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Discussion on the Dilemmas and Optimization Strategies of Rural Economic Development under the Rural Revitalization Strategy

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Abstract: This article focuses on the challenges of rural economic development under the strategy of rural revitalization, and deeply analyzes the current situation of rural economic development. Research has found that although the rural revitalization strategy has achieved significant results in improving residents' quality of life, promoting agricultural modernization, it still faces challenges such as severe loss of human resources, insufficient agricultural technological innovation, and backward infrastructure construction. In response to these challenges, this paper proposes optimization strategies from three aspects: strengthening rural education and talent team construction, promoting agricultural technology innovation and achievement transformation, and increasing investment in rural infrastructure construction.

Keywords: Dilemmas and optimization strategies; Rural economic development; Rural revitalization strategy

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1. Introduction

In the process of comprehensively promoting rural revitalization, rural economic development serves as both a critical link and the fundamental underpinning for achieving comprehensive rural revitalization. However, the current development of rural economy in China still faces many challenges, and the limitations of traditional development models are becoming increasingly prominent, forming a stark contrast with the rapid development of the urban economy. Exploring the challenges of rural economic development under the strategy of rural revitalization and seeking practical and feasible optimization strategies is not only crucial for addressing the problems of rural economic development, but also represents an imperative requirement for promoting agricultural and rural modernization and achieving the grand goal of rural revitalization [1].

2. The promoting role of the rural revitalization strategy in rural economic development

2.1. Improving the quality of life for rural residents

In terms of enhancing the quality of life for rural residents, the rural revitalization strategy drives the coordinated improvement of farmers' income and quality of life through the dual engines of extending the industrial value chain and improving the living environment [2]. On one hand, it promotes the transformation of traditional agriculture into modern agriculture that is efficient and high-value, encouraging deep processing of agricultural products and the development of the entire industrial chain. Through diversified sales channels such as brand building and e-commerce platform expansion, farmers are transformed from mere producers of raw materials into beneficiaries who share in the profits along the industrial chain, significantly enhancing their income-generating capacity. On the other hand, the rural living environment improvement campaign comprehensively enhances infrastructure such as water supply, drainage, electricity, and communication in rural areas, narrowing the gap in basic public services between urban and rural areas. Meanwhile, housing construction and renovation projects fundamentally improve the living conditions of farmers, enabling rural residents to enjoy a more convenient and comfortable living environment alongside growing economic incomes, thereby genuinely enhancing their sense of well-being and fulfillment [3].

2.2. Promoting agricultural modernization

In terms of promoting agricultural modernization, the rural revitalization strategy takes the application of science and technology and innovation in production organization as dual drivers, driving a transformation in the quality and efficiency of agricultural development. On the one hand, the in-depth application of agricultural biotechnology, intelligent agricultural machinery, and precision agriculture technology has enabled precise control over the growth environment of crops and intelligent management of the production process. This not only significantly boosts per unit area yield and agricultural efficiency but also promotes the transformation of agricultural production towards green and low-carbon by reducing the use of chemical fertilizers and pesticides, thus establishing an environmentally friendly agricultural development model. On the other hand, policy support for new types of business entities such as rural cooperatives and family farms has broken through the limitations of traditional small-scale farming, facilitating the scaling up and intensification of agricultural production. This large-scale operation model enhances the organizational level of agricultural production, improving the market competitiveness and risk resistance of agricultural products. Meanwhile, intensive management optimizes the allocation of production factors, stimulating the intrinsic vitality of the agricultural economy to adapt to market demands [4].

3. Analysis of the dilemmas in rural economic development under the rural revitalization strategy

3.1. Severe loss of human resources

There is a significant gap in economic development between urban and rural areas. Due to the abundant employment opportunities and higher wages in industrialization and service industries, cities have led to a one-way flow of young and middle-aged labor into cities, constituting a primary driver for the loss of human resources. The rural industrial structure is single, and the traditional planting and breeding industry has low added value, making it difficult to cover essential expenditures such as education and healthcare, exacerbating labor outflow. At the same time, the rural social service system lags behind, high-quality educational resources are scarce, and grassroots

medical capabilities are insufficient, which weakens the attractiveness of rural areas to talents. This has led to an aging and low-skilled agricultural production, with a high proportion of elderly individuals engaged in farming and a low prevalence of modern agricultural machinery. The talent gap has led to a lack of intellectual support for rural industrial upgrading, and emerging agricultural operators find themselves at a disadvantage in market competition. In addition, the lack of social security for left behind groups, the increase in medical expenses for empty nest elderly, and the lack of education for left behind children represent long-term challenges on rural economic development [5].

3.2. Insufficient agricultural, scientific, and technological innovation

Due to the low proportion of agricultural research and development investment in agricultural GDP in China, key areas such as seed research and development and biotechnology breeding are constrained by dependence on foreign technologies. More than half of the high-end vegetable seeds are imported, and there is an imbalance in the distribution of research and development investment in the industrial chain, with a low proportion in the pre-production stage, such as agricultural machinery manufacturing, and limited breakthroughs in the post-production stage, such as deep processing technology. Moreover, there are deficiencies in the mechanism for the transformation of scientific and technological achievements, with serious information barriers between research institutions and production bases, and a low alignment between laboratory achievements and practical field demands. In addition, the weakening of the grassroots agricultural technology promotion system has led to a low proportion of highly qualified agricultural technicians in towns and townships across the country and a lack of continuous training opportunities, creating a “last mile” bottleneck. As a result, the contribution rate of agricultural scientific and technological progress has remained relatively low for a long time, with a significant gap compared to developed countries, which has further constrained the improvement of agricultural total factor productivity [6].

3.3. Backward infrastructure construction

In the promotion of the rural revitalization strategy, the backwardness of rural infrastructure construction has become a key constraint on economic development, and its lag exhibits significant spatial disparities. Rural road density in the central and Western regions is substantially lower than that in the Eastern region, and the poor condition and weak disaster resistance of county roads. The aging of water conservancy facilities, low effective utilization coefficient of irrigation water, and significant food losses caused by facility damage every year; Insufficient communication network coverage and low 4G coverage in remote areas hinder the development of new business models such as rural e-commerce. This “short board effect” reshapes the cost structure of the rural economy: the lack of technology in the transport sector leads to a high loss rate of agricultural products logistics, the information blockage makes the price fluctuation of agricultural products greater than the urban market, the deterioration of the investment environment causes the growth rate of rural fixed asset investment to be lower than the national average for a long time, and the willingness of social capital to invest in rural areas is low [7].

4. Optimization strategies for rural economic development under the rural revitalization strategy

4.1. Strengthening rural education and talent team building

4.1.1. Building a solid foundation for human capital

The state and local governments should establish a rigid mechanism for tilting educational resources towards ru-

ral areas. In terms of investment, the central government should formulate a special transfer payment system for rural education to ensure that the growth rate of per-student education expenditure is not lower than the national average, with a focus on improving digital teaching equipment, laboratory facilities, and library resources in rural schools. Local governments should establish a "Silver Teacher" introduction plan, attracting retired urban teachers and outstanding young teachers to teach in rural areas through policies such as housing subsidies and preferential treatment in professional title evaluation. At the same time, the "County-Managed School-Hired" management reform should be implemented to promote balanced allocation of teachers between urban and rural areas. Additionally, a rural education quality monitoring system should be established, incorporating indicators such as the consolidation rate of compulsory education and the rate of teachers meeting educational qualifications into local government performance evaluations, ensuring precise matching of education investment and demand at the institutional level [8].

4.1.2. Aligning with industrial development demands

Vocational training should restructure its curriculum system based on the "industry demand orientation". In response to the demands of agricultural modernization, develop training modules covering areas such as smart agriculture operation, quality and safety control of agricultural products, and green planting techniques. Aligned with the trend of rural industrial integration, add practical contents such as e-commerce operation of agricultural products, rural tourism services, and rural logistics management. In terms of implementation, establish a dual-track training system of "online + offline": online, rely on platforms such as the "Rural Revitalization College" of the Open University of China to develop standardized MOOC courses, and incorporate live Q&A sessions and online assessment features; offline, collaborate with leading agricultural enterprises and cooperatives to establish training bases, and implement a three-stage training model of "theoretical teaching + field practice + enterprise internship". At the same time, establish a training effect tracking mechanism, link farmers' vocational skills levels with industrial support policies, and form a virtuous cycle of "training–employment–income increase".

4.2. Promoting agricultural, scientific, and technological innovation and the transformation of achievements

4.2.1. Breaking through bottlenecks in key areas

Research funding allocation should be prioritized towards the entire chain from "basic research–applied research–industrial transformation". In the field of basic research, establish key special projects focusing on areas such as agricultural biotechnology and intelligent breeding, support universities and research institutes to carry out basic research on germplasm resource protection and crop stress resistance, and ensure that the proportion of basic research investment increases to more than 20% of the total agricultural research funds. At the applied research level, focus on supporting the domestic development of agricultural machinery, promote the development and adoption of lightweight and intelligent agricultural machinery in hilly and mountainous areas, and at the same time strengthen the technological research on deep processing of agricultural products, and develop high-value-added products such as functional foods and bio-based materials. In terms of the investment mechanism, establish a diversified investment system of "government guidance + enterprise subject + social participation", encourage leading agricultural enterprises to set up research and development centers, and offer a 150% super tax deduction for enterprise research and development investment [9].

4.2.2. Opening up the pathway from laboratory to field

Establish an integrated transformation network of "research institutions–production entities–extension system". Research institutions should establish a topic selection mechanism oriented towards market demand, and jointly tackle "bottleneck" technologies through the approach of "enterprises posing questions and research institutions answering them". At the production end, promote the joint construction of experimental demonstration bases by research institutes and new types of agricultural business entities, and directly transfer scientific research achievements to the production front line. Reforming the grassroots extension system should focus on "professionalization of the team + digitalization of services". On the one hand, improve the educational level of agricultural technicians through "targeted training + on-the-job training", ensuring that the proportion of those with a bachelor's degree or above in the township agricultural technician team reaches 40%. On the other hand, develop an "agricultural technology extension APP", integrate data such as soil moisture and pest and disease warnings, and provide precise technical guidance for farmers. At the same time, improve the incentive mechanism for the transformation of scientific and technological achievements, increase the share of income from the transformation of scientific and technological achievements allocated to researchers to over 70%, and stimulate innovation vitality.

4.3. Increase investment in rural infrastructure construction

4.3.1. Building a diversified investment pattern

Innovate in the utilization of fiscal funds, implement a combined allocation model of "factor method + project method", and allocate funds scientifically based on factors such as rural population size and infrastructure gap. At the same time, a competitive project approval mechanism can be implemented for major infrastructure projects. In terms of financing models, issue "rural revitalization special bonds", allowing local governments to use bond funds for rural roads, water conservancy and other public welfare projects; promote the PPP model, formulate the "Operation Guidelines for Rural Infrastructure PPP Projects", and clarify the return mechanism for social capital participation in rural water supply, logistics and other projects, such as ensuring reasonable returns through user fees and feasibility gap subsidies. In addition, establish a "rural infrastructure development fund" to attract long-term funds such as social security funds and pensions, and use "reward instead of subsidy" methods to encourage local governments to improve the efficiency of fund use [10].

4.3.2. Enhancing service delivery and guarantee capabilities

Infrastructure construction should follow the principle of "comprehensive planning- categorized advancement-moderate advancement". In terms of transportation facilities, implement the "Four Good Rural Roads" quality improvement project, focusing on building industrial roads and tourism roads, and simultaneously improve rural integrated passenger, freight, and postal service stations to reduce the cost of the "first mile" for agricultural products entering the city. For water conservancy facilities, promote the modernization transformation of medium-sized irrigation areas, establish efficient water-saving irrigation demonstration zones, and at the same time reinforce dilapidated and dangerous reservoirs and dredge river channels to enhance flood control and drought resistance capabilities. Digital infrastructure is a key breakthrough point. Implement the "Digital Village Construction Action", and building upon the achievement of full 4G network coverage in administrative village, gradually promote 5G networks and gigabit optical fiber access to households, and build rural e-commerce public service centers to provide support for the development of the digital economy.

5. Conclusion

This paper has systematically analyzed the current situation and challenges of rural economic development under the rural revitalization strategy and proposes targeted optimization strategies. The effective implementation of these strategies is expected to strongly promote the high-quality development of rural economy and contribute to the realization of the goals of the rural revitalization strategy. However, rural economic development constitutes a long-term and complex systemic undertaking. In the future, it is still necessary to continuously pay attention to new problems and new challenges, and continuously refine relevant policies and measures to adapt to the new requirements of economic and social development, thereby providing sustained impetus for the comprehensive revitalization of rural areas.

Disclosure statement

The author declares no conflict of interest.

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