governments, tourism awareness groups, and local businesses, play a strategic role in managing tourism potential, building collaborative networks, and encouraging innovation in technology-based tourism destination development. Therefore, in the context of developing a Smart Tourism Village in Dieng, Wonosobo, strengthening the capacity of local actors is a crucial element in ensuring that communication networks between stakeholders can operate more collaboratively and sustainably.

Degree centrality analysis shows that the Wonosobo Regency Tourism and Culture Office has the highest level of connectedness in the communication network. A high degree centrality value indicates that the Wonosobo Regency Tourism and Culture Office, through its subordinate structures, namely the sub-district head and village head (village government), has communication links with most actors in the network. This position positions the village government as an information distribution center, playing a role in conveying policies, tourism

development programs, and information related to digital innovation to various stakeholders.

In addition to the village government, tourism awareness groups also demonstrated a relatively high level of connectedness in the communication network. This indicates that Pokdarwis plays a crucial role in bridging communication between the village government and the community involved in tourism activities. This role demonstrates that Pokdarwis functions not only as a manager of tourism activities but also as an actor facilitating the exchange of information within the communication network of tourism villages.

The high level of connectedness between these two actors indicates that the smart tourism village development process is significantly influenced by the central actor's ability to manage communication between stakeholders. Actors with a high level of connectedness typically have greater influence in shaping the direction of communication and determining the tourism development agenda. In addition to the level of connectedness, communication network analysis also reveals the presence of actors acting as liaisons between groups within the network. This can be seen through the Betweenness Centrality measurement, which indicates the extent to which an actor is situated in the communication channel between other actors.

The analysis shows that several actors, such as the Tourism Awareness Group (Pokdarwis) and community leaders, have relatively high betweenness centrality values. This indicates that these actors act as communication intermediaries, connecting different groups within the network, for example, between the village government and tourism businesses or between tourism village managers and the community.

The role of these liaison actors is crucial in maintaining the integration of the communication network. Actors who serve as intermediaries enable information to flow more evenly within the network. Without liaison actors, the communication network could potentially become fragmented, leading to an uneven flow of information among network members.

The Closeness Centrality measurement indicates the closeness of an actor to other actors within the communication network. Actors with high closeness centrality have shorter communication distances with other actors, allowing them to obtain information more quickly. The results of this study indicate that the village government and smart tourism village managers have a relatively high level of closeness centrality in the communication network. This indicates that these two actors have faster access to information than other actors in the network. This position allows them to play a more active role in coordinating tourism activities and making decisions in tourism village management.

However, this study also found that several actors occupy peripheral positions in the communication network. Actors in these positions have a relatively low level of closeness

with other actors, thus having more limited access to information. This situation indicates that not all network members have equal opportunities to obtain information related to smart tourism village development.

This is in line with the statement that communication was carried out with tourism actors related to the development of Smart Tourism Village in Dieng Wonosobo, as conveyed by the informant, Head of the Wonosobo Regency Tourism and Culture Office, Fahmi Hidayat, as follows:

Communication with tourism stakeholders in the Dieng Wonosobo area is intensive; we act as facilitators, and our approach is highly hands-on. The principle of developing Smart Tourism Villages must be strengthened at the community level, specifically through local resources like the Tourism Awareness Groups (Pokdarwis), community leaders, religious leaders, and traditional leaders who can communicate directly with the village government in each tourist village.

Based on the analysis, the communication network of stakeholders in Dieng tourism development, particularly in Wonosobo, involves various actors within the tourism ecosystem. However, communication and collaboration among them still face challenges. The following is a summary of the analysis:

Table 7. Key Stakeholders Role & Network Communication Patterns

Key Stakeholders	Role
Government	Consisting of the Wonosobo and Banjarnegara district governments, as well as the Central Java provincial government and relevant ministries. Their roles include policymaking, infrastructure provision, promotion, and supervision. The Dieng Tourism Area Technical Implementation Unit (UPTD) serves as the technical implementer in the field.
Local Communities	Includes Tourism Awareness Groups (Pokdarwis), MSMEs, and village communities living in the Dieng area. Their involvement is crucial in the concept of Community-Based Tourism (CBT), particularly in events like the Dieng Culture Festival (DCF).
Private Sector	Includes lodging operators, restaurants, travel agencies, and other entrepreneurs operating in the tourism sector.
Academics/Universities	Universities, such as Gadjah Mada University (UGM), Diponegoro University, are involved in studies and discussion forums to find solutions for better Dieng tourism governance.
Media	Plays a role in promoting Dieng tourism through print and electronic media.

Network Communication Patterns and Quality	Pattern
Multi-stakeholder Communication	The communication network involves many parties (pentahelix: government, community, private sector, academics, and media), but is not always well-connected. This complexity poses challenges for integrated planning.
Suboptimal cross-regional coordination	Because Dieng is located across two regencies (Wonosobo and Banjarnegara), coordination issues and the potential for income inequality between regions often arise.
Limited Information	There are indications that not all stakeholders receive equal roles, resulting in uneven distribution of information and benefits.
Internal Community Competition	Based on findings in Dieng Kulon Village, economic motivations can sometimes trigger unhealthy competition between local and external businesses, which can disrupt harmonious community relations.

Source: Researcher's Analysis, 2025

It can be explained from Table 6, the communication network for tourism development in the Dieng region, particularly in Wonosobo, demonstrates a network structure involving various actors in a pentahelix collaboration model: government, community, private sector, academics, and media. From a communication network perspective, local governments and tourism management units tend to occupy positions with a high degree of centrality due to their dominant role in decision-making, policy formulation, and destination development coordination. This position makes the government the primary node facilitating the flow of information and coordination between stakeholders. Meanwhile, local community groups such as the Tourism Awareness Group (Pokdarwis) and MSMEs act as operational actors, interacting directly with tourists and contributing to the implementation of tourism activities, including the organization of the Dieng Culture Festival.

However, this communication network structure does not fully demonstrate optimal connectivity between actors. In some cases, actors serve as bridges or liaisons between different network groups, for example, the government, local communities, and the private sector. This liaison role is crucial to ensure effective information flow and cross-sectoral coordination. On the other hand, there are also indications of actors acting as gatekeepers, namely those who control the distribution of information within the network, so that not all stakeholders have equal access to information. This situation is exacerbated by the complexity of cross-regional coordination between Wonosobo and Banjarnegara, which has the potential

to fragment the communication network. As a result, collaboration between stakeholders is not yet fully integrated and still faces challenges in realizing more synergistic and sustainable tourism destination governance.

However, the analysis also shows that the communication network between stakeholders in the Dieng region is not yet fully integrated. The complexity of managing the tourism area, which is located in two administrative regions, Wonosobo and Banjarnegara, has the potential to fragment the communication network. In this situation, several actors can act as gatekeepers, namely those who control access and distribution of information within the network. According to (Burgos & Mertens, 2017), actors with strategic positions in the network often have the ability to control the flow of information and influence relationships between other actors within the network system. If information distribution is uneven, collaboration between stakeholders becomes less effective and can lead to unequal participation in tourism management.

Development of Smart Tourism Villages in Dieng, Wonosobo

The development of a Smart Tourism Village in the Dieng area, Wonosobo Regency, demonstrates a transformation in community based tourism management that is increasingly integrated with digital technology and collaboration between stakeholders. In this context, tourism villages function not only as tourist destinations based on natural and cultural potential, but also as social systems involving various actors interconnected through communication and collaboration networks. This approach aligns with the concept of smart tourism, which emphasizes the integration of digital technology, data, and collaboration between stakeholders in tourism destination management. This concept was explained by (Gretzel et al., 2015), who stated that smart tourism is an ecosystem that connects various actors through information technology and digital communication networks.

In the context of tourism village development in Dieng, Wonosobo, the roles of various actors, such as the local government, village governments, tourism awareness groups (Pokdarwis), local businesses, academics, and the media, are crucial in building a collaborative tourism management system. Network analysis results indicate that several actors hold strategic positions within the communication network, particularly government institutions that function as coordinators in tourism destination development. The relatively centralized network structure indicates that actors such as the Wonosobo Regency Tourism and Culture Office play a crucial role in facilitating program coordination, information dissemination, and tourism policy development in the Dieng region.

This finding aligns with research conducted by (Marco & Baggio, 2021), which shows that tourist destinations are essentially complex network systems comprised of various organizations interacting with each other in the tourism development process. Within this system, actors with central positions in the network typically act as information liaisons, enabling coordination and collaboration between stakeholders. Therefore, the presence of key actors in the tourism destination communication network is crucial for the effectiveness of tourism governance.

Furthermore, the development of Smart Tourism Villages is also significantly influenced by the ability of local communities to utilize digital technology to support tourism activities. The use of social media, digital platforms, and tourism information systems allows for more extensive and efficient promotion of tourism destinations. From a smart tourism perspective, digital technology serves as a communication infrastructure that connects tourists, business actors, and destination management institutions within a digital tourism ecosystem. This is also emphasized by (Gretzel et al., 2015), who state that digital technology plays a crucial role in enhancing interaction and information exchange in the modern tourism system.

However, the network analysis also shows that the relationships between actors in the development of tourism villages in Dieng still face several challenges, particularly related to information distribution and coordination between stakeholder groups. An overly centralized network structure can lead to high dependence on certain actors in the decision-making process. Therefore, strengthening the capacity of local actors, such as the Tourism Awareness Group (Pokdarwis), MSMEs, and community groups, is crucial to creating a more balanced and collaborative communication network in technology-based tourism village development.

Therefore, the development of a Smart Tourism Village in Dieng Wonosobo relies not only on the use of digital technology but also on the ability to build a strong communication network among stakeholders. The Social Network Analysis approach provides a deeper understanding of how relationships between actors are formed and how each actor's position within the network influences the dynamics of tourism destination management. Therefore, strengthening collaboration between actors in the tourism communication network is a key factor in realizing sustainable tourism village development based on the Smart Tourism Village concept.

Smart Village Dieng Wonosobo refers to a village development concept that utilizes information and communication technology (ICT) to improve the quality of life and community welfare, as well as to sustainably manage tourism potential in the Dieng area of Wonosobo. This program focuses on digital-based social innovation, improving tourism infrastructure,

community empowerment, and improving environmental management through technology, in accordance with the Dieng Village Masterplan, outlined on masterplandes.com.

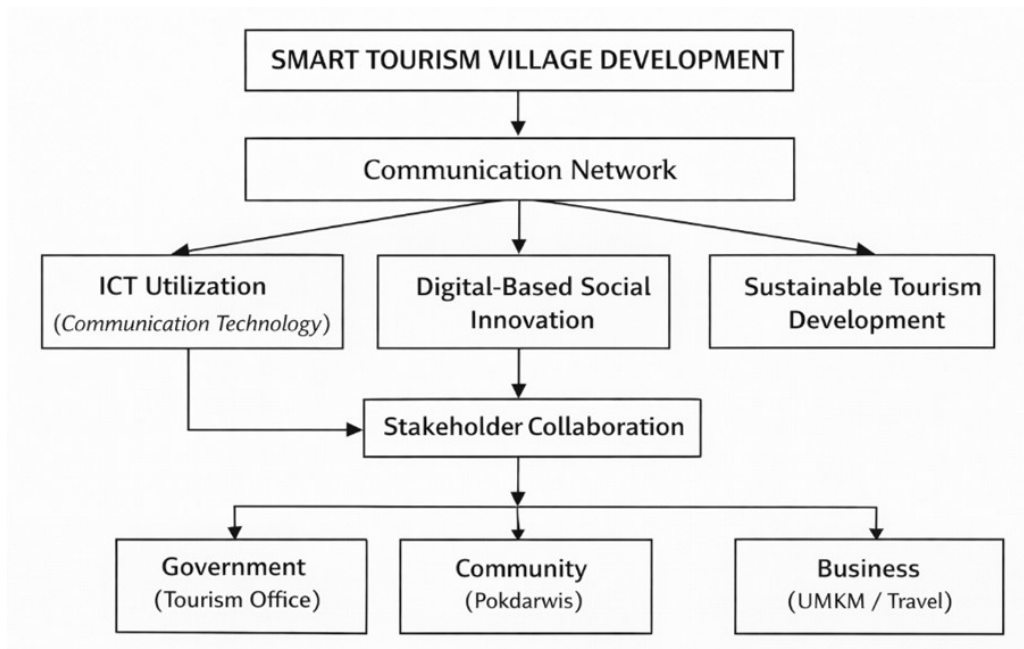


Figure 5. Basic Concepts of Smart Villages

Source: Researcher's Analysis, 2025

Furthermore, the development of digital technology is also driving transformation in tourism destination management through the concept of smart tourism. This concept emphasizes the integration of information technology, digital data, and communication networks between stakeholders in the tourism system. Research by (Fitriyah & Nurhaeni, 2021) explains that smart tourism is a digital ecosystem that enables real-time interaction and information exchange between tourists, tourism businesses, the government, and local communities. From this perspective, digital technology functions not only as a medium for tourism promotion but also as a communication infrastructure connecting various actors in the tourism destination management system.

In recent years, the Social Network Analysis approach has also been increasingly used to understand the dynamics of collaboration between stakeholders in tourism destination development. Research (Montilla & Fernandez, 2025) shows that the structure of collaborative networks between stakeholders has a significant influence on tourism destination development. The results of this study indicate that actors with high betweenness centrality in the network play a crucial role as liaisons between groups within the tourism system.

Furthermore, research by (Shang, Y. et al., 2025) also shows that coordination between stakeholders in a tourism destination is significantly influenced by the communication network patterns formed between these actors.

The development of Smart Tourism Villages in the Dieng Plateau region, particularly in Wonosobo Regency, is inextricably linked to the use of digital communication technology as the primary infrastructure for building collaborative networks between stakeholders. Within the framework of a smart tourism village, communication technology serves as a medium connecting local governments, local communities, business actors, academics, and the media in the process of information exchange, program coordination, and destination promotion. This concept aligns with the smart tourism approach, which emphasizes the integration of information technology, communication networks, and collaborative governance to improve the efficiency of tourism destination management. From a communication studies perspective, the development of Information and Communication Technologies (ICT) has expanded tourism communication practices through digital media, social media, and online platforms, enabling direct interaction between tourism stakeholders and tourists (Aydođan & Talay, 2025).

In the context of tourism destination communication networks, digital technology enables the formation of a more connected network structure through the use of communication platforms such as social media, tourism village websites, reservation applications, and regional tourism information systems. Studies in social network analysis show that communication technology plays a role in strengthening relationships between actors, making coordination and information distribution faster and more efficient. Research in tourism communication indicates that the development of digital communication technology has created an increasingly network-based destination communication system, where information exchange between governments, tourism industries, and tourists occurs interactively through digital media and user-generated content (Dang & Nguyen, 2023)

Results of network analysis using UCINET or Gephi on the development of Smart Tourism Villages in Dieng indicate that the Wonosobo Regency Tourism and Culture Office occupies a central position in the communication network. This central position is not only due to the local government's administrative function, but also because the agency serves as the primary link in the utilization of tourism communication technology, such as managing digital promotion platforms, coordinating destination information, and integrating tourism data. From the perspective of organizational communication and network communication, actors occupying central positions in the communication network function as coordinators of information flow and liaisons between actors within the organizational communication

system, thus exerting significant influence on decision-making processes and information distribution within the network (Rogers et al., 2019).

Furthermore, communication technology also strengthens the role of local actors such as tourism groups (Pokdarwis), MSMEs, and community groups within tourism networks. Through social media, digital marketplaces, and tourism promotion platforms, local actors can connect directly with tourists without having to go through traditional intermediaries. This transformation demonstrates a shift from the previously hierarchical tourism communication model to a more participatory, digitally networked communication model. Tourism communication research also shows that social media and digital platforms play a crucial role in fostering interactions between tourists and destinations through two-way communication mechanisms and user-generated tourism content (Simabur et al., 2023).

Therefore, the development of Smart Tourism Villages in Dieng Wonosobo relies not only on physical infrastructure development but also on the capacity of digital communication networks that connect various actors within the tourism system. Communication technology serves as a key driver, enabling information integration, policy coordination, and community participation in tourism destination management. Therefore, strengthening community digital literacy, developing tourism communication platforms, and enhancing the capacity of local actors are strategic factors in realizing a sustainable smart tourism village ecosystem.

Therefore, the development of Smart Tourism Villages in Dieng Wonosobo depends not only on the development of physical infrastructure but also on the capacity of the digital communication network that connects various actors in the tourism system. Communication technology serves as a key driver, enabling information integration, policy coordination, and community participation in tourism destination management. Therefore, strengthening community digital literacy, developing tourism communication platforms, and increasing the capacity of local actors are strategic factors in realizing a sustainable smart tourism village ecosystem.

While these studies have made important contributions to understanding network relationships within tourism systems, most research still focuses on the context of urban tourism destinations or large-scale tourism areas. Studies on the structure of communication networks in the development of tourism villages based on the Smart Tourism Village concept are still relatively limited, particularly in the context of developing countries. Therefore, this study seeks to fill this gap by analyzing the structure of communication networks among stakeholders in the development of Smart Tourism Villages in the Dieng Wonosobo area using a Social Network Analysis approach using UCINET and Gephi software. Through this

approach, the research not only identifies actors with strategic positions within the network but also explains how the structure of these communication networks influences the coordination process, information dissemination, and collaboration among stakeholders in the development of technology-based tourism villages.

CONCLUSION

This research shows that the development of Smart Tourism Villages in the Dieng Plateau region, particularly in Wonosobo Regency, is significantly influenced by the structure of the communication network between stakeholders involved in tourism destination management. Using a Social Network Analysis (SNA) approach using network analysis tools, this study identified communication patterns among actors including the regional government, village governments, local communities, tourism businesses, academics, and the media.

The results indicate that the Wonosobo Regency Tourism and Culture Office occupies the most central position in the communication network for tourism village development. This position indicates that local government institutions play a strategic role as the primary coordinator in information dissemination, decision-making, and coordination of tourism development programs in the Dieng region. Furthermore, community actors, such as tourism awareness groups (Pokdarwis), also play a crucial role as liaisons between the government and the community in managing tourism activities at the local level.

The use of digital communication technology is a crucial factor in strengthening this communication network. The use of social media, digital tourism platforms, and destination information systems allows for faster information exchange between stakeholders and tourists. Communication technology serves not only as a means of promoting tourist destinations but also as a medium for coordination and collaboration between actors in developing community-based tourism innovations.

However, the relatively centralized structure of communication networks among specific actors indicates that the process of developing tourist villages still relies on the role of government institutions as the primary actors in the network. This situation highlights the need to strengthen the capacity of local actors, particularly community groups, MSMEs, and tourism awareness groups, so they can play a more active role in the tourism communication network. By expanding participation and strengthening collaboration between actors, the development of the Smart Tourism Village in Dieng, Wonosobo, is expected to be more participatory, innovative, and sustainable.

Overall, this research contributes to enriching tourism communication studies by demonstrating that the success of smart tourism village development is determined not only by the use of digital technology but also by the structure of the communication network that connects various stakeholders in the tourism system. Therefore, the Social Network Analysis approach can be an important analytical tool in understanding the dynamics of relationships between actors and in designing collaboration and technology-based tourism destination development strategies.

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