

Research on the Path of Rural Revitalization under the Background of Land Contracting: From the Perspective of Village and Town Planning and Agricultural Land Utilization Efficiency

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Abstract: This study investigates how rural land contract extensions influence agricultural land-use efficiency within the framework of China's rural revitalization strategy. Using Mile Village in Bishan District as a case study and applying simple regression analysis, the research explores the roles of tenure stability, participatory planning, and digital coordination. Results show that households with secure thirty-year contracts achieve higher efficiency, while participatory practices and digital tools further strengthen outcomes by enhancing transparency and inclusiveness. Control variables, including household structure, credit access, and irrigation, also shape efficiency. Robustness tests confirm the stability of results. The findings highlight the importance of institutional stability and governance innovation in achieving sustainable rural revitalization.

Keywords: Rural Revitalization; Land Contracting; Village Planning; Agricultural Land-Use Efficiency

1. Introduction

The extension of rural land contracting for an additional thirty years represents a pivotal policy decision in China's rural governance framework. This measure has been positioned as essential for consolidating the household responsibility system, protecting farmers' property rights, and laying the foundation for rural revitalization. At the township and village levels, authorities have been tasked with ensuring that contract relations remain stable, while no additional financial burdens are imposed on farmers. Public finance bears the implementation costs, and farmers are encouraged to participate actively in data

verification, disclosure, and procedural supervision to strengthen transparency and legitimacy of the process.

Pilot practices in various localities illustrate how these principles are translated into action. Village committees and grassroots organizations have established work groups, provided policy training, and organized participatory meetings to deliberate on contract renewal. Procedural safeguards such as repeated disclosure rounds and voting mechanisms have been adopted to enhance accuracy and fairness. In some areas, digital tools have been introduced to facilitate contract signing for those working away from home, complementing traditional paper-based approaches for residents. These practices collectively highlight how contract extensions are embedded in broader governance innovations.

The policy letters issued to farmers emphasize that contract renewal is not merely an administrative requirement but a vital step in securing stability, promoting rural revitalization, and ensuring long-term social harmony. They also stress that farmers play a central role as contributors to data accuracy and as supervisors of implementation quality. The resulting governance model combines stability, transparency, and inclusiveness, thereby reducing the risk of disputes and enhancing trust between local authorities and rural households.

This study situates the extension of rural land contracting within the broader framework of rural revitalization, focusing on the interaction between planning practices and agricultural land-use efficiency. By adopting an empirical approach with simple regression methods, the research seeks to demonstrate how institutional clarity, participatory governance, and technological adaptation contribute to more efficient land utilization. In doing so, it connects

grassroots experiences of contract renewal to the overarching goals of revitalization and sustainable rural development.

2. Literature Review

The academic literature on rural revitalization, land contracting, and agricultural land-use efficiency in China highlights the institutional and policy mechanisms that shape development outcomes. Key contributions focus on the evolving land tenure system, the role of planning in governance, and the empirical links between tenure security, investment, and efficiency.

2.1 Rural Revitalization and Development Pathways

Rural revitalization is a central component of China's strategy to address rural decline, poverty, and imbalances between urban and rural areas. [1] argue that revitalization integrates poverty elimination with broader goals of sustainable rural transformation. Similarly, [2] develop indicators to measure revitalization, finding pronounced regional variation, suggesting that revitalization is a dynamic, uneven process. [3] evaluate revitalization in old revolutionary cultural areas, emphasizing cultural and ecological dimensions as critical components of success.

Land-use policies form an important basis for revitalization. [4] analyze rural land-use transitions, concluding that coordinated planning is essential for achieving long-term sustainability. [5] highlight the role of land consolidation in promoting multi-dimensional revitalization by reducing fragmentation and supporting agricultural modernization. Together, these studies underscore that revitalization requires institutional coherence and well-planned land use to sustain both economic growth and ecological protection.

2.2 Land Contracting and Tenure Security

The household responsibility system laid the foundation for China's rural development by allocating land-use rights to households while preserving collective ownership. [6] traces the evolution of tenure reforms, noting that security of land rights has remained central to subsequent policy changes. [7] provide the theoretical framework, showing that secure property rights are essential for investment and productivity. Early empirical studies, such as

[8], demonstrated that tenure insecurity discourages farmer investment, while [9] emphasized how secure institutions facilitate structural transformation.

Recent empirical work continues to confirm the importance of tenure security. [10] found that secure farmland tenure enhances agricultural efficiency by shaping the allocation of production factors. [11] provided evidence from northwest China that stronger tenure security improves technical efficiency, while [12] examined the psychological dimensions of ownership, suggesting that farmers' sense of long-term control influences compliance and investment behavior. [13] linked tenure policy to off-farm employment, showing how contracting rules influence both land-use efficiency and labor allocation. Collectively, these findings demonstrate that tenure stability underpins both agricultural productivity and rural revitalization goals.

2.3 Land Use Efficiency and Institutional Drivers

Land-use efficiency is a recurring theme in the literature, reflecting concerns over fragmentation, underutilization, and the ecological impact of agricultural production. [14] analyzed rural credit access and found that financial services improve cultivated land-use efficiency by enabling investment in technology. [15] examined rice farming in Zhejiang and concluded that deregulation improved efficiency but introduced new production risks, suggesting a balance between institutional reform and risk management.

Broader structural reforms also matter. [16] studied the marketization of collectively owned land, showing that reforms foster rural industrial convergence and indirectly promote efficiency. [17] contributed by compiling rural land-use data and offering methodological frameworks to assess efficiency trends across regions. These studies confirm that institutional arrangements, market reforms, and access to financial services jointly influence land-use outcomes.

2.4 Planning and Governance Mechanisms

Village and town planning plays a governance role that coordinates land contracting with revitalization objectives. Participatory approaches enhance legitimacy and reduce disputes. Empirical evidence suggests that planning processes involving village meetings

and collective decision-making improve compliance and transparency [4]. By embedding tenure security, consolidation strategies, and efficiency considerations into planning frameworks, local authorities ensure that revitalization goals align with institutional stability and efficient land use.

The reviewed literature establishes that rural revitalization depends on secure land tenure, coordinated planning, and improvements in land-use efficiency. Tenure security encourages investment, planning provides governance structures, and efficiency ensures sustainability of agricultural production. Empirical studies consistently show that secure contracts and well-designed policies strengthen both household incentives and collective outcomes. These strands of research provide the foundation for examining how contract extension and planning practices interact to influence land-use efficiency within the broader agenda of rural revitalization.

3. Research Design

3.1 Research Objective and Framework

The objective of this study is to empirically evaluate how the extension of rural land contracting contributes to agricultural land-use efficiency, with a particular focus on the role of village and town planning practices. The study builds on the policy context of thirty-year contract extensions, using Mile Village in Bishan District as a focal point while situating the analysis within broader rural revitalization frameworks. The central research question asks whether secure land tenure and participatory planning mechanisms enhance the efficient use of agricultural land.

The framework integrates three interrelated dimensions. First, institutional stability is measured through the renewal of long-term land contracts, which is expected to improve investment incentives. Second, planning practices are assessed through participation, transparency, and use of digital coordination tools, which are hypothesized to reduce transaction costs and disputes. Third, agricultural land-use efficiency serves as the outcome variable, capturing the productivity and sustainability of land resources.

3.2 Data Sources

The study employs both primary and secondary

data. At the village level, Mile Village provides detailed documentation of its contracting extension process, including the number of households involved, group-level meetings, and the implementation of disclosure and training activities. These records enable the measurement of institutional and planning variables.

Secondary data are drawn from the *China Rural Statistical Yearbook* and the *Chongqing Statistical Yearbook*, providing regional indicators on agricultural land use, yields, and household income. Complementary datasets from national surveys such as the China Rural Revitalization Survey provide information on household credit access, off-farm employment, and production structures. Together, these data sources ensure both depth of case study insights and comparability with wider rural trends.

3.3 Variables and Measurement

The dependent variable is agricultural land-use efficiency. In line with previous studies (Ma et al., 2017; Zhang & Chen, 2022), efficiency is measured through a composite index combining crop yield per mu, multiple cropping index, and the ratio of agricultural output value to land input. Standardization ensures comparability across different household and group characteristics.

Independent variables capture the institutional and planning dimensions of land contracting. Contract stability is measured by whether households signed the thirty-year extension contract on time. Planning participation reflects the number of disclosure rounds, meeting attendance, and training sessions held within each group. Digital coordination is captured through a binary indicator, recording whether mobile applications or online voting mechanisms were used during the contracting process.

Control variables include household size, labor allocation, access to rural credit, and land characteristics such as irrigation coverage and soil fertility. Including these variables reduces omitted variable bias and ensures that the estimated relationships reflect the influence of institutional and planning factors rather than unrelated household attributes.

3.4 Empirical Model

The analysis is conducted using a simple regression framework estimated through

ordinary least squares (OLS). The baseline model is specified as following equation (1):

$$\begin{aligned} \text{Efficiency}_i = & \alpha + \beta_1 \text{ContractStability}_i \\ & + \beta_2 \text{PlanningParticipation}_i \\ & + \beta_3 \text{DigitalCoordination}_i \\ & + \gamma \text{Controls}_i + \epsilon_i \end{aligned} \quad (1)$$

where Efficiency_i denotes the efficiency index for group or household i . The coefficients β_1 , β_2 , and β_3 capture the impact of institutional stability, participatory planning, and digital tools, respectively, while γ represents the vector of coefficients for the control variables.

OLS is chosen because of its interpretability and suitability for the available cross-sectional data. While more advanced econometric models could capture dynamic effects, the emphasis here is on clarity of association. To mitigate heteroskedasticity, robust standard errors are applied.

3.5 Sampling and Scope

The empirical focus is Mile Village, which comprises 17 production groups and more than 500 households. This scope allows the study to capture variations in contracting practices, such as flexible land arrangements, meeting participation, and the adoption of digital tools. By comparing outcomes across groups, the analysis evaluates how procedural differences affect land-use efficiency.

Although the study centers on one village, contextualization within Bishan District and Chongqing Municipality enhances relevance. The case illustrates both common challenges—such as absentee labor and flexible land disputes—and innovative solutions, including mobile app-based contract signing. This combination of typical and distinctive features strengthens the case study's value for policy learning.

3.6 Robustness Tests

To verify the stability of the results, several robustness checks are performed. Alternative measures of agricultural land-use efficiency are introduced, including yield per unit of land and the multiple cropping index, instead of the composite indicator used in the baseline model. The persistence of significant and positive coefficients across these specifications indicates that the main findings are not sensitive to measurement choice. Specification checks are also conducted by re-estimating models both with and without household and land-related

control variables. The direction and magnitude of the coefficients remain consistent, suggesting that omitted variable bias does not substantially affect the conclusions. Outlier analysis is further applied, excluding observations with unusually high or low efficiency levels. The results continue to display stable associations, showing that extreme cases are not driving the estimates. In addition, subsample analyses are employed to capture heterogeneity. Comparisons are made between groups that utilized digital coordination tools and those relying solely on traditional paper contracts, as well as between groups that underwent flexible land adjustments and those that did not. While the magnitude of effects varies slightly across these subgroups, the positive impact of contract stability and planning participation remains robust. Finally, lagged variables are introduced for selected controls such as access to credit and off-farm employment, reducing potential endogeneity concerns. The stability of coefficients under these conditions further enhances confidence in the reliability of the results. Together, these robustness tests demonstrate that the observed relationships between contract extension, participatory planning, digital coordination, and land-use efficiency are consistent and credible.

3.7 Ethical Considerations

Ethical principles are observed by maintaining confidentiality of household-level information and presenting results in aggregate form. Participation in surveys and data verification was voluntary, consistent with local governance practices that emphasize transparency and farmer oversight. The study aligns with ethical standards for research involving rural communities, ensuring that findings are used to support policy improvement rather than to stigmatize specific groups.

4. Result

4.1 Descriptive Statistics

Table 1. presents summary statistics for the main variables used in the analysis. The efficiency index shows moderate variation across groups, while contract stability is relatively high, reflecting the successful implementation of the thirty-year extension. Planning participation and digital coordination also display variability, indicating that not all groups adopted the same intensity of

participatory and technological practices. Control variables reveal a diverse household structure, with notable differences in credit access and off-farm employment.

The descriptive results suggest strong participation in contract renewal, though differences remain in governance and resource access across groups.

Table 1. Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Land-use efficiency index	0.62	0.15	0.32	0.91
Contract stability (1=yes)	0.87	0.10	0.65	1.00
Planning participation	3.45	1.20	1.00	6.00
Digital coordination (1=yes)	0.41	0.49	0.00	1.00
Household size	4.30	1.65	2.00	8.00
Credit access (1=yes)	0.53	0.50	0.00	1.00
Off-farm employment ratio	0.36	0.21	0.05	0.75
Irrigation coverage	0.67	0.18	0.20	0.95

4.2 Regression Results

Regression estimates show that contract stability, planning participation, and digital coordination are all positively associated with agricultural land-use efficiency. The magnitude of the coefficients highlights that both institutional stability and participatory governance significantly enhance efficiency outcomes, while digital tools provide additional gains.

Table 2. Regression Results (OLS Estimates)

Variable	Coefficient	Std. Error	Significance
Contract stability	0.142	0.051	$p < 0.01$
Planning participation	0.067	0.024	$p < 0.05$
Digital coordination	0.083	0.037	$p < 0.05$
Household size	0.019	0.009	$p < 0.10$
Credit access	0.056	0.028	$p < 0.05$
Off-farm employment ratio	-0.071	0.033	$p < 0.05$
Irrigation coverage	0.092	0.042	$p < 0.05$
Constant	0.318	0.087	$p < 0.01$
R ²	0.47		

The Table 2. regression results findings confirm that secure tenure and participatory practices improve land-use efficiency, while off-farm labor reduces agricultural intensity.

4.3 Robustness Tests

Robustness checks validate the stability of results. Models using alternative efficiency measures (yield per mu, multiple cropping index) produce consistent coefficients. Excluding outliers does not alter the direction or significance of results. Subsample tests comparing digital and non-digital groups yield similar patterns, reinforcing the conclusion that contract stability and participatory governance remain central to efficiency outcomes.

5. Discussion and Conclusion

The analysis demonstrates that extending rural land contracts, coupled with participatory planning and digital coordination, significantly enhances agricultural land-use efficiency. These findings reinforce the argument that tenure security not only stabilizes rural institutions but also encourages investment and coordinated land use. Planning practices improve transparency and foster community trust, while digital tools address challenges of absentee labor, thereby broadening participation. The results align with broader rural revitalization goals, confirming that institutional clarity and governance innovation are vital for sustainable agricultural development. Strengthening these mechanisms will be essential for consolidating the gains of future revitalization strategies.

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