

Village Governance in Transition: Collaborative Networks, Spatial Strategy, and Sustainable Development

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ABSTRACT

This research focuses on the dynamics of village governance and development by highlighting the urgency of transformation towards an inclusive, transparent, collaborative, and adaptive governance model to global change. The background of this research is based on the fact that villages in developing countries face serious challenges, ranging from development gaps, the impacts of climate change, to the need for digitalization of governance. To address these challenges, this research uses a bibliometric approach with the Scopus database and the support of R-Studio Biblioshiny, VOSviewer, and CiteSpace analysis tools, which enable mapping of research trends, academic collaboration networks, thematic evolution, and the direction of development of village governance theory and practice. The main findings indicate that digital governance, including the implementation of e-Government and open data programs, has significant potential to increase transparency, accountability, and citizen participation, although it still faces obstacles such as inconsistent data quality, resistance to boundaries, and limited digital literacy. Furthermore, governance based on participation and collaboration between stakeholders has been shown to strengthen social cohesion, optimize the use of social capital, and increase the effectiveness of local development. Furthermore, the integration of spatial governance and socio-ecological resilience approaches plays a crucial role in strengthening rural adaptation to climate change and urbanization, while the development of rural tourism and agrotourism opens

up strategic opportunities for transforming local resources into sustainable economic value. The significance of this research lies in the novelty of the hybrid model that combines digital technology, social capital, and spatial-ecological governance as a framework for adaptive and contextual rural governance. Theoretically, the research findings enrich the literature on sustainable village governance, while practically, this research provides concrete recommendations for policymakers and local stakeholders to strengthen institutional capacity, encourage citizen engagement, and integrate digital innovation into inclusive, resilient, and long-term competitive village development.

Keywords: *Village Governance¹, Transition², Sustainable Development³*

INTRODUCTION

This study highlights the urgency of reforming village governance in response to the increasingly complex, multidimensional, and interconnected dynamics of rural development shaped by social, economic, and technological changes. Villages can no longer be understood merely as passive administrative entities that receive policies from the central government, but rather as strategic arenas that require adaptive, innovative, and participatory capacities in managing resources and public interests. In this context, digital governance initiatives and the implementation of open data principles have proven to be important catalysts in promoting transparency and accountability in village administration. Open access to public information not only strengthens mechanisms of social oversight but also creates new opportunities for citizen participation in the planning, implementation, and evaluation of local development policies, as emphasized in various previous studies. Nevertheless, this study also underscores that digital transformation cannot be separated from fundamental challenges, including data quality and validity, persistent bureaucratic resistance, and gaps in digital literacy within rural communities. These constraints call for policy innovations that go beyond technical solutions and address institutional arrangements, organizational culture, and sustainable community empowerment (Chu & Chiang, 2014; Hidayat, 2025; Xia, 2017)

The main novelty of this study lies in the integration of e-government with community-based governance practices. This approach demonstrates that the

digitalization of village administration becomes more effective when accompanied by the active involvement of citizens as subjects of development rather than merely as service recipients. Such integration strengthens the political legitimacy of village governments, as public decisions are produced through more open, inclusive, and accountable processes. In addition, the quality of public services improves because the resulting policies are more responsive to the real needs of the community. These findings enrich the literature on village governance by emphasizing that technology is not an end in itself, but rather an instrument that must be combined with social capital and local capacity to generate sustainable development impacts (Jibladze et al., 2024; McNutt et al., 2016).

This study positions collaborative and participatory practices as central pillars of rural development. Governance models that emphasize inclusivity, deliberative dialogue, and trust-building among stakeholders have proven to be more adaptive and responsive than hierarchical technocratic approaches. In rural contexts, development success is not determined solely by compliance with central regulations, but largely depends on the capacity of local actors to build productive and sustainable social networks. These networks encompass relationships among village governments, customary institutions, community groups, civil society organizations, and the private sector. The findings indicate that when such social capital is institutionalized within clear governance mechanisms, it can reduce social inequality, strengthen community cohesion, and promote a more equitable distribution of development benefits. Accordingly, the novelty offered by this study lies in its emphasis that social capital is not merely a cultural resource, but can function as a strategic policy instrument in rural development (Bettis et al., 2021; Fischer, 2012; Muzaqi et al., 2025).

The rural revitalization agenda highlighted in this study also emphasizes the strategic role of spatial governance and socio-ecological resilience. Sustainable rural development cannot be separated from equitable and long-term-oriented spatial management. Unequal spatial distribution has the potential to trigger agrarian conflicts, environmental degradation, and social exclusion, which ultimately weaken the foundations of rural development. Therefore, this study stresses the importance of multi-stakeholder participation in village spatial

planning, including the involvement of local communities in determining the direction of natural resource utilization. In addition, adaptive mechanisms for responding to climate change and the pressures of globalization constitute key elements in building village resilience. The emphasis on socio-ecological resilience adds a new perspective to the literature by positioning villages as dynamic spaces of adaptation capable of developing internal capacities to respond to crises and uncertainty (Edward & Nganyi, 2025; Fry et al., 2024).

Rural tourism and agrotourism are presented as strategic instruments for transforming local resource advantages into sustainable economic value. This study reveals that the development of these sectors not only contributes to increased community income but also has the potential to strengthen local identity and promote environmental conservation when properly managed. Nevertheless, the success of rural tourism largely depends on collaborative governance that involves communities, government, and the private sector in a balanced manner. Without fair benefit-sharing mechanisms and transparent compensation systems, tourism risks widening social inequality and damaging local ecosystems. By highlighting the integration of sustainable tourism into village governance agendas, this study offers a novel hybrid model that combines economic innovation with socio-ecological sustainability, ensuring that economic development does not come at the expense of social welfare and environmental integrity (LIU & YE, 2021a; Sun et al., 2021).

The emphasis on socio-ecological resilience adds a new perspective to the literature by positioning villages as dynamic spaces of adaptation that are not merely passive recipients of central government policies, but are capable of innovating to build internal capacity. At the same time, rural tourism and agrotourism are identified as important instruments for transforming resource advantages into sustainable economic value. However, this study also emphasizes that the success of this model depends on collaborative governance involving communities, government, and the private sector, particularly in terms of benefit distribution and compensation mechanisms (Fan et al., 2024; Xue et al., 2024). By highlighting the integration of sustainable tourism into governance agendas, this study offers a novel hybrid model that combines economic innovation with socio-

ecological sustainability (Lin et al., 2023).

Theoretically, this study enriches the literature on village governance by emphasizing that digital transformation, the strengthening of social capital, and socio-ecological spatial integration are essential prerequisites for successful rural development. Practically, the findings provide valuable recommendations for policymakers to design policies that are more participatory, adaptive, and technology-based (Rahman et al., 2025; Sukri et al., 2025). Accordingly, this study not only strengthens the literature on governance and sustainable development but also provides significant practical guidance for accelerating the achievement of inclusive, resilient, and sustainable village development goals.

METHOD

SAfter the initial search stage, the identified studies were systematically screened to eliminate irrelevant articles by applying inclusion and exclusion criteria, ensuring that the retained literature directly addressed the research questions while remaining substantial yet manageable in number. The search was limited to publications between January 1, 2010, and September 25, 2025, to capture recent research developments, minimize historical bias, and maintain the relevance of the findings to contemporary rural development dynamics. The inclusion criteria encompassed articles written in English, published as indexed scholarly journal articles in the form of research articles or review papers, directly addressing issues of village governance, rural administration, sustainable development, community participation, urbanization, and sustainability in developing countries, and using the most recent publication version when multiple versions were available, while articles not written in English, published as editorials, books, book chapters, conference proceedings, short reports, or posters, containing only policy recommendations without clear empirical analysis or methodological rigor, employing inadequate methodologies, consisting of fewer than five pages, or lacking full-text accessibility were excluded from the analysis. The data search strategy was conducted using the Scopus database with the keyword combination (“village governance” AND “e-government”), which yielded 1,116 documents related to rural governance and sustainable development

in developing countries and were subsequently exported to MS Excel 365 for metadata management, including titles, abstracts, keywords, publication years, and subject areas. Furthermore, following the PRISMA guidelines and utilizing the PRISMA 2020 flowchart, a structured process of identification, screening, and eligibility assessment was implemented through filtering by publication year, language, document type, and relevance to the social sciences, ultimately resulting in 230 studies being included in the final review, ensuring that the analyzed articles were aligned with the research objectives of mapping rural governance approaches and sustainable development practices in developing countries.

RESULT AND DISCUSSION

Data Analysis and Visualizatio

Bibliometric analysis was conducted by selecting 230 documents to construct a bibliometric mapping of rural governance and sustainable development studies. VOSviewer was applied to visualize the literature network, identify co-authorship links, and highlight thematic relationships across documents (Nurmandi et al., 2021; Syahputra et al., 2023). CiteSpace was employed for keyword co-occurrence and network visualization, enabling the detection of emerging themes and research frontiers in village governance (Lawelai & Nurmandi, 2024). Furthermore, RStudio-Biblioshiny complemented the analysis by providing advanced statistical tools, including trend topics, thematic evolution, tree maps, and authors' coupling, thereby offering a comprehensive visualization of the structural and dynamic patterns of the field (Barbosa, 2021).

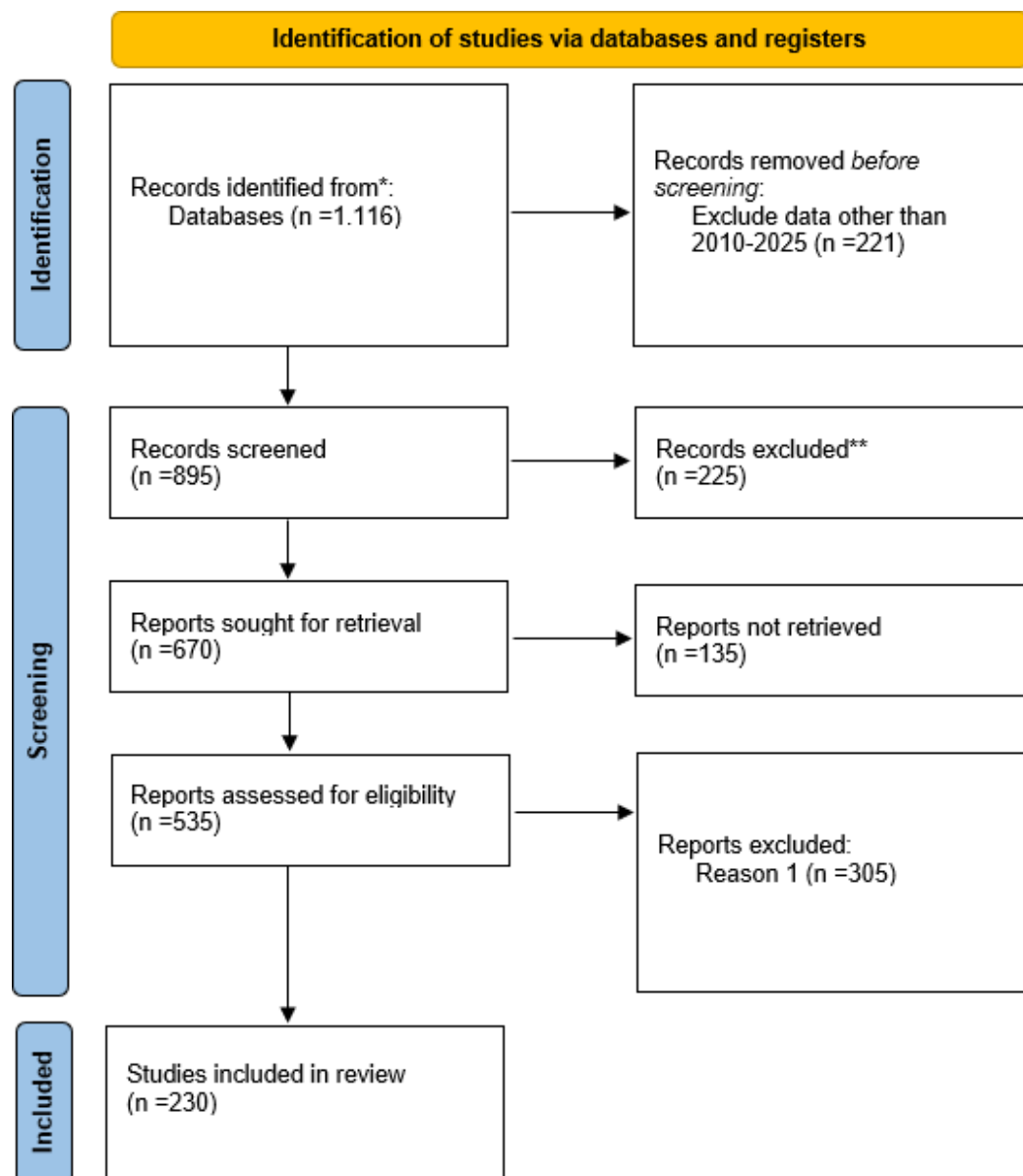


Figure 1. The modified PRISMA diagram illustrates the article screening process in the systematic review.

The figure illustrates the flow of the article selection process in the systematic review using a modified PRISMA diagram. The process begins with the identification of 1,116 records obtained from databases, of which 221 records were removed because they fell outside the 2010–2025 publication period, leaving 895 records for the screening stage. During screening, 225 records were excluded due to irrelevance, and 670 reports proceeded to the retrieval stage. Of these, 135 reports could not be retrieved, resulting in 535 reports assessed for eligibility. At the

eligibility assessment stage, 305 reports were excluded for failing to meet the predetermined criteria, leading to a final total of 230 studies included in the review. This diagram demonstrates that the selection process was conducted systematically and transparently to ensure that the analyzed studies were relevant to the research objectives.

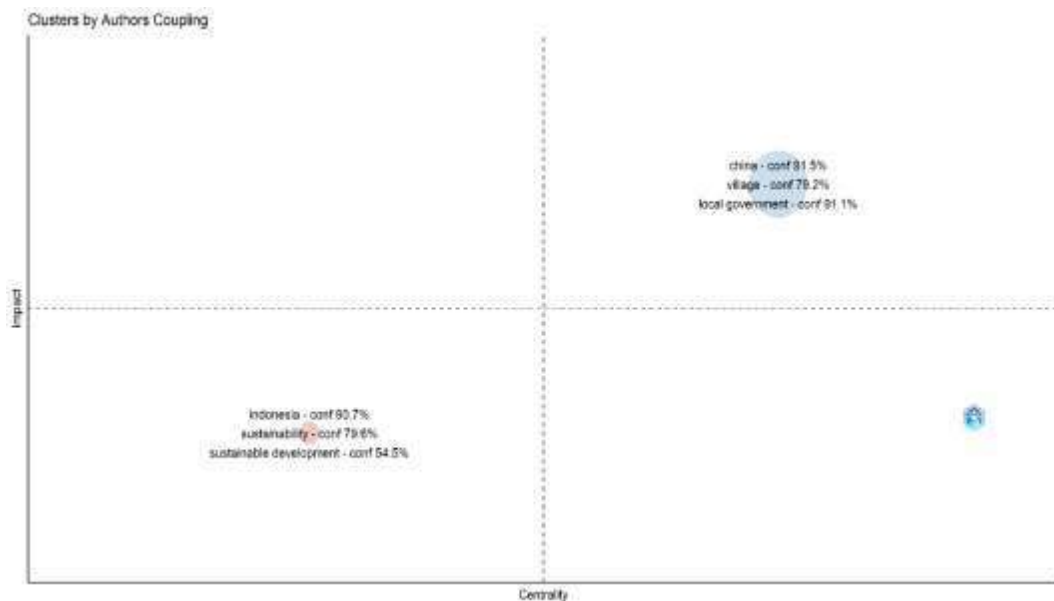


Figure 2. Authors' Coupling of Collaborative Networks, Spatial Strategies, and Sustainable Development

Source: Data processing using RStudio

Figure 2 The analysis identifies two main clusters that reflect the direction of academic discourse on rural governance. The first cluster, centered on China, village, and local government, demonstrates a very high level of interconnectedness (91.5%, 79.2%, and 91.1%, respectively), indicating that the literature on China holds strong centrality in shaping the global conceptual framework. Research in China highlights a paradigm shift from managerial approaches toward rights-based governance that integrates socio-ecological resilience into rural–urban governance practices (LIU & YE, 2021a; Xu et al., 2021). This is further reinforced by multi-actor participation, ranging from village committees and non-governmental organizations to the private sector (X. Wang et al., 2017). As well as institutional restructuring at the local level since the early 2000s to enhance the effectiveness of policy implementation. (Ahlers et al., 2016). In addition, strengthening cultural identity and the community's deliberative

capacity has been shown to enhance participation in governance (X. Wang et al., 2017). Meanwhile, innovations in digital governance, spatial planning, and land incentive-based policies have increasingly driven the success of rural revitalization (Qu et al., 2025; Sun et al., 2021; T. Wang et al., 2024).

In contrast, the second cluster, which focuses on Indonesia, sustainability, and sustainable development, occupies a position with moderate levels of interconnectedness (90.7%, 79.6%, and 54.5%, respectively), indicating a significant contribution, although not as strong as that of China. The Indonesian literature emphasizes the importance of strengthening village capacity to address development and migration challenges, where weak governance responses tend to perpetuate traditional migration patterns (Nurlinah et al., 2020). The Village SDGs Program also faces limitations in resources and stakeholder coordination, necessitating more adaptive and contextualized approaches (Setha, 2024). In the context of tourism, political bureaucracy plays only a minimal role in fostering community support, making community empowerment and awareness key determinants of sustainability (Amir et al., 2024). Community-based models help preserve land ownership and enhance the bargaining position of local communities (Yang et al., 2024). Meanwhile, agrotourism and participatory tourism governance emphasize the importance of multi-actor collaboration (Asdar & Abdullah, 2024; Zulgani et al., 2023).

Accordingly, research from China contributes significantly to the development of conceptual and institutional frameworks in sustainable rural governance, while Indonesia provides valuable community-based practical contributions; together, they complement each other in enriching the global literature on sustainable rural governance. Studies conducted in China emphasize the importance of strong institutional capacity, coordinated spatial planning, and the strategic use of digital technologies in driving rural revitalization and administrative efficiency. Through comprehensive policy integration and centralized governance mechanisms, the Chinese model demonstrates how state-led initiatives can enhance service delivery, optimize resource allocation, and promote structural transformation in rural areas. These institutional innovations not only strengthen administrative performance but also provide theoretical

insights into the role of governance architecture in shaping long-term development outcomes. As a result, the Chinese experience offers an important reference for understanding how formal regulatory systems and technological modernization can be aligned to support sustainability objectives in complex rural settings.

In contrast, research from Indonesia highlights the central role of community participation, social capital, and localized policy adaptation in advancing sustainable rural development. Indonesian rural governance is characterized by strong grassroots engagement, collaborative decision-making processes, and the empowerment of local institutions that reflect cultural values and social networks. These community-oriented practices illustrate how inclusive governance can enhance social cohesion, strengthen accountability, and improve the responsiveness of public services to local needs. By prioritizing participatory mechanisms and social empowerment, the Indonesian experience demonstrates that sustainable development is not solely dependent on institutional strength, but also on the capacity of communities to mobilize collective action and sustain local initiatives. This bottom-up approach provides practical lessons on how governance systems can remain flexible and adaptive in the face of socioeconomic and environmental challenges.

Taken together, the experiences of China and Indonesia reveal that effective rural governance cannot rely exclusively on either state-centered or community-centered models, but must instead be grounded in hybrid arrangements that integrate institutional authority with participatory engagement. The interaction between top-down policy coordination and bottom-up social initiatives creates opportunities for mutual learning and policy innovation, enabling rural governance systems to balance efficiency, inclusiveness, and sustainability. By combining China's emphasis on institutional coherence and technological advancement with Indonesia's focus on community empowerment and contextual responsiveness, a more comprehensive governance framework can be developed. Such a framework is capable of addressing multidimensional development challenges, including economic inequality, environmental degradation, and limited administrative capacity. Consequently, the complementary nature of these two national experiences enriches the global

discourse on sustainable rural governance and provides a foundation for comparative and interdisciplinary research. Future studies can build upon this integrated perspective to explore how diverse governance arrangements may be adapted and transferred across different sociopolitical contexts, thereby contributing to the formulation of more resilient, equitable, and sustainable rural development strategies worldwide.



Figure 3: The Emergence of Technology Integration and Smart Village Development.

Source: Utilization of RStudio for data processing.

Figure 3 The findings indicate the dominance of keywords such as village, governance approach, rural area, local government, rural development, urbanization, sustainable development, and sustainability. This pattern confirms that, in the context of developing countries, villages constitute a central arena of governance that strongly determines the effectiveness of local development. Participatory, transparent, and accountable governance approaches enable village governments to improve public services while simultaneously strengthening institutional legitimacy (Handayani et al., 2023). At the same time, rural local governments serve as strategic actors in coordinating development programs and ensuring that resource management is oriented toward sustainability (Budiono et al., 2024; Purnamasari et al., 2024).

In addition, the frequent occurrence of the terms urbanization and sustainable development reflects the importance of integrating village governance in responding to global dynamics. Urbanization reshapes rural–urban relations,

thereby requiring adaptive governance capable of maintaining a balance between economic growth, social equity, and environmental sustainability (LIU & YE, 2021b). Therefore, rural development should be oriented toward collaborative and inclusive principles, including the development of community-based sectors such as rural tourism, which has proven effective in supporting sustainability (Ćurčić et al., 2021; Valderrama et al., 2025). Accordingly, this word cloud illustrates the close interconnection between governance, rural development, and sustainability as the main foundation for village transformation in developing countries.

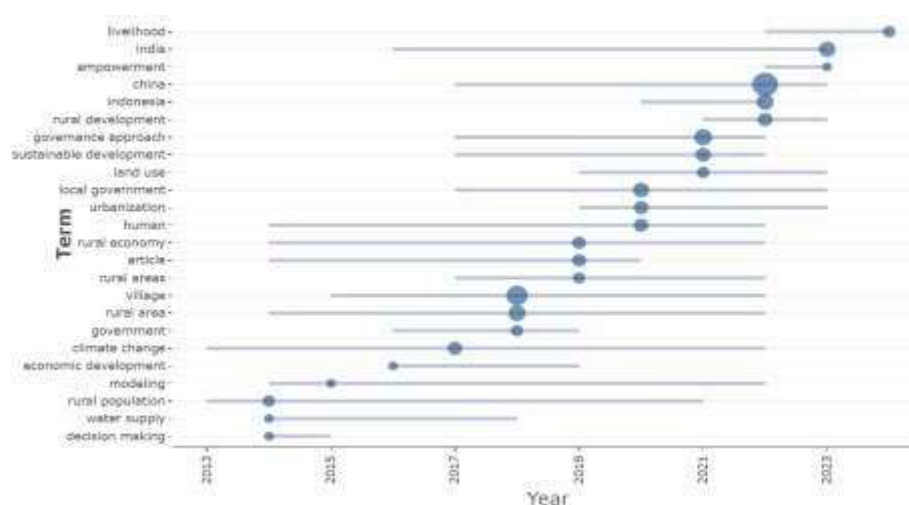


Figure 4. Trends in Collaborative Networks, Spatial Strategies, and Sustainable Development
 Source: Data processed using RStudio

Figure 4 The study indicates that research on rural governance in developing countries has undergone a paradigm shift from a technocratic approach to a multidimensional framework emphasizing collaboration, participation, and community empowerment. The concept of collaborative governance has proven to be vital for sustainable tourism village development, as demonstrated in the case of Karangreja, Indonesia, where the involvement of government, communities, and civil society organizations has strengthened institutional capacity despite resource constraints and power dynamics (Nuraini et al., 2025). In line with this, the community empowerment approach serves as a strategic instrument for integrating energy, education, innovation, and social development as the foundation for achieving sustainable development goals, as exemplified by the ALMIA project in Spain (del Arco et al., 2021).

The study emphasizes that sustainable rural development must balance food security, economic stability, and socio-cultural sustainability, with small enterprises playing a crucial role in maintaining local economic resilience (Abilova et al., 2021). The shift from a top-down development strategy to a participatory approach has strengthened local capacity but has also sparked debates regarding power relations (Storey, 2009). In China, spatial governance has been shown to enhance public services and spatial asset value through multi-actor coordination, although coordination challenges persist (Sun et al., 2021). At the same time, participatory governance drives the transition of agricultural villages into sustainable tourism destinations by balancing economic, social, and ecological dimensions (Sgroi, 2022). Transformational leadership factors strengthen the adaptive capacity of communities (DAVIES, 2009). Meanwhile, community partnership networks enhance the quality of social services in marginalized areas (M. Zhang et al., 2018). Finally, technological solutions are only effective when balanced with social needs, so the principle of smart living emphasizes community-based sustainability rather than mere technical modernization (Zavratnik et al., 2020).

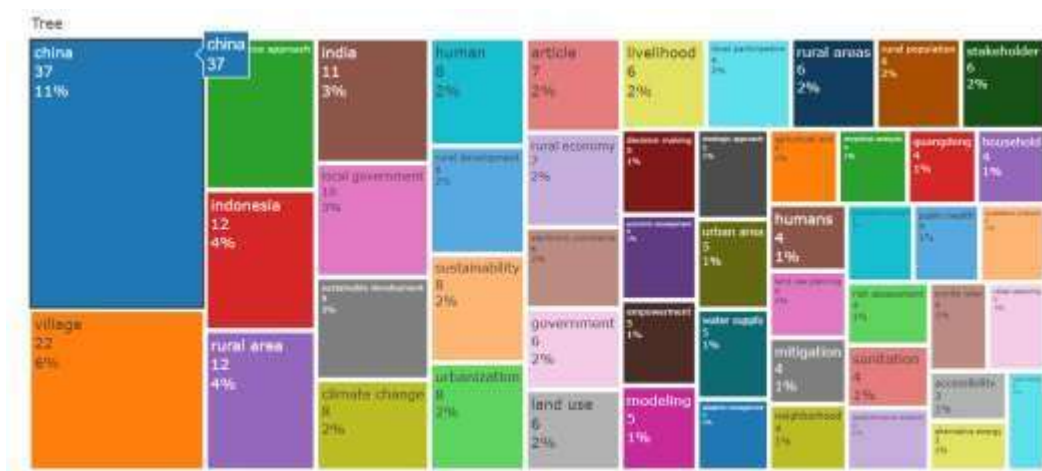


Figure 5 . Tree Map of Topics: Collaborative Networks, Spatial Strategy, and Sustainable Development

Source: Data processed using RStudio

Figure 5 The study shows that research on rural governance and development is most prominent in China, followed by Indonesia and India, highlighting Asia as a key laboratory for rural governance studies. In China, rural development is carried out through a multi-actor model involving village

committees, cooperatives, NGOs, and the private sector, with a focus on enhancing public services, spatial management, and local economic empowerment (Sun et al., 2021; X. Wang et al., 2017). However, rapid urbanization poses challenges such as the loss of cultural identity and governance inefficiencies, making the strengthening of participatory capacity and community identity essential for effective development (Yao et al., 2018a). The paradigm shift from management to rights-based governance, involving multiple stakeholders, indicates a transformation toward a more resilient city–village co-governance model (YE et al., 2021). The success of rural revitalization in China has been supported by community leadership, policy consistency, and infrastructure investments, which succeeded in eradicating extreme poverty by 2020 (Mugambwa et al., 2025). Similar findings in Indonesia confirm that the implementation of good governance principles directly influences village government performance and public perception, while community participation serves as the foundation for policy legitimacy (Handayani et al., 2023). Nonetheless, approaches that remain hierarchical and technocratic limit local innovation, highlighting the need to strengthen institutional capacity and involve communities in policy formulation (Ahmad Iman Sukri et al., 2025). Community-based development models, such as integrated farming and community-based forest management, offer a pathway toward more sustainable development, although they still require improvements in institutional frameworks, financial strategies, and long-term support (Sambodo et al., 2023). On the other hand, migration issues reveal a close link between weak village governance and development challenges, making the strengthening of local government capacity crucial (Nurlinah et al., 2020). For comparison, India's Panchayati Raj system demonstrates success in promoting citizen political participation, which can serve as a reference for strengthening village democratization in Indonesia (Ahmad Iman Sukri et al., 2025).

These findings underscore the importance of integrating participation, community leadership, and governance innovation as key factors for the success of sustainable rural development, as they collectively shape the capacity of rural communities to respond effectively to social, economic, and environmental

challenges. Community participation serves as a foundational element in ensuring that development initiatives reflect local needs, priorities, and cultural values, thereby enhancing policy legitimacy and long-term sustainability. When rural residents are actively involved in decision-making processes, planning activities, and program implementation, they develop a stronger sense of ownership and responsibility toward development outcomes. This participatory dynamic not only strengthens social cohesion but also improves accountability and transparency within governance structures, reducing the risk of elite capture and policy fragmentation. In this context, participation functions not merely as a procedural requirement, but as a transformative mechanism that enables communities to articulate their aspirations and contribute meaningfully to governance processes.

At the same time, community leadership plays a critical role in mobilizing collective action, mediating conflicts, and facilitating collaboration among diverse stakeholders. Effective local leaders act as intermediaries between formal institutions and grassroots actors, translating policy objectives into locally relevant practices while ensuring that community voices are represented in broader governance arenas. Through inclusive and ethical leadership, community leaders can foster trust, strengthen institutional legitimacy, and encourage innovation at the local level. Leadership that is grounded in social responsibility and cultural sensitivity further enhances the adaptive capacity of rural governance systems, enabling communities to navigate changing political, economic, and environmental conditions. In many developing contexts, strong community leadership has proven instrumental in sustaining development initiatives beyond project cycles and external funding periods.

Governance innovation constitutes the third pillar in this integrative framework, encompassing the adoption of digital technologies, collaborative policy instruments, and flexible institutional arrangements that enhance administrative efficiency and service delivery. Innovations such as e-government platforms, participatory budgeting systems, and open data initiatives contribute to improved transparency, responsiveness, and coordination across governance levels. By leveraging technological and organizational innovations, rural administrations can overcome structural constraints, reduce information

asymmetries, and promote evidence-based decision-making. Moreover, governance innovation facilitates cross-sectoral partnerships involving government agencies, civil society organizations, and private actors, thereby expanding resource mobilization and knowledge exchange.

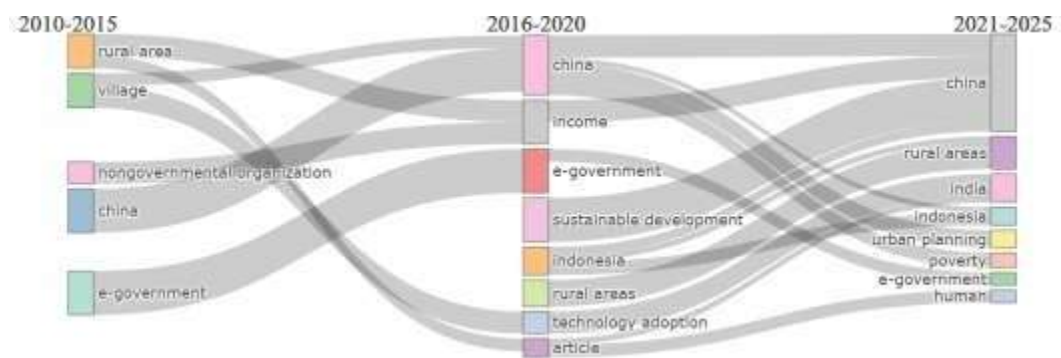


Figure 6. Evolution of the Topics: Collaborative Networks, Spatial Strategy, and Sustainable Development
 Source: Data processed using RStudio

Figure 6 The discourse on rural governance in China, India, and Indonesia has become increasingly complex, emphasizing the integration of local institutions, community participation, and technological innovation as the foundation for sustainable development. In China, the shift from a management paradigm to rights-based governance and village–city co-governance underscores the importance of a socio-ecological approach in addressing rural challenges (YE et al., 2021). Rapid urbanization has triggered a hollowing-out phenomenon, where the migration of young laborers weakens village social structures, making the strengthening of cultural identity and deliberative capacity crucial for promoting citizen participation (Yao et al., 2018b). The implementation of spatial governance has been shown to enhance public services, collective organization, and the value of spatial assets (Sun et al., 2021). Meanwhile, NGOs play a crucial role in environmental improvement, while village cooperatives drive the strengthening of the local economy (X. Wang et al., 2017). On the other hand, formal institutional structures, such as village committees and the party, remain the primary pillars for managing land, the economy, and social welfare (Joseph, 2024).

India exhibits a relatively different pattern, emphasizing the use of e-government as a tool for poverty alleviation and the enhancement of public

services, although limitations in digital literacy and infrastructure continue to constrain implementation effectiveness (Suresh Kumar & Joseph, 2016). Sustainable Rural Development policies strengthen local governance capacity through more inclusive decision-making and effective village leadership (Rahman et al., 2025). Schemes such as MGNREGA demonstrate how community-based water infrastructure can enhance climate resilience and irrigation, supported by strong civil society organizations (Mehta et al., 2024). In Indonesia, the theme of rural tourism development emphasizes that success is influenced not only by political bureaucracy but also by the awareness and empowerment of local communities (Mehta et al., 2024). Cross-country comparisons reveal a commonality: NGOs play a crucial role as a driving force for socio-environmental change (Das & Takahashi, 2009; X. Wang et al., 2017). Meanwhile, community leadership plays a central role in implementing sustainable rural revitalization (Mugambwa et al., 2025). Thus, these findings underscore that successful rural governance in developing countries requires the integration of multi-actor participation, technology adoption, and adaptive local leadership.

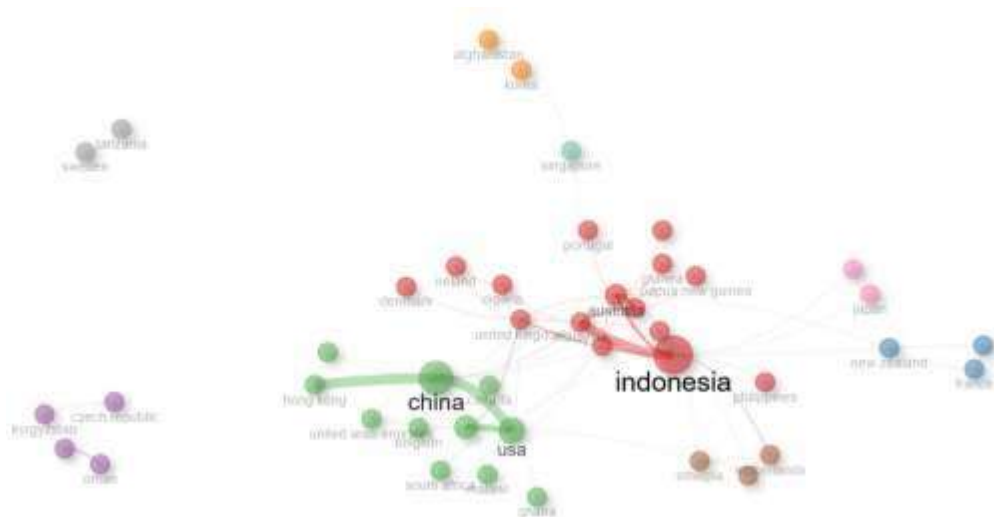


Figure 7. Collaboration Networks, Spatial Strategy, and Sustainable Development

Source: Data processed using RStudio

Figure 7 The findings indicate that research collaboration underscores the vital role of international research networks in enhancing the quality, visibility, and impact of scientific publications. Cross-country collaboration, measured

through co-authored publications, has been shown to enrich knowledge exchange, increase citations, and expand the global influence of research (Geng et al., 2022; Low et al., 2014). Nevertheless, the Asia-Pacific region still faces structural barriers, such as financial constraints, geographical distance, language differences, and a lack of institutional support (Sugiyama et al., 2017). In the institutional context, university–industry collaboration, particularly through dual affiliations, creates stronger and longer-lasting knowledge networks (Ljungberg et al., 2025). Big data–driven analytical approaches, such as Spatio-Temporal Graph Convolutional Networks, increasingly clarify the spatial and temporal dynamics of collaboration by mapping relationships among authors, keywords, and institutions (Hu et al., 2025).

At the global level, long-term collaboration can be seen as a symbiotic relationship, where complementary expertise and resources significantly enhance scientific performance (J. Liu et al., 2023). The Asia-Pacific region, particularly China, emerges as a global collaboration hub, extending networks to the Western Pacific, although it still faces regional challenges (Benavent-Pérez et al., 2012; Huang et al., 2021). Although currently showing a declining trend, US–China collaboration remains a key driver of global knowledge production and innovation diffusion (Kitajima & Okamura, 2025; Tang & Hu, 2013). Top universities in China are increasingly strengthening networks with the US, the UK, Australia, Hong Kong, and Belt and Road partner countries, which directly impacts academic performance (D. Zhang et al., 2022). Furthermore, research shows a positive correlation between international collaboration and research quality, including significant benefits for early-career researchers through indirect connections to transnational networks (Chen et al., 2025; D. Zhang et al., 2022). Co-author analysis and collaboration-based recommendations (Andrade et al., 2025; Hoang et al., 2019; G. M. Liu et al., 2023). This emphasizes that strengthening global collaboration not only expands access to knowledge but also enhances institutional capacity to address global development challenges.

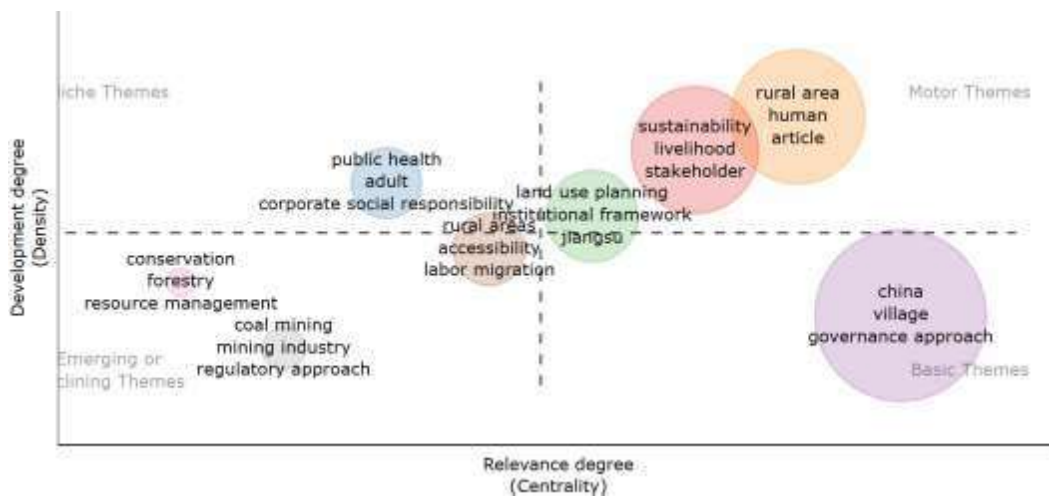


Figure 8. Thematic Map of Collaborative Networks, Spatial Strategy, and Sustainable Development

Source: Data processed using RStudio

Figure 8 shows that research on rural development and governance in China is progressing toward the integration of sustainability, community participation, and institutional innovation. In the Motor Themes cluster, topics such as sustainability, livelihood, stakeholder, and rural area serve as key drivers, effectively linking social, economic, and environmental dimensions. A socio-ecological resilience-based approach promotes the development of adaptive village-city governance through planning, participation, and multi-level policies. (LIU & YE, 2021b). China's rural development strategy aims to transform villages into attractive living spaces by 2050, focusing on food security, cultural preservation, environmental protection, and poverty alleviation (Xu et al., 2021). The key to the success of this strategy is the active involvement of communities in planning and resource management, which has been shown to enhance awareness, distribution efficiency, and residents' sense of ownership (Feng et al., 2024; Kadam, 2024; Wikantiyoso et al., 2021).

Meanwhile, Basic Themes such as China, village, and governance approach continue to serve as the main conceptual foundation explaining the theoretical framework of rural governance, although their development is relatively less intensive. Studies on sustainable rural tourism indicate that community-based development models can maintain a balance between economic growth and cultural preservation (Feng et al., 2024). Meanwhile, multi-level

governance in low-carbon tourism requires adaptive policies that are sensitive to local contexts (Feng et al., 2024). In terms of environmental governance, farmers' participation is influenced by perceptions of social justice and the strength of community networks (Hou et al., 2024). This aligns with global findings on the link between resource management and improved livelihoods (Black & Cobbinah, 2017; Mbaiwa, 2011). Furthermore, the success of policies heavily depends on institutional flexibility and the multi-stakeholder involvement of government, village committees, NGOs, and the private sector in establishing inclusive governance (Liangco et al., 2024). Furthermore, the success of policies heavily depends on institutional flexibility and the multi-stakeholder involvement of government, village committees, NGOs, and the private sector in establishing inclusive governance (Chunga et al., 2023; Feng et al., 2024). Up to disparities in water and forest management (Asbetsadik et al., 2025). Thus, this thematic map emphasizes the need for adaptive governance that is capable of integrating sustainability, community participation, and innovative institutional frameworks to achieve sustainable rural development.

The dynamics of village governance in developing countries reveal variations in governance models that influence the effectiveness of local development. In China, the supportive agency pattern demonstrates how village elites utilize resource allocations to maintain dominance, which often leads to social differentiation and weakens village autonomy (Shi & Dong, 2022). In contrast, governance in Indonesia remains largely hierarchical and technocratic, thereby constraining community-based innovation. Comparisons with India and Germany underscore that combining community participation with strengthened institutional capacity can foster more inclusive and sustainable governance (Ahmad Iman Sukri et al., 2025).

Furthermore, community empowerment based on social capital through bonding, bridging, and linking ties has been shown to strengthen social harmony and civic participation, although the optimization of private sector engagement remains limited (ULUM, n.d.). The implementation of good governance principles, such as transparency, participation, and accountability, is also crucial, as stipulated in Indonesia's Village Law, although gaps in understanding among

local officials persist (Susan & Budirahayu, 2018). At the same time, digital innovation through AI- and IoT-based e-government enhances the quality of public services (Al-Ansi et al., 2024). Meanwhile, open data initiatives strengthen transparency, although they continue to face challenges related to data quality and bureaucratic resistance (Hidayat, 2025). Challenges in digital literacy remain a limiting factor for equitable participation (Belkhamza, 2024).

Furthermore, sustainable rural development requires multi-actor and holistic approaches, such as the Human-Centered Design–Participatory Rural Appraisal framework, which has proven effective in India (Su set al., 2025). The resilience dimension is also crucial, as rural communities need to strengthen infrastructure, adopt sustainable agricultural practices, and build self-organized institutions to cope with disasters (Su et al., 2024; Ying et al., 2023). On the other hand, rural tourism and agrotourism have emerged as revitalization strategies, with evidence from South Africa demonstrating that integrating tourism with agricultural practices can support local livelihoods while preserving environmental sustainability (Ramaano, 2025). Overall, these findings confirm that effective village governance depends on the synergy between institutional capacity, community empowerment, digitalization, and locally based sustainability strategies.

CONCLUSION

These findings affirm that village governance and rural development in developing countries are shaped by complex interactions among institutional capacity, levels of community participation, digital transformation, and sustainability strategies, with each national context exhibiting distinct patterns. The analysis indicates that China stands out through strong institutional restructuring, reinforced spatial governance, and the strategic use of digital innovation as a primary instrument for rural revitalization, while Indonesia places greater emphasis on community-based approaches, social empowerment, and contextual policy adaptation in promoting sustainable development. These differences underscore that no single model is capable of addressing the complexities of rural governance; instead, a hybrid model that combines state

capacity with participatory societal strengths is required. The implications of these findings are both theoretical and practical. Conceptually, this study extends the rural governance framework by emphasizing the importance of collaborative approaches that bridge formal institutional structures and local dynamics. Practically, it provides a foundation for policymakers to design more inclusive rural development strategies through strengthened digital inclusion, enhanced transparency, and economic diversification based on rural tourism and sustainable agricultural practices. The significance of this study lies in its contribution to filling gaps in the literature, which has previously been fragmented between state-centric and community-centric approaches, while also opening new directions for comparative cross-national research to identify transferable governance practices and to explore the role of digital technology in bridging capacity gaps in village governance. Consequently, future research has the potential to develop more comprehensive frameworks that balance institutional efficiency, social equity, and environmental sustainability in responding to global challenges such as urbanization, climate change, and the strengthening of rural resilience.

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