

## Exploring the Value and Path of Rural Ecological Revitalization under the Background of Carbon Neutrality

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### Abstract

**"Rural Revitalization, Ecological Livability". Ecological revitalization is an important part of implementing the "Five in One" strategic layout in rural areas and promoting the construction of ecological civilization. At present, rural areas still face problems such as severe damage to natural resources, serious environmental pollution, lack of awareness of ecological protection, weak supervision, and incomplete policies. To achieve rural ecological revitalization, it is necessary to make reasonable use of ecological resources, enhance residents' environmental awareness, improve collaborative management mechanisms, and relevant laws and regulations. In exploring the value of rural ecological revitalization, this article deeply analyzes the problems faced by rural ecological revitalization and provides targeted solutions to achieve carbon reduction and green rural goals.**

### Keywords

**Carbon neutrality; Rural ecological revitalization; Ecological protection.**

## 1. INTRODUCTION

The report of the 20th National Congress of the Communist Party of China specifically proposes to comprehensively promote rural revitalization, adhere to the optimized development of agriculture and rural areas, and accelerate the construction of an agricultural power. Under the leadership of Party committees at all levels, how to effectively promote the conscientious implementation of the "Two Mountains Theory" by departments at all levels, firmly establish the concept that green waters and mountains are golden mountains and silver mountains, accelerate the green development of agriculture, vigorously develop green, ecological, and efficient circular agriculture, strengthen the protection of agricultural resources and ecological environment, promote energy conservation and emission reduction, and thus address the ecological environment and management issues in rural areas. Against the backdrop of comprehensively promoting ecological construction, It is increasingly receiving high attention from society.

The research on the concept of ecological revitalization in rural areas is an applied research that combines theory with practice. It not only has guiding significance for the development of rural revitalization towards green, energy-saving, emission reduction, and low-carbon directions in reality, but also promotes the green development of agricultural and rural modernization construction, achieves the goal of energy conservation and emission reduction, and provides strong support for the realization of the "dual carbon" goal. This project

introduces the theory of multi-agent collaboration mechanism into the exploration of the value and path of rural revitalization in the context of carbon neutrality. Collaboration theory can analyze and optimize subsystems, promote cooperation between various systems, achieve supply-demand balance through resource integration, and thus achieve the goal of ecological revitalization. And combine psychological theories to explore farmers' understanding of the implementation and implementation of rural ecological revitalization strategies.

Rural ecological revitalization is an important part of implementing the "Five in One" strategic layout of rural areas and promoting the construction of ecological civilization. Implementing the rural ecological revitalization strategy is a key measure to build a beautiful China. Agriculture is an important supplier of ecological products, and rural areas are the main areas for ecological conservation. Ecology is the greatest development advantage of rural areas. Ecological livability is the key to rural revitalization. Implementing the strategy of rural revitalization, coordinating the governance of mountains, rivers, forests, fields, lakes, and grasslands, accelerating the implementation of green development methods in rural areas, and strengthening the improvement of rural living environments are conducive to building a new pattern of rural development where people and nature coexist harmoniously, and achieving the unity of people's wealth and ecological beauty.

Grasping good ecological conditions, rural revitalization, and ecological revitalization can provide strong support for achieving the dual carbon goals. Agriculture and rural areas are a comprehensive system of production, life, and ecology. Agricultural resources, agricultural ecology, agricultural structure, and agricultural production activities are important element systems in the system. The large-scale system is not only an important foundation for economic and social development, but also an important field of carbon emissions. According to the assessment report of the United Nations Intergovernmental Panel on Climate Change, global agricultural carbon emissions account for about one-third of the total global carbon emissions, with livestock emissions accounting for about 15% of the total global carbon emissions. These carbon emissions come from agricultural production, processing, circulation and other links, as well as production and business activities such as crop cultivation and animal husbandry. Therefore, implement the comprehensive rural revitalization strategy, promote the modernization of agriculture and rural areas, and always shoulder the responsibility and mission of achieving the dual carbon goals. Starting from the requirements of achieving the dual carbon goals, we should effectively focus on ecological well-being, rural revitalization, and ecological revitalization, and achieve the modernization of agriculture and rural areas. This should become a process of energy conservation, emission reduction, and carbon neutrality.

Achieving the "dual carbon" goal is an important part of ecological civilization construction, which will promote the comprehensive green transformation of economic and social development. Achieving the "dual carbon" goal is a requirement for the global response to climate change and the protection of our planet's home. Accelerating the development of clean energy is an inevitable choice to meet the needs of industry, agriculture, and residents' lives, and to reduce the external dependence of fossil fuels such as oil and gas. Developing clean, efficient, energy-saving, and environmentally friendly technologies, promoting industrialization, is a requirement for forming new growth points and driving forces. It is an inherent requirement for transforming extensive development methods, improving energy utilization efficiency, reducing carbon dioxide emission intensity, and achieving sustainable economic and social development.

## 2. LITERATURE REVIEW

### 2.1. Research on the "dual carbon" goal

In February 2008, the United Nations Environment Programme launched a global project called the United Nations Climate Neutrality Network Program at the Global Ministerial Environment Forum held in Monaco, aiming to unite cities and organizations that have made the most outstanding contributions to climate change globally, and guide global efforts to transition to a low-carbon economy, ultimately achieving the global goal of zero overall impact of human activities on climate change (Deng Mingjun et al., 2013).

On September 22, 2020, Xi Jinping promised the world at the United Nations General Assembly that China will increase its national independent contribution to addressing climate change, striving to achieve carbon peak by 2030 and carbon neutrality by 2060 (Shen Hongtao, 2022). Achieving carbon peak and carbon neutrality is a broad and profound economic and social systemic transformation (Wang Juan et al., 2021). Promoting the green and low-carbon transformation of energy is not only the key to achieving the "dual carbon" goal, but also conducive to improving the level of energy autonomy and controllability. We must adhere to the principle of first establishing, then breaking, and orderly promote the reduction, substitution, and transformation development of traditional energy (Feng Xingzhen, 2022). Under the vigorous promotion of the "dual carbon" goal, it is necessary to view and solve problems in a more "systematic" and "ecological" manner, pay attention to the recycling and utilization of resources in all aspects of industrial development, improve resource utilization capacity, and effectively reduce waste and environmental pollution and damage (Pei Chao, 2022).

### 2.2. Research on ecological revitalization strategy

The 19th National Congress proposed that building ecological civilization is a millennium plan for the sustainable development of the Chinese nation. To implement the rural revitalization strategy and accelerate the modernization of agriculture and rural areas, it is necessary to adhere to the concept of green development and strengthen the construction of rural ecological civilization (Zhao Weiqi, 2021).

Against the backdrop of comprehensive promotion of ecological civilization construction, rural ecology and its governance issues have gradually become a hot topic of social concern (Wu Yanping, 2018); Rural ecological revitalization should keep pace with the times (Zhang Xiaoxiao, 2022); Rural ecological livability is related to the happiness and satisfaction of the majority of villagers, and good ecological governance is the support of rural revitalization strategy (Yin Guosheng, 2022). Beautiful China cannot do without the construction of beautiful countryside. Implementing the strategy of rural revitalization, establishing and practicing the concept that green waters and green mountains are golden mountains and silver mountains, adhering to respecting nature, conforming to nature, and protecting nature, coordinating the governance of mountains, rivers, forests, fields, lakes, and grasslands, accelerating the implementation of rural green development methods, and increasing the governance of rural living environments, is conducive to building an ecological livable and beautiful countryside with clean and beautiful living environments, stable and healthy ecosystems, and harmonious coexistence between humans and nature (Hao Baoquan, 2019).

### 2.3. Brief evaluation of literature

Looking at the existing research results on rural ecological revitalization both domestically and internationally, scholars in various fields have conducted a large amount of research from different perspectives, providing many valuable references for the development of this study. At present, the academic community at home and abroad has achieved certain results in rural

ecological revitalization and dual carbon goals, but there are still many imperfect aspects in the existing literature that need further research.

### **3. THE CURRENT SITUATION AND CHALLENGES OF RURAL ECOLOGICAL REVITALIZATION**

The basic requirement for rural revitalization is to continuously improve the living conditions of rural residents, and maintaining good ecological conditions is an important part of it. With the strong support of the country for the rural revitalization strategy, the rural ecological revitalization strategy has achieved some achievements, but rural revitalization also faces some difficulties and challenges.

#### **3.1. Severe damage to rural ecological conditions and natural resources**

Against the backdrop of narrowing the urban-rural gap, with the vigorous development of rural economy, the problems of industrial pollution and excessive soil development and cultivation are becoming increasingly severe. In rural production and daily life, there are mainly the following problems: firstly, the problem of rural household waste is severe. Data shows that 40% of established villages in China still lack facilities for collecting and treating household waste, resulting in a large amount of household waste accumulation and causing certain pollution to the rural environment. Secondly, the problem of rural water pollution is severe. Data shows that 78% of established villages in China still lack professional treatment for domestic sewage, resulting in a large amount of untreated wastewater being directly discharged, further polluting the water sources in rural areas, and making the waste of water resources in China increasingly serious. Finally, the problem of animal husbandry waste is severe. Data shows that 40% of the livestock and poultry farming waste generated in established villages in China has not been utilized or treated harmlessly, which will lead to the accumulation of a large amount of waste and cause certain pollution to rural land and air.

#### **3.2. Lack of awareness of rural ecological protection**

The protection and governance of rural ecological environment is of great significance for achieving "beautiful countryside". In terms of the current situation, rural residents lack a deep understanding of environmental protection and the concept of building a green countryside, have a low level of education, face significant economic pressure, lack environmental publicity and education, and have limited channels for information exchange. Firstly, rural residents have a low level of education, and some farmers have a low level of education. They lack modern environmental science knowledge and awareness, so environmental protection issues are often overlooked in their daily lives. Secondly, rural residents face significant economic pressure. In order to obtain higher income, most residents will obtain economic resources through illegal logging and other means. In this process, they will prioritize their own interests and ignore environmental protection issues, thereby increasing the environmental burden. Furthermore, there is a lack of environmental awareness and education, and limited investment from communities and governments is insufficient to effectively promote environmental related knowledge. As a result, phenomena such as deforestation, littering, and water pollution continue to occur in rural areas. Finally, the channels for information exchange are limited. For some rural areas far from cities, the channels for information exchange are limited and there is information asymmetry, which will lead to inadequate communication and acceptance of relevant environmental policies.

#### **3.3. Lack of supervision and policies on rural environmental protection**

Effective supervision and management are the prerequisite and foundation for promoting rural ecological revitalization. Nowadays, although there have been initial achievements in rural

environmental protection supervision and policies, there are still shortcomings. Firstly, the supervision of rural environmental protection is insufficient. Currently, many rural areas have a serious shortage of environmental management personnel, inadequate environmental protection facilities and monitoring methods, and relatively little investment in rural environmental governance. Secondly, the rural environmental protection regulatory system is not perfect enough, and the specific implementation of environmental governance in rural areas involves many aspects, requiring cooperation from multiple parties. There will inevitably be some deficiencies in regulation, and the relevant departments do not attach high importance to environmental regulation, which leads to the problem of imperfect environmental collaborative governance. Finally, rural environmental protection policies need to be improved, and the current rural environmental protection policies and regulations are relatively backward, lacking refinement and improvement. Some current environmental regulations have not formulated specific measures for rural ecological environment protection, resulting in difficulties and problems in practical implementation.

#### **4. THE VALUE OF RURAL ECOLOGICAL REVITALIZATION UNDER THE GUIDANCE OF CARBON NEUTRALITY BACKGROUND**

##### **4.1. It is conducive to improving the rural ecological environment and promoting the construction of ecological civilization**

The ecological environment is the foundation on which human society relies for survival and development. However, in recent years, due to factors such as industrial pollution, excessive development, and human destruction, the problems in rural ecological environment have become increasingly apparent. Therefore, implementing the rural ecological revitalization strategy has become an important part of building a "beautiful China". Agriculture, as the main supplier of ecological products, and rural areas as the main area for ecological protection, their biggest development advantage is ecological environment protection. Implementing the strategy of rural revitalization, coordinating the governance of mountains, rivers, forests, fields, lakes, and grasslands, accelerating the green development of rural areas, and strengthening the improvement of rural living environment is extremely beneficial for establishing a new pattern of rural development where people and nature coexist harmoniously, and achieving the goal of people's wealth and ecological beauty.

##### **4.2. It is conducive to achieving the dual carbon goal and building a green countryside**

The rural ecological revitalization strategy is one of the effective ways to achieve the dual carbon goal and build a green countryside. Rural ecological revitalization promotes land protection and restoration, achieving carbon reduction through improving agricultural production efficiency and quality. According to the assessment report of the United Nations Intergovernmental Panel on Climate Change, agriculture accounts for about one-third of global carbon emissions, with livestock accounting for 15% of global carbon emissions. These carbon emissions come from agricultural production, processing, and circulation, as well as agricultural planting, animal husbandry, and other production and operation activities. Therefore, implementing the comprehensive rural revitalization strategy and promoting the modernization of agriculture and rural areas always shoulder the responsibility and mission of achieving the dual carbon goals. We must start from the need to achieve the dual carbon goals, effectively carry out rural ecological revitalization work, promote agricultural and rural modernization, win the battle against poverty, and achieve sustainable development goals and carbon emission reduction goals.



### **4.3. It is conducive to promoting economic and social development and achieving comprehensive green transformation**

Rural ecological revitalization is one of the powerful measures to promote economic and social development and comprehensive green transformation. Achieving the "dual carbon" goal is a global response to climate change and the need to protect our Earth's environment. Accelerating the development of clean energy is not only a way to meet the needs of industry, agriculture, and people's livelihoods, but also a necessary way to reduce dependence on oil, natural gas, and other fossil fuels. Developing clean, efficient, energy-saving, and environmentally friendly technologies and promoting industrialization is not only a need to find new growth points and driving forces, but also an important way to transform development methods, improve energy utilization efficiency, and reduce carbon dioxide emission intensity. It is also an inevitable requirement for achieving the gradual development of rural economy towards green, high-quality, and sustainable development.

## **5. THE IMPLEMENTATION PATH OF LEADING RURAL ECOLOGICAL REVITALIZATION UNDER THE BACKGROUND OF CARBON NEUTRALITY**

### **5.1. Reasonable utilization of rural ecological resources and protection of natural resources**

At present, the ecological environment of rural areas in China has been severely damaged. Therefore, in order to achieve the goal of rural ecological revitalization, it is necessary to make reasonable use of rural ecological resources and recycle natural resources. Firstly, promote ecological protection, strengthen ecological restoration and environmental protection, promote low-carbon green production methods, and achieve carbon reduction and sustainable economic development. Secondly, support technological innovation by introducing high-tech and non agricultural enterprises, utilizing high-tech to achieve carbon reduction and rational utilization of resources; Furthermore, promoting ecological planting and aquaculture, adopting green, low-carbon, and environmentally friendly production methods, improving the quality and value of crops, and avoiding the use of substances such as fertilizers that pollute natural resources. Finally, we will strengthen the publicity efforts for environmental protection, guide residents to establish environmental awareness, start from small matters, form good ecological civilization habits, and deeply ingrain the concept of "green waters and mountains are golden mountains and silver mountains" in people's hearts, contributing our modest efforts to carbon reduction and rural ecological revitalization.

### **5.2. Enhance residents' awareness of ecological protection and assist in carbon reduction**

Residents are the direct influencers of ecological reality problems, and in fact, everyone's actions will have an impact on the environment. When residents actively participate in ecological protection, take action to protect and improve the environment, they become actors in ecological protection. The improvement of residents' awareness of ecological protection can effectively alleviate phenomena such as deforestation, indiscriminate disposal of household waste, and pollution of water sources, improve environmental quality, and form a livable and healthy living and working environment. Secondly, it can enhance residents' respect and appreciation for nature, enabling them to take practical actions to protect the environment. Furthermore, it can enhance residents' sense of social responsibility and shoulder their obligations to environmental protection. Finally, emergency plans can be made for the arrival of large-scale ecological disasters to prevent more serious ecological problems such as natural disasters and environmental risks, thereby reducing rural economic losses.

### 5.3. Improve the rural ecological collaborative management mechanism and relevant policies

The ecological issues in rural areas are not a separate issue, such as the use of pesticides and fertilizers, deforestation, land pollution, and garbage disposal. They are closely related and will also have an impact on the ecology of the surrounding areas as water bodies and regions approach. Therefore, in order to better solve these ecological problems, firstly, it is necessary to increase environmental management personnel in rural areas, improve environmental protection facilities, strengthen monitoring methods, and increase investment in rural environmental governance. Secondly, it is necessary to establish a corresponding rural environmental protection supervision system across regions and departments, systematically plan rural ecological governance issues, improve work processing efficiency, and better promote the implementation of rural ecological revitalization strategy. Finally, it is necessary to improve rural ecological protection policies and the legal system, implement ecological compensation policies, and formulate corresponding contingency plans and specific measures for rural ecological environment protection, clarify division of labor, increase resource investment, and promote efforts, so that the rural revitalization strategy can be steadily promoted under the guarantee of the system.

## 6. CONCLUSION

In recent years, the country has vigorously promoted the rural revitalization strategy, advocating the concept of rural revitalization and ecological livability, linking the "dual carbon" goals, building ecological livable villages, and improving residents' sense of happiness and satisfaction. Focusing on the core issues faced by rural ecological revitalization, it is necessary to make reasonable use of resources, increase publicity efforts, enhance residents' awareness of ecological protection, establish a rural environmental protection supervision system among various departments, improve relevant policies and regulations, promote carbon reduction in rural areas, take the path of green development, promote harmonious and win-win economic development and ecological environmental protection, promote urban-rural integration, and enhance residents' happiness index.

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