

Planning for Harmonious Rural Construction and New Business Format Development: A Case Study of Selected Villages in Yuan'an County, Yichang City

MAO Mao¹, FU Wanlin², XU Jing¹

(1. College of Science and Technology of China Three Gorges University, Yichang, Hubei 443002, China; 2. College of Horticulture and Gardening, Yangtze University, Jingzhou, Hubei 434025, China)

Abstract In light of the national focus on developing livable and harmonious villages and fostering high-quality development in the central region, alongside the establishment framework of modern industrial system in Hubei Province and the actual situation of the villages in Yuan'an County, this paper analyzes the region's strengths, which include its ecological environment, natural climate, key industries, and tourism resources, as well as the challenges in industrial structure, infrastructure, public services and population loss. Additionally, it presents concrete strategies for the development of relevant villages in the Yuan'an region, elucidates the development concepts of one product for one village, village linkage, industrial integration, and business format renewal through various practical case studies in rural planning and design. Furthermore, it emphasizes the powerful impetus of emerging rural business formats, including cultural tourism, digital village, great health, and study tour education, in advancing rural revitalization in the contemporary era, thus serving as a valuable reference for promoting high-quality development and fostering urban-rural integration in the central region.

Keywords Harmonious rural construction, New business format, Industrial integration, Cultural tourism
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The fundamental approach to revitalizing rural development and enhancing the income and prosperity of farmers is through the industrial revitalization of rural areas. Furthermore, the comprehensive promotion of rural revitalization serves as a support and guarantee for achieving high-quality development. On December 23, 2022, General Secretary Xi Jinping emphasized in his address at the Central Rural Work Conference that industrial revitalization constitutes the foremost priority of rural revitalization, asserting that the revitalization of industries is fundamental to achieving this goal. In the No.1 central document for the years 2023 and 2024, specific guidelines have been established for the industrial revitalization of rural areas and the cultivation of new business formats. These guidelines include the implementation of a rural leisure tourism boutique project and the promotion of quality improvements and upgrades in rural accommodations. Furthermore, the document emphasizes the in-depth execution of agricultural products from rural areas to urban markets through digital commerce and the Internet +. This initiative promotes the advancement of e-commerce for agricultural products, which encompasses direct procurement and tailored production. It also aims to establish live e-commerce platforms for agricultural and sideline products, enhance the standardization and normalization of industries such as clean vegetables and central kitchens, and

foster the cultivation and development of the prefabricated food industry^[1]. The opinion of the state council on promoting comprehensive rural revitalization fosters the integrated development of primary, secondary, and tertiary industries in rural areas. It encourages the establishment of characteristic industries tailored to local conditions, supports the creation of local distinctive brands, and implements projects that facilitate the deep integration of rural culture and tourism. Additionally, it promotes the construction of rural tourism clusters (villages), cultivates eco-tourism, forest wellness, leisure camping, and other innovative business formats, and advocates for the standardized development of rural accommodations to enhance quality. Furthermore, it optimizes the implementation of integrated rural industry development projects and nurtures agricultural industrialization consortia^[2].

In the chapter concerning the acceleration of new rural business format cultivation within the *Action Plan for the Development of Digital Rural Areas (2022–2025)*, published in January 2022, it is proposed to advance the intelligent development of rural tourism. The plan aims to establish a series of leisure and sightseeing parks, rural homestays, forest homes, and wellness bases that are equipped with comprehensive facilities, diverse functions, and enhanced intelligence and convenience. Additionally, it recommends a selection of boutique scenic spot

routes for rural tourism. The plan also seeks to promote the emergence of new Internet-based business formats, including creative agriculture, adoption agriculture, and health and wellness sectors, while exploring innovative operational models such as shared farms and cloud farms. Furthermore, the plan aims to disseminate various forms of intangible cultural heritage resources in rural areas via the network, while also fostering the development of culturally distinctive industries in these regions^[3]. On June 21, 2021, the Ninth Plenary Session of the Eleventh Hubei Provincial Party Committee emphasized the necessity of accelerating the transformation and upgrading of industries to establish a modern industrial system primarily driven by advanced manufacturing industry. The committee aims to cultivate and develop 5 trillion-yuan pillar industries, 10 advantageous industries valued at 500 billion yuan each, and 20 characteristic industrial clusters worth 100 billion yuan each. Furthermore, it advocates for the vigorous promotion of industrial clustering, high-end development, digitalization, integration, and sustainable practices. The committee also seeks to advance the modern service industry alongside the advanced manufacturing industry, fostering the deep integration of productive and living services, as well as the convergence of the digital economy with the real economy^[4].

The No.1 central document of the past two years has respectively planned and laid out

the development of new industries in rural areas, such as leisure tourism, boutique homestay, agricultural product e-commerce, prefabricated food, eco-tourism, forest wellness, leisure camping and so on. From the standpoint of digitalization, intelligence, sustainability, and integration, the *Action Plan for the Development of Digital Villages* and the 51020 Modern Industrial System of Hubei Province outlines strategies to foster the integrated development of urban and rural areas, as well as to promote the emergence of new business formats in rural regions. This is to be achieved through the acceleration of industrial transformation and upgrading, alongside the advancement of a deeper integration between the digital economy and the real economy. In comparison to the rural construction and industrial development in East and South China, significant disparities exist between the rural areas of the central and western regions regarding planning direction, construction progress, industrial structure, environmental style, and villagers' income. The new pattern of high-quality development for the rise of Central China and the establishment of the 51020 Modern Industrial System in Hubei Province offers explicit development objectives and implementation strategies for the creation of livable and harmonious rural areas in the contemporary era, particularly the rural revitalization in the central part of China. This study focuses on the villages within Yuan'an County, which are characterized by abundant ecological resources and significant industrial advantages. The objective is to contribute to the revitalization of the central region and to promote the high-quality development of the regional economy. Through the research and practice of rural planning and design, as well as the optimization of the industrial structure, this work aims to identify scientifically sound and rational approaches for establishing a modern industrial system in these rural areas. Furthermore, it seeks to offer innovative ideas and exemplary cases that can enhance the construction of livable, economically viable, and harmonious rural areas in the central region.

1 Overview of Yuan'an County and the current status of relevant village development

1.1 Overview of Yuan'an County

Yuan'an County is situated within Yichang City, Hubei Province, in the central region of China, specifically in the northeastern part of Yichang. The county's topography is characterized by a high elevation in the northwest and a lower

elevation in the southeast. The highest point is Taipingding, which reaches an altitude of 1,325.1 m, while the lowest point is Leidayan, at an altitude of 76 m. This results in a relative altitude difference of 1,249.1 m, contributing to a vertical geomorphological landscape. Yuan'an County serves as a transitional zone between the mountainous terrain of western Hubei and the Jiangnan Plain. The region exhibits a continental monsoon climate characterized by substantial rainfall, with an average annual precipitation ranging from 1,000 to 1,100 mm. It experiences four distinct seasons throughout the year and maintains a mild climate, with an average annual temperature of 16 °C and a frost-free period of approximately 270 d. The county is endowed with abundant surface water resources, featuring three major river systems: the Juhe River, the Zhanghe River, and the Xihe River. Additionally, it boasts an excellent ecological environment, with a forest coverage rate of 74.5%. Notably, it is the first county in Hubei Province to achieve the greening standards and is recognized as an ecological county within the province. Yuan'an County possesses a rich historical and cultural heritage, being recognized as the birthplace of Lei Zu, the mother of Huaxia, as well as the origin of Chu culture^[5]. The county exercises jurisdiction over Mingfeng, Hualinsi, Jiuxian, Yangping, Leizu, and Maopingchang townships, as well as Hekou Town. This jurisdiction encompasses a total of six townships and one town, comprising 117 villages, with a population of 184,700 individuals. The current industry is characterized by a diverse composition across its three industries. The primary industry is predominantly comprised of agricultural products, including grains, oilseeds, tea, vegetables, fruits, edible fungi, herbs, pigs, poultry, and various aquatic products. The secondary industry is primarily represented by four pillar industries: the phosphorus chemical industry, machinery manufacturing, new building materials, and the processing of agricultural products. In contrast, the tertiary industry is largely focused on the postal and tourism industries. Notable tourist attractions include the Mingfeng Mountain Scenic Spot, Leizu Hometown Scenic Spot, Zhaijialing Ancient Village, Taiqing Cave Scenic Spot, Wulingxiakou Scenic Spot, Juhe River Ecological Wetland, and Luyuan Barbecue Base. This sector encompasses a wide array of tourism resources, highlighting natural, cultural, and rural elements.

1.2 Current status of village development

Taking into account the geographic location,

ecological resources, advantageous industries, tourism resources, planning objectives, and other relevant factors of the rural area, this study identifies Hongjia, Dongjia, Luyuan, and Shiqiaoping villages in Jiuxian Township, as well as Luoxing Village in Hekou Town of Yuan'an County, as the primary research subjects. The aim is to investigate the integration of primary, secondary, and tertiary industries within these rural areas, explore methods for cultivating new business formats, and emphasize the construction of a distinctive development model for rural areas, along with a pattern for village linkage development.

1.2.1 Geographical location. Hongjia, Dongjia, Luyuan, and Shiqiaoping villages, which fall under the jurisdiction of Jiuxian Township in Yuan'an County, share a common source of mountains and water, establishing a continuous connection between them. Shiqiaoping Village is situated in the high mountainous region of northwest Jiuxian Township, with an average altitude of 682 m. In close proximity to Shiqiaoping Village, Luyuan Village is located at the base of the mountains to the southeast, positioned at the intersection of the mountainous area and the Juhe River region. This location benefits from a sufficient water supply and convenient transportation. Dongjia Village lies to the east of Luyuan Village, characterized by gentle terrain and a sprawling layout along both banks of the Luxi River. To the northeast of Dongjia Village is Hongjia Village, which converges at notable landscape features, including Shuangheyuan and Internet-famous bridge. Luoxing Village, situated in the northern region of Yuan'an County, serves as the southern gateway to Hekou Town. The village is characterized by a diverse array of geological structures and a rich abundance of paleontological fossils, and it is in proximity to the Wulingxiakou Scenic Spot. While it is not directly adjacent to the villages within Jiuxian Township, the distance separating them is merely 30 km. Due to its unique geological resources, Luoxing Village has the potential to complement other rural cultural tourism projects.

1.2.2 Ecological resources. The four neighboring villages in Jiuxian Township exhibit similar environmental and climatic conditions. They are situated along the Yuan'an Juhe River urban and rural development axis, sharing a provincial forest town ecological substrate. The area is characterized by Danxia landforms, which are encircled by mountains, and is noted for its picturesque scenery and favorable climate.

This region is abundant in water resources and features lush forests. The Luyuan River, which originates in the deep mountains of Beigou Village, flows through the villages of Luyuan, Dongjia, and Hongjia, ultimately converging with the Juhe River at the scenic point of Shuangheyuan. The riverbank is characterized by a rich diversity of flora and fauna, encompassing a wide array of species. The predominant native tree species include *Pinus massoniana*, *Pinus elliottii*, *Metasequoia glyptostroboides*, *Cryptomeria japonica*, *Juniperus chinensis*, *Platycladus orientalis*, *Osmanthus* spp., *Pterocarya stenoptera*, *Juglans regia*, and *Camphora officinarum*, etc. The national key protected plants consist primarily of *Eucommia ulmoides*, *Houpoa officinalis*, *Camphora officinarum*, *Metasequoia glyptostroboides*, and *Ginkgo biloba*. The avian population is predominantly composed of resident species, including *Bambusicola thoracica*, *Chrysolophus pictus*, *Pica pica*, *Garrulax canorus*, and *Leiothrix lutea*, migratory birds such as *Cuculus canorus*, *Hirundo rustica*, and *Accipiter gentilis*, as well as passing migrant species like *Upupa epops*, *Aviceda leuphotes*, and *Syrnaticus reevesii*. In terms of climate, Shiqiaoping and Luyuan villages, situated in the northwest low hills of Jiuxian Township, experience a warm and humid environment characterized by ample sunlight, cloud and mist cover. These conditions are particularly conducive to the growth of tea trees. Dongjia and Hongjia villages, located in the Juzhong area in the central-eastern part of Jiuxian Township, possess flat terrain, and deep and fertile soil, making them suitable for the cultivation and production of grains and oilseeds. The forest cover in Hekou Town is approximately 82%, characterized by ample rainfall and abundant sunlight, creating favorable conditions for the cultivation of economic forests and agricultural crops. During the Triassic period, Luoxing Village was submerged under an ocean, but over an extended period characterized by significant geological transformations, including sea-level fluctuations and crustal uplift, it transitioned into a hill. The limestone strata in this area are rich in ancient marine fossils and exhibit unique karst landform features. Luoxing Village has been designated as the first three-star geological and cultural village in China and is recognized as the first fossil village in the country.

1.2.3 Advantageous industries and tourism resources. The average altitude of Shiqiaoping Village exceeds 500 m, characterized by high humidity levels and favorable temperatures throughout the year. These climatic conditions

are particularly conducive to the cultivation of tea trees and rice. The primary industry in the region is predominantly characterized by the cultivation of tea and high-quality rice, serving as a significant source of Yuan'an yellow tea and Mingfeng rice. In 2017, the village collective formally established the Shiqiaosi Tea Professional Co-operative in Jiuxian Township, Yuan'an County, by acquiring 37 hm² of land from local farmers. This initiative actively promoted the standardization of the yellow tea industry, the development of a distinct tea brand, and the renovation of aging tea plantations. In October 2021, the establishment of a demonstration plantation tea plantation was initiated. The secondary industry related to this sector has not yet developed a comprehensive system, primarily encompassing tea processing and sales. This industry has been supported by enterprises such as Shengming Tea Company, Jiayu Tea Company, and Shanjing Shiye Tea Industry Co., Ltd. The tertiary industry is currently characterized by a lack of development; however, the region's distinctive climate and temperature, the established scale of the tea industry, and the presence of over 20 ancient trees, as well as cultural relics such as the Tianjing house, are all significant tourism resources.

Leveraging the ecological tourism resources of the Luyuan River, the traditional intangible cultural heritage skills associated with yellow tea processing, and a collaborative grassroots governance mechanism, the integrated development of agriculture and tourism in Luyuan Village has yielded significant progress. Consequently, the rural industry has become more comprehensive and vibrant. In the context of primary industry, Luyuan Village has proactively engaged in the introduction of enterprises to implement a cooperative +farmers model. The village has vigorously developed traditional yellow tea cultivation, with the area dedicated to tea plantations reaching 73 hm². The output value of the tea industry in the village has surpassed 8 million yuan. The secondary industry, as an extension of the primary sector, encompasses activities such as the processing, packaging, and marketing of yellow tea. Since the production of Luyuan yellow tea has been designated as a provincial intangible cultural heritage, it is imperative to enhance technical training to promote the integration and intensification of the yellow tea industry. The tertiary industry in Luyuan Village exhibits a diversified trend, centered around its core tourism resources, which include Danxia landforms, natural landscapes, and yellow tea

culture. The village has developed various venues for leisure and tourism, such as a self-service barbecue base, a children's water park, a tea culture plaza, a yellow tea culture experience garden, and waterfront village coffee shop. The development of rural live streaming platforms and we-media publicity is being implemented concurrently. This includes the regular planning and organization of events such as yellow tea tastings, tea-picking contests, and folk village evening parties, which have gained significant tourism awareness. On average, these initiatives attract over 200,000 tourists annually, with daily visitor peaks exceeding 3,000 individuals. Overall, the whole industrial chain for the integrated development of primary, secondary, and tertiary industries in Luyuan Village has been preliminarily established, thereby providing a solid foundation for further scientific planning and the cultivation of new business formats.

Dongjia Village is characterized by waterfront basin topography. The primary industry in the area is centered on the development of fruit farming and aquaculture. Currently, there are nearly 20 hm² dedicated to the cultivation of grapes, strawberries, and other fruit plantations, as well as loach demonstration aquaculture bases. The annual output value of these activities is approximately 9 million yuan. The Dongjia grape brand has gained significant recognition locally, contributing to a substantial influx of visitors for fruit-picking activities. Currently, leveraging the established scale, intensification, and market-oriented development of the grape industry, the village is utilizing idle land for the cultivation of strawberries, dragon fruits, and other crops. This initiative aims to diversify the range of characteristic fruit varieties available. Additionally, the village is developing a dual promotion platform that integrates offline fruit tourism with online livestream commerce. This approach actively promotes the fruit-picking industry, which can be harmoniously integrated with the development of the primary industry. The popularity generated by fruit-picking activities is being utilized to enhance the promotion of various rural tourism projects, including the Shuangheyuan hydrophilic tour, sightseeing tours of the rape fields, and outdoor fishing activities, thereby contributing to the establishment of a relatively diverse tertiary industry.

Hongjia Village encompasses a total of 147 hm² of arable land. Notably, groups 1 and 2 feature particularly flat terrain, fertile soil, ample sunlight, and a suitable temperature for agricultural activities. The Juhe River, which serves as the most significant natural water

system in Yuan'an, exhibits three natural bends and turns upon reaching the confluence of Hongjia and Guandong villages. This designation renders Hongjia Village the county's longest river-crossing village, creating a geographical pattern characterized by water on three sides. The Donggan Trunk Canal, an artificial diversion canal that originates from the Madu River in Yangping Township to the north and extends to the Dachong Reservoir in Mingfeng Township to the south, traverses the village in a north-south direction. Therefore, Hongjia Village possesses concentrated arable land, abundant water supply, and convenient irrigation facilities. The primary agricultural industry is predominantly comprised of rice, wheat, maize, oilseed rape, and other grain and oil crops. This region has established a double cropping system for both rice and wheat, as well as for rice and oilseed crops, thereby positioning itself as one of the principal grain and oil producing areas in Yuan'an County. Since 2000, Hongjia Village has accelerated the transition from traditional agriculture to modern agricultural practices. This transformation has resulted in a significant increase in the degree of mechanization, a steady rise in food production, and the advancement into a new developmental stage characterized by high-yield, high-efficiency, and high-quality eco-agriculture and green food. In 2011, a new breeding base for beef cattle was established, followed by the founding of Yichang Hongjiawan Agricultural Technology Co., Ltd. in 2013. This company primarily focuses on the breeding of high-quality beef cattle, as well as the procurement of maize and straw agricultural products. It has successfully initiated the development of an industrial chain that encompasses the processing of beef agricultural products, as well as the recovery and recycling of seeding and breeding waste. In addition, Hongjia Village possesses a strong foundation in the processing industry for agricultural products, including mung bean skin and wild spicy vegetables. The tertiary industry predominantly depends on ecological landscape resources, including the Shuangheyan water conservancy landscape and the Juhe River water system. It has successfully established various tourism venues, such as the Shijing oasis, wetland parks, bird watching platforms, and Hongjia manor. Additionally, there are cultural and natural attractions available for development, including the Yao'eryan Rock House Cluster, the Hundred Step Ladder, and the Muddy Waters Cave. Consequently, the foundation for tourism development in this region is robust.

The arable land area of Luoxing Village

encompasses 162 hm², which constitutes 13.85% of the village's total land area. The distribution of arable land is extensive and fragmented, resulting in a limited per capita availability of arable land. The village primarily engages in traditional agricultural practices, which are characterized by low economic efficiency. The agricultural land is predominantly located in the eastern region of the village, where traditional rice and maize cultivation prevails. In recent years, the cultivation of red sorghum and edible fungi has emerged, facilitated by the transfer of land contract management rights. Additionally, the practice of recycling sorghum straw as substrate for fungal cultivation has established a primary and secondary industry chain, promoting the comprehensive utilization and recycling of agricultural by-products. The tertiary industry in the village is currently fragmented and has not yet achieved a significant scale. However, the area is rich in geological relics and paleontological fossils. Notably, it has yielded the distinctive 247-million-year-old Hubei crocodile fossils, as well as the earliest known fossils of ichthyosaurs and sauropterygia in Earth's history. The village has established a fossil in-situ museum, a geological culture park, Triassic Paradise, and the Wulingxia Cave Ski Resort, and other tourism venues. Additionally, it boasts natural and cultural tourism resources, including the Hongyan River, Xiaoshui Cave (the entrance to the underground dark river), and traditional residential buildings. These attributes indicate significant potential for the development of eco-tourism, as well as opportunities for science popularization and research.

1.2.4 Development orientation and planning objectives. Following the progressive achievements in the construction of harmonious villages, and in response to the evolving trends of the contemporary era as well as the increasing demands for improved agricultural productivity, each village has formulated new construction planning objectives that are specifically tailored to its distinct characteristics, in order to further advance the establishment of livable and harmonious villages, and consistently enhance the sense of well-being and satisfaction among farmers.

Shiqiaoping Village leverages its annual average temperature and tea cultivation as essential resources to formulate a development strategy that focuses on wellness in mountainous regions and the integration of tea cultivation with tourism. The village aims to create an industrial chain that combines the primary tea industry with summer resort wellness services.

Drawing upon its farming culture, Shiqiaoping Village emphasizes tea as a distinctive feature and aspires to develop a comprehensive beautiful village that harmoniously integrates five key elements: picturesque landscapes, cultural richness, economic prosperity, quality tea production, and harmonious environment. Luyuan Village primarily depends on its long-standing tradition of yellow tea cultivation, the intangible cultural heritage skills associated with yellow tea processing, and the unique Danxia landscape. Building upon its existing tourism brand recognition and a diversified leisure and tourism industry, the village adheres to the principles of co-creativity, which encompass collaborative planning, construction, management, assessment, and shared benefits in grassroots initiatives and rural development. The village is committed to advancing the modernization of yellow tea cultivation, enhancing the deep processing of yellow tea, leveraging self-media marketing, and promoting cultural tourism, aiming to establish an industry chain that facilitates the deep integration of primary, secondary, and tertiary industries. Dongjia Village, leveraging its advantageous location and established fruit industry, as well as the popularity of fruit picking, aims to enhance its aquaculture, fishing, waxed goods smoking, and food deep processing sectors. The village seeks to utilize the construction of a comprehensive production and sales center for agricultural products as a developmental opportunity, and gradually establishes a complete industrial chain encompassing primary, secondary, and tertiary industries. The primary industry includes the cultivation of fruits and aquatic products, the secondary industry focuses on the deep processing of fruits, fish, shrimp, and meat, while the tertiary industry encompasses activities such as fruit picking, fishing, farmhouse catering, agro-tourism, online sales, etc. Supported by the traditional advantages of the cold water rice industry and leveraging the ecological resources of the Juhe River wetland, as well as the cultural heritage of Shijing (Classic of Poetry), Hongjia Village has established a precise positioning of fragrant rice, crystal water, and searching for the origins of Shijing, and has developed a comprehensive plan to advance the modernization of agriculture. This initiative aims to promote the cultivation of cold water rice and rice seedling planting towards a trajectory of intensive, large-scale, modernized, standardized, and high-efficiency development. The village aims to establish a food deep processing industry that integrates various components, including

agricultural planting, research and development, production and processing, storage, and sales. This initiative seeks to produce organic agricultural products that are green, ecological, healthy, and convenient, such as cold water rice, rapeseed oil, Hongjia beancurd skin, and morel mushrooms. Additionally, the village plans to research and develop related nutritious health foods, while incorporating contemporary visual design and brand planning concepts to create an autonomous brand for Hongjia Village agricultural products. Simultaneously, drawing upon the cultural connotations of Shijing, there is a robust development of the agro-tourism industry focused on rice fields and oilseed rape, the popularization of science and study tour industry related to ecological wetlands, rare bird species, and agricultural production, and the new cultural and tourism business formats, encompassing activities such as hydrophilic experiences along the Juhe River, starry sky camping, rural coffee shop, rural bookstores, and themed cultural and creative activities. Luoxing Village leverages its rich geological landscape and ancient marine fossils as key competitive advantages. The village is committed to an overarching strategy centered on rural aesthetics and fossil slow village. It aims to establish two pillar industries: ecological recycling agriculture and fossil science popularization culture and tourism, thereby promoting the integrated development of these sectors. A comprehensive development plan has been formulated, which positions the fossil culture brand as the central theme and emphasizes the enhancement of the Wulingxia Scenic Spot as a focal point. The ultimate objective is to transform Luoxing Village into a model region for national rural revitalization through the integration of agriculture and tourism.

1.3 Challenges confronting the development of rural industries

1.3.1 Relatively homogeneous composition of industrial structure and insufficient extension of industrial chain. The core resources and industrial structures of the villages concerned, though not identical, exhibit a general homogeneity of industrial structure. Many villages exhibit a disproportionately high proportion of traditional industries, predominantly centered around food production. These industries are significantly impacted by climate change and market fluctuations, resulting in low value-added agricultural products. The secondary industry remains limited in both scale and quantity, with the overall quality and efficiency of the industrial economy being suboptimal.

Enterprises within this industry demonstrate a weak capacity for technological innovation and have not sufficiently expanded towards the two ends. Furthermore, there is a notable absence of high-technology and high-value-added products. The tertiary industry is characterized by slow development, and the infrastructure supporting cultural and tourism activities is severely underdeveloped. The development of primary, secondary, and tertiary industries is characterized by an imbalance, as these sectors do not effectively extend and integrate with one another to create a comprehensive industrial chain economy. Furthermore, the emergence of new business formats is largely confined to the domains of live streaming e-commerce and agricultural tourism, which exhibit a low degree of systematization, diversification, and digitization^[6].

1.3.2 Inadequate infrastructure and low level of public services. The level of infrastructure development and public services in rural areas serve as a fundamental determinant for the prosperity of rural industries. This development significantly influences the advancement of the three primary industries across various domains, including irrigation, processing, transportation, logistics, communication, sanitation, housing, security, and cultural activities. Furthermore, it has a direct impact on the overall quality of life for residents in these villages. The deficiencies in rural infrastructure primarily pertain to the inadequate hardening of roads in villages, a scarcity of communication base stations, outdated electricity and water conservation facilities, and a lack of waste disposal equipment. These shortcomings significantly hinder the modern advancement of the primary industry and the innovative development of the secondary industry in rural areas. Simultaneously, the inadequate state of public services in rural areas, including education, healthcare, catering, retail, accommodation, parking, cultural and recreational facilities, and public health, has negatively impacted both the improvement of living standards for residents and the quality of tourism services available to visitors.

1.3.3 High labor turnover and insufficient motivation among farmers. The cultivation and development of new business formats within the village necessitate a substantial workforce. However, the ongoing processes of urbanization and industrialization have led to a significant outmigration of young and middle-aged individuals from the village to urban areas in search of employment. This trend has resulted in the underutilization of land, abandonment

of agricultural fields, and the deterioration of infrastructure within the village. Conversely, traditional agriculture is characterized by low value-added agricultural products, low prices, outdated facilities, high labor intensity, but low returns. Additionally, the limited educational levels among villagers, combined with inadequate information dissemination, have contributed to a lack of understanding among farmers regarding policies that could benefit the agricultural industry. Consequently, this situation has significantly undermined the incentives for their labor.

2 Analysis of the causes of the problem

The challenges and dilemmas associated with rural industrial development arise from a multitude of factors, including history, resources, transport, talents, concepts, technology, market, policy, planning, economic structure, etc. A primary underlying issue is the persistent urban-rural dual economic structure, which has resulted in significant disparities between urban and rural areas in terms of economic forms, industrial structures, consumption levels, infrastructure development, population distribution, and household registration systems^[7].

2.1 History and natural resources

The longstanding survival philosophy of the village, which emphasizes the importance of utilizing resources that are readily available in the surrounding environment, underscores the significant dependence of the village's industries on the surrounding natural environment, resources, and climatic conditions. For generations, the villagers have relied on agricultural production, including subsistence farming and livestock breeding and aquaculture, as their primary industry, which has constrained the diversification of the local industrial structure. Conversely, during the initial phases of China's economic development, there was a prolonged emphasis on the advancement of heavy industry in urban areas to expedite the process of industrialization. The constraints imposed by the traditional urban and rural household registration system facilitated a disconnection between cities, characterized by modern industrial practices, and villages, which were primarily engaged in traditional agricultural activities. This resulted in a significant imbalance in development between these two sectors.

2.2 Location and traffic conditions

The geographical positioning of villages is often characterized by remoteness, coupled with underdeveloped road infrastructure, particularly in mountainous regions. Environmental factors,

including topography and climate, significantly hinder transportation to urban centers. This situation contributes to a deficiency in market information and challenges in product transportation. Furthermore, the predominance of a dispersed small-farm economy persists, while the inherent conditions for industrial development within these villages remain inadequate. This inadequacy exacerbates the homogeneity of the industrial structure and contributes to the emigration of the young and capable labor force.

2.3 Demand and market environment

The market demand in rural and urban areas is comparatively constrained, with the demand structure for products exhibiting a degree of homogeneity, primarily centered on essential goods for daily living and production. Conversely, the labor return rate among rural residents is relatively low, and their income levels are generally inferior to those in urban areas. This situation is compounded by limited consumption capacity, inadequate supervision, insufficiently standardized market conditions, and a lack of financial and technical support. Consequently, the market mechanisms in rural areas exert a limited influence, resulting in fewer employment opportunities and a suboptimal entrepreneurial environment. These factors significantly hinder the cultivation and development of new industries in rural regions.

2.4 Technology and resource allocation

The distribution of natural resources among villages is characterized by significant imbalance. In comparison to urban areas, villages face disadvantages in the allocation of capital, technology, talents, public services, and other essential resources. This disparity contributes to inadequacies in infrastructure and public service facilities within rural areas. Furthermore, the environment for entrepreneurship and employment in villages lacks sufficient appeal, which hinders the cultivation and development of innovative industries, and leads to a notable shortage of high-quality, skilled talent in rural regions, thus restricting the market expansion, technological innovation, and the scaling of rural industries.

2.5 Concepts and sense of autonomy

Due to entrenched traditional beliefs, the influence of policy, and disparities in access to information, rural areas significantly lag behind urban cities in various aspects, including ideological concepts, habits and customs, production modes, and technological means. Consequently, there is a limited awareness and acceptance of novel things, technologies, and industries in rural areas, resulting in a deficiency

in innovative awareness and transformative thinking. Simultaneously, a lack of comprehensive understanding of the policy, coupled with uncertainty regarding market direction and the ongoing exodus of young, skilled individuals, has resulted in a diminished enthusiasm and initiative among villagers, who are the primary agents of rural revitalization, in selecting the direction for industrial structure adjustment and in fostering new business formats. Consequently, they exhibit a passive reliance on external forces for promotion and implementation.

3 Solution ideas and counter-measures

Rural revitalization and sustainable development should be guided by the principles of urban-rural integration. This involves balancing the supply and demand dynamics between urban and rural areas, optimizing the allocation of public resources, enhancing infrastructure conditions, and fostering a conducive environment for rural economic growth and industrial development. Based on this, we comprehend and apply the developmental connotations of original ecology, modern industrial systems, rural aesthetics, rural rhythms, and nostalgia within the context of harmonious villages. Through the comprehensive planning of industry, culture, and landscape in the case study of Yuan'an village, the diverse values inherent to the village can be investigated thoroughly. We take into account the actual circumstances and developmental trajectory of the village, with particular emphasis on emerging business formats such as modern agricultural product processing, rural leisure tourism, and rural e-commerce. It is essential to promote the modernization of agriculture, enhance research and development in agricultural product processing technologies, and foster the growth of ecological and non-polluting cultural tourism. Furthermore, it is important to encourage the integrated development of primary, secondary, and tertiary industries, extend the industrial chain, and increase the added value of products. Simultaneously, we should generate innovative concepts for rural development and establish a linkage cultural and tourism system among villages. This approach aims to preserve the unique cultural heritage of each village while also recognizing and leveraging the complementary strengths of the villages. By doing so, we can mitigate homogeneous competition, accelerate the development of new business formats, and promote the construction of local homogeneous villages, as well as the construction of pilot digital villages.

3.1 Improvement of infrastructure, provision of public services, and management of ecological environment

3.1.1 Improvement of infrastructure construction.

(1) Improvement of production and living infrastructure. It is imperative to effectively utilize specialized financial resources to enhance the hardening, expansion, and repair of rural roadways. Additionally, there is a need to improve the construction of irrigation, drainage, and other water conservation infrastructure. Efforts should also be directed towards the development of rural power grids and the upgrading of their facilities. Furthermore, the establishment of network base stations must be prioritized to enhance network quality. The construction of lighting facilities along major rural roads and in public areas should be strengthened, alongside the advancement of sanitation infrastructure, including the installation and renovation of public toilets and waste disposal systems. These initiatives are essential to ensure that rural areas benefit from accessible transportation, reliable power supply, efficient communication networks, safety, and overall comfort, thereby providing fundamental support for the return of skilled individuals to their hometowns and the introduction of advanced technologies.

(2) Improvement of tourism service infrastructure. In alignment with the comprehensive planning of rural areas, we should expand financing avenues, attract social capital, and consistently enhance the development of tourism service infrastructure within villages. This includes improvements in facilities such as parking, guided tours, accommodations, dining, retail, postal services, and logistics. The objective is to establish a high-quality environment conducive to the growth of the rural culture and tourism industry, while simultaneously providing villagers and tourists with accessible and comfortable recreational and cultural venues and facilities.

3.1.2 Provision of rural public services. The soundness of rural public service system, along with advancements in comprehensive governance, contributes positively to the enhancement of farmers' sense of well-being and accessibility. Furthermore, these improvements are instrumental in mitigating the emigration of young and middle-aged laborers. It is essential to allocate public service resources rationally between urban and rural areas, with an emphasis on increasing investment in rural regions. This should involve enhancing the development of venues and facilities, as well as facilitating the introduction of human resources and technology

in critical sectors such as public health, medical care, production services, basic education, vocational training, legal aid, and mental health. Such measures aim to significantly address the deficiencies in public services within rural areas and to reduce the disparity in living standards between urban and rural residents.

3.1.3 Rural ecosystem management. A favorable ecological environment, harmonious natural landscapes, and tranquil rural lifestyle constitute essential resources for rural development and serve as a foundational barrier for the sustainability of urban livability. The primary contributors to the degradation of the rural ecological environment during the process of urbanization include industrial pollution, agricultural pollution, and domestic pollution.

The management of rural ecological environments should be approached through two fundamental levels: protection and restoration. At the protection level, it is imperative to improve public awareness and education concerning ecological and environmental conservation among rural populations, as well as to raise consciousness regarding ecological protection. Continued efforts are necessary to preserve natural landscape patterns, safeguard natural forest resources, establish protected zones for water sources, delineate nature reserves in accordance with legal regulations, provide habitats for wildlife, and maintain biodiversity. At the restoration level, it is imperative to enhance environmental protection laws and regulations, as well as to establish effective incentive mechanisms. Additionally, it is essential to guide local villagers in the implementation of the conversion of sloping arable land to forested areas in response to soil erosion. Efforts should be made to strengthen the development of ecological forests on barren hills and wastelands, promote eco-agriculture, and foster a circular economy for agricultural and sideline products. Furthermore, the regulation and centralization of domestic waste management should be prioritized. Through the implementation of rural ecological protection, restoration, and management strategies, the ecological benefits of forest towns in Yuan'an County are preserved. The functions of soil and water conservation, as well as biological purification provided by ecological forests and wetlands, are fully utilized. Additionally, there is a proactive development of modern eco-agriculture and green industries, facilitating a pathway toward sustainable green development within the village.

3.1.4 Cultural heritage and intangible cultural heritage preservation. The village serves as

the cradle of China's esteemed traditional culture and represents the foundation of the Chinese nation. In this case, rural areas are characterized by a profound cultural heritage, picturesque natural landscapes, and abundant human resources. Among the villages identified, Luyuan Village in Jiuxian Township and Luoxing Village in Hekou Town have been designated as traditional villages to be protected at the county level. Additionally, Dongjia and Shiqiaoping villages in Jiuxian Township have been recognized as idyllic landscapes in high mountain and hilly areas at the county level. The protection and inheritance of both tangible and intangible cultural heritage in villages serve as a fundamental way for condensing the essence of nostalgia and enhancing the unique appeal of a village. The preservation and restoration of traditional rural buildings, historical sites, and other cultural relics are essential components of safeguarding tangible cultural heritage. By effectively implementing these measures, it is possible to enhance the core competitiveness and brand image of rural cultural tourism. Notable examples include the Luyuan Temple in Luyuan Village, the Luxi Dam in Dongjia Village, the Yao'eryan rock house in Hongjia Village, the Huyuetang ancient house in Luoxing Village, and the Lijiawan old house in Shiqiaoping Village. Intangible cultural heritage primarily encompasses folk arts and culture, handicrafts, traditional customs, and artisan practices. In this region, it predominantly includes the skills associated with the production of yellow tea, beancurd skins, yellow cakes, and bamboo weaving. Under the contemporary development framework of the new era, the exploration of innovative approaches to both the innovation and inheritance of intangible cultural heritage constitutes a significant endeavor aimed at promoting the rich traditional culture of China and safeguarding the skills associated with folk intangible heritage^[8].

(1) Attracting aboriginal people back home. The continuation and transmission of intangible cultural heritage are significantly influenced by market demand and are contingent upon the individuals responsible for its preservation. Aborigines possess a profound understanding of the environment, climate, history, and culture of their villages, along with their customs and modes of production and lifestyle. This knowledge not only supplies adequate labor for the advancement of rural industries and fosters innovation and entrepreneurship within these areas, but also enhances the comprehensive governance of

villages and the preservation of rural culture. The preservation of local cultural identity and continuity can only be guaranteed by indigenous peoples residing in their ancestral rural locations. Moreover, while it is crucial to preserve traditional intangible cultural heritage skills, it is equally important to adapt these skills to contemporary needs and rejuvenate them through innovative forms and methods, thereby ensuring their live transmission.

(2) Cultural tourism planning and exhibition. The integration of intangible cultural heritage culture and skills into the tourism, along with the combination of innovative and traditional approaches in the planning of cultural tourism projects, skills exhibitions, and performances, constitutes a primary strategy for addressing the declining market demand for traditional intangible cultural heritage skills. These strategies also serve as effective mechanisms for achieving the innovative inheritance of traditional culture and facilitating the transformation and enhancement of contemporary tourism. The tourism economy has the potential to generate significant market demand for intangible cultural heritage, thereby enabling folk craftsmen and artists to achieve a reasonable economic income. This, in turn, can fundamentally address the challenges associated with the lack of successors for intangible cultural heritage skills. Conversely, intangible cultural heritage can provide tourists with more immersive experiences, enhance the cultural and interactive dimensions of tourism, offer a wider array of tourism activities, and fulfill the intrinsic needs associated with contemporary cultural tourism. For instance, intangible cultural heritage is transmitted through various folk cultural activities, including folk festivals, culinary practices, and traditional customs. Additionally, the techniques of dyeing, weaving, and production associated with intangible cultural heritage are preserved through activities such as exhibitions, visits, and experience. Furthermore, the elements of dance, music, theater, and traditional costumes that constitute intangible cultural heritage are conveyed through performance activities^[9].

(3) Cultural and creative industries and digital technology. The thematic IP design is performed by leveraging unique intangible cultural heritage resources alongside innovative visual design thinking concepts. Building upon this foundation, a series of cultural and creative products, including mascots, accessories, stationery, food items, clothing, commodity packaging, and daily necessities, can be developed. The approach prioritizes innovation, personalization,

and coherence, thereby enhancing branding influence and facilitating the expansion of diverse markets for traditional intangible cultural heritage products and skills.

The integration of digital technology with various industries represents an inevitable progression of contemporary society and presents new opportunities for the recording, preservation, dissemination, and development of intangible cultural heritage. Technologies such as high-definition photography and video, real-time monitoring, and 3D scanning facilitate the convenient, rapid, and comprehensive digital documentation and display of cultural artifacts and monuments. Virtual reality and augmented reality technologies possess the capability to interpret intangible cultural heritage skills and enhance interactive experiences, transcending the constraints of time and space. Additionally, internet and new media technologies can optimize the dissemination of intangible cultural heritage culture and facilitate the marketing of cultural and creative products^[10-11].

(4) Scientific research and study tour services.

It is essential to enhance collaboration among colleges, universities, research institutes, and rural areas. This collaboration should focus on integrating scientific research topics and practical teaching in disciplines such as ethnology, sociology, art, and agronomy with projects aimed at the protection of intangible cultural heritage resources in rural areas. Such integration can facilitate a mutually beneficial relationship wherein intangible cultural heritage resources contribute to the reform of scientific research and teaching methodologies for both faculty and students. In turn, the outcomes of these educational and research efforts can support the preservation and development of intangible cultural heritage skills. This approach is conducive to the comprehensive construction of industry-academia-research-application and the cultivation of applied talent within higher education institutions.

The integration of intangible cultural heritage elements with study tours represents an innovative business format that merges cultural tourism with science popularization education. By developing intangible cultural heritage study tour products and curriculum systems tailored to various age groups, this approach can generate a stable income from study tour services for rural areas. Furthermore, it promotes the cultivation and advancement of new business formats of rural tourism while facilitating the dissemination of traditional culture and folk skills towards social education.

3.2 Insisting on one product for one village, avoiding homogeneous competition and promoting industrial integration

Villages should leverage a sense of nostalgia associated with local culture, create unique brands, and establish industrial clusters, aiming for a trajectory of ecological sustainability, modernity, and personalized construction and development. This approach should be fundamentally rooted in their natural resources, historical context, cultural heritage, unique industries, and other characteristic attributes. Furthermore, the principle of one product for one village, and one rhyme for one village should be insisted to prevent imitation and the indiscriminate replication of models, thereby avoiding homogeneous competition. Efforts should be made to promote the integrated development of primary, secondary, and tertiary industries, as well as to facilitate urban-rural integration.

3.2.1 Shijing culture ecological tour + deep processing of grains and animal husbandry + paddy field agro-tourism in Hongjia Village. The cultivation of Yuan'an cold water rice and the transplantation of seedlings will progress towards intensification, scalability, modernization, standardization, and enhanced efficiency. Additionally, the development of centralized rice seedling transplantation will be expedited to transition from a focus on seed supply to seedling supply, thereby facilitating the comprehensive modernization of agriculture. Hongjia Village actively promotes both the primary and deep processing of agricultural products. The village has established a comprehensive industry chain for its independent brand, Yuan'an cold water rice, rapeseed oil, Hongjia beancurd skin, and morel mushrooms. This initiative integrates various components such as planting, research and development, production and processing, storage, and sales. Furthermore, efforts are ongoing to enhance the recycling and comprehensive utilization of agricultural and sideline products. The village effectively utilizes the ecological resources provided by the mountains, waters, forests, fields, and lakes to establish a multi-dimensional eco-agricultural tourism system. This system encompasses the exploration of the origins of Shijing in the wetlands of the Juhe River, agricultural tourism centered around the fragrance of rice, and ecological science popularization focused on the observation of migratory birds. Over time, the village aims to develop a paddy field agro-tourism landscape that highlights themes such as

oilseed rape, the fragrance of rice, the Juhe River, and migratory birds (Fig.1).

3.2.2 Yellow tea culture + hydrophilic leisure + talent station in Luyuan Village. Leveraging the popularity of the intangible cultural heritage associated with the yellow tea production process in Luyuan Village, as well as the well-established integration of the manufacturing and marketing industry of yellow tea, the village is advancing the intelligent management of tea plantations from pest control, temperature and humidity monitoring, and the implementation of advanced equipment and technology. The village effectively engages in the design of its visual image and the independent branding of yellow tea. Furthermore, it establishes a modern yellow tea workshop that integrates various functions, including the cultivation, picking, primary processing, packaging, deep processing, product research and development, as well as study tour and education related to Luyuan yellow tea. This approach will facilitate the continuous expansion of the secondary industry into both the primary and tertiary industries. Leveraging the Danxia landform and the landscape resources of the Luxi River, the village further enhances the connectivity of water bodies and improve water purification efforts. Building upon existing enterprises such as the waterfront self-service barbecue garden, children's water park, and water viewing cabins, the village further develops hydrophilic leisure and tourism initiatives, and establishes a multifunctional ecological waterfront park that incorporates hiking, sightseeing, water activities, amusement, dining, tea tasting, shopping, and other amenities, thereby catering to the leisure and tourism needs of individuals across all age groups. Utilizing the rural talent station and creator space as a carrier, the village aims to attract a robust labor force, encouraging both local youth and college students from urban areas to return to their hometowns. Additionally, the initiative seeks to entice high-quality enterprises to establish operations within the village, thereby fostering employment and entrepreneurship. The focus is on the incubation of emerging industries, including live broadcasting, skills training, cultural and creative design, digital services, and recreational and health care services. Additional tourist attractions, including the four seasons flower sea, rural coffee shop, and intelligent architecture park, have been established in and around talent station park. These developments aim to enhance the scope of leisure agro-tourism and broaden the range of deep processing of agricultural products in Luyuan Village (Figs.2-4).

3.2.3 Fruit picking + rural fishing + artistic sketching in Dongjia Village. The fruit brands in Dongjia Village, particularly the Dongjia grapes, are characterized by their exceptional quality and effective marketing strategies, which have contributed to their significant popularity within the local region as well as in neighboring counties and cities. Additionally, the fruit-picking activities involving grapes, strawberries, dragon fruits, and other varieties have successfully attracted a substantial influx of visitors. Consequently, the village will persist in advancing the fruit cultivation industry. Building upon the foundational agro-tourism integration model characterized by planting and picking, the village aims to promote intelligent agricultural practices. This initiative seeks to enhance the diversity, quality, and yield of fruits and vegetables, while also innovating and optimizing the industrial structure. Furthermore, the village intends to foster new business formats, including the deep processing of fruits and vegetables, the establishment of study tour bases for these products, and the development of online fruit farms, thereby facilitating the integration of the three industries. By utilizing fruit picking as a strategy to attract visitors, a diverse array of recreational activities has been introduced, including fishing in designated ponds, wild fishing, wading, and hand-catching of fish. Furthermore, an annual fishing festival and fishing competition have been instituted to enhance the overall impact of the initiative. This strategy promotes the whole fish banquet experience, Dongjia grilled fish and other distinctive farm-based catering services, as well as ready-to-eat or semi-ready-to-eat food products, including fish balls, fish cakes, fish fillets, and dried fish, thereby facilitating the continuous expansion of the industry chain. By utilizing the high-quality ecological water system and cultural scenery, the Shuangheyuan sightseeing area in Dongjia Village can supplement landscape structures and tourism service facilities. Furthermore, it can foster collaboration with artists' associations and various colleges and universities in neighboring cities and regions to significantly advance the art sketching service industry.

3.2.4 Summer resort and wellness + tea tourism integration + young businesses format in Shiqiaoping Village. Shiqiaoping village is situated at an average altitude exceeding 500 m, with an average annual temperature of 16 °C. The village is characterized by its mountainous surroundings, which provide fresh air, abundant rainfall, and ample sunshine, contributing to

the picturesque scenery of tea tree terraces. The primary industries in the village are tea and rice cultivation, and it is recognized as the origin of Yuan'an yellow tea and Mingfeng rice. Leveraging its favorable climate and advantageous industries as primary resources, the region progressively enhances the development of homestay hotels and wellness centers. This initiative will concentrate on the growth of the summer resort and forest wellness sectors, primarily catering to the residents of the urban area of Yichang and its surrounding counties. The aim is to address the lodging and wellness requirements of diverse groups, including those seeking short-term summer vacations, long-term rehabilitation, and recreational tourism. In terms of tea tourism integration, the entire production process, including tea cultivation, monitoring, harvesting, processing, packaging, and marketing, is incorporated with various leisure and tourism activities, such as sightseeing, experience, scientific popularization, education, and tasting. In the context of the young business format of tea industry, it is essential to move beyond traditional tea processing and conventional products. This can be achieved by employing innovative visual design concepts, effectively positioning the brand, and strategically planning its image. Furthermore, it is crucial to research and develop new products that align with the aesthetic interests and consumption preferences of young consumers. This can be accomplished through various approaches, including but not limited to: themed restaurants, new style cuisine, tea performances, tea training sessions, refreshment production, tea-flavored cold beverages, popular internet tea bags, nourishing floral teas, healthy milk teas, and culturally creative peripheral products, as well as collaborations with animation brands (Fig.5).

3.2.5 Geological culture + fossil cultural and creative products +scenic spot linkage in Luoxing Village. The primary competitive advantage of Luoxing Village lies in its invaluable geological heritage resources. These resources include the unique 247-million-year-old Hubei crocodile fossils, as well as the earliest known ichthyosaur and sauropterygian fossils in earth's history. Additionally, the village is characterized by its natural landforms and cultural landscapes, which encompass the Hongyan River, Xiaoshui Cave, underground rivers, ancient military fortifications, and clusters of stone houses (Fig.6). The village primarily depends on paleontological fossil archaeology, showcasing fossil culture and geological science. It aims to establish a distinctive brand of geological science

popularization and cultural tourism through key projects, including the fossil wisdom museum, the triassic theme park, and the geological culture plaza (Fig.7). The design of the village's logo, mascot, and logo system is inspired by paleontological fossils. A range of thematic cultural and creative products, including gifts, handicrafts, toys, food items, daily necessities, clothing, and bags, are researched and developed. Additionally, modern digital technology is leveraged to create a triassic period virtual reality experience game and a cloud exhibit platform, thereby establishing an interactive intelligent exposition system that integrates both online and offline experiences. Leveraging the geographical advantages of Luoxing Village, the Wulingxiakou Ecological Tourism Scenic Spot has been integrated into a comprehensive tourism circuit. By enhancing the Wulingxiakou sightseeing area, hot springs resort center, four seasons ski resort, and other leisure and tourism initiatives, significant improvements have been made to the scenic spots. This development aims to foster complementary relationships between rural tourism and scenic area visits, thereby enhancing the mutual attraction of visitor traffic.

3.3 Realizing village linkage, creating high-quality routes and prospering the nighttime economy

The advantageous industries and core resources of the villages in this case are coordinated to integrate rural industrial development, tourism planning, and landscape design, all of which adhere to ecological principles. By conceptualizing the rural leisure tourism industry as a cohesive chain, various innovation-driven sectors, including digital technology, new media technology, modern agricultural product processing, health and wellness, and green building materials, are interconnected. A new paradigm for rural tourism characterized by village linkage, complementary advantages, industrial innovation, and route penetration is established. This will provide practical insights for Yichang to undertake the strategic responsibility of advancing agricultural and rural modernization and build the wings of the comprehensive revitalization of rural areas.

The village is characterized by its relatively small size, with land use primarily consisting of forested areas, agricultural land, and residential settlements. Additionally, leisure tourism initiatives are frequently integrated with agricultural production, natural landscapes, and local cultural traditions. The limited size of individual villages results in fragmented tourism projects, which hinders the establishment of a

cohesive system. Consequently, the capacity and duration of tourist visits are restricted, leading to low tourism revenue. Furthermore, the market environment for the development of new businesses formats is inadequate. Through the establishment of village linkages, the realization of complementary advantages, the enhancement of tourism services, the development of high-quality routes, the emphasis on thematic culture, and the provision of diverse options, the primary objective is to augment the capacity for visitor

acceptance, prolong the duration of tours, meet the demand for extended stays, and stimulate the nighttime economy. This approach aims to generate sufficient market demand and create a conducive environment for the economic revitalization and industrial innovation of the relevant villages (Tables 1–3).

3.4 Cultivating new business formats, building digital villages and extending industrial chains

New business formats represent emerging

industries that facilitate industrial transformation and upgrading, as well as the iterative updating of products, through technological innovation, mode innovation, and integration innovation, in contrast to traditional industries. The application of contemporary digital technologies, interdisciplinary collaboration, and low-carbon green development are distinguishing characteristics of new business formats. The unique characteristics of the villages in Yuan'an County present opportunities for the development of several industries, including the cultural tourism sector, which emphasizes natural science popularization, eco-education, artistic services, and cultural and creative research and development. Additionally, the great health industry can be cultivated, focusing on organic fruits and vegetables, health foods, low-calorie meal replacements, eco-tourism, wellness and healthcare, beauty care, and the integration of sports and tourism. Furthermore, the digital industry can be enhanced through initiatives such as rural live broadcasting, online sales, cloud tourism, smart agriculture, virtual reality, and twinned villages. Lastly, the study tour education industry can be developed with an emphasis on agricultural science popularization, eco-education, geological science popularization, nature education, intangible cultural heritage inheritance, production visits, and scientific and technological experiences. Through the introduction of innovative concepts, advanced technologies, and novel business formats, it is possible to invigorate the rural economy. This approach allows us to continuously extend the industrial chain, enhance the added value of products, and achieve comprehensive integration and development of primary, secondary, and tertiary industries (Tables 4–7).



Fig.1 Cold water rice agricultural demonstration garden in Hongjia Village (photo by Fu Wanlin)



Fig.2 Juhe River waterfront rural bookstore and rural coffee shop in Hongjia Village (photo by Fu Wanlin)



Fig.3 Talent station plaza in Luyuan Village (photo by Xu Xiange)



Fig.4 Four seasons flower sea in Luyuan Village (photo by Miao Yuxin)



Fig.5 Tea mountain summer resort and wellness homestay in Shiqiaoping Village (photo by Li Mengyu)

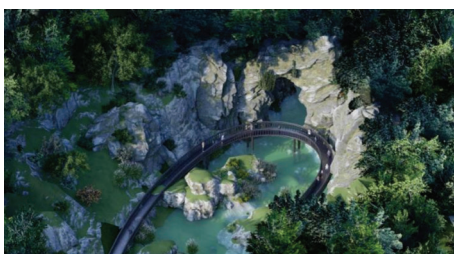


Fig.6 Geological landscape node at the entrance of underground dark river in Xiaoshui Cave of Luoxing Village (photo by Wang Ying)



Fig.7 Fossil wisdom museum of Luoxing Village (photo by Zhu Yuandong)

4 Summary and prospects

It is essential to enhance ecological protection, advance green development, and expedite the modernization of agriculture and rural regions. We will facilitate the establishment of functional areas dedicated to grain production, designated zones for the cultivation of critical agricultural products, and regions favorable for the production of unique agricultural goods. Furthermore, we will actively promote the production of advantageous agricultural products, including oilseeds, live pigs, and aquatic products, and develop a number of bases for the production, processing, and supply of green agricultural products. The advancement of the agricultural products processing industry, the expedited establishment of demonstration

Table 1 Three-day elite tour route of rural agriculture and tourism integration

Tour time	Destination	Tourism project	Same day accommodation	Product features
First day (morning)	Hongjia Village, Jiuxian Township	① Juhe River Shijing oasis	Luyuan Village characteristic homestay	① Ecological science popularization ② Shijing culture ③ Agricultural study tour ④ Waterfront bookstore
First day (afternoon)	Dongjia Village, Jiuxian Township	② Dairy cattle breeding base		
First day (evening)	Luyuan Village, Jiuxian Township	③ Speciality fruit picking ④ Luyuan self-service barbecue		
Second day (morning)	Luyuan Village, Jiuxian Township	① Enjoying the flowers, the deer and the water	Wulingxia Hot Spring Hotel	① Leisure agriculture tourism ② Intangible cultural heritage ③ Wellness treatment
Second day (afternoon)	Luyuan Village, Jiuxian Township	② Yellow tea intangible cultural heritage learning		
Second day (evening)	Wulingxiakou Scenic Spot	③ Warm spring wellness experience		
Third day (morning)	Luoxing Village, Hekou Town	① Visiting the geological plaza	None	① Geoscience popularization ② Fossil exhibition ③ Ecotourism ④ Rural industry
Third day (afternoon)	Luoxing Village, Hekou Town	② Visiting the fossil museum		
Third day (evening)	Return journey	③ Visiting the edible mushroom production base		

Table 2 Five-day leisure tour route of rural agriculture and tourism integration

Tour time	Destination	Tourism project	Same day accommodation	Product features
First day (morning)	Hongjia Village, Jiuxian Township	① Juhe River Shijing oasis	Hongjia Village paddy field stary sky camping base	① Ecological science popularization ② Shijing culture ③ Waterfront bookstore ④ Stary sky camping
First day (afternoon)	Hongjia Village, Jiuxian Township	② Dairy cattle breeding base		
First day (evening)	Hongjia Village, Jiuxian Township	③ Paddy field stary sky camping		
Second day (morning)	Dongjia Village, Jiuxian Township	① Speciality fruit picking	Luyuan village characteristic homestay	① Leisure agriculture tourism ② Parent-child fun ③ Speciality food
Second day (afternoon)	Dongjia Village, Jiuxian Township	② Rural fishing and hand-catching of fish		
Second day (evening)	Luyuan Village, Jiuxian Township	③ Characteristic farmhouse whole fish banquet		
Third day (morning)	Luyuan Village, Jiuxian Township	① Enjoying the flowers, the deer and the water	Shiqiaoping Village tea mountain summer resort homestay	① Leisure agriculture tourism ② Intangible cultural heritage ③ Wellness treatment
Third day (afternoon)	Luyuan Village, Jiuxian Township	② Yellow tea intangible cultural heritage learning		
Third day (evening)	Shiqiaoping Village, Jiuxian Township	③ Summer resort tea mountain homestay		
Fourth day (morning)	Shiqiaoping Village, Jiuxian Township	① Tea plantation tour and picking	Wulingxia Hot Spring Hotel	① Leisure agriculture tourism ② Innovative business format ③ Traditional residence
Fourth day (afternoon)	Shiqiaoping Village, Jiuxian Township	② Tea new business format experience		
Fourth day (evening)	Shiqiaoping Village, Jiuxian Township Wulingxiakou Scenic Spot	③ Visiting the Lijiawan old house		
Fifth day (morning)	Luoxing Village, Hekou Town	① Visiting the geological plaza	None	① Geoscience popularization ② Fossil exhibition ③ Ecotourism ④ Rural industry
Fifth day (afternoon)	Luoxing Village, Hekou Town	② Visiting the fossil museum		
Fifth day (evening)	Return journey	③ Hongyan River, Xiaoshui Cave ④ Edible mushroom production base		

Table 3 Seven-day in-depth tour route of rural agriculture and tourism integration

Tour time	Destination	Tourism project	Same day accommodation	Product features
First day (morning)	Hongjia Village, Jiuxian Township	① Juhe River Shijing oasis	Hongjia Village paddy field stary sky camping base	① Ecological science popularization ② Shijing culture ③ Waterfront bookstore ④ Stary sky camping
First day (afternoon)	Hongjia Village, Jiuxian Township	② Dairy cattle breeding base		
First day (evening)	Hongjia Village, Jiuxian Township	③ Paddy field stary sky camping		
Second day (morning)	Dongjia Village, Jiuxian Township	① Speciality fruit picking	Luyuan Village characteristic homestay	① Leisure agriculture tourism ② Parent-child fun ③ Speciality food
Second day (afternoon)	Dongjia Village, Jiuxian Township	② Rural fishing and hand-catching of fish		
Second day (evening)	Luyuan Village, Jiuxian Township	③ Characteristic farmhouse whole fish banquet		
Third day (morning)	Luyuan Village, Jiuxian Township	① Enjoying the flowers, the deer and the water	Shiqiaoping Village tea mountain summer resort homestay	① Leisure agriculture tourism ② Intangible cultural heritage ③ Wellness treatment
Third day (afternoon)	Luyuan Village, Jiuxian Township	② Yellow tea intangible cultural heritage learning		
Third day (evening)	Shiqiaoping Village, Jiuxian Township	③ Summer resort tea mountain homestay		
Fourth day (morning)	Shiqiaoping Village, Jiuxian Township	① Tea plantation tour and picking	Wulingxia Hot Spring Hotel	① Leisure agriculture tourism ② Innovative business format ③ Traditional residence
Fourth day (afternoon)	Shiqiaoping Village, Jiuxian Township	② Tea new business format experience		
Fourth day (evening)	Wulingxiakou Scenic Spot	③ Visiting the Lijiawan old house		
Fifth day (morning)	Wulingxiakou Scenic Spot	① Wulingxia Scenic Spot	Luoxing Village fossil theme homestay	① Scenic spot ② Skiing experience ③ Featured cultural and creative products
Fifth day (afternoon)	Wulingxiakou Scenic Spot	② Four seasons ski resort		
Fifth day (evening)	Luoxing Village, Hekou Town	③ Fossil cultural and creative commercial street		
Sixth day (morning)	Luoxing Village, Hekou Town	① Visiting the geological plaza	Hongyan River waterfront cabin	① Geoscience popularization ② Fossil exhibition ③ Ecotourism
Sixth day (afternoon)	Luoxing Village, Hekou Town	② Visiting the fossil museum		
Sixth day (evening)	Luoxing Village, Hekou Town	③ Hongyan River, Xiaoshui Cave		
Seventh day (morning)	Luoxing Village, Hekou Town	① Triassic theme park	None	① Parent-child fun ② Rural industry ③ Featured village
Seventh day (afternoon)	Zhaijialing Village	② Edible mushroom production base		
Seventh day (evening)	Return journey	③ Zhaijialing traditional residence		

parks for the integrated development of rural industries, and the promotion of the cohesive development of primary, secondary, and tertiary industries in rural areas are explicitly outlined as essential objectives in the Opinions of the Central Committee of the Communist Party of China and the State Council Regarding the

Promotion of High-quality Development in the Central Region during the New Era^[12].

The villages of Yuan'an County, located in the central region of China, benefit from the location advantages of Yichang, a prominent tourist city. The unique ecological environment and favorable natural climate contribute to

the region's exceptional tourist resources. Additionally, the area is endowed with abundant geological resources, clear industrial advantages, and a solid foundation for the construction of rural revitalization. The relevant villages have been designated as the national demonstration village of one product for one village, the typical

Table 4 Novel rural cultural tourism industry in Yuan'an County

Village	Culture and tourism industry project	Industry sector
Hongjia Village, Jiuxian Township	Searching for the Shijing Juhe River ecological corridor	Ecotourism
	Juhe River waterfront rural bookstore, rural coffee	Leisure service
	Rice paddy starry sky camping base	Characteristic accommodation
Luyuan Village, Jiuxian Township	Cold water rice agricultural demonstration park	Agriculture and tourism integration
	Children's water park	Children's entertainment
	Waterfront self-service barbecue camp	Speciality catering
	Yellow tea workshop	Intangible cultural heritage study tour
	Flower sea rural complex	Agriculture and tourism integration
Dongjia Village, Jiuxian Township	Talent station and intelligent construction demonstration park	Technical training
	Huangjiayuanzi courtyard economic demonstration zone	Courtyard economy
	Speciality fruit picking farm	Agriculture and tourism integration
	Happy fishery fishing + hand-catching of fish	Outdoor leisure
Shiqiaoping Village, Jiuxian Township	Shuangheyuan art writing camp	Artistic service
	Tea mountain summer resort homestay	Characteristic accommodation
Luoxing Village, Hekou Town	Tea plantation sightseeing and picking	Agriculture and tourism integration
	Ancient marine biological fossil wisdom museum	Intelligence expo
	Hongyan River-Lushui Cave geological landscape zone	Geoscience popularization
	Triassic theme children's park	Children's entertainment
	Wulingxiakou scenic spot	Ecotourism
	Wulingxia four seasons ski resort	Sports and tourism integration
	Fossil-themed cultural and creative research and development	Cultural creativity

Table 5 Rural great health industry in Yuan'an County

Village	Great health industry project	Industry sector
Hongjia Village, Jiuxian Township	Low-calorie, low fat meal replacement beancurd skin	Slimming and shaping
	Hongjia ecological organic cold water rice	Organic food
	Hongjia wild spicy vegetable	Natural wild vegetable
Luyuan Village, Jiuxian Township	Hongjia yellow beef	Quality meat
	Luyuan yellow tea	Health care and wellness
	Fresh flower deep processing	Beauty and skin care
Dongjia Village, Jiuxian Township	Wellness center	Rural elderly care
	Organic fruit processing	Organic fruit and vegetable
	Deep processing of aquatic products	Prefabricated food
Shiqiaoping Village, Jiuxian Township	Rural marathon	Sports and tourism integration
	Summer resort and recuperation	Wellness and healthcare
Luoxing Village, Hekou Town	Tea plantation sightseeing and picking	Agriculture and tourism integration
	Wulingxia spa	Wellness and healthcare
	Hongyan River-Luoshui Cave hiking	Outdoor hiking

Table 6 Rural digital industry in Yuan'an County

Village	Digital industry project	Industry sector
Hongjia Village, Jiuxian Township	Intensification and modernization of rice planting and seedling raising	Smart agriculture
	Rural live streaming, online sales	New media, internet
	Agricultural and sideline products recycling economy	Green development
Luyuan Village, Jiuxian Township	3D printing theme park	Intelligent construction
	Digital twin village	Virtual simulation
	Rural live streaming, online sales	New media, internet
Dongjia Village, Jiuxian Township	Rural VI design and cultural and creative research and development	Visual design, brand planning
	Smart farm, happy fishery	Cloud tourism
Shiqiaoping Village, Jiuxian Township	Rural live streaming, online sales	New media, internet
	Modernization of tea cultivation	Smart agriculture
Luoxing Village, Hekou Town	Tea-themed cultural and creative product development	Visual design, product design
	Fossil wisdom museum	Smart expo, virtual reality
	Fossil-themed cultural and creative products research and development	Visual design, product design
	Triassic paleontological digital park	Cloud tourism, virtual reality

demonstration village of beautiful countryside in Hubei Province, and the first village of fossils in China. Simultaneously, it is imperative to acknowledge the prevailing circumstances of

uneven rural development, characterized by a predominantly unitary industrial structure, inadequate infrastructure, significant brain drain, and other detrimental factors that impede rural

progress. By thoroughly investigating the core resources and nostalgic culture of each village, we aim to develop a comprehensive plan for village development that is grounded in scientific

Table 7 Rural research and education industry in Yuan'an County

Village	Study tour industry project	Industry sector
Hongjia Village, Jiuxian Township	Smart rice fragrance base study tour	Agricultural science popularization, production visit
	Juhe River wetland nature education base	Ecological science popularization, nature education
Luyuan Village, Jiuxian Township	Talent station new technology centre	Science and technology experience, technical training
	Yellow tea workshop study tour	Agricultural science popularization, intangible cultural heritage inheritance
	Luyuan flower sea intelligent industrial park	Nature education, production visit
Dongjia Village, Jiuxian Township	Danxia landform landscape	Geological science popularization, ecological science popularization
	Dongjia fruit industry centre	Agricultural science popularization, production visit
	Aquatic products processing workshop	Agricultural science popularization, production visit
Shiqiaoping Village, Jiuxian Township	Tea modernization plantation	Agricultural science popularization, ecological science popularization
	Tea-themed cultural and creative products research and development centre	Production visit, technology experience
Luoxing Village, Hekou Town	Xiaoshui Cave geological education station	Geological science popularization, nature education
	Smart museum youth education centre	Geological science popularization, technology experience
	Edible mushroom production base	Agricultural science popularization, production visit

principles. This involves significantly enhancing infrastructure and improving the public service system. Furthermore, we will integrate a multi-disciplinary knowledge framework encompassing design, economics, agronomy, sociology, and other relevant fields into the planning and design processes of the villages. The preservation of ecological benefits, commitment to sustainable development, enhancement of the business environment, integration of advanced technologies, cultivation of emerging business formats, expansion of industrial supply chains, promotion of rural linkage, and stimulation of the nighttime economy offer innovative strategies and practical insights for advancing high-quality development in the central region, as well as for the construction of harmonious rural area.

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