

Towards the Future Village: An Integrated Planning Framework for Tianmu Village, Lin'an, China

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ABSTRACT

Rural revitalization in contemporary China has progressed through successive policy frameworks, from physical environmental improvement under the Beautiful Countryside campaign to the more systemic ambitions of the Future Village initiative, which seeks to reconstruct rural communities as economically viable, ecologically sustainable, and digitally empowered units within the broader metropolitan economy. This paper presents an integrated planning framework developed for Tianmu Village, a mountain rural settlement located in Tianmu Mountain Township, Lin'an District, Hangzhou, Zhejiang Province. Situated at the gateway to the West Tianmu Mountain UNESCO Man and Biosphere Reserve, the village possesses an exceptional convergence of ecological landscape assets, layered cultural heritage, and an established rural hospitality economy — conditions that create both significant development opportunity and heightened risk of asset erosion through uncoordinated growth. The planning framework responds through five coordinated strategic interventions: comprehensive environmental remediation, targeted infrastructure and service improvement, thematic connectivity across dispersed heritage and landscape assets, industrial integration centered on bamboo culture, and digital empowerment of governance and visitor experience systems. The framework argues that durable rural tourism competitiveness depends not on the accumulation of generic amenities but on the articulation of a coherent, place-specific cultural identity grounded in the intersection of Tianmu's bamboo productive landscape, mountain ecological character, and multi-layered settlement heritage. The governance dimensions of the proposal — including a federated homestay quality management structure and a village-scale digital platform integrating smart tourism, agricultural monitoring, and community service delivery — are argued to be as critical to long-term success as the physical planning interventions themselves.

KEYWORDS

Future Village; rural revitalization; heritage conservation; digital governance; landscape planning.

1. INTRODUCTION

1.1. Research Background and Motivation

The tension between rural decline and urban growth has become one of the defining spatial challenges of contemporary China. Decades of rapid industrialization and urbanization have drawn successive waves of working-age population away from rural communities, leaving behind ageing residents, underutilized land, and eroding social infrastructure. While the physical environments of many villages have been improved through successive rounds of the Beautiful Countryside campaign — launched nationally in 2013 — the deeper structural challenges of rural economic viability, demographic sustainability, and governance capacity have proven considerably more resistant to policy intervention[1].

It is within this context that the Future Village initiative, pioneered by Zhejiang Province from 2022, represents a meaningful evolution in rural development thinking. Where earlier campaigns focused predominantly on physical environmental improvement — facade upgrades, road resurfacing, sanitation infrastructure — the Future Village framework advances a more systemic ambition: to reconstruct rural communities as genuinely competitive, livable, and self-sustaining units within the broader metropolitan economy. The framework is organized around three foundational principles — humanization, ecological sustainability, and digital empowerment — operationalized through nine livable scene typologies spanning health, education, culture, industry, governance, and community life. Critically, the initiative targets villages that have already achieved a reasonable baseline of physical environmental quality, directing investment toward institutional capacity, industrial development, and digital infrastructure rather than remedial environmental improvement alone.

Zhejiang Province provides a particularly generative context for this experiment. As one of China's most economically dynamic provinces, Zhejiang has long been characterized by an unusually dense network of small and medium enterprises, a strong tradition of private entrepreneurship, and relatively high levels of rural per capita income. These structural advantages have created conditions in which rural communities possess the economic foundation and institutional confidence to absorb and leverage new development frameworks in ways that may not be replicable in less developed provincial contexts. The province's designation as a national demonstration zone for high-quality balanced development has further concentrated policy attention and financial resources on rural transformation, creating a supportive environment for experimentation at the village scale[2].

Tianmu Village, the subject of this paper, was selected for Future Village designation against this backdrop. The village presents a planning situation of considerable complexity and opportunity: a well-established rural tourism economy built around an exceptional natural and cultural asset base, but one that has developed in an ad hoc and spatially fragmented manner that limits its competitiveness and threatens the ecological and cultural integrity upon which its long-term appeal depends. This paper documents and critically reflects on the integrated planning framework developed in response to this situation, with the aim of contributing to the growing body of scholarship on rural revitalization planning methodology in the Chinese context.

1.2. Location and Regional Connectivity

Tianmu Village is situated in Tianmu Mountain Township, Lin'an District, Hangzhou, at the southern foothills of the Tianmu Mountain range in northwestern Zhejiang Province. The village occupies a geographically strategic position within a wider mountain tourism corridor that includes the West Tianmu Mountain National Nature Reserve — one of the oldest and most ecologically significant protected areas in eastern China, designated as a UNESCO Man and Biosphere Reserve in 1996 — and the emerging Tianmu Mountain National Park planning area.

In terms of regional accessibility, the township lies approximately 26 kilometers from the Lin'an district center, reachable within 30 minutes by road, and approximately 60 kilometers from central Hangzhou, within approximately one hour's drive via the Hang-Rui Expressway. This proximity to Hangzhou — a city of over 12 million people with a large and affluent urban middle class — constitutes one of the village's most significant structural assets, placing it comfortably within the day-trip and weekend-escape catchment of a major metropolitan consumer market.

Ongoing regional infrastructure development is expected to materially improve this accessibility profile. The planned Hangzhou-Lin'an-Ji'an intercity railway, once operational, will reduce travel times between central Hangzhou and the Lin'an area to under 30 minutes, substantially expanding the effective visitor catchment. The concurrent reconstruction of National Highway G329 will improve road connectivity along the primary tourism corridor. At the local scale, the Zao-Tian county road constitutes the principal vehicular access route to Tianmu Village, connecting it to the broader Tianmu Mountain tourism circuit and the adjacent Moon Bridge Village cluster.

1.3. Planning Policy Framework

The planning framework developed for Tianmu Village is situated within a multi-scalar policy environment that has shaped both the aspirations and the specific design responses of the proposal. At the national level, China's Fourteenth Five-Year Plan (2021–2025) and the 2035 Vision Goals establish rural revitalization as a central national development priority, framing the improvement of rural living standards and the narrowing of the urban-rural income gap as fundamental objectives of the socialist modernization project.

At the provincial level, Zhejiang's designation as a national demonstration zone for high-quality balanced development has generated a cascading series of policy instruments with direct implications for village-scale planning. The Tianmu Mountain Famous Mountain Park visioning plan, which covers the broader landscape area within which Tianmu Village sits, establishes a hierarchical tourism product structure — organized around six flagship projects, thirteen supporting experience projects, and fourteen scenic hamlet clusters — that positions Tianmu Village within the "Tianmu Moon Township" hamlet cluster, alongside Moon Bridge Village, Xu Village, and Baihe Village. This cluster-level framework is significant for the Tianmu Village planning proposal, as it establishes the spatial and thematic relationships within which village-scale interventions must be calibrated.

The Tianmu Mountain Village Scenic Area Plan provides a further layer of planning guidance, designating the Moon Bridge Village area as a life experience zone and establishing "moon culture" as the overarching thematic narrative of the township tourism product. Within this framework, Tianmu Village's role is most coherently positioned as a complementary destination offering depth of ecological and cultural experience that the moon culture narrative alone cannot provide — a positioning that the planning framework developed in this paper seeks to consolidate and strengthen.

2. SITE ANALYSIS

2.1. Physical Geography and Natural Conditions

Tianmu Village encompasses a total area of approximately 6.19 square kilometers on the southern slopes of the Tianmu Mountain range, within a landscape characterized by the complex topographic transitions typical of the Tianmu massif — mid-elevation peaks and deep valleys giving way to lower hill ranges and small intramontane basins. The village's elevation ranges from approximately 200 meters at the valley floor to considerably higher on the surrounding ridgelines, creating a varied microclimate and a layered vegetation profile that constitutes one of its primary scenic assets.

The climate is classified as subtropical monsoon, with mean annual temperatures of approximately 14.9°C, mean January temperatures of 3.2°C, and mean July temperatures of 28.0°C. Annual precipitation averages 1,659 millimeters, distributed predominantly across the spring and summer months. The frost-free period extends to approximately 221 days, supporting a diverse agricultural calendar that includes bamboo shoot harvesting in spring, summer vegetable cultivation, and autumn fruit production. These climatic characteristics — mild temperatures, high humidity, and abundant rainfall — are particularly conducive to bamboo cultivation, explaining the historical dominance of bamboo in the local agricultural economy.

Four watercourses traverse the planning area: Zhengqing Stream, Shuangqing Stream, Dongguan Stream, and Tianmu Stream, with channel widths ranging from 12 to 45 meters. These streams originate in the forested upper catchments of the Tianmu range, ensuring generally good water quality throughout the planning area. Beyond their ecological function, the watercourses constitute a significant spatial structuring element within the village landscape, offering potential as linear public realm connectors and experiential amenity assets that the current planning largely fails to exploit.

The land cover is dominated by forested area, which accounts for approximately 430 hectares — nearly 70 percent of the total village area — of which bamboo forest constitutes the largest single component. Arable land covers approximately 50.73 hectares, distributed in fragmented parcels across the valley floor and lower slopes. This land cover distribution reflects both the ecological constraints of the mountain terrain and the historical primacy of bamboo cultivation in the local agricultural economy.

2.2. Settlement History and Cultural Heritage

The settlement history of Tianmu Village spans nearly eight centuries of continuous habitation, with documentary records placing the earliest administrative designation of the area in the Southern Song dynasty (1265–1274 CE), when it formed part of Jiiade Township in Yu'qian County. The current village administrative unit was established in 2007 through the merger of three previously independent natural villages — Dayou, Zhangzhuang, and Tianmu — taking its name from the historic Tianmu Zhuang settlement. This administrative consolidation brought together communities with subtly different historical trajectories and spatial characters, a layering that is still legible in the morphological variety of the current settlement fabric.

The village's cultural heritage is multi-stranded. Its folk narrative tradition encompasses several locally specific legends associated with the Tianmu Mountain landscape, including stories connected to the imperial prince Zhaoming of the Liang dynasty, who is said to have frequented the mountain during a period of scholarly retreat. The village also retains several significant built heritage assets: the former residence of General Ye Changgeng, a figure of local military history; an eighteenth-century vernacular dwelling at No. 72 Shangfan; and the historic Tianmu River Qing Bridge, a stone arch structure of considerable scenic and historical value. These assets collectively constitute a heritage resource of a depth and authenticity rarely found in villages that have undergone intensive tourism development, and their careful conservation and interpretation is accordingly a central concern of the planning framework[3].

The village's association with bamboo culture — encompassing cultivation practices, culinary traditions, craft skills, and vernacular architectural use of bamboo — represents a further dimension of intangible cultural heritage that the planning framework seeks to foreground as a primary identity marker. Bamboo is deeply embedded not only in the economic life of the village but in its spatial character and seasonal rhythms, and its cultural dimensions have historically been underexploited relative to its economic significance.

2.3. Socioeconomic Conditions

The village economy has undergone a significant structural transition over the past two decades. Bamboo shoot cultivation — which once provided the primary income for virtually all resident households, with approximately 5,000 mu (333 hectares) under cultivation generating annual revenues of approximately 4.5 million yuan at its peak — has progressively given way to a service economy anchored by rural homestay hospitality. This transition reflects broader trends in the Chinese rural economy, driven by rising urban disposable incomes, growing demand for nature-based leisure experiences, and the competitive disadvantage of smallholder agricultural production in increasingly integrated national commodity markets[4].

By the time of this study, the village was receiving approximately 200,000 visitors annually, generating total annual revenues of approximately 26.25 million yuan, with per capita resident income of approximately 25,000 yuan. The hospitality sector now accounts for the majority of this revenue, supported by a cluster of rural homestay operations that have grown rapidly but without coordinating governance or quality assurance mechanisms. The result is a sector characterized by significant quality variation, limited product differentiation, and a tendency toward price competition that threatens the long-term viability of the higher-quality operators.

The primary sector — encompassing bamboo shoot cultivation, tea, walnut, and vegetable production — remains economically significant but has been progressively repositioned from a standalone livelihood to a supporting element of the tourism economy, providing locally sourced ingredients for homestay catering and raw materials for craft and food processing activities. The secondary sector remains underdeveloped, representing a structural gap that the plan's proposed bamboo cultural industry cluster seeks partially to address.

The village population of approximately 1,035 residents across 403 households exhibits the demographic characteristics typical of rural tourism communities in eastern China: an ageing permanent resident base, with working-age adults either engaged in the local hospitality sector or commuting to employment in Lin'an and Hangzhou, and a relatively small but growing cohort of returnee entrepreneurs who have come back to the village to establish homestay or food and beverage businesses. The sustainability of this demographic structure — and the extent to which Future Village investment can strengthen the incentives for younger residents to remain and invest in the community — is a critical determinant of the long-term success of the planning framework.

2.4. Comprehensive Assessment

A structured assessment of the village's development conditions reveals a profile that is characteristic of a rural destination at an important inflection point: substantial and genuine asset richness, but mounting pressures that threaten to erode the ecological and cultural integrity upon which long-term competitiveness depends.

The village's principal strengths lie in the combination of its exceptional natural setting — the Tianmu Mountain landscape is among the most ecologically significant and scenically distinctive in the Yangtze Delta region — with a layered cultural heritage and an already functioning tourism economy that provides both a proven market demand signal and an established operational base for further development. Its gateway position relative to the West Tianmu Mountain Nature Reserve generates consistent visitor flows that no amount of destination marketing could independently replicate.

The principal weaknesses are structural rather than incidental. The rapid and uncoordinated growth of the homestay sector has produced a destination product that lacks coherence, thematic identity, and the kind of experiential depth that would justify extended stays or repeat visits. The spatial fragmentation of visitor attractions — currently connected by neither physical infrastructure nor interpretive narrative — limits the ability of individual visitors to discover and engage with the full range of assets the village possesses. The underdevelopment of facilities and amenities for younger visitor demographics represents a particular market gap, given the importance of this cohort to the social media-driven word-of-mouth dynamics that increasingly determine rural destination visibility.

The opportunities presented by the current planning moment are considerable. The convergence of the Future Village policy framework — with its associated investment resources and institutional support — with the ongoing development of the Tianmu Mountain National Park and the regional transport infrastructure improvements creates a window of opportunity for transformative investment that is unlikely to recur in the medium term. The growing urban middle-class market for high-quality nature-based and culturally distinctive rural experiences is structurally favorable to a destination of Tianmu Village's character, provided that its offer can be sufficiently differentiated and coherently presented.

The principal challenge, and the one that the planning framework must most directly confront, is the risk of a development trajectory in which short-term commercial pressures drive a progressive homogenization of the visitor offer — eroding the ecological and cultural authenticity that constitutes the village's fundamental competitive advantage — before the institutional and spatial infrastructure necessary to sustain a higher-quality model has been put in place. Managing this tension between the urgency of economic development and the imperative of quality preservation is the central planning problem to which the proposals in the following sections are addressed.

3. PRECEDENT STUDIES

3.1. Domestic cases

3.1.1. Fenshuitang Village, Yiwu, Zhejiang: Red Heritage Tourism and Multi-Platform Digital Outreach

Fenshuitang Village, located in the Chengxi Sub-district of Yiwu City, occupies a distinctive position in China's rural heritage landscape as the birthplace of Chen Wangdao, the scholar responsible for the first complete Chinese translation of *The Communist Manifesto*, published in 1920. This historical association has shaped the village's development strategy in fundamental ways, providing a singular and nationally recognized cultural identity around which a coherent heritage tourism product has been constructed[5].

The physical centerpiece of this strategy is the Wangdao Exhibition Hall, a purpose-built heritage interpretation facility that documents both the historical significance of Chen Wangdao's translation work and the broader intellectual context of early twentieth-century Chinese socialist thought. What distinguishes Fenshuitang's approach to heritage interpretation from conventional memorial hall models is its systematic integration of digital technology into the visitor experience. The hall incorporates a 5G-enabled autonomous navigation robot capable of conducting guided tours with synchronized audiovisual presentation, real-time question-and-answer interaction, and adaptive routing based on visitor density — a deployment that has attracted considerable attention as a model for technologically enhanced rural heritage interpretation.

Beyond the exhibition hall, Fenshuitang has developed a multi-platform digital outreach strategy that extends the village's cultural reach well beyond its physical visitor catchment. Partnerships with university media programs and regional broadcasters have generated a sustained programme of live-streamed cultural content, including documentary-style coverage of village life, heritage lectures, and seasonal agricultural events. The village has also developed a structured rural e-commerce operation through which locally produced agricultural specialties — including Yiwu's distinctive red dates and traditional fermented products — are marketed directly to urban consumers via major Chinese e-commerce platforms, generating revenues that directly benefit resident households.

The governance dimension of Fenshuitang's development is equally noteworthy. The village has invested substantially in cultivating a cadre of digitally literate young residents capable of managing its online platforms, producing content, and operating its e-commerce infrastructure — addressing one of the most persistent structural weaknesses of rural digital development, namely the shortage of locally embedded technical capacity.

For Tianmu Village, Fenshuitang's experience is relevant across several dimensions. Its model of heritage interpretation technology provides a concrete benchmark for the digital programming proposed for the General Ye Changgeng memorial site and the Cultural Hall governance display platform. Its multi-platform content strategy offers a proven framework for the kind of digital marketing outreach that will be necessary to build Tianmu's brand among younger urban visitor demographics. Most significantly, its investment in local digital capacity — rather than dependence on externally contracted technical services — offers an important lesson for the long-term sustainability of Tianmu's proposed digital infrastructure.

3.1.2. Lujia Village, Anji County, Zhejiang: Family Farm Federation and Bamboo-Integrated Agritourism

Lujia Village, located in Panan Township of Anji County — itself nationally renowned as China's leading bamboo production county — represents one of the most extensively documented cases of innovative rural industrial organization in Zhejiang Province. The village's significance as a planning precedent derives not from any single intervention but from the systemic coherence of its approach

to integrating agricultural production, rural tourism, and community economic governance within a unified spatial and institutional framework.

The cornerstone of Lujia's development model is the Family Farm Federation, an institutional arrangement in which 24 individually operated family farms — each with a distinct agricultural or recreational specialism — are linked together under a shared governance and marketing structure. Individual farms retain operational autonomy and ownership, while the federation coordinates joint infrastructure investment, unified branding, cross-promotional marketing, and collective negotiation with tour operators and government agencies. A 4.5-kilometer internal railway circuit connects the farms, providing visitors with a coherent spatial experience of what would otherwise be a dispersed collection of independent operations. This physical connectivity infrastructure has proven to be a significant driver of extended visitor dwell time and per-visitor expenditure, transforming a collection of individual attractions into an integrated destination.

The farm portfolio encompasses a deliberately diversified range of agricultural and recreational products — including bamboo shoot cultivation and processing, freshwater aquaculture, fruit orchards, flower cultivation, equestrian activities, and camping facilities — ensuring year-round visitor appeal and reducing the revenue volatility associated with single-product seasonal tourism. Anji's bamboo industry provides an important contextual backdrop: the county's mature bamboo processing supply chain has enabled Lujia to develop a bamboo cultural tourism product of considerable depth, encompassing farm-gate bamboo shoot sales, artisanal bamboo craft workshops, and bamboo cuisine programming that draws on a rich local culinary tradition.

The village has also made significant investments in ecological infrastructure, positioning environmental quality as a core component of its competitive proposition. Riparian corridor restoration, organic certification of agricultural production, and the management of bamboo forest understory as a recreational landscape asset have collectively established Lujia as a destination where ecological integrity and economic productivity are understood as complementary rather than competing objectives.

The relevance of Lujia Village to Tianmu is direct and substantial. The Family Farm Federation model offers a compelling institutional template for addressing one of Tianmu's most pressing planning challenges: the coordination of a rapidly expanding but poorly differentiated homestay sector. Adapting the federation concept to Tianmu's context — with bamboo culture as the unifying thematic identity and the proposed thematic trail network providing the spatial connectivity infrastructure — could provide the governance architecture necessary to realize the plan's ambitions for a high-quality, diversified, and collectively managed rural hospitality economy. Lujia's experience with bamboo cultural tourism product development is also of immediate practical relevance, given the centrality of bamboo shoot cultivation to Tianmu's agricultural identity and the plan's aspiration to elevate this asset from a commodity input to a culturally grounded visitor experience.

3.2. International Cases

3.2.1. Miyama, Kyoto Prefecture, Japan: Vernacular Heritage Conservation and Rural Hospitality Integration

Miyama is a rural settlement located in the mountainous interior of Kyoto Prefecture, renowned for its exceptionally well-preserved cluster of kayabuki (thatched-roof) farmhouses, of which 38 are designated as Important Cultural Properties under Japanese national heritage law. The settlement sits within a forested valley landscape that has remained largely free from the pressures of industrial agriculture and mass tourism development, preserving a spatial and ecological integrity rare among accessible rural destinations in Japan[6].

What distinguishes Miyama as a planning precedent is the manner in which heritage conservation and rural economic development have been pursued as mutually reinforcing rather than competing

objectives. The community established a resident-led thatched roof maintenance cooperative — the Kayabuki no Sato Preservation Society — which coordinates the labor-intensive upkeep of traditional structures while simultaneously functioning as a vehicle for community cohesion and cultural transmission. This governance model has ensured that heritage assets remain living, inhabited structures rather than static museum pieces, a distinction that fundamentally shapes the character of the visitor experience.

The rural hospitality economy has grown organically around this preserved landscape. Farmhouse bed-and-breakfast accommodation, locally sourced seasonal cuisine, and craft workshops offer visitors an immersive encounter with traditional rural life, while revenues from tourism are partially reinvested into conservation activities through a dedicated community fund. Crucially, the scale and pace of tourism growth has been deliberately managed to prevent the displacement of agricultural livelihoods — bamboo, rice, and vegetable cultivation continue alongside the visitor economy, maintaining the productive landscape that gives the destination its authenticity.

The relevance of Miyama to Tianmu Village is considerable. Both settlements share a mountainous forested setting, a heritage of vernacular architecture deserving of conservation attention, and an emerging rural hospitality sector at risk of quality dilution through uncoordinated growth. Miyama's community governance model for heritage maintenance offers a directly applicable framework for the management of Tianmu Village's historic structures, including the former residence of General Ye Changgeng. Its approach to balancing agricultural continuity with tourism development also speaks directly to the challenge of sustaining Tianmu's bamboo shoot economy alongside its expanding homestay sector.

3.2.2. Shirakawa-go, Gifu Prefecture, Japan: UNESCO Heritage Village and Community-Based Governance

Shirakawa-go, inscribed on the UNESCO World Heritage List in 1995 together with the neighboring Gokayama settlements, represents one of the most extensively studied cases of heritage village planning and management in East Asia. The settlement is defined by its gassho-zukuri farmhouses — large, steeply pitched thatched structures engineered to bear the heavy snowfall characteristic of the Shogawa River valley — of which approximately 59 examples survive in varying states of preservation within the core conservation zone[7].

The planning significance of Shirakawa-go lies less in its physical form than in the institutional architecture that has been constructed to manage it. Heritage designation brought with it the twin pressures of dramatically increased visitor volumes and heightened regulatory constraints on physical modification, creating conditions in which conventional top-down preservation approaches proved inadequate. In response, the community developed a multi-stakeholder governance framework in which residents, local government, the prefectural heritage authority, and tourism operators share responsibility for conservation decisions, visitor management, and revenue distribution. This framework has enabled the community to negotiate the tensions between preservation imperatives and economic development aspirations with a degree of flexibility and local responsiveness that centralized governance structures typically cannot achieve.

Visitor management has been a particular area of innovation. Shirakawa-go now deploys a reservation-based entry system during peak periods, channels visitor flows through designated circulation routes, and restricts private vehicle access to the historic core — measures that have substantially reduced congestion-related wear on heritage fabric while improving the quality of the visitor experience. Digital infrastructure plays an increasingly important role in this system, with real-time visitor monitoring data informing dynamic management decisions.

For Tianmu Village, Shirakawa-go offers valuable lessons in two specific domains. First, its community governance model provides a precedent for the kind of participatory management structure that will be necessary to sustain quality standards across Tianmu's distributed homestay

sector — a challenge that the plan's proposed unified oversight mechanism must be designed to address. Second, its experience with digitally-supported visitor flow management offers a concrete application for the village's proposed smart tourism infrastructure, moving beyond passive data collection toward active experiential and conservation management.

4. KEY NODE DESIGN

4.1. Cultural Hall and Community Service Center

The proposed Cultural Hall and Community Service Center is positioned as the primary civic and spatial anchor of Tianmu Village. Located at the village's main entry point, the facility functions simultaneously as an administrative hub, a community gathering space, a visitor orientation center, and a digital governance platform. The design program allocates the ground floor to public-facing functions — community services, an elderly activity center, a farmers' market showroom, a village parlor, and accessible restrooms — while the upper level houses a governance and data visualization center, a village learning hall, a formal cultural assembly space, and an observation terrace.

Critically, the Cultural Hall is conceived not merely as a functional building but as the operational "brain" of the Future Village digital infrastructure, integrating data streams from across the village to support evidence-based governance and service delivery.



Figure 1. Cultural Hall and Community Service Center

4.2. Adaptive Reuse: Abandoned Building at Guanshanyue

An abandoned structure left over from an incomplete real estate development project occupies a pivotal position between the northern and southern portions of the village. Rather than demolition, the planning proposes its adaptive reuse as a mixed-use cultural and commercial facility incorporating dining, leisure, craft workshops, and a local agricultural and artisanal product showroom. This intervention is intended to serve as a key mediating node in the visitor experience itinerary, providing a venue through which natural and cultural resources are translated into tangible economic activity.



Figure 2. Guanshanyue

4.3. Conservation and Interpretation of General Ye Changgeng's Former Residence

The former residence of General Ye Changgeng, currently serving as the village cultural hall, is in sound structural condition but has suffered from deferred maintenance and an accumulation of programmatic uses inconsistent with its heritage significance. The planning proposes to restore its primary function as a heritage memorial site: stripping away non-interpretive uses, undertaking specialist interior restoration and period furnishing reinstatement, repairing the external envelope, and installing comprehensive interpretive signage. This intervention consolidates the residence as a discrete node within the village's red culture (revolutionary heritage) tourism circuit.

5. INTEGRATED DESIGN STRATEGIES

5.1. Comprehensive Environmental Remediation

Environmental remediation is understood broadly to encompass the physical fabric of roads, buildings, watercourses, agricultural land, and forested areas. Along the primary Zao-Tian access corridor and internal village lanes, interventions focus on standardizing roadside vegetation, rationalizing signage and advertising hoardings, centralizing waste receptacle management, and undertaking selective road widening with surface repair. Building facades and courtyards are to be upgraded with an emphasis on bamboo cultural motifs, establishing a coherent vernacular aesthetic that foregrounds rural simplicity and ecological sensitivity.

Water environment improvement concentrates on Zhengqing Stream, where degraded riparian edges will be restored, accumulated waste removed, and selective channel widening undertaken. The introduction of accessible riverfront platforms will enhance the stream's role as a continuous public-

realm asset connecting different parts of the village. Agricultural landscapes, currently dispersed and of limited scenic value, are to be reorganized into differentiated production zones incorporating seasonal organic cultivation, rotational grain cropping, and the integration of interpretive waymarking and elevated viewing walkways — transforming working farmland into an experiential visitor resource.

The forested areas, dominated by economically productive bamboo groves, currently offer little accessibility or amenity value. The plan proposes to rationalize the understory, establish a network of forest footpaths and shaded leisure spaces, and introduce complementary planting to enrich spatial variety. Central to this strand of the strategy is the reactivation of the dormant Dayou Osmanthus Valley project, a historically significant site that now lies abandoned. Large-scale osmanthus planting, combined with new footpath infrastructure and supporting facilities, would restore the valley as a distinctive sensory landscape and provide the basis for a thematically differentiated homestay offering within the broader village economy.

5.2. Infrastructure and Service Improvement

A systematic audit of existing service provision identified critical gaps across transport, healthcare, education, and sanitation that constrain both resident quality of life and the village's capacity to accommodate growing visitor demand. In response, the plan proposes a coordinated programme of infrastructure upgrading calibrated to the specific conditions of each sector.

On transport, two consolidated parking facilities of approximately 50 spaces each are proposed for the Tianmu and Dayou clusters respectively, resolving the chronic parking pressure currently dispersed across informal roadside locations. These facilities will be complemented by a public bicycle sharing system and the installation of electric vehicle charging infrastructure — addressing an unmet visitor need that has grown in significance with the rapid uptake of electric vehicles among urban leisure travellers.

Healthcare provision is to be restructured around an upgraded village clinic incorporating a 5G-enabled remote consultation facility. This hybrid infrastructure supports chronic disease follow-up, health screening, appointment booking, and automated pharmaceutical dispensing, effectively integrating the clinic into provincial digital health networks and extending specialist care access to a population that would otherwise face significant travel barriers. The existing health station will be repurposed entirely for clinical use, consolidating functions previously diluted by its secondary role as a visitor center.

The absence of early childhood facilities within the village represents a gap with direct implications for the retention of young families. A childcare and early education center is therefore proposed within the Cultural Hall complex, providing infant and toddler care services for the village's youngest children. Complementary outdoor educational programming will utilize the village's bamboo forests and heritage sites for nature-based learning, rural studies, and experiential science education — assets that can serve both resident children and school groups visiting as part of organized study tours. Sanitation infrastructure will be expanded through the addition of five waste collection points meeting provincial classification standards, with existing waste transfer facilities progressively upgraded to support full waste-sorting compliance across the village.

5.3. Thematic Connectivity and Identity Strengthening

To address the current fragmentation of visitor attractions, a thematic connectivity strategy organizes the village's key sites into a coherent experiential sequence. Two primary thematic routes are proposed: a bamboo culture and nature study circuit, and a red (revolutionary) heritage trail. These routes link existing and new program elements — including the Cultural Hall, the Guanshanyue

adaptive reuse project, General Ye's former residence, the bamboo forest educational trail, and the osmanthus valley — into a legible and engaging visitor journey.

5.4. Industrial Integration and Economic Development

The village's economic development strategy is organized around three complementary clusters. The homestay cluster addresses current quality inconsistency through the establishment of a unified governance and quality assurance mechanism, while simultaneously encouraging product differentiation to prevent market cannibalization between operators. The bamboo shoot culture cluster elevates bamboo shoot production from a commodity activity to a culturally grounded agritourism product, encompassing demonstration production, artisanal food processing, and branded specialty goods. The agri-tourism integration cluster links agricultural landscapes with visitor experience programming to create a diversified, year-round visitor economy less dependent on peak-season arrivals[8].

5.5. Digital Empowerment

The digital strategy proposes the construction of a comprehensive public data platform for the Tianmu Moon Township cluster, integrating 5G connectivity, cloud computing, big data analytics, artificial intelligence, and the Internet of Things. This platform is designed to provide the operational backbone for five digital service domains: smart community welfare, smart agriculture, smart cultural tourism, smart education, and smart commerce. The goal is to construct a coherent digital ecosystem in which physical interventions and digital infrastructure mutually reinforce each other — enabling more efficient governance, richer visitor experiences, and more equitable distribution of economic benefits among residents[9].

6. INTEGRATED DESIGN STRATEGIES

The planning framework developed for Tianmu Village operationalizes the Future Village concept within a specific mountainous, peri-urban context characterized by rich ecological and cultural assets alongside structural economic and infrastructure challenges. By grounding the planning strategy in a rigorous site analysis, drawing selectively on domestic and international precedents, and organizing interventions around five coherent strategic themes, the framework aspires to a model of rural development that is simultaneously place-specific and methodologically transferable.

Three contributions merit particular emphasis. First, the framework demonstrates that digital empowerment need not be treated as a standalone technology project but can be deeply embedded within physical planning and economic development strategies. Second, the emphasis on thematic connectivity — organizing dispersed assets into legible experiential sequences — offers a practical response to one of the most persistent weaknesses of Chinese rural tourism development: spatial fragmentation. Third, the adaptive reuse of dormant and degraded structures as cultural-commercial nodes provides a resource-efficient strategy for expanding village amenity without unnecessary new construction.

Future research should examine the implementation trajectory of this framework, with particular attention to the governance mechanisms required to sustain quality standards in the homestay sector, the long-term economic returns of digital infrastructure investment, and the social equity dimensions of rural tourism growth in communities undergoing rapid structural change.

CONFLICTS OF INTEREST

The authors declare that they have no conflict of interest.

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