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Application of the Rural Web Framework Within the Context of China's Rural Revitalization Strategy: A Case Study of Zhangshui Town*

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Abstract

This paper uses the Rural Web Framework (RWF) to examine Zhangshui's development initiatives within the scope of China's Rural Revitalization Strategy. By applying the RWF's six dimensions—endogeneity, novelty production, sustainability, social capital, institutional arrangements, and market governance—this study provides insights into Zhangshui's unique blend of agricultural innovation, industrial growth, cultural preservation, sustainable practices, and community engagement. Findings demonstrate the alignment between Zhangshui's initiatives and national rural revitalization goals, suggesting Zhangshui's integrated approach to development can serve as a model for sustainable rural revitalization in China.

Keywords: Rural Web Framework, rural development, rural revitalization, sustainable development, China

Application du cadre d'analyse du réseau rural dans le contexte de la stratégie chinoise de revitalisation rurale : étude de cas de la ville de Zhangshui*

Résumé

Cet article utilise le cadre d'analyse du réseau rural (CWR) pour examiner les initiatives de développement de Zhangshui dans le cadre de la stratégie chinoise de revitalisation rurale. En appliquant les six dimensions du CWR – endogénéité, production de nouveautés, durabilité, capital social, dispositifs institutionnels et gouvernance du marché – cette étude met en lumière la combinaison unique d'innovation agricole, de croissance industrielle, de préservation culturelle, de pratiques durables et d'engagement communautaire qui caractérise Zhangshui. Les résultats démontrent la cohérence entre les initiatives de Zhangshui et les objectifs nationaux de revitalisation rurale, suggérant que l'approche intégrée du développement de Zhangshui peut servir de modèle pour une revitalisation rurale durable en Chine.

Mots clés: cadre web rural, développement rural, revitalisation rurale, développement durable, Chine

1.0 Introduction

As one of the world's largest developing nations and foremost agricultural regions, China has long prioritized feeding its population of 1.3 billion. Since the establishment of the People's Republic of China, rural development has been essential to ensuring national food security and economic stability. However, rural development in China has lagged behind urban growth due to several complex factors. In particular, China's reliance on small-scale farming with limited mechanization constrains agricultural productivity, limiting income potential in rural areas (Wang et al., 2016; Wang et al., 2020). This productivity gap is further widened by China's 'dual economic structure,' which historically directs resources and investments toward urban centers, leaving rural areas with fewer economic opportunities and public services (Giles & Mu, 2024; Liu & Schmitt, 2014). As a result, large-scale rural-to-urban migration has left rural communities composed mainly of the elderly and young, reducing the active labor force and straining social support systems (He & Ye, 2014). Additionally, natural resource limitations, such as water shortages in certain rural regions, combined with insufficient public infrastructure, further restrict economic diversification in these areas (Jiang, 2009). Together, these factors have perpetuated a cycle of underdevelopment in rural China, stalling wealth accumulation, infrastructure growth and educational access, in stark contrast to the rapid progress in urban China.

To address these challenges, Chinese General Secretary Xi Jinping first introduced the Rural Revitalization Strategy in the Reports of the 19th National Congress of the Communist Party of China. This strategy is a comprehensive approach to addressing the urban-rural divide and serves as a guiding agenda for government efforts in agriculture, rural development and improving the livelihoods of rural populations (Xi, 2017). The strategy's primary goals are, in short, to achieve industrial development, environmentally sustainable living, a civilized rural culture, effective governance, and improved living standards for the rural sector (Ma & Mu, 2024).

Located in Haishu District, Ningbo, Zhejiang Province, Zhangshui Town is distinguished by its rich natural resources and cultural heritage. By effectively leveraging these assets, Zhangshui has developed a diversified local economy centered on sustainable agriculture, eco-tourism, and unique regional products. Recognized as a National Ecological Town and a Provincial Leader in Agriculture and Advanced Industry (Zhangshui Town Government, 2024), Zhangshui's achievements align closely with national objectives for rural revitalization, making it a valuable case for studying China's Rural Revitalization Strategy.

This study examines Zhangshui as a case of effective alignment with China's Rural Revitalization Strategy and offers policy recommendations for similar rural areas. Using the Rural Web Framework by van der Ploeg and Marsden (2008), this analysis explores how each dimension of the 'rural web' contributes to rural revitalization and how these dimensions synergize to enhance the 'web' of rural development as a cohesive whole in Zhangshui.

2.0 Literature Review

2.1 China's Rural Revitalization Strategy

China's Rural Revitalization Strategy was first proposed in 2017 in the Reports of the 19th National Congress of the Communist Party of China (Xi, 2017). It emphasizes integrated urban-rural development as a key pathway to restructure and balance the urban-rural relationship, characterized by industrial promotion, ecological livability, cultural advancement, governance efficiency and improved rural living standards (Liu, 2018; Ma & Mu, 2024).

The strategy is structured in three stages to achieve the final goal of rural revitalization: institutional and policy framework development (2018–2020), modernization of agriculture and rural areas (by 2035), and full rural revitalization by 2050. Urban-rural integration remains central, with goals to achieve a balanced development system by 2030 and equalized urban-rural growth by 2050 (Liu et al., 2020). To achieve this goal, the Chinese government has implemented powerful measures, including institutional and financial supports. Notably, the establishment of the National Rural Revitalization Administration and the passage of the Law on the Promotion of Revitalization of Rural Areas have provided essential legal and institutional support (Deng, 2023). Financial backing has been significant, with substantial annual allocations for infrastructure and local industry development. In 2021, the central government allocated 156.1 billion yuan, a 10 billion yuan increase from the previous year, to support poverty alleviation and the transition to rural revitalization. A joint document from six relevant departments specified that these funds must be used exclusively for rural revitalization projects, such as public infrastructure and local industries (Xinhua, 2021).

In response to the central government's call, local authorities across various regions have implemented practices under the Rural Revitalization Strategy. In 2019, Shan County in Shandong Province leveraged its geographic advantages and local charm to develop an ecological cultural tourism resort. The county focused on specialized agriculture, transforming agricultural farms into tourist attractions offering fruit picking and other leisure activities (Heze Municipal Government, 2020). Similarly, Libao Town in Jiangsu Province developed specialized farming cooperatives and established a modern industrial chain that integrates planting, processing, and selling. Additionally, local authorities worked to increase vegetation coverage and clean village rivers to promote sustainable development (Ministry of Agriculture and Rural Affairs of the People's Republic of China, 2024). In this study, Zhangshui Town is selected as a case study to explore the local implementation and impact of national rural revitalization strategies, due to its outstanding achievements, including multiple provincial and national awards in recognition of its efforts.

2.2 The Rural Web Framework

The RWF, developed by van der Ploeg and Marsden (2008), offers a comprehensive model for assessing rural development by examining the complex interplay of economic, social, and environmental dimensions. The RWF comprises six interconnected dimensions: endogeneity, novelty production, sustainability, social capital, institutional arrangements, and market governance, each contributing to a holistic understanding of rural performance. By addressing these areas, the RWF has become an essential tool for evaluating sustainable rural development across different contexts.

In specific, each dimension of the RWF captures critical aspects of rural development:

1) *Endogeneity* – focuses on how well a regional economy relies on and develops local resources. It enhances regional resilience by promoting economic autonomy and leveraging local assets, such as food production, to generate social and economic benefits (van der Ploeg & Marsden, 2008).
2) *Novelty Production* – highlights a community's capacity to innovate, fostering new products, practices, and cooperation methods that contribute to economic dynamism and adaptability. Novelty production emphasizes that unique regional innovations strengthen competitiveness and sustainability (Wiskerke & van der Ploeg, 2004).
3) *Sustainability* – a core dimension that balances economic growth, social equity, and environmental protection. It underpins the long-term viability of rural areas, ensuring that economic activities do not degrade the natural and social environments that support them (Kitchen & Marsden, 2006).
4) *Social Capital* – refers to the networks of trust and cooperation within rural communities, facilitating collective action. Strong social capital promotes social cohesion and resilience, enabling communities to work together toward shared goals (van der Ploeg & Marsden, 2008).
5) *Institutional Arrangements* – address coordination challenges by fostering cooperation and empowering communities to control resources. Effective governance structures align stakeholder interests and support sustainable development (Hagedorn et al., 2002; van der Ploeg & Marsden, 2008).
6) *Market Governance* – strengthens existing markets while facilitating the creation of new ones. It ensures equitable market participation and connects rural economies to broader systems, retaining value locally (van der Ploeg & Marsden, 2008).

A distinguishing feature of the RWF is its emphasis on the interconnectedness of these dimensions. Unlike frameworks that assess rural development factors in isolation, the RWF posits that rural resilience emerges from the dynamic interactions between these dimensions, creating a "web" of relationships that strengthen regional development. For example, endogeneity often supports novelty production by grounding new practices in local resources, which enhances market governance by producing unique, competitive local products (van der Ploeg & Marsden, 2008).

The RWF has also been widely used in case studies of European rural regions (e.g., Esparcia, 2014; Stoffelen & Vanneste, 2016) to analyze how local resource utilization, community engagement and innovative practices strengthen rural economies. However, as Addai et al. (2023) noted, RWF applications remain less frequent in developing countries, indicating an opportunity to explore its relevance in diverse global contexts, including China.

In the context of China's Rural Revitalization Strategy, the RWF aligns closely with key strategic priorities such as industrial prosperity, ecological sustainability, cultural revitalization, and improved governance. It provides a nuanced assessment of how these priorities are implemented at the local level, ensuring that each dimension of rural development is thoroughly addressed and aligned with national objectives. The RWF's application facilitates a holistic evaluation that is beyond

solely agriculture; it examines how grassroots actions contribute to broader policy goals, advancing both local and national aspirations.

2.3 Previous Studies on Rural Development

The RWF has been applied across diverse rural contexts to trace how ecological resources, institutions, and innovation networks co-produce development outcomes. In UK case analyses, Horlings and Marsden (2010) and Paddock and Marsden (2015) show how organic agriculture, value-added food strategies, and sustainable tourism are enabled by the mobilization of local ecological assets and place-based governance. In Ghana, Vecchio et al. (2020) demonstrate how upgrading shea-butter production through improved production practices and coordination mechanisms can strengthen resilience by building on local resources. Evidence from European innovation projects also highlights how knowledge exchange and inter-regional linkages facilitate the diffusion of new practices, including renewable-energy uptake and other forms of rural novelty production (Esparcia, 2014; von Münchhausen & Knickel, 2010). Other case-based studies further indicate that collective eco-economic initiatives depend on institutional arrangements and social capital that coordinate stakeholders and reduce fragmentation (Arato et al., 2017; Marsden et al., 2011; Stoffelen & Vanneste, 2016). Overall, the literature reinforces the RWF's core claim that rural revitalization depends on synergy across multiple dimensions.

3.0 Methodology

To draw insights from Zhangshui's development experience for other rural areas pursuing revitalization in China, this study adopts a framework-based case study. The RWF is applied as an analytical framework to examine how its six dimensions manifest in local development practices and how these initiatives align with the objectives of China's Rural Revitalization Strategy.

3.1 Data Collection

The study uses documentary research as the primary data collection method, drawing on publicly accessible secondary sources, including news reports, government websites, municipal publications, and community digital platforms relevant to Zhangshui's development initiatives. In addition, informal communications with township staff were used to clarify practical details of specific initiatives. Compared with field research constrained by site access, documentary research enables a broader mapping of Zhangshui's revitalization practices as reported in public records.

3.2 Data Analysis

The analysis followed a deductive thematic coding procedure. Each RWF dimension—endogeneity, sustainability, novelty production, institutional arrangements, social capital, and market governance—served as an initial coding category. Relevant text segments were coded to identify recurring practices and mechanisms associated with each dimension. The coded findings were then synthesised to assess how Zhangshui's initiatives collectively support key rural revitalization goals.

To enhance credibility, claims about major initiatives and outcomes were triangulated across multiple documents where possible (e.g., government releases

cross-checked with municipal publications and media reports). Academic and policy literature was used to contextualise interpretations and clarify how the case relates to broader debates on rural development and the RWF synergy.

While using publicly available documents enables a systematic RWF-based mapping of Zhangshui's initiatives, as a single-case, document-based study relying mainly on government publicity sources, the findings are analytically transferable rather than statistically generalizable.

4.0 Unfolding the Rural Web in Zhangshui

This section presents the analysis of Zhangshui's rural revitalization efforts, outlining how the town's initiatives align with the key dimensions of the RWF and assessing their contribution to the broader goals of China's Rural Revitalization Strategy. The results highlight key areas of success, innovative approaches, and the overall impact of Zhangshui's development trajectory.

4.1 Endogeneity

In line with the emphasis on *regional* by van der Ploeg and Marsden in the Rural Web Framework (2008), Zhangshui's "One Village, One Product" (OVOP) campaign exemplifies the strategic alignment of local innovation with national rural revitalization objectives. This initiative fosters shared prosperity and improved livelihoods by focusing on the development of products that are uniquely endogenous to each village, reinforcing the principles of thriving industries and ecological sustainability.

OVOP, initiated in Japan's Oita Prefecture, responded to rural depopulation and stagnation by mobilizing local resources through community-led development supported by enabling policy (Fujimoto, 1992). Often illustrated by Oyama Town's shift from rice to higher-value plum and chestnut production under local initiative (Pitchayapisut, 2008, as cited in Anh, 2013), OVOP is commonly summarized by the principles of "Think globally, act locally" (Kurokawa, 2010, p. 59). These principles map onto the RWF's emphasis on endogeneity, institutional arrangements, market governance, and novelty production, and the approach later informed regional adaptations such as Thailand's OTOP programme (Kurokawa, 2009).

The adoption of OVOP in Zhangshui has been localized and tailored to pioneer new approaches, enabling villages to diversify their development in ways that align with their unique circumstances. Across its 18 administrative villages, the town has successfully cultivated 31 premium agricultural products, including fruits, vegetables, Chinese medicinal herbs, and teas (Chen, 2022).

One example is Zhang Village's Plate Noodle (盘面), a signature local food with a reported history of over 100 years. Distinguished by its plate-like shape and golden colour and made through more than a dozen preparation steps (Li, 2019), it represents a place-specific product that reflects the RWF emphasis on endogeneity and regionality.

Similarly, Lijiakeng Village is known for *Huaqi taro* (花旗芋艿), a protected local variety in Haishu District. This type of taro is grown only in the high-mountain 香灰土 (incense ash soil), a unique fine local soil named for its ash-like appearance, and cultivated without chemical fertilizers; its reported nutritional profile (e.g.,

higher starch, protein, and vitamin content) is cited as a distinguishing feature compared with other taro varieties (Haishu District Government, 2022; Zhang, 2023). This case illustrates how endogeneity can be combined with sustainability-oriented production practices.

The OVOP approach in Zhangshui also exemplifies synergy between institutional arrangements and endogeneity within the RWF. In Baxia Village, the place-based specialty Zhejiang Fritillary—with a cultivation history of over 300 years—has been upgraded through formal research partnerships, including the Zhejiang Fritillary Research and Innovation Center and collaboration with a Chinese Academy of Sciences team. This resulted in a new variety (Zhejiang Fritillary No. 3) and strengthened local branding as the Hometown of Zhejiang Fritillary, alongside reported gains in yield value and output (Haishu District Government, 2023, January 19; Zhang, 2023). A similar institution-farmer linkage is evident in Zhangxi Village, where the Ningbo Academy of Agricultural Sciences supported the breeding and technical extension of the Lanxin watermelon, further differentiating local products and improving production practices (Haishu District Government, 2023, June 12). These cases show how institutionalized expertise can translate local resources into novelty production and market-facing value.

Zhangshui's implementation of the OVOP approach reflects its strategic ingenuity in balancing national priorities with local strengths. By leveraging this approach, Zhangshui not only aligns with the Rural Revitalization Strategy's goals of thriving industries, ecological preservation and improved governance, but also showcases a model of collective intelligence and sustainable development.

4.2 Novelty Production

In the RWF, van der Ploeg and Marsden (2008) highlight that novelty production emphasizes "the capability, within the region, to continuously improve processes of production, products, patterns of cooperation, etc.," where "novelties are crucial" (p. 9). This principle manifests in Zhangshui not only through agricultural innovations but also in the development of value-added products, and the adoption of advanced technologies in production.

Zhangshui Town, recognized as "The Hometown of Cherry Blossoms" in China, hosts the nation's largest and most concentrated cherry blossom planting base, spanning over 7,500 mu (1,238 acres). In February 2022, the National Health Commission of the People's Republic of China officially recognized cherry blossoms as edible, marking a historic shift from ornamental to culinary use (Zhangshui Town Government, 2024). Seizing this opportunity, Zhangshui Town embarked on developing a comprehensive cherry blossom industrial chain under the brand "Cherry Blossoms Above the Clouds" (云上樱花), creating a novel and competitive local industry (Haishu District Government, 2023, January 19).

The cherry blossom earns its name from its cultivation in the Siming Mountain ecological zone at an average elevation of over 700 meters. The cherry blossom base benefits from year-round mist and pristine environmental conditions, being far removed from industrial and residential areas. The cultivation process is governed by a zero-pollution policy, with fertilizers and pesticides strictly regulated and regularly inspected (Zhangshui Town Government, 2024). This innovative approach to sustainable agriculture highlights Zhangshui's ability to integrate ecological conservation with high-value agricultural production.

Building on this foundation, Zhangshui has successfully expanded its cherry blossom industry into a range of unique products. The town established the Siming Mountain Cherry Blossom Agricultural Development Company and partnered with research institutions to overcome technical challenges in drying, preservation, and refrigeration. By employing such specially developed eco-friendly production techniques, the entire process—from handpicking to final production—is completed within 12 hours, ensuring product authenticity and quality. This has resulted in a diverse array of offerings, including edible products like cherry blossom beverages and non-edible items such as cherry blossom fragrances (Zhang, 2023).

These initiatives exemplify the principles of novelty and cooperative innovation outlined by van der Ploeg and Marsden (2008), highlighting Zhangshui's ability to leverage strategic partnerships, drive product innovation, and integrate sustainability into its economic development. Zhangshui's efforts demonstrate how novelty production can act as a catalyst for transforming traditional resources into modern, competitive industries, contributing significantly to its rural revitalization goals.

4.3 Sustainability

As van der Ploeg and Marsden (2008) emphasize, sustainability can be understood in diverse ways. In Zhangshui, sustainability is not only evident in its efforts to preserve its exceptional natural environment but also deeply embedded in nearly all of its key initiatives, including the OVOP program, the cherry blossom industrial chain, and eco-tourism development.

In terms of ecological preservation, Zhangshui Town, nestled within the scenic Siming Mountains, boasts 140,000 mu (9,333 hectares) of forested land and a standing timber volume of 604,145 cubic meters. The town has prioritized green initiatives in recent years, such as expanding urban green spaces, constructing ecological corridors along roads and rivers, and implementing large-scale afforestation projects. These efforts have resulted in 897 mu (60 hectares) of new urban green space, with residential and workplace greenery reaching 25.8%. Public parks now span 122.6 mu (8.2 hectares), offering 7.5 square meters of green space per resident, while 4,000 mu (267 hectares) of land has been reforested (Haishu District Government, 2023, January 16). These achievements have garnered recognition at both national and provincial levels, with Zhangshui receiving titles such as National Ecological Town, Forested Town of Zhejiang Province, and Provincial Pilot for Low Carbon Town (Zhangshui Town Government, 2024).

This ecological base has also underpinned eco-tourism and a forest economy agenda. After the 2022 tightening of restrictions on non-agricultural use of farmland, Zhangshui reported revitalizing over 2,000 mu of land and designating substantial forestland for forest-economy development (Zhangshui Town Government, 2024). A flagship initiative is the 40-km Zhangxi Impression ecological conservation belt, which links ecological protection with tourism development and has encouraged investment in nature-based services such as green cafés and eco-resorts.

Sustainability also underpins Zhangshui's OVOP campaign and its cherry-blossom value chain. Both report strict restrictions on chemical fertilizers and

additives and incorporate pollution-minimising processing and production design (Zhangshui Town Government, 2024; Zhang, 2023).

By integrating sustainability into its development initiatives, Zhangshui answers the national strategic call for balancing ecological protection with economic growth and improved livelihoods. Zhangshui's holistic approach showcases how localized, innovative strategies can serve as a blueprint for achieving the national vision of a prosperous, environmentally sustainable, and culturally vibrant rural China.

4.4 Social Capital

Social capital, as defined by van der Ploeg and Marsden (2008), is the collective ability to "get things done" through collaboration among "individuals, groups, organizations, and institutions" (p. 10). In the context of Zhangshui, social capital has played a pivotal role in advancing the town's rural revitalization efforts, particularly through the local Communist Party branch's leadership in developing the 'Red Tourism' sector.

Zhangshui Town has a strong "red" heritage linked to the Siming Mountain revolutionary base area in eastern Zhejiang. It reportedly served as an important revolutionary and guerrilla base during the War of Resistance against Japanese Aggression and the subsequent liberation period. Today, it is recognized as one of China's top 100 Red Tourism sites, with more than 20 revolutionary relics and preservation sites scattered throughout the town (Ethnic and Religious Affairs Committee of Zhejiang Province, 2024). The Siming Mountain Cemetery of Revolutionary Martyrs in the town is a national educational base for patriotism and a provincial-level cultural heritage site (Zhangshui Town Government, 2024).

Building on its revolutionary heritage, Zhangshui's local party branch functions as a key organising unit in the "Red+" initiative. Under its coordination, a "red tourism" alliance was established to link more than 20 heritage sites, including Zhang Village and the Siming Mountain Martyrs' Cemetery, and to mobilise local personnel—particularly Party members—for joint planning and service delivery (Haishu District Government, 2023, January 19). The initiative has developed branded red-education products and related services (e.g., themed routes and dining), and is reported to attract over 700,000 visitors annually, reducing site-level fragmentation and increasing the overall visibility of Zhangshui's red tourism offer (Ethnic and Religious Affairs Committee of Zhejiang Province, 2024).

Beyond the tourism sector, social capital has been further strengthened through initiatives like the Entrepreneurs' Alliance (创客联盟), which brings together small and medium-sized businesses to foster a mutually supportive and innovative entrepreneurial ecosystem (Xincaijing News, 2023). This alliance aims to provide new entrepreneurs with the resources, guidance, and networking opportunities needed for growth, supporting the national goal of boosting rural entrepreneurship and local industry diversification.

Through these initiatives, Zhangshui has capitalized on its social networks by leveraging both cultural and entrepreneurial resources, responding to the national call for cultural preservation while improving governance efficiency, and promoting rural living standards.

4.5 Institutional Arrangements

The concept of institutional arrangements in the RWF emphasizes the effective coordination of social configurations through regulations, laws, norms, and other mechanisms (van der Ploeg & Marsden, 2008). In response to China's national strategic objectives of boosting rural industry and improving livelihoods, Zhangshui has adopted several innovative models tailored to its local context.

For instance, the establishment of Zhangshui Rural Revitalization Investment Co., Ltd., a joint venture between the town government and its governing villages, follows a corporate model that strengthens village-level economies. This model operates on a *guaranteed returns + profit distribution based on shares* principle, making it a pioneering initiative in Ningbo City (Zhangshui Town Government, 2024; Zhejiang News, 2018).

Additionally, Zhangshui has explored an "agricultural enterprise or talent-led" model, which focuses on fostering partnerships between agricultural enterprises or professionals and village collectives or farmers (Haishu District Government, 2024, May 27). For example, Ningbo Mugwort Agriculture Development Co., Ltd. has implemented a contract system with farmers in the Zhangxi area, where the company collectively purchases Siming mugwort from the farmers and processes it into medicinal products such as moxibustion sticks. This initiative has significantly boosted farmers' incomes, generating an additional 3,500 yuan per mu in revenue. Moreover, the company has created job opportunities for local residents in its processing and transportation sectors (Zhang, 2023).

Moreover, Zhangshui has also developed a farmer-led cooperative model, a crowdsourced approach that pools resources, assets, funds, and technologies from local farmers to establish an industrial consortium, based on the principle of *collective development + profit distribution by shares*. For example, 257 farmers have co-founded the Zhangxi Agricultural Specialized Cooperative Organization, investing in funds, farmland, forestland, nurseries, and agricultural facilities (Zhang, 2023). This cooperative focuses on cultivating green, eco-friendly agricultural products for visitors to pick and experience, further diversifying the local economy and promoting sustainable agricultural practices (Haishu District Government, 2020).

These models showcase Zhangshui's innovative institutional arrangements, which effectively harness both local natural and social resources to drive sustainable economic growth. By facilitating collaboration between agricultural enterprises, local government, and farmers, Zhangshui not only boosts economic outcomes but also strengthens social ties and improves governance as key aspects of the national Rural Revitalization Strategy.

4.6 Market Governance

Market governance in the Rural RWF focuses on the "institutional capacity to control and strengthen markets and to construct new ones" (van der Ploeg & Marsden, 2008, p. 11). Zhangshui Town has exemplified this concept by prioritizing the creation of a comprehensive industrial chain that goes beyond individual products or production processes. One of the town's most notable initiatives in this regard is the *One Two Three Industrial Chain*.

The cherry blossom industry provides an excellent example of how this model works in practice. The first step, represented by *One*, focuses on optimizing traditional

industries (Zhang, 2023). In the case of cherry blossoms, this includes ensuring product quality through a strict zero-pollution policy, thereby enhancing its market competitiveness as an organic, premium product. Similarly, for other traditional specialties like Zhang Village's plate noodles, the strategy focuses on preserving traditional craftsmanship, making them more attractive and unique to both local and broader markets (Chen, 2022).

The second step, *Two*, involves extending the industrial chain by adding value to raw agricultural products. Zhangshui has successfully transformed raw materials like cherry blossoms into value-added products, such as cherry blossom beverages and fragrances. Similarly, raw mugworts are processed into medicinal products. These products not only increase the market appeal of local agriculture but also significantly improve profitability (Haishu District Government, 2025).

The final step, *Three*, is about diversifying the dynamics of the industrial chain. By leveraging its specialized products, picturesque landscapes, and revolutionary history, Zhangshui has created various new business models, such as the eco-tourism initiative "Zhangxi Impression" and the "Shuning Red" red-tourism program. In the case of cherry industry, the Zhangxi Cherry Blossom Festival was launched in 2017, attracting over 400,000 visitors annually (Zhangshui Town Government, 2024). In 2022, these downstream industries generated more than 10 million yuan in revenue, with an average dividend of 3,000 yuan per household (Zhang, 2023).

Through the three steps, Zhangshui's market governance strategy highlights the synergistic relationship between agricultural production, value-added processing, and downstream tourism, thereby aligning with national rural revitalization objectives and fostering sustainable, long-term economic growth.

4.7 Synergy Across the Rural Web in Zhangshui's Development Model

The Rural Web Framework emphasizes that rural development emerges not from isolated interventions, but from the dynamic interplay among endogeneity, novelty production, sustainability, social capital, institutional arrangements, and market governance (van der Ploeg & Marsden, 2008). The case of Zhangshui provides a clear illustration of how these six dimensions operate as a mutually reinforcing system, generating a coherent development trajectory aligned with China's Rural Revitalization Strategy.

In particular, sustainability forms the baseline conditions that enable the effective mobilization of endogenous resources, the development of local novelties, and the strengthening of community participation. Large-scale afforestation, ecological corridors, and protected mountain zones safeguard the high-quality environmental assets essential for distinctive agricultural products—such as mountain-grown cherry blossoms and herbal teas (Zhangshui Town Government, 2024)—and support the innovation needed to develop value-added derivatives. These ecological resources also underpin cultural and eco-tourism activities, which in turn reinforce social capital by fostering shared environmental responsibility and deepening local pride. Together, these dynamics ensure that ecological sustainability remains a foundation for Zhangshui's long-term social and economic development.

Endogeneity serves as the foundation for novelty production and market governance. For instance, Zhangshui's OVOP strategy demonstrates how reliance on local resources—such as Huaqi taro, Zhang Village plate noodles, and Zhejiang Fritillary—provides the material basis for innovation. The uniqueness and

authenticity of these products not only enable novelty production (e.g., developing new varieties like Lanxin watermelon) but also strengthen market governance by giving Zhangshui a competitive position in regional markets. Local specificity thus becomes a catalyst for product differentiation, branding, and the creation of value-added industries such as the cherry blossom industrial chain.

Novelty production enhances sustainability and promotes value-chain diversification within market governance. The cherry blossom industrial chain provides a clear example of how innovation can transform traditional agricultural resources into a multi-layered value system encompassing food processing, eco-friendly cultivation, value-added product development, and tourism. These forms of "novelty" contribute to sustainability by embedding stringent environmental protections—such as zero-pollution policies and mountain-based cultivation—while also generating diversified income streams. Such diversification reduces economic vulnerability and supports key objectives of China's Rural Revitalization Strategy, including industrial prosperity, ecological livability, and the enhancement of rural livelihoods.

Social capital demonstrates how community networks and collective action strengthen the institutional arrangements and market governance that underpin rural revitalization. Zhangshui's extensive revolutionary heritage—activated through initiatives such as the "Red+" initiative and "Red Tourism" alliance—cultivates shared identity, inter-village cooperation, and strong grassroots participation. These community networks facilitate coordination between party branches, village committees, enterprises, and cooperatives, thereby enhancing the effectiveness of local governance structures. Social capital also supports market governance by ensuring service quality, reinforcing local branding efforts, and enabling benefit-sharing mechanisms that distribute value more equitably across households.

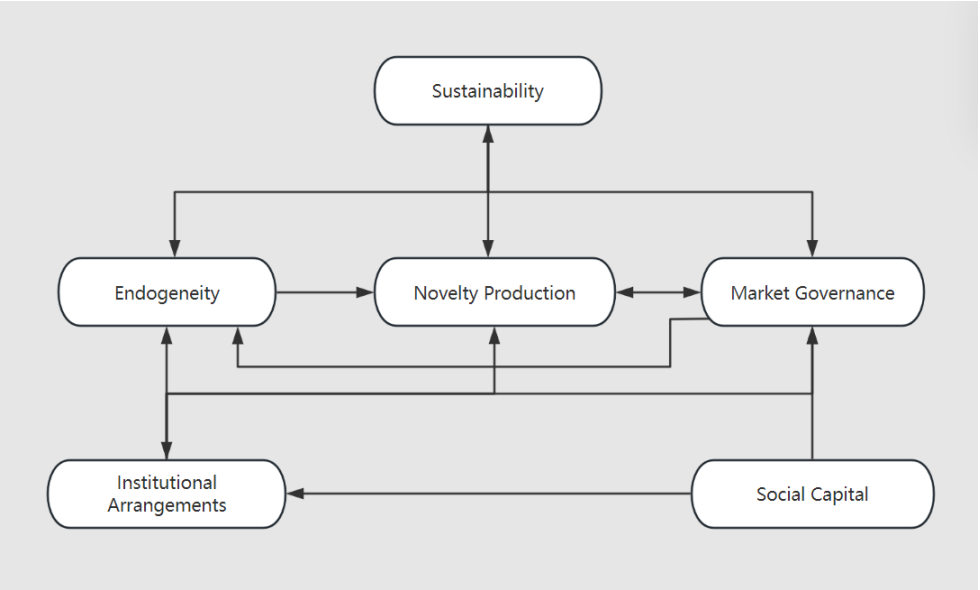
Institutional arrangements coordinate endogenous resources and locally generated novelties to support effective market governance. In particular, enterprise–village joint ventures, farmer-led cooperatives, and professionalized agricultural contracting serve as organizational mechanisms that align governmental, collective, and private interests. These arrangements channel scientific expertise into local resource development through partnerships with institutions such as the Chinese Academy of Sciences (Haishu District Government, 2023, January 19), facilitate knowledge exchange, and improve risk-sharing among stakeholders. In doing so, they provide the governance capacity required to translate local resource endowments and innovation outcomes into scalable, market-ready industries.

In turn, Zhangshui's market governance demonstrates how value-chain restructuring connects endogenous resource advantages and locally generated novelties with the coordinating role of institutional arrangements. The One–Two–Three Industrial Chain integrates agricultural production (*One*), value-added processing (*Two*), and downstream tourism and services (*Three*), creating a coherent system that commercializes distinctive local resources while stimulating continual innovation. This model relies on supportive governance structures—such as enterprise–village partnerships and cooperative mechanisms—to maintain product quality, branding consistency, and fair distribution of benefits.

In sum, Zhangshui's development trajectory shows that the six dimensions of the Rural Web Framework function as an interconnected system. As illustrated in Figure 1, endogeneity supplies the distinctive resource base that enables novelty production, while these innovations strengthen market governance by expanding and

upgrading local value chains. Institutional arrangements coordinate these processes and provide the organizational capacity for collaboration, which in turn helps cultivate social capital through shared participation and benefit-sharing. Sustainability underpins all dimensions, ensuring that ecological integrity supports long-term economic and social development. Together, these relationships form a coherent rural web that equips Zhangshui to pursue resilient and locally grounded rural revitalization.

Figure 1: Zhangshui model RWF synergy.



5.0 Broader Implications of Zhangshui Model

Building on the synergistic interactions identified across the six dimensions of the RWF, Zhangshui's development trajectory offers insights that extend beyond the local case, raising questions of scalability, governance transferability, international relevance, and policy implications.

5.1 Scalability, Transferability, and International Relevance

Zhangshui's experience demonstrates how the RWF can function not only as an analytical lens but also as a practical guide for rural development when local resources, institutional innovation, and market mechanisms are effectively coordinated. However, the wider relevance of this model hinges on distinguishing between transferable components and context-dependent enabling conditions.

Several components of the Zhangshui approach appear potentially transferable: (1) endogenous product development anchored in place-based ecological and cultural assets; (2) hybrid institutional arrangements (e.g., cooperative-based coordination and enterprise–village collaboration) that can reduce fragmentation and improve benefit-sharing; and (3) value-chain extension through processing, branding, and agri-tourism integration. These elements align with international rural development thinking that emphasizes locally grounded development pathways and innovation supported by multi-actor networks.

At the same time, Zhangshui's trajectory is enabled by conditions that may not be readily replicable in less endowed regions, including proximity to Ningbo's consumer markets, relatively strong administrative capacity, dense ecological/cultural resources, and access to technical expertise and research support. In this sense, "scaling" is better understood as selective adaptation supported by participatory resource identification, tailored technical assistance, and meso-level coordination.

Zhangshui also illustrates a two-way process of learning and adaptation. Some strategies draw inspiration from international models, notably Japan's OVOP initiative (Fujimoto, 1992), while local innovations (e.g., enterprise–village joint ventures) suggest governance options that may be considered in other contexts facing rural depopulation and fragmented coordination, such as some parts of Eastern Europe or Latin America.

Importantly, the case also reveals barriers that shape sustainability and limit transfer, including ecological trade-offs, coordination costs, and the operational fragility of tourism-linked upgrading. For example, some experiential tourism ideas were abandoned due to environmental concerns, such as "Firefly Love Flashes," which reportedly involved bottling fireflies for lovers to release (Guo, 2022). Tourism initiatives are also vulnerable to on-site operational risks; in our informal communications with township staff, "Star-gazing on Mountain Tops" was described as being discontinued after early implementation problems, including reports of mosquito bites and inadequate preventive measures. Overall, Zhangshui's broader relevance lies less in offering a ready-made blueprint than in demonstrating an iterative policy-learning process in which initiatives are piloted, evaluated, and adjusted under ecological, institutional, and market constraints.

5.2 Policy Implications and Recommendations

Aligning China's Rural Revitalization Strategy, Zhangshui's experience offers practical policy implications for advancing industrial prosperity, ecological livability, and effective rural governance in an integrated manner. Importantly, it also suggests that policy support should address not only "what to replicate" but also how to manage trade-offs and implementation risks when transferring place-based models.

At the national level, the Zhangshui case supports moving beyond sector-specific interventions toward coordinated policy instruments that enable endogenous innovation systems. This includes strengthening regional research-and-extension platforms for specialty agriculture, expanding technical training and advisory services that reach township and village actors, and developing governance toolkits for cooperative coordination and enterprise-village collaboration (e.g., clearer templates for accountability, benefit-sharing, and risk allocation). Given the operational fragility of tourism-linked upgrading observed in Zhangshui, national policy should also embed minimum sustainability and risk-management requirements for rural tourism and branding initiatives (e.g., ecological safeguards, visitor safety planning, and monitoring mechanisms) rather than prioritising growth indicators alone, do not generate sustainability trade-offs that undermine long-term rural livability.

At the local level, Zhangshui highlights the role of township governments and development organizations in operationalizing rural revitalization through participatory and place-based governance. Systematic mapping of endogenous resources enables villages to align industrial development with local ecological and

cultural conditions, supporting differentiated development pathways. Strengthening cooperative governance—through transparent benefit-sharing arrangements and leadership development—directly supports the goal of effective rural governance. Meanwhile, diversifying into agricultural processing and culture- and tourism-related industries expands value chains and enhances livelihood resilience. Notably, local authorities should also treat pilot initiatives as iterative learning processes—testing, evaluating, and adjusting—especially for tourism-based innovations that are sensitive to demand volatility and on-site operational constraints.

In conclusion, this study applies the Rural Web Framework to Zhangshui to show how rural revitalization is produced through the interaction of endogeneity, novelty production, sustainability, social capital, institutional arrangements, and market governance. Rather than any single intervention, Zhangshui's trajectory points to the importance of coordinating place-based resources with innovation support and governance arrangements within the broader Rural Revitalization Strategy, especially in balancing ecological priorities with livelihood and value-chain upgrading. While the evidence base is necessarily bounded by a document-led, single-town case, the Zhangshui experience nonetheless offers a concrete reference for thinking through how integrated rural development can be designed, adjusted, and sustained under real institutional and environmental constraints.

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