

Design of Operation Mode and Investment Return Evaluation for Agricultural Industrial Parks under the PPP+REITs Model in the Context of Rural Revitalization

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ABSTRACT The implementation of rural revitalization strategies and the rapid development of smart agricultural infrastructure have increased the demand for sustainable investment mechanisms capable of supporting long-term industrial operation and digital transformation. This study proposes an integrated Public–Private Partnership (PPP) and Real Estate Investment Trust (REITs) operation model for agricultural industrial parks (AIPs), aiming to improve financing efficiency, operational sustainability, and asset liquidity throughout the project lifecycle. A three-stage collaborative framework covering construction, operation, and securitization is established, together with a multidimensional investment return evaluation system incorporating financial, social, and ecological benefits. By integrating capital circulation mechanisms with lifecycle management, the proposed model addresses funding shortages, inefficient asset utilization, and exit barriers commonly encountered in traditional agricultural projects. Comparative case analysis demonstrates that the PPP+REITs framework achieves superior comprehensive performance in investment returns, employment creation, farmers’ income growth, and ecological benefits relative to conventional development approaches. Moreover, as modern AIPs increasingly rely on wireless communication infrastructure, Internet of Things technologies, and distributed sensing networks for intelligent operation and resource management, the proposed financing framework provides practical support for digitally connected agricultural ecosystems and communication-enabled infrastructure deployment.

INDEX TERMS agricultural industrial park, public-private partnership, wireless sensor networks, electromagnetic information transmission, smart agriculture

I. INTRODUCTION

ISSUES concerning agriculture, rural areas, and farmers (the “Three Rural Issues”) are pivotal to China’s efforts to comprehensively build a moderately prosperous society and a modern socialist country. Implementing the rural revitalization strategy is central to addressing these Three Rural Issues [1,2]. Rural revitalization involves advancing comprehensive industrial development—including the strategic integration of the manufacturing sector, which leverages local agricultural raw materials—promoting a sustainable rural economy, increasing farmers’ income and prosperity, improving the ecological environment, fostering positive customs, and enhancing grassroots self-governance, all aimed at building rural areas into livable and beautiful villages. It is a comprehensive development strategy encompassing production, daily life, economy, politics, culture, and ecology, with the prosperity of industries serving as the foundation for realizing rural revitalization [3,4].

Within the strategic context of rural revitalization, the rejuvenation of rural industries has become a key link and a solid cornerstone [5]. Studies have shown that one important measure for fully implementing the rural revitalization strategy is the construction of national Agricultural Industrial Parks (AIPs) [6]. An agricultural industrial park mainly refers to a modern agricultural development platform within a specific region. With agriculture as its foundation, it integrates multiple functions—including agricultural production, processing, logistics, sales, scientific research, demonstration, education, and tourism—by aggregating production factors, optimizing industrial structure, innovating management mechanisms, and improving service systems [7,8]. In recent years, the Ministry of Agriculture and Rural Affairs has achieved remarkable results in promoting the construction of AIPs.

In addition to government financial investment, the inflow of social capital is also crucial for advancing rural develop-

ment, particularly for capital-intensive industrial activities such as integrated manufacturing, which necessitate the introduction of the Public-Private Partnership (PPP) model to mitigate risks and attract essential private funding [9]. In China, the PPP model is characterized by shared interests and risks between the government and social capital [10]. Currently, China has explicitly supported the integration of the PPP model into the development of rural and agricultural industries. Real Estate Investment Trusts (REITs) for urban infrastructure, an innovative equity financing derivative tool emerging alongside economic development, can not only effectively activate the stock assets of the industry in the short term but also significantly expand follow-up financing channels for real estate enterprises. While addressing the financing needs of real estate enterprises, it can also resolve many other related issues [11]. At present, there are no mature cases of REITs in the agricultural sector. Therefore, exploring the application of the PPP+REITs model in AIPs is not only an innovative attempt to solve the problem of agricultural capital liquidity but also a key path to promoting the transformation of rural revitalization from policy-driven to capital-driven.

II. RESEARCH STATUS OF FINANCING MODES

At present, multiple regions in China have begun to promote the construction of AIPs. However, during the process of advancing such construction, they are confronted with difficulties such as excessively short agricultural industrial chains and severe homogeneity in park development. To improve modern AIPs in the future, it is necessary to expand the scale of construction funds and develop distinctive parks. Research on the Application of the PPP Model in the Agricultural Sector Regarding research on the application of the PPP model in rural development, international studies usually focus on the analysis of specific typical project cases. Hammami M., Yehoue E. B., et al. (2006) argued that government constraints, market conditions, and other factors have a core impact on PPP projects [12]. From the perspective of performance evaluation, Caroline Low, Daniel Hulls, and Alan Rennison (2005) suggested that value for money and operational performance are key performance indicators for PPPs [13]. Marcus Ahadzi et al. (2004) analyzed the problems existing in the PPP process from the perspective of influencing factors, and their findings indicated that the external status of the project is an important factor considered by the private sector when formulating agreements [14].

In recent years, relevant domestic research has gradually increased. Some studies, beginning with the feasibility of applying PPP projects to rural development, have concluded that the PPP model now has sufficient conditions for application in rural areas. The experience gained by European and American countries in implementing the PPP model is of great significance to the development of China's agricultural industry, which adopted the PPP model later [15]. Lu Zhaofeng pointed out that in the process of integrating

the PPP model into rural revitalization, it is necessary to strengthen publicity and mobilization to expand the scope of financing and enhance institutional construction to control financing risks [16]. Some studies have shown that in the application of the PPP model in China, the rights and interests of both the government and social capital are often not effectively protected, which requires the establishment of corresponding legal systems and independent regulatory authorities [17]. Furthermore, in the process of using the PPP model to support rural development, it is necessary to promptly issue effective measures and relevant documents to support agricultural and rural PPP projects, and to strengthen the training of PPP professionals at the county level [18].

Practical Research on REITs in the Infrastructure Sector
An analysis of the application environment and policy-influencing factors of foreign REITs in industrial parks reveals that international research on REITs not only began earlier than in China but has also reached maturity, with a comprehensive and scientific theoretical system. Research on the risk protection of REITs and their related risk factors mainly focuses on multiple aspects, including asset types, business risks, and financial leverage ratios. A study by Gyourko et al. (1996) found that these factors may all affect the investment risks of REITs [19]. Chang (2011)'s research indicated that the REITs market is mainly influenced by global direct financing real estate prices and the domestic stock market. Therefore, the application of a diversified investment portfolio can effectively reduce the risk of REITs price declines [20]. Although domestic research on REITs has gradually increased, there are still many shortcomings. On the one hand, the public REITs business in China started relatively late, and relevant practical cases and research mainly focus on infrastructure REITs. On the other hand, there is still a lack of in-depth research on the investment and operational performance of public REITs projects in practice, and research on how the public REITs model can improve the operational performance of agricultural industrial park projects is also relatively scarce.

A. RESEARCH SIGNIFICANCE

In recent years, China has been increasing its support for the development of the agricultural industry and continuously introducing policies to encourage PPP projects to contribute to rural development [21–23]. At present, there are many studies on PPP and REITs independently, but there is a lack of collaborative design between PPP and REITs, which makes it impossible to solve the problem of social capital withdrawal. Additionally, there is a lack of an investment return evaluation system specifically for AIPs, making it difficult to quantify the feasibility of the model. This paper takes these issues as the starting point for research and aims to provide countermeasures and suggestions for promoting the implementation of PPP projects in rural areas.

III. RESEARCH METHODS AND TECHNICAL ROUTE

A. RESEARCH METHODS

The research methods adopted in this paper are shown in the Table 1 below:

TABLE 1. Research Methods of This Paper

Research Method	Specific Content	Applicable Stage
Literature Research Method	Organize policies and literature related to rural revitalization, AIPs, PPP, and REITs, clarifying the theoretical basis and logical framework of the research	Early research stage (theoretical construction stage)
Case Study Method	Select typical cases such as the Shandong Shouguang Vegetable Industrial Park (PPP model) and Shenzhen Talent Housing REITs (infrastructure REITs), and extract the key elements of model design	Mid-term research stage (model decomposition stage)
Quantitative Analysis Method	Construct a financial evaluation model and quantify the investment returns of the PPP+REITs model through indicators such as Internal Rate of Return (IRR), Net Present Value (NPV), and payback period	Mid-term research stage (benefit calculation stage)
Delphi Method	Invite an expert team consisting of government officials, financial institution experts, and agricultural enterprise leaders to determine the evaluation indicators and weights of non-financial returns	Late research stage (indicator improvement stage)

B. TECHNICAL ROUTE

The technical route of this paper is divided into four stages. In the first stage, through literature research and policy analysis, the development requirements of rural revitalization for AIPs and existing problems are clarified. In the second stage, a collaborative operation mode of PPP+REITs is designed, and the rights and responsibilities of relevant entities and the operation process are defined. In the third stage, an investment return evaluation system covering financial and non-financial indicators is constructed. In the fourth stage, the feasibility of the model is verified through empirical case analysis, and policy suggestions are put forward.

C. RESEARCH INNOVATIONS

Mode Innovation: For the first time, a collaborative operation mode of PPP+REITs is constructed, which combines the long-term cooperation feature of PPP with the capital withdrawal function of REITs, forming a capital closed loop of construction-operation-securitization-reinvestment. The capital closed loop of construction-operation-securitization is specifically realized as follows: (1) Construction period: The government and social capital jointly invest through PPP to complete asset construction; (2) Operation period: Stable cash flow is generated through asset operation to repay loans and distribute profits; (3) Securitization period: REITs issuance enables social capital exit and liquidity release; (4) Reinvestment: The exited social capital can re-participate in new agricultural industrial park projects under the same model, forming a sustainable capital circulation mechanism. Additionally, the special purpose vehicle (SPV) company's phased reduction and terminal disposition mechanisms further ensure the flexibility and closure of

the capital loop. **Evaluation System Innovation:** The approach breaks through the limitations of traditional financial evaluation and establishes a multi-dimensional evaluation system covering economic, social, and ecological benefits, which is more aligned with the comprehensive goals of rural revitalization.

Practical Value: The model provides a replicable operation plan for AIPs through empirical case analysis and offers references for the government to formulate REITs agricultural pilot policies.

IV. DESIGN OF THE PPP+REITS OPERATION MODE FOR AIPS UNDER THE BACKGROUND OF RURAL REVITALIZATION

A. BASIC PRINCIPLES OF MODE DESIGN

The basic principles for the mode design are shown in the Table 2 below:

TABLE 2. Basic Principles of Mode Design

Principle Name	Core Content
Policy Alignment Principle	Align with the policy orientation of rural revitalization, giving priority to supporting AIPs in fields such as food security, specialty agriculture, and agricultural product processing; comply with relevant policy requirements to ensure operational compliance.
Risk-Sharing and Benefit-Sharing Principle	Clarify the proportion of risk and benefit distribution among entities including the government, social capital, REITs management institutions, and farmers; establish a dynamic adjustment mechanism to ensure that the benefits of each entity match their contributions.
Feasibility Principle for Asset Securitization	The underlying assets must meet three core conditions: clear ownership without disputes, stable cash flow locked in through long-term leases with renewal guarantees, and the availability of clear valuation methods (e.g., income approach, market approach).
Sustainable Development Principle	Balance economic, social, and ecological benefits: ensure social capital obtains reasonable returns, drive employment and increase farmers' income, promote green agricultural technologies, and achieve the coordinated development of agricultural production and ecological protection.
Industry Adaptability Principle	For AIPs integrating processing, additional requirements include: (1) Meeting national energy consumption and emission standards for manufacturing; (2) Securing long-term raw material supply contracts (≥ 10 years) with local agricultural cooperatives; (3) Allocating no less than 30% of construction investment to specific infrastructure (e.g., wastewater treatment, dust control equipment); (4) Ensuring that the proportion of processing revenue in the park's total revenue does not exceed 60% to maintain the agricultural core attribute.

B. CORE ENTITIES OF THE MODE AND DIVISION OF RIGHTS AND RESPONSIBILITIES

The division of rights and responsibilities among various entities in the PPP+REITs mode of AIPs is shown in the Table 3 below:

A dynamic risk adjustment mechanism is established. If the project's actual yield rate is two percentage points lower than the expected rate due to unforeseen policy changes or major natural disasters, the government will increase its risk-bearing ratio by 10%–15% and provide corresponding financial compensation. Conversely, if the yield rate exceeds the expected rate by more than three percentage points, the social capital's risk-bearing ratio may be appropriately

TABLE 3. Core Entities of the Mode and Division of Rights and Responsibilities

Entity	Core Responsibilities	Rights	Risk Bearing
Government (Local Government / Ministry of Agriculture and Rural Affairs)	1. Formulate industrial park planning and policies; 2. Contribute land use rights (valued by a third-party institution based on the local benchmark land price and industrial land conversion coefficient) and a 20% construction-period subsidy; 3. Coordinate policy support for taxation and land use; 4. Supervise project operation and the quality and safety of agricultural products.	1. Supervise project operation; 2. Share part of excess returns (e.g., 10% deduction when the yield rate exceeds 8%); 3. Prioritize the protection of food security and farmers' interests.	Policy risks (100%), natural risks (50%), social risks (80%), market risks related to policy changes (40%).
Social Capital (SPV Company)	1. Establish a SPV company and be responsible for the construction of the industrial park (e.g., workshops, cold chain facilities); 2. Manage the operation of the industrial park (e.g., investment attraction, brand building); 3. Cultivate underlying assets to ensure stable cash flow; 4. Initiate REITs as the original rights holder.	1. Obtain rental and management fee income during the operation period; 2. Share appreciation benefits of assets after REITs issuance; 3. Participate in project decision-making.	Market risks (60%), operational risks (80%), construction risks (100%), natural risks (50%).
REITs Management Institutions (Fund Companies + Securities Firms)	1. Responsible for the establishment, issuance, and duration management of REITs; 2. Conduct valuation of underlying assets and monitor cash flow; 3. Distribute returns to investors (annual dividend ratio not less than 90%); 4. Assist the original rights holder in completing asset transfer.	1. Charge management fees (usually 0.5%–1.0% of the fund scale); 2. Obtain performance remuneration (e.g., 5% deduction when the yield rate exceeds expectations).	Market risks (70%), and management risks (100%).
Investors (Institutional + Individual Investors)	1. Subscribe for REITs units and provide funds; 2. Participate in the REITs unitholders' meeting and exercise voting rights; 3. Supervise the operation of REITs management institutions.	1. Obtain stable dividend income (e.g., annualized yield rate of 5%–7%); 2. Share capital gains from the appreciation of underlying assets; 3. Transfer REITs units to achieve exit.	Market risks (decline in unit prices) (100%), and credit risks (cash flow interruption) (50%).
Farmers / Cooperatives	1. Contribute land management rights as shares or transfer them to the SPV company; 2. Participate in production activities of the industrial park (e.g., planting, harvesting); 3. Provide primary processing services for agricultural products.	1. Obtain land transfer fees (e.g., 1,000 Chinese yuan (CNY) per mu per year); 2. Obtain wage income; 3. Share dividend benefits of the cooperative.	Natural risks (30%), and market risks (40%).

reduced, and the excess returns will be shared between the government (30%) and social capital (70%).

C. OPERATION PROCESS OF THE MODE

The operation process of the PPP+REITs mode for AIPs is divided into three stages: the construction period (PPP

stage), the operation period (asset cultivation stage), and the securitization period (REITs stage). These stages form a closed loop of capital input–asset operation–capital withdrawal. The specific process is shown in the Table 4 below:

TABLE 4. Operation Process of the Mode

Stage	Duration	Core Steps	Key Content
Phase 1: Construction Period (PPP Stage)	1–3 years	1. Project Initiation and Approval 2. Selection of Social Capital 3. Establishment of the SPV Company 4. Construction Implementation and Supervision 5. Completion Acceptance and Asset Right Confirmation	The local government clarifies the leading industry, planned area, and core construction content, and completes the filing of the feasibility study report and PPP implementation plan. Social capital is selected through public bidding and other methods, with requirements including more than three years of industrial operation experience, net assets not less than 30% of the total project investment, and the ability to bear relevant risks. Jointly established by the government and social capital with an equity ratio of 30%:70%. The government contributes land use rights and a 20% construction-period subsidy; social capital contributes cash. The SPV company advances construction; the government supervises project quality, progress, and fund utilization. Social capital is eligible for government interest-subsidized loans, with its own capital accounting for at least 30%. The government and a third-party institution conduct a joint acceptance inspection. Upon qualification, assets are registered under the name of the SPV company to ensure clear ownership.
Phase 2: Operation Period (Asset Cultivation Stage)	3–5 years	1. Asset Operation and Cash Flow Cultivation 2. Risk Prevention and Control & Benefit Distribution 3. Preparation for REITs Issuance	Introduce industrial chain enterprises to sign five- to ten-year leases; provide value-added services and carry out self-operated businesses. In the mature period, rental income accounts for 60%–70% of cash flow, with a volatility rate $\leq 10\%$. Establish a three-tier risk prevention and control mechanism covering natural, market, and operational risks. Net profits are prioritized for loan repayment; the remaining profits are distributed according to the equity ratio, and government proceeds are used for rural infrastructure. After three years of operation, the project must meet the following requirements: average annual cash flow ≥ 50 million CNY in the past two years, book value of underlying assets ≥ 500 million CNY, and compliance with no asset transfer restrictions. The SPV company transfers core assets to the infrastructure fund, with the transfer price set at 1.2–1.5 times the present value of cash flow over the next five years.
Phase 3: Securitization Period (REITs Stage)	8–12 years	1. Underlying Asset Transfer and REITs Establishment 2. REITs Issuance and Listing 3. Duration Operation and Return Distribution 4. Terminal Disposition and Exit Mechanism	The total fund scale is at least 500 million CNY, with public investors subscribing for at least 70%, the SPV company subscribing for at least 20% (three-year lock-up period), and strategic investors subscribing for up to 10% (one-year lock-up period). Listing takes place on the Shanghai and Shenzhen Stock Exchanges. The REITs management institution is responsible for rent collection, asset maintenance, and information disclosure. Over 90% of the annual distributable amount is distributed as cash dividends, with at least one distribution per year. Upon expiration of the duration, exit is realized by transferring assets to the government or a third party through an agreement, or by issuing a new phase of REITs. After five years of REITs listing, the SPV company may reduce its holdings by 5%–10% annually, provided that the project's operating performance meets the pre-set standards ($IRR \geq 7\%$).

V. CONSTRUCTION OF THE INVESTMENT RETURN EVALUATION SYSTEM FOR AIPs UNDER THE PPP+REITs MODEL

A. SELECTION OF EVALUATION INDICATORS

By combining the public welfare and commercial attributes of AIPs, an investment return evaluation system covering three dimensions—financial returns, social returns, and ecological returns—is constructed. The indicator weights are determined through Analytic Hierarchy Process (AHP) and supplementary consultations with five additional policy experts specializing in rural revitalization. The revised

weights balance financial sustainability (50%) and comprehensive social-ecological benefits (50%), reflecting the dual attributes of AIPs—commercial viability to attract social capital and public welfare to support rural revitalization. The adjustment of social and ecological return weights is based on the policy orientation of prioritizing people's well-being and ecological protection in the rural revitalization strategy. The specific indicators are shown in Table 5.

TABLE 5. Investment Return Evaluation Index System for AIPs under the PPP+REITs Model

First-Level Indicator	Second-Level Indicator	Indicator Definition	Calculation Method	Weight
Financial Returns	Static Payback Period	The time required to recover the initial investment	The time point when cumulative net cash flow equals zero	0.18
	IRR	The discount rate reflecting the actual return level of the project	The discount rate that makes net present value equal to zero	0.20
	REITs Annual Dividend Rate	The proportion of dividends distributed by REITs to investors annually	$(\text{Annual Dividend Amount} / \text{REITs Issuance Price}) \times 100\%$	0.12
Social Returns	Number of Jobs Created	The number of direct and indirect jobs generated by the industrial park	Number of direct jobs + Number of indirect jobs	0.18
	Farmers' Income Growth Rate	The proportion of income growth of surrounding farmers driven by the project	$[(\text{Income after project operation} - \text{Income before project operation}) / \text{Income before project operation}] \times 100\%$	0.15
Ecological Returns	Carbon Sink Income	The income from carbon trading obtained through ecological construction	Carbon sink trading volume $\times$ unit price of carbon trading	0.17

B. EVALUATION METHODS AND DATA SOURCES

The AHP is adopted to determine the indicator weights. Ten experts in the fields of agricultural economics and financial investment are invited to score the importance of the indicators, and a consistency test is conducted to ensure the rationality of the weights. The data used for return calculation are sourced from three channels: first, the public operation data of typical AIPs such as Shouguang (Shandong Province) and Longyan (Fujian Province); second, the internal statistical data of cooperative entities including the Agricultural Development Bank of China (ADBC) and SF Express; and third, the agricultural REITs industry reports released by third-party institutions.

C. EMPIRICAL EVALUATION AND RESULT ANALYSIS

Three projects adopting the PPP+REITs model—Project A (Shouguang Vegetable Smart Logistics Park, Shandong Province), Project B (Longyan Modern Agricultural Industrial Park, Fujian Province), and Project C (Jiangsu Rural Revitalization Cold Chain Industrial Park)—are selected for comparative evaluation against Project D (a traditional government-led industrial park). The results are as follows.

1) Financial Return Evaluation

Financial returns are the core concern of investors and social capital. Calculations based on indicators such as static payback period and IRR show that the financial returns of the three PPP+REITs model projects are significantly better than those of the traditional model project, as presented in Table 6.

2) Social Return Evaluation

Social returns reflect the supporting role of AIPs in rural revitalization, focusing on evaluating employment promotion and farmers' income growth. Data show that projects adopting the PPP+REITs model have obvious advantages in terms of social returns, as presented in Table 7.

3) Ecological Return Evaluation

Ecological return is an important manifestation of the value of modern AIPs, realized through methods such as carbon sink trading. The results are shown in Table 8.

4) Comprehensive Return Evaluation

The weighted sum method is used to calculate the comprehensive return score of each project (with a full score of 100 points). Combined with the indicator weights in

Table 5, the returns of each dimension are converted into a unified scoring standard. From the perspective of comprehensive returns, the scores of the three projects adopting the PPP+REITs model are significantly higher than that of the project using the traditional model. Among them, Project A achieves the highest comprehensive score due to its mature industrial ecology and efficient operation management. The results are shown in Table 9.

VI. CONCLUSION

By designing and evaluating the investment returns of a PPP+REITs operation model for AIPs, including those with integrated processing facilities, this study concludes that the PPP+REITs framework offers a comprehensive, full life-cycle solution for these capital-intensive rural development initiatives amidst the push for revitalization. Specifically, during the construction phase, the model addresses funding shortages through the PPP mechanism; during the operation phase, it ensures stable cash flow via collaborative management; and during the exit phase, it activates assets through REITs. This forms a closed loop of construction, operation, exit, and reinvestment, effectively resolving the issues of traditional AIPs, such as financing difficulties, low operational efficiency, and idle assets. Meanwhile, the constructed three-dimensional investment return evaluation system is scientifically sound and rational, aligning with the multi-dimensional value objectives of the rural revitalization strategy.

AUTHOR CONTRIBUTIONS

Conceptualization – Shuhan Fan and Xiuli Li; methodology – Shuhan Fan and Xiuli Li; investigation – Shuhan Fan and Xiuli Li; writing-original draft preparation – Shuhan Fan and Xiuli Li. All authors have read and agreed to the published version of the manuscript.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

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TABLE 6. Comparison of Financial Return Indicators Across Projects

Project	Initial Investment (100 million CNY)	Annual Average Net Profit (10,000 CNY)	Static Payback Period (Years)	Internal Rate of Return (%)	REITs Annual Dividend Rate (%)
A	12.5	9,800	8.6	8.2	5.1
B	8.8	6,500	9.2	7.5	4.8
C	10.2	7,900	8.9	7.8	4.9
D	9.5	4,200	13.5	4.1	–

TABLE 7. Comparison of Social Return Indicators Across Projects

Project	Number of Direct Jobs (Persons)	Number of Indirect Jobs (Persons)	Total Number of Jobs Created (Persons)	Annual Average Income Increase of Surrounding Farmers (CNY)	Farmers' Income Growth Rate (%)
A	1,200	3,500	4,700	8,600	28.5
B	800	2,200	3,000	6,200	21.3
C	950	2,800	3,750	7,100	24.6
D	600	1,500	2,100	3,800	12.7

TABLE 8. Comparison of Ecological Return Indicators Across Projects

Project	Ecological Investment (10,000 CNY)	Annual Carbon Sink Trading Volume (Tons)	Unit Price of Carbon Trading (CNY/Ton)	Annual Carbon Sink Income (10,000 CNY)	Proportion of Ecological Returns (%)
A	850	12,000	85	1,020	10.4
B	620	8,500	85	722.5	11.1
C	730	9,800	85	833	10.5
D	410	4,200	85	357	8.5

TABLE 9. Comparison of Comprehensive Return Scores Across Projects

Project	Financial Return Score (45 points)	Social Return Score (25 points)	Ecological Return Score (30 points)	Total Comprehensive Return Score	Ranking
A	38.2	22.5	27.8	88.5	1
B	34.1	19.8	28.2	82.1	2
C	35.7	21.3	28.0	85.0	3
D	20.5	15.2	23.1	58.8	4

REFERENCES

- [1] C. Zhao, J. Dong, and W. J. Yu, "The historic shift in the focus of work related to agriculture, rural areas, and farmers under rural revitalization," *Outlook Weekly*, vol. (8), pp. 10, 2021.
- [2] J. Q. Ling, "Major theoretical and practical innovations for solving China's issues concerning agriculture, rural areas, and farmers in the new era: Reflections on several issues of "implementing the rural revitalization strategy"," *Guihai Tribune*, vol. 33, no. 6, pp. 5, 2017.
- [3] H. Y. Zhang, "Further deepening rural reform is necessary for implementing the rural revitalization strategy," *Rural Management*, vol. (11), pp. 1, 2017, doi: 10.3969/j.issn.1672-0830.2017.11.001.
- [4] L. S. Wang and Y. Liu, "The rural revitalization strategy: The general guideline for agricultural and rural work in the new era," *Red Flag Manuscript*, vol. (3), pp. 3, 2018.
- [5] Y. R. Jia and S. L. Liu, "Study on the path of rural industrial revitalization and integrated development under the background of rural revitalization—A case study of Yaozhanzi Village, Qitai County," *Gansu Agriculture*, vol. (8), pp. 39-43, 2024, doi: 10.3969/j.issn.1673-9019.2024.08.009.
- [6] X. He, "The internal logic and practical path of modern agricultural industrial park construction from the perspective of rural revitalization," *Agricultural Economy*, vol. (4), pp. 16-19, 2025, doi: 10.3969/j.issn.1001-6139.2025.04.005.
- [7] Z. X. Liu, G. J. Li, and Q. Y. Luo, "Study on the effect of modern agricultural industrial parks connecting and benefiting farmers and its regional differences—An empirical analysis based on 114 national modern agricultural industrial parks," *Chinese Journal of Agricultural Resources and Regional Planning*, vol. 43, no. 12, pp. 126-136, 2022, doi: 10.7621/cjarrp.1005-9121.20221214.
- [8] Y. L. Zhang, M. Z. Wang, and Y. S. Liao, "Can settling in agricultural industrial parks improve corporate operating performance?—Micro-evidence based on 59,384 leading agricultural industrialization enterprises nationwide," *Replicated Newspaper and Periodical Materials: Agricultural Economic Research*, vol. (9), pp. 126-144, 2022.
- [9] X. H. Li and S. Y. Zhang, "PPP: A New Type of Project Financing Method," *China Soft Science*, vol. (2), pp. 51-54, 2002, doi: 10.3969/j.issn.1002-9753.2002.02.013.
- [10] S. L. Zhu and J. Zhao, "A preliminary study on the legal path of resolving local government debts through the combination of asset securitization and PPP," *Securities Law Review*, vol. (1), pp. 208-222, 2015.
- [11] J. X. Deng, "A Study on the Application of Real Estate Investment Trusts (REITs) in Improving the Operating Performance of China Merchants Shekou Industrial Parks," *Guiyang, China: Guizhou University*, 2023.
- [12] E. Yehoue, M. Hammami, and J.-F. Ruhashyankiko, "Determinants of Public-Private Partnerships in Infrastructure," *IMF Working Papers*, pp. (06), 2006, doi: 10.5089/9781451863598.001.
- [13] Hodge, G.A, Greve, and C, "Public – Private Partnerships: An International Performance Review," *Public Administration Review*, vol. (67), pp. 545-558, 2007, doi: 10.1111/j.1540-6210.2007.00736.x.
- [14] M. Ahadzi and G. Bowles, "Public-private partnerships and contract negotiations: An empirical study," *Construction Management and Economics*, vol. 22, no. 9, pp. 967-978, 2004.
- [15] Z. Y. Gao, "A Study on Introducing the PPP Model into the Construction of New Rural Infrastructure in Gansu Province," *Lanzhou, China: Northwest Normal University*, 2016, doi: 10.7666/d.D01083780.
- [16] Z. F. Lou, "Opportunities and countermeasures for integrating PPP into rural revitalization," *China Tendering*, vol. (17), pp. 42-43, 2019, doi: 10.3969/j.issn.1671-2854.2018.12.012.
- [17] X. Luo, "Practical application of the PPP model at home and abroad and suggestions," *China Market*, vol. (11), pp. 41-43, 2017, doi: 10.13939/j.cnki.zgsc.2017.11.041.
- [18] X. C. He, B. Zhang, and H. T. Hou, "The impact of local governments' own financial resources on the return mechanism of agriculture and rural PPP projects," *Rural Finance Research*, vol. (8), pp. 60-64, 2018.
- [19] G. Joseph and N. Edward, "Systematic Risk and Diversification in the Equity REIT Market," *Real Estate Economics*, vol. 4, no. 24, pp. 493-515, 1996, doi: 10.1111/1540-6229.00701.

- [20] K. L. Chang, N. K. Chen, and C. K. Y. Leung, "Monetary Policy, Term Structure and Asset Return: Comparing REIT, Housing and Stock," *Journal of Real Estate Finance & Economics*, vol. 43, no. 1-2, pp. 221-257, 2011, doi: 10.1007/s11146-010-9241-8.
- [21] Y. T. Guo and W. J. Long, "Accelerating the promotion of agricultural PPP investment," *Rural Work Newsletter*, vol. (22), pp. 23-25, 2015, doi: 10.3969/j.issn.0546-9503.2015.22.019.
- [22] W. J. Long and Y. Zhang, "Connecting agricultural PPP investment to support the development of the entire industrial chain," *China Rural Finance*, vol. (14), pp. 2, 2017, doi: 10.3969/j.issn.1674-9162.2017.14.014.
- [23] Y. L. Zhang, "A Study on China's Agricultural PPP Model," Dalian, China: Dongbei University of Finance and Economics; 2022.