

ORIGINAL ARTICLE

Developing a dynamic evaluation framework for rural heritage regeneration from the perspective of rural revitalization

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Abstract

Within the context of rural revitalization, the discourse on rural heritage regeneration is shifting from traditional static protection to one more concerned with dynamic activation of historic sites through adaptive reuse and community participation. This transformation focuses on heritage protection and inheritance and revitalizes rural areas through heritage regeneration. To assess the effectiveness of rural heritage regeneration, scholars have established evaluation systems encompassing rural heritage transformation and revitalization. However, these evaluations still face challenges, including a lack of dynamic indicators, poor availability of data at the village level, and neglect of the correlation between regeneration effects and measures. In addition, there is a mismatch of indicators and dimensions between economically focused rural evaluations and conservation-focused heritage evaluations, resulting in a lack of holistic and integrated rural heritage evaluations. Therefore, this study summarizes the transformation process of rural heritage regeneration from individual to overall protection, from static to dynamic management, expert-led to multi-participation, and physical space to cultural coordination by sorting out the conceptual system and policy evolution of rural heritage. Based on these findings, the study aims to develop a heritage evaluation framework that incorporates rural revitalization perspectives and provides a foundational structure for building a more systematic and sustainable evaluation system.

Keywords: Rural heritage; Dynamic evaluation; Regeneration indicators; Rural revitalization policy; Full life cycle

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1. Introduction

With the development of the revitalization strategy, rural heritage regeneration is shifting from static protection to dynamic activation. As emphasized by the Council of Europe's Convention on the Value of Cultural Heritage for Society, heritage is a resource that reflects people's evolving values and traditions (Council of Europe,

2005). This means that heritage is undergoing constant transformation, evolving over time, undergoing changes in the present, and is set to undergo further changes in the future (Fairclough *et al.*, 2008). Therefore, the current trend is to move away from the perception of cultural heritage as a static “immutable document” and to recognize its dynamic character as a continuous process of selection, interpretation, and transmission (Cerquetti & Romagnoli, 2022). This transformation not only focuses on the protection and inheritance of heritage, but also emphasizes rural revitalization through heritage regeneration, promoting the enhancement of economic vitality (Kourilova & Pelucha, 2017), the continuation of cultural traditions (Fang & Li, 2022), and the reconstruction of social structures (Ma *et al.*, 2022).

To assess the effectiveness of rural heritage regeneration, scholars have gradually established evaluation systems that encompass the process of transformation and revitalization of rural heritage (Wang, 2022). Existing research on rural heritage evaluation addresses both tangible and intangible heritage elements. Studies have focused on how tourism development impacts village spatial layouts and architectural features (Xi *et al.*, 2015). In addition, the quality of village living environments (Long *et al.*, 2024) and the functionality and user experience of public spaces (Zhao *et al.*, 2022) constitute key evaluation components. Regarding intangible heritage, evaluation systems emphasize the diversity, integrity, and continuity of cultural heritage (Fang & Li, 2022). Demographic structure and local economic development serve as central evaluation factors (Li *et al.*, 2023). Furthermore, evaluation frameworks measure rural vitality by examining living environments, industrial development status, and natural ecology to assess village development potential (Jia *et al.*, 2024).

However, the evaluation of rural heritage regeneration still faces multiple challenges. In terms of conservation and development conflicts, architectural relocations in Huizhou and Shaoxing, China, have triggered authenticity controversies due to over-commercialized renovations (González Martínez, 2022). In Hong Kong's Tai O, tourism-focused redevelopment has damaged the stilt houses of the Tanka people, which shows how economic priorities often ignore ecological and cultural sustainability (Li & He, 2020). In terms of sustainable heritage renewal, the use of traditional materials in the Saudi village of Ushaiger maintains cultural integrity, but its full life cycle environmental costs are often overlooked (Mazzetto, 2025). Although the Lai Chi Wo project in Hong Kong is regarded as a model (Williams *et al.*, 2021), it fails to effectively balance villagers' livelihoods with tourism development

(Chang, 2022). Problems such as obstacles to villagers' return to the village need to be addressed through multi-party collaborations to establish a long-term participatory mechanism (Li, 2022). These contradictions suggest a dynamic assessment tool to bridge the gap between rural development and heritage restoration practices.

To address the dynamic assessment of rural heritage regeneration, this study introduces the theory of life cycle assessment (LCA). The theory originated in energy analysis in the 1960s and 1970s to explore potential impacts on various environmental indicators and resource consumption (McManus & Taylor, 2015). It has since evolved into a tool for systematically assessing the “inputs, outputs, and potential environmental impacts” of products throughout their life cycle (Guinée, 2001, p.5). The methodological framework covers the four phases of material manufacture, construction, use and maintenance, and end-of-life (Bayer *et al.*, 2010). In the heritage field, LCA, as an emerging tool for evidence-based decision-making, can support selecting specific conservation materials at the micro-level and provide a quantitative basis for environmental benefits in macro-level policymaking (Elnaggar, 2024). However, its application is still exploratory and remains underutilized, especially in rural villages in developing countries (Jouini *et al.*, 2019). On the one hand, existing systems such as the International Council on Monuments and Sites (ICOMOS) Heritage Impact Assessment focus on sectoral conservation (Angrisano *et al.*, 2024). This has led to a lack of mechanisms to dynamically track post-regeneration outcomes and in-depth exploration of the dynamic linkages between conservation measures and performance indicators (Huang *et al.*, 2022). On the other hand, the assessment of rural heritage regeneration often separates economically oriented rural revitalization indicators from conservation-oriented heritage indicators, leading to assessment fragmentation. Therefore, LCA must go beyond a single environmental dimension and synergize with socio-cultural-economic assessments to provide scientific support (Gravagnuolo *et al.*, 2021).

Therefore, this research summarizes the conceptual framework and policy evolution of rural heritage, documenting its transformation from individual to comprehensive protection, static preservation to dynamic management, expert-led to multi-stakeholder participation, and from physical spaces to integrated cultural planning. Based on these findings, the study aims to develop a heritage evaluation framework incorporating rural revitalization perspectives and providing a foundational structure for building a more systematic and sustainable evaluation system.

2. Definition of heritage related to rural areas

The concept of heritage related to rural areas includes traditional villages, vernacular architecture, and rural landscape heritage. Among them, rural heritage is a more comprehensive concept. It considers multiple factors, such as landscape, architecture, products, and skills, while emphasizing cultural attributes and human subjectivity. Therefore, it is the core discussion object of this study.

2.1. Vernacular architecture

Vernacular architecture first gained attention in 19th-century England as a critical response to industrialization (Asquith & Vellinga, 2006). The Venice Charter of 1964 declared that historic monuments encompass not only individual buildings but also rural settings that serve as witnesses to civilization, development, or historical events (ICOMOS, 1964). As a supplement to it, the 1999 Charter on Built Vernacular Heritage established principles for managing and protecting vernacular architectural heritage. It defines vernacular architecture by several characteristics, including community-shared construction methods, local or regional environmental adaptations, coherent style and form, informally transmitted design and construction expertise, and effective responses to functional, social, and environmental constraints. The charter emphasizes architectural heritage as both a fundamental expression of community culture and its territorial relationships while demonstrating global cultural diversity (ICOMOS, 1999). Notably, Canivell & Pastor (2018) describe vernacular architecture as building forms constructed using traditional methods and techniques, forming crucial tangible and intangible cultural heritage components.

2.2. Traditional village

Traditional villages are historically rooted settlements with rich traditional resources, holding multidimensional value in historical, cultural, scientific, artistic, social, and economic aspects (MOHURD, 2012). They embody two fundamental attributes, serving as residential and productive living spaces while carrying cultural heritage significance in the modern context (Wang & Sun, 2021). According to the Cultural Relics Protection Law of 2002, traditional villages refer to villages with rich cultural relics, great historical significance, and the ability to reflect the traditional style and regional characteristics of a specific historical period (NPC, 2002). The 2008 Regulations on the Protection of Famous Historical and Cultural Cities, Towns, and Villages added that villages that were once political, economic, cultural, military, and transportation hubs should also be included in the protection list (CPC,

2008). Therefore, unlike ordinary villages, traditional villages are not only the carriers of agricultural civilization and the basic units of rural society but also the civilization imprint of the historical process and the living heritage of national culture, which have the resources and potential for modern tourism (Wang & Sun, 2021).

2.3. Rural landscape heritage

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) defines rural heritage as a continuing landscape within organically evolved landscapes (Zhou & Zhong, 2015). Its value lies in irreplaceable environmental resources (ICOMOS, 1982a). Rural landscape heritage encompasses multidimensional vernacular characteristics, including landscape patterns, settlement morphology, and landmark buildings (ICOMOS, 1999). The landscape pattern emphasizes regional-scale integrity (ICOMOS, 2011) and local identity (ICOMOS, 2017). In terms of settlement morphology, the interdependent relationship between agricultural settlements and their natural environment is prioritized (CPC, 2008), viewing settlements as carriers of regional characteristics. At the landmark building level, local construction technology is embodied through the protection of traditional agricultural settlements' layout and architectural forms (CIA, 2004).

2.4. Rural heritage redefinition

The concept of rural heritage is holistic and contains four core elements. The first is the landscape formed by people through generations of farming and using natural resources. The second is the buildings, including villages, hamlets, isolated houses, and other buildings. The third is the local products developed to adapt to local conditions and needs. The fourth is the technology, tools, and knowledge that make creative activities possible (Chiva *et al.*, 1994).

The cultural attributes of rural heritage are reflected in multiple international frameworks. ICOMOS defines traditional rural settlements as unique cultural heritage, whereas UNESCO categorizes them into tangible, intangible, and natural dimensions, emphasizing their symbolic, historical, artistic, and other values (UNESCO, 2020; Yang, 2023). This cultural perspective has evolved into a systematic understanding, viewing rural heritage as an integrated carrier of cultural, natural, and landscape heritage (CEMAT, 2003). Through unified cultural landscapes requiring care and regeneration, this approach drives rural transformation (TECNALIA, 2019) and strengthens the cultural identity and sense of belonging within heritage communities. This interdependence between culture and heritage, embodied in biocultural and cultural and natural heritage concepts, has become a

core driver for rural sustainable development (Giliberto & MacLagan, 2021).

Multi-stakeholder participation is key in rural heritage protection. Rural residents have developed a stronger sense of heritage ownership and play an important role in preservation, whereas rural heritage is considered a common property of urban residents (Chiva *et al.*, 1994). In contemporary society's quest for identity, rural heritage serves as both a driver and foundation for social development (CEMAT, 2003). The Offida heritage community exemplifies this through its multi-generational cultural activities, demonstrating the community's vital role in heritage preservation (Shakya & Vagnarelli, 2024).

In summary, rural heritage encompasses tangible and intangible cultural elements, integrating dimensions from landscapes and buildings to products and techniques. In addition, multiple stakeholders hold a prominent position in rural heritage, which is evident in residents' sense of heritage ownership and its role in shaping identity (Figure 1).

3. Rural heritage policy development

3.1. International: Post-war recovery to living heritage

3.1.1. 1919 – 1950s: Post-war recovery and initial recognition

The period was marked by initial efforts to recognize and protect rural heritage against the backdrop of post-World War I (1914 – 1918) recovery. In 1919, France enacted the Appellation of Origin Protection Act to safeguard rural products through brand certification (French Parliament, 1919). Sites in 1930 formally incorporated rural areas into national heritage protection (Yang & Zhou, 2016). Britain introduced protection measures through the 1931 Ancient Monuments Act and the 1932 Town and Country Planning Act, focusing on rural historical sites and architectural preservation (UK Parliament, 1931; 1932). The 1947 Agriculture Act regulated farming practices (UK Parliament, 1947), whereas the 1949 National Parks and Access to the Countryside Act established a legal framework for protecting rural history and landscapes (UK Parliament,

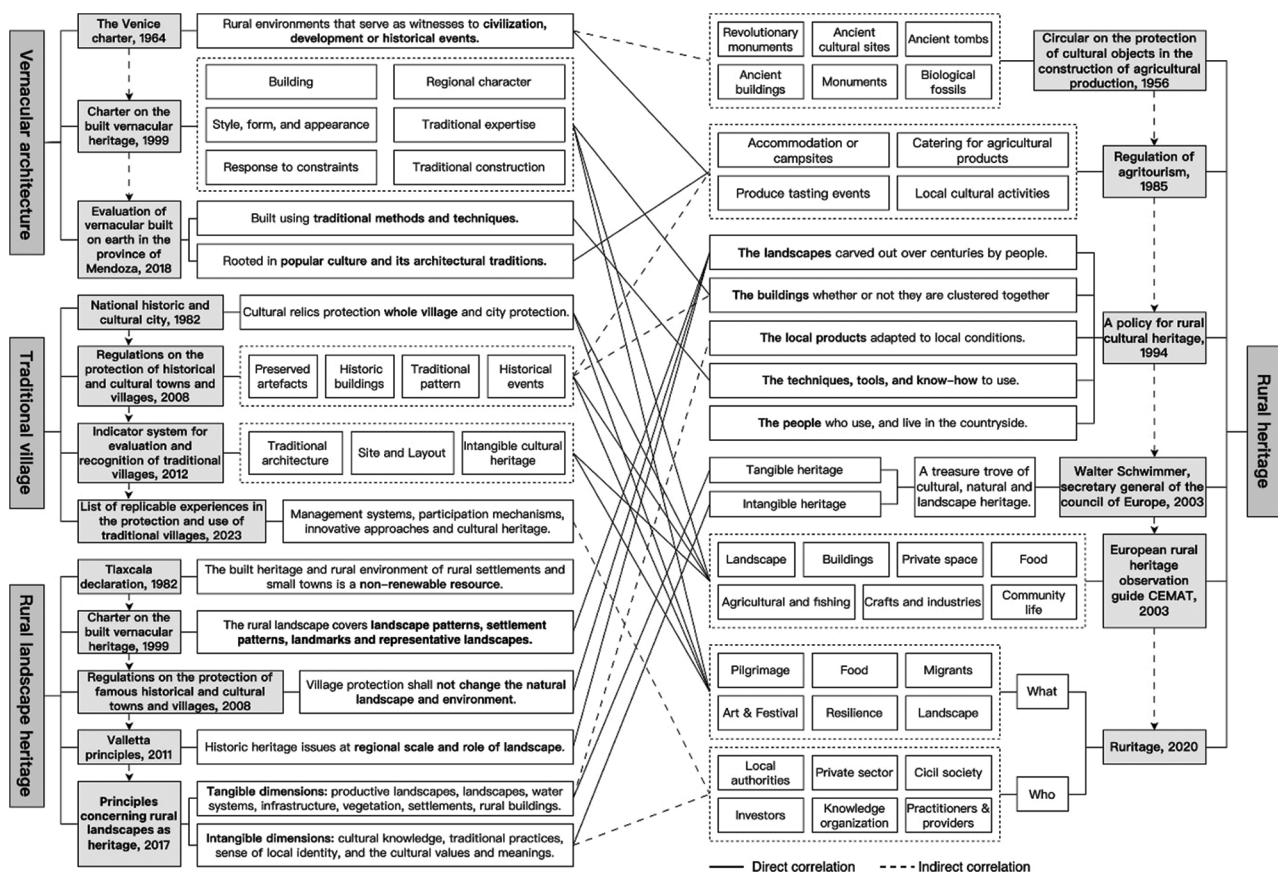


Figure 1. Definition of heritage related to rural areas
Source: Concept map by the authors

1949). Italy conducted systematic surveys of vernacular architecture in 1938 (Li & Xue, 2024), developing one of the earliest comprehensive rural architecture research systems. Later, the 1951 Milan Triennale served as a crucial platform for addressing post-World War II (1939 – 1945) rural reconstruction challenges (Triennale Milano, 1951).

3.1.2. 1960s – 1970s: Expanding scope and comprehensive protection

Rural heritage protection evolved from individual sites to comprehensive environmental preservation. The European Common Agricultural Policy of 1962 addressed trade protectionism and controlled agricultural supply and price fluctuations (EPRS, 2022). France's 1962 Conservation Areas Act introduced the Protected Sector concept, initiating holistic protection of historical environments (French Parliament, 1962). Britain's 1968 Town Planning Act expanded the National Parks Commission's role and established the Countryside Commission (UK Parliament, 1968). Italy's 1978 Standards for Residential Building responded to landscape changes from agricultural intensification by regulating rural housing restoration, renovation, and expansion (French Parliament, 1978).

3.1.3. 1980s – 1990s: Decentralization and living heritage

Decentralization fostered bottom-up conservation practices. France's 1983 Decentralization Act and the Architectural, Urban and Landscape Heritage Protection Zone marked a shift from elite-driven to locally-managed heritage preservation (French Parliament, 1983). This trend was reinforced in 1994, emphasizing the role of rural inhabitants and users (Chiva *et al.*, 1994). Meanwhile, in Europe, the Leader Approach was launched in 1991 to increase the participation of rural inhabitants, and the Agri-Environmental Measures were implemented in 1992 to protect rural biodiversity (EU CAP, 2025). Italy enacted the 1985 Agritourism Law, which focused on overnight stays that supported the restoration of farm buildings and the diversification of income sources for working farms in rural areas. (Lamie *et al.*, 2021). This period also witnessed the emergence of Living Heritage, evolving from the concept of Living Monument in the 1982 Florence Charter (ICOMOS, 1982b). UNESCO's World Heritage Committee adopted this concept in the 1990s, emphasizing the dynamic use and transmission of cultural heritage within local communities.

3.1.4. 2000s – present: Multi-stakeholder participation and sustainable development

Multi-stakeholder engagement has driven sustainable development in rural heritage conservation. The Rural

Heritage Observation Guide in 2003 established a systematic evaluation of cultural and natural diversity (CEMAT, 2003), whereas the European Landscape Convention in 2006 promoted approaches tailored to specific landscape characteristics (UK government, 2006). The World Rural Landscapes Initiative redefines rural landscapes as sustainable systems encompassing traditional methods, techniques, knowledge, and cultural practices (ICOMOS-IFLA, 2017). In practice, France's Grands Sites became a label for rural cultural heritage, whereas its Heritage Craftspeople System safeguards traditional skills (Yang & Zhou, 2016). Britain legislated for integrated social, economic, and environmental development. Recent initiatives, such as the Ruritage project (TECNALIA, 2019), created a six-category stakeholder framework from local governments to practitioners, whereas the Holistic Heritage Impact Assessment Model strengthens collaboration among decision-makers, managers, and researchers (SoPHIA, 2021).

3.2. National: Individual conservation to experience replication

3.2.1. 1950s – 1970s: Monumental heritage protection and census registration

China's first official heritage conservation policy was the Circular on Protection of Cultural Relics in Agricultural Production Construction, issued in 1956, which led to the first official census of cultural relics since the founding of China (State Council, 1956). The document conducted a wide-ranging census and registration of immovable cultural relics, focusing on protecting individual relics.

3.2.2. 1980s – 1990s: Comprehensive protection and multiple values

Following China's Reform and Opening Up, rural heritage protection evolved from single-monument preservation to a dual focus on physical and cultural values. In the 1980s, China promulgated the Cultural Relics Protection Law and announced the first batch of national historical and cultural cities, followed by the Notice on Strengthening Historical City Planning (Lan *et al.*, 2019). These policies have made the objects of cultural relics protection more explicit, indicating that China has risen from the protection of single cultural relics to the holistic protection of entire villages.

3.2.3. 2000s: Multi-level governance and diverse participation

In 2003, the Ministry of Housing and Urban-Rural Development and the National Cultural Heritage jointly launched the selection of Famous Towns and Villages of Chinese Historical and Cultural Heritage, which was

upgraded to a national strategy (MOHURD, 2003). Since then, a systematic protection framework has emerged through various initiatives. The Third National Cultural Relics Survey separately categorized vernacular architecture (State Council, 2007), while different departments established registries for historic towns and villages, distinctive landscape tourism villages, and traditional villages. The Regulations on the Protection of Famous Historical and Cultural Cities and Towns and Villages of 2008 made a double breakthrough, devolving supervision to the provincial and municipal governments and encouraging the participation of enterprises, institutions, social groups, and individuals in the protection work (CPC, 2008).

3.2.4. 2010s – present: Experience replication and cultural inheritance

During this period, attention was paid to standardized evaluation systems and sustainable protection modes. In 2012, the Traditional Village Evaluation and Recognition Indicator System established unified evaluation standards and promoted the evaluation of traditional villages at the national level (MOHURD, 2012). In 2014, the Guiding Opinions on Effectively Strengthening the Protection of Traditional Villages in China introduced the concept of living conservation and emphasized the continuity of the villages, the sustainable development of the human environment, and the traditional culture (MOHURD, 2014). In 2023, the List of Reproducible Experiences in the Protection and Utilization of Traditional Villages further innovates protection methods, proposing revitalizing traditional architecture and introducing a digital protection system (MOHURD, 2023).

International organizations led by UNESCO and ICOMOS have established universal protection frameworks through evolving declarations and charters, emphasizing transnational cooperation and diverse collaboration. China has developed a multi-level inventory system from the national to the county levels, creating a top-down, government-led model. This evolution indicates that rural heritage protection is moving toward greater inclusivity and sustainability, forming a dynamic system encompassing living, cultural, and ecological dimensions (Figure 2).

4. Characterization of existing rural heritage evaluations

4.1. Scales: Region, village, and building

The evaluation of rural heritage shows a multi-level assessment system, ranging from regional resource integration and village sustainable development to building conservation and utilization.

Region-scale evaluation studies focus on integrated natural resources and human resource utilization. In terms of integrated natural resources, the study focuses on the functional positioning of traditional villages (Wang *et al.*, 2022), vulnerability assessment (Shi *et al.*, 2023), risk prevention and control mechanisms (Long *et al.*, 2024), the balanced mechanisms of regional ecological resources protection and utilization (Zhang *et al.*, 2024), and heritage corridor planning (Xin, 2022). In terms of human resource utilization, scholars have studied the mechanism of population mobility's influence on the vitality of village development and livability (Ma *et al.*, 2022), the strategy of constructing a regional cultural tourism network (Zhong *et al.*, 2015), the spatial distribution characteristics of regional cultural heritage resources and the protection pattern (Huang, 2021), as well as the regional level of human resource allocation and technical support system construction (Liu *et al.*, 2023; Xin, 2022).

Village-scale evaluation studies focus on sustainable development and village spatial patterns. In terms of sustainable development, the research focuses on enhancing the vitality and sustainable development capacity of traditional villages. Scholars have constructed an evaluation system of village adaptability (Dai & Ping, 2024; Xue *et al.*, 2024), vitality enhancement (Liu, 2024), and livability (Chen *et al.*, 2023) from various dimensions such as demographics (Liu & Xu, 2021), village tourism (Meng *et al.*, 2022), and cultural inheritance (Kang *et al.*, 2023). It is worth noting that continuous follow-up surveys (Zhao, 2006; Zhao *et al.*, 2008) for different batches of nationally recognized village heritage sites are also being conducted. In terms of the spatial pattern of villages, the research focuses on the organizational characteristics and evolutionary patterns of village space. Scholars have analyzed the space-making of traditional villages (Liu & Zhang, 2024), explored the organizational pattern of public space (Zhao *et al.*, 2022) and the conservation strategy of the landscape pattern (He, 2024), and studied the evolution mechanism of village morphology (Xi *et al.*, 2015).

Architectural-scale evaluation studies focus on heritage authenticity preservation and adaptive reuse. In terms of heritage authenticity preservation, scholars have assessed the multiple values (Feng, 2024; Shao & Fu, 2012; Xu *et al.*, 2023), repair techniques, and energy control of traditional buildings (Fedorczak-Cisak *et al.*, 2020), and explored the integrated focus on tangible and intangible heritage in reuse (Angrisano *et al.*, 2024). In adaptive reuse, research focuses on renewal strategies for traditional buildings under modern conditions. Scholars have emphasized the continuous evaluation of the whole process of heritage reuse (Van Laar *et al.*, 2024; Yang *et al.*, 2024), functional

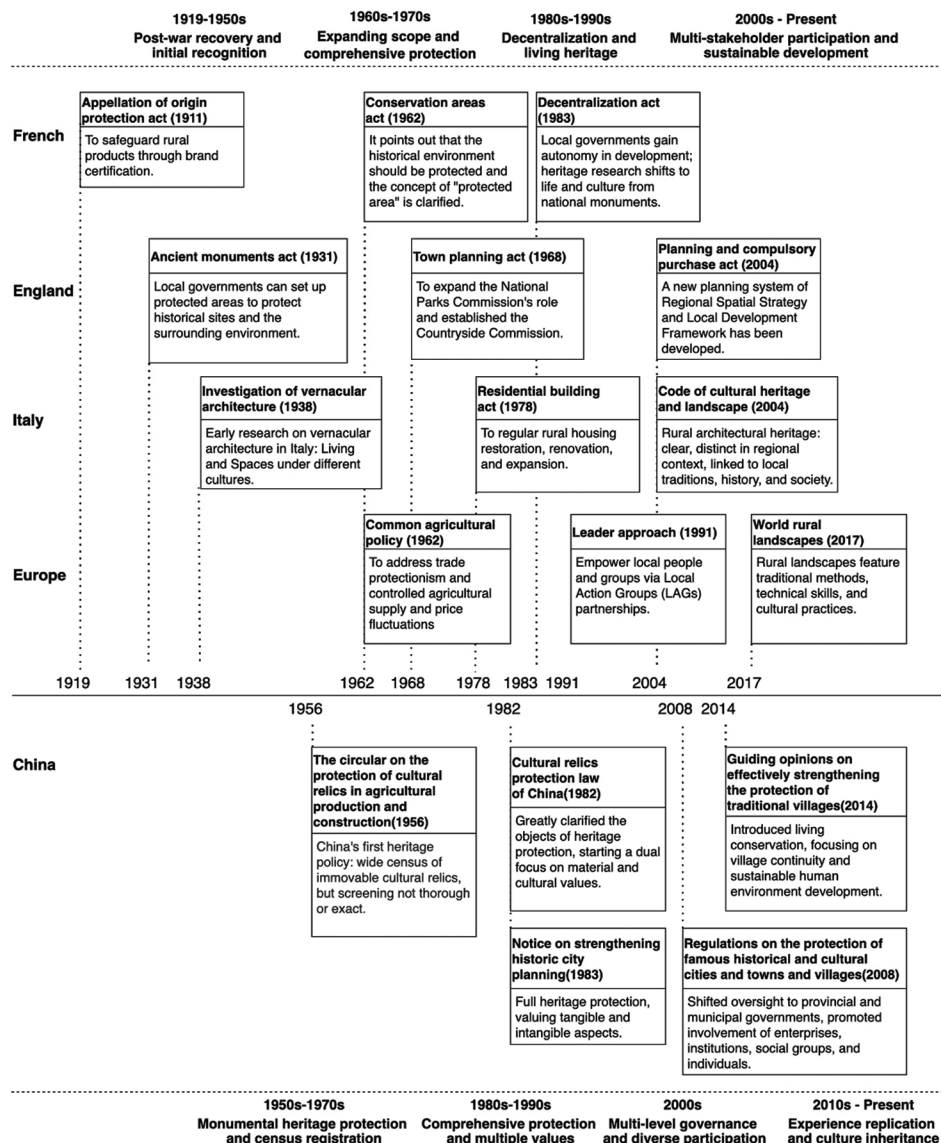


Figure 2. International rural heritage conservation policy after World War I
Source: Chart by the authors

enhancement (Chen *et al.*, 2018), circular economy (Bosone *et al.*, 2021), and technological and managerial innovations in the process of reuse (Tu & Yu, 2024).

4.2. Lifecycle: Before, during, and after reuse

Rural heritage has distinctive dynamic attributes. Heritage culture is both the basic attributes of traditional villages and the new attributes reflected by contemporary society (Wang & Sun, 2021); hence, what needs to be protected is a historical process rather than a cross-section (Du & Zhang, 2024). Villages as carriers of farming civilization have a historical inheritance function (Wang, 2022), which helps to develop traditional culture and promote the

revitalization of traditional crafts (State Council, 2018). Therefore, the evaluation research of rural heritage also presents a chronological character.

The indicators of the before-reuse period focus on intrinsic value investigation and potential assessment. The intrinsic value is mainly reflected by the basic indicators such as the construction date of the earliest existing buildings, the number and grade of cultural relics protection units (Feng, 2024; Wang & Sun, 2021), as well as the investigation of customs and spiritual beliefs (He, 2024; Meng *et al.*, 2022). In terms of development potential, the ecological background and disaster prevention of the villages can be assessed to predict their sustainable

development (Dai & Ping, 2024; Wei, 2023), while the road network density and transportation accessibility assessment can determine the location advantage of the villages (Chen *et al.*, 2023), which provides a scientific basis for judging the development prospects of the villages.

The indicators during the reuse period focus on dynamic monitoring of the implementation process. The utilization rate of traditional building revitalization reflects the transformation effect of space (Dai & Ping, 2024; Tu & Yu, 2024), whereas the assessment of spatial flexibility reflects the concern for the functional adaptability of the building (Angrisano *et al.*, 2024; Van Laar *et al.*, 2024). In terms of cultural revitalization, the effectiveness of the living inheritance of intangible cultural heritage is assessed through the frequency and scale of cultural activities (Dai & Ping, 2024; Kang *et al.*, 2023).

The indicators of the after-reuse period focus on objective economic benefits and subjective satisfaction assessment. Economic benefits are reflected in the number of tourists and their consumption (Angrisano *et al.*, 2024; Meng *et al.*, 2022), as well as the industrial development as reflected in the annual per capita income and employment opportunities (Yang *et al.*, 2025). In addition, avoiding gentrification and over-tourism on villagers' quality of life reflects a deeper consideration of sustainable village development (Bosone *et al.*, 2021).

4.3. Dimensions: Culture, ecology, and governance

Cultural heritage is related to the uniqueness of the village and the continuation of its historical value. The evaluation indicators of tangible cultural heritage centered on traditional architecture have received the most attention, including architectural authenticity, integrity, and overall appearance (Feng, 2024; Wang & Sun, 2021). Indicators of building revitalization utilization rate, on the other hand, reflect the thinking of sustainable utilization of tangible cultural heritage (Tu & Yu, 2024).

Ecological balance emphasizes the symbiotic relationship between the village and the natural environment. Scholars have constructed a production-life-ecology evaluation framework (Kong *et al.*, 2021), and deepened the theoretical connotation of sustainable development assessment from various perspectives, such as village vitality (Jia *et al.*, 2024), hollowing governance (Liu & Xu, 2021), habitat appropriateness (Long *et al.*, 2024), and sustainable development of the traditional village (Meng *et al.*, 2022).

Governance efficacy focuses on governance with multiple participation, which affects the implementation effectiveness of village conservation and development (Chung & Ho, 2023; Hu *et al.*, 2021; Tian *et al.*, 2021). In

the top-down modern governance system, administrators establish an evaluation system that includes elements such as supervision, technology, and funding (Liu *et al.*, 2023), promote the application of digital governance tools (Tu & Yu, 2024), and improve the village management mechanism (Zhu, 2016). In a bottom-up system, the community participates in governance in diversified ways (Kong *et al.*, 2021). Villagers optimize basic unit governance through compliance with village rules and regulations and active participation in public affairs (Yang *et al.*, 2025). As a result, the closed-loop management system of vitality evaluation enhancement was gradually formed (Liu, 2024).

In general, existing rural heritage evaluation studies have a multilevel evaluation system. However, there are still deficiencies in the existing studies. First, the evaluation timeline is unbalanced, focusing on the historical value while lacking dynamic tracking of protection effectiveness, which makes it difficult to reflect actual changes before and after protection. Second, the low level of integration with the official rural revitalization evaluation framework has led to a disconnect between heritage regeneration and the evaluation system.

5. Rural heritage evaluation in the context of rural revitalization policy

Introducing the perspective of rural revitalization into the evaluation of rural heritage can help optimize the evaluation paradigm and clarify the development objectives. In terms of the evaluation paradigm, this idea draws on the open system thinking of the world cultural heritage's Thematic Framework, whereby rural heritage can be labeled with open systems and overlapping classifications (Jokilehto *et al.*, 2005). This evaluation combines heritage conservation with rural development, enhancing the existing rural revitalization system by integrating heritage regeneration into its five dimensions: industry, ecology, culture, governance, and life (State Council, 2018) (Table 1).

5.1. Integrity: Symbiosis across scales

In the architecture-village-region system, cross-scale indicators are considered alongside indicators at different scales (Figure 3). At the region-village level, indicators related to specialty industries and regional public transportation influence economic growth and talent return. At the regional-architecture level, indicators concerning adaptive reuse shape distinctive regional characteristics. At the village-architecture level, the inheritance of traditional building techniques and activities represents the living continuation of village culture. These three dimensions collectively work toward achieving harmonious ecological environments, cultural

Table 1. Rural heritage indicators incorporating the rural revitalization evaluation dimension

Dimension	Indicator	Source
Industry	Specialty industry	Kong <i>et al.</i> , 2021; Meng <i>et al.</i> , 2022; Wang & Sun, 2021; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022; Zhong <i>et al.</i> , 2015
	Agricultural development	Wang <i>et al.</i> , 2019; Yang <i>et al.</i> , 2025
	Production methods and technology	Fang & Li, 2022; Shcherbak <i>et al.</i> , 2020
	Per capita annual income	Kong <i>et al.</i> , 2021; Memo & Pieńkowski, 2023; Wei, 2023; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022
	Subsidies and benefits	Chen <i>et al.</i> , 2018
	Ability to create new permanent jobs	Angrisano <i>et al.</i> , 2024; Memo & Pieńkowski, 2023
	Intensity of land development	Wang <i>et al.</i> , 2019
	Increase in land use value	Chen <i>et al.</i> , 2018
	Ability to attract tourists to spend money	Angrisano <i>et al.</i> , 2024; Jagodzińska <i>et al.</i> , 2015; Meng <i>et al.</i> , 2022
	Number of rural tourists	Angrisano <i>et al.</i> , 2024; Jagodzińska <i>et al.</i> , 2015; State Council, 2018
Ecology	Green coverage	Chen <i>et al.</i> , 2023; Dai & Ping, 2024; He, 2024; Long <i>et al.</i> , 2024; State Council, 1956; Wang & Sun, 2021; Wei, 2023; Xi <i>et al.</i> , 2015; Yang <i>et al.</i> , 2025
	Harmonization of the village environment	Chen <i>et al.</i> , 2018; Dai & Ping, 2024; Fang & Li, 2022; Feng, 2024; MOHURD, 2012; Xin, 2022; Xue <i>et al.</i> , 2024; Zhou <i>et al.</i> , 2011
	Biodiversity protection	Bosone <i>et al.</i> , 2021; Memo & Pieńkowski, 2023
	Agricultural landscape	Fang & Li, 2022; Memo & Pieńkowski, 2023
	Integrity of the natural environment	MOHURD, 2010; Tu & Yu, 2024; Zhao, 2006
	Number of preserved historical streets and lanes, rivers, and streams with traditional features	MOHURD, 2010; Zhao, 2006; Zhou <i>et al.</i> , 2011
	Scale and spatial characteristics of streets and lanes	Zhou <i>et al.</i> , 2011
	Integrity of the village core area	Feng, 2024; Kong <i>et al.</i> , 2021; Liu & Zhang, 2024; Tu & Yu, 2024; Wang & Sun, 2021; Xin, 2022; Xue <i>et al.</i> , 2024
	Disaster prevention capacity of the village	Dai & Ping, 2024; Liu, 2024; Liu <i>et al.</i> , 2023; Wang & Sun, 2021; Wei, 2023
	Waste disposal rate	Bosone <i>et al.</i> , 2021; Wang & Sun, 2021; Yang <i>et al.</i> , 2025
	Renewable energy for recycling	Bosone <i>et al.</i> , 2021; Memo & Pieńkowski, 2023
Culture	Construction date of the earliest existing buildings	Fang & Li, 2022; Feng, 2024; MOHURD, 2012; Wang & Sun, 2021; Xi <i>et al.</i> , 2015
	Village historicity	Fang & Li, 2022; Kang <i>et al.</i> , 2023; Wang & Sun, 2021; Zhao <i>et al.</i> , 2008
	Richness of historical elements	Dai & Ping, 2024; Tu & Yu, 2024; Xin, 2022
	Construction date of traditional architectural clusters	Fang & Li, 2022; Feng, 2024; MOHURD, 2012; Xin, 2022
	Number and influence of historical events and celebrities	Fang & Li, 2022; Lu & Ahmad, 2023; Zhao, 2006
	Number of cultural relics protection units	Fang & Li, 2022; Feng, 2024; MOHURD, 2012; Zhang <i>et al.</i> , 2022; Zhou <i>et al.</i> , 2011
	Level of cultural relics protection	Fang & Li, 2022; Feng, 2024; Zhang <i>et al.</i> , 2022
	Authenticity of cultural relics	Feng, 2024; Wang & Sun, 2021; Zhao, 2006
	Authenticity of streets and lanes	Tu & Yu, 2024
	Integrity of vernacular architecture	Chen <i>et al.</i> , 2018; Feng, 2024; He, 2024; Liu & Zhang, 2024; Tu & Yu, 2024; Wang & Sun, 2021; Xi <i>et al.</i> , 2015; Zhao, 2006
	Harmony of traditional building features	He, 2024; Kong <i>et al.</i> , 2021; Wang & Sun, 2021; Zhao, 2006; Zhou <i>et al.</i> , 2011
	Integrity of the building layout	Feng, 2024; Kang <i>et al.</i> , 2023; Xi <i>et al.</i> , 2015
	Utilization rate of traditional buildings	Dai & Ping, 2024; Tu & Yu, 2024; Xue <i>et al.</i> , 2024
	Percentage of traditional buildings	Kang <i>et al.</i> , 2023; Liu, 2024; Wang <i>et al.</i> , 2019; Wang & Sun, 2021; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022

(Cont'd...)

Table 1. (Continued)

Dimension	Indicator	Source
	Retention of traditional buildings	Dai & Ping, 2024; Kang <i>et al.</i> , 2023; Zhou <i>et al.</i> , 2011
	Traditional building area	Angrisano <i>et al.</i> , 2024; MOHURD, 2012; Van Laar <i>et al.</i> , 2024; Xin, 2022; Zhou <i>et al.</i> , 2011
	Functionality of traditional buildings	MOHURD, 2012
	Regionalization of building materials	Feng, 2024
	Construction techniques	Fang & Li, 2022; Feng, 2024
	Architectural cultural symbols and decorations	Fang & Li, 2022; Feng, 2024; Jagodzińska <i>et al.</i> , 2015
	Number of intangible cultural heritages such as traditional festivals, traditional handicrafts, etc.	Dai & Ping, 2024; Fang & Li, 2022; Feng, 2024; He, 2024; Kang <i>et al.</i> , 2023; Kong <i>et al.</i> , 2021; Meng <i>et al.</i> , 2022; MOHURD, 2010; Tu & Yu, 2024; Wang <i>et al.</i> , 2019; Wang & Sun, 2021; Xin, 2022; Xue <i>et al.</i> , 2024; Zhang <i>et al.</i> , 2022
	Number of cultural inheritors	Dai & Ping, 2024; Fang & Li, 2022; Feng, 2024; Kong <i>et al.</i> , 2021; Wang & Sun, 2021; Xue <i>et al.</i> , 2024; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022
	Cultural activities	Dai & Ping, 2024; Jagodzińska <i>et al.</i> , 2015; Kang <i>et al.</i> , 2023
	Customs and spiritual beliefs	Feng, 2024; He, 2024; Meng <i>et al.</i> , 2022; Yang <i>et al.</i> , 2025
	Continuity of the clan system	Dai & Ping, 2024; Fang & Li, 2022; Xue <i>et al.</i> , 2024
	Villager participation in cultural life	Angrisano <i>et al.</i> , 2024; He, 2024; Kong <i>et al.</i> , 2021; Xue <i>et al.</i> , 2024; Zhang <i>et al.</i> , 2022
	Conservation awareness of villagers	Dai & Ping, 2024; Xue <i>et al.</i> , 2024
	Tourism development	Dai & Ping, 2024; Jagodzińska <i>et al.</i> , 2015; Memo & Pieńkowski, 2023; Shcherbak <i>et al.</i> , 2020
	Continuity of geographic relations	Dai & Ping, 2024
Governance	Number of protected landmarks	MOHURD, 2010
	Ratio of maintenance funds to construction funds	Chen <i>et al.</i> , 2018; MOHURD, 2010
	Completeness of village management systems and personnel	Kong <i>et al.</i> , 2021; Liu <i>et al.</i> , 2023; Wei, 2023
	Number of wealthy community leaders	Kong <i>et al.</i> , 2021
	Effectiveness of village regulations	Yang <i>et al.</i> , 2025
	Level of villagers' participation in village affairs	Kong <i>et al.</i> , 2021; Wang <i>et al.</i> , 2019; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022
	Level of villager self-governance organizations	Yang <i>et al.</i> , 2025
	Richness of digital construction for protection	Tu & Yu, 2024; Memo & Pieńkowski, 2023
	Diversity of organizational models	Dai & Ping, 2024; Shcherbak <i>et al.</i> , 2020
	Implementation of degree of protection plans	Dai & Ping, 2024; Memo & Pieńkowski, 2023
	Initial investment in heritage protection	Chen <i>et al.</i> , 2018; Dai & Ping, 2024; Long <i>et al.</i> , 2024
	Collaborative initiatives within and across departments	Angrisano <i>et al.</i> , 2024; Memo & Pieńkowski, 2023
Livelihood	Proportion of government financial support	Liu <i>et al.</i> , 2023
	Number of public participation channels	Liu <i>et al.</i> , 2023
	Number of talents moving to rural areas	Kong <i>et al.</i> , 2021; State Council, 2018
	Number of rural population returning to villages	Kong <i>et al.</i> , 2021; State Council, 2018
	Degree of village hollowing	Liu & Xu, 2021; Yang <i>et al.</i> , 2025

(Cont'd...)

Table 1. (Continued)

Dimension	Indicator	Source
	Living infrastructure	Chen <i>et al.</i> , 2018; Feng, 2024; Kong <i>et al.</i> , 2021; State Council, 2018; Wang & Sun, 2021; Yang <i>et al.</i> , 2025; Zhang <i>et al.</i> , 2022
	Number of public spaces and key nodes	He, 2024; Kong <i>et al.</i> , 2021
	Frequency of public service facility usage	Lu & Ahmad, 2023
	Transportation convenience	Kong <i>et al.</i> , 2021; Meng <i>et al.</i> , 2022; Shcherbak <i>et al.</i> , 2020; Xi <i>et al.</i> , 2015
	Connectivity with town/village public transport	Chen <i>et al.</i> , 2023; Dai & Ping, 2024; Wang <i>et al.</i> , 2019; Wang & Sun, 2021
	Road density	Chen <i>et al.</i> , 2023
	Distance from surrounding attractions to the village	Feng, 2024
	Harmony of neighborhood relationships	Dai & Ping, 2024
	Avoid gentrification and over-tourism	Bosone <i>et al.</i> , 2021
	Villagers' satisfaction with building renovations	Yang <i>et al.</i> , 2024
	Room comfort level	Fedorczak-Cisak <i>et al.</i> , 2020
	Spatial flexibility	Angrisano <i>et al.</i> , 2024; Van Laar <i>et al.</i> , 2024
	Diversity of public space	Xi <i>et al.</i> , 2015

heritage protection, and enhanced village vitality, forming a comprehensive cross-scale development system.

5.2. Dynamism: Full lifecycle evaluations

To address the dynamic assessment of rural heritage regeneration, this paper introduces the theory of life cycle assessment. From a temporal perspective, the regeneration process is divided into three distinct stages: Before reuse, during reuse, and after reuse, each marked by its own set of characteristics. In terms of indicators, a dual approach is utilized: static indicators reflect the unchanging, inherent attributes of the heritage, providing a stable baseline, while dynamic indicators measure the evolving changes and impacts that occur before and after the regeneration process.

Static indicators can be divided into basic value assessment and revitalization effect verification. The basic value indicators are mainly reflected in the pre-reuse period, including historical indicators such as the construction date of the earliest existing buildings, the number and level of rural heritage, and the integrity of the historical elements. Environmental indicators include the green coverage rate and the degree of coordination between the village and the natural environment. The validation of the revitalization effect focuses on indicators specific to the later stages of reuse, such as the rate of revitalization utilization of traditional buildings, spatial flexibility, and functional adaptability.

Dynamic indicators mainly reflect the change process of the village. Indicators throughout the process include

villagers' participation, frequency of cultural heritage activities, and waste disposal rate, which need to be continually monitored to reflect the overall dynamics of village development. Indicators focusing on the before and during regeneration stages mainly include research and design indicators, such as the preparation of conservation planning and heritage research and registration, reflecting the scientific nature of preliminary planning. Indicators focusing on the during and after regeneration stages include management-operational indicators such as efficiency in using conservation funds and sectoral cooperation initiatives, which reflect the program implementation. Indicators focusing on the before and after stages mainly include per capita annual income, degree of hollowing out, industrial output value, and other comparative indicators, which visualize the effectiveness of village revitalization (Figure 4).

5.3. Vernacularity: Evaluation of multidimensional integration

Indicators are classified by combining the five dimensions of rural revitalization evaluation, namely industry, ecology, culture, governance, and life (State Council, 2018). The cultural dimension covers cultural relics and monuments, traditional architecture, and intangible cultural heritage, and emphasizes the process of cultural inheritance evaluation. The life dimension mainly constructs an evaluation system based on population, facilities, and services, focusing on rural hollowing and infrastructure improvement. The governance dimension focuses on

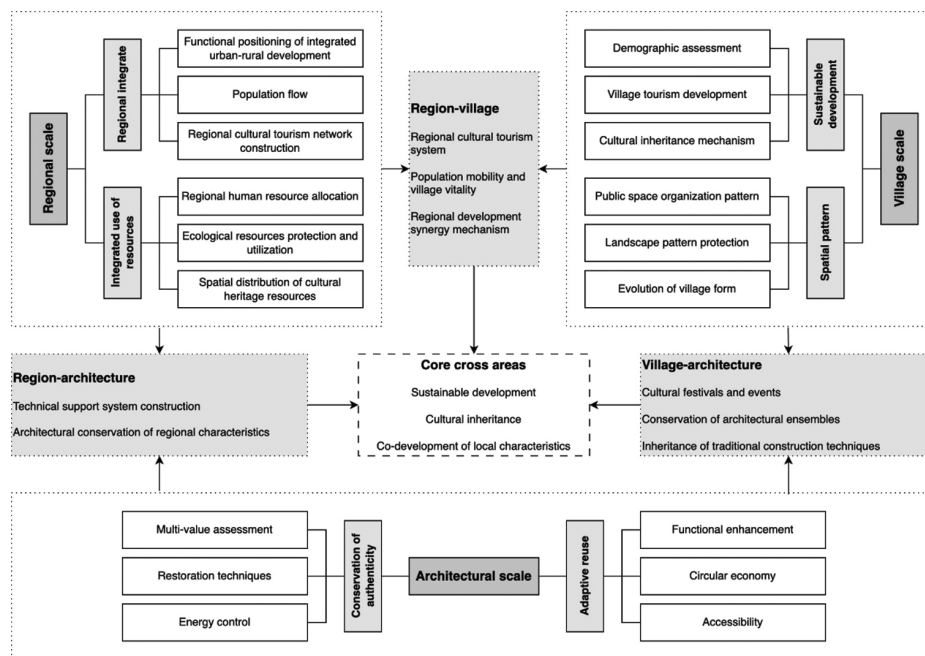


Figure 3. Dimensions and indicators for evaluating rural heritage at the regional, rural, and architectural scales
Source: Diagram by the authors

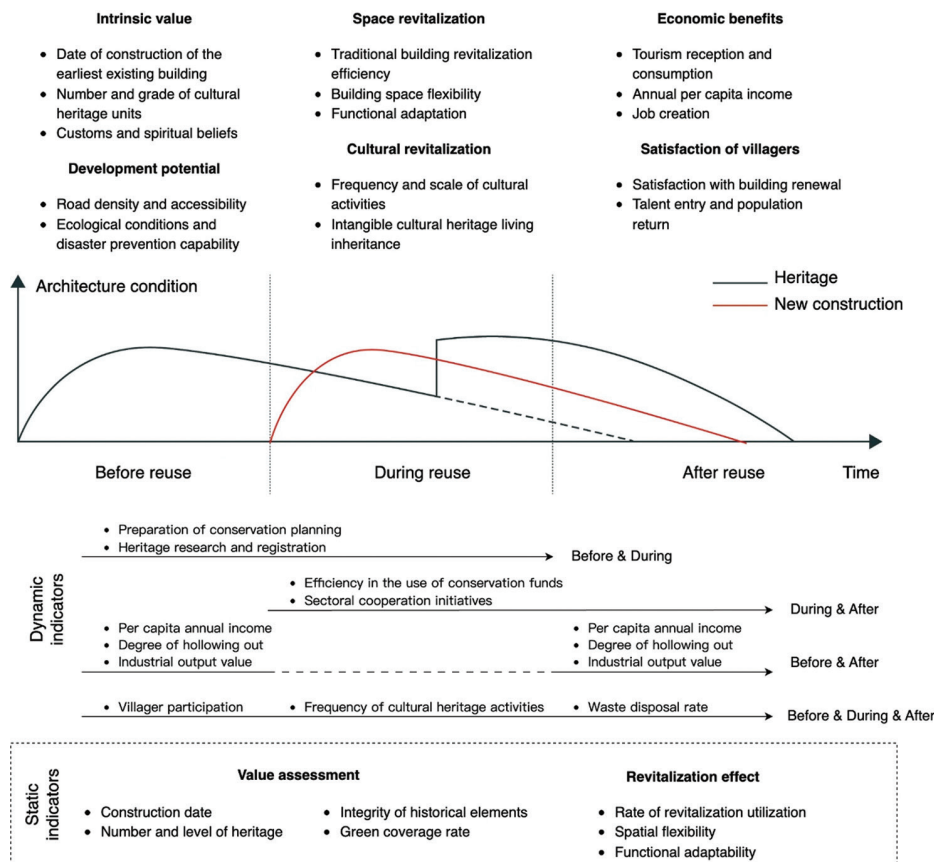


Figure 4. Dimensions and indicators for evaluating rural heritage before, during, and after reuse
Source: Diagram by the authors

the organization and institutions of the village, taking into account villagers' autonomy and resource security. The ecological dimension focuses on the harmonious coexistence of humans and nature, especially natural and agricultural landscapes. The industrial dimension sets up evaluation indicators regarding the cultivation of specialty industries and enhancing economic benefits.

6. Conclusion

By analyzing the conceptual framework and policy evolution of rural heritage, this study identifies its multidimensional characteristics as it has expanded from physical spaces to encompass socio-cultural dimensions. Although international and Chinese practices follow different institutional paths, they share common trends toward holistic protection, multi-stakeholder participation, and dynamic development. In this context, although the existing evaluation system has formed a multilevel framework, it still suffers from insufficient dynamic tracking, dispersed indicators, and low integration with rural revitalization.

Therefore, this study develops an evaluation framework integrating rural revitalization perspectives into heritage assessment. First, it aligns with the five dimensions of rural revitalization (industry, ecology, culture, governance, and life), fostering positive interaction between heritage preservation and rural development. Second, it emphasizes dynamic indicators that track changes before and after heritage regeneration, addressing the gap in monitoring conservation effectiveness. Third, it provides a foundation for establishing a more inclusive and sustainable evaluation system.

This rural heritage system ensures comparability by harmonizing the core assessment criteria as comprehensively as possible. In addition, the system allows for flexibility in adjusting specific indicators according to the heritage characteristics and level of development of different regions, considering both generalizability and local adaptability. For example, in economically advanced areas (e.g., villages in China's Pearl River Delta), the prioritization of cultural indicators could be strengthened to avoid the risk of Huizhou- and Shaoxing-style over-commercialization. Furthermore, governance indicators are emphasized in areas with dense indigenous heritage (e.g., Tai O Village in Hong Kong) to harmonize on-the-ground practices such as tourism facilities and rural heritage maintenance. It should be noted that this also reflects the limitations of this study in discussing the complexity and heterogeneity of local contexts. While this study focuses on building a scalable assessment framework, specific calibrations must be deepened with empirical evidence from cases to balance systemic normativity and local subjectivity.

Future research should focus on three major directions to break through the bottleneck of local adaptability. First, future research can build an interdisciplinary and dynamic empowerment mechanism by integrating the expertise of scholars to contextualize the weights of the five dimensions and the core indicators. Second, future research can develop computational models to simulate and predict local adaptability outcomes by leveraging real-time data. Third, based on typical samples from different cultural circles and economic gradients, a database of the full life cycle of rural heritage must be developed to provide scalable quantitative benchmarks for region-specific indicators.

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