

Rural Sustainability Challenges, Responses, and Tourism: A Systematic Review

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ABSTRACT

Rural areas worldwide face persistent and interconnected challenges that threaten long-term sustainability. Although rural development is a strategic priority across countries at different stages of development, existing responses remain fragmented and uneven in effectiveness. This study conducts a systematic literature review to identify principal rural challenges and critically examine proposed measures, with particular attention to sustainability-oriented tourism. The review analyzes 192 articles indexed in ScienceDirect, Scopus, and Google Scholar to map core challenges, and examines 223 key studies published over the past seven years to assess solutions. Thematic analysis identifies seven major challenge categories: economic, demographic, developmental, cultural, agricultural, cognitive, and ecological. Twelve types of interventions are identified in response. Tourism-related interventions—characterized by innovative themes, technologies, objectives, and conceptual frameworks—emerge as the most frequently proposed and wide-ranging, offering potential to address multiple challenges simultaneously. However, significant limitations persist. Both tourism-based and non-tourism-based measures often lack systematic integration, localized adaptation, and effective cross-sectoral coordination. Moreover, weak linkages between indigenous knowledge systems, cultural practices, and development strategies grounded in ethnoscience constrain their capacity to support sustainable rural transformation. This study argues that advancing rural sustainability requires a systemic tourism model grounded in local ethnoscientific knowledge and embedded within an integrated sustainability framework. By clarifying dominant challenges–solution patterns and identifying critical conceptual and practical gaps, the findings contribute to rural sustainability research and inform more resilient, context-sensitive rural development pathways worldwide in practice.

1. INTRODUCTION

Rural is a zone of interaction and survival for natural and cultural resources. Urbanization, globalization, natural pollution, ecological loss, and cultural loss continuously impact and affect rural development. Each village faces distinct challenges due to its region and stage of development. Different countries or regions have focused on rural development when formulating their strategies. (Common Agricultural Policy and Leaders Programme in the EU region; China's Rural

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Revitalisation Strategy; Kenya's Vision 2030; India's Budget 2024; the Rural Partners Network in the US; and Japan's Towards the Development of Attractive Rural Areas).

Rural issues are not single issues; they involve complex relationships, and the need to link rural issues and measures across dimensions requires more comprehensive analyses (Knickel & Renting, 2000). Systematic analysis of the specific problems faced by rural areas is important for rural development. Furthermore, examining the categories and logical relationships among these rural issues and identifying the more fundamental rural issues and their linkages to other categories helps systematize the understanding of rural problems. Moreover, the root causes of rural failures will be identified by analyzing the linkages between rural measures (adopted for rural development in recent years) and the issues they address, a crucial step in building a sustainable rural future.

In this article, we focused on rural issues analyzed by various scholars and categorized the issues faced by rural areas through a systematic review spanning two decades. Based on a review of literature from 2004 to 2024, seven issues have been identified and widely discussed worldwide: economic, population, industry, cultural, territorial, cognitive, and ecological. Subsequently, we systematically analyzed measures from 1,011 articles published over the past seven years to assess their relevance and limitations, thereby informing future strategies and actions for rural sustainability.

Finally, the importance of this review for sustainable rural development is that it provides guidance for further research by highlighting the diverse issues in the countryside, the measures taken to address them in recent years, and their interrelationships. A systematic understanding of rural issues, measures, and their interconnections can help identify the most deeply rooted problems in rural areas, thereby informing the most appropriate solutions to achieve sustainable rural development.

2. RESEARCH METHODOLOGY

This paper is based on a systematic approach to literature searching and screening, drawing on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework (Page et al., 2021).

The literature was screened and analyzed from 23 April 2024 to 6 August 2024, using academic research indexing databases such as ScienceDirect, Scopus, and Google Scholar.

The whole process can be divided into four phases: the pre-identification phase, the identification and analysis phase, the primary search and analysis phase, and the summary phase. In the first stage, we focused on basic knowledge of rural issues and identified 49 documents from three databases for summary reading and analysis. After establishing this baseline, we pre-categorised rural issues into seven categories to facilitate the subsequent identification and further search. In the second stage, a total of 143 documents were identified across categories, with an average of at least 15 per category, and were then analysed thematically within each category.

In the third stage, the main focus was on rural measures implemented in the last five years in response to rural issues, and 1,011 articles were identified in Scopus, of which it is worth noting that the years were adjusted by two years prior to the outbreak to account for the impact of COVID-19. Therefore, the results were retrieved over the last seven years, covering 2018-2024. At this stage, an initial review of the titles and abstracts of these studies was conducted to select the 223 most relevant studies, a process guided primarily by the research question. Subsequently, a detailed review of the screened literature was conducted, a key indicator was selected for in-depth analysis, and 148 articles unrelated to this index were excluded. A detailed review of the remaining 75 articles was conducted to extract the necessary data for analysis, and 15 articles that were less instructive or insufficiently supported by examples of practice were further

excluded after the full texts were read and analyzed. In addition, five relevant articles from other databases were added. Ultimately, this phase led to the review of 62 articles for this study. The main research questions are as follows:

- 1) What measures have been taken to promote rural development?
 - 2) What strategies address existing problems in the villages?
 - 3) What are the potential strategies or measures in the study that could solve the rural issues?
- The last stage is to correlate and summarise the results of the searches and analyses conducted in the previous stages.

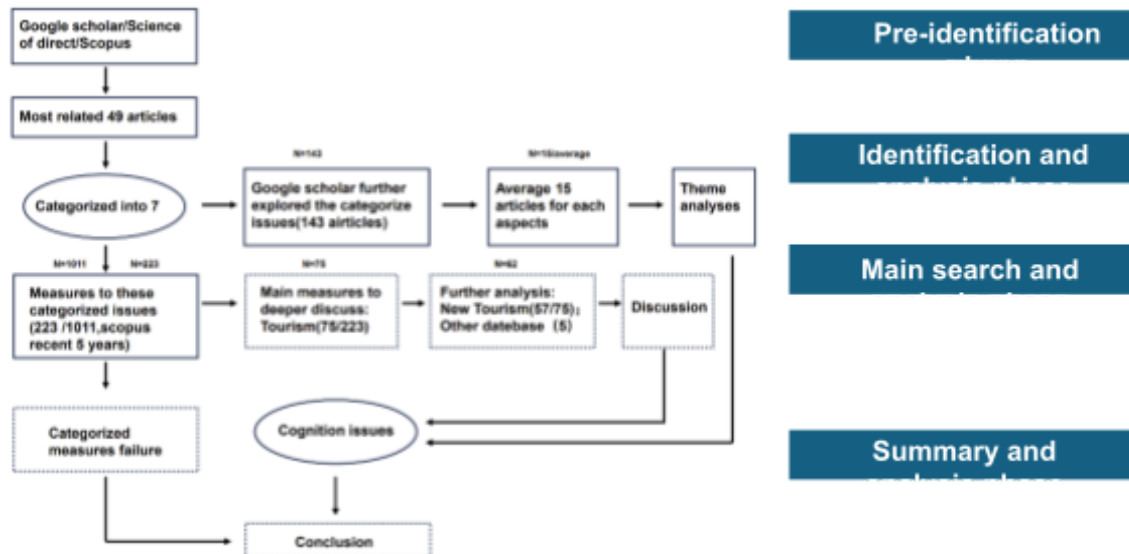


Figure 1. The methodological steps to perform the literature search
Source: Author, 2025

The keywords used in the structured literature review used in the main stages, as well as the mix and combination of 'OR' and 'AND' operators, are listed below:

("rural" OR "back-country" OR "countryside"; "development measures" OR "development strategies" OR "development action" OR " development approach")

Restrictions are selected as: Language restriction is English; Literature category is Articles, Conference Papers and Reviews; Year is 2018-2024; Discipline category restriction is nine categories(Social sciences, environmental sciences, agricultural and biological sciences, engineering, economics, econometrics and finance; multidisciplinary, decision sciences, arts and humanities; business, management and accounting).

3. LITERATURE REVIEW

3.1 Rural issues

Defining rural is a crucial first step, but also a complex and comprehensive process. Rural areas were typically conceptualized as distinct from cities. However, rurality has continually undergone changes in its conceptualization as society has evolved, and the need to better define rurality for policy and practice has become more apparent (Nelson et al., 2021). Despite the ongoing changes, rural characteristics can be summarized into three: social characteristics (such as

small scale, low-density settlement, homogeneous economy, a sparse population, or distance from the central city), cultural characteristics (local cultural ties and social relations), and environmental characteristics (represented by the abundance of natural resources)(Cohen & Greaney, 2022; Deavers, 1992; Freudenburg & Gramling, 1994; Wiggins & Proctor, 2001).

Rural areas are largely defined in contradistinction to urban areas, but it is increasingly recognized that such definitions and distinctions are problematic(Dasgupta et al., 2014). Koziol et al (2015) highlighted that rural theoretical perspectives could be classified into place-based characteristics and socio-cultural relationships. Bennett et al (2019) suggested rural areas could be measured through population density, travel or distance, geographic isolation, resources, socio-economic characteristics, local perceptions or culture, and amenities. Deconstructing the concept of ‘rurality’ requires finding more specific characteristics and attributes called ‘rural’. Based on previous studies, rural areas are defined in this paper as a distinct space within a boundary at a certain distance from a central city with a small population, settlements, socio-cultural relations, and amenities. It is usually characterized by an abundance of natural resources, certain cultural ties, strong social bonds, geographic isolation, information lag, or economic homogeneity.

Inevitably, due to the specific characteristics of rural areas, a series of problems arise in the development process; these problems can be grouped into seven categories.

3.2 Economic issues

Generally, an unfavorable economic environment, economic depression, economic inequality, lack of job opportunities, and low income are the main impressions of economic development in rural areas. Job opportunities are often assumed to be scarce and diverse in rural areas, which forces young people to move to cities to find more opportunities (Delgado-Viñas & Gómez-Moreno, 2022; Gómez-Ullate et al., 2020). Furthermore, rural residents will be forced to face physical and economic displacement (Marcuse, 1985), including cultural displacement(Yang & Loopmans, 2023) , due to the highly attractive impact of urbanization and urban economic development. The rural economy, daily lifestyle, social system, etc., all changed in reference to urban economic development. Rural economic depression occurs following sustained, large-scale rural-urban migration(Li et al., 2022).

Besides, rural economic development is deeply affected by globalization: shortened distance between products and markets; increased external competition; destruction of the original local market and economic vitality (Y. Liu et al., 2022; Petric & Gibson, 2023; Rushing, 2000). The changes not only bring unequal and unreasonable competition to rural economic development but also trigger a series of chain reactions. Rural economic forms have changed in response to the social and economic environment; booming tourism has transformed villages dominated by the agrarian economic model. It is no longer dominated by agricultural activities but by small-scale industrial production, service provision, landscape management, and residential use (Markantoni & Strijker, 2012). “Farmer”, the most distinctive and traditional place identity, has gradually faded (J. Wang et al., 2024). Rural areas have not adapted well to the new era. The unfavorable economic environment resulting from insufficient infrastructure has left rural areas at a competitive disadvantage (L. Chen et al., 2023; Kandilov & Renkow, 2010). The original economic cognition has not been in line with the new era.

To bridge the gap between farmers and markets, Ma et al. (2024) highlight the importance of targeted educational programs and infrastructure development to support this transition. The original identity cognition prevents rural residents from realizing their advantages and acquiring new economic cognition and capabilities. Hence, economic issues in the historical development process persist, exacerbating environmental and cultural problems. Persistent external competitive disadvantage, driven by globalization and market pressures, economic recession, and inequality in adverse economic environments, ultimately results in a lack of employment opportunities and low income at the individual level.

3.3 Population issues

Rural population issues are mainly reflected in four aspects: Aging, depopulation, migration, and population disparity. It faces challenges affecting the well-being of the countryside and has a profound impact on daily life. Aging has become one of the most pressing issues of the twenty-first century, both in developed and developing countries, and it is worth noting that the rate of population aging in rural areas is accelerating (Liao et al., 2019; Napier et al., 2023; Yarker et al., 2020). Social assistance, economic development, and health care for the aging are often in sharp contrast to those in urban areas (Davies, 2011). It further accelerates the population disparity between urban and rural areas.

Demographic imbalance and inequality are also attributed to the large-scale migration of young adults and skilled people from rural areas to cities, which has further accelerated the aging of the rural population (Glasgow & Brown, 2012; Winterton & Warburton, 2012). Long-term continuous migration and irreversible aging further aggravated the rural population decline (Krawchenko et al., 2016; Zang et al., 2020). It has resulted in a large number of abandoned or vacant houses in villages (Ma et al., 2018), abandoned farmlands (Lee et al., 2021), continuing decline in economic vitality (Hart et al., 2011; Zang et al., 2020), a decline of collective functions (P. Liu et al., 2020), loss of village life and cultural vitality (Cáceres-Feria et al., 2021).

3.4 Industry issues

Rural development, which is dependent on agriculture and natural resources, is undergoing dramatic changes. The process from the agricultural economy into an urban-industrial economy and further into a knowledge-based economy affects rural development. The rural industry, represented as the agricultural industry, is in decline because of a lack of industrial competitiveness and potential (Kahan, 2013; Li et al., 2019; Michael, 2009). Industrial development is hampered, further affecting the construction and development of rural infrastructure.

However, better Infrastructure development is best envisioned as services that come from a set of public works (Fox & Porca, 2001), and it should include physical infrastructure (e.g., transport, water, electricity, networks, etc.) and intangible infrastructure (e.g., economic infrastructure, marketing services, basic social services, etc.) (Barrios, 2008). Industry decline is aggravated by insufficient infrastructure development, and thus, rural development is caught in a vicious circle (Cook, 2011; Economics--Global et al., 2008; Fox & Porca, 2001; Li et al., 2019; Qin et al., 2022). Besides, other issues related to rural development included blindly developing tourism (Sishi et al., 2020; L. en Wang et al., 2013), unreasonable space planning and policies (Alexander, 2002; Ge et al., 2020; Sun et al., 2021; Y. Tang et al., 2015).

Undoubtedly, rural tourism has become an important approach to rural development, but blindly and uncontrolled tourism development that lacks strategy and scientific procedures is often grossly overestimated. Contrary to having a positive impact, it brings a series of problems (such as environmental damage, stimulation of local conflicts, economic disputes, excessive construction, and the loss of local cultures) that accelerate the decline of the countryside (Almeida et al., 2021; Chang et al., 2018; Hajimirrahimi et al., 2017; Ibanescu et al., 2018). Inappropriate rural planning ignores the link between the past and the future and fails to consider in an integrated way how current actions will shape future socio-spatial relationships (Shucksmith, 2010). Further, ineffective planning due to a lack of communication and misunderstanding of rural conditions, problems, and people has rather misguided the development of villages, forgetting the fundamental goal of genuinely improving the quality of residents' lives (Belshaw, 1977; Jaszczak et al., 2017; Shucksmith, 2010; Yi & Son, 2022).

3.5 Cultural issues

Cultural issues in the rural development process can be grouped into three: the fading of tradition, erosion of culture, and decline of the rural idyll. A major socio-economic transformation, such as deagrarianisation, leads to a progressive loss of traditional ways of life, such that a fading tradition (an art form, craft, way of life, food, music, celebration, or anything else) and social relationships are disappearing (Alden, 2011; Delgado-Viñas & Gómez-Moreno, 2022; Mariola, 2005; Robertson, 2007). The culture of a people is their identity, as it gives them the recognition that encompasses lifestyles, historical habits, and collections of thoughts (Brosi et al., 2007; Wahab et al., 2012).

However, local people are overwhelmed by a lack of recognition of their identity and cultural perception, even though they want to preserve their culture. The cultural erosion accelerated process is most related to the disappearance of traditional knowledge, loss of historic ways of life, and cultural conflict and hijack (Brosi et al., 2007; Cloke & Davies, 1992; X. Wang, 2023). Moreover, rural unity is not a natural association to place, but the interaction between the individual, place, social relationships, collective culture, and imagination (McManus et al., 2012; O'Rourke, 2006; Peters et al., 2018).

The loss of tradition, culture, and rural unity undermines the integrity of the rural idyl, further contributing to a decline in the social functions of villages, stimulating conflicts and contradictions in various aspects of society and culture, and catalyzing the formation of hollow villages (Bock & Shortall, 2006; Delgado-Viñas & Gómez-Moreno, 2022b; Little & Austin, 1996; Lowe, 2019; Panzer-Krause, 2020; Shucksmith, 2018).

3.6 Territory issues

Rural territorial challenges can be broadly grouped into three interconnected areas: land tenure, land use, and land governance. Land tenure problems arise from both external and internal conflicts. Externally, urbanization and industrial expansion continue to encroach on rural land, reducing cultivated and ecological areas (Gao et al., 2020; Iortyom et al., 2020). Internally, conflicts over land ownership and control among individuals, communities, and institutions remain common, often reflecting unequal access to land and competing land rights (Yanagisawa, 2008). Irrational land use is widely observed in rural areas, including farmland abandonment, land fragmentation, idle land, uncontrolled construction, and single-function land use. These patterns generate economic, ecological, and socio-cultural problems, such as population outmigration and landscape degradation (Jagt et al., 2007; Pašakarnis et al., 2013).

In contrast, sustainable rural land use emphasizes multifunctionality and differentiated development through integrated strategies such as land consolidation, cooperative land management, land banking, and alternative land uses (Jagt et al., 2007; Munton, 2009; Pašakarnis et al., 2013; Qu et al., 2019; van Dijk, 2003). Land governance further shapes rural land outcomes. Rapid socio-economic change has exposed limitations in existing planning and management systems, leading to mismanagement and weak policy implementation (Slee, 2007; Van Lier, 1998). Although policy innovations have been introduced—for example, in China and the European Union—practical constraints, limited policy coordination, insufficient funding, and weak integration between theory and practice continue to undermine their effectiveness (Y. Liu et al., 2014; Long, 2014; J. Wang et al., 2012, 2018). Overall, the literature suggests that rural land challenges are systemic in nature and require coordinated, context-sensitive governance approaches aligned with long-term sustainability goals.

3.7 Cognition issues

There are challenges between traditional village perceptions and the reality of modern village development, and crossing or changing traditional perceptions is difficult (Cobern & George, 1999; Petković, 2007). The lack of education and specialized training has led to a series of problems as rural people continue to maintain their traditional perceptions in choosing development strategies in the modern world and in making changes passively. There is a general negative

understanding of the countryside - backward, undesirable, uninspiring, and worthless subordinate area, due to the traditional definition of the countryside and its specificities (Dilley et al., 2022; Gkartzios et al., 2020).

Therefore, traditionally minded people are culturally "left behind" as society's values shift towards cosmopolitan modern attitudes (Deppisch et al., 2023). Moreover, local people do not play an active role (participation, vision, voice, and effectiveness) in the rural development strategy formulation and development process due to a lack of awareness or capacity (Shubin, 2006; Willits & Luloff, 1995; Ye et al., 2020). In particular, Sharpley (2002) identified that the lack of awareness and skills training hinders and restricts the development process of agro-tourism in Cyprus. Actually, these are mainly caused by the mismatch between the old perceptions and skills of the local people and the requirements of the new era. Proper awareness is important for development decisions; otherwise, development strategies that lack vision will further lead to overbuilding and waste of resources (Cabini et al., 2018; Molle, 2006). In addition, different scholars have explored the strong relationship between perception (of the environment or environmental elements) and the extent of environmental damage and environmental pollution (Akpabio, 2011; Jia et al., 2021; H. Tang et al., 2021; Triguero-Mas et al., 2009).

Hence, rural cognitive issues can be summarized in three main points: outdated perceptions and ideas; a lack of information, education, and professional training; and a lack of new values and competencies to match the new era. The consequences of cognitive issues are not unilateral; they are the root causes of environmental, cultural, economic, and developmental problems.

3.8 Ecology issues

Rural ecological problems can be divided into two main categories: pollution problems (agricultural, domestic, industrial, land, etc.); ecological and environmental impacts (climate change, loss of biodiversity, resource depletion, food nutrition, and health).

It explores the impact of agricultural pollution - pesticides - on the health of children in rural families (Arcury et al., 2007). (V. R. Reddy & Behera, 2006; M. Wang et al., 2008) exposed the industrial pollution (water pollution) that comes along with rural industrial development, which seriously threatens local communities and livelihoods. The characteristics of rural domestic wastewater pose a serious risk to groundwater quality (Chen et al., 2023; Easa & Abou-Rayhan, n.d.). It is worth noting that pollution from rural domestic waste can further contaminate rural waters, and that there is a close link between domestic wastewater and agricultural pollution (Cao et al., 2022). The causes and effects of rural pollution exist in a complex network of external social, economic, environmental and technological relationships; there are also interrelationships within the different categories of pollution, and it is closely related to disease, mortality and well-being (Briggs, 2003; Hendryx et al., 2010; Mihai et al., 2021; R. Reddy et al., 2017). Nowadays, people have recognized the seriousness of rural ecological pollution, but there are obvious gaps in the environmental management system: Deficiencies in the effectiveness and adaptability of rural pollution management; and the absence of guardianship roles that are trusted and can guard rural ecology (Hendryx et al., 2010; Lowe et al., 2023; Mihai et al., 2021; Su et al., 2008).

Moreover, the ecological problems of the countryside pose challenges beyond pollution, and these challenges are closely related to the survival of the human race and the Earth's environment. Rural areas are more vulnerable to the impacts of climate change due to the agrarian nature of the countryside, which includes increased vulnerability of farmers, extreme economic poverty, and low resilience of communities (Austin et al., 2020; New et al., 2013; Nicholls & Amelung, 2015; Pittman et al., 2011). Call & Gray (2020) highlighted that people's livelihoods in rural areas are increasingly under the dual assault of land degradation and climate change. Land degradation is also a manifestation of land resource depletion, which ultimately undermines the sustainability of rural development. It is economically and demographically

driven and is also influenced by factors such as soils, topographical constraints, and community land-use structures (Karamesouti et al., 2015; Rahmawati & Rudiarto, 2019; Vu et al., 2014). (Salvati & Zitti, 2008) have shown that the more serious the depletion of natural resources due to land degradation, the lower the per capita income in rural areas of southern Italy.

The history of human development and resource utilization is closely linked, but the depletion of natural resources today is the result of human overexploitation and the use of natural resources, as well as unsustainable planning and waste (Mittal & Gupta, 2015; Xu & Zhao, 2023). The motivation behind this is often the blind pursuit of economic efficiency at the expense of environmental crises. Such overconsumption of natural resources will exacerbate irreversible socio-economic and environmental problems, such as climate change, declining economic growth, and loss of biodiversity (Kouassi et al., 2021). The rural environment is an area where indigenous biodiversity is exceptionally active (Zhang, 2020). However, resource and environmental changes—including changes in land-use patterns—are leading to the loss of native rural biodiversity.

3.9 Rural measures

In recent years, many scholars have proposed different measures for rural development. Using Citespace software to analyze the keywords of 1011 documents obtained from the Scopus database for the seven-year period of 2018-2024, it is easy to see a steady rise in the number of articles focused on rural measures, and it can also be found that social capital, rural tourism, and local development are mentioned more frequently.

Finally, 223 articles were selected to explain different measures related to rural development after the abstracts, titles, and keywords of the literature were further read and screened.

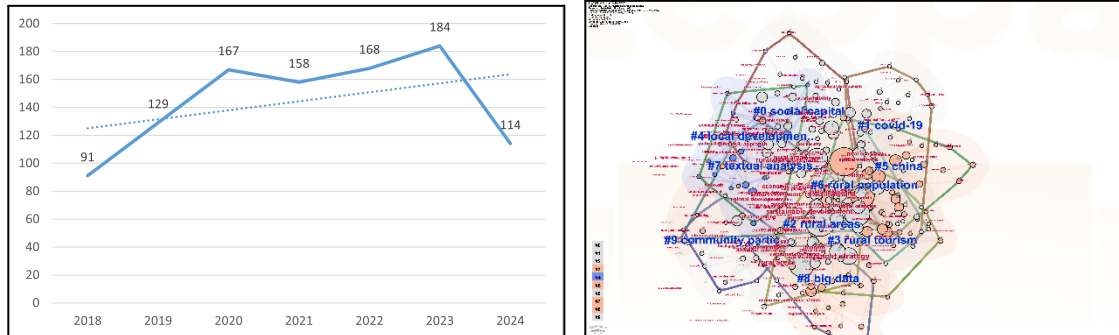


Fig. 2. (Left) Number of articles per year; (Right) Keyword cluster analysis map

Source: Generated by the author using CiteSpace 2025

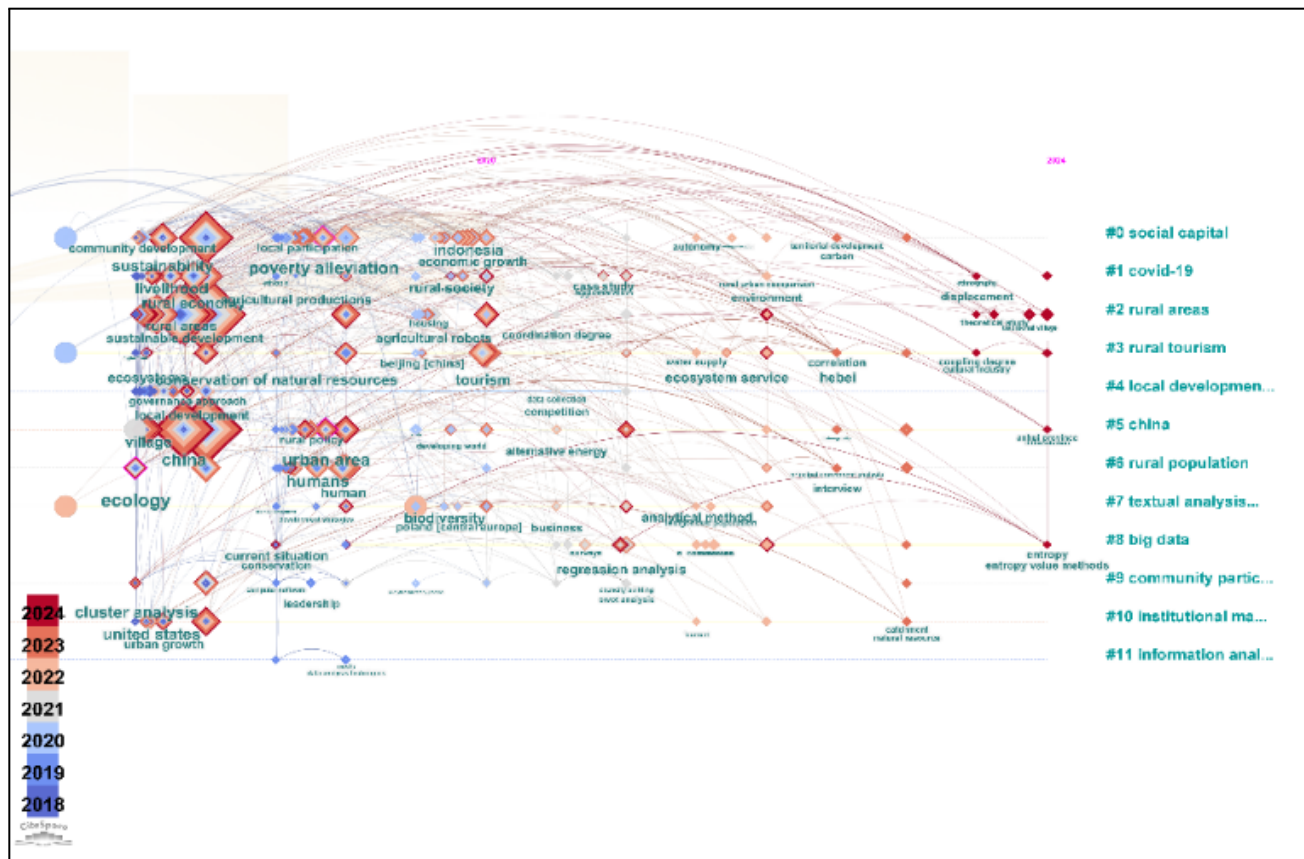


Fig. 4. Keyword time zone map

Source: Generated by the author using CiteSpace ,2025

It could be further categorized as tourism measures (75), community participation (25), land measures (11), Industrial development adjustment (21), local enterprises (8), economic measures (11), infrastructure improvement (7), ecological measures (4), link Academics and Villages (6), Education and Training (6), Local Culture (7), and Other Cognitively-Based Adjustments to Development Strategies (42).

It is very easy to see that rural tourism is a measure of rural development that has been mentioned frequently since 2020, but the rural tourism proposed in recent years is different from the tourism understood in the traditional sense. In this paper, this measure will be selected for further study and analysis, and will be defined as new tourism:

New forms of tourism have emerged in rural areas in recent years that differ from traditional tourism. They are more experiential and deeply connected and are mostly accompanied by new themes, concepts, technologies, or purposes.

3.10 Rural New Tourism

A total of 184 articles were identified in the Scopus database by extending the previous search terms to include rural tourism. 49 closely related articles were selected after further reading. After comparison, 48 of these articles were also present in the 56 articles initially selected from the 75, and with the addition of one new article, a total of 57 articles were identified. Combined with the 5 articles added from the Google Scholar database, a total of 62 closely related articles were selected for further analysis and in-depth research.

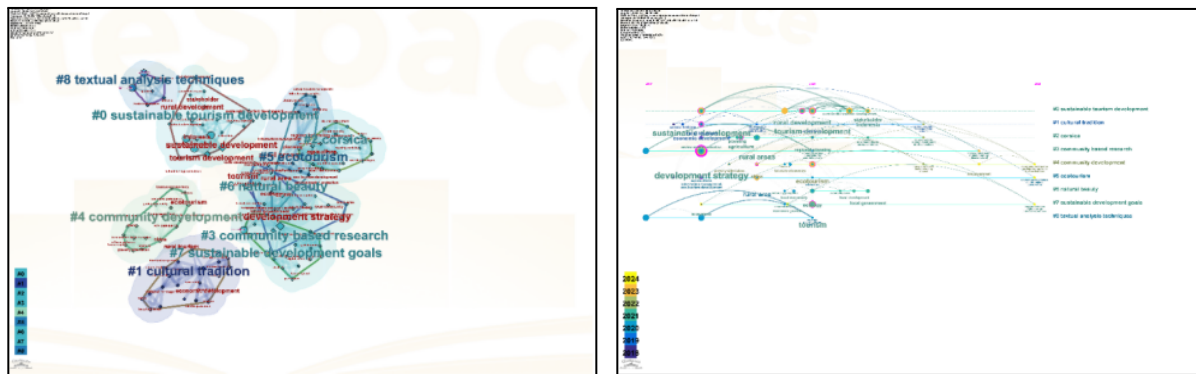


Fig. 5. (Left) Keyword cluster analysis map; (Right) Keyword time zone map
Source: Generated by the author using CiteSpace,2025

The distribution of cluster groups can be characterized from Figures 4 and 5. Except for the mention of Corsial, which is a place name, the top five clusters are sustainable tourism development, cultural traditions, community-based research, community development, and ecotourism. It is noteworthy that the terms sustainable and community each accounted for two of all nine clusters, with natural beauty as the second nature-related cluster besides ecotourism, coming in just after ecotourism.

New tourism can be further categorized as: New themes (rural tourism that uses the same kind of physical themes that actually exist and can be seen as new attractions), New concepts (promotion of new concepts in rural tourism organization and promotion), New technology (using new technology or new means to promote rural tourism in conjunction with the development hotspots of the times), and New purpose (rural tourism that is pursued in accordance with a new objective or strategy).

The common measures and limitations can be seen in Figure 7 and Appendix Table 1. Ecotourism, agro-tourism, gastro-tourism, cultural heritage route, outdoor tourism, and forest bathing tourism are the representations of the new theme tourism. They add to the attractiveness of tourism and also provide new insights in terms of resources, conditions, and activities. However, most of them lack practicality and guidance; integration and connectivity are insufficient; and companies with inadequate cultural soft power. The new purpose of tourism included unconventional investment, establishing a tourism ecosystem, focusing on Indigenous tourism, sustainable management and Criteria, industrial integration, and community participation. Starting from another perspective and goal helps to solve the original intractable rural problems, and the different goals are set in a way that is relevant to all seven types of rural problems mentioned in the previous section. However, there are certain drawbacks, such as a lack of systematic linkages between specific strategies or measures and objectives, insufficient connection between local environment and social culture, and no systematic design of economic development programs.

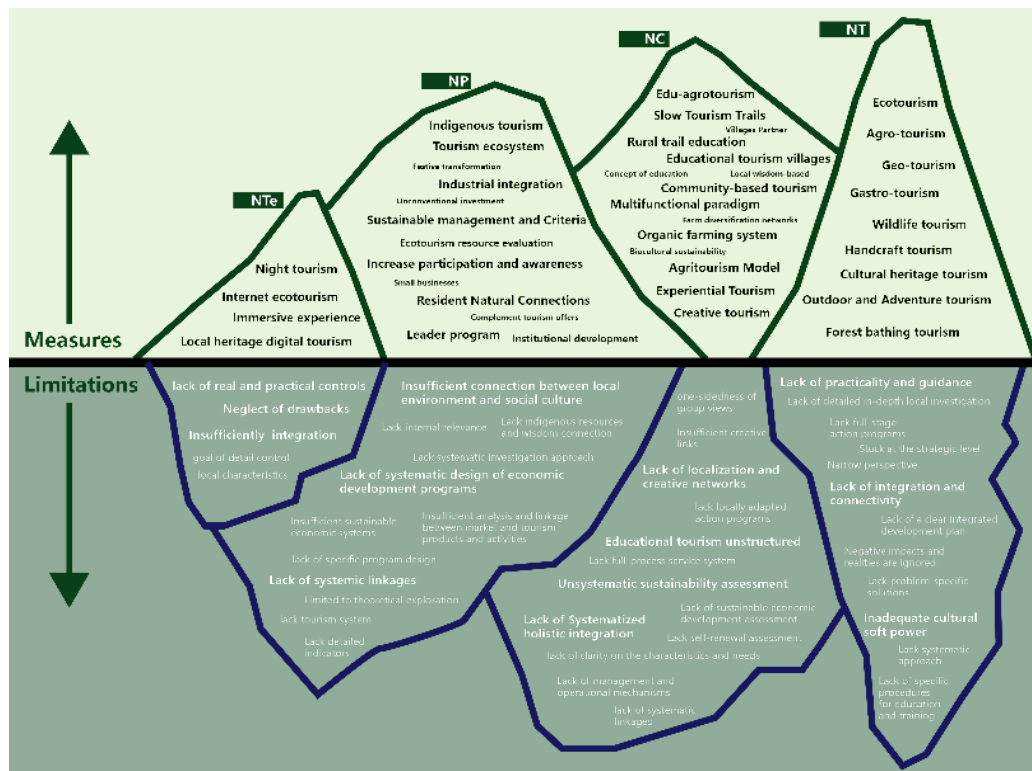


Fig. 7. The common measures and hidden limitations
Source: Author, 2025

Along with the era trends and the impact of COVID-19, there has been a shift in the mindset and interest of tourists; some new concept tourism appeared in recent years, such as slow tourism, trail education, community-based tourism, edu-agrotourism, experiential Tourism, creative tourism, educational tourism villages, and biocultural sustainability. etc. Most of these concepts are closely related to nature, regionalised features, educational and authentic experiences, and have led to a shift in rural tourism towards educational, community-based multifunctionality and ecology. It seems to promote the countryside to a better future; however, it will take more time and practice to move from concept to real transformation. Lack of systematized holistic integration, lack of localization and creative networks, insufficient sustainable assessment, and unsystematic educational tourism are the main challenges for new concept tourism.

Local heritage digital tourism, “internet+” ecotourism, night tourism, and enhanced virtual reality are all new efforts to integrate science and technology with rural tourism. There will be two sides to the coin, and the same is true for technological development. Neglect of drawbacks and pitfalls, lack of control measures to ensure reality and practicality, and lack of local integration are the limitations of new technology tourism development.

3.11 Other measures

Cognitive-based adjustment of development strategies as an integrated type of measure to solve rural problems and promote rural development is repeatedly mentioned in the literature under study, which can be categorized mainly as: identity perception, product perception, village perception, and policy and governance perception (Appendix Table.2). The measures and objectives of community participation are diverse and can be divided into four main categories: community participation in decision-making, community participation in action, co-management or governance, and connecting

community social networks. (Appendix Table 3). Industrial development adjustment mainly includes three categories: industrial integration, industrial innovation, and industrial transformation and upgrading. (Appendix Table 4). A collation of the literature reveals that rural economic measures in recent years can be categorized into four main categories: financial support, livelihood safeguard, e-economy, and green economy. (Appendix Table 5). Measures for land could be categorized into three groups: rezoning and redistribution of rural land, integrated land consolidation, and modern technology for better land management. (Appendix Table 6).

3.12 Systematic review results

Issue relevancy

There is actually a correlation between different categories of rural issues. Economic issues are shaped by perceptions of original identity, economic perceptions, and new capabilities, which drive rural areas out of market competition and exacerbate ecological and cultural problems.

Population issues are closely linked to daily life and the emergence of villages, but one of the most important drivers of these trends is economic and industrial development. Population issues, in turn, have a further impact on ecological and cultural issues. The decline of old industries and the failure of new industries to adapt well to local development have contributed to the economic backwardness of villages, while infrastructure constraints and irrational industrial planning have further exacerbated economic inequalities, and industrial and economic problems have been caught in a deadly circle in villages, which have further led to social welfare, demographic, cultural, and ecological problems. Besides, territorial issues also affect industrial issues. As for the ecological issues (whether it is pollution or environmental impact), industry and economic development are important factors contributing to them. However, the economy cannot afford to solve the ecological issues, which are similarly deadlocked.

Hence, economic issues appear to be directly or indirectly the cause of all problems, with economic and industrial issues at the center of the bullseye, as shown in the figure. However, a closer analysis reveals that cognitive problems are at the heart of the inner circle, where unrenewed traditional understandings, the lack of new and more pluralistic values, and the lack of information, education, and competence training are at the root of the economic problems, which further affect all the problems.

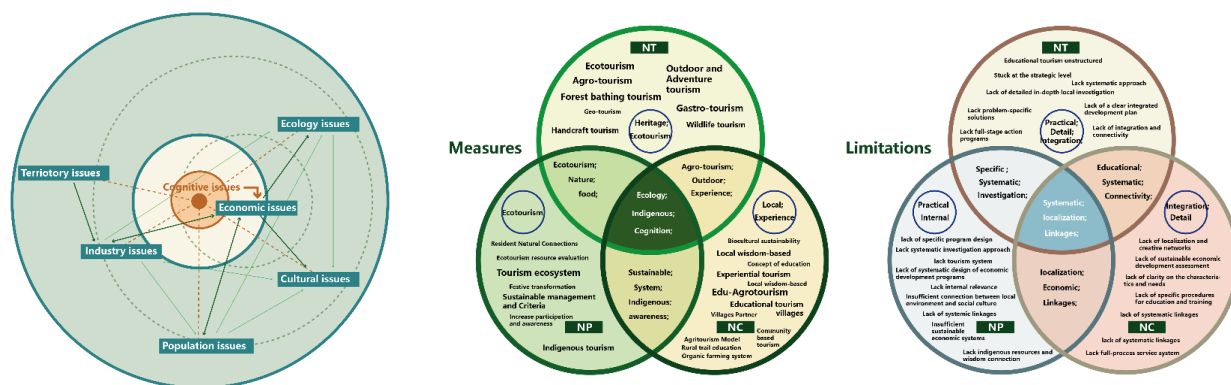


Fig. 8. (Left) Issue relevance analysis; (Right) measures relevancy analysis
Source: Author, 2025

3.13 Measures relevance

Ecology, Indigenous, and cognition are considered to be the core elements of the new tourism measures in the four categories. The new technological tourism(Nte) measure focuses on the use of the Internet to enhance ecotourism, the new purpose (NP)measure focuses on ecotourism system building, and the new concepts(NC)measure makes more specific mentions of educational concepts and ecotourism modeling. Indigenous is the keyword in each type of measure, whether it is geographic features, cultural heritage, etc., that are the source of the NT tourism resources, the NP focuses closely on local empowerment as well as sustainable development, NC mainly proposes different development models based on community or local wisdom, and the Nte focuses more on the digitization of the local heritage. The interesting finding is that tourism empowerment, particularly local capacity and cognition, is a priority objective in the NP Tourism Measure, and the NC Tourism Measure provides a solution to this objective by proposing a series of development measures guided by the concept of education. It could be seen that while there is overlap between the four types of new tourism measures, the focus of attention is different, and this particular interrelationship makes it possible for one type to be complementary to, or a solution for, another.

Meanwhile, the four types of new tourism measures also have certain limitations, of which all demonstrated limitations can be summarised in three main areas: lack of systematic, lack of local, and lack of connectivity.

4. CONCLUSION

In conclusion, the lack of tourism models and systems that are deeply compatible with local ethnosience is the main reason for the failure of rural tourism, which is reflected in the mismatch between local perceptions and capacities, the contradictions and conflicts in local development strategies, lack of in-depth understanding as well as innovative use of local resources, and the disconnect between local ethnosience and the needs of the economic market.

However, the lack of connection to local ethnosience is not only a reason for the failure of new tourism measures but has also become one of the reasons for the failure of other solutions to rural problems. For example, problems in new eco-economic measures, such as practical issues (skills, organization) and regulatory issues (impact assessment, use and management of funds, linkages to villagers' needs), are affected by the poor ethnosience linkages(Bull et al., 2013; Calvet et al., 2015; Pratomo et al., 2016; Yu et al., 2023). Community participation and Cognitive-based adjustment of development strategies are even more closely linked to local ethnosience. The correlation between the different measures and problems can be seen in the previous descriptions, where the failure of the countryside is not a single problem, but a systemic one, and tourism is a suitable, sustainable, and integrated measure for the countryside.

It should be noted that new tourism solutions should systematically take into account internal and external linkages while emphasizing ethno-scientific connections, including by drawing on or integrating experiences from other measures. Thus, a new, systematic model of tourism rooted in local ethno-science will help to move towards a sustainable rural future.

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CONFLICT OF INTEREST STATEMENT

The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

AUTHORS' CONTRIBUTIONS

Su Yiqiu: Conceptualisation, methodology, formal analysis, writing – original draft, writing – review and editing. **Suhardi Maulan:** Conceptualisation, supervision, writing- review and editing, and validation. **May Ling Siow:** Conceptualisation, methodology, supervision, writing- review and editing. **Aini Jasmin Ghazalli:** Conceptualisation, methodology, writing- review and editing, and validation.

ETHICS STATEMENT

This study is based on a review of existing literature and conceptual analysis. The authors declare that this research did not involve human or animal subjects.

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