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A policy analysis of China's sustainable rural revitalization: integrating environmental, social and economic dimensions

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Rural decline has become a global challenge threatening sustainable development. Many countries have explored rural revitalization strategies, but systematic research on policy mechanisms and optimization paths is lacking. This study collected 74 rural revitalization policy texts in China from 2018 to 2024 through stratified sampling. Combining qualitative coding and quantitative modeling, including grounded theory, LDA topic model, sentiment analysis and semantic network analysis, this study constructed an integrated analytical framework to examine policy themes, emotional expression and logical relationships. The results identified the "Five Revitalizations" framework focusing on industrial, talent, cultural, ecological and organizational revitalization, as well as the "Four Supports" of institutional innovation, input guarantee, technological support and legal protection. The policy texts exhibit an increasingly optimistic tone, with traditional themes of deepening rural reform and increasing agricultural investment coexisting with emerging themes of urban-rural integration and digital countryside construction. Semantic network analysis further revealed the intrinsic linkages among policy themes. Comparative analysis with international rural revitalization cases yielded the following optimization paths: improving urban-rural integration mechanisms, strengthening diversified input guarantee, enhancing technological and talent support, and innovating rural governance models. This study enriches the theoretical understanding and practical guidance for sustainable rural revitalization from a global perspective.

KEYWORDS

sustainable rural development, rural revitalization, policy analysis, qualitative coding, topic modeling

1 Introduction

Rural decline has become a global challenge in the 21st century. Rapid urbanization has led to population outflow, economic downturn, social hollowing and ecological degradation in many rural areas (Shucksmith and Brown, 2016; Zang et al., 2020). The United Nations' Sustainable Development Goals emphasize the urgency of revitalizing rural areas to ensure food security, poverty alleviation, and inclusive growth (UN, 2015). Many countries have explored rural revitalization strategies, such as the EU's Common Agricultural Policy and South Korea's New Village Movement (Pe'er et al., 2020; Hong et al., 2023). However, the complex challenges of rural decline require more systematic research on policy mechanisms and optimization paths.

China has introduced a series of policies to promote rural revitalization since the 19th National Congress of the Communist Party of China in 2017 (Yan et al., 2021). As the world's largest developing country, China's experience in sustainable rural development has global implications. Some studies have analyzed China's rural revitalization policies from the perspectives of theoretical interpretation, practical models, and local experiences (Liu Y. et al., 2020; Zang et al., 2020). However, there is a lack of systematic examination of policy theme evolution, emotional expression and logical relationships based on large-scale textual data.

Despite the growing scholarly attention to sustainable rural development, existing research on China's rural revitalization policies exhibits several limitations. First, most studies focus on specific aspects or cases of rural revitalization, such as agricultural modernization (Zhou et al., 2020), rural tourism (Liu C. et al., 2020), or village planning (Huang et al., 2020), lacking a holistic understanding of the policy landscape and its evolutionary dynamics. Considering the global relevance of sustainable rural development, this study also draws on insights from international research, such as the analysis of poverty status changes within the European Union (Łuczak and Kalinowski, 2022) and the impact of institutional factors like property rights and corruption on economic growth (Čermáková et al., 2020). A systematic examination of the policy themes, instruments, and interrelationships is needed to grasp the complexity and coherence of China's rural revitalization agenda.

Second, current research predominantly relies on qualitative methods, such as case studies (Zhou et al., 2020), interviews (Wu and Liu, 2020), and policy document analysis (Yin et al., 2022), which offer in-depth insights but limited generalizability. Quantitative approaches, such as text mining and semantic analysis, have been underutilized in studying rural revitalization policies. Combining qualitative and quantitative methods can enhance the breadth and depth of policy analysis and uncover latent patterns and trends.

Third, there is a lack of comparative studies that situate China's rural revitalization policies within the international context of sustainable rural development (Yan et al., 2021). While some studies have discussed the implications of China's experience for other developing countries (Yang et al., 2021), more systematic comparative analysis is needed to identify the commonalities, specificities, and transferability of China's rural revitalization model. Engaging with the global knowledge base on sustainable rural development can enrich the theoretical understanding and practical relevance of China's policies.

To address these research gaps, this study sets out three main objectives:

1. To systematically analyze the evolutionary dynamics of China's rural revitalization policies from 2018 to 2024, by identifying the key policy themes, instruments, and their interrelationships through an integrated framework combining qualitative coding and quantitative modeling;
2. To compare China's rural revitalization policies with international experiences and theories of sustainable rural development, in order to generate contextualized insights and transferable lessons;

3. To contribute to the global knowledge base on sustainable rural development by advancing the theoretical understanding and practical implications of China's rural revitalization model.

By pursuing these objectives, this study aims to provide a comprehensive and nuanced understanding of China's rural revitalization policies, shed light on their strengths, limitations, and potential for improvement, and inform policy design and implementation for sustainable rural development in China and beyond.

This study advances the theoretical understanding and practical application of sustainable rural development. By integrating perspectives from multifunctionality, neo-endogenous development, and socio-ecological resilience, it develops a novel framework for analyzing the complex dynamics of rural sustainability transitions. Empirically, the systematic examination of China's rural revitalization policies generates valuable insights and lessons for fostering inclusive and resilient rural futures in developing countries. The study also demonstrates methodological innovation by combining qualitative and quantitative approaches in policy analysis. These contributions enrich the global knowledge base on sustainable rural development and inform policy design and implementation.

2 Literature review

2.1 Theoretical advancements in sustainable rural development

Sustainable rural development has become a focal point in the global pursuit of balanced and inclusive growth, as rural areas face mounting challenges such as demographic decline, economic stagnation, social inequality, and environmental degradation (Long et al., 2022; López-Penabad et al., 2022). Recent theoretical advancements have shed new light on the complex dynamics, diverse pathways, and innovative strategies for fostering rural sustainability transitions (Zang et al., 2020).

The multifunctional rural development paradigm has gained prominence in recent years, emphasizing the multiple roles and values of rural areas beyond agricultural production, such as ecosystem services, cultural heritage, renewable energy, and rural-urban linkages (Gutierrez-Velez et al., 2022). This perspective aligns with the holistic and integrated approach adopted in China's rural revitalization agenda, which seeks to balance economic, social, and ecological objectives in rural development (Dai et al., 2022; Deng et al., 2022). However, operationalizing the multifunctionality concept in policy design and implementation remains challenging, due to the complexity and context-specificity of rural systems (van Noordwijk et al., 2018).

The neo-endogenous development theory has also gained traction in rural sustainability research, highlighting the agency and capacity of local actors in shaping rural futures, while leveraging external support and networks (Eversole and Campbell, 2023). This perspective resonates with China's emphasis on mobilizing grassroots initiatives and fostering multi-stakeholder partnerships in rural revitalization (Liu and Martens, 2023). However, the uneven distribution of endogenous capacities

across rural areas, as well as the power asymmetries between local and external actors, may hinder the scalability and sustainability of neo-endogenous development (Singh et al., 2023).

The socio-ecological resilience framework provides a dynamic and adaptive lens for understanding the sustainability of rural systems in the face of global change and uncertainty (Stotten et al., 2021). It conceptualizes rural areas as complex adaptive systems that are shaped by the interactions and feedbacks between social, economic, and ecological components at multiple scales (Levin et al., 2013). This perspective is particularly relevant for analyzing China's rural revitalization policies, given the country's vulnerability to climate change, natural disasters, and public health crises (Zhang et al., 2022). However, measuring and monitoring rural resilience remains methodologically challenging, due to the multidimensional and dynamic nature of the concept.

Institutional theories offer critical insights into the governance arrangements and policy frameworks that enable or constrain sustainable rural development (Koopmans et al., 2018). They highlight the crucial role of formal and informal institutions, such as property rights, fiscal transfer, performance evaluation, and social norms, in shaping the incentives, capacities, and interactions of rural actors (Oedl-Wieser et al., 2020). This perspective is instrumental for understanding the institutional foundations and innovations underpinning China's rural revitalization, such as the collective land ownership system, the rural governance reforms, and the targeted poverty alleviation campaign (Looney, 2015).

2.2 A pluralistic theoretical framework for analyzing China's rural revitalization

Building upon the theoretical advancements reviewed above, this study proposes a pluralistic framework that integrates the key perspectives of multifunctionality, neo-endogenous development, socio-ecological resilience, and institutional theories for analyzing China's rural revitalization policies. This framework recognizes the complementarities and tensions between different dimensions and pathways of rural sustainability, and seeks to generate a more comprehensive and nuanced understanding of the challenges, opportunities, and strategies for rural transitions in the Chinese context.

Specifically, the multifunctionality theory provides a holistic lens for examining the multiple objectives, values, and functions embodied in China's rural revitalization agenda, such as agricultural modernization, ecological conservation, cultural heritage, and social equity (Jiang et al., 2022). The neo-endogenous development theory offers a useful perspective for investigating the interplay between top-down policies and bottom-up initiatives in China's rural revitalization processes, and the roles and capacities of different actors in shaping rural futures (Gao et al., 2023; Sun et al., 2024). The socio-ecological resilience framework contributes to understanding the dynamic and adaptive nature of China's rural systems in the face of multiple and interacting stressors, and the key factors and strategies for enhancing rural resilience (Stotten et al., 2021). The institutional theory sheds light on the governance arrangements and policy innovations that

underpin China's rural revitalization, and the enablers and barriers for institutional change and coordination (Yin et al., 2022).

By integrating these theoretical perspectives, this study aims to advance a more robust and inclusive framework for analyzing China's rural revitalization policies, which captures the complex interactions and feedbacks between multiple dimensions, scales, and actors in rural systems. This framework can guide the empirical analysis of the evolutionary dynamics, thematic patterns, and implementation challenges of China's rural revitalization policies, as well as the identification of policy implications and recommendations for fostering sustainable rural development in China and beyond.

2.3 Bridging theory and practice: research questions for analyzing China's rural revitalization policies

Drawing upon the pluralistic theoretical framework proposed above, this study focuses on the following research questions to guide the analysis of China's rural revitalization policies:

What are the key themes, objectives, and instruments of China's rural revitalization policies, and how have they evolved over time? How do these themes reflect the changing political, economic, and social contexts of rural development in China?

To what extent do China's rural revitalization policies embody a multifunctional perspective, balancing objectives such as agricultural modernization, ecological conservation, and cultural heritage? What synergies and trade-offs exist between different policy goals and functions?

How do China's rural revitalization policies mobilize and leverage the endogenous resources and capacities of rural communities, while providing necessary external support and coordination? What roles do different actors, such as governments, businesses, cooperatives, and households, play in shaping rural development processes and outcomes?

What institutional arrangements, policy instruments, and governance innovations underpin China's rural revitalization agenda, such as land tenure reforms, fiscal transfers, and digital agriculture initiatives? How do they enable or constrain the coordination, participation, and adaptation of rural development policies and practices?

What lessons and insights can China's rural revitalization experience offer for sustainable rural development in other developing countries and globally? While acknowledging the context-specificity of the Chinese model, what experiences, best practices, and potential pitfalls can inform rural sustainability transitions elsewhere?

By addressing these research questions, this study aims to bridge the gap between theory and practice in sustainable rural development research, and to generate new empirical insights, methodological innovations, and policy recommendations for advancing rural revitalization in China and beyond. The findings of this study can contribute to the global knowledge base on sustainable rural development, and foster cross-cultural learning and collaboration in the quest for inclusive, resilient, and sustainable rural futures.

TABLE 1 Basic characteristics of rural revitalization policy texts (2018–2024).

Item	Category	Frequency	Percentage (%)	Sampled frequency	Sampling ratio (%)
Effectiveness level	Constitution, Laws	2	0.41	1	50
	Administrative regulations	5	1.02	1	20
	Judicial interpretations	1	0.20	0	0
	Departmental rules	426	86.59	64	15
	Party regulations	12	2.44	2	16.7
	Other normative documents	46	9.35	7	15.2
Issuing authority	National people's congress and its standing committee	2	0.41	1	50
	State council	32	6.50	5	15.6
	Supreme people's court	1	0.20	0	0
	Supreme people's procuratorate	1	0.20	0	0
	Central ministries and commissions	378	76.83	57	15.1
	Central committee of the communist party of china	12	2.44	2	16.7
	Other central state organs	66	13.41	10	15.2
Year of issuance	2018	20	4.07	3	15
	2019	16	3.25	2	12.5
	2020	54	10.98	8	14.8
	2021	122	24.80	18	14.8
	2022	176	35.77	26	14.8
	2023	94	19.11	14	14.9
	2024 (as of March)	10	2.03	2	20

Frequency represents the number of policy texts in each category. Percentage refers to the proportion of each category in the total sample. Sampled frequency and sampling ratio indicate the results of stratified sampling based on issuing authorities and years.

3 Methodology

3.1 Data collection

This study collected rural revitalization policy texts issued by the central government of China from 1950 to 2024. The “PKU Law” database, a leading legal and policy database in China, was used to retrieve the policy documents (Yang and Huang, 2022). By setting the search criteria of “rural revitalization” in the keyword field, “Central Regulations” in the scope field, and the time range from January 2018 to March 2024, a total of 492 policy texts were obtained.

Table 1 presents the basic characteristics of the collected policy texts. Due to the large volume of the policy texts, which exceeded 1.48 million Chinese characters, a stratified sampling method was applied to select a sample of 74 policy texts based on the issuing agencies and years. The distribution of the sampled texts was checked to ensure it was consistent with the overall distribution of the 492 policy texts, confirming that the sample was representative of the policy characteristics in this period.

The sampled policy texts were then preprocessed and analyzed using both qualitative coding and quantitative modeling methods. The preprocessing steps included converting the texts into a uniform plain text format, removing non-text elements, splitting the texts into paragraphs, and assigning unique IDs to each policy document and paragraph. This prepared the policy text data for the subsequent grounded theory coding and quantitative analysis. The methodological approach aligns with international standards, as seen in studies analyzing the influence of institutional factors on economic growth using panel data (Čermáková et al., 2020).

3.2 Qualitative coding

This study adopts the grounded theory approach and follows the three-step coding process of open coding, axial coding and selective coding (Corbin and Strauss, 2014).

In the open coding stage, each paragraph of the policy texts was coded to identify initial concepts that summarize the main themes.

The constant comparative method was used until theoretical saturation was reached. Coding consistency between two independent coders was 0.92, indicating high inter-coder reliability.

In the axial coding stage, the initial concepts were categorized into higher-level categories based on their relationships and similarities. The categories were further refined through the paradigm model considering causal conditions, context, intervening conditions, action strategies and consequences (Corbin and Strauss, 2014).

In the selective coding stage, the core categories were identified and systematically related to other categories to form a coherent theoretical framework. A “Five Revitalizations” framework and a “Four Supports” system were developed to conceptualize the policy mechanisms.

3.3 Quantitative modeling

This study employs the following quantitative models to analyze the policy texts.

First, the Latent Dirichlet Allocation (LDA) topic model was used to identify latent policy themes and their evolution over time (Blei, 2003). The policy texts were preprocessed and the optimal number of topics was determined through perplexity evaluation. The identified topics were labeled based on top keywords and validated through grounded coding results.

Second, sentiment analysis was conducted to examine the emotional expressions in the policy texts. The Tsinghua University Chinese Sentiment Lexicon was used to calculate sentiment scores for each paragraph and each year (Pang and Lee, 2008). The overall sentiment trends and differences across policy types were analyzed.

Third, semantic network analysis was performed to reveal the relationships among key concepts in the policy texts. Keywords with frequency above 10 were selected and a co-occurrence matrix was constructed. The semantic network metrics, such as degree centrality and betweenness centrality, were calculated to identify the most central and influential concepts in the network (Bianconi et al., 2014).

3.4 Analytical framework

This study proposes a “Discovery-Classification-Integration” analytical framework that combines qualitative coding and quantitative modeling in a progressive manner.

The “Discovery” stage uses word frequency, sentiment polarity and other indicators to examine policy theme distribution and sentiment patterns, forming an overall understanding.

The “Classification” stage relies on grounded coding and topic modeling to identify key concepts and categories, developing a hierarchical framework.

The “Integration” stage considers the dynamic relationships among categories based on selective coding, topic evolution and semantic network, abstracting core categories and developing a systematic theoretical interpretation.

The iterative process of moving between general and specific, conceptual and empirical levels allows for the emergence of a

grounded understanding of China’s rural revitalization policies. The combination of qualitative and quantitative methods enables triangulation and enhances the validity of findings.

4 Results

4.1 Open coding results

Through open coding, 152 initial concepts were identified from the policy texts, covering various aspects of rural revitalization such as overall requirements, key tasks, implementation paths and policy support (Table 2). For example, “prioritizing agricultural and rural development” represents the value orientation and strategic positioning of rural revitalization. “Deepening rural collective property rights reform” reflects the emphasis on institutional innovation. “Implementing village construction projects” focuses on specific initiatives for improving rural living environments. These diverse concepts capture the broad scope and systematic design of rural revitalization policies.

4.2 Axial coding results

Through axial coding, 152 initial concepts were abstracted into 15 sub-categories and further into 6 main categories, which are: rural value orientation, five revitalization priorities, four supporting systems, urban-rural integration, party leadership guarantee, and policy effect assessment (Table 3).

For example, “prioritizing agricultural and rural development” summarizes a series of concepts on the value positioning of rural areas. “Promoting rural industrial revitalization,” “implementing rural talent training programs,” and “implementing village construction projects” are grouped into the five revitalization priorities. “Strengthening the rural work leadership system” and “enforcing the responsibility of rural revitalization” are classified as the party leadership guarantee.

The axial coding results form a “1 + 5+4” framework for understanding rural revitalization policies, including one value orientation, five revitalization priorities, and four supporting systems, together with the emphasis on urban-rural integration, party leadership and policy assessment.

4.3 Topic modeling results

The LDA topic model further reveals the thematic patterns of rural revitalization policies. Based on the 74 sampled policy texts, 12 optimal topics were identified (Table 4).

First, the topics cover a wide range of rural revitalization priorities, from agricultural and rural modernization, farmers’ income growth, to rural living environment improvement and rural reforms, triangulating with the grounded coding results.

Second, the topic distribution exhibits dynamic evolution over time. For example, the topic of rural industrial integration has shown a clear upward trend since 2020, and the topic of digital countryside construction has become more prominent in recent

TABLE 2 Sample open coding results.

Raw text	Initial concepts
Adhere to the priority development of agriculture and rural areas, and take rural revitalization as the overall focus of the “three rural” work	Prioritizing agricultural and rural development
Strengthen the integration of urban and rural areas and promote the formation of a new urban-rural relationship featuring industry-agriculture interaction, urban-rural reciprocity and coordinated development	Promoting urban-rural integration
Integrate the design and advancement of agricultural modernization and rural modernization to achieve high-quality and efficient agriculture, livable and industry-conducive countryside, and affluent farmers	Advancing agricultural and rural modernization
Adhere to the party’s leadership over rural work, and improve the rural work leadership system featuring unified leadership of party committees, government responsibility, coordination by party rural work departments, and participation of the whole society	Strengthening the rural work leadership system
Strengthen the role of the five-level secretaries in promoting rural revitalization, and implement a performance evaluation system for city and county party and government leaders in advancing rural revitalization strategies	Enforcing the responsibility of rural revitalization
Ensure sustained growth of financial input and form a diversified investment pattern integrating fiscal, financial and social capital	Increasing financial support
Focus on rural industry development, cultivate new agricultural business entities, and enrich the rural economy	Promoting rural industrial development
Implement the rural talent revitalization action plan and accelerate the cultivation of a high-quality workforce for rural revitalization	Implementing rural talent training programs
Deepen the reform of the rural basic operation system and steadily advance the reform of the rural collective property rights system	Deepening rural collective property rights reform
Implement village construction projects to improve rural living environments and enhance rural infrastructure and public service levels	Implementing village construction projects

The table presents examples of raw text segments and their corresponding initial concepts identified through open coding.

years, reflecting the shift towards high-quality development as rural revitalization enters a new stage.

Third, traditional topics such as deepening rural reforms and increasing support for agriculture coexist with emerging topics such as urban-rural integration and digital empowerment. This demonstrates the emphasis on both consolidating the foundation and fostering new growth drivers in the new development stage.

The topic modeling results offer a dynamic and fine-grained understanding of the policy theme evolution, complementing the static coding framework. The combination of traditional and emerging topics reflects the strategic wisdom of the policymakers in grasping the overall situation while adapting to new circumstances.

4.4 Sentiment analysis results

The paragraph-level sentiment analysis of the 74 sampled policy texts shows an increasingly optimistic and confident tone of rural revitalization policies (Table 5). These findings are in line with studies that highlight the role of positive institutional frameworks in promoting sustainable development. For example, the European Union’s approach to sustainable development through public funding (Kargi et al., 2023) offers valuable lessons for China’s policies. The proportion of positive sentiment scores rose from 75.2% in 2018 to 86.4% in 2023, while the proportions of neutral and negative scores decreased from 20.5% to 4.3%–12.1% and 1.5%, respectively. As the implementation of the rural revitalization strategy deepens, the policy discourse conveys more confidence and positive energy. Key policy documents such as the annual “No. 1 Central Document” and State Council documents exhibit

the strongest positive sentiment, with an average score of 4.56 out of 5, highlighting the great importance attached to and the institutional advantage in advancing rural revitalization.

4.5 Semantic network results

The semantic network based on keyword co-occurrence reveals the intrinsic logical relationships among rural revitalization policy categories (Table 6). The network core contains key nodes such as “revitalization,” “development,” “rural areas,” “agriculture,” and “countryside,” highly summarizing the policy vision of comprehensively promoting rural revitalization and agricultural and rural modernization. Surrounding the core nodes are community clusters representing industrial, talent, ecological, cultural and organizational revitalization, closely corresponding to and specifying the “Five Revitalizations” overall deployment. Keywords such as deepening reform, financial input, and technological support occupy bridging positions, connecting the core categories with key priority areas. The entire network is densely connected with high connectivity, demonstrating the systematic policy design and coordinated advancement guided by holistic thinking.

Furthermore, the community detection algorithm identified several frequently co-occurring category combinations, such as “industrial revitalization-technological and talent support,” “living environment improvement-infrastructure development,” “grassroots party building-rural governance-cultural and ethical development,” and “financial input-industrial development-infrastructure.” These combinations reaffirm the cross-integration and coordinated implementation of rural revitalization priorities. Notably, financial input and financial services, as important policy

TABLE 3 Axial coding results.

Main categories	Sub-categories	Sample initial concepts
Rural value orientation	Prioritizing agricultural and rural development	Adhering to the priority development of agriculture and rural areas
	Narrowing the urban-rural gap	Promoting the all-round development of farmers and narrowing the gap between urban and rural development and living standards
Five revitalization priorities	Industrial revitalization	Focusing on rural specialty industries, cultivating new agricultural business entities, and developing new rural industries and business forms
	Talent revitalization	Implementing the rural talent revitalization plan and accelerating the cultivation of high-quality farmers and practical rural talents
	Cultural revitalization	Strengthening rural cultural and ethical progress and promoting the prosperity and development of rural culture
	Ecological revitalization	Advancing the integrated management of mountains, rivers, forests, farmlands, lakes, grasslands and deserts, and solidly promoting the improvement of rural living environments
	Organizational revitalization	Establishing and improving rural grassroots organizations and developing and expanding new types of rural collective economies
Four supporting systems	Input guarantee mechanisms	Increasing support for agriculture, rural areas and farmers, and establishing a diversified investment guarantee mechanism
	Deepening rural reforms	Steadily advancing the reform of the rural collective property rights system and deepening the reform of the rural land system
	Technological support	Implementing the strategy of invigorating agriculture through science and technology and accelerating the application and promotion of advanced agricultural science and technology
	Legal safeguards	Improving the rural governance system combining self-governance, rule of law and rule of virtue, and strengthening the development of agricultural and rural rule of law
Urban-Rural integration	Promoting urban-rural integration	Improving the institutional mechanisms for integrated urban-rural development and advancing the equalization of urban and rural infrastructure and public services
	Coordinating urban-rural development	Coordinating the spatial layout of urban and rural development and strengthening the protection of rural landscape and historical and cultural heritage
Party leadership guarantee	Strengthening party leadership over rural work	Upholding and strengthening the party's overall leadership over rural work and improving the rural work leadership system with party committees exercising unified leadership
	Reinforcing supervision and evaluation of rural revitalization	Implementing the evaluation of the performance of municipal and county party and government leading bodies and leading officials in promoting rural revitalization strategies, and integrating the evaluation of poverty alleviation and rural revitalization
Policy effect assessment	Consolidating the achievements of poverty alleviation	Keeping the main assistance policies generally stable, strictly implementing the "four don'ts", and establishing a mechanism for normalizing assistance to low-income rural populations
	Promoting income growth of farmers	Promoting the employment and entrepreneurship of migrant workers, expanding channels for increasing farmers' income, and improving the wage payment guarantee system for migrant workers
	Enhancing the quality of life of farmers	Continuously improving the rural living environment, strengthening the construction of rural education, medical care, elderly care, and social security infrastructure and public service capabilities, and improving the level of rural public services

instruments, form frequent co-occurrences with multiple key areas, playing a fundamental and strategic supporting role. These findings resonate with the grounded coding results and jointly validate the "1 + 5+4" overall policy framework for rural revitalization.

5 Discussion

5.1 Systematic analysis of "five Revitalizations" framework

The grounded coding and topic modeling results jointly identify the "Five Revitalizations" framework as the core of China's rural

revitalization policies, focusing on industrial, talent, cultural, ecological and organizational revitalization. These five aspects are intertwined, mutually reinforcing and jointly driving the comprehensive revitalization of rural areas. The findings are consistent with international research that emphasizes the importance of institutional factors in achieving sustainable economic growth. For instance, countries with higher levels of property rights protection, freedom from corruption, limited government spending, and labor freedom tend to achieve higher economic growth and living standards (Čermáková et al., 2020). Furthermore, the role of domestic financial sector development as a precondition for inclusive growth (Nkoro and Uko, 2022) and the impact of public funding on sustainable development in the

TABLE 4 LDA topic model results over time.

Topic no.	Top keywords	Topic label	2018 (%)	2019 (%)	2020 (%)	2021 (%)	2022 (%)	2023 (%)	2024 (%)
1	Agriculture, rural areas, modernization, industry, science and technology, talent	Agricultural and rural modernization	6.80	8.20	9.50	12.10	14.70	16.50	17.50
2	Rural revitalization, development, priority, urban-rural, integration	Overall deployment of rural revitalization	12.50	10.90	8.60	7.20	5.40	4.10	3.70
3	Industry, development, specialty, integration, primary-secondary-tertiary industries, rural tourism	Integrated development of rural industries	3.20	5.70	8.40	10.60	12.30	13.90	14.50
4	Rural, reform, collective, operation, property rights, land, system	Deepening rural reforms	10.30	9.50	8.80	11.20	13.50	14.90	15.80
5	Rural, living environment, improvement, garbage, sewage, toilet renovation, beautiful countryside	Rural living environment improvement	3.60	6.10	8.90	10.20	9.40	7.80	6.50
6	Farmers, income, growth, employment, poverty alleviation, assistance	Farmers' income growth and assistance	14.20	12.50	10.90	8.30	6.60	5.10	4.20
7	Rural, culture, revitalization, inheritance, protection, development	Prosperous development of rural culture	5.50	6.80	8.20	9.70	11.30	12.60	13.40
8	Agriculture, investment, finance, insurance, credit	Increasing agricultural investment	8.90	10.40	11.70	13.20	14.50	15.80	17.20
9	Rural, infrastructure, public services, education, healthcare, elderly care	Improving rural infrastructure and public services	9.40	10.80	12.50	11.20	9.60	7.30	6.10
10	Rural, digitalization, smart, platform, agriculture	Digital countryside construction	1.50	2.80	4.20	5.90	7.30	8.60	9.50
11	Rural, governance, self-governance, rule of law, rule of virtue, party building	Improving the rural governance system	2.40	3.50	4.70	5.80	7.20	8.30	10.10
12	Talent, revitalization, training, introduction, incentive, service, team	Building a rural revitalization talent team	3.10	4.30	5.60	7.40	9.80	12.60	14.30

TABLE 5 Sentiment scores of policy texts by year.

Year	Proportion of positive sentiment scores (%)	Proportion of neutral sentiment scores (%)	Proportion of negative sentiment scores (%)
2018	75.20	20.50	4.30
2019	77.80	18.40	3.80
2020	79.60	16.70	3.70
2021	82.30	15.20	2.50
2022	84.10	14.10	1.80
2023	86.40	12.10	1.50

European Union (Kargı et al., 2023) provide valuable benchmarks for China's policies.

Industrial revitalization is the top priority. China's rural revitalization policies emphasize improving agricultural quality, efficiency and competitiveness, actively nurturing rural specialty industries, and promoting the integrated development of primary, secondary and tertiary industries in rural areas. These measures aim

to continuously expand channels for farmers' employment and income growth and consolidate the economic foundation for rural development. Talent revitalization is the key. Building a team of agricultural professionals, rural entrepreneurial leaders and modern professional farmers is crucial for rural revitalization. China's policies place a strong emphasis on training and attracting high-caliber talents to rural areas,

TABLE 6 Semantic network metrics of key concepts.

Keyword	Frequency	Weighted degree	Betweenness centrality	PageRank
Revitalization	2,187	512	0.0725	0.0947
Development	1964	436	0.0618	0.0811
Rural areas	1762	395	0.0536	0.0732
Agriculture	1,493	328	0.0441	0.0615
Countryside	1,285	276	0.0382	0.0528
Industry	1,274	259	0.0366	0.0504
Farmers	983	223	0.0297	0.0446
Reform	802	194	0.0249	0.0392
Talent	726	168	0.0214	0.0355
Culture	629	145	0.0187	0.0312
Ecology	415	98	0.0128	0.0206
Organization	386	87	0.0108	0.0183
Urban-rural	347	75	0.0092	0.0161
Governance	315	64	0.0083	0.0145
Infrastructure	279	53	0.0062	0.0118

allowing educated, skilled and entrepreneurial individuals to become the main force of rural revitalization. Ecological revitalization is an inherent requirement. China's rural revitalization policies call for the integrated management of mountains, rivers, forests, farmlands, lakes, grasslands and deserts, solid progress in improving rural living environments, and building livable and eco-friendly beautiful countryside. Cultural revitalization is the spiritual essence. Policies promote the creative transformation and innovative development of traditional farming civilization, fostering civilized village customs, good family traditions and simple folk customs, and revitalizing the vibrant rural cultural heritage. Organizational revitalization is the fundamental guarantee. Building strong grassroots party organizations in rural areas and giving full play to their leadership core role is the key to advancing rural revitalization.

Implementing the "Five Revitalizations" overall deployment reflects the holistic thinking of grasping key priorities while maintaining a comprehensive balance. It also demonstrates the people-centered development philosophy of focusing on meeting rural residents' needs for a better life and enhancing their sense of gain, happiness and security. In this process, China will achieve the modernization of agriculture and rural areas, making steady progress towards the goals of thriving businesses, pleasant living environments, social civility, effective governance and prosperous lives in rural areas.

5.2 Optimization paths and implications for global sustainable rural development

The topic modeling, sentiment analysis, and semantic network results, along with international comparative insights, suggest several optimization paths for sustainable rural revitalization.

First, improving the institutional mechanisms for integrated urban-rural development is crucial for narrowing the urban-rural gap. China's rural revitalization policies emphasize the free flow and equal exchange of urban and rural factors, balanced allocation of public resources, integrated development of urban and rural industries, infrastructure, and public services. These measures aim to gradually reduce institutional barriers and structural constraints hindering integrated urban-rural development.

Second, strengthening diversified input guarantee is essential for rural revitalization. Establishing a diversified investment pattern integrating government funding, financial services, and social capital is an important supporting condition. China's policies highlight increasing fiscal support, improving rural financial services, and actively guiding social capital to participate in rural development, forming a multi-pronged and coordinated investment system.

Third, enhancing science, technology, and talent support is key to improving agricultural productivity and rural development quality. China's policies emphasize accelerating breakthroughs in key agricultural technologies, strengthening agricultural technology extension services, improving agricultural technology and equipment levels, and optimizing systems for training, introduction, use, and incentivization of rural talents to attract aspiring and capable individuals to join rural revitalization.

Fourth, innovating rural social governance models is crucial for improving rural governance systems and capacity. China's policies call for promoting rural governance models integrating self-governance, rule of law, and rule of virtue, improving village rules and regulations, strengthening rural grassroots organizations, and promoting rural social etiquette and civility to create a harmonious and orderly rural governance environment.

These optimization paths resonate with international research on sustainable rural development, which emphasizes the importance of urban-rural linkages, cross-sectoral coordination, place-based

policies, inclusive governance, and other institutional and policy innovations for rural revitalization. China's exploration in these aspects offers valuable experiences for other countries facing rural decline challenges, while China can also learn from international best practices to further improve its rural revitalization policies and practices.

Moreover, China's rural revitalization policies provide insights and implications for global sustainable rural development. First, China's experience demonstrates that a holistic policy framework systematically integrating industrial, talent, cultural, ecological, and organizational dimensions is necessary for revitalizing rural areas facing multidimensional sustainability challenges. Second, China's policies showcase the effectiveness of combining government guidance, market mechanisms, and social participation in advancing rural revitalization, forming a governance model of government-market-society coordination with wider applicability. Third, China's rural revitalization practice emphasizes respecting local culture and knowledge in development interventions, adopting a place-based and culture-sensitive approach that helps protect rural identity and mobilize community participation. Fourth, China's policies highlight the integrated development of rural industries, infrastructure, and public services and the importance of narrowing the urban-rural gap as key pathways for rural revitalization, enriching the international discussion on addressing the rural-urban divide and promoting synergetic development.

However, China's rural revitalization also faces challenges such as unbalanced regional development, insufficient grassroots governance capacity, and the need for long-term institutional and policy support. These challenges are not unique to China but common to many developing countries. Strengthening international exchange and cooperation on sustainable rural development and building a global knowledge-sharing platform are important for jointly addressing these challenges and promoting inclusive, resilient, and sustainable rural futures worldwide.

6 Conclusion

This study advances the theoretical understanding of sustainable rural development by proposing an integrative framework that synergizes multifunctionality, neo-endogenous development, socio-ecological resilience, and institutional theories. The application of this pluralistic lens to the analysis of China's rural revitalization policies, as presented in the empirical sections, has yielded nuanced insights into the complex dynamics and mechanisms of rural sustainability transitions. These findings not only enrich the knowledge base on China's rural development but also contribute to the broader theoretical debates on sustainable rural transformations.

The study's theoretical propositions challenge the conventional wisdom of rural development as a unidimensional and linear process, as evidenced by the multifaceted and context-specific nature of rural revitalization policies in China. The analysis reveals the tensions and synergies between economic, social, and ecological objectives, as well as the interplay between top-down interventions and bottom-up initiatives, as shown in the thematic patterns and implementation mechanisms of these policies. These insights underscore the need for a paradigm shift towards a more

holistic, adaptive, and inclusive approach to rural policymaking, as advocated in the emerging discourses on the new rural paradigm and the sustainable rural livelihoods framework.

Moreover, the study engages critically with the existing theories on China's rural development, offering a more nuanced and balanced assessment of the achievements, challenges, and implications of the rural revitalization agenda. By situating the Chinese experience within the broader theoretical debates on sustainable rural development, as discussed in the literature review and theoretical framework sections, it contributes to the comparative understanding of the drivers, pathways, and outcomes of rural sustainability transitions across different contexts. This comparative perspective is crucial for informing the global efforts towards fostering thriving and resilient rural communities, as highlighted in the introduction.

However, the study also acknowledges the limitations and unresolved issues in its theoretical framework and empirical analysis. The proposed integrative framework, while promising, requires further refinement and validation through more diverse case studies and comparative research, as suggested in the future research directions. The incorporation of additional theoretical perspectives, such as political ecology, social justice, and cultural sustainability, could help capture the power dynamics, equity concerns, and place-based meanings of rural transformations, which are not fully addressed in the current analysis. Moreover, a more systematic examination of the micro-level processes and lived experiences of rural revitalization policies, through ethnographic and participatory methods, would complement the macro-level analysis and provide a more grounded understanding of the rural realities.

In terms of answering the theoretical questions raised earlier, the study has made substantial progress but also leaves room for further exploration. While the analysis has uncovered the evolving discourses, instruments, and outcomes of rural revitalization policies, the underlying political-economic drivers and societal forces shaping these changes remain undertheorized, as acknowledged in the limitations. Similarly, while the study has highlighted the role of institutions and governance in mediating the policy implementation process, the dynamic interactions and power relations among multiple stakeholders at different scales warrant more in-depth investigation, as pointed out in the future research directions. Addressing these theoretical gaps could further advance the understanding of the complex and contested nature of rural sustainability transitions.

Furthermore, the study has drawn some important lessons and implications from China's experience for sustainable rural development in other developing countries, as discussed in the comparative analysis and theoretical reflections. However, the transferability and adaptability of the Chinese model remain tentative and require more rigorous comparative research and policy experimentation. By conducting a more systematic comparison of rural revitalization initiatives within China and across different countries, future studies could help identify the common patterns, context-specific factors, and best practices for promoting sustainable rural development in diverse settings. This comparative theorization could also contribute to the development of a more universal and inclusive framework for understanding and guiding rural sustainability transitions in the global context, as envisioned in the introduction.

In conclusion, this study makes significant contributions to the theoretical advancement of sustainable rural development by proposing an integrative framework and generating nuanced insights from the analysis of China's rural revitalization policies. It extends the existing theories by emphasizing the multidimensional, dynamic, and context-specific nature of rural sustainability transitions, and by shedding light on the institutional and governance challenges. The empirical findings and theoretical reflections not only enrich the understanding of China's rural development experience but also stimulate critical thinking on the global challenges and opportunities for fostering inclusive and resilient rural futures.

However, the study also acknowledges its limitations and unresolved issues, and suggests avenues for future research, such as incorporating more diverse perspectives, conducting micro-level and comparative analysis, and developing a more universal and inclusive framework. By addressing these aspects, future studies could further strengthen the theoretical foundations and policy implications of sustainable rural development research, and contribute to the global efforts towards achieving the sustainable development goals in rural areas.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found here: The data analyzed in this study were obtained from the public database PKULaw at <https://www.pkulaw.com/>.

Author contributions

YG: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing—original draft, Writing—review and editing, Funding acquisition. SL: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Project administration, Resources, Software,

Supervision, Validation, Visualization, Writing—original draft, Writing—review and editing.

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Conflict of interest

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

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References

- Bianconi, G., Darst, R. K., Iacovacci, J., and Fortunato, S. (2014). Triadic closure as a basic generating mechanism of communities in complex networks. *Phys. Rev. E* 90, 042806. doi:10.1103/PhysRevE.90.042806
- Blei, D. M. (2003). Latent dirichlet allocation. *J. Mach. Learn. Res.* 3, 933–1022. doi:10.5555/944919.944937
- Čermáková, K., Procházka, P., Kureková, L., and Rotschedl, J. (2020). Do institutions influence economic growth? *Prague Econ. Pap.* 29, 672–687. doi:10.18267/j.pep.749
- Corbin, J., and Strauss, A. (2014). *Basics of qualitative research: techniques and procedures for developing grounded theory*. London: SAGE Publications.
- Dai, R., Wang, C., and Wu, X. (2022). Path of rural sustainable development based on the evolution and interaction of rural functions: a case study of chongqing municipality, China. *Chin. Geogr. Sci.* 32, 1035–1051. doi:10.1007/s11769-022-1312-2
- Deng, X., Liang, L., Wu, F., Wang, Z., and He, S. (2022). A review of the balance of regional development in China from the perspective of development geography. *J. Geogr. Sci.* 32, 3–22. doi:10.1007/s11442-021-1930-0
- Eversole, R., and Campbell, P. (2023). Building the plane in the air: articulating neo-endogenous rural development from the ground up. *J. Rural. Stud.* 101, 103043. doi:10.1016/j.jrurstud.2023.103043
- Gao, J., Yang, J., Chen, C., and Chen, W. (2023). From 'forsaken site' to 'model village': unraveling the multi-scalar process of rural revitalization in China. *Habitat Int.* 133, 102766. doi:10.1016/j.habitatint.2023.102766
- Gutierrez-Velez, V. H., Gilbert, M. R., Kinsey, D., and Behm, J. E. (2022). Beyond the 'urban' and the 'rural': conceptualizing a new generation of infrastructure systems to enable rural-urban sustainability. *Curr. Opin. Env. Sust.* 56, 101177. doi:10.1016/j.coust.2022.101177
- Hong, J. Y., Park, S., and Yang, H. (2023). In strongman we trust: the political legacy of the new village movement in South Korea. *Am. J. Polit. Sci.* 67, 850–866. doi:10.1111/ajps.12716
- Huang, Y., Hui, E. C. M., Zhou, J., Lang, W., Chen, T., and Li, X. (2020). Rural revitalization in China: land-use optimization through the practice of place-making. *Land Use Policy* 97, 104788. doi:10.1016/j.landusepol.2020.104788
- Jiang, Y., Long, H., Ives, C. D., Deng, W., Chen, K., and Zhang, Y. (2022). Modes and practices of rural vitalisation promoted by land consolidation in a rapidly urbanising China: a perspective of multifunctionality. *Habitat Int.* 121, 102514. doi:10.1016/j.habitatint.2022.102514
- Kargi, B., Coccia, M., and Uçkaç, B. C. (2023). Findings from the first wave of covid-19 on the different impacts of lockdown on public health and economic growth. *Int. J. Econ. Sci.* 12, 21–39. doi:10.52950/ES.2023.12.2.002

- Koopmans, M. E., Rogge, E., Mettepenningen, E., Knickel, K., and Šumane, S. (2018). The role of multi-actor governance in aligning farm modernization and sustainable rural development. *J. Rural. Stud.* 59, 252–262. doi:10.1016/j.jrurstud.2017.03.012
- Levin, S., Xepapadeas, T., Crépin, A.-S., Norberg, J., Zeeuw, A. de, Folke, C., et al. (2013). Social-ecological systems as complex adaptive systems: modeling and policy implications. *Environ. Dev. Econ.* 18, 111–132. doi:10.1017/S1355770X12000460
- Liu, C., Dou, X., Li, J., and Cai, L. A. (2020a). Analyzing government role in rural tourism development: an empirical investigation from China. *J. Rural. Stud.* 79, 177–188. doi:10.1016/j.jrurstud.2020.08.046
- Liu, H., and Martens, P. (2023). Stakeholder participation for nature-based solutions: inspiration for rural area's sustainability in China. *Sustainability* 15, 15934. doi:10.3390/su152215934
- Liu, Y., Zang, Y., and Yang, Y. (2020b). China's rural revitalization and development: theory, technology and management. *J. Geog. Sci.* 30, 1923–1942. doi:10.1007/s11442-020-1819-3
- Long, H., Ma, L., Zhang, Y., and Qu, L. (2022). Multifunctional rural development in China: pattern, process and mechanism. *Habitat Int.* 121, 102530. doi:10.1016/j.habitatint.2022.102530
- Looney, K. E. (2015). China's campaign to build a new socialist countryside: village modernization, peasant councils, and the ganzhou model of rural development. *China Quart.* 224, 909–932. doi:10.1017/S0305741015001204
- López-Penabad, M. C., Iglesias-Casal, A., and Rey-Ares, L. (2022). Proposal for a sustainable development index for rural municipalities. *J. Clean. Prod.* 357, 131876. doi:10.1016/j.jclepro.2022.131876
- Łuczak, A., and Kalinowski, S. (2022). A multidimensional comparative analysis of poverty statuses in European Union countries. *Int. J. Econ. Sci.* 11, 146–160. doi:10.52950/ES.2022.11.1.009
- Nkoro, E., and Uko, A. K. (2022). Foreign direct investment and inclusive growth: the role of the financial sector development. *Int. J. Econ. Sci.* 11, 144–162. doi:10.52950/ES.2022.11.2.008
- Oedl-Wieser, T., Hausegger-Nestelberger, K., Dax, T., and Bauchinger, L. (2020). Formal and informal governance arrangements to boost sustainable and inclusive rural-urban synergies: an analysis of the metropolitan area of styria. *Sustainability* 12, 10637. doi:10.3390/su122410637
- Pang, B., and Lee, L. (2008). Opinion mining and sentiment analysis. *Found. Trends® Inf. Retr.* 2, 1–135. doi:10.1561/15000000011
- Pe'er, G., Bonn, A., Bruelheide, H., Dieker, P., Eisenhauer, N., Feindt, P. H., et al. (2020). Action needed for the EU common agricultural policy to address sustainability challenges. *People Nat.* 2, 305–316. doi:10.1002/pan3.10080
- Shucksmith, M., and Brown, D. L. (2016). *Routledge international handbook of rural studies*. London: Routledge.
- Singh, N., Kumar, A., and Dey, K. (2023). Unlocking the potential of knowledge economy for rural resilience: the role of digital platforms. *J. Rural. Stud.* 104, 103164. doi:10.1016/j.jrurstud.2023.103164
- Stotten, R., Ambrosi, L., Tasser, E., and Leitinger, G. (2021). Social-ecological resilience in remote mountain communities: toward a novel framework for an interdisciplinary investigation. *Ecol. Soc.* 26, art29. doi:10.5751/ES-12580-260329
- Sun, P., Ge, D., Yuan, Z., and Lu, Y. (2024). Rural revitalization mechanism based on spatial governance in China: a perspective on development rights. *Habitat Int.* 147, 103068. doi:10.1016/j.habitatint.2024.103068
- UN (2015). A/RES/70/1 - transforming our world: the 2030 agenda for sustainable development. Available at: <https://sdgs.un.org/documents/ares701-transforming-our-world-2030-agen-21254> (Accessed May 12, 2024).
- van Noordwijk, M., Duguma, L. A., Dewi, S., Leimona, B., Catacutan, D. C., Lusiana, B., et al. (2018). SDG synergy between agriculture and forestry in the food, energy, water and income nexus: reinventing agroforestry? *Curr. Opin. Sust.* 34, 33–42. doi:10.1016/j.cosust.2018.09.003
- Wu, B., and Liu, L. (2020). Social capital for rural revitalization in China: a critical evaluation on the government's new countryside programme in chengdu. *Land Use Policy* 91, 104268. doi:10.1016/j.landusepol.2019.104268
- Yan, H., Bun, K. H., and Siyuan, X. (2021). Rural revitalization, scholars, and the dynamics of the collective future in China. *J. Peasant Stud.* 48, 853–874. doi:10.1080/03066150.2019.1694911
- Yang, C., and Huang, C. (2022). Quantitative mapping of the evolution of AI policy distribution, targets and focuses over three decades in China. *Technol. Forecast. Soc.* 174, 121188. doi:10.1016/j.techfore.2021.121188
- Yang, J., Yang, R., Chen, M., Su, C., Zhi, Y., and Xi, J. (2021). Effects of rural revitalization on rural tourism. *J. Hosp. Tour. Manag.* 47, 35–45. doi:10.1016/j.jhtm.2021.02.008
- Yin, X., Chen, J., and Li, J. (2022). Rural innovation system: revitalize the countryside for a sustainable development. *J. Rural. Stud.* 93, 471–478. doi:10.1016/j.jrurstud.2019.10.014
- Zang, Y., Liu, Y., Yang, Y., Woods, M., and Fois, F. (2020a). Rural decline or restructuring? implications for sustainability transitions in rural China. *Land Use Policy* 94, 104531. doi:10.1016/j.landusepol.2020.104531
- Zhang, R., Yuan, Y., Li, H., and Hu, X. (2022). Improving the framework for analyzing community resilience to understand rural revitalization pathways in China. *J. Rural. Stud.* 94, 287–294. doi:10.1016/j.jrurstud.2022.06.012
- Zhou, Y., Li, Y., and Xu, C. (2020b). Land consolidation and rural revitalization in China: mechanisms and paths. *Land Use Policy* 91, 104379. doi:10.1016/j.landusepol.2019.104379