land

MDPI

Article

Promoting Rural Revitalization via Natural Resource Value Realization in National Parks: A Case Study of Baishanzu National Park

Hongyu Luo [1], Guangning Sun [1], Weilong Zhou [2], Jihe Lian [2], Yanfei Sun [3] and Yingen Hu [1,*]

[1] College of Public Administration, Huazhong Agricultural University, Wuhan 430070, China; luohongyu@webmail.hzau.edu.cn (H.L.); sgn@webmail.hzau.edu.cn (G.S.)
[2] Baishanzu Scientific Research and Monitoring Center, Qianjiangyuan-Baishanzu National Park, Lishui 323000, China; zwl0217@163.com (W.Z.); 13757840562@163.com (J.L.)
[3] Ecological Forestry Development Center of Jingning She Autonomous County, Jingning 323500, China; sunyanfei808@163.com
* Correspondence: hyg@mail.hzau.edu.cn; Tel.: +86-15-972-075729

Abstract: The realization of natural resource value serves as a critical entry point for advancing rural revitalization within the framework of ecological civilization construction, representing an essential approach to balancing ecological conservation and economic development in national parks. Based on clarifying the logical relationship and the driving mechanisms between the realization of natural resource value and rural revitalization, this paper employs field observation and in-depth interviews using Baishanzu National Park as a case study to analyze how general control zones in national parks can promote rural revitalization under ecological constraints through the realization of natural resource value. The results indicate the following: (1) By constructing a framework of "realistic background—pathway selection—model condensation—effectiveness analysis", the mechanism of how natural resource value realization promotes rural revitalization can be analyzed, with a focus on its pathways and models. (2) The pathways for realizing natural resource value to promote rural revitalization include resource integration, investment development, capital production and operation, and the circulation and exchange of ecological products and services. These pathways contribute to various dimensions of rural revitalization at different stages: assetization, capitalization, productization, and monetization. (3) Within different functional zones of the general control area in national parks, including ecological restoration zones, traditional utilization zones, and recreation and exhibition zones, the value of natural resources can promote rural revitalization through three realization modes: preservation, transformation, and value-added enhancement, reflecting diverse approaches and differentiated outcomes of value realization. To comprehensively promote rural revitalization in national parks through the realization of natural resource value, it is first necessary to fully identify regional resource endowments, conservation objectives, and developmental constraints. Second, regional resources should be integrated to pursue synergistic innovation. Finally, attention must be paid to achieving comprehensive benefits for sustainable development. The research findings provide valuable references for the high-quality development of national parks and rural revitalization.

Keywords: national parks; realization of natural resource value; rural revitalization; pathways and models; promotion

check for updates

Academic Editors: Fanglei Zhong and Lihua Zhou

Received: 31 December 2024
Revised: 28 January 2025
Accepted: 29 January 2025
Published: 31 January 2025

Citation: Luo, H.; Sun, G.; Zhou, W.; Lian, J.; Sun, Y.; Hu, Y. Promoting Rural Revitalization via Natural Resource Value Realization in National Parks: A Case Study of Baishanzu National Park. *Land* **2025**, *14*, 298. https://doi.org/10.3390/land14020298

Copyright: © 2025 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https://creativecommons.org/licenses/by/4.0/).

1. Introduction

Achieving sustainable development in rural areas is a major challenge faced by countries worldwide [1]. In developing countries especially, rural revitalization is not only a critical means to alleviate poverty and improve the quality of life for farmers [2,3] but is also a strategic priority for ensuring long-term stability and the security of the nation [4]. Within the framework of global ecological civilization construction and Sustainable Development Goals (SDGs), effectively advancing the establishment of natural protected areas such as national parks, while coordinating ecological conservation and economic development within and around rural areas, has become a focal issue of international concern [5–7]. However, most of national parks are located in remote rural areas, where rural development is constrained by ecological protection, as well as location, transportation, and other conditions, with weak supporting infrastructure and industrial support. Rural populations residing within and around the park areas continue to face significant conflicts between livelihood development and ecological conservation [8,9]. National parks, as protected areas endowed with unique natural resource attributes, are critical ecological safety barriers and major providers of ecological products [10]. They possess immense natural resource value in areas such as biodiversity conservation, water source conservation, scientific research and education, and recreational activities [11,12]. Rural revitalization within and around national park areas is inseparable from their valuable natural resources, which can be effectively leveraged to transform inherent ecological advantages into economic development opportunities [13,14].

At present, many scholars have conducted research on the realization of natural resource value in national parks and its relationship with rural revitalization [15–17]. Some scholars have focused on leveraging the ecological services of national parks to promote regional economic development and enhance community well-being, such as through eco-tourism [18], sustainable agriculture, and biodiversity conservation to realize the economic value of natural resources in national parks [19,20]. Meanwhile, some scholars have proposed adopting community participatory governance models in national park management, treating the transformation of natural resource value as a means to alleviate poverty and improve livelihoods, effectively enhancing the equity of resource distribution and the sustainability of community development [21–23]. Additionally, other scholars have explored mechanisms for valorizing rural ecological resources in the context of rural revitalization [24], the pathways and models for realizing the value of ecological products in national parks and promoting rural revitalization [25–27], and strategies for balancing ecological conservation and economic development within different functional zones of national parks [28,29], all of which provide valuable insights for this study. However, there has been limited exploration of the adaptability of natural resource value realization in national parks under varying socio-economic and environmental conditions, and further research is needed to examine differentiated pathways and mechanisms for resource utilization and community participation across regions. The current realization of natural resource value in national parks still faces challenges such as limited pathways, slow development of transaction markets, and overall low levels of realization [30], which have not effectively driven coordinated regional rural development and comprehensive revitalization. Considering the differences in resource endowments, environmental conservation priorities, target orientations, and residents' production and living needs across different zones in national parks [31], the intensity of natural resource development and utilization, as well as the pathways and degrees of value realization, should also vary accordingly [32,33]. The implementation of universal natural resource value realization pathways faces obstacles in the different functional zones of the general control areas of national parks, preventing the maximization of natural resource value.

In view of this, this study explores the scientific connotations of natural resource value realization, elucidates its mechanisms for promoting comprehensive rural revitalization, and analyzes the general pathways and typical models across different functional zones of the national park. The study also synthesizes practical approaches and viable pathways based on typical regional cases. The study aims to provide theoretical support and policy recommendations for advancing natural resource value realization in national parks to promote rural revitalization within the broader context of ecological civilization construction and the rural revitalization strategy.

The report of the 20th National Congress of the Communist Party of China (NCCPC) emphasized that the most challenging and demanding tasks in comprehensively building a modern socialist country still lie in rural areas. Guided by Xi Jinping's thought on ecological civilization, comprehensively advancing the rural revitalization strategy and achieving the modernization of agriculture and rural areas in harmony with nature is the central goal of China's current rural development agenda [34,35]. The Third Plenary Session of the 18th Central Committee of the Communist Party of China first proposed the establishment of a national park system, and continuously promoting a protected area system with national parks at its core has become a pivotal measure in the current ecological civilization reform. As one of the most biodiverse countries in the world, China's national parks serve as vital platforms for advancing ecological conservation and rural development [36], advocating for the integrated and coordinated development of both, with the ultimate aim of achieving harmony between humans and nature [37,38]. Therefore, the realization of natural resource value is undoubtedly a vital pathway for advancing the transformation of national parks from "lucid waters and lush mountains" to "golden and silver mountains" (hereafter referred to as the "Two Mountains" transformation), thereby driving comprehensive rural revitalization [39].

To address multi-objective management demands, the General Office of the Central Committee of the Communist Party of China and the General Office of the State Council issued the "Guiding Opinions on Establishing a Protected Area System with National Parks as the Main Body", proposing the implementation of differentiated management for protected areas, dividing national parks and nature reserves into core conservation zones and general control zones. Based on this management zoning, the existing national park pilot programs further subdivide functional zones according to ecosystem functions, conservation objectives, and utilization value. These zones specifically include strictly protected areas, ecological restoration areas, traditional use areas, and recreation and exhibition areas [40,41]. The core conservation zone (i.e., strictly protected area) enforces the strictest scientific protection of natural ecosystems and resources, with human activities being highly restricted except for those necessary to meet specific national strategic needs. In contrast, the general control zone represents the traditional living and production spaces within national parks, where some original residents continue to reside. However, rural development in these areas is constrained by ecological protection requirements, making comprehensive revitalization challenging. Therefore, in the general control zones of China's national parks, how to leverage natural resource value realization as a pathway to systematically resolve the developmental and conservation conflicts caused by unique regional constraints, while simultaneously generating spillover and adhesive effects to drive rural revitalization effectively, has become a critical issue in need of urgent resolution.

Baishanzu National Park, as a key ecological barrier in the Yangtze River Delta, offers an ideal case for studying how natural resource value realization promotes rural revitalization, given its unique location, rich resources, and socio-economic characteristics. Zhejiang Province is the birthplace of China's "Two Mountains" philosophy and a demonstration province for the mechanism of ecological product value realization, as well as a pilot zone

for achieving common prosperity [42]. Under this backdrop, Baishanzu National Park highlights the unique advantages of balancing resource value realization and conservation in economically developed eastern China. Compared to Sanjiangyuan National Park in western China, which focuses on the protection of fragile alpine ecosystems [43], or Jiuzhaigou National Park in central China, which leverages karst landscapes for tourism development [44], Baishanzu National Park exhibits stronger resource integration capacity and market-oriented potential, facilitating the efficient conversion of natural resource value. Moreover, as a representative of subtropical forest ecosystems, Baishanzu National Park boasts the most distinct montane three-dimensional climate characteristics among regions at the same latitude and is a key distribution area for China's germplasm resources of wild macrofungi, highlighting its exceptional natural endowments and ecological value. Additionally, Baishanzu National Park is one of the few near-natural ecosystems in eastern China. Its surrounding areas have low rural population density but face pronounced conflicts between ecological conservation and farmers' livelihoods, offering a practical context for studying how to harmonize ecological protection with rural development. Internationally, the conversion of natural resource value has become a key trend in national park management. For instance, Yellowstone National Park in the United States promotes a balance between economic development and conservation through eco-tourism [45], South Africa's Kruger National Park achieves resource value realization via community-based participation [46], and Australia's Great Barrier Reef National Park manages resources through an ecological certification system [47]. In contrast, Baishanzu National Park, located in the economically developed coastal region of eastern China, integrates unique natural landscapes, rich She ethnic culture, and a profound revolutionary history into its resource utilization model, which is characterized by greater complexity and market orientation. As a pioneer in practicing the "Two Mountains" philosophy, Baishanzu National Park holds significant representativeness and exemplary value in advancing natural resource value realization and rural revitalization. Therefore, this study takes the general control area of Baishanzu National Park in China as the case study region.

2. Literature Review and Theoretical Framework

2.1. Definition of Relevant Concepts

In 1933, the geographer Zimmermann first proposed the concept of natural resources in *World Resources and Industries*, defining them as any part of the environment, whether as a whole or in part, that can or is perceived to meet human needs [48,49]. The *Guidance Book on the Decision of the Central Committee of the Communist Party of China on Several Major Issues of Comprehensive Reform* adopted by the Third Plenary Session of the 18th CPC defines natural resources as the sum of naturally occurring environmental factors that have utility value and can enhance current and future human well-being. In a narrow sense, natural resources typically refer to tangible resources existing in nature that, under certain socio-economic and technological conditions, can be developed and utilized by humans to generate ecological or economic value, thereby improving current or foreseeable future quality of life. Broadly, natural resources include both tangible resources, such as land and water bodies, and intangible environmental resources, such as climate and biodiversity. This paper adopts the broader definition, referring to natural resources as both tangible and environmental resources with functional attributes that enhance current and future human well-being.

The value of natural resources refers to the material products and services produced by human utilization of natural resources in social production activities, as well as the ecological effects and public attributes demonstrated by natural environmental ecosystems. These values can be categorized by function into economic, ecological, and social

values [50,51]. Marx viewed commodities as a unity of use value (i.e., utility) and value (i.e., human labor embodied in the commodity). Based on Marx's labor theory of value, the realization of natural resource value is understood as the process where natural resources, after being combined with human labor, are transformed into assets. These assets are subsequently developed into capital through investment operations and become tradable commodities within market mechanisms, primarily realized through ecological products and services [52,53]. Therefore, this paper argues that the essence of natural resource value realization lies in the process of investigation, confirmation of rights, development, and production operations. Through this process, natural resources are transformed into natural resource assets and natural capital, with their value condensed in ecological products and associated services. These are subsequently recognized by consumers through direct or indirect market mechanisms, providing economic value or societal benefits.

2.2. General Evolution Pathway of Natural Resource Value Realization

The realization of natural resource value undergoes four stages: "Assetization—Capitalization—Productization—Monetization", representing the process in which participating subjects adopt specific methods and actions to alter the forms of natural resources as objects [54]. Thus, the general evolution pathway of natural resource value realization can be summarized as follows:

The first stage is the assetization of natural resources. In this stage, scarce natural resources with potential economic benefits are recognized for their existence value. Subsequently, property rights are defined, ownership is clarified, and their utilization value is assessed and calculated [55], transforming natural resources into natural resource assets. As "public goods", natural resources often face challenges such as unclear property rights, complex power structures, and fragmented and dispersed resources, which can lead to "free-riding" behavior, resulting in blind exploitation and misuse [56]. Therefore, realizing the value of natural resources requires the planning, integration, and comprehensive assessment of fragmented and dispersed resources. This includes clarifying property rights, quantifying resources, and assessing their quality to enhance resource management and create a more effective and scalable structure for subsequent production and operational activities.

The second stage is the capitalization of natural resource assets. This involves the investment of production factors and advanced technologies to develop and utilize natural resource assets, clarifying their value as production factors and converting them into natural capital [57]. The capitalization stage is a core phase in the realization of natural resource value, requiring coordinated development across multiple factors, sectors, and fields. By investing production inputs and attracting labor, funding, and advanced technologies, it establishes a government-led development model with active participation from enterprises, village collectives, and farmers. This approach facilitates the systematic and large-scale utilization of natural resources while engaging diverse stakeholders in rural development [58].

The third stage is the productization of natural capital. In this stage, production and operational activities are carried out on natural capital, optimizing the allocation of production factors to produce ecological products and services needed by humans. The exchange value of natural capital is thereby condensed in specific products. Through systematic planning and operations, the process integrates natural, economic, social, and cultural dimensions to achieve multi-dimensional value output for ecological products and services [26]. This includes not only tangible material products but also intangible outputs such as ecological regulation and cultural services, fully reflecting the exchange value of natural capital [27].

The fourth stage is the monetization of ecological products and services, which represents a critical step in realizing the value of natural resources. In this phase, ecological products and services serve as carriers, which are introduced directly or indirectly into the market through various methods to generate revenue, thereby realizing their value. This stage relies on clear property rights and value evaluation as its foundation [59], generating revenue through mechanisms such as ecological compensation, resource rights trading, and ecological industry development [60]. This facilitates the transformation of natural resources from ecological elements to economic elements, advancing the "Two Mountains" transition and achieving sustainable ecological-economic development. Ultimately, this process feeds the distributable monetary benefits back into the conservation and restoration of natural resources, forming a continuous, iterative cycle mechanism (Figure 1).

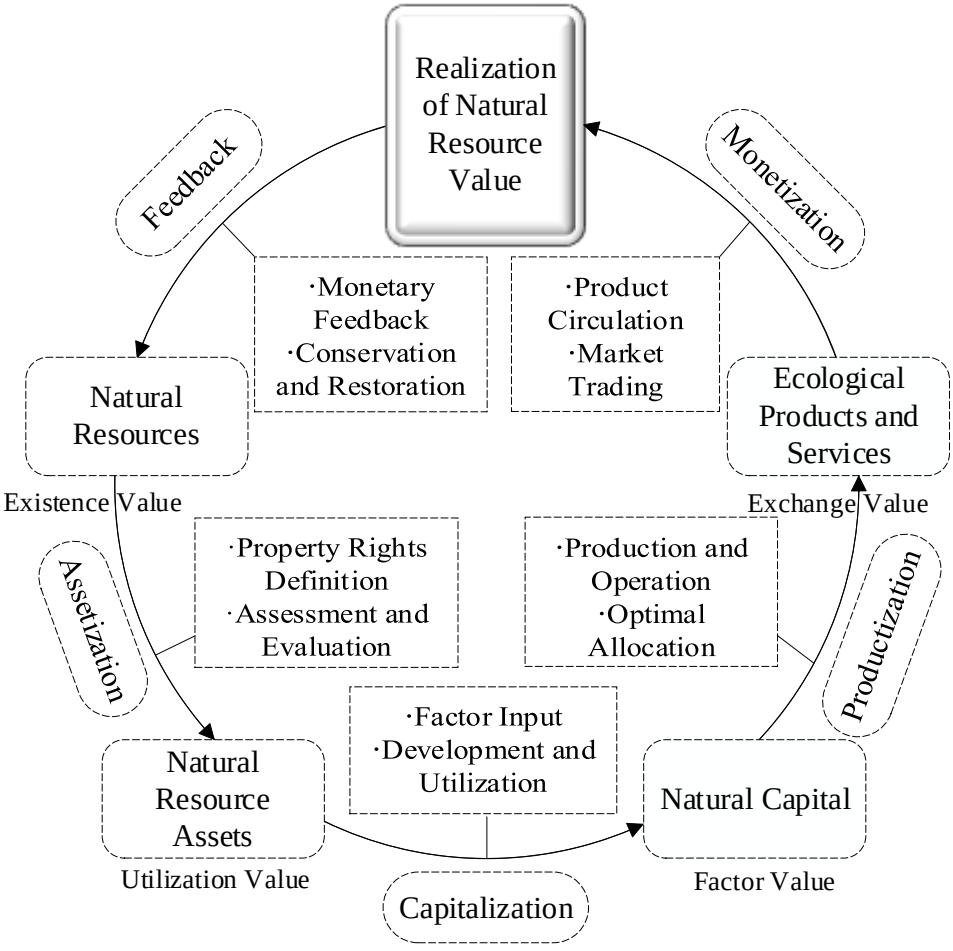

Figure 1. The general evolution pathway of natural resource value realization.

2.3. Logical Connection Between Natural Resource Value Realization and Rural Revitalization

2.3.1. Resource Integration to Establish a Material Foundation

Both natural resource value realization and rural revitalization involve the process of activating various resources and realizing their value. The object of natural resource value realization refers to natural resources that can provide various ecological products and services for humans, including tangible resources such as land, forests, and water, as well as intangible resources such as the environment and biodiversity [50]. The object of rural revitalization refers to various resources encompassing natural environmental and human elements related to industries, talent, culture, ecology, and organizational aspects [61]. The two overlap and integrate in terms of resource objects, with the combination and synergy of natural and human resources jointly forming the material foundation for rural

revitalization. Additionally, through effective management and optimized allocation of resources, rural revitalization in turn promotes the sustainable utilization and conservation of natural resources.

2.3.2. Value Co-Creation to Stimulate Endogenous Motivation

Both natural resource value realization and rural revitalization share a commonality in their participating subjects, involving the participation and collaboration of farmers, village collectives, local governments, and social capital, with a particular emphasis on farmers as the core subjects. In China, natural resource ownership is divided into state ownership and collective ownership. Under collective ownership, farmers as members of collective economic organizations actively participate in the development, utilization, and management of natural resources, collaborating with other stakeholders to create multi-dimensional value encompassing economic, social, and ecological aspects. Moreover, rural revitalization is aimed at benefiting farmers, rural construction is carried out for farmers, and comprehensive rural revitalization is a farmer-centric process [62]. Only by adequately balancing the interests of farmers with other stakeholders and addressing the motivations and demands of all actors in the value creation process, can the endogenous motivation for rural development be enhanced, thereby maximizing the realization of rural revitalization.

2.3.3. Benefit Sharing to Enhance Well-Being

Benefit sharing represents the ultimate goal of natural resource value realization and rural revitalization. The realization of natural resource value uses natural resources as an opportunity to effectively enhance the ecological environment and achieve the transformation of the "Two Mountains" concept ("Lucid waters and lush mountains are invaluable assets") and the "Two Transformations" (ecological industrialization and industrial ecologicalization) [63]. It aims to promote human welfare and achieve multiple benefits including ecological, economic, and social sustainability, under the premise of respecting nature [39]. The rural revitalization strategy aims to achieve the modernization of agriculture and rural areas by promoting industrial restructuring and upgrading, attracting the return of talent, capital, and technology, thereby enhancing the ecological environment and enriching the pathways for realizing natural resource value. It also strives to increase farmers' income, narrow the urban–rural gap, and improve the living standards of rural populations [64]. The two are highly aligned in driving economic development, improving the ecological environment, and enhancing social welfare. Through organic linkage and coordinated development, they ensure that multiple stakeholders including farmers, village collectives, local governments, and social capital jointly benefit from economic, social, and ecological gains, thereby achieving sustainable development.

2.4. Theoretical Analytical Framework for Natural Resource Value Realization to Promote Rural Revitalization

The realization of natural resource value is an important driving force for promoting rural revitalization, and rural revitalization is the inevitable outcome of unlocking the potential of natural resources. The evolution and development process of natural resource value realization in the general control zones of national parks are closely linked to specific pathways for promoting rural revitalization. This paper constructs a framework of "Realistic Background—Pathway Selection—Model Condensation—Effectiveness Analysis" to analyze the mechanism and explore key pathways and models for boosting rural revitalization (Figure 2).

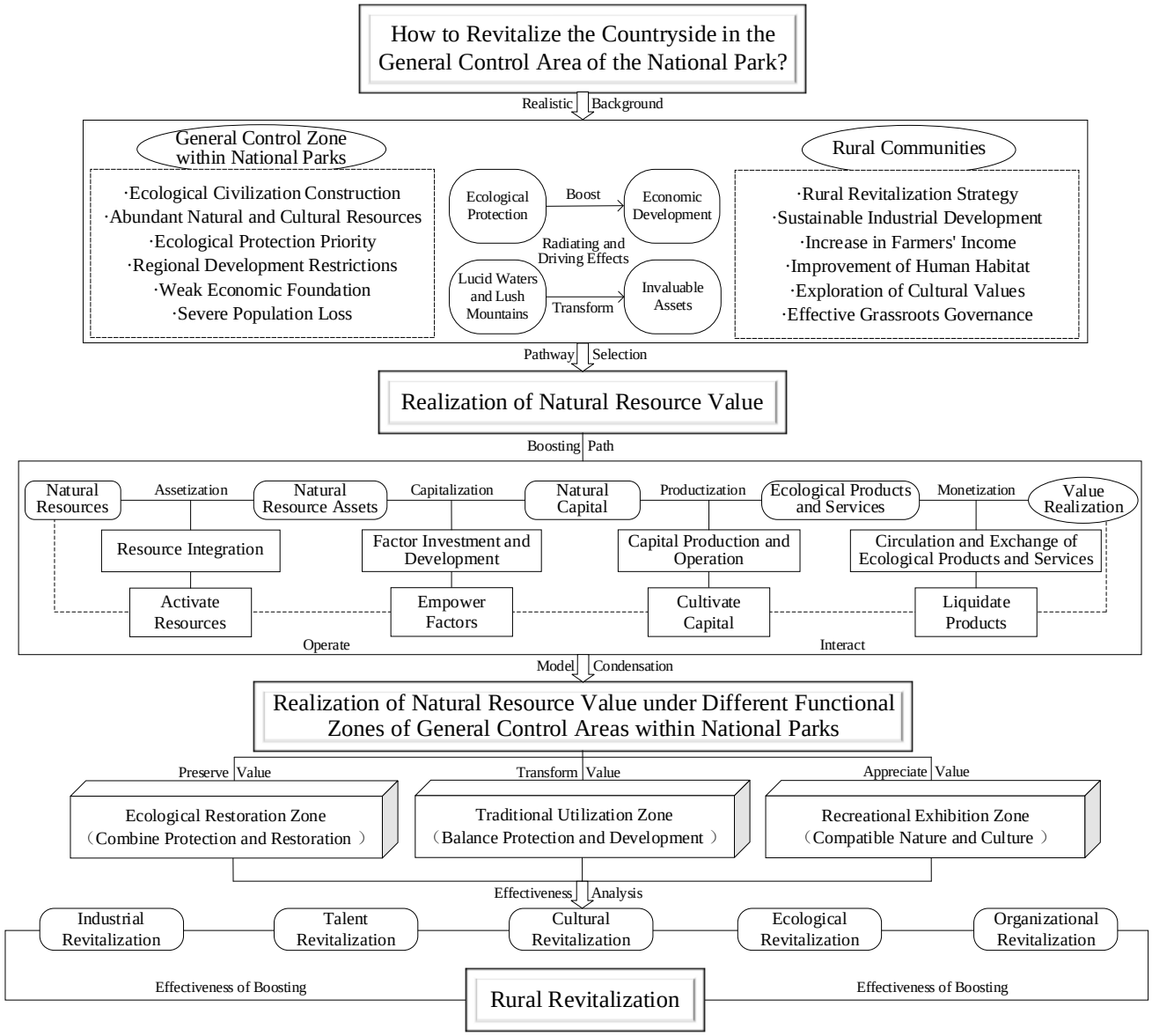

Figure 2. The mechanism analysis of natural resource value realization in promoting rural revitalization.

2.4.1. Explaining the Boosting Pathways

The promotion of rural revitalization through the realization of natural resource value is centered on four main pathways: resource integration, factor investment and development, capital production and operation, and the circulation and exchange of ecological products and services. These pathways, respectively, function at different stages of natural resource value realization and in various aspects of rural revitalization, addressing the boosting pathways question.

1. Assetization Stage: Promoting Rural Revitalization Through Resource Integration

At the assetization stage, the integration and standardized management of natural resources provide essential material support for rural revitalization. Relying on the foundational data platform for territorial spatial planning, a natural resource information supervision platform is constructed to create a unified "resource map" of natural resources within national park boundaries, enabling systematic monitoring and dynamic management [55]. Concurrently, a natural resource archive and management system is established, integrating outcomes from ownership registration processes and other data. Through a unified information management platform, this ensures the interoperability

and sharing of registration, approval, and transaction information, enabling socialized services. Based on clearly defined property rights for natural resources, their physical and value quantities are comprehensively assessed. By preparing natural resource asset and liability statements, stock levels and changes are calculated to understand the ownership, utilization, and conservation of resources by various stakeholders [65], providing essential references for management decisions and ecological conservation in national parks and rural communities.

2. Capitalization Stage: Promoting Rural Revitalization Through Factor Investment and Development

During the capitalization stage, the injection and optimization of production factors provide new momentum for rural economic growth. In practice, national parks establish dedicated management agencies, research institutions, and community co-management committees, creating a judicial linkage and assurance system to bring together highly skilled talent, social capital, and robust institutional safeguards. This creates a joint governance mechanism involving the government, academia, and local communities. At the same time, a "government-led, multi-stakeholder, win-win cooperation" franchising mechanism is promoted, encouraging residents to participate in national park operations through investment, cooperative partnerships, and labor contributions [20]. This approach mobilizes the enthusiasm of members of village collective economic organizations, revitalizing collective assets and effectively promoting a virtuous cycle between the realization of natural resource value and rural revitalization and enhancing grassroots governance capacity and economic vitality.

3. Productization Stage: Promoting Rural Revitalization through Capital Production and Operation

The productization stage centers on the production and operation of natural capital, injecting innovation into rural revitalization through the development of ecological products and services. Leveraging the ecological resources and rich historical culture of national parks, franchising frameworks are utilized to orderly develop industries such as organic agricultural production and processing, eco-tourism, environmental education services, under-forest resource utilization, and cultural industries, ensuring the efficient provision of ecological products and services [66]. For instance, specialty industries such as unique ecological farming and aquaculture can be developed within national parks to achieve a green transformation and upgrade traditional industries. Simultaneously, the integration of surrounding cultural heritage towns and traditional ancient villages enables the development of a green, "farm-culture-tourism" ecological cultural industry model, broadening income-generating avenues for farmers.

4. Monetization Stage: Promoting Rural Revitalization through the Circulation and Exchange of Ecological Products and Services

The monetization stage achieves the comprehensive realization of natural resource value through the market circulation of ecological products and services. The monetization pathways for ecological products and services vary depending on the attributes of the natural resources [24]. For operational natural resources, unique ecological agricultural, forestry, and fishery products, such as "One Village, One Product" or "One Village, One Style", can be developed based on the resource endowments of villages and market demand [60]. Additionally, using the national park brand as an ecological origin quality certification enhances value-added products, allowing farmers to reap greater benefits. For natural resources that are of public interest, value can be realized through property rights transfer transactions or government ecological compensation mechanisms. Compensation funds

should be closely tied to ecological conservation outcomes, enabling local communities to receive fair compensation for their participation in ecological protection and thereby improving farmers' living standards and promoting comprehensive rural revitalization.

2.4.2. Condensing the Boosting Model

Balancing conservation and development is a core mean for realizing the value of natural resources. It involves clarifying the methods of resource value realization within the various functional zones of the general control areas in national parks, addressing the boosting model question. The delineation of functional zones within the general control areas of national parks, such as ecological restoration zones, traditional utilization zones, and recreational exhibition zones, imposes differentiated constraints on conservation and restoration objectives, development limits, and conflict resolution needs [41]. These distinctions lead to varying degrees of resource value realization and different pathways and outcomes for promoting rural revitalization.

1. Ecological Restoration Zones: Combining Protection and Restoration to Preserve Value

Unlike traditional methods of relying solely on harvesting and fishing for economic gains, contemporary approaches to realizing the value of natural resources prioritize the sustainable development of ecological resources. These zones often include irreplaceable or high-cost resources that are ecologically fragile yet uniquely valuable, such as forest resources, wetlands, and water resources. Such natural resources provide critical ecosystem services, including biodiversity, soil and water conservation, and water retention, but are difficult to monetize effectively through conventional market mechanisms to achieve optimal cost–benefit outcomes. In this functional zone, governments generally prioritize ecological restoration, while some local communities or enterprises prefer resource development for short-term economic gains. However, such activities often harm ecological functions and are strictly restricted in this zone. Ecological restoration often requires significant investment in funds and technology, with long-term benefits that are difficult to quantify, placing sustainability pressures on managers. Without adequate support from local residents and stakeholders, challenges such as implementation difficulties and potential reversals may arise [67]. Therefore, unified planning and management should be implemented to promote the establishment of ecological compensation and benefit-sharing mechanisms, resulting in the creation of ecosystem-regulating products. By prioritizing conservation and restoration, the value of natural resources can be preserved. This approach supports ecological and organizational revitalization in rural areas.

2. Traditional Utilization Zones: Balancing Conservation and Development to Achieve Value Transformation

Traditional utilization zones aim to balance scientific conservation and the sustainable utilization of natural resources, reducing destructive activities such as illegal logging and excessive emissions, thereby providing stable resource support for rural development. During this process, local residents primarily depend on traditional agricultural and forestry activities for their livelihoods, while environmental organizations or governments prefer to implement restrictive development policies [68]. Enterprises may seek large-scale resource development (e.g., forestry and agricultural products) for economic benefits, which conflicts with resource conservation and management objectives. Thereby, these zones support traditional livelihoods and production methods in local communities, respecting traditional farming and cultural practices. Communities and enterprises are encouraged to adopt low-impact, high-efficiency production methods to address their interests. They promote the sustainable use and processing of agricultural, forestry, and fishery resources, and allow low-impact forestry, farming, and other compliant traditional production activities under

the premise of conservation [41]. The value of natural resources is embedded in ecological products, which are monetized through the market via transactions in tangible goods and resource property rights transfers. This approach monetizes the ecological, economic, and social values of natural resources, thereby driving the revitalization of rural industries, talent, culture, and ecology.

3. Recreational Exhibition Zones: Integrating Nature and Culture to Achieve Value Enhancement

Recreational exhibition zones typically possess favorable location advantages, scenic landscapes of mountains, forests, fields, and lakes, or other prominent natural attractions. These zones often also feature unique residential environments, traditional customs, and historical and cultural heritage sites. However, the involvement of diverse stakeholders in these zones often leads to notable conflicts of interest. Local governments typically prioritize developing the tourism industry to stimulate economic growth, while local communities emphasize the protection of traditional culture and living environments, expressing concerns over potential ecological damage and cultural homogenization caused by tourism activities [36]. Meanwhile, enterprises focus on implementing large-scale, comprehensive development projects to maximize economic benefits. Based on ecological conservation as a prerequisite and natural resources ("green") as the core, these zones incorporate local traditional customs, revolutionary ("red") culture, and historical ("antique") culture into the natural environment to foster social interactions. This creates a virtuous cycle of the original ecology of natural resources and the original life of human resources. By promoting the synergistic development of natural and cultural resources, these zones attract social capital for development and management. They also leverage advanced technologies, institutional policies, and innovative management models to establish sustainable eco-tourism, ecological cultural education, and nature-based experiential activities, fostering the deep integration of agriculture, culture, and tourism [33]. The value of ecological products that cannot be directly traded is embedded in agricultural, industrial, or service products, creating a green industry chain centered on the "Ecology+" principle. During the process of realizing the value of natural resources, ecological and cultural brand premiums are generated, gradually achieving industrial integration and chain extension. This value enhancement provides sustained momentum for comprehensive rural revitalization.

3. Research Design

3.1. Case Selection

The general control zone of Baishanzu National Park in Lishui City, Zhejiang Province, China, covers an area of 24,325.37 hectares, accounting for 48.18% of the park's total area and spanning three administrative regions: Longquan City, Jingning She Autonomous County, and Qingyuan County. Effectively utilizing the natural resources in this region not only provides high-quality ecological products and services for the human population but also enhances the local rural economy and social development, thereby promoting comprehensive rural revitalization. By comprehensively assessing the natural resource endowments, industrial development status, and collective economic conditions of villages, the research team selected 15 villages, including Fengping, Longyan, Zhailang, and Baishanzu, as survey samples within and around Baishanzu National Park in Lishui City. The team conducted in-depth research on nearly 10 eco-industrial projects, such as Ganoderma lucidum cultivation bases, moss cultivation bases, family farms, and homestays. A questionnaire was designed for farmers and stakeholders in the case study areas, covering topics such as natural resource asset management, resource utilization benefits, ecological conservation awareness, and rural industrial development. Through random sampling

both online and offline, 116 valid questionnaires were collected. Combining field surveys, online data collection, and key informant interviews, this study ultimately selects three cases for in-depth analysis: the "Protect Green for Prosperity" value preservation model in the ecological restoration zone, the "Turn Green into Gold" transformation model in the traditional utilization zone, and the "Three Colors Co-prosperity" value enhancement model in the recreational exhibition zone, for the following reasons: (1) The selected cases encompass the three major functional zones of the general control zone in Baishanzu National Park, ensuring comprehensiveness. (2) The three case areas exhibit unique characteristics in terms of geographical environment, cultural background, and resource endowments, facilitating multi-dimensional and multilayered comparisons. (3) The three cases represent different resource utilization models and industrial development pathways, covering the comprehensive transition from traditional agriculture to modern ecological industries, with significant demonstration effects and typical value.

3.2. Data Collection

The research team conducted in-depth investigations in the case study areas in April 2023 and July 2024 using various methods, including meetings, representative interviews, and field observations, collecting a wealth of research data. Specifically, the methods included the following: (1) Participatory Observation. Team members visited the case areas multiple times, attending meetings of relevant departments to understand the local government's policy planning and practices in natural resource management and rural revitalization strategies. They also provided consultation and guidance to local farmers on "natural resource value transformation" and "rural revitalization". (2) In-depth Interviews. The research team conducted semi-structured in-depth interviews with personnel from government departments, such as the Baishanzu Management Bureau and the National Park Nature Education Center, as well as village committees and organizations like the Longquan Wild Ganoderma Research Institute, to gather firsthand data. (3) Secondary Data. Secondary data included local government summary reports, planning documents, work plans, media reports, and other literature. Using multiple channels and sources, the research team applied the "data triangulation method" to cross-validate and compare different types of data, ensuring their authenticity and validity. The detailed data collection is shown in Table 1.

Table 1. Case data collection overview.

Data Source	Collection Method	Main Content
Document Materials	Collected approximately 200,000 words of documents and media reports through online and offline channels.	Statistical manuals, ledgers, and records of community development and management related to natural resource asset management and value realization.
Interviews with Officials	Conducted interviews with staff from Baishanzu National Park Management Bureau, township leaders, village officials, and the head of Longquan Wild Ganoderma Research Institute.	Natural resource value realization status, transformation pathways, major challenges, and village development demands.
Interviews with Villagers	Conducted face-to-face interviews with nearly 50 local villagers	Information on local farmers' employment, income from resource utilization, and the impacts of the national park.

Table 1. *Cont.*

Data Source	Collection Method	Main Content
Participatory Observation	Attended relevant departmental work meetings and provided consultation to farmers.	Specific grassroots needs and practical issues in the realization of natural resource value and rural revitalization.
Field Visits	Observed nearly 10 ecological industrialization projects, including family farms, Ganoderma cultivation bases, moss cultivation bases, and homestays.	Insights into eco-industrial models, natural resource conservation, and multi-channel sales strategies.

3.3. Data Analysis

Based on the data and materials collected from multiple channels, this study conducted a comprehensive assessment of the natural resources in the case study area. Through remote sensing image analysis and GIS data extraction, information on land types, vegetation coverage, and resource ownership distribution was obtained. Integrating domestic and international natural resource classification systems with regional realities, the study categorized the natural resources in the general control zone of Baishanzu National Park into six major types: forest resources, grassland resources, biological resources, water resources, natural landscapes and relic resources, and other resources. Additionally, using the ecosystem service evaluation model, the study employed both the functional value method and the equivalent factor method to calculate the explicit and implicit values of regional natural resources. Based on the previous research conducted by the project team [69], it is evident that explicit value primarily includes the direct output of ecological products and their market revenues, such as economic benefits from ecological planting and value-added processed products, with a total value estimated at approximately CNY 4.33 billion. Implicit value encompasses the potential values of ecosystem service functions and social and cultural benefits, and is estimated at approximately CNY 3.05 billion, accounting for about 41% of the total natural resource value. Through systematic investigation and evaluation, the research team found that despite the coupling development of natural resource value realization and rural revitalization in the case area, significant untapped potential remains due to regional policy constraints and practical challenges. To further realize the transformation of both explicit and implicit natural resource values and to distill replicable and scalable pathways and models for value realization, this study selected three typical cases from the practical experiences of the study area for in-depth analysis.

4. Results

4.1. "Protect Green for Prosperity" Value Preservation Model in Ecological Restoration Zone

Realistic Background. The general control zone of Baishanzu National Park exhibits a land use pattern characterized by "nine parts mountain, half part water, and half part farmland", featuring abundant forest resources with significant ecological potential. The collective forestland covers 21,533.40 hectares, accounting for 93.47% of the total forest area. As a critical factor for maintaining ecological security, biodiversity, and ecosystem stability, collective forests are also essential resources for achieving rural revitalization. However, the high proportion of collective forests has led to issues such as forestland fragmentation, unclear ownership, and inadequate long-term maintenance funding, posing challenges to the construction and management of the national park. Moreover, irrational exploitation driven by economic interests could lead to environmental pollution and diminished resource potential. To address these issues, Baishanzu National Park established easements on collective forestland and trees (including common forests, responsibility forests, and privately retained forests, collectively referred to as collective forests) within

ecological restoration zones. This initiative effectively resolved challenges related to the high proportion of collective forests, ecological conservation, and development limitations in underdeveloped rural areas (Figure 3).

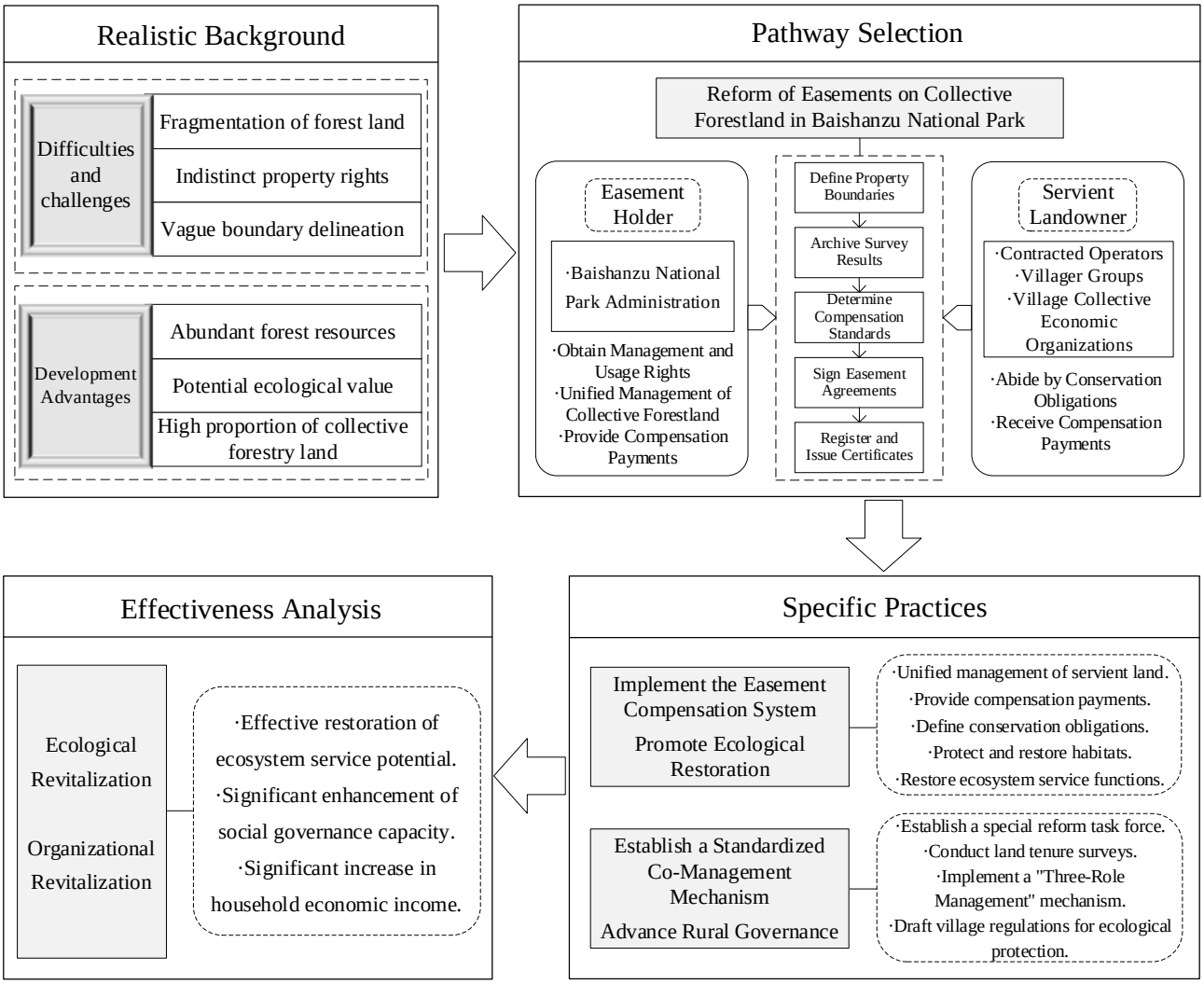

Figure 3. Pathway diagram of the "Protect Green for Prosperity" value preservation model in an ecological restoration zone promoting rural revitalization.

- Pathway Selection. Based on the contextual background, Baishanzu National Park implemented easement reforms for collective forests. The usage and management rights of collective forests were granted to management institutions to achieve unified administration. Additionally, using the results of the unified registration of natural resource ownership, collective forests within the park were designated as servient lands, while state forests were designated as dominant lands. Easement agreements were signed with relevant contractors or village collective economic organizations as servient landowners, specifying compensation standards and regulatory measures, and completing registration and certification. Ecological compensation is a key approach to realizing the value of ecosystem-regulating products. It effectively enhances natural resource protection and management while providing long-term financial compensation benefits to rural collectives and contractors, accelerating the pace of rural revitalization.
- Specific Practices. First, an easement compensation system was implemented to promote ecological restoration. The Baishanzu National Park management institution, as

the easement holder, conducted the unified management of servient lands and provided compensation of CNY 48.2 per mu per year to servient landowners, increasing the income of farmers and village collective economies. Additionally, the easement reform defined the protective responsibilities of servient landowners, restricting environmentally destructive activities. This reform played a crucial role in protecting and restoring habitats for rare species such as the Baishanzu fir and black muntjac, as well as in the recovery and maintenance of ecosystem services such as water conservation and soil stability. Second, a standardized co-management mechanism was established to promote rural governance. Since the Baishanzu National Park Administration issued the Implementation Plan for the Reform of Easement Establishment on Collective Forestland in 2020, a dedicated team was promptly formed to conduct natural resource ownership investigations and create a database for collective forestland ownership. By implementing a "three-role management" system involving national park administrators, forest rangers, and wildlife conservation officers, local farmers were prioritized for these roles, enabling structured patrols and grid-based management. Simultaneously, local townships and villages were encouraged to incorporate ecological conservation into local regulations, effectively improving rural governance capabilities and maintaining community harmony and stability.

- Effectiveness Analysis. The implementation of the easement reform on collective forestlands facilitates the protection of natural resources' authenticity and integrity, while achieving co-management of resources, co-governance in rural areas, and benefit-sharing. In terms of ecological potential, by specifying the ecological protection obligations of servient landowners, the reform effectively restricted certain potentially destructive activities, creating favorable conditions for both the natural and artificial restoration of damaged ecosystems. In terms of social governance, the reform established a collective forestland ownership database through the confirmation and registration of collective forestland rights, effectively resolving ownership disputes for some forestlands. Additionally, the easement reform significantly enhanced local community awareness and participation in ecological conservation, contributing to the establishment of a long-term conservation mechanism. Economically, apart from a few plots with ownership disputes, easement compensation payments have been disbursed, resulting in an average annual income increase of over CNY 2000 per household. Furthermore, Baishanzu National Park explored a forestland easement mortgage mechanism, enabling local farmers to secure entrepreneurial funds through forest rights mortgages. This allowed priority development of ecological agriculture, recreational experiences, and other franchised projects while granting free use of the Baishanzu National Park brand logo. These measures ensured tangible benefits from the reform, promoting ecological prosperity and green development.

4.2. "Turn Green into Gold" Value Transformation Model in Traditional Utilization Zone

- Realistic Background. The ecological environment of Baishanzu National Park is highly prioritized for protection, and any industrial activities that damage the natural environment are strictly restricted. Additionally, being located in mountainous terrain with complex topography and inconvenient transportation, large-scale industrial development is severely constrained. Some local residents, influenced by traditional beliefs or economic constraints, show low acceptance of the new development model, highlighting the urgent need to balance ecological protection and economic development. Against this backdrop, the Longquan area of the traditional utilization zone in Baishanzu National Park fully leverages its natural resource advantages to develop an under-forest economy through the forest–Ganoderma lucidum (Lingzhi) co-cultivation

ecological cycle model. This area benefits from excellent natural conditions, high air quality, significant vertical differentiation in mountainous terrain, large day–night temperature variations, and red and yellow soils that are ideal for the cultivation of Ganoderma lucidum. Furthermore, the unique forest–Ganoderma co-cultivation ecological cycle model achieves zero pollution in the ecological environment, promoting efficient resource utilization (Figure 4).

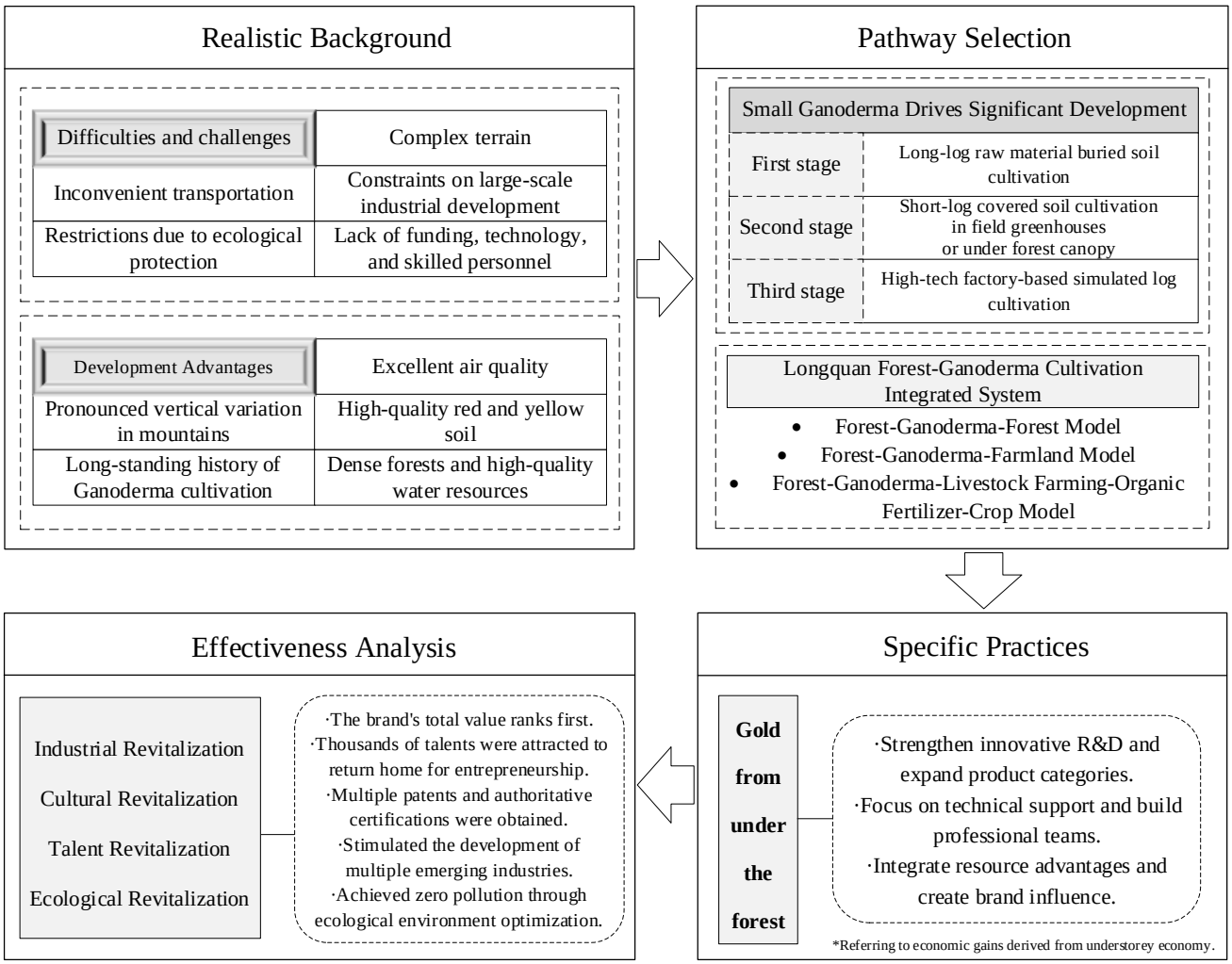

Figure 4. Pathway diagram of the "Turn Green into Gold" value transformation model in a traditional utilization zone promoting rural revitalization.

- Pathway Selection. The cultivation of Ganoderma lucidum in Longquan, as a traditional craft, originated during the Northern Song Dynasty and has a history of over a thousand years. The cultivation system has undergone three stages: Long log raw material buried for soil cultivation, short log-covered soil cultivation in field greenhouses or under the forest canopy, and high-tech factory-based simulated log cultivation. Ganoderma cultivation depends on the forest's robust water and soil conservation capacity to provide a shaded, humid environment. The Longquan forest—Ganoderma cultivation system has developed three models: "Forest—Ganoderma—Forest", "Forest—Ganoderma—Farmland", and "Forest—Ganoderma—Livestock Farming—Organic Fertilizer—Crop", exemplifying harmony between humans and nature by avoiding competition for time, land, or forest resources. By maximizing the advantages of forest resources and fully utilizing under-forest spaces, a comprehensive industrial chain has been developed, spanning from Ganoderma cultivation to product development.

- Specific Practices. First, innovation and research were strengthened to expand product types. Through resource integration, creative design, and production processing, additional products such as Ganoderma tea, wine, and accessories were developed alongside traditional Ganoderma and spore powder. Second, technical support was emphasized, and a professional team was built. Experts from the National Edible Fungus Industry Technology System were introduced, and Ganoderma research institutes were established. A tiered talent system was created, consisting of "position scientists, comprehensive experimental stations, edible fungus research institutes, and agricultural technicians", to enhance the research and promotion of Ganoderma cultivation technology. Third, resource advantages were integrated to create brand effects. By leveraging the ecological environment resources of the national park, ecological origin quality certification was pursued, enhancing the brand effect of Baishanzu National Park. Combined traditional Ganoderma cultivation techniques with its health and wellness benefits have been used to enhance the added value of the products.
- Effectiveness Analysis. The "Turn Green into Gold" Ganoderma cultivation model in the traditional utilization zone, with its exceptional quality and continuous innovation, has gradually overcome regional limitations, emerging as a flagship industry driving development in Longquan and even other national park regions across the country. First, the industry has adopted innovative business models to boost community income. "Longquan Ganoderma" has topped the Ganoderma category in China's regional edible fungus industry brand value rankings for consecutive years, with a valuation of CNY 6.117 billion. Local farmer-entrepreneurs, using an "enterprise + cooperative + base" operational model, have established 16 standardized Ganoderma cultivation bases, creating employment and entrepreneurial opportunities for over 5000 farmers. Farmers actively participate in all stages of Ganoderma production, processing, and sales, effectively increasing their income and contributing to improved living standards. Second, the industry has catalyzed related sectors and injected vitality into development. The Longquan Ganoderma industry has secured over 100 patents and authoritative certifications, spawning high-value-added products such as Ganoderma spore oil and Ganoderma wine. Additionally, it has stimulated the rise of related fields in nearby recreational exhibition zones, including ecological tourism, wellness, and senior care services. By establishing multifunctional wellness centers, such as Wild Ganoderma Valley and Ganoderma Culture Park, which integrate sightseeing, recreation, and experiential activities, diverse industries such as forest tourism, leisure health services, and educational programs have emerged. While achieving the ecological conservation of natural resources, this initiative has continuously infused vitality into cultivating rural talent, supporting rural industries, and promoting the preservation and celebration of historical culture.

4.3. "Three Colors Co-Prosperity" Value Enhancement Model in Recreational Exhibition Zone

- Realistic Background. The Qinyuan County section of the recreational exhibition zone in Baishanzu National Park faced numerous challenges in its early development stages. On the one hand, the industrial foundation was weak, and arable land was limited due to natural conditions such as elevation and slope, which constrained the variety of cultivable crops and resulted in low land productivity. Rising agricultural production costs and shrinking profit margins have led farmers to favor non-agricultural employment. The outflow of young labor, limited capacity among elderly residents, and an inadequate understanding of policies resulted in some land being left uncultivated. Furthermore, underdeveloped infrastructure and a lack of funding and technical support constrained regional socio-economic development. However, the

region's abundant natural resources, numerous streams, and excellent water quality provided a strong foundation for the development of "green-colored" ecological industries. Additionally, the area features concentrated and well-preserved ancient villages and numerous historical sites. Cultural elements such as Ganoderma culture and covered bridge culture add significant cultural value and tourism appeal, providing excellent conditions for the development of "antique-colored" historical and cultural tourism industries. Additionally, as a revolutionary base area, Qinyuan County possesses rich red cultural resources, offering strong support for the development of "red-colored" immersive experience industries. As a result, this area actively explored the "Three Colors Co-prosperity" value enhancement model, aiming to protect and inherit its rich cultural heritage, improve local economic development, and promote rural revitalization (Figure 5).

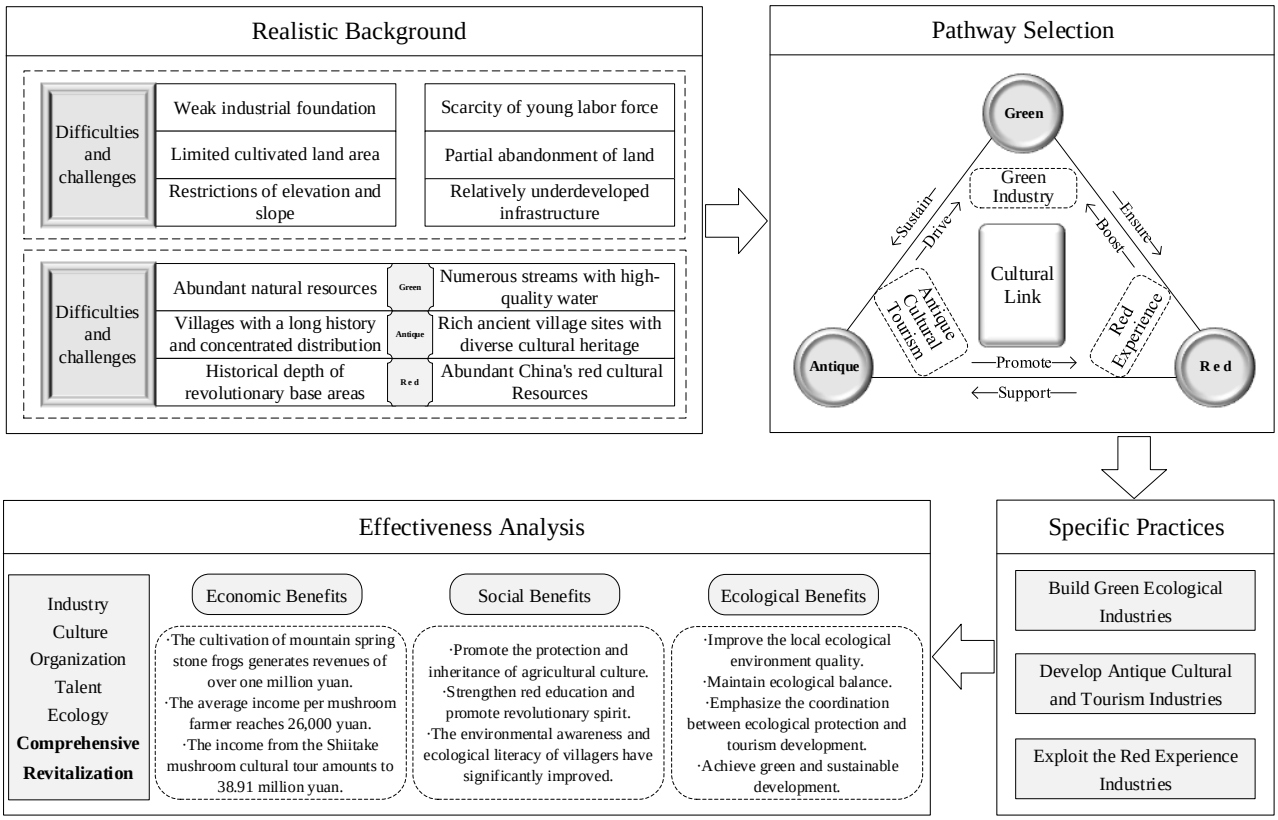

Figure 5. Pathway diagram of the "Three Colors Co-prosperity" value enhancement model in a recreational exhibition zone promoting rural revitalization.

- Pathway Selection. To address developmental constraints, the Qinyuan County section of the recreational exhibition zone in Baishanzu National Park tapped into its unique resource advantages, adopting a diversified development strategy. This pathway integrates natural and cultural resources, including green ecology, antique cultural tourism, and red experiential industries, using "cultural ties" to build green-colored ecological industries, develop antique-colored tourism, and exploit red-colored experience industries. The "Three Colors Co-prosperity" value enhancement pathway skillfully integrates natural resources with local cultural and historical characteristics, demonstrating a synergistic mechanism that leverages green ecological resources, revitalizes antique-colored historical resources, and explores red revolutionary resources. It not only innovates ways to realize the value of natural resources but also maximizes their multiple benefits, comprehensively supporting rural revitalization.

- Specific Practices. First, the green-colored ecological industries were built. Known as the "Mushroom Capital of China", Qingyuan County has promoted the "forest-mushroom co-cultivation" agricultural model, establishing a mountain agroforestry complex production system that integrates forest conservation, mushroom cultivation, and agricultural production. Wu Sangong, an ancestor of Qinyuan's early inhabitants, is regarded as the "Mushroom Pioneer" for inventing the "flower cutting method", a natural inoculation technique that initiated a thousand-year legacy of mushroom culture. Qinyuan County is the birthplace of artificial Ganoderma cultivation worldwide. It has preserved this cultural heritage by building the Wu Sangong Memorial Hall and Mushroom Museum, hosting cultural events like the Mushroom God Festival and theatrical performances. These activities include cultural celebrations and cultivation experience projects, driving ecological and cultural tourism development. Additionally, the county has capitalized on its natural advantages to grow specialty agricultural products such as Chinese chinquapin and spicy peppers, along with green aquaculture such as stone frogs. These efforts are combined with branding Qinyuan as a "longevity region" to enhance product added value.
- Second, antique-colored cultural tourism industries were developed. By preserving the original appearance of ancient villages and their cultural heritage, reasonable planning and development were undertaken to revitalize and utilize these rustic villages. In Daji Village, Songyuan Town, traditional Ming- and Qing-era residential buildings, the Lu Fu Temple, and wooden covered bridges were utilized to explore cultural significance and promote traditional crafts and folk activities, such as hand weaving and traditional festivals. By integrating the scholar culture of Daji Ancient Village, the traditional Chinese medicine culture of Bian Que, and ancient residential culture, cultural exhibition halls were built to host traditional cultural activities and handicraft exhibitions regularly. Additionally, the village introduced new business formats such as homestays, agritainment, and handicraft experience centers to boost tourism development. Village collective economic organizations coordinated governance to simultaneously focus on protecting and inheriting ancient village culture and promoting sustainable economic development.
- Third, red-colored experiential industries were developed. Utilizing the red cultural resources of the revolutionary base area, historical sites such as the Zhailang Village Red Cultural Relics and the Longyan Village Historical Museum were restored and expanded, preserving numerous Red Army activity sites and historical commemorative facilities. In Zhailang Village, Baishanzu Town, specialized red cultural facilities such as the Red Cultural Memorial Hall, Red Cultural Plaza, and Red Army School were established. These venues hosted exhibitions, educational programs, and experiential activities to systematically promote the revolutionary deeds and spirit of the Red Army. As a major red education base, Zhailang Village developed red-themed tourism routes and cultural creative products, establishing a "red cultural tourism brand" that achieved a positive interaction between red culture and the local economy.
- Effectiveness Analysis. Economically, systematic development attracted tourists, driving the growth of local industries such as lodging, catering, and transportation, creating employment opportunities and increasing villagers' incomes. For example, spring-fed stone frog aquaculture generated over CNY one million in revenue, shiitake farmers earned an average income of CNY 26,000 per person, and the shiitake mushroom cultural tourism activities brought in CNY 38.91 million in revenue. Socially, multiple academic exchanges on agricultural cultural heritage protection have promoted the preservation and inheritance of farming culture. Red education programs were strengthened to promote revolutionary spirit, leading to the creation of multiple

red demonstration towns and villages, enhancing villagers' cultural confidence and sense of cultural identity. At the same time, local residents' environmental awareness and ecological literacy were significantly improved. Ecologically, the promotion of eco-agricultural models improved local environmental quality and helped to maintain ecological balance. Additionally, emphasis on integrating ecological protection with tourism development achieved green, sustainable development and advanced rural ecological revitalization. The practice and promotion of this model represent a deep exploration and efficient utilization of local resource endowments, enabling rural areas to achieve ecological livability, cultural prosperity, effective governance, industrial growth, and improved livelihoods.

5. Conclusions and Discussion

5.1. Conclusions

By constructing a "Realistic Background—Pathway Selection—Model Condensation—Effectiveness Analysis" framework and using Baishanzu National Park as a case study, this paper explores the pathways and models through which natural resource value realization promotes rural revitalization in general control zones of national parks under ecological constraints. The main conclusions are as follows:

First, natural resource value realization is a key driving force for rural revitalization, while rural revitalization is an inevitable outcome of unlocking the potential of natural resources. The two are closely linked in terms of resource mobilization, value creation, and benefit sharing.

Second, natural resource value realization progresses through four dynamic stages: Assetization—Capitalization—Productization—Monetization. These stages, respectively, adopt resource integration, factor investment and development, capital production and operation, and the circulation and exchange of ecological products and services as pathways, driving multi-dimensional rural revitalization in industries, talent, culture, ecology, and organization at different stages.

Third, the regional characteristics of general control zones in national parks require a careful balance between ecological conservation goals and resource development constraints. Differentiated protection and development strategies should be adopted for different functional zones such as ecological restoration zones, traditional utilization, and recreational exhibition zones. The models for promoting rural revitalization through natural resource value realization can be refined into three types: preservation, transformation, and enhancement.

Fourth, in the general control zone of national parks, ecological restoration zones can adopt conservation and restoration measures to preserve natural resource value, providing a solid foundation for rural ecology and organization; traditional use zones can achieve resource value transformation through sustainable use and processing, promoting revitalization in rural industries, talent, culture, and ecology, while recreational exhibition zones can enhance resource value through the synergy of natural and cultural resources, enabling comprehensive rural revitalization. These models align with the three case studies undertaken in Baishanzu National Park: "Protect Green for Prosperity", "Turn Green into Gold", and "Three Colors Co-prosperity".

5.2. Discussion

Realizing the value of natural resources to promote rural revitalization is a critical issue for Chinese-style modernization and ecological civilization construction, bearing significant theoretical implications. As special ecological protection zones, national parks hold significant practical value in exploring the pathways and models of natural resource

value realization to promote rural revitalization in their general control zones. This study reveals the intrinsic logic and driving relationships between natural resource value realization and rural revitalization. It has important practical applications for advancing the transformation of natural resource value, comprehensive rural revitalization, and urban–rural integration in national parks and their surrounding areas. First, this study broadens the research on community development pathways in national parks by taking natural resource value realization as the entry point. Existing research primarily focuses on community co-management models [70], community participation in national park development [71], and community involvement in franchising operations [66], with limited attention on how the resource endowments of national parks as unique ecological areas can promote community development. This study examines the mechanisms and pathways by which natural resource value realization drives rural revitalization within national parks, providing new developmental strategies for rural revitalization in national parks and surrounding areas. Second, this study examines rural revitalization pathways based on the different functional zones of national parks, considering various resource endowments and ecological constraints. Previous studies have elucidated the influence of factors such as policies, technology, and labor on rural development in national parks [72,73], but have yet to provide targeted optimization pathways and model references based on functional zones within national parks. This study integrates ecological conservation goals and developmental constraints in the various functional zones of national parks, connecting natural and cultural resources to propose sustainable rural revitalization pathways and models. Furthermore, case studies are used to illustrate specific outcomes, providing practical experiences and references for achieving rural revitalization in national parks and their surrounding areas.

Overall, realizing the value of natural resources in national parks to drive comprehensive rural revitalization requires understanding certain fundamental principles and strategies. First, it is necessary to identify regional resource endowments, conservation goals, and developmental constraints. Given the differences in natural resources and socio-economic conditions across regions, as well as the varying developmental potential of different functional zones in national parks, it is essential to thoroughly understand the natural resource endowments and cultural characteristics of local villages. Conservation goals and developmental constraints should be systematically considered to design tailored pathways that maximize resource value and promote rural revitalization. It is also important to systematically consider conservation objectives and mitigate developmental constraints in various areas, thereby formulating locally tailored development pathways to maximize resource value and promote rural revitalization. Second, regional resources should be integrated to pursue synergistic innovation. By effectively integrating natural and cultural resources, and combining green ecological resources, cultural assets, and advanced technologies from the region and its surroundings, innovative development models can be established, creating cross-sectoral resource linkages and scaled impacts. Simultaneously, new co-construction and co-management mechanisms based on community participation should be explored to promote the comprehensive development of national parks and surrounding areas. Finally, emphasis must be placed on achieving comprehensive benefits to ensure sustainable development. The realization of natural resource value in national parks should prioritize sustainability, emphasizing the combined economic, social, and ecological benefits. While pursuing economic growth, it is equally important to enhance community cohesion and development resilience, maintain ecosystem service potential, and ensure the long-term stability of ecological civilization and rural revitalization strategies.

However, this study has certain limitations that warrant further exploration: First, this study is mainly conducted from a qualitative perspective. Future research could develop

an evaluation framework to quantitatively measure the effectiveness of natural resource value realization in promoting rural revitalization within national parks. This could involve integrating multi-dimensional indicators, such as village economic benefits, community participation, and ecological conservation outcomes, to establish a comprehensive evaluation model across economic, social, and ecological dimensions and quantify the level of contribution. Second, this study only analyzes three typical cases within the study area but does not fully encompass all natural resource categories and rural types in national parks. As the development of China's national parks is still in the exploratory stage, the current case studies can only reflect the success of certain pathways and fails to capture all possible scenarios. Future studies could expand to include resource categories under policy restrictions, such as mineral and water resources, to explore sustainable management models under the negative list system and identify dynamic equilibrium points between conservation and development. Additionally, future research could differentiate villages based on their characteristics, such as cultural heritage villages, ethnically distinctive villages, and specialty industry villages, to effectively identify how different village types influence the realization of national park natural resource value. This would provide tailored policy recommendations for realizing natural resource value and promoting rural revitalization across diverse village endowments.

Author Contributions: Conceptualization, methodology, writing—original draft and investigation, H.L.; investigation writing—review and editing, G.S.; Formal analysis, investigation, W.Z., J.L. and Y.S.; writing—review and editing, supervision and funding acquisition, Y.H. All of the authors contributed to improving the quality of the manuscript. All authors have read and agreed to the published version of the manuscript.

Funding: The study was funded by the National Natural Science Foundation of China (Grant number 42171263), the "Unveiling the Plaque" Project of Baishanzu National Park in 2022 (Grant number 2022JBGS07), and the Rural Revitalization Research Project from Huazhong Agricultural University (Grant number 2662024YT002).

Data Availability Statement: The datasets used and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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

References

1. Yin, X.; Chen, J.; Li, J. Rural innovation system: Revitalize the countryside for a sustainable development. *J. Rural Stud.* **2022**, *93*, 471–478. [CrossRef]
2. Liu, Y.; Liu, J.; Zhou, Y. Spatio-temporal patterns of rural poverty in China and targeted poverty alleviation strategies. *J. Rural Stud.* **2017**, *52*, 66–75. [CrossRef]
3. Liu, Y.; Li, Y. Revitalize the world's countryside. *Nature* **2017**, *548*, 275–277. [CrossRef]
4. Rashid, M.F.; Ngah, I.; Misnan, S.H. Revitalizing Rural Areas in Malaysia: A Framework for Economic Revitalization. *Iop Conf. Series. Earth Environ. Sci.* **2019**, *385*, 12004. [CrossRef]
5. Zhang, J.; Fu, B. Eco-civilization: A complementary pathway rooted in theory and practice for global sustainable development. *Ambio* **2023**, *52*, 1882–1894. [CrossRef] [PubMed]
6. Sriarkarin, S.; Lee, C. Integrating multiple attributes for sustainable development in a national park. *Tour. Manag. Perspect.* **2018**, *28*, 113–125. [CrossRef]
7. Ibrahim, R.; Clayden, A.; Cameron, R. Tropical urban parks in Kuala Lumpur, Malaysia: Challenging the attitudes of park management teams towards a more environmentally sustainable approach. *Urban. For. Urban. Green.* **2020**, *49*, 126605. [CrossRef]
8. Sun, B.; Wang, X.; Luo, P.; Zhao, Y.; Rijal, M. Importance of Farmers' Awareness on Ecological Revitalization to Promote Sustainable Development. *Sustainability* **2024**, *16*, 10134. [CrossRef]
9. Ma, B.; Cai, Z.; Hou, Y.; Wen, Y. Estimating the household costs of human–wildlife conflict in China's giant panda national park. *J. Nat. Conserv.* **2023**, *73*, 126400. [CrossRef]

10. He, S.; Su, Y.; Wang, L.; Gallagher, L.; Cheng, H. Taking an ecosystem services approach for a new national park system in China. *Resour. Conserv. Recycl.* **2018**, *137*, 136–144. [CrossRef]
11. Sutton, P.C.; Duncan, S.L.; Anderson, S.J. Valuing Our National Parks: An Ecological Economics Perspective. *Land* **2019**, *8*, 54. [CrossRef]
12. Luo, X.; Huang, Z.; Wang, L. Assessing the Recreational Resource Value of National Park Based on Visitor Perception—A Case of Three-River-Source National Park in China. *Land* **2024**, *13*, 1882. [CrossRef]
13. Li, Y.; Gong, P.; Ke, J. Development opportunities, forest use transition, and farmers' income differentiation: The impacts of Giant panda reserves in China. *Ecol. Econ.* **2021**, *180*, 106869. [CrossRef]
14. He, S.; Gallagher, L.; Su, Y.; Wang, L.; Cheng, H. Identification and assessment of ecosystem services for protected area planning: A case in rural communities of Wuyishan national park pilot. *Ecosyst. Serv.* **2018**, *31*, 169–180. [CrossRef]
15. Shi, J.; Huang, Y. Research Progress on National Park Management. *World For. Res.* **2019**, *32*, 40–44.
16. Zang, Z.; Xu, W.; Ouyang, Z. Exploration on the value realization of ecological products in China's national park system pilots. *Biodivers. Sci.* **2021**, *29*, 275–277. [CrossRef]
17. Xie, H.; Liu, Q.; Chen, B.; Chen, Q.; Zeng, H. Value Realization of Ecological Products in National Parks: Basic Logic, Core Mechanism and Typical Model. *Econ. Geogr.* **2024**, *44*, 158–169.
18. Yu, P.; Zhang, J.; Wang, Y.; Wang, C.; Zhang, H. Can tourism development enhance livelihood capitals of rural households? Evidence from Huangshan National Park adjacent communities, China. *Sci. Total Environ.* **2020**, *748*, 141099. [CrossRef] [PubMed]
19. Chen, Z.; Yang, J.; Xie, Z. Economic development of local communities and biodiversity conservation: A case study from Shennongjia National Nature Reserve, China. *Biodivers. Conserv.* **2005**, *14*, 2095–2108. [CrossRef]
20. Duan, W.; Wen, Y. Impacts of protected areas on local livelihoods: Evidence of giant panda biosphere reserves in Sichuan Province, China. *Land. Use Policy* **2017**, *68*, 168–178. [CrossRef]
21. Sobhani, P.; Esmaeilzadeh, H.; Sadeghi, S.M.M.; Wolf, I.D.; Deljouei, A. Relationship Analysis of Local Community Participation in Sustainable Ecotourism Development in Protected Areas, Iran. *Land* **2022**, *11*, 1871. [CrossRef]
22. Peng, J.; Xiao, H.; Wang, R.; Qi, Y. The Impacts of Establishing Pilot National Parks on Local Residents' Livelihoods and Their Coping Strategies in China: A Case Study of Qilianshan National Park. *Sustainability* **2022**, *14*, 3537. [CrossRef]
23. Chen, H.; Shivakoti, G.; Zhu, T.; Maddox, D. Livelihood Sustainability and Community Based Co-Management of Forest Resources in China: Changes and Improvement. *Environ. Manag.* **2012**, *49*, 219–228. [CrossRef] [PubMed]
24. Li, Y.; Wang, H.; Liu, C.; Sun, J.; Ran, Q. Optimizing the Valuation and Implementation Path of the Gross Ecosystem Product: A Case Study of Tonglu County, Hangzhou City. *Sustainability* **2024**, *16*, 1408. [CrossRef]
25. Pu, L.; Lu, C.; Yang, X.; Chen, X. Spatio-Temporal Variation of the Ecosystem Service Value in Qilian Mountain National Park (Gansu Area) Based on Land Use. *Land* **2023**, *12*, 201. [CrossRef]
26. Pérez-Calderón, E.; Prieto-Ballester, J.M.; Miguel-Barrado, V.; Milanés-Montero, P. Perception of Sustainability of Spanish National Parks: Public Use, Tourism and Rural Development. *Sustainability* **2020**, *12*, 1333. [CrossRef]
27. Tang, C.; Liu, J.; Qin, S.; Jiang, L.; Lu, J. Mechanism and mode of realizing the value of ecological products in national parks: Taking Shennongjia National Park as an example. *Acta Ecol. Sin.* **2024**, *44*, 5786–5800.
28. Fu, M.; Tian, J.; Ren, Y.; Li, J.; Liu, W.; Zhu, Y. Functional zoning and space management of Three-River-Source National Park. *J. Geogr. Sci.* **2019**, *29*, 2069–2084. [CrossRef]
29. Geneletti, D.; van Duren, I. Protected area zoning for conservation and use: A combination of spatial multicriteria and multiobjective evaluation. *Landsc. Urban. Plan.* **2008**, *85*, 97–110. [CrossRef]
30. Zhao, X.; He, Y.; Yu, C.; Xu, D.; Zou, W. Assessment of Ecosystem Services Value in a National Park Pilot. *Sustainability* **2019**, *11*, 6609. [CrossRef]
31. Dong, Q.; Zhang, B.; Cai, X.; Morrison, A.M. Do Local Residents Support the Development of a National Park? A Study from Nanling National Park Based on Social Impact Assessment (SIA). *Land* **2021**, *10*, 1019. [CrossRef]
32. Wang, Y.; Yang, H.; Qi, D.; Songer, M.; Bai, W.; Zhou, C.; Zhang, J.; Huang, Q. Efficacy and management challenges of the zoning designations of China's national parks. *Biol. Conserv.* **2021**, *254*, 108962. [CrossRef]
33. Sheng, C.; Wang, Y.; Ye, S. Discussion on the national park management mode under China's National Park System: A case of Wuyishan National Park System Pilot Area. *Int. J. Geoheritage Parks* **2020**, *8*, 230–234. [CrossRef]
34. Hansen, M.H.; Li, H.; Svarverud, R. Ecological civilization: Interpreting the Chinese past, projecting the global future. *Glob. Environ. Chang.* **2018**, *53*, 195–203. [CrossRef]
35. Wu, M.; Liu, Y.; Xu, Z.; Yan, G.; Ma, M.; Zhou, S.; Qian, Y. Spatio-temporal dynamics of China's ecological civilization progress after implementing national conservation strategy. *J. Clean. Prod.* **2021**, *285*, 124886. [CrossRef]
36. He, S.; Jiao, W. Adapting traditional industries to national park management: A conceptual framework and insights from two Chinese cases. *J. Clean. Prod.* **2022**, *367*, 133007. [CrossRef]
37. Wang, J.Z. National parks in China: Parks for people or for the nation? *Land Use Policy* **2019**, *81*, 825–833. [CrossRef]

38. Huang, Y.; Fu, J.; Wang, W.; Li, J. Development of China's nature reserves over the past 60 years: An overview. *Land Use Policy* **2019**, *80*, 224–232. [CrossRef]
39. Zhao, N.; Wang, H.; Zhong, J.; Bai, Y.; Yi, S. Evaluation of the Gross Ecosystem Product and Analysis of the Transformation Path of "Two Mountains" in Hulunbuir City, China. *Land* **2023**, *12*, 63. [CrossRef]
40. Ma, B.; Zeng, W.; Xie, Y.; Wang, Z.; Hu, G.; Li, Q.; Cao, R.; Zhuo, Y.; Zhang, T. Boundary delineation and grading functional zoning of Sanjiangyuan National Park based on biodiversity importance evaluations. *Sci. Total Environ.* **2022**, *825*, 154068. [CrossRef] [PubMed]
41. Ye, Y.; Zhang, J. Discussion on method of controlled zoning and functional zoning of national parks: Take Shennongjia National Park System Pilot Area as an example. *J. Nat. Resour.* **2023**, *38*, 1075–1088. [CrossRef]
42. Kong, F.; Wang, N.; Xu, C. Value Realization Efficiency of Forest Ecological Products in the Birthplace of Two Mountains Idea. *Sci. Silvae Sin.* **2022**, *58*, 12–22.
43. Zhang, B.; Min, Q.; Jiao, W.; Liu, M.; He, S.; Liu, X.; Yao, S.; Li, H. Comparative study between Three-River-Source National Park of China and Jiri National Park of Korea. *Acta Ecol. Sin.* **2019**, *39*, 8271–8285.
44. Tang, W. Influences of Touristssense of Place on Their Attitude Towards Resource Protectiona Case Study of Jiuzhaigou, Sichuan. *Resour. Environ. Yangtze Basin* **2011**, *20*, 574–578.
45. Yu, Q.; Han, M. Review and enlightenment of the centennial history of American national park roads and parkways. *J. Nat. Resour.* **2019**, *34*, 1850–1863.
46. Han, L.; Wu, H.; Cheng, B.; Wen, Y. South Africa's Biodiversity Conservation and Its Enlightenment to China: A Case Study of Kruger National Park. *World For. Res.* **2015**, *28*, 75–79.
47. Fraser, K.A.; Adams, V.M.; Pressey, R.L.; Pandolfi, J.M. Purpose, policy, and practice: Intent and reality for on-ground management and outcomes of the Great Barrier Reef Marine Park. *Mar. Policy* **2017**, *81*, 301–331. [CrossRef]
48. Zimmermann, E.W. *World Resources and Industries: A Functional Appraisal of the Availability of Agricultural and Industrial Resources*; Harper & Row Publishers: New York, NY, USA, 1951.
49. Song, M.; Cui, L.; Zhou, Y. Management system and institution of natural resources in China: Status, problems and prospects. *J. Nat. Resour.* **2022**, *37*, 1–16.
50. Song, M.; Du, J. Mechanisms for realizing the ecological products value: Green finance intervention and support. *Int. J. Prod. Econ.* **2024**, *271*, 109210. [CrossRef]
51. Geng, J.; Liang, C. Analysis of the Internal Relationship between Ecological Value and Economic Value Based on the Forest Resources in China. *Sustainability* **2021**, *13*, 6795. [CrossRef]
52. Raymond, C.M.; Bryan, B.A.; Macdonald, D.H.; Cast, A.; Strathearn, S.; Grandgirard, A.; Kalivas, T. Mapping community values for natural capital and ecosystem services. *Ecol. Econ.* **2009**, *68*, 1301–1315. [CrossRef]
53. Wang, H.; Luo, J.; Tian, L.; Liu, J.; Gan, Y.; Han, T. "Realization–Feedback" Path of Ecological Product Value in Rural Areas from the Perspective of Capital Recycling Theory: A Case Study of Zhengjiabang Village in Changyang County, China. *Sustainability* **2023**, *15*, 13905. [CrossRef]
54. Xie, H.L.; Chen, B. The whole process collaborative path for realizing the value of ecological products. *China Land* **2022**, *11*, 9–13.
55. Zhang, X.; Wu, F.; Shen, C.; Jin, Z.; Chen, C.; Zhou, Q. Theoretical Connotation, Functional Mechanism and Compilation Logic of Natural Resources Assets Planning. *China Land Sci.* **2024**, *38*, 11–19.
56. Agrawal, A.; Erbaugh, J.; Pradhan, N. The Commons. *Annu. Rev. Environ. Resour.* **2023**, *48*, 531–558. [CrossRef]
57. Zhang, R.; Aljumah, A.I.; Ghardallou, W.; Li, Z.; Li, J.; Cifuentes-Faura, J. How economic development promotes the sustainability targets? Role of natural resources utilization. *Resour. Policy* **2023**, *85*, 103998. [CrossRef]
58. Salimian, S.; Mamipour, S.; Salimian, S. The impact of sanctions on the exploitation of shared natural resources: A game theory approach. *Energy Strateg. Rev.* **2024**, *54*, 101447. [CrossRef]
59. Yandle, T. Understanding the consequences of property rights mismatches: A case study of New Zealand's marine resources. *Ecol. Soc.* **2007**, *12*, 18. [CrossRef]
60. Wang, K.; Liu, P.; Sun, F.; Wang, S.; Zhang, G.; Zhang, T.; Chen, G.; Liu, J.; Wang, G.; Cao, S. Progress in Realizing the Value of Ecological Products in China and Its Practice in Shandong Province. *Sustainability* **2023**, *15*, 9480. [CrossRef]
61. Liu, Y. Research on the urban-rural integration and rural revitalization in the new era in China. *Acta Geogr. Sin.* **2018**, *73*, 637–650.
62. Luo, Q.; Lun, R.; Yang, Y.; Ma, L.; Liu, Z.; Gao, M. Consideration on Several Issues of Implementing Rural Revitalization in Order. *J. China Agric. Resour. Reg. Plan.* **2019**, *40*, 1–7.
63. Wang, Y.; Liu, Y. Summarization and classification of China's rural revitalization model from the perspective of lucid waters and lush mountains. *Geogr. Res.* **2023**, *42*, 2005–2017.
64. Lang, Y.; Wang, G. The logical mechanism and breakthrough path for the activation of ecological resources value to promote rural revitalization. *J. Nat. Resour.* **2024**, *39*, 29–48. [CrossRef]
65. Zhang, J.; Liu, Y.; Pan, T.; Feng, Z.; Yang, Y.; Ge, Q. Ecological profit and loss accounting in the preparation of natural resources balance sheet. *J. Nat. Resour.* **2020**, *35*, 755–766.

66. Sun, D.; Zhong, F.; Nie, Y.; Ma, Y.; Liu, Y.; Liu, Y. Synergistic Development Pathways for National Parks and Local Regions: Shared Socioeconomic Pathway Scenario Forecasting and Optimization. *Land* **2024**, *13*, 1409. [CrossRef]
67. Bellanger, M.; Fonner, R.; Holland, D.S.; Libecap, G.D.; Lipton, D.W.; Scemama, P.; Speir, C.; Thébaud, O. Cross-sectoral externalities related to natural resources and ecosystem services. *Ecol. Econ.* **2021**, *184*, 106990. [CrossRef]
68. Li, Y.; Song, Z. Have protected areas in China achieved the ecological and economic "win-win" goals? Evidence from the Giant Panda Reserves of the Min Mont Range. *For. Policy Econ.* **2022**, *144*, 102845. [CrossRef]
69. Liao, Y. Estimation of the Value of Natural Resource Asset in the General Control Area of National Parks. Master's Thesis, Huazhong Agricultural University, Wuhan, China, 2024.
70. Li, N.; Gu, D.; Li, Y.; Huang, X.; Chen, Q.; Li, X.; Lv, B. Exploring the Link Between Landscape Perception and Community Participation: Evidence from Gateway Communities in Giant Panda National Park, China. *Land* **2024**, *13*, 2216. [CrossRef]
71. Wei, X.; Pu, P.; Cheng, L.; Jiang, H.; Liu, Y. Ethnic community's perception of benefit-sharing and participation intentions in national park tourism in China: An asymmetric modeling approach. *Ecol. Indic.* **2024**, *166*, 112257. [CrossRef]
72. Zhang, W.; Rong, L.; Xiong, K.; Zhang, Z.; Chang, H. Spatial Pattern of Ecosystem Services and the Mechanism of Eco-Industry Formation in South China Karst Nature Reserves. *Forests* **2024**, *15*, 493. [CrossRef]
73. Bell, J.; Stockdale, A. Evolving national park models: The emergence of an economic imperative and its effect on the contested nature of the 'national' park concept in Northern Ireland. *Land Use Policy* **2015**, *49*, 213–226. [CrossRef]

Disclaimer/Publisher's Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.