

Article

Symbiotic Governance Mechanisms for Revitalizing Idle Rural Homesteads: A Systems Perspective on Rural Operational Dynamics

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Abstract

The revitalization of idle rural homesteads constitutes a key policy instrument for promoting rural revitalization and enhancing rural household income. However, existing studies predominantly adopt a single-actor or policy-instrument perspective and lack a systematic examination of the complex coupling relationships among multiple actors, resource endowments, and institutional environments. Adopting a rural operational perspective, this study explores how internal and external elements interact to reshape rural systems and identifies the configurational paths through which multiple actors' behavioral logics drive efficient idle homestead revitalization. Drawing on symbiosis theory, we constructed a systemic analytical framework. A mixed-methods design combining fuzzy-set Qualitative Comparative Analysis and case studies of 35 typical villages in Zhejiang Province was employed. The findings reveal that (1) there exist four equifinal high-performance paths—market-driven, government-led, multi-actor co-governance, and endogenous development; (2) efficient revitalization does not rely on any single actor but depends on the dynamic alignment between actor behavioral logics, resource endowments, and the institutional environment; and (3) a robust policy environment can compensate for resource endowment deficiencies, whereas superior resource conditions allow for optimal efficiency, even with streamlined actor participation. Theoretically, this study extends symbiosis theory to the field of rural governance. Practically, it offers transferable governance solutions for Global South countries confronting rural decline and addressing rural poverty.

Keywords: idle homestead revitalization; rural operation; symbiosis theory; fuzzy-set Qualitative Comparative Analysis (fsQCA)

Academic Editors: Dinko Primorac and Katerina Fotova Čiković

Received: 26 May 2026

Revised: 4 July 2026

Accepted: 8 July 2026

Published: 10 July 2026

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1. Introduction

Driven by the continuous advance of post-industrialization, counter-urbanization, and globalization, rural areas worldwide are undergoing profound structural transformations [1]. In Western developed countries, rural transformation exhibits a clear linear evolutionary trajectory [2]. In the mid-20th century, Western rural areas were in a pronounced productivist phase, in which rural development revolved around agriculture. Production efficiency was enhanced through centralized, specialized, and intensive methods, thereby supporting industrial expansion and ensuring national food security [1]. In

the 1970s, driven by the oil crisis and the trend of counter-urbanization [3], Western Europe (represented by the United Kingdom) and North America (represented by the United States) entered a period of rural restructuring. Rural areas subsequently entered a new phase of post-productivism and consumption transition, centered on the restructuring of economic dimensions such as “capital, land, and property rights” [4,5]. Industrial capital, alongside financial capital and state intervention, penetrated rural markets [6]. The urban middle class became embedded in rural areas on a large scale. Simultaneously, the non-agricultural and consumption attributes of rural areas began to emerge, and agricultural property rights centered on land underwent fundamental adjustments [7,8]. Rural spaces thus transitioned from productive spaces to consumption spaces [9].

In the 1990s, postmodern thought and “urban diseases” gave rise to a “rural idyll” in urban society. With the rise of ecological awareness and the concept of sustainable development [10], rural restructuring shifted towards a social dimension centered on “discourse, otherness, and construction.” The urban middle class, through cultural reproduction and discursive construction of rural space, “otherized” disadvantaged rural groups [11], thereby reshaping rural social relations and cultural landscapes. The ecological and cultural values of rural areas were gradually realized, rendering the protection of agricultural resources and the restoration of cultural landscapes new policy orientations. Consequently, rural areas were transformed into multifunctional rural spaces embodying diverse values [12,13].

Since the beginning of the 21st century, driven by the “time-space compression” effect facilitated by internet technology [14,15], rural areas have entered a phase of comprehensive restructuring characterized by “actors, culture, and networks”. The flows of factors such as capital and labor within rural regional systems have expanded to a global scale [13,16], and new types of rural actors—such as multinational corporations, international labor migrants, and non-human entities (e.g., the natural environment)—have emerged. Rural areas are being redefined as multicultural, hybrid network spaces where global and local elements intertwine, and where human and non-human actors participate jointly [17–19], thus giving rise to the new form of the “globalized village”. Alongside this three-dimensional restructuring of Western rural areas—economic, social, and comprehensive—the core value of rural space has undergone a fundamental shift: from a purely agricultural production site to a multifunctional (or composite) arena integrating residential, recreational, ecological, and cultural values [12].

The primary economic driver of this systemic transformation is the pervasive commodification of rural space and resources. Rural space is no longer merely a carrier of agricultural production; its natural landscapes, local cultures, and even lifestyles have been redefined as tradable commodities [20]. Through high-value-added formats such as homestays, study tours, and cultural creativity, these commodities are integrated into global capital circuits [21]. In the Western experience, this process has typically been accompanied by rural gentrification, whereby the middle class or urban elites embed themselves in rural areas by virtue of their economic and cultural capital [22]. By transforming physical space and social structures, they reshape the countryside into a “consumption space” catering to their specific lifestyles and aesthetic preferences [23,24]. In the Western context, gentrification is often closely associated with “deprivation”—local disadvantaged groups become marginalized, and their life chances and cultural identities are “otherized” within the new order [11,25]. Therefore, this study focuses on the logic of commodification, as it directly reveals the underlying mechanism through which idle rural assets transition from “use value” to “exchange value”. Commodification constitutes the foundational soil for rural operation [26] and represents a crucial pathway for the synergistic modernization of both “material” conditions and “human” development.

Unlike the sequential rural transformation in Western countries, developing nations confront a “modernity paradox”: urban expansion drives land demand while resource concentration in cities depresses rural utilization of labor, infrastructure, and land [27,28]. China’s rural restructuring exhibits “parallel and compressed development” [29,30], where stages of productivism, consumption, multifunctionality, and globalization coexist and interact [31,32], creating a uniquely diverse landscape. Rapid industrialization and urbanization propel one-way flows of labor, land, and capital toward cities, causing severe rural hollowing-out, de-agriculturalization, aging populations, and homestead idling in most villages [33,34]. Conversely, counter-urbanization has emerged in developed coastal regions and metropolitan peripheries, accelerating rural transitions toward multifunctionality and globalization [29,35]. Against this background, the introduction of the Rural Revitalization Strategy and the “Separation of Three Rights” reform of rural homesteads have provided institutional legitimacy for social capital entry, making the activation of idle homesteads a key lever for optimizing land resource allocation and driving endogenous rural revitalization [33,36].

The “rural operation” perspective treats villages as integrated products, systematically integrating fragmented resources through professional teams and social capital to create high-value-added industrial spaces [37,38]. Beyond a technical means of activating idle homesteads, it constitutes a pivotal mechanism for rural structural transformation, re-integrating production, consumption, and ecological functions via market logic to facilitate the “resources–assets–capital” conversion [31]. However, revitalization still confronts a triple governance dilemma: high property rights clarification costs, uneven benefit distribution, and multi-actor collaboration difficulties. At the property rights confirmation level, although approximately 70% of homesteads nationwide have completed registration and certification, cumulative homestead-related judicial cases have exceeded 600,000, of which an estimated 5–10% of disputes remain difficult to resolve effectively at the grassroots level due to ambiguous property rights and complex historical issues, constituting a governance bottleneck [4,39]. At the benefit distribution level, the distribution ratios of value-added benefits among different actors vary significantly, with village collectives consistently receiving disproportionately low shares across various consolidation models [40,41]. At the multi-actor collaboration level, this remains a challenge yet to be adequately addressed. A typical case is Nanxi Village in Ninghai County, Zhejiang Province, where a plot of less than 5 mu became mired in a 20-year deadlock due to difficulties in interest coordination [41,42]. These dilemmas converge on a core proposition: how can the divergent interests of multiple actors be reconciled, and how can their actions be coordinated?

Existing studies still exhibit gaps. At the theoretical level, the current literature predominantly adopts a static “structure–institution” approach, treating governments, enterprises, village collectives, and farm households as actors with fixed roles and functions, focusing on the unidirectional constraints of institutions on behavior while neglecting the dynamic processes of continuous interaction and mutual adaptation among multiple actors [31,43]. At the practical level, the difficulties in revitalizing idle homesteads stem from the disorderly interaction among multiple actors in the “resources–assets–capital” conversion chain: internal relationships of rights, responsibilities, and interests remain unclear [21]; external capital lacks local network support, making it difficult to integrate into acquaintance-based rural societies [29,44]. More critically, current international rural research is predominantly situated within the context of private farmland systems in Europe and the United States, whereas China’s homesteads are characterized by collective ownership. Their revitalization involves unique issues such as the “separation of three rights” reform and the cultivation of collective economic organizations. Coupled with the simultaneous coexistence of productivist, consumption, and globalization stages in a “compressed” transition, Western paradigms are not readily transferable. However, institu-

tional friction resulting from communal property rights is not unique to China. Approximately 90% of land in Sub-Saharan Africa remains under customary rights, with only 10% formally registered [45,46]; customary communities in Southeast Asia confront dilemmas of legal fragmentation [47]; and the ejido system in Latin America faces challenges of tenure ambiguity [48]. These regions universally encounter tensions between legal formalization and customary rights, barriers to capital entry, and coordination dilemmas in collective action. Against similar backgrounds, China has promoted the ‘separation of three rights’ reform through administrative intervention, creating a state-empowered pathway. This approach provides a comparative reference for developing countries facing analogous predicaments.

To address these issues, this study grounds itself in China’s institutional context and introduces symbiosis theory as the core framework for interpreting the evolutionary logic of Complex Adaptive Systems (CAS). It conceptualizes governments, enterprises, village collectives, and farm households as symbiotic units with adaptive capabilities. By analyzing the symbiotic environment, symbiotic interface, and symbiotic model, this study constructs an integrated analytical framework—“actor behavioral logics—external environmental constraints—coupling of internal mechanisms”—that strengthens the systemic perspective. A mixed-methods design combines fsQCA of 35 typical Zhejiang villages to identify configurational paths of resource endowment, actor intensity, and industrial integration with in-depth process tracing of 4 representative cases, revealing underlying mechanisms. This study aims to answer two core research questions: (1) From the perspective of rural operation, what combinations of conditions can drive the efficient revitalization of idle homesteads? (2) How should villages with different resource endowments and governance foundations select appropriate revitalization paths to achieve efficient operation? The findings are intended to provide actionable governance solutions for land system innovation in the rural modernization process of developing countries, particularly in the Global South.

2. Theoretical Framework

Since the mid-20th century, global rural development has undergone a multi-stage restructuring, transitioning from productivism to multifunctionality and then to globalization. During this process, the core value of rural space has continuously expanded, gradually evolving from a traditional carrier of agricultural production into a composite functional space integrating residence, leisure, ecology, and cultural heritage. Driven by the dual forces of spatial commodification and cross-border factor flows, the activation and efficient utilization of idle resources have become a central task of contemporary rural restructuring. Against this macro background, the revitalization and utilization of idle rural homesteads serve not only as a key lever to address rural resource idleness and factor outflows, but also as a complex adaptive system encompassing multi-actor collaboration, factor mobility, and multi-objective coordination [49]. Because this system integrates production, living, ecological, and governance attributes, it exhibits significant nonlinear interaction characteristics, making the traditional single-dimensional linear analytical paradigm ineffective at explaining its inherent operational logic.

Therefore, this study introduces symbiosis theory as an analytical tool for complex adaptive systems. This theory originally stemmed from the concept of “symbiosis” in biology, which was first proposed by the German biologist Anton de Bary in 1879 [50]. Its core value lies in revealing the co-evolutionary relationships between a system as a whole and its constituent units, achieving overall benefit maximization by optimizing the interaction mechanisms of various elements within the system [51]. Symbiosis theory offers unique applicability and comparative advantages in explaining multi-actor interactions within idle homestead revitalization. This analytical relevance stems from the structural

alignment between the revitalization process and the operational logic of a symbiotic system; the former can be viewed as an open, dynamic, and multi-interactive symbiotic system. Among the prevailing mainstream theories, collaborative governance theory emphasizes consensus-building through multi-actor negotiation but struggles to capture the nonlinear interactions and self-organizing evolution of rural systems [52]. Actor-network theory excels at describing network construction processes but lacks tools for evaluating structural constraints and outcomes [53]. The Social-Ecological Systems framework provides a multi-level analytical structure with strong macro-orientation, yet its operationalization remains somewhat insufficient [54]. In comparison, symbiosis theory offers the integrative advantage of combining micro-level actor behavior analysis, meso-level interface interaction, and macro-level system evolution. It effectively captures the multiple concurrent causal relationships and nonlinear synergistic effects among various governance factors in rural operation, making it a more suitable analytical theory for examining the multi-level coupling mechanisms in idle homestead revitalization. Using the systematic analytical framework of symbiosis theory, this study abstracts the resource conditions, multiple actors, industrial development, and benefit distribution within homestead revitalization into the symbiotic environment, symbiotic units, symbiotic interface, and symbiotic model, respectively. This reveals the co-evolutionary mechanisms within the system, thereby providing a clear theoretical framework for addressing the key question of “how to construct an effective governance structure among different actors to enhance revitalization performance” (see Figure 1).

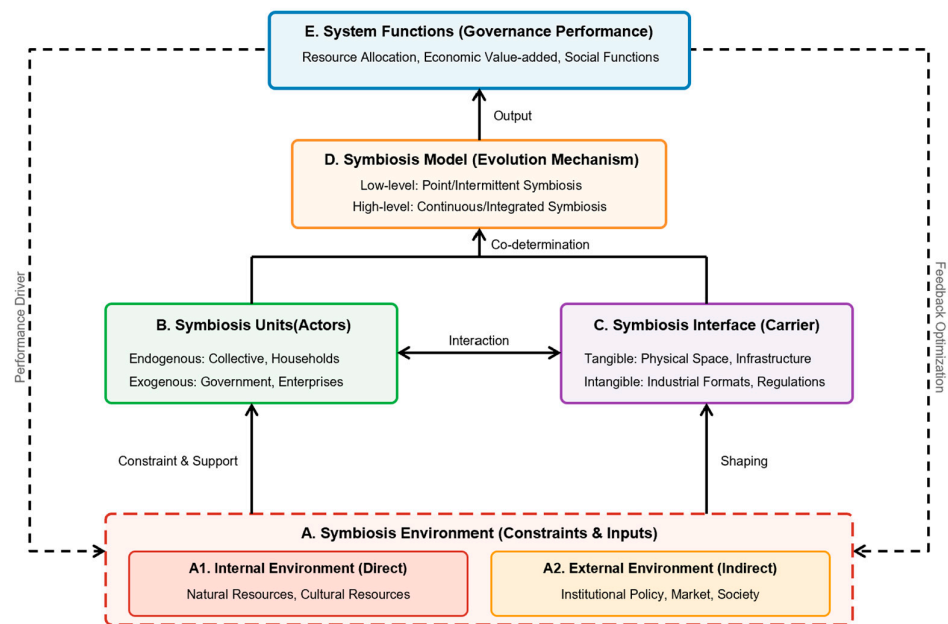


Figure 1. Theoretical Framework.

2.1. Symbiotic Environment

This refers to the sum of external conditions for the existence and evolution of a symbiotic system. It provides action boundaries, incentive orientations, and binding rules for symbiotic units, playing a key role in supporting, maintaining, or regulating symbiotic relationships [55]. In the symbiotic system of idle homestead revitalization, the symbiotic environment can be divided into internal and external environments based on factor sources and attributes. The internal environment refers to the inherent ontological conditions of the rural system, mainly comprising the natural resource environment and the

cultural environment, which together serve as the spatial carrier and value core for revitalization and utilization [56]. For instance, the natural resource environment determines the material potential and industrial format adaptability boundary for homestead development [57], while the cultural resource environment shapes the unique positioning and differentiated competitiveness of revitalization projects [58]. The external environment is input from outside the system, encompassing macro-conditions such as institutional policies, markets, and society. It primarily performs guiding, regulatory, and safeguarding functions, providing institutional incentives and market foundations for the participation of multiple actors. Since the external environment mostly exerts indirect effects through government support, capital investment, and interest linkages [59,60], this study focuses on the regional and stable internal environment, concentrating on the foundational influence of natural and cultural resources on the revitalization process.

2.2. Symbiotic Units

These refer to the symbiotic actors, constituting the basic units of a symbiotic system. They are the core entities that participate in the exchange of materials, energy, and information [61]. Their behavioral preferences and interactive capabilities directly shape the foundational basis and evolutionary direction of the symbiotic structure [62]. In the symbiotic system of revitalizing idle rural homesteads, a dual structure of endogenous local forces and exogenous embedded forces is evident. Endogenous units primarily consist of village collectives and villagers, providing internal support based on property rights, local networks, and place-based resources [63–65]. Exogenous units are primarily composed of governments and enterprises, supplying external momentum through policies, capital, and professional operation [66,67]. These two types of actors have complementary resource endowments and differentiated functional positions, together forming the core action basis for homestead revitalization governance.

2.3. Symbiotic Interface

This serves as the core link connecting symbiotic units, functioning as the channel and carrier for the exchange of resources, information, interests, and energy [68]. It encompasses both tangible interfaces, such as physical space and facility platforms, and intangible interfaces, such as institutional rules and social relationships. Its core function is to reduce transaction costs, facilitate factor mobility, and ensure synergistic operation. In the process of homestead revitalization and utilization, the symbiotic interface takes the concrete form of industrial formats and industrial integration. It is the key arena where multiple actors cooperate and achieve value co-creation, mainly embodied in diverse formats such as homestays and wellness tourism, rural tourism, cultural experiences, and e-commerce warehousing [69,70]. Industry, as the core interface, effectively connects exogenous factors (policy, capital, technology) with endogenous resources (homesteads, local culture) on the one hand, facilitating the local adaptation of external factors. On the other hand, through industrial chain extension and format diversification, it enhances resource utilization efficiency and value-added potential, driving the symbiotic system from low-level mutuality towards high-level synergistic evolution. Therefore, the richness and degree of integration of the symbiotic interface directly influence the depth of actor interaction, the efficiency of resource transformation, and the sustainability of the revitalization and utilization process.

2.4. Symbiotic Model

This refers to the stable form of relationship formed through long-term interaction among symbiotic units, which centrally reflects the intensity of interaction, the closeness of linkages, and the benefit distribution mechanisms among actors [71]. Based on the level

of synergy, it is typically divided into four progressive levels: point symbiosis, intermittent symbiosis, continuous symbiosis, and integrated symbiosis, ranked from low to high. In the homestead revitalization system, the symbiotic model is jointly shaped by the constraints of the symbiotic environment and the behaviors of the symbiotic units. When villages are characterized by resource scarcity and cultural hollowing-out, the attractiveness of the environment is insufficient, and the system often remains at the point or intermittent symbiosis stage, dominated by short-term leasing and seasonal operations. This is manifested in loose linkages, high transaction costs, low resource integration efficiency, and unstable benefit distribution. Conversely, when natural and cultural resources possess dual advantages, the system is more likely to evolve toward continuous and integrated symbiosis [72–75]. In such cases, actors achieve high-frequency interaction and benefit distribution through shareholding cooperation and whole-village operations, leading to significantly improved mutual trust and synergistic efficiency, which is conducive to resource value appreciation and long-term operation. Promoting the upgrading of the symbiotic model from lower levels to continuous and integrated symbiosis represents a key pathway for improving the governance performance of homestead revitalization.

2.5. System Function

This refers to the comprehensive effect generated by the overall operation of the symbiotic system. It is the resultant representation of the synergistic action of all elements, primarily embodied in the generation and distribution of symbiotic energy (i.e., system value-added) [76]. Systems theory emphasizes an analytical closed-loop integrating structure, process, and function [77,78]. However, existing rural governance studies based on symbiosis theory have largely focused on characterizing structures and operational processes [79], while neglecting the evaluation of operational outcomes [69]. Some scholars have pointed out the need to extend the symbiosis theory framework to the domain of governance performance assessment, in order to bridge the gap between process analysis and outcome verification [80]. Therefore, this study adds the system function dimension to address this theoretical gap. In the context of idle homestead revitalization and utilization, system function corresponds to the governance performance of the revitalization process, serving as the ultimate output of the co-evolution of the symbiotic environment, symbiotic units, symbiotic interface, and symbiotic model. Specifically, the system function of revitalization and utilization is manifested in three dimensions. The first is the resource allocation function, reflected in the utilization rate of idle homesteads, which indicates the level of optimal allocation of existing land resources [81,82]. The second is the economic function, realized through industrial embedding and format innovation, which turns resources into assets, thereby increasing the income growth rate of village collectives and the income growth rate of rural households [69]. The third is the social function, which involves enhancing rural cohesion through the reconstruction of public space and increased participation, thereby improving governance effectiveness and villagers' sense of gain [83]. The optimized combination of the symbiotic environment, units, interface, and model ultimately aims to achieve a leap in governance performance—from idle resources to value co-creation—through functional coupling.

3. Research Methodology

3.1. Research Methods

The revitalization and utilization of idle rural homesteads constitutes a complex systemic process driven by multiple factors and characterized by the synergistic action of multiple actors. Its governance performance is not linearly determined by any single variable but depends instead on the combined interplay of multiple conditions. Traditional

quantitative research methods struggle to effectively capture this kind of non-linear, equifinal, complex causality. While single case studies can provide in-depth explanations, they face limitations in external validity and difficulty in generating generalizable conclusions [84]. The core advantage of fsQCA lies in its ability to uncover multiple configurational causal relationships, overcoming the limitation of regression analysis that requires variables to be parallel and independent. It identifies different configurational paths driving high-performance revitalization from a holistic perspective, yet it falls short in explaining dynamic evolutionary logics. Therefore, this study introduces multiple case studies to conduct in-depth tracing of the configurational evolution process, aiming to compensate for the limitations of configuration analysis in temporal dimensions and dynamic mechanisms through case narratives, thereby achieving a balance between breadth and depth.

First, this study employed the fsQCA method to handle asymmetric relationships and multiple equifinal paths within a medium- N sample ($N = 35$) [85]. By operationalizing the symbiotic units, symbiotic environment, symbiotic interface, and symbiotic model derived from the symbiosis theory framework as condition variables, and governance performance as the outcome variable, Boolean algebra was used to identify typical configurational paths leading to high and low performance. This approach revealed the multiple configurational mechanisms of governance factors at an aggregate level. Subsequently, to address the limitation that fsQCA can only reveal set-theoretic relationships but cannot explain social processes and actor interaction mechanisms [86], this study further conducted case analyses. Based on the key configurations identified by fsQCA, typical high-performance cases were selected for in-depth analysis. Through retrospective within-case analysis and cross-case comparison, the driving mechanisms and action logics underlying the condition configurations were uncovered. This compensated for the limited micro-level explanatory power of fsQCA, thereby enhancing the credibility and theoretical saturation of the research findings.

The selection of research samples followed the principle of maximum variation, covering villages with different economic levels, resource endowments, and locational conditions, to ensure the case heterogeneity required for configuration analysis. The empirical analysis was advanced in three stages: In the first step, after completing variable calibration and data standardization, fsQCA 4.1 software was used to conduct necessity tests and condition configuration analysis to identify the multiple governance models that drive high revitalization performance. In the second step, empirical elaboration was carried out by integrating typical case studies, and the formation mechanisms of different configurational paths were analyzed in depth. In the third step, optimization schemes for idle home-stead revitalization governance, tailored to different village resource endowments and development stages, were distilled, thereby providing theoretical and practical references for improving rural governance structures. The technical roadmap is presented in Figure 2.

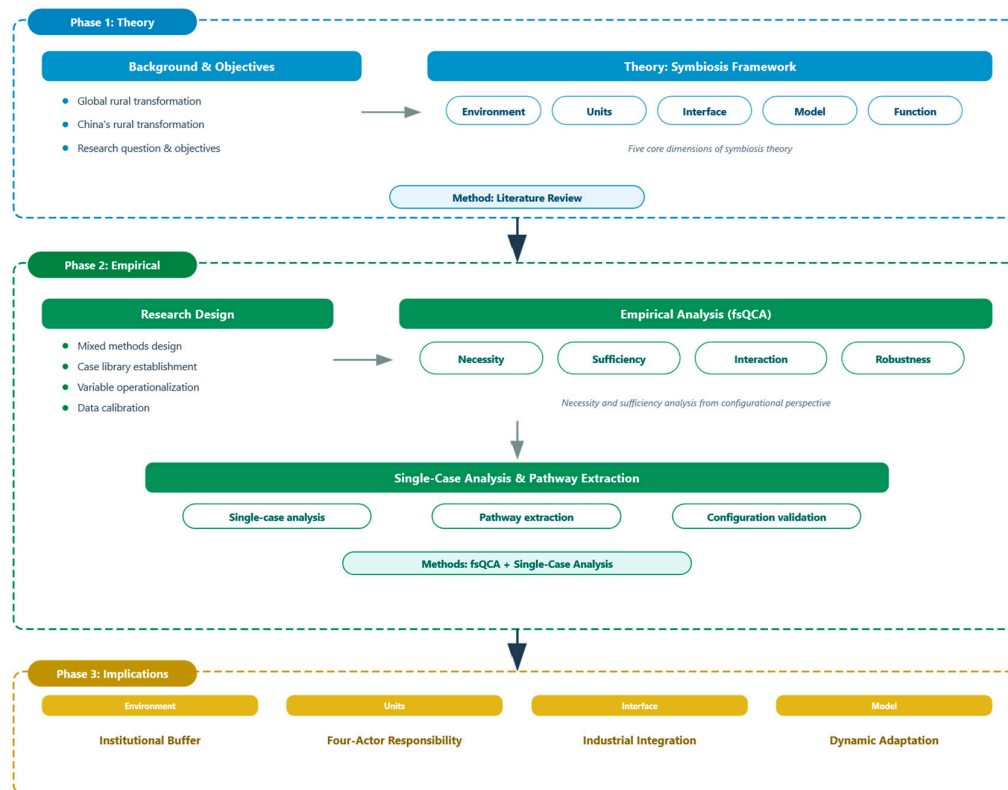


Figure 2. Technical Roadmap.

3.2. Case Selection and Data Collection

Against the backdrop of deepening urbanization, Zhejiang Province, as a pioneer in urban–rural integrated development in China, had already achieved a permanent resident urbanization rate of 75.5% by 2024. Following the continuous out-migration of rural labor to cities and county seats, the outflows of rural factors have induced a notable phenomenon of “houses left vacant as people leave.” According to statistics, by 2025, the total number of idle rural houses in the province had reached 222,000 units, of which approximately 100,000 were long-term idle and approximately 120,000 were seasonally or partially idle. Notably, the spatial distribution of idle homesteads exhibits significant unevenness: in remote mountainous and island areas, the idling problem is particularly acute. Taking Jiangshan City in 2022 as an example, the idling rate of homesteads and rural houses reached 17.5%, with some natural villages even falling into the predicament of “whole-village shrinkage” and “comprehensive idling.” This large-scale resource mismatch has not only led to the loss of rural land factors but has also resulted in the inefficient operation of rural infrastructure. Zhejiang Province, as a pioneer pilot province for rural revitalization and rural land system reform in China, exhibits significant regional gradients in socioeconomic development, rich and diverse rural resource endowments and village development forms, and mature practical models for idle homestead revitalization, making it a typically representative region for studying homestead revitalization. To this end, this study strictly adhered to the principles of theory guidance and maximum variation, selecting 35 sample villages in Zhejiang Province. The spatial coverage includes three major regions: Northeast Zhejiang, Central Zhejiang, and Southwest Zhejiang. The village types include four categories: suburban, plain agricultural, mountainous ecological, and historical-cultural. The economic dimension distinguishes among low, medium, and high economic development gradients (see Table 1 for details). By maximizing case variance across

multiple dimensions, this ensures sample heterogeneity, coverage, and regional representativeness, fully meeting the requirement of configuration analysis for diverse cases. Through systematic multi-case comparison and fsQCA, the key condition configurations influencing the performance of idle homestead revitalization and their multiple concurrent causal relationships were identified, aiming to deeply analyze the internal mechanisms and optimization paths for generating high performance, thereby providing empirical support for homestead system reform.

Table 1. Sample Distribution of Villages by Spatial Zone and Typology.

Dimension	Category	Number of Samples (n)	Proportion (%)
Spatial Zone ¹	Northeast Zhejiang	20	54.14
	Central Zhejiang	8	22.86
	Southwest Zhejiang	7	20.00
	Total	35	100
Village Typology	Suburban Villages	5	14.3
	Plain Agricultural Villages	7	20
	Mountain Ecological Villages	13	37.1
	Historical-Cultural Village	10	28.6
	Total	35	100
Economic Level ²	High	11	31.43
	Medium	13	37.14
	Low	11	31.43
	Total	35	100

Note: ¹ Classification criteria for spatial zones: Following the conventional practice of Zhejiang Province's economic regionalization, the sample villages are divided into three major regions: Northeast Zhejiang (Hangzhou, Ningbo, Jiaxing, Huzhou, Shaoxing, and Zhoushan), Central Zhejiang (Jinhua and Quzhou), and Southwest Zhejiang (Wenzhou, Taizhou, and Lishui). ² Classification criteria for economic levels: Based on each village's collective economic income in 2025, the samples are divided into low, medium, and high groups using the tertile method. Specifically, the low-level group falls below the 33.3rd percentile (<664.9 thousand CNY), the medium-level group lies between the 33.3rd and 66.7th percentiles (664.9–1234.5 thousand CNY), and the high-level group exceeds the 66.7th percentile (>1234.5 thousand CNY). (Original data unit: 10,000 CNY).

To obtain research data, this study conducted a systematic survey covering relevant villages in 11 prefecture-level cities and 2 subordinate counties (cities/districts) in Zhejiang Province. Structured data required for configurational analysis were collected through targeted distribution of standardized questionnaires. At the same time, field investigations were carried out in selected typical villages, and semi-structured interviews were conducted with key informants and core stakeholders, including village cadres, business operators, tourists, rural operation managers, and villagers. These interviews captured the details of actor interactions and practical dilemmas in the homestead revitalization process, compensating for the limitations of the questionnaire data. Admittedly, this study is subject to potential measurement bias, as the questionnaires were primarily completed by single key informants, whose individual cognitive frames may introduce partial information bias. To mitigate this limitation, a multi-source data triangulation strategy was implemented: internal cross-verification was conducted through field interviews with multiple stakeholders, while external comparison was performed using publicly available sources, including government statistical yearbooks, official websites, WeChat public accounts, and rural operation platforms. This triangulation procedure effectively offsets the information bias inherent in single-informant reporting, thereby en-

sureing the authenticity and reliability of the data and providing a solid foundation for the subsequent configurational analysis.

3.3. Variable Measurement and Calibration

This study focused on the synergistic mechanisms of multiple governance factors in the revitalization and utilization of idle homesteads, systematically revealing the differentiated impact paths of different factor combinations on revitalization performance. Through literature review and theoretical refinement, the four core dimensions of symbiosis theory—symbiotic environment, symbiotic units, symbiotic interface, and symbiotic model—were transformed into operational variables for the governance structure of homestead revitalization, as shown in Table 2. Variable selection strictly followed the principles of theory-driven and operationally feasible approaches, ensuring that the variables could capture the core characteristics of the governance structure and their mechanisms of action on revitalization performance.

Table 2. Variable Definitions and Calibration Standards.

Category	Theoretical Basis	Core Variable	Variable Code	Sub-Variable	Sub-Variable Code	Operational Definition and Calibration Standard
Condition Variable	Symbiotic Environment	Resource Endowment	C1	Natural Conditions	C11	5: Core of 5A scenic area/rare landscape resources; 4: Surrounding area of 4A scenic area/high-quality contiguous ecological resources; 3: Ordinary landscape/contiguous farmland; 2: Scattered farmland/ordinary village greening; 1: No distinctive natural landscape/average ecological conditions
				Cultural Conditions	C12	5: National-level cultural heritage site/intangible cultural heritage; 4: Provincial-level cultural heritage site/intangible cultural heritage; 3: Municipal-level cultural resources; 2: County-level cultural resources; 1: No distinctive cultural resources
	Symbiotic Units	Actor Richness	C2	Number of actor types stably participating in revitalization	/	5: ≥3 types; 3: 2 types; 1: 1 type
				Degree of government-led project planning and investment attraction	C31	5: Leading planning, investment attraction, and investment; 3: Providing policy guidance and coordination; 1: Routine administrative approval
		Government-Led Intensity	C3	Amount of policy-driven project entries and capital inflows (10,000 RMB)	C32	5: Top 20%; 4: 21–40%; 3: 41–60%; 2: 61–80%; 1: 81–100%
				Degree of operator participation in investment and overall operation	C41	5: Professional institution fully responsible for investment, construction, and operation; 3: Enterprise and collective co-planning and co-sharing; 1: Scattered individual leasing
	Symbiotic Interface	Market-Led Intensity	C4	Registered capital of enterprises within the rural area (10,000 RMB)	C42	5: Top 20%; 4: 21–40%; 3: 41–60%; 2: 61–80%; 1: 81–100%

		Village Collective-Led Intensity	C5	Degree of village collective leadership in operational decision-making	C51	5: Village collective leads the entire process; 3: Village collective assists but does not lead; 1: Village collective is passive or basically non-participatory
				Idle resource integration degree	C52	Proportion of homesteads uniformly transferred by the collective: $\geq 80\%$ = 5; 50–79% = 4; 20–49% = 3; $< 20\%$ = 2; No integration = 1
	Symbiotic Interface	Industrial Integration Degree	C6	Dominant format of homestead revitalization	C61	5: Integration of primary, secondary, and tertiary industries; 3: Composite of secondary and tertiary industries/workshops; 1: Single low-end industry
				Format richness	C62	5: Number of format types ≥ 6 ; 4: 4–5 types; 3: 2–3 types; 2: 1 type; 1: No format
	Symbiotic Model	Interest Linkage Tightness	C7	Tightness of cooperation and distribution model	/	5: Collective-led development type; 4: Shareholding cooperation type (guaranteed minimum + dividend); 3: Cooperative operation type (risk sharing); 2: Fixed leasing type (with contract/medium-long term); 1: Loose transfer type (no contract/short term)
	Outcome Variable	Revitalization Performance	R1	Revitalization and utilization rate of idle homesteads	/	Revitalized area of idle homesteads/Total area of idle homesteads
		Economic Performance	R2	Village collective economy income growth rate	R21	Average growth rate of village collective income over 2–3 consecutive years
				Farm household income growth rate	R22	Average annual growth rate of farm household income over 2–3 consecutive years
		Social Performance	R3	Villager satisfaction	/	Mean score on a 1–10 scale

3.3.1. Condition Variables

Condition variables were selected and measured according to the symbiosis theory framework, drawing from its four core dimensions: symbiotic environment, symbiotic units, symbiotic interface, and symbiotic model.

(1) Symbiotic Environment

C1 Resource Endowment: This refers to the material foundation of the homestead revitalization system, determining the potential and direction of resource development. Following the concept of the symbiotic environment in symbiosis theory, the level of resource endowment was characterized in terms of both natural conditions and cultural conditions [87]. Natural conditions were assigned values based on the development value grade of natural resources surrounding the village, drawing on grading approaches for resource development value from existing studies [88]. This covered a five-grade standard ranging from no distinctive natural landscape to the core of a 5A-rated scenic area or rare landscape resources. Cultural conditions were measured by the grade of surrounding cultural resources, with a five-grade assignment ranging from no distinctive cultural resources to a nationally protected cultural heritage site or intangible cultural heritage. Together, these indicators comprehensively reflected the foundational resource conditions for homestead revitalization.

(2) Symbiotic Units

C2 Actor Richness: This refers to the number of types of core actors stably participating in the revitalization of idle homesteads. The greater the number of actor types, the

more likely a multi-actor synergistic governance structure is to form. This was characterized by the number of actor types stably participating in the revitalization process, including government, village collectives, enterprises, and farm households. Values were assigned based on the number of types (≥ 3 types, 2 types, or 1 type), reflecting the basic condition for multi-actor synergy.

C3 Government-Led Intensity: This reflects the degree of government involvement in project planning, resource introduction, and operational management. The stronger the government's role, the greater its tendency to promote revitalization through policy guidance and public resource investment. Based on the level of government participation in project planning, investment attraction, and investment, this variable was divided into three levels and assigned values accordingly: "leading planning, investment attraction, and investment," "providing policy guidance and coordination," and "routine administrative approval." Additionally, the proportional range of policy-driven project entries and capital inflows was used as a supplementary indicator to further quantify the extent of government support.

C4 Market-Led Intensity: This measures the degree of investment and operational participation by professional operators or enterprises in the revitalization of idle homesteads. Based on whether the operator was fully responsible for planning, investment, and operation, this variable was assigned values across levels ranging from "professional institution fully responsible for investment, construction, and operation," "enterprise and collective co-planning and co-sharing," to "scattered individual leasing." The registered capital of enterprises within the rural area was also used as a supplementary measurement indicator for capital investment.

C5 Village Collective-Led Intensity: This reflects the decision-making power and coordinating capacity of the village collective in the revitalization of idle homesteads. The stronger the collective's role, the more conducive it is to resource integration and benefit sharing. Based on the role positioning of the village collective in operational decision-making, this variable was divided into three levels and assigned values: "village collective leads the entire process," "village collective assists but does not lead," and "village collective is passive or basically non-participatory." The proportion of homesteads uniformly transferred by the collective was also used to characterize the degree of idle resource integration, reflecting the collective's organizational mobilization and resource coordination capacity.

(3) Symbiotic Interface

C6 Industrial Integration Degree: This refers to the extent of extension and integration along the industrial chain of the dominant formats formed through the revitalization of idle homesteads. A higher degree of integration is more conducive to enhancing resource value-added and overall system efficiency. This variable was measured from two aspects: the type of dominant format and the richness of formats. Based on the industrial hierarchy and value-added capacity [89], the dominant format type was divided into three categories and assigned values: "integration of primary, secondary, and tertiary industries," "composite of secondary and tertiary industries/workshops," and "single low-end industry." Format richness was assigned values in a graded manner based on the number of format types, including leisure agriculture, rural tourism, food and beverage consumption, homestay accommodation, cultural experiences, and commercial services, comprehensively reflecting the breadth and depth of industrial integration.

(4) Symbiotic Model

C7 Interest Linkage Tightness: This reflects the cooperation methods and benefit distribution rules formed among different actors around the revitalization of idle homesteads. The tighter the interest linkage, the more conducive it is to forming stable and sustainable symbiotic relationships [90]. Drawing on the classification approaches of interest linkage

mechanisms in existing studies, the cooperation models were divided into five types: loose transfer type, fixed leasing type, cooperative operation type, shareholding cooperation type, and collective-led development type. The degree of linkage tightness and cooperation stability increases progressively across these five models. Through ordinal assignment, this variable distinguished the degree of tightness in an ordered categorical form, reflecting the stability of actor interaction and the benefit distribution mechanism.

3.3.2. Outcome Variable

From the perspective of symbiosis theory, an efficient and stable symbiotic system can maximize system functionality through multi-actor synergistic interaction and optimal factor allocation. This is primarily manifested in improved resource utilization efficiency, value-added, and comprehensive benefit enhancement, the essence of which is the operational performance of the symbiotic system. Therefore, this study adopted governance performance as the core outcome variable to test the comprehensive impact of different symbiotic models on the effectiveness of homestead revitalization. To fully capture the multidimensional characteristics of system functionality, governance performance was operationalized as a composite concept, measured across three dimensions: revitalization performance, economic performance, and social performance [40]:

(1) R1 Revitalization Performance: This was measured by the revitalization and utilization rate of idle homesteads, reflecting the degree of resource activation. It was operationally defined as “the area of successfully revitalized idle homesteads/the total area of idle homesteads in the village.”

(2) R2 Economic Performance: This included two indicators: the village collective economy income growth rate and the farm household income growth rate. The former reflects the collective’s resource value-added capacity and was defined as “the average growth rate of village collective economic income over 2–3 consecutive years.” The latter reflects the income improvement of villagers in the revitalization process and was defined as “the average annual growth rate of per capita disposable income of farm households over 2–3 consecutive years.”

(3) R3 Social Performance: This was measured by villager satisfaction, reflecting the degree of recognition and social acceptance of the governance process. Subjective evaluations of the revitalization outcomes were obtained through a questionnaire survey, using a 1–10 point scale. This was operationally defined as “the average score of villager satisfaction.”

3.3.3. Data Processing and Calibration

Prior to conducting the fsQCA configuration analysis, this study carried out systematic preprocessing and operationalization of the multi-source data. First, sample data cleaning was performed to eliminate invalid cases with logical contradictions or missing key information, ultimately retaining 35 valid cases, thereby ensuring the completeness and reliability of the sample data. Second, for the condition variables and outcome variables comprising multiple sub-indicators, the extreme value method was adopted to standardize dimensions; subsequently, the successive equal weighting method was applied to assign weights to each sub-indicator, laying the data foundation for subsequent calibration.

Following the completion of data preprocessing, descriptive statistics were conducted for all condition variables and outcome variables to observe the value ranges and central tendencies of the variables (see Table 3), thereby grasping the overall data structure of the sample and providing a basis for the selection of calibration anchors. This study employed the direct calibration method [91] to set the calibration anchors: full membership (0.95), crossover point (0.5), and full non-membership (0.05). For categorical variables such as actor richness and interest linkage tightness, fuzzy-set scores were assigned

through equal-interval mapping: original values ranging from 1 to 5 were mapped to fuzzy-set scores of 0.05, 0.25, 0.5, 0.75, and 0.95, respectively. For continuous variables such as revitalization utilization rate and economic growth rate, the logistic calibration formula was applied for calculation.

Table 3. Descriptive Statistics of Variables.

Core Variable	Sub-Variable	Maximum	Minimum	Mode
Resource Endowment	Natural Conditions	5	1	4
	Cultural Conditions	5	1	4
Actor Richness	Number of actor types stably participating in revitalization	5	1	5
Government-Led Intensity	Degree of government-led project planning and investment attraction	5	1	3
	Amount of policy-driven project entries and capital inflows (10,000 RMB)	15,000	0	0
Market-Led Intensity	Degree of operator participation in investment and overall operation	5	1	3
	Registered capital of enterprises within the rural area (10,000 RMB)	5000	0	0
Village Collective-Led Intensity	Degree of village collective leadership in operational decision-making	5	1	5
	Idle resource integration degree	5	1	5
Industrial Integration Degree	Dominant format of homestead revitalization	5	1	5
	Format richness	5	2	4
Interest Linkage Tightness	Tightness of cooperation and distribution model	5	1	2
Revitalization Performance	Revitalization and utilization rate of idle homesteads	1	0	1
Economic Performance	Village collective economy income growth rate	0.73	−0.03	0
	Farm household income growth rate	0.37	0.01	0.1
Social Performance	Villager satisfaction	10	5	10

4. Qualitative Comparative Analysis

4.1. Necessary Conditions for Single Variables

The analysis of necessary conditions is used to determine whether a single condition variable constitutes a necessary condition for achieving high governance performance. When the consistency of a condition exceeds 0.9, that condition can be regarded as necessary for the outcome [92]. This study employs fsQCA 4.1 software to test the necessity of the seven antecedent conditions. The results are presented in Table 4. The analysis shows that only the consistency of industrial integration degree exceeds 0.9, indicating that industrial integration constitutes a necessary condition for high performance in the revitalization and utilization of idle homesteads and plays a foundational role in promoting such revitalization. This finding is highly consistent with the sample characteristics. Among the villages covered in this study, the majority have already developed integrated formats dominated by the tertiary sector—such as cultural tourism, homestays, and study tours—with a rich variety of format types, indicating that industrial integration has become a prevalent precondition for high-performance revitalization. The consistency values of village collective-led intensity and government-led intensity rank second and third, respec-

tively, highlighting the importance of actor agency. From a counterfactual analysis perspective, the absence of government-led intensity and insufficient industrial integration degree emerge as key constraining factors leading to low governance performance. This result validates, from a negative perspective, the foundational role of government guidance and industrial support in homestead revitalization.

These findings indicate that no single condition alone constitutes a sufficient condition for high governance performance in homestead revitalization. Instead, improving governance performance requires the synergistic interaction of multiple factors, demonstrating the necessity of adopting a configurational perspective for in-depth analysis.

Table 4. Analysis of Necessary Conditions.

Condition Variable	High Governance Performance		Low Governance Performance	
	Consistency	Coverage	Consistency	Coverage
Good Resource Endowment	0.6605	0.7979	0.7646	0.5697
Poor Resource Endowment	0.6438	0.8159	0.7288	0.5697
High Actor Richness	0.7769	0.7067	0.8208	0.4605
Low Actor Richness	0.4069	0.7864	0.4772	0.5689
High Government-Led Intensity	0.8047	0.7177	0.9120	0.5018
Low Government-Led Intensity	0.4414	0.8905	0.4869	0.6059
High Market-Led Intensity	0.8012	0.7349	0.8403	0.4754
Low Market-Led Intensity	0.4281	0.8130	0.5314	0.6224
High Village Collective-Led Intensity	0.8291	0.6927	0.9024	0.4650
Low Village Collective-Led Intensity	0.3597	0.8566	0.4037	0.5929
High Industrial Integration Degree	0.9096 ¹	0.6644	0.9113	0.4105
Low Industrial Integration Degree	0.1929	0.7790	0.2549	0.6351
Tight Interest Linkage	0.5915	0.7880	0.7695	0.6323
Loose Interest Linkage	0.6875	0.8358	0.7419	0.5283

¹ Bold values indicate consistency exceeding 0.9, signifying a necessary condition.

4.2. Condition Configuration

Based on the data characteristics of the 35 homestead revitalization cases and the distribution of the truth table, this study sets the raw consistency threshold at 0.8, the PRI consistency threshold at 0.7, and the case frequency threshold at 1. Through standard analysis of the condition combinations, the complex solution, parsimonious solution, and intermediate solution are obtained respectively. By comparing the nested relationships between the parsimonious and intermediate solutions, the core conditions and peripheral conditions in each path are identified. Table 5 presents four condition configurations leading to high governance performance in homestead revitalization, corresponding to four distinct realization paths. The consistency of all individual paths and the overall solution exceeds 0.85, indicating that the configuration analysis results are highly reliable. The overall solution consistency is 0.935, meaning that in cases meeting any of the paths, 93.5% achieve high performance. The overall solution coverage is 0.615, indicating that these four paths together explain 61.5% of the high-performance cases, revealing the complex configurational relationships underlying homestead revitalization.

Table 5. Results of Multi-Variable Configuration Analysis.

Condition Configuration	Configuration 1	Configuration 2	Configuration 3	Configuration 4
Revitalization Path	Market-Driven	Government-Led	Multi-Actor Co-Governance	Endogenous Development
Representative Case	Yongwang Village	Qingshan Village	Lujia Village	Xilifang Village
Resource Endowment	○	○	/	●
Actor Richness	○	●	●	⊗

Government-Led Intensity	/	●	●	●
Market-Led Intensity	●	/	●	●
Village Collective-Led Intensity	○	●	●	●
Industrial Integration Degree	●	●	●	●
Interest Linkage Tightness	⊗	⊗	⊗	●
Consistency	0.967	0.934	0.928	0.975
Raw Coverage	0.164	0.262	0.364	0.207
Unique Coverage	0.106	0.039	0.127	0.106
Overall Coverage			0.615	
Overall Consistency			0.935	

Note: ● indicates the presence of a core condition; ● indicates the presence of a peripheral condition; ⊗ indicates the absence of a core condition; ○ indicates the absence of a peripheral condition; blank spaces indicate that the presence or absence of the condition does not affect the outcome.

Based on the macro-level context of the global rural restructuring transition from “productivism” to “post-productivism,” and particularly the parallel and compressed development characteristics exhibited by rural China, the four high-performance configurations identified in this study essentially represent four typical symbiotic models that have evolved in different villages to maximize system functionality, driven by the dual forces of spatial commodification and cross-border factor flows.

4.2.1. Configuration 1: Market-Driven Path

The condition combination of Configuration 1 features high market-led intensity and low interest linkage tightness as core conditions, complemented by low resource endowment, low actor richness, low village collective-led intensity, and high industrial integration degree as peripheral conditions. This combination effectively drives high governance performance. From the perspective of symbiosis theory, this path exhibits the combined characteristics of a weak symbiotic environment, a single market unit as the dominant actor, a strong symbiotic interface, and a weak symbiotic model, corresponding to a spatial commodification restructuring driven by external capital. In villages with weak resource endowments and insufficient endogenous capacity, market actors, leveraging their advantages in capital and operation, become the core symbiotic unit. Through high-integration formats such as homestays and cultural tourism, they facilitate the transformation of rural spaces from traditional production spaces to consumption spaces. The symbiotic interface, characterized by a high degree of industrial integration, effectively compensates for resource deficiencies, while the loose interest linkage and low village collective participation manifest as an intermittent symbiotic form. This path demonstrates that resource-poor villages can achieve efficient revitalization by relying on external market forces and a strong industrial interface, representing a typical model of spatial commodification restructuring in rural areas.

4.2.2. Configuration 2: Government-Led Path

Configuration 2 features low interest linkage tightness as a core condition, with low resource endowment, high actor richness, high government-led intensity, high village collective-led intensity, and high industrial integration degree as peripheral conditions. This path represents a combination of a weak symbiotic environment, synergy among multiple strong units, a strong symbiotic interface, and a weak symbiotic model, corresponding to a governance structure restructuring driven by public forces. In villages without advantageous resource endowments, the government and village collective constitute the core symbiotic units: the government provides policy empowerment and resource introduction, while the village collective offers resource coordination, organizational mobilization, and multi-actor participation. Together, they drive the village from a state of hollowing-

out and fragmentation toward organization and synergy. The high degree of industrial integration provides a stable interface for actor interaction, while the loose interest linkage manifests as a continuous symbiotic form. This path validates that a synergy model combining government guidance and village collective leadership can compensate for resource deficiencies through governance restructuring, thereby achieving efficient homestead revitalization.

4.2.3. Configuration 3: Multi-Actor Co-Governance Path

Configuration 3 demonstrates that, under the core conditions of high market-led intensity and loose interest linkage, combined with high actor richness, high government-led intensity, high village collective-led intensity, and high industrial integration degree, high governance performance can be achieved. This path exhibits the typical characteristics of a neutral symbiotic environment, synergy among all actor types, a strong symbiotic interface, and a weak symbiotic model, corresponding to a simultaneous three-dimensional restructuring of society, industry, and space driven by multiple actors. The participation of all actors—government, market, village collectives, and farm households—forms a co-governance pattern, driving the village from a singular agricultural space toward a multifunctional composite space. The high-integration industrial interface provides a platform for factor mobility and value co-creation, while the flexible and loose interest linkage creates a continuous symbiotic form that aligns with the parallel and compressed restructuring characteristics of rural China. This path demonstrates that the combination of multi-actor co-governance and a strong interface represents the most universally applicable revitalization model and currently constitutes the mainstream form of rural operation.

4.2.4. Configuration 4: Endogenous Development Path

Configuration 4 features low actor richness, high government-led intensity, and high market-led intensity as core conditions, with high resource endowment, high village collective-led intensity, high industrial integration degree, and high interest linkage tightness as peripheral conditions to drive high governance performance. This path represents an optimal combination of all elements—a strong symbiotic environment, linkage among three core units (government, market, and village collective), a strong symbiotic interface, and a strong symbiotic model—corresponding to a high-quality, endogenously driven comprehensive rural restructuring. Superior natural and cultural resources provide strong support from the symbiotic environment, offering the material foundation for the transformation of rural spaces from production spaces to consumption spaces. The government, market, and village collective form stable symbiotic units. The high-integration industrial interface enables efficient resource transformation. The tight interest linkage mechanism ensures shared benefits among actors, driving the symbiotic system toward integrated symbiosis. This path not only achieves spatial and industrial upgrading but also realizes the simultaneous optimization of governance structures, social relations, and benefit distribution. Characterized by high-quality interaction among actors, it maximizes resource value and enables long-term operation, representing the ideal configuration for high-quality development in homestead revitalization.

4.3. Potential Interactions Among Conditions

Based on the configuration analysis results, the complex interactions among the condition variables can be further explored, revealing multiple interactive mechanisms—such as synergy and complementarity—within homestead revitalization governance.

(1) Foundational Supporting Role of Industrial Integration. Across all configurational paths, industrial integration degree is present either as a core or peripheral condition, and

it reaches the 0.9 threshold in the necessity analysis. This indicates that industrial integration serves as a foundational supporting condition for improving homestead revitalization performance and constitutes the core interface for realizing resource value transformation and activating rural development momentum.

(2) Synergistic Relationship Between Village Collective-Led Intensity and Government-Led Intensity. A comparative analysis reveals a notable pattern of co-directional change between village collective-led intensity and government-led intensity. In Configurations 2, 3, and 4, village collective-led intensity and government-led intensity are either both present or both absent, indicating a highly synergistic rather than substitutive relationship. This suggests that in homestead revitalization practice, government support and village collective organizational capacity tend to reinforce each other and operate synergistically. The government empowers the village collective through policy preferences, project funding, and talent assistance, while the village collective exercises its core functions of organizational mobilization and resource integration to effectively receive and transform government inputs.

(3) Complementary and Substitutive Relationship Between Resource Endowment and Actor Richness. Comparing Configuration 2 and Configuration 4 reveals a clear inverse complementary pattern in their configurations of resource endowment and actor richness. In Configuration 2, resource endowment is a core missing condition, while actor richness is a peripheral present condition. This suggests that in resource-scarce contexts, extensive participation by multiple actors is needed to compensate for resource deficiencies. In contrast, in Configuration 4, resource endowment is a core present condition, while actor richness is a core missing condition. This indicates that when resource endowments are superior, efficient revitalization can be achieved without relying on broad actor participation; deep synergy among core actors (government, market, and village collective) suffices. This configurational difference reveals a resource substitution mechanism in homestead revitalization: villages lacking resource endowments require the synergistic participation of multiple actors to compensate for their disadvantages, whereas villages with superior resource endowments can streamline actor participation and rely on core actor synergy to achieve efficient operation.

(4) Complementary and Phased Relationship Between Government-Led Intensity and Interest Linkage Mechanisms. In Configurations 2 and 3, interest linkage tightness is consistently a core missing condition. This suggests that under conditions of high government-led intensity, the symbiotic system can maintain operation even when the benefit distribution mechanism is not yet mature, with administrative forces playing a crucial role in providing a safety net and initiating the process. However, in the higher-order symbiotic model represented by Configuration 4, interest linkage tightness becomes a core present condition, together with high levels of government-led intensity, market-led intensity, village collective-led intensity, and resource endowment, forming a governance structure driven by all elements. This distinction reveals a phased complementary relationship between the two factors: administrative forces play a substitutive driving role in the initial stage of revitalization, whereas progress toward sustainable high-performance governance must rely on stable and tight interest linkage mechanisms.

4.4. Robustness Tests

To ensure the reliability and validity of the research findings, this study employs two methods for robustness testing [93]. First, with other parameters constant, the raw consistency threshold was raised from 0.8 to 0.85. The resulting configurations remained consistent with the baseline, showing no substantial changes in structure, coverage, or consistency indicators. The overall solution parameters stayed stable, indicating reliable results. Second, in the PRI consistency threshold sensitivity analysis, it was adjusted from

0.7 to 0.75. The results showed that core condition combinations did not change substantially. Although solution coverage decreased from 0.614 to 0.533, consistency increased from 0.935 to 0.961. This suggests that a higher PRI threshold enables more precise identification of high-performing cases, confirming the robustness of the study's findings. It should be noted that these robustness checks, involving adjustments to fsQCA thresholds, are designed to assess the sensitivity of configurational results to calibration standards; as such, they constitute a rigorous logical validation at the configurational level.

5. Representative Case Studies

Following the identification of four configurational paths to high governance performance through fsQCA, 4 representative villages were further selected for in-depth case analysis. This approach elaborates on the formation mechanisms, actor interaction logics, and practical operational mechanisms of each path, compensating for the limitations of configuration analysis in explaining micro-level processes and enhancing the explanatory power and practical reference value of the research findings.

5.1. Configuration 1: Market-Driven Path

Yongwang Village in Zhenhai District serves as a representative case of Configuration 1 (market-driven path). By relying on market-oriented operation, the village effectively compensated for its own resource and organizational deficiencies, exemplifying this equivalent path.

(1) Symbiotic Environment. Yongwang Village is located in the suburban area of Ningbo, where urban consumer demand is strong. However, its scores for both natural and cultural resources were low (natural conditions: 2; cultural conditions: 1), lacking high-end cultural tourism resources. The village collective's coordination capacity and financial reserves were insufficient, and the types of actors participating in rural development were relatively limited. Nevertheless, rural revitalization policies provided a stable institutional environment, effectively attracting social capital. By May 2024, the government had invested a cumulative total of over 200 million RMB, providing favorable external conditions for market-oriented operation and constituting a mechanism whereby the external environment compensated for the deficiencies of the internal environment.

(2) Symbiotic Units. Yongwang Village developed a four-tier symbiotic structure with market actors as the core, complemented by the village collective, villagers, and the government providing a safety net. A district-level state-owned enterprise, Huigu Company, served as the core market unit, taking full responsibility for project planning, capital investment, unified renovation, targeted investment attraction, and professional operation. The degree of market-led intensity was thus high. The village collective was primarily responsible for the collection, transfer, contracting coordination, and basic implementation of idle homesteads. Villagers obtained stable income by leasing out their homesteads and finding local employment. The government focused on policy provision, land planning, basic infrastructure, and environmental support, without directly intervening in operational activities.

(3) Symbiotic Interface. Relying on market operation, the village achieved a high degree of industrial integration. The Youth Innovation Apartment project provided over 400 high-quality rental housing units, introducing a stable tenant population. Establishments such as a paddy field café and a specialty commercial street received an average of over 2000 daily visitors and attracted more than 400,000 visitors annually. The Rural Youth Innovation Hub attracted 49 resident enterprises, and the Agricultural Innovation Park formed a closed-loop experiential model. This multi-format, integrated interface effectively compensated for the village's resource endowment deficiencies.

(4) Symbiotic Model. The village adopted a loose interest linkage based on fixed rental payments, with overall reliance on the operational capacity of the market actors. The degree of interest linkage tightness was therefore low.

(5) System Function. Driven by the conditions of Configuration 1, Yongwang Village achieved a revitalization and utilization rate of over 80% for idle homesteads. More than 40 farmhouses were uniformly renovated and transferred, and over 1.33 hectares of idle land were revitalized. The village collective's annual income increased from less than 100,000 RMB to over 2 million RMB. Both the farm household income growth rate and villager satisfaction levels remained high. The village successfully transformed into a provincial-level future rural pilot zone and the “back garden” of the Yongjiang Science and Technology Innovation Corridor, demonstrating outstanding comprehensive governance performance. From an evolutionary temporal perspective, early-stage spontaneous transformations by farmers were scattered and inefficient. As the government improved infrastructure and the village collective advanced homestead integration, initial local linkages began to emerge. Following the full entry of the district-level state-owned enterprise Huigu Company, external capital and diverse industries—including youth innovation, cultural creativity, and agricultural innovation—were introduced, propelling Yongwang Village toward integrated symbiosis. The symbiotic evolution logic of this path is illustrated in Figure 3.

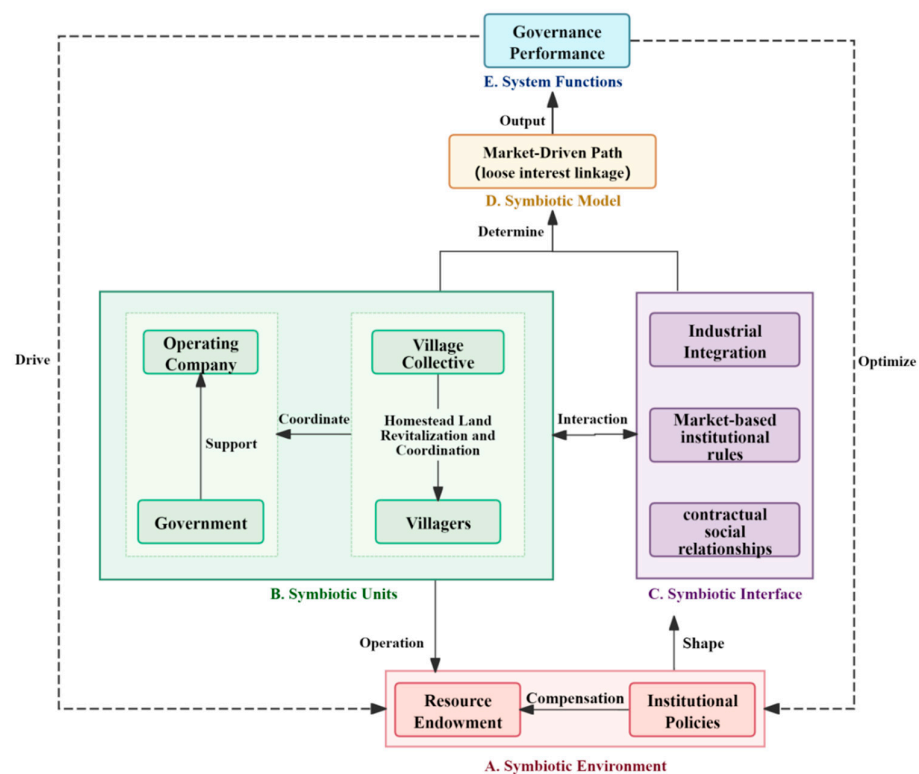


Figure 3. Market-Driven Symbiosis Path.

5.2. Configuration 2: Government-Led Path

Qingshan Village in Yuhang District constitutes a representative case of Configuration 2 (government-led path). By relying on the government and village collective to collaboratively build a multi-actor network, the village successfully achieved efficient revitalization under conditions of resource scarcity.

(1) Symbiotic Environment. Qingshan Village possessed relatively good ecological resources, with a forest coverage rate as high as 79.9% and abundant bamboo production, including important ecological resources such as Longwu Reservoir. However, in the early period, villagers overused chemical fertilizers and pesticides in pursuit of high bamboo yields, leading to excessive nitrogen and phosphorus levels in Longwu Reservoir and creating a vicious ecological cycle of “the more they cultivated, the poorer they became; the poorer they became, the more they cultivated.” This contradiction long constrained the coordinated progress of ecological protection and villager income enhancement, consequently causing outmigration of original residents and creating problems of numerous and scattered idle homesteads, resulting in a low level of resource development and utilization. In 2015, spearheaded by the government and village collective, the ‘Shanshui Fund’ was established. This initiative facilitated the transfer of bamboo forest management rights via a trust model, marking a strategic shift from extracting value from nature to nurturing ecological assets. This action restructured the symbiotic relationships in Qingshan Village, laying a foundation of green hills and clean water for the subsequent entry of multiple actors and industrial transformation and integration. Relying on the future rural pilot zone policy, the institutional environment of the area was significantly optimized.

(2) Symbiotic Units. Actor richness reached a high level, with participating actors including the government, village collective, villagers, designers, non-profit organizations, market actors, and other types of units. Among these, the government played a core guiding role. The Yuhang District government reduced the entry costs for external actors through policy empowerment, financial support, and facility development, while also introducing institutions such as Alibaba Philanthropy, Wanxiang Trust, and The Nature Conservancy to build a multi-resource support network. The village collective assumed resource coordination and operational functions, conducting a comprehensive survey of idle homesteads, establishing a management ledger, and creating a unified operation platform for centralized external cooperation. This not only avoided the problem of scattered, low-rent leasing but also achieved the large-scale revitalization of idle homesteads. The collective leveraged nearly 300 million RMB in social capital, enrolled over 70 households in the “Good Neighbors of Nature” program, and uniformly operated idle houses. It also established a benefit distribution mechanism to guarantee villagers’ triple income from rent, dividends, and employment. Designers, entrepreneurs, non-profit organizations, and others introduced distinctive formats, forming a multi-actor co-governance pattern.

(3) Symbiotic Interface. The industrial integration degree reached a high level, promoting the transformation of the traditional bamboo industry towards ecological cultural tourism, design innovation, and rural leisure. The village received nearly 100,000 visitors annually, forming a core interface for the deep integration of the primary and tertiary industries.

(4) Symbiotic Model. The village adopted a loose, symmetric, and mutually beneficial symbiotic model without strong equity linkages. The government, non-profit organizations, and market actors each obtained policy benefits, public welfare value, and operating profits according to their respective roles. The degree of interest linkage tightness was moderately low (assigned value 2).

(5) System Function. Under the influence of Configuration 2, the scale of homestead transfer in Qingshan Village increased significantly, and economic performance continued to improve. The village collective economy achieved leapfrog growth, with its annual income rising from only 300,000 RMB in 2015 to 9.41 million RMB in 2024, of which operating income reached 3.62 million RMB, a year-on-year increase of 136.6% from the previous period. Farm household income also rose in tandem, with villagers participating in the handicraft and cultural tourism industries experiencing an average monthly income

increase of nearly 3000 RMB. Social performance improved synergistically, with villager satisfaction remaining high. The revitalization efforts not only provided local employment for over 200 people but also achieved talent return. The water quality of Longwu Reservoir steadily improved from Class III/IV to Class I. The village was successively recognized as a 3A scenic village in Zhejiang Province and a national typical case of ecological protection and rural development. Retracing the evolutionary trajectory of Qingshan Village, early ecological degradation led to scattered, spontaneous leasing of idle farmhouses by farmers. In 2015, the “Shanshui Fund” broke the deadlock by transferring bamboo forest management rights through a trust model, prompting the village collective to consolidate resources and attracting diverse actors—including non-profit organizations and designers—to embed themselves in the village. Following the future rural pilot zone policy, the village collective established a unified operation platform and introduced distinctive industries such as eco-cultural tourism and artistic creativity, ultimately achieving a high-level symbiotic state. The symbiotic evolution logic of this path is illustrated in Figure 4.

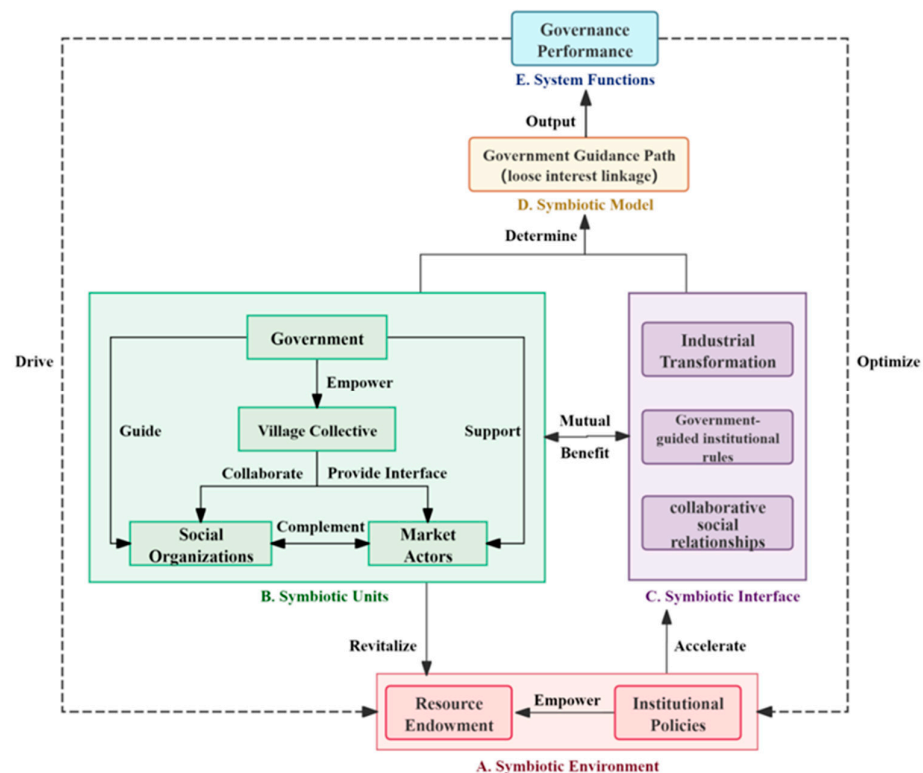


Figure 4. Government-Led Symbiosis Path.

5.3. Configuration 3: Multi-Actor Co-Governance Path

Lujia Village in Anji County constitutes a representative case of Configuration 3 (multi-actor co-governance path). This path exhibits the highest coverage among the four configurations, and the practice of Lujia Village well demonstrates the characteristics of multi-actor synergistic governance.

(1) Symbiotic Environment. Lujia Village was once a debt-ridden village characterized as “dirty, chaotic, and poor,” lacking core cultural tourism and ecological resources. Starting in 2011, the village leveraged policy dividends from initiatives such as the “Thousand Villages Demonstration Project,” beautiful countryside construction, and the “separation of three rights” reform of homesteads. The environment for rural tourism and study tours became increasingly mature, and market-led intensity continued to strengthen. Con-

currently, the government strengthened policy guidance and infrastructure support, investing a cumulative total of over 280 million RMB in infrastructure construction. The governance capacity of the village collective improved continuously, successfully attracting market operators, family farms, social organizations, and other diverse actors. The space for integrating agriculture with tourism, study tours, cultural creativity, and wellness industries continued to expand. The practice of this village demonstrated that a strong policy environment can effectively compensate for initial deficiencies in natural and cultural resources.

(2) Symbiotic Units. Multiple actors—including the government, enterprises, the village collective, farm households, and social organizations—achieved full participation (actor richness value: 5), forming a platform-based symbiotic pattern [94]. Within this pattern, the village collective acted as the platform builder, while the government and market actors served as resource providers. The government was responsible for policy support, land planning, infrastructure development, and regulatory services. With government support, Lujia Village innovatively established an industrial integration development platform of “Company + Village + Family Farm”. The entire village was uniformly planned to create 18 distinctive family farms, transforming ordinary resources into unique advantages. A market operation company was responsible for overall planning, capital introduction, and brand promotion. The village collective played roles in resource integration, interest coordination, organizing villagers, and managing cooperatives. Family farms and operators were responsible for format implementation, product production, and service provision. Villagers contributed land and homesteads as shares and achieved employment and entrepreneurship. Social organizations provided supporting services such as technology, training, and marketing.

(3) Symbiotic Interface. The industrial integration degree of the village reached a high level (value: 5), successfully constructing a composite industrial system integrating agriculture, tourism, study tours, and cultural creativity. Annual visitor numbers exceeded 1.2 million, with study tour groups exceeding 300,000. The multi-format synergy provided interface support for its high governance performance.

(4) Symbiotic Model. The village adopted various flexible distribution methods, including guaranteed minimum dividends, share-based dividends, and rental income, resulting in a moderately low level of interest linkage tightness (value: 2). The efficacy of this loosely coupled interest linkage stemmed from the fact that platform-based operations significantly reduced transaction costs, enabling all parties to gain returns in proportion to their contributions.

(5) System Function. Driven by the conditions of Configuration 3, Lujia Village achieved remarkable results in homestead revitalization performance, with the utilization rate of idle farmhouses exceeding 95%. Economic performance achieved a leapfrog increase, rising from a debt of 1.5 million RMB in 2011 to over 8 million RMB in operating income for the village collective economy by 2024, an increase of over 50 times in collective income within a decade. The effects on increasing farm household income were outstanding, with villagers’ per capita annual income rising from less than 15,000 RMB in 2011 to 58,000 RMB in 2024. Triple income streams from land shares, house rentals, and farm employment drove income growth for every household. Social performance remains among the highest in the province, absorbing over 800 local employees. The village has been successively recognized as a National Rural Governance Demonstration Village and a National Beautiful and Livable Village, becoming a benchmark sample of multi-actor co-governance under the “Thousand Villages Demonstration Project.” Social capital continues to flow in, and its comprehensive governance performance ranks among the top in the province. Surveying the transformation trajectory of Lujia Village, early-stage scattered leasing of idle farmhouses by farmers, lacking planning, resulted in unstable income. From 2011

onward, leveraging the “Thousand Villages Demonstration Project” and the “separation of three rights” reform of homesteads, the village collective took the lead in establishing family farms and introducing market actors, initiating large-scale integration. Following government investment in infrastructure improvements, the “Company + Village + Family Farm” platform was ultimately established. Family farms and diverse industries—such as study tours and cultural tourism—were introduced in clusters, achieving full integration of multiple actors and ultimately realizing an integrated symbiotic form. The symbiotic evolution logic of this path is illustrated in Figure 5.

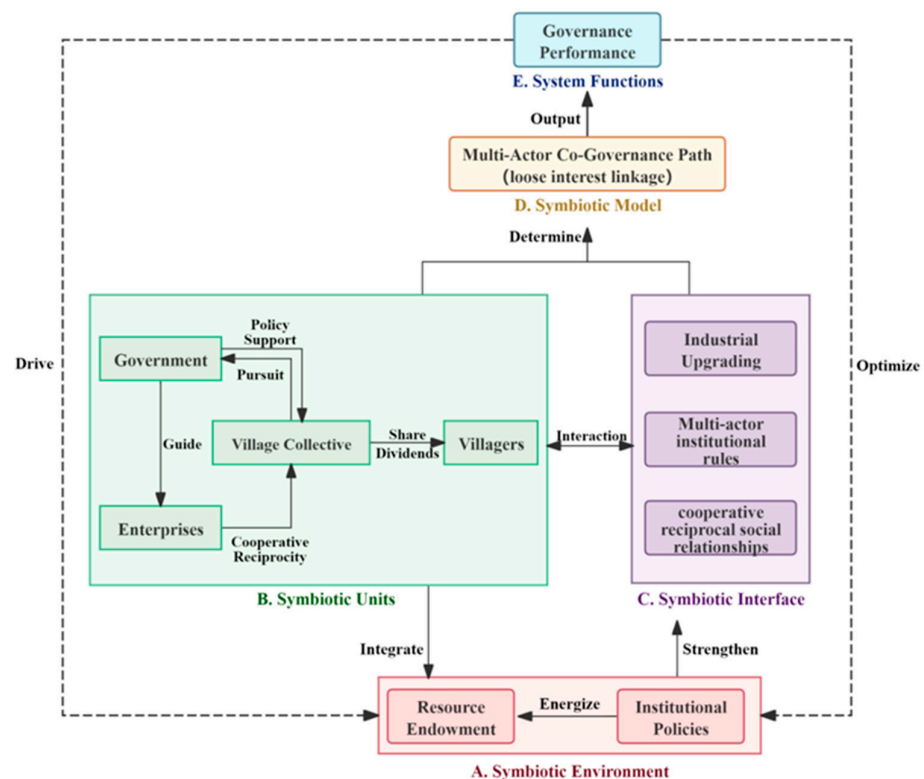


Figure 5. Multi-Actor Co-Governance Symbiosis Path.

5.4. Configuration 4: Endogenous Development Path

Xilifang Village in Xiangshan County constitutes a representative case of Configuration 4 (endogenous development path). This path exhibits the highest consistency and optimal sustainability among the four configurations, reflecting the synergistic effect of streamlined actors and tight interest linkage under conditions of high resource endowment.

(1) Symbiotic Environment. Xilifang Village possesses high resource endowment advantages (natural conditions: 4; cultural conditions: 5). As a provincial-level historical and cultural village, it holds unique resources including Ming and Qing dynasty ancient architecture, distinctive stone houses, and maritime culture. Prior to 2018, the village’s ancient buildings faced deterioration, idleness, and a lack of maintenance, with the village collective’s annual income below 100,000 RMB and a single, undiversified economic format. With the advancement of policies such as art-driven rural construction, ancient village protection, and the “separation of three rights” reform of homesteads, market demand for leisure vacations and cultural experiences grew increasingly strong, providing a favorable environment for the revitalization of the ancient village.

(2) Symbiotic Units. The core decision-making actors were streamlined to three parties: the government, the village collective, and a single operating company (actor richness

value: 3), forming a pattern of few actors with deep binding. The Xiangshan County government played a guiding and enabling role, launching artist-in-residence programs and introducing professional art institutions and operation teams to inject creative energy and market resources into the revitalization of the ancient village. The village collective performed organizational and coordination functions, uniformly transferring ancient building resources and taking the lead in establishing a shareholding economic cooperative. The market operation team was responsible for creative input and market expansion. The streamlining of actors significantly reduced the negotiation costs associated with tight interest linkage.

(3) Symbiotic Interface. The industrial integration degree reached a high level (value: 5). The village successfully introduced diverse formats including art studios, boutique homestays, cultural creative workshops, and study tours. In 2023, it received 190,000 visitors and achieved total tourism revenue of 22 million RMB, providing an ample carrier for the transformation of resource value.

(4) Symbiotic Model. The village adopted a tight interest linkage based on shareholding cooperation (value: 5). The village collective contributed ancient building resources as shares to jointly establish an operating company, sharing profits according to shareholdings. Villagers obtained multiple income streams by leasing assets, working as employees, and investing shares, constructing a closed-loop value transformation of “resources into assets, assets into shares, and villagers into shareholders,” thereby forming an integrated symbiotic form.

(5) System Function. Driven by the conditions of Configuration 4, Xilifang Village achieved outstanding revitalization performance for its homesteads and ancient buildings, with a utilization rate exceeding 90% for idle ancient buildings and homesteads. Thirteen core ancient buildings were restored in keeping with their original styles, and more than 40 idle residential houses achieved unified transfer and operation. Economic performance grew steadily, with the village collective’s annual income increasing from below 0.1 million RMB to 0.8 million RMB in 2024, representing an average annual increase of over 40%. Villager income improved significantly, with average annual rental and dividend income per household reaching 30,000–60,000 RMB. Social performance was comprehensively optimized, providing local employment for over 120 people. The village successfully established itself as a provincial-level art-driven rural construction characteristic village and a 3A scenic village. Its ancient village protection and revitalization model became a provincial benchmark, achieving a pattern of resource value transformation and multi-party win–win outcomes, realizing endogenous and sustainable development under conditions of high resource endowment. Retracing the revitalization trajectory of Xilifang Village, although the ancient buildings possessed profound cultural heritage, they remained idle for an extended period. After 2018, leveraging the policies of art-driven rural construction and the “separation of three rights” reform of homesteads, the county government launched artist-in-residence programs and introduced professional operation teams. The village collective uniformly transferred ancient building resources and established a shareholding cooperative, successively introducing diverse formats such as art studios, boutique homestays, and cultural creative workshops. Following the completion of the ancient building renovations, the shareholding cooperation mechanism in Xilifang Village began to operate comprehensively, ultimately entering a phase of integrated symbiosis characterized by high-quality and sustainable development. The symbiotic evolution logic of this path is illustrated in Figure 6.

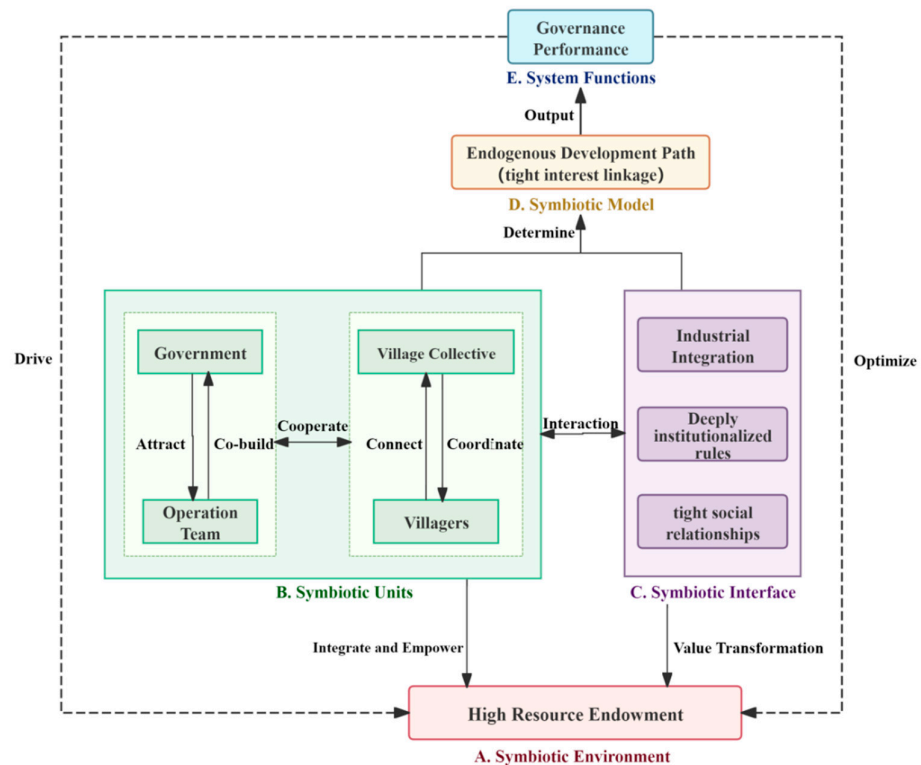


Figure 6. Endogenous Development Symbiosis Path.

5.5. Cross-Case Comparison and Discussion

A comprehensive comparison of the four paths reveals the following patterns (see Table 6). The market-driven path relies on external capital to inject vitality, achieving rapid results, yet its sustainability is constrained by the control of investors. Should operational returns fall short of expectations, capital may withdraw, leaving villages with limited countermeasures. The government-led path establishes a framework through policies and institutions, introducing multiple actors. Although the revitalization cycle is longer, the village collective consistently retains initiative in resource allocation, rendering the symbiotic system more resilient. The multi-actor co-governance path offers the broadest coverage and the lowest resource threshold. Its core advantage lies in the significant reduction of transaction costs through platform-based operations, sustaining the efficient functioning of loose interest linkages. However, it is highly dependent on platform institutional design; once coordination mechanisms fail, synergy among actors may deteriorate. The endogenous development path has the highest threshold, employing shareholding cooperation to deeply bind the interests of all parties. With high exit costs and strong incentive compatibility, this path offers the greatest systemic stability. However, it relies heavily on innate resource endowments and the organizational capacity of the village collective, rendering it less universally applicable. In summary, the differences among the four paths lie in the distribution structure of governance power and the sources of systemic stability: external drivers achieve speed but place control outside the village, whereas internal drivers proceed more slowly but establish deeper foundations. The essence of path selection lies in whether the internal factors of the village and the external environment can effectively sustain the continuous operation of the chosen path.

Table 6. Comparison of Revitalization Paths.

Comparison Dimension	Market-Driven Path	Government-Led Path	Multi-Actor Co-Governance Path	Endogenous Development Path
Representative Cases	Yongwang Village	Qingshan Village	Lujia Village	Xilifang Village
Revitalization Cycle	3–5 years	5–8 years	3–5 years	5–10 years
Sustainability Characteristics	Dependent on market operational capacity	Ecological nurturing and multi-actor participation	Platform-based operations enabling sustained self-generation	Shareholding cooperation ensuring long-term stability
Primary Income Sources for Farmers	Fixed rent, local employment	Fixed rent, employment opportunities, limited dividends	Guaranteed minimum dividends, fixed rent, employment opportunities	Shareholding cooperation, asset equity participation, employment opportunities
Interest Linkage Form	Loose type (fixed contracts)	Loose to semi-tight type (mixed contracts)	Loose type (platform-based flexible distribution)	Tight type (equity binding)
Government Fiscal Investment Characteristics	Infrastructure support	Policy support and platform development	Infrastructure support	Primarily policy guidance
Applicable Village Conditions	Suburban areas with strong urban consumer demand and average resource endowments	Areas with good ecological resources, strong government impetus, and potential for introducing multiple actors	Broadest coverage, suitable for various resource conditions	High resource endowment (historical/cultural heritage or natural landscapes) with strong village collective capacity

6. Research Conclusions and Policy Implications

6.1. Research Conclusions

Drawing on symbiosis theory, this study framed idle homestead revitalization as a complex adaptive system with five dimensions: symbiotic environment, units, interface, model, and system function. Focusing on two interrelated core questions—how multiple actors and resource conditions interact synergistically to reshape system function, and how different combinations of factors drive efficient homestead revitalization under varying initial conditions—this study conducted configuration analysis and multi-case comparative analysis on 35 typical villages in Zhejiang Province, identifying four paths that drive high governance performance. The main conclusions are as follows:

(1) Industrial integration degree constitutes a necessary condition for high governance performance in homestead revitalization. The necessity analysis shows that the consistency of high industrial integration degree reached 0.9096 (exceeding the 0.9 threshold), making it the only variable among the seven antecedent conditions that constitutes a necessary condition. In all four high-performance configurations, industrial integration is present either as a core or peripheral condition, confirming that industrial integration serves as the foundational interface for the interaction between internal and external rural elements.

(2) Cross-configuration comparison further reveals two types of synergistic mechanisms. First, resource endowment and actor richness exhibit a complementary and substitutive relationship. Resource-scarce villages require broad participation by multiple actors to compensate for their disadvantages (Configuration 2), whereas resource-rich villages can streamline participating actors and rely on deep synergy among core actors to achieve efficient operation (Configuration 4). Second, government-led intensity and interest linkage exhibit a phased complementary relationship. Administrative forces can sub-

stitute for mature benefit distribution mechanisms to drive system initiation in the early stages of revitalization (Configurations 2 and 3). However, to achieve sustainable high-performance governance, a shift toward stable and tight interest linkage mechanisms is required (Configuration 4). These two mechanisms suggest that external actor participation intensity and internal resource conditions do not operate independently; rather, they jointly shape rural governance structures through substitution and complementarity. The evolutionary trajectories of the four cases further confirm the pattern of symbiotic model upgrading from intermittent symbiosis toward integrated symbiosis.

(3) The four high-performance condition configurations correspond to four differentiated symbiotic models, each suited to different village conditions. Configuration 1, the market-driven path, compensates for village resource and organizational deficiencies through professional operation and industrial integration, and is suitable for villages with scarce endogenous resources but accessible to external capital. Configuration 2, the government-led path, uses policy support to compensate for early-stage market deficiencies, and is suitable for villages with average endowments but strong government organizational capacity. Configuration 3, the multi-actor co-governance path, achieves the broadest coverage and most stable pattern through extensive participation by all parties. Configuration 4, the endogenous development path, is suitable for villages with superior resource endowments. The failure patterns of low-performance configurations can be summarized as “single industry, capital absence” and “fragmented rights and responsibilities, single actor,” respectively confirming the foundational role of industrial integration and the necessity of multi-actor synergy.

(4) The governance performance of homestead revitalization exhibits multidimensional synergistic improvement across resource utilization, economic growth, social recognition, and institutional systems. In all high-performance configurational paths, revitalization utilization rate (R1), village collective and farm household income growth rates (R2), and villager satisfaction (R3) all achieved improvement, indicating that the system function of homestead revitalization possesses multiple value-adding effects [95].

6.2. Theoretical Contributions and Policy Implications

6.2.1. Theoretical Contributions

The theoretical contributions of this study are two-fold, distilled from the empirical analysis. While not constituting the construction of an entirely new theory, they represent an extended application of the symbiosis theory analytical framework to the rural governance context.

(1) Innovation in analytical perspective. By incorporating system function into the traditional four-dimensional framework of ‘environment–units–interface–model’ and introducing governance performance as an output evaluation indicator of system operation, this study moves beyond the theory’s traditional emphasis on process description, thereby offering a more complete explanation of how symbiotic systems operate within rural governance contexts.

(2) Innovation in research methods. This study employs fsQCA configurational analysis to identify multiple equifinal pathways that concurrently drive high governance performance, transcending the limitations of conventional regression-based net-effect approaches. Accordingly, this study reveals an asymmetric equivalent governance logic. The four high-performance configurations demonstrate that in villages with varying constraints on resources, actors, and institutions, governance factors can achieve equally efficient governance outcomes through substitutive compensation. Substitutive compensation refers to the mutual substitution and supplementation of different governance factors under specific conditions: resource scarcity is compensated by actor diversity, and loose interest linkage is temporarily driven by administrative forces, thereby achieving the same

level of system function through differentiated factor combinations. This finding provides an alternative to the assumption of a ‘single optimal model’ and offers a complementary analytical approach for understanding governance diversity within complex rural systems.

6.2.2. Policy Implications

Based on the above empirical findings, this study derives the following policy implications.

(1) Prioritize industrial integration as the foundational revitalization interface. Villages should adopt differentiated industry introduction strategies based on their resource endowments. Resource-poor but market-accessible villages (Configuration 1) may rapidly build industrial interfaces through external capital. Average-endowment, government-led villages (Configurations 2 and 3) require policy-guided industrial upgrading. Resource-rich villages (Configuration 4) should leverage high-value-added cultural tourism and creative industries to maximize the synergy between resource endowment and industrial integration.

(2) Match governance paths to resource endowments and organizational capacity. Local governments should systematically assess village conditions and implement tailored strategies: resource-scarce but locationally favorable villages (Configuration 1) should prioritize professional operators; average-endowment villages with strong government mobilization (Configuration 2) need enhanced early-stage investment and collective coordination; moderate villages (Configuration 3) should expand participatory channels to foster co-governance; resource-superior villages (Configuration 4) should streamline actors, cultivate core synergy, and establish shareholding cooperation. Clear boundaries of rights and responsibilities must be established to prevent actor imbalances and industrial stagnation.

(3) Establish dynamic assessment and gradient upgrading mechanisms. Given the multidimensional nature of governance performance, periodic assessment of system operation is essential. Localities should implement a closed-loop governance cycle of “resource inventory—type identification—path matching—stage assessment—dynamic adaptation,” with assessments conducted every 2–3 years. Based on the results, industrial integration strategies, actor participation structures, and interest linkage models should be adjusted to progressively upgrade the symbiotic system from loose, intermittent symbiosis toward continuous and integrated symbiosis.

(4) Within the broader context of global rural transformation, the challenges that Zhejiang faces—concerning property rights, capital penetration, and community interest conflicts—share deep structural commonalities with those confronting the Global South. By relying on “village collectives” as an institutional intermediary, and by utilizing the transfer of operation rights and contractual distribution, Zhejiang has successfully balanced the integration of external capital with the protection of community rights and interests. The core implication is that the focus of rural development has shifted from merely attracting capital to effectively governing capital, with the key lying in the establishment of organizational intermediaries that combine community representativeness with market connectivity. Three internationally transferable lessons can be drawn from this experience: clarifying the lists of responsibilities and rights and aligning them with the SDGs, sharing models for industrial integration, and establishing assessment mechanisms for symbiotic resilience. The practices of countries such as Indonesia have demonstrated that this governance logic, which balances local adaptation with sustainability, can offer a general reference for the rural modernization of developing countries through collaborative efforts under the framework of South–South cooperation.

6.3. Research Limitations and Future Directions

6.3.1. Research Limitations

This study has four limitations. (1) Zhejiang is a pioneer zone for urban–rural integration reform, and its institutional environment and governance capacity are significantly higher than the average rural level in most developing countries. Consequently, the generalizability of the findings requires cross-regional validation. The effectiveness of the four configurational paths depends on specific institutional foundations and market conditions, and may require adjustment of variable weights when applied to Global South cases. (2) This study relied primarily on cross-sectional data for configuration analysis, which cannot fully replace temporal causal verification. Although case-based retrospection partially supplemented the evolutionary process, this leaves the triggering mechanisms and temporal patterns of symbiotic model transitions underexplored. Third, variable simplification for fsQCA constrained the rich connotations and multidimensional tensions of symbiosis theory. Fourth, the focus on high-performance paths neglected structural barriers and negative mechanisms in low-performance cases, underscoring the necessity for comparative negative case analysis to refine the governance landscape.

6.3.2. Future Directions

Future research should expand sample coverage to central, western, and northeastern China for cross-regional validation of external validity. Longitudinal case tracking and temporal QCA can overcome cross-sectional limitations by revealing the dynamic evolution of the symbiotic system and model transition triggers. To address variable simplification, variable dimensions should be refined and qualitative methods (e.g., in-depth interviews, grounded theory) integrated to deepen mechanism analysis and enhance explanatory power. Moreover, low-performance negative cases warrant systematic examination of structural obstacles and constraints; positive–negative comparisons can yield governance lessons, offering comprehensive theoretical and practical guidance for policy optimization.

Author Contributions: Conceptualization, Z.X.; Resources, Z.X.; Funding Acquisition, Z.X.; Supervision, Z.X.; Writing—Review and Editing, Z.X.; Investigation, Z.X., J.Z., Q.J. and S.Y.; Writing—Original Draft Preparation, J.Z. (Research Methodology, Theoretical Framework, Empirical Results), Q.J. (Introduction, Literature Review), and S.Y. (Case Study, Conclusions and Policy Implications). All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the National Natural Science Foundation of China (NSFC No. 42171254).

Institutional Review Board Statement: The study was conducted according to the guidelines of the Declaration of Helsinki, and approved by the Institutional Review Board of Law College, Ningbo University (protocol code [61]) on 22 December 2025.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data supporting this study are available upon reasonable request from readers, and the authors will provide them in a timely manner.

Acknowledgments: The authors would like to thank the anonymous reviewers for their insightful suggestions. Zhongguo Xu sincerely thanks Jianmei Luo, Ruikun Xu, Ruihao Xu and other family members for their firm support of his work over the years. This article is dedicated to Zhongguo Xu’s mother, Jinglian Dong, and his deceased father, Muxian Xu.

Conflicts of Interest: The authors declare no conflicts of interest.

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