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Does Government Embedment Enhance Villagers' Willingness to Mutually Supervise Rural Residential Land Utilization?

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Abstract

The purpose of this study is to clarify the impact of government embedment on villagers' willingness to engage in mutual supervision of rural residential land utilization. It also examines the role of local elders' involvement in this process, with the goal of improving the regulatory framework for rural residential land utilization. The data used in this study are sourced from a field survey of 450 rural households in Sichuan Province, China. Data analysis was conducted using Logit, Probit, and moderation effect models, among others. The results show the following: (1) Organizational Embedment significantly enhances villagers' willingness to participate in mutual supervision, with government-established regulatory bodies and dedicated management personnel effectively incentivizing oversight participation. (2) Due to social risks in actual supervision, Ideological Embedment fails to effectively stimulate supervisory behavior. (3) The effects of Government Embedment vary significantly across villages in different geographic locations. (4) The involvement of local elders enhances the effectiveness of Government Organizational Embedment, with their role in rural residential land governance leaning more toward practical implementation than conceptual dissemination. The findings of this study are as follows: Against the backdrop of government administrative embedment in rural residential land governance, the involvement of local elders has played a significant role in enhancing effectiveness. Efforts should continue to focus on strengthening organizational oversight of rural residential land utilization, reinforcing communication between the government and villagers, and deepening collaboration with local elders to encourage active villager participation in the supervision and management of rural residential land use.

Keywords: rural residential land; government embedment; willingness to engage in mutual supervision; involvement of local elders

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1. Introduction

Rural residential land possesses typical characteristics of "collective ownership, member acquisition, one household per plot, free use, and closed operation", which are crucial for ensuring that farmers have housing and for maintaining rural social stability [1,2]. However, with the development of the economy and society, the property function has become the dominant one of rural residential land, driven by the intrinsic demand of farmers [3]. Calls for "unlocking" restrictions on the disposal of residential land and usage rights to enable rural areas to generate income through the transfer of such rights have

become increasingly vocal [4,5], highlighting the property attributes of rural residential land and their structures. This has led to issues such as excessive occupation, unaffordable free provision, poor illegal management, and difficulties in controlling quantities [6]. In 2020, the Ministry of Agriculture and Rural Affairs issued the "Notice on Standardizing the Approval and Management of Rural Residential Land", stressing the need for strict management throughout the land use and construction process. While local departments conduct dynamic inspections of rural land use and construction in accordance with the law, they also guide village-level organizations to improve democratic management procedures for rural residential land, fully affirming the importance of collaborative supervision by governments and village collectives. The "administrative embedding + rural self-governance" model of government/village collaborative governance represents an efficient approach, pioneering a new paradigm in grassroots social governance [7]. Embedded governance activates grassroots organizations by centralizing supervision authority and decentralizing the decision-making authority, improving the order of supervision and resource utilization in villages, and encouraging villagers to comply with rural residential land utilization regulations [8]. Therefore, based on the increasing administrative intervention of the government in rural governance, researching the relationship between Government Embedment and rural residential land supervision effectiveness is of practical importance for improving supervision and deepening the reform of the rural residential land system.

Rural residential land constitutes a common pool resource where villagers collectively utilize the rural residential land resource system while separately enjoying resource units [9]. Ostrom proposed collective governance to resolve the governance challenges of common pool resources. Villagers' self-organized supervision of others' rural residential land use can effectively enhance their own welfare. However, due to the characteristics of rural society, such as information asymmetry, shared values, and interactive transparency [10], supervising other villagers' rural residential land use inevitably offends some people and causes unnecessary disputes. Therefore, Government Embedment in rural residential land governance has become urgently required for strengthening control and making necessary adjustments.

The term "embedment" originates from Polanyi, referring to the embedding of economic behavior within social relations [11], and more broadly to the incorporation of one force, system, or structure into another. Granovetter further deepened the theoretical interpretation of embedment, dividing it into "structural embedment" and "relational embedment" at the macro level [12]. In the early development of governance theory, Western governance discourse emphasized a "retreat of the state", with the notion of "governance without government" representing a typical claim aimed at excluding state logic [13]. However, as governance theory evolved, the limitations of eliminating state involvement gradually became evident. Scholars observed that relations between the government and the private sector could not achieve self-regulation, and that intervention from a strong and competent government was in fact essential [14]. Government embedment refers to the state's use of its political and organizational advantages to integrate social resources and embed state authority into the structures, relations, and norms of society through mechanisms such as penetration, publicity, mobilization, and coordination [15].

In reality, self-supervision is not as effective as expected. With the deepening of the rural revitalization strategy, a large amount of governmental administrative power has been introduced into rural governance, changing the traditional rural residential land supervision model. The mainstream view holds that government intervention through institutional norms and resource allocation can enhance villagers' autonomy and maintain proper order in rural residential land use [16]. However, some studies argue that excessive administrative intervention leads to a pronounced "proactive overreach" of governmental

authority [17], resulting in "administrative dissolution of autonomy" that further hinders villagers' self-organized rural residential land governance. In response, the 2018 Central Document No. 1, "Opinions of the Central Committee of the Communist Party of China and the State Council on Implementing the Rural Revitalization Strategy", pointed out the following: "For rural revitalization, effective governance is fundamental. The role of new rural elders should be actively utilized". Rural elders are leaders of rural ethical life and public spirit, playing a key role in promoting the economic, social, and cultural revitalization of rural areas. On the one hand, rural elders leverage their various advantages to play a democratic governance role, promote policy advocacy, reconstruct order, and provide democratic supervision in rural community governance, helping to create multiple village governance participation mechanisms and practice models, thus contributing to the socialization of rural governance [18]. On the other hand, rural elders' reliance on experience-based decision-making hinders the development of "rule of law in village governance" [19]. Against the backdrop of government and rural elders' multi-party involvement in rural residential land governance, villagers' rural residential land utilization behaviors are constrained not only by the formal institutional system of government land management but also by the informal system of homestead management within the village and the dual constraints of rural elders.

Existing research provides important support for further exploring the relationship between government embedment and villagers' willingness to mutually supervise rural residential land utilization, yet several gaps remain. First, in terms of research methodology, most studies on Government Embedment and the supervision of rural residential land use remain at the theoretical level, lacking empirical verification of the relationship between the two. Second, in research design, prior studies have highlighted the significant role of local elders in rural governance, but the analysis of the synergistic governance effects between Government Embedment and elders' involvement remains insufficient. Third, in terms of research content, existing studies have not fully recognized the influence of locational heterogeneity of rural residential land on its functional value.

In response to these gaps, this study introduces the following improvements. First, from an empirical perspective, it examines the impact of Government Embedment on villagers' willingness to mutually supervise rural residential land utilization, thereby enriching the application of embedment theory. Second, from the perspective of collaborative governance between Government Embedment and elders' involvement, it tests the synergistic effects between the two. Third, based on regional heterogeneity among households, it investigates the functional value differences of rural residential land and systematically analyzes their influence on villagers' supervision willingness.

2. Theoretical Analysis and Research Hypotheses

2.1. Impact of Government Embedment on Villagers' Willingness to Supervise Each Other in Rural Residential Land Use

Effective supervision of public pool resources such as rural residential land depends on functioning supervision and sanction mechanisms [20]. Organizational embedment refers to government involvement in rural governance through entities including rural residential land regulatory bodies and personnel. With the further advancement of the rural revitalization strategy, the role of Organizational Embedment in the supervision and management of rural residential land has become increasingly significant. Existing research has shown that the government has embedded itself in rural governance through political absorption, cultivation, guidance, and communication coordination [21]. It uses organizational collaboration to stimulate governance enthusiasm, mechanism coordination to foster governance consensus, and mutual promotion to construct a governance community [22].

These efforts aim to achieve an effective connection between Government Embedment and village rural residential land governance. Furthermore, a clearly defined hierarchical management system can improve management efficiency, enhance farmers' trust in government systems, and encourage farmers to engage in mutual supervision [23]. Specifically, the government can regulate illegal rural residential land use behaviors effectively by setting up supervisory bodies and appointing dedicated management personnel to implement grid-based management of rural residential land.

Conceptual Embedment refers to the government's intervention in rural governance through legal education and public awareness campaigns, which are important ways for the government to promote villagers' understanding and compliance with the law. Publicity personnel engaging in appropriate policy and system promotion can deepen farmers' understanding of rural residential land policies and systems, enhancing their awareness of the value of rural residential land [24] and effectively addressing the issue of "information asymmetry" [25]. As farmers' understanding of rural residential land policies increases, they are more likely to comprehend the importance of rural residential land supervision and management [26], which not only reduces their own violations but also encourages them to report others' illegal activities. Based on the above analysis, this study proposes Hypothesis H1 and Hypothesis H2:

Hypothesis H1: *Organizational Embedment enhances villagers' willingness to mutually supervise rural residential land use.*

Hypothesis H2: *Conceptual Embedment enhances villagers' mutual supervision willingness regarding rural residential land.*

2.2. Moderating Role of Local Elders' Intervention

Local elders are multifaceted elites recognized by villagers for their deep ties to hometown sentiments and dedication to village public welfare [27]. Whether they stay in the village or leave it, they are embedded in the social structure of rural communities, and their connection to their roots cannot be erased by geographical distance or time [28]. In response to the call to harness the positive forces of rural society to support rural revitalization, the role of rural elders in village governance has gradually emerged. They have reconstructed the dual-track governance structure and mechanism in the process of governance modernization, activating the endogenous vitality of rural society [29]. Specifically, on the one hand, rural elders returning to govern a village can optimize the structure of governance entities, promote the diversification of governance subjects and strategies, and cultivate modern values among villagers, encouraging them to increase public rationality and adhere to behavioral norms [30]. On the other hand, by integrating into the rural governance system, rural elders can compensate for the lack of endogenous momentum in rural areas and address the challenges of "moral governance" becoming hollow, the "rule of law" becoming rigid, and the weakening of "self-governance". With their contributions to the functions of self-governance, rule of law, and moral governance, rural elders can help shape a governance system combining all three aspects [31]. Therefore, the intervention of rural elders in village governance is an important improvement to the governance framework and has a positive guiding effect on villagers' rural residential land use behaviors. Based on the above analysis, this study proposes Hypothesis H3 and Hypothesis H4:

Hypothesis H3: *The involvement of local elders will enhance the influence of Organizational Embedment on villagers' willingness to mutually supervise each other regarding rural residential land.*

Hypothesis H4: *The involvement of local elders will enhance the effect of Conceptual Embedment on the willingness of villagers to engage in mutual supervision regarding rural residential land.*

3. Materials and Methods

3.1. Data Sources

The data used in this study come from a field survey conducted by the authors and their research team in July–August 2023 in Sichuan Province. The team selected Lu County, Pidu District, and Chongzhou City as the research areas in accordance with the Rural Residential Land Reform Pilot, the Operational Construction Land in the Market Pilot, and the Control Sample. Luxian County and Pidu District were selected as pilot areas for China's first-round rural residential land system reform and for the market entry of operational construction land launched in 2015, respectively, representing the frontier of China's rural residential land system reform. At the same time, Chongzhou City was chosen as a comparison area to ensure the representativeness of the sample, as shown in Figure 1. In the three sample counties (covering cities and districts), three townships (towns) were randomly selected according to their distance from the center of the county, from near to far, and from these selected townships (towns), two sample villages were randomly selected (because the number of surveyed households for Lu County was insufficient, three sample villages were selected in the town of Fangdong). The research covered 3 counties (cities and districts), 9 townships (towns), and 19 villages (communities), and data were collected from 473 households, of which 450 were valid samples, with a questionnaire validity rate of 95.14%.

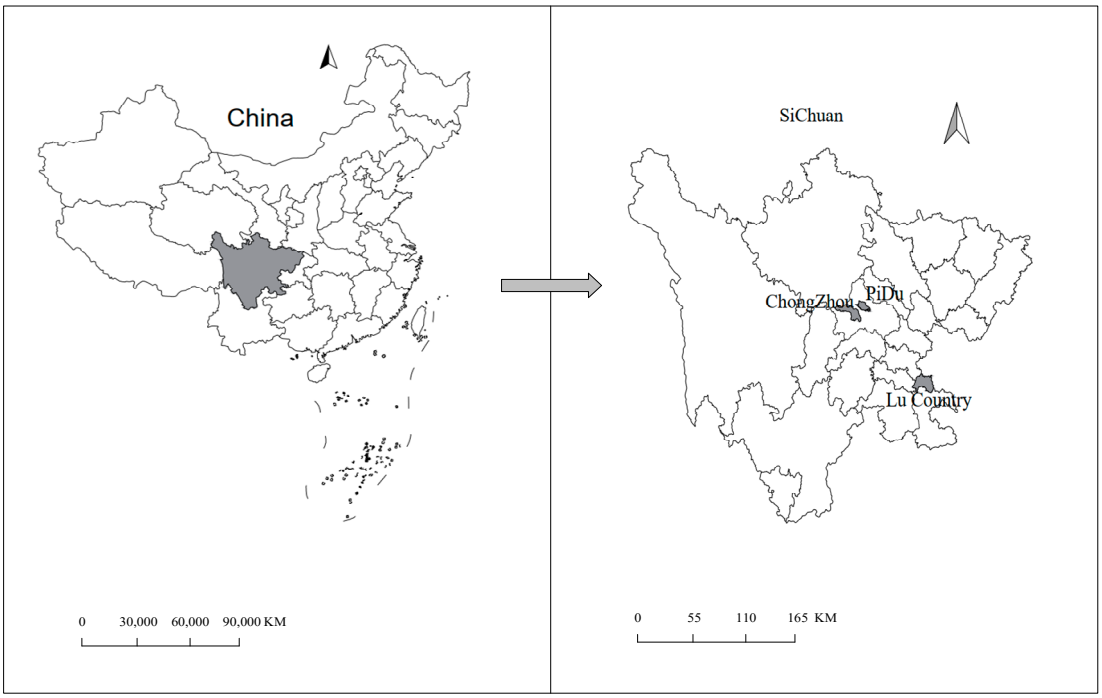


Figure 1. Investigation area.

3.2. Model Specification

The dependent variable in this study is villagers' willingness to mutually supervise rural residential land utilization, which is a binary discrete variable. Currently, the academic community commonly uses the Logit or Probit models for analysis. Although the results from the two models do not show significant differences, the Probit model requires the data to be normally distributed. Therefore, to avoid issues such as heteroscedasticity in linear

models, this study employs the Logit model for regression analysis and uses the Probit model for robustness testing. The specific model specifications are as follows:

$$Willingness = \alpha Org + \beta Con + \delta + \varepsilon \quad (1)$$

$$Willingness = \alpha Min + \beta Con + \delta + \varepsilon \quad (2)$$

To estimate the moderating effect of village elders' involvement on the influence of Government Embedment on villagers' willingness to engage in mutual supervision, a regression model incorporating the interaction term between village elders' involvement and Government Embedment is constructed based on Equations (1) and (2). The specific model is as follows:

$$Willingness = \alpha Org + \lambda Sag + \phi Org \times Sag + \beta Con + \delta + \varepsilon \quad (3)$$

$$Willingness = \alpha Min + \lambda Sag + \varphi Min \times Sag + \beta Con + \delta + \varepsilon \quad (4)$$

In Equations (1) to (4), *Willingness* denotes villagers' willingness to mutually supervise, *Org* represents Organizational Embedment, *Min* indicates Conceptual Embedment, *Sag* signifies the variable reflecting intervention by respected elders, *Con* is the control variable, α, β, λ, ϕ are the coefficients to be estimated, δ represents the intercept term, and ε denotes the random disturbance term.

3.3. Variable Selection

This study selects villagers' willingness to engage in mutual supervision of rural residential land utilization as the dependent variable. The core explanatory variables are Organizational Embedment and Conceptual Embedment, which represent Government Embedment. The study analysis examines how Government Embedment influences villagers' willingness to engage in mutual supervision for rural residential land governance and verifies the moderating role of village elders' involvement in this process. To control for the potential effects of other factors in influencing villagers' willingness to mutually supervise rural residential land governance, variables such as gender, age, educational attainment, total income, and rural residential land size are included as control variables in the model.

(1) Dependent Variable: Villagers' willingness to mutually supervise rural residential land utilization. This willingness to engage in mutual supervision is captured by the following question in the questionnaire: "Are you willing to supervise the Rural Residential Land use behavior of other villagers?" A response of "Yes" indicates a willingness to supervise others, while "No" indicates unwillingness.

(2) Core Explanatory Variables: Government Embedment comprising Organizational Embedment and Conceptual Embedment. In this study, Government Embedment refers to the incorporation of governmental administrative power, resources, and structures into the governance of rural residential land. According to Xu et al., Government Embedment comprises five dimensions: Conceptual Embedment, Organizational Embedment, Rights Embedment, Cultural Embedment, and Resource Embedment [32]. Among these, Organizational Embedment primarily concerns the collaborative arrangements between township governments and village collectives in the supervision of homestead use, including coordination in organizational structures and personnel. Conceptual Embedment, on the other hand, relates mainly to government-led publicity and training on rural residential land, governance institutions, land use regulations, and management practices. Organizational Embedment is reflected in the question: "How do you think the government's Rural Residential Land use regulation work in your village in recent years?" The responses are categorized as "Very Poor",

"Poor", "Average", "Good", and "Very Good". Conceptual Embedment is reflected by the interview question, "How many Rural Residential Land use promotional training sessions were conducted by the government in the village last year?" The actual number of training sessions reflects the degree of Conceptual Embedment.

(3) Moderating Variable: Local elders' involvement. This study aims to investigate how the involvement of local elites influences rural residential land supervision under Government Embedment. Therefore, the degree of involvement of local elites is reflected by the interview question, "How many local elites in the village are involved in Rural Residential Land governance?" The number of local elites involved in governance directly reflects the degree of involvement.

(4) Control Variables. Drawing on research on mutual supervision in public pool resource governance [33], this study includes gender, age, education level, the number of rural residential land plots, whether the rural residential land is idle, whether land rights have been confirmed, labor mobility, anonymous reporting, and collective scale as control variables. The definition of each variable can be found in Table 1.

Table 1. Variable definitions and descriptive statistics.

Variable Name	Definition and Assignment	Mean	Standard Deviation	Minimum	Maximum
Willingness to Engage in Mutual Supervision	0 = Unwilling to supervise, 1 = Willing to supervise	0.724	0.447	0	1
Organizational Embedment	1 = Very Poor, 2 = Poor, 3 = Average, 4 = Good, 5 = Very Good	3.396	1.027	1	5
Concept Embedment	Number of training sessions conducted by the government in villages last year on Rural Residential Land utilization	5.707	7.328	0	30
Gender	0 = Female, 1 = Male	0.776	0.418	0	1
Age	Age of Head of Household/Years	57.687	11.060	26	90
Educational attainment	1 = Elementary school or below; 2 = Junior high school; 3 = High school or vocational school; 4 = College or above	1.802	0.830	1	4
Total Income	Total Household Income/Ten Thousand Yuan	10.844	0.953	7.6	15.38
Number of Rural Residential Land Plots	How many Rural Residential Land Plots does your household have? 0 = 1 Rural Residential Land; 1 = 2 or more Rural Residential Land	0.073	0.261	0	1
Is It Idle?	Is your Rural Residential Land idle? 0 = No; 1 = Yes	0.06	0.238	0	1
Whether rights are confirmed	Has your Rural Residential Land been legally confirmed? 0 = No; 1 = Yes	0.804	0.397	0	1
Labor Mobility	What is the labor mobility situation in the village? 0 = inflow; 1 = outflow?	0.884	0.320	0	1
Whistleblowing	Does the village have an anonymous reporting channel for illegal residential land use? 0 = No; 1 = Yes	0.642	0.480	0	1
Collective Scale	How many households are there in the village? 1 = 500 households or fewer; 2 = [500, 1000) households; 3 = [1000, 1500) households; 4 = 1500 households or more	1.904	1.008	1	4

4. Empirical Findings and Analysis

4.1. Impact of Government Embedment on Mutual Supervision Intentions in Rural Residential Land Governance

The software used for data analysis in this study is Stata 18. The empirical analysis results regarding the effect of Government Embedment on villagers' willingness to mutually supervise rural residential land utilization are shown in Table 2. Among these, the effect of Organizational Embedment on mutual supervision willingness is significant at the 1% confidence level, with a coefficient of 0.638. This indicates that Organizational Embedment by the government significantly enhances villagers' willingness to engage in mutual supervision in rural residential land governance. The more thorough the government's regulation of rural residential land use, the more likely villagers are to participate in supervising it. This shows that Organizational Embedment, as an important way for the government to regulate rural residential land use, not only effectively regulates land use behavior but also encourages villagers to actively participate in mutual supervision, thereby confirming Hypothesis H1.

Table 2. Impact of Government Embedment on willingness to engage in mutual supervision in rural residential land governance.

Variable Name	Willingness to Engage in Mutual Supervision in Rural Residential Land Governance			
	(1)	(2)	(3)	(4)
Organizational Embedment	0.638 *** (0.108)	0.631 *** (0.112)		
Concept Embedment			0.053 (0.079)	0.023 (0.084)
Gender		−0.341 (0.286)		−0.315 (0.275)
Age		0.002 (0.012)		0.004 (0.012)
Educational Attainment		0.395 ** (0.176)		0.409 ** (0.168)
Total Income		0.022 (0.120)		0.034 (0.116)
Number of Rural Residential Land Plots		−0.617 (0.411)		−0.594 (0.385)
Is It Idle?		0.045 (0.472)		−0.015 (0.456)
Whether Rights are Confirmed		−0.340 (0.301)		−0.294 (0.288)
Labor Mobility		0.093 (0.390)		0.289 * (0.371)
Whistleblowing		0.435 * (0.266)		0.425 (0.255)
Collective Scale		−0.031 (0.115)		−0.051 (0.112)
Log Likelihood	−246.102	−237.741	−264.688	−255.021
R^2	0.071	0.103	0.001	0.037
LR Chi-squared	37.63	54.35	0.46	19.79
Sample size	450	450	450	450

Note: ***, **, * donate significance levels at 1%, 5%, 10% respectively. The same as blow.

The results in columns (3) and (4) show that Concept Embedment can increase villagers' willingness to engage in mutual supervision, but this finding is not statistically significant.

The potential reason for this could be that although the various publicity and training sessions conducted by the government help villagers better understand rural residential land use policies and regulations, supervising others' rural residential land use carries risks, such as coming across as offensive and causing disputes. As a result, villagers are more likely to comply with the rural residential land management system but are unwilling to supervise others' land use behaviors, leading to a less effective impact of Concept Embedment.

Regarding the estimation results of the control variables, Column (2) shows that education level has a significant positive effect on villagers' willingness to engage in mutual supervision. This suggests that as villagers become more educated, their cognitive capacity and horizons broaden, increasing their enthusiasm for participating in village public affairs. The anonymous reporting mechanism also exhibits a significant positive impact, indicating that it helps villagers report violations in homestead use without jeopardizing social relationships, thereby encouraging participation in supervision. Column (4) further indicates that, in addition to education level, labor outflow has a significant positive effect on villagers' willingness to supervise. A possible explanation is that as more laborers leave the village, its public affairs are increasingly managed by middle-aged and older residents. Given their more frequent interactions and lower supervision costs, these residents tend to exhibit stronger willingness to participate in mutual supervision.

4.2. Robustness Tests

This study employs a Logit model to analyze the impact of Government Embedment on mutual supervision willingness in rural residential land governance. Robustness checks are performed by using the Probit model and adding or removing control variables. The results, shown in Table 3, indicate that the estimates from all models are generally consistent with the Logit model results, suggesting that the conclusions drawn are highly robust.

Table 3. Robustness tests.

Variable Name	Willingness to Engage in Mutual Supervision in Rural Residential Land Governance			
	(1)	(2)	(3)	(4)
Organizational Embedment	0.373 ***	0.369 ***		
	(0.063)	(0.065)		
Concept Embedment			0.013	0.005
			(0.008)	(0.011)
Constant	−0.635 ***	−1.103 *		−0.019
	(0.216)	(1.019)		(1.008)
Control Variables	Uncontrolled	Controlled	Uncontrolled	Controlled
Log Likelihood	−246.554	−237.741	−263.689	−254.931
R^2	0.069	0.103	0.005	0.038
LR Chi-squared	36.73	54.35	2.46	19.97
N	450	450	450	450

4.3. Endogeneity Test

Given that Organizational Embedment is measured based on villagers' perceptions of the quality of government supervision over rural residential land, potential endogeneity issues may arise due to mutual influence stemming from willingness to engage in mutual supervision in rural residential land governance or the omission of important variables. To address this, the endogeneity of the Organizational Embedment variable is tested. The null hypothesis of the Wald exogeneity test is $\rho = 0$. If the null hypothesis is rejected, it suggests the presence of endogenous explanatory variables and the need to use instrumental variable methods; otherwise, it suggests no endogeneity.

The endogeneity test results are presented in Table 4. Since the *p*-value of the exogeneity test is 0.472, we cannot reject the null hypothesis of $\rho = 0$, meaning that in this model,

Organizational Embedment is not an endogenous variable, and there is no need to apply instrumental variables. Additionally, using the two-stage least squares (2SLS) method, the DWH test shows that the *p*-values of the Durbin (score) test and the Wu–Hausman test are 0.499 and 0.503, respectively, both greater than 0.05. These results further confirm that there is no endogeneity problem between Government Embedment and willingness to engage in mutual supervision. Therefore, the above estimation results are robust, and Organizational Embedment can enhance villagers' willingness to engage in mutual supervision in rural residential land governance.

Table 4. Endogeneity tests.

Variable Name	Willingness to Engage in Mutual Supervision	
	IV-Probit	**2SLS**
Organizational Embedment	0.679 ***	0.109 ***
		(0.027)
Constant	0.884 *	
	(0.494)	
Wald Test *p*-value	0.472	
Durbin (Score) Test *p*-value		0.499
Wu–Hausman Test *p*-value		0.503
Control Variables	Controlled	Controlled
N	450	450

4.4. Heterogeneity Analysis

The impact of Government Embedment on villagers' willingness to engage in mutual supervision of rural residential land governance primarily comes through government administrative intervention, which actively encourages farmers to participate in mutual supervision and enhances the effectiveness of rural residential land regulation. To further analyze the heterogeneous effects of Government Embedment on mutual supervision willingness in rural residential land governance, this study draws on research by other scholars and uses village location characteristics as a proxy variable for Government Embedment (since village location is strongly correlated with Government Embedment). The survey sample villages are divided into urban villages, suburban villages, and remote rural villages.

As shown in Table 5, in urban villages, suburban villages, and remote suburban rural villages, Organizational Embedment significantly increases villagers' willingness to engage in mutual supervision of rural residential land use, with the impact coefficients increasing from urban villages to suburban villages and remote rural villages. A possible explanation for this is that as the distance between the village and the urban center increases, the level of Organizational Embedment gradually weakens, leading to insufficient regulation of rural residential land use by the government. Therefore, in more geographically distant villages, the influence of Organizational Embedment on villagers' willingness to supervise each other becomes more pronounced.

The impact of Conceptual Embedment on mutual supervision willingness is only significant in suburban villages, with a negative impact coefficient in urban villages and positive coefficients in suburban and remote rural villages. A possible explanation is that in urban villages, the property value of rural residential land is relatively high. Conceptual Embedment helps villagers better understand land management policies and regulations, which may stimulate their demand for the property value of rural residential land and lead to illegal land transactions, thus reducing villagers' willingness to supervise each other. In suburban villages, the production function and residential security function of rural residential land are still significant, and government propaganda and education help villagers better understand and comply with the law. In remote rural villages, the traditional kinship social structure

persists, and due to concerns about offending neighbors, Conceptual Embedment has little direct effect on villagers' willingness to supervise one another.

Table 5. Heterogeneity analysis.

Variable Name	Urban Villages		Suburban Villages		Remote Suburban Villages	
	(1)	(2)	(3)	(4)	(5)	(6)
Organizational Embedment	0.605 **		0.630 ***		0.903 ***	
	(0.248)		(0.157)		(0.278)	
Conceptual Embedment		−0.144		1.114 *		0.407
		(0.171)		(0.711)		(0.629)
Constant	−1.092	1.200	−3.191	−1.275	−0.583	2.004
	(4.452)	(4.413)	(2.797)	(2.611)	(3.251)	(2.977)
Control Variables	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
Log Likelihood	−59.066	−61.941	−111.788	−119.222	−56.448	−62.248
LR chi^2	17.77	12.03	32.26	17.39	20.89	8.52
N	118	118	222	222	110	110

4.5. Test of Moderating Effects

In addition to examining the direct impact of Government Embedment on villagers' willingness to engage in mutual supervision of rural residential land governance, this study focuses on the moderating role of local elites and the interaction between Organizational Embedment and Conceptual Embedment. In Columns (1) and (2) of Table 6, the interaction term between Organizational Embedment and the number of local elites is significant at the 5% and 10% confidence levels, respectively, indicating that the number of rural elites has a moderating effect, thereby supporting Hypothesis H3. At the same time, the coefficients for both Organizational Embedment and the number of local elites are not significant, suggesting that the involvement of local elites does not directly influence villagers' willingness to engage in mutual supervision, but rather enhances this willingness by substituting the constraints imposed by Organizational Embedment, thereby motivating villagers to supervise each other.

Columns (3) and (4) show that local elites enhance the impact of Conceptual Embedment on villagers' willingness to engage in mutual supervision, supporting Hypothesis H4. However, this result is not significant. This study argues that local elites are villagers with strong personal abilities, reputation, and influence, whom villagers trust and are willing to follow their decisions. However, since the subject of Conceptual Embedment is the government, the content of propaganda and training may lack credibility and persuasiveness among villagers, resulting in poor practical effects. Therefore, the intervention of local elites does not significantly promote the effect of Conceptual Embedment on villagers' mutual supervision willingness.

Finally, Columns (5) and (6) examine the interaction between Organizational Embedment and Conceptual Embedment. The results are not significant, indicating that there is no clear relationship between Organizational Embedment and Conceptual Embedment in practice.

Table 6. Test of moderating effects.

Variable Name	Willingness to Mutual Supervision					
	(1)	(2)	(3)	(4)	(5)	(6)
Organizational Embedment	0.203	0.280			0.619 ***	0.645 ***
	(0.212)	(0.218)			(0.137)	(0.142)
Conceptual Embedment			−0.085	−0.075	−0.021	0.001
			(0.039)	(0.043)	(0.043)	(0.047)
Number of Local Elders	−0.259	0.173	−0.047	0.023		
	(0.126)	(0.128)	(0.054)	(0.055)		

Table 6. *Cont.*

Variable Name	Willingness to Mutual Supervision					
	(1)	(2)	(3)	(4)	(5)	(6)
Organizational Embedment × Number of Local Elders	0.085 ** (0.039)	0.067 * (0.039)				
Concept Embedment × Number of Local Elders			0.010 (0.006)	0.010 (0.007)		
Organizational Embedment × Conceptual Embedment					0.002 (0.013)	−0.002 (0.014)
Constant	0.241 (0.699)	−0.855 (1.890)	1.374 *** (0.303)	0.334 (1.760)	−0.964 ** (0.454)	−0.172 (1.769)
Control Variables	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
Log Likelihood	−237.682	−229.744	−255.168	−245.968	−245.506	−237.681
LR Chi^2	40.91	56.79	5.94	24.34	38.52	54.47
N	450	450	450	450	450	450

5. Discussion

This study examines how Government Embedment influences villagers' willingness to mutually supervise the use of rural residential land and further evaluates the moderating role of local elders. The results show that Organizational Embedment significantly enhances villagers' supervisory behavior. From an institutional governance perspective, Organizational Embedment clarifies rules, strengthens enforcement, and reduces the institutional costs associated with supervision. Through collaboration between township governments and village collectives, the governance of rural residential land use gradually becomes a shared public concern, improving information transparency and increasing interaction among villagers. Government embedment thus contributes to the formation of normative social capital at the village level, facilitating mutual supervision an "expected behavior" in rural governance. For example, baseline surveys of rural residential land and targeted rectification campaigns establish clear behavioral norms and governance expectations, enabling villagers to more easily identify violations and participate in supervision. This aligns with He's findings that Organizational Embedment strengthens social linkages through resource coordination, fosters co-promoted behavior [34], and facilitates the coupling of state power and rural autonomy.

In contrast, Conceptual Embedment shows no significant effect. This may be attributed to the deeply rooted social relationships, kinship ties, and community pressure in rural acquaintance societies, where collective action typically exhibits "mobilization without organization" [35]. Conceptual guidance alone cannot overcome these entrenched interpersonal constraints, limiting its ability to motivate villagers' supervisory behavior.

The moderating effect of local elders is significant, indicating their key role as a "trust bridge" between government and villagers, consistent with existing research. Local elders possess high social credibility, which enhances the perceived legitimacy of government policies [25]. Their familiarity with village affairs improves communication efficiency and reduces information gaps and misunderstandings. Consequently, their involvement helps translate the institutional effects of Government Embedment into villagers' actual supervision behavior more effectively.

6. Conclusions and Policy Implications

The conclusions of this study are as follows: (1) Organizational Embedment significantly enhances villagers' willingness to participate in mutual supervision of rural residential land utilization. This indicates that through effective regulatory mechanisms and organizational measures, the government can effectively motivate villagers to participate in land use supervision. (2) While Concept Embedment theoretically helps to improve villagers' willingness to supervise, its practical effect is not significant. This could be due to social risks involved in actual supervision, which prevents the full impact of Concept Embedment from being realized. (3) The impact of Organizational Embedment on villagers' willingness to supervise varies across different geographic locations. In urban villages, suburban villages, and rural villages, the effect of Organizational Embedment on supervision willingness increases gradually, indicating that geographic location moderates the effect of Government Embedment. (4) The intervention of local elites enhances the effect of Organizational Embedment but has a smaller impact on Concept Embedment. This suggests that local elites play a more practical role in village governance, rather than influencing ideological dissemination.

Based on the research conclusions and their policy implications, this study proposes the following policy recommendations: First, strengthen Organizational Embedment and improve the supervision mechanism for rural residential land. This can be achieved by establishing clear regulatory systems at the village level, regularly conducting land surveys, rectifying violations, and implementing classified management to form standardized and operational supervision procedures. In addition, it is crucial to clarify supervisory responsibilities and define villagers' rights and obligations, making supervision institutionalized and standardized while reducing the social or relational risks villagers face when participating. Second, enhance policy publicity and institutional transparency to build villagers' trust. This can be achieved by strengthening the interpretation and promotion of government policies through meetings, announcements, WeChat groups, and other channels to inform villagers of land management rules and their rights and obligations. Ensuring that villagers understand supervision procedures and reporting channels can enhance their trust in the system and willingness to participate. Third, leverage the role of local elders to build a practice-oriented governance bridge. This can be achieved by encouraging local elders to act as communicators and supervisors in policy implementation, leveraging their social prestige and familiarity with village affairs to increase policy acceptance and enforcement effectiveness. Fourth, consider the resource endowment characteristics of rural residential land and implement differentiated governance. It is important to design stratified policies for villages in different geographic locations: in remote villages, this can be achieved by relying on Government Embedment and local elders to guide supervision mechanisms, while in urban villages or suburban areas, community self-organization and villagers' autonomy can be combined to strengthen supervision effectiveness.

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