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Practical Challenges and Solutions for the Withdrawal of Homestead Land in Traditional Agricultural Areas

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Abstract The withdrawal of rural households from their homestead sites is an inevitable step in rural revitalization and a product of urbanization reaching a certain stage of development. This study analyzes the practical challenges faced in the withdrawal of homestead sites in traditional agricultural areas. Based on questionnaire data from a traditional agricultural area, statistical analysis and binary logistic regression models are employed to investigate rural households' willingness to withdraw from their homestead sites and the factors influencing this decision. The study also explores potential pathways to alleviate the challenges associated with homestead site withdrawal in traditional agricultural areas. The results show that the surveyed farmers have a low level of understanding regarding homestead withdrawal, and their overall willingness to withdraw is weak, with less than 30% expressing such intent. The primary factors influencing the willingness to relinquish homestead land include the educational level of farmers, their understanding of whether homestead land can be bought and sold and its ownership status, the type of insurance they participate in, whether they already own housing in urban areas, as well as the geographical conditions of the village, annual household income, and the utilization status of homestead land. The first five factors have a positive influence on the willingness to relinquish homestead land, while the latter three have a negative influence. Strengthening publicity and promotion, establishing exit incentive mechanisms, improving relevant laws and regulations, and developing diverse compensation funding sources are the key pathways to enhance farmers' willingness to exit homestead land.

Index Terms statistical analysis, binary logistic model, homestead land, exit willingness

I. Introduction

Since the 1980s, with the rapid advancement of urbanization in China, driven by the urgent need for family development, a large number of young and middle-aged farmers have embarked on a "rural-to-urban migration" movement. The non-agriculturalization and urbanization of a significant rural population have led to the loss of rural labor force, slower economic development, and the emergence of the "hollowed-out village" phenomenon, characterized by idle or abandoned homestead land [1]. Compared to eastern rural areas with obvious locational advantages and greater economic development potential, as well as suburban rural areas in central and western regions, traditional rural areas face more severe issues of idle homestead land [2], [3]. In particular, some economically disadvantaged traditional rural villages have struggled to seize development opportunities amid the urbanization wave, resulting in slow or even stagnant development [4], [5].

Faced with a large number of idle homesteads and idle farmhouses, the efficiency of rural land resource utilization urgently needs to be improved, and the asset value of farmers' homesteads urgently needs to be activated [6]. To this end, potential governance measures for idle homesteads can be considered from two perspectives: the market and farmers. First, by improving the systems related to the confirmation of homestead rights and their transfer, encouraging industrial and commercial capital to invest in rural areas, and promoting the gradual market-based allocation of idle homestead resources [7]-[9]. Second, promote the voluntary and compensated withdrawal of homestead land by farmers, i.e., the government-led promotion of the voluntary and compensated withdrawal of rural homestead land use rights and the ownership of residential buildings on the land [10]-[12]. From the perspective of actual implementation outcomes, in traditional agricultural areas where agricultural production is the primary economic activity and population outflow is severe, most villages lack corresponding locational advantages and have weak industrial development foundations, making it difficult to promote market-based allocation of homestead land. As a result, voluntary compensated withdrawal often becomes the primary method for managing idle homestead land in such regions [13]-[16]. Therefore, the withdrawal of homestead land must not only activate farmers' willingness to withdraw their homestead land in a conditional and phased manner but also enhance the efficiency of rural land use and support regional economic development through the withdrawal of homestead land [17]-[19].

Thus, exploring relevant pathways tailored to local conditions, guiding farmers to scientifically and orderly withdraw idle homestead land, promoting the optimal allocation of homestead land resources, and increasing regional development opportunities are important issues in the current governance of idle homestead land in traditional agricultural areas [20]-[23].

Numerous scholars have studied and explored feasible pathways for the withdrawal of homestead land in traditional agricultural areas, with the premise of safeguarding farmers' rights and improving land use efficiency. Literature [24] analyzed the supply-demand relationship of rural homestead land based on high-resolution remote sensing imagery data from traditional agricultural areas, thereby formulating homestead land withdrawal and transformation strategies aligned with residents' intentions, which is conducive to promoting rural sustainable development and the rural revitalization strategy. Literature [25] explores the evolution of rural homestead functions and their driving mechanisms, finding that factors such as transportation and socio-economic conditions have played different roles at different times, providing support for rural economic development and the rural revitalization strategy based on rural homesteads. Literature [26] revealed the impact of household livelihood vulnerability levels on the willingness to consolidate residential land, suggesting that improving household livelihood vulnerability can optimize the layout of residential land in rural areas, which is of great significance for promoting the intensive use of residential land and rural revitalization. Literature [27] emphasizes that farmer differentiation is a key factor influencing their willingness to renovate idle homesteads. By exploring the relationship between farmer differentiation and rural revitalization intentions, while helping farmers establish positive farmer cognition, this can facilitate the mobilization of rural land resources and assets, thereby promoting integrated urban-rural development. Literature [28] indicates that land use policies have a significant impact on rural resilience. By establishing rural homestead withdrawal policies (WMRH) and complementing them with robust market and government regulation, rural resilience in the region can be significantly enhanced. Literature [29] explores how to formulate scientifically reasonable rural homestead withdrawal compensation policies, addressing the governance of idle rural homesteads from the perspectives of farmers' livelihood reconstruction and sustainable development, thereby improving the efficiency of rural construction land utilization. Literature [30] explores the mechanism by which psychological resilience influences farmers' homestead withdrawal behavior from a psychological perspective. Enhancing farmers' psychological resilience helps reduce their land dependency mindset and increase their risk tolerance, thereby facilitating the implementation of homestead withdrawal policies. Literature [31] established an evolutionary game theory framework for homestead withdrawal involving multiple stakeholders, analyzing the evolution of interest conflicts and strategic developments within it to formulate homestead withdrawal policies that balance the interests of farmers, governments, and markets. The aforementioned studies analyze the obstacles faced by homestead withdrawal behavior in traditional agricultural areas from the perspectives of farmer characteristics, homestead functional evolution, and policy implementation mechanisms, and propose corresponding solutions, thereby accumulating valuable experience for the smooth advancement of homestead system reforms.

The study discusses the practical challenges of rural homestead withdrawal in traditional agricultural areas and explores solutions to these challenges by examining farmers' willingness to withdraw from rural homesteads and the factors influencing it. Using survey data from 20 villages in a traditional agricultural area as the research sample, the study analyzes the basic situation of farmers' rural homesteads, their willingness to withdraw, and compensation methods. A theoretical model of farmers' willingness to withdraw from homestead land in traditional agricultural areas is constructed, selecting 17 relevant variables from dimensions such as regional characteristics, individual farmer characteristics, family characteristics, homestead land characteristics, cognitive characteristics, and livelihood security characteristics. A binary logistic model is used to identify the factors influencing farmers' willingness to withdraw from homestead land. Finally, based on the statistical analysis of farmers' willingness to withdraw from homestead land and the results of the analysis of influencing factors, pathways to alleviate the challenges of homestead land withdrawal in traditional agricultural areas are proposed.

II. Practical difficulties in the withdrawal of residential land in traditional agricultural areas

The withdrawal of homestead land in traditional agricultural areas refers to the withdrawal of various land rights associated with homestead land. The practical challenges faced in the withdrawal of homestead land in traditional agricultural areas are illustrated in Figure 1. In addition to challenges such as insufficient compensation funds for homestead land withdrawal, lack of motivation for utilizing homestead land after withdrawal, and obstacles to the urbanization of farmers, there are also psychological challenges.

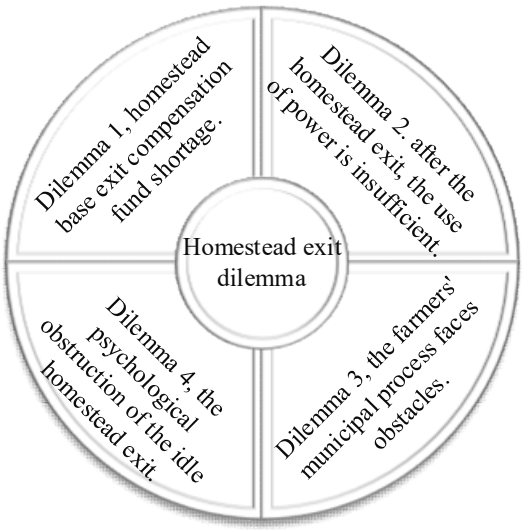


Figure 1: The practice dilemma of the traditional agricultural area homestead exit

II. A. Lack of compensation funds

One of the challenges is the shortage of compensation funds for the withdrawal of residential land. Currently, pilot reform areas in suburban and resource-rich regions have relatively ample compensation funds. These areas primarily obtain compensation funds from two sources: first, central government subsidies for rural residential land system reform pilot programs; second, funds from the monetization of residential land. Traditional agricultural areas are mostly non-pilot reform regions. The withdrawal of idle homesteads not only lacks government fiscal support but also, due to the absence of locational and resource advantages, makes it difficult to utilize the withdrawn homesteads for non-agricultural industrial development, which could generate higher expected returns. As a result, the government lacks the motivation to promote homestead reform. Additionally, due to the lack of sufficient withdrawal compensation funds, farmers who meet the withdrawal criteria also lack the motivation to withdraw. Therefore, the withdrawal of idle homesteads in traditional agricultural areas often faces significant challenges.

II. B. Utilizing insufficient power

The second challenge is the lack of motivation to utilize idle homestead land after it is withdrawn. After idle homestead land is withdrawn, it can be utilized in the following ways: first, it can be used for other eligible residents in the village to apply for homestead land; second, it can provide construction land for the development of the secondary and tertiary industries in rural areas; third, it can be used for urban-rural construction land exchange programs; and fourth, it can be used for land reclamation. Traditional agricultural areas are at a disadvantage in terms of location and resource endowments, resulting in insufficient demand for the development of the secondary and tertiary industries. Additionally, due to the lack of corresponding policy support in most traditional agricultural areas, withdrawn homestead land is difficult to utilize for urban-rural construction land exchange programs. Therefore, currently, idle homestead land withdrawn in traditional agricultural areas is primarily used for other eligible residents within the village collective to apply for homestead land use and for land reclamation. Since homestead land allocation in most regions remains a non-compensated process, the transfer of withdrawn homestead land to other members of the village collective fails to generate expected returns. Additionally, it is difficult to collect usage fees for homestead sites used for land reclamation. Therefore, the motivation to utilize idle homestead sites after withdrawal in traditional agricultural areas is significantly lacking.

II. C. Obstacles to the process of urbanization

Challenge Three: The process of urbanization for farmers faces obstacles. First, the high cost of urban commercial housing hinders the withdrawal of rural homestead land by some farmers who have moved to the city. While some farmers who have moved to the city have stable jobs, they struggle to afford urban commercial housing and instead rely on renting, while retaining their rural homestead land as a future retirement security. Second, small-property-right housing also hinders the relinquishment of idle homestead land. Some rural residents who have migrated to cities for work have stable jobs in urban areas but reside in small-property-right housing purchased in suburban areas. Since small-property-right housing cannot obtain property ownership certificates or homestead land use rights certificates, they worry about the lack of security associated with small-property-right housing and thus retain their idle rural homestead land. Retaining idle rural homestead

land is not only seen as part of their assets but also as a risk-mitigation strategy. Thirdly, farmers who move to cities often continue to participate in rural medical and pension insurance. Due to the lack of medical and pension insurance equivalent to that of urban employees, farmers who move to cities are reluctant to give up their rural homestead land, viewing it as a form of retirement security.

II. D. Psychological barriers among farmers

Challenge Four: Psychological Barriers to the Release of Idle Homestead Land. Traditional notions such as "nostalgia for one's hometown," "returning to one's roots," and "ancestral home consciousness" also hinder the release of idle homestead land to some extent. Some rural residents, despite having stable jobs and housing in cities, still retain idle homestead land and houses. These residents often return to their rural homes for a few days during major holidays or family events, or elderly family members return annually due to nostalgia for their hometown. Some families also retain rural homestead land and houses as a means to experience rural life, often bringing their children back to the countryside for extended stays during holidays. Retaining rural homesteads and housing serves the need to maintain familial connections with relatives and friends living in rural areas, as well as acting as a vessel for nostalgia or remembrance of ancestors, and is necessary for preserving communal ties. Therefore, the issue of idle homestead withdrawal is more challenging to resolve than that of contracted land withdrawal and requires more time. This issue cannot be resolved simply by individual households relocating to urban areas; it often necessitates the relocation of most or all family members to urban areas and the establishment of new social networks in the city.

III. Data sources and research methods

III. A. Data Sources

Using stratified random sampling, a household survey was conducted in 20 villages in a traditional agricultural area. Questionnaires were distributed through interviews, with a total of 250 questionnaires distributed and 214 valid questionnaires returned, resulting in a valid response rate of 85.6%.

The questionnaire primarily covered regional conditions, household member profiles, family circumstances, living conditions, basic information on residential land, household members' understanding of their rights to residential land and knowledge of relevant policies, as well as their willingness to relinquish their residential land qualification rights.

III. B. Research Methods

III. B. 1) Mechanism of influence and variable selection

By combining the basic characteristics of farmers with the behavioral states of microeconomic entities, we construct a framework for the influencing mechanisms of traditional rural homestead withdrawal intentions from three aspects: differences among farmers themselves, differences in family factors, and differences in homesteads, as shown in Figure 2.

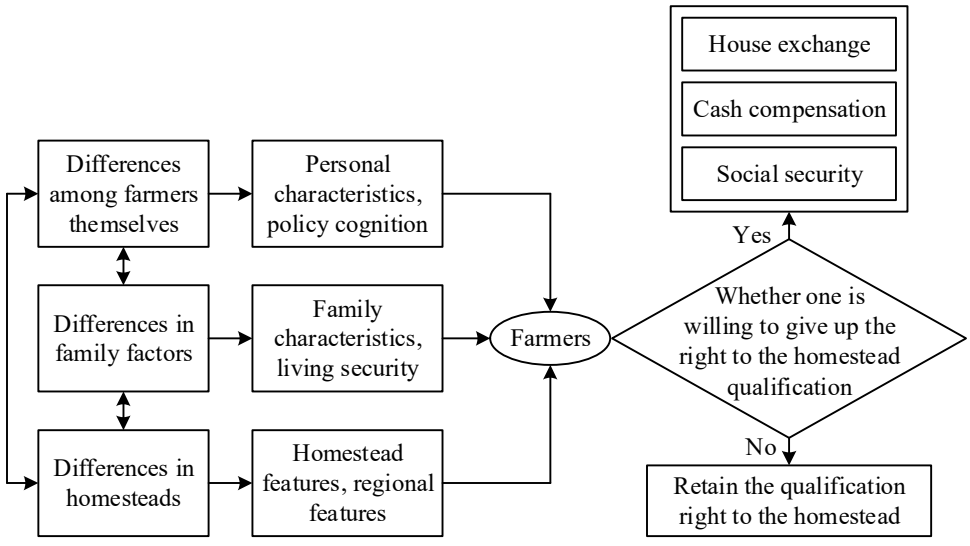


Figure 2: The influence framework of the homestead withdrawal will

Based on the influence mechanism framework of the willingness to relinquish homestead land in traditional agricultural areas, we selected the possible influencing factors of the willingness to relinquish homestead land in traditional agricultural

areas from six aspects: regional characteristics, individual characteristics of farmers, family characteristics, homestead land characteristics, cognitive characteristics, and livelihood security characteristics:

Regional characteristics: distance of the village from the county seat X1, terrain conditions of the village X2.

Individual characteristics of farmers: age X3, level of education X4.

Family characteristics: annual household income X5, sources of household income X6, number of elderly dependents X7, number of children to be raised X8.

Homestead characteristics: current number of homesteads X9, homestead area X10, homestead utilization status X11, satisfaction with the current residential homestead situation X12.

Cognitive characteristics: Whether homestead land can be bought and sold X13, level of understanding of homestead land withdrawal policies X14, whether the ownership of homestead land is correctly understood X15.

Living security characteristics: Types of insurance participated in X16, whether there is already a house in the town X17.

III. B. 2) Logistic model

Logistic regression analysis is a multivariate regression analysis method used to analyze continuous or discrete independent variables and predict discrete dependent variables. In this study, farmers' willingness to participate in the withdrawal of homestead land is a binary categorical variable, i.e., "willing" and "unwilling." Using farmers' willingness to participate in the withdrawal of homestead land as the dependent variable, a binary logistic model is employed to conduct regression analysis on the various factors influencing the willingness to withdraw homestead land, in order to identify which factors have a more significant impact on farmers' willingness to withdraw homestead land.

The binary logistic regression model is a nonlinear regression model with two categories of dependent variables. The model assumes the existence of a continuous variable y^* representing the probability of risk occurrence, with a critical point c in between, where the two sides of the critical point represent different meanings. The relationship between y^* and the critical point c is shown in Formula (1):

$$\begin{cases} y^* \geq c, y = 0 \\ y^* \text{takes other values}, y = 1 \end{cases} \tag{1}$$

The logistic regression model is a nonlinear regression model that uses indicator data to construct a regression model, estimate the probability of the platform's operational performance, and make judgments based on predefined classification values. Compared to linear regression models, the logistic regression model does not require the independent variables to follow a normal distribution or other conditions, making it more widely applicable in real-world scenarios.

The binary logistic regression model assumes that y^* has a linear relationship with the indicator variable x, which is expressed by formula (2):

$$y^* = \alpha + \beta x + \varepsilon \tag{2}$$

Assuming that ε follows a Logistic distribution, $c = 0$ we obtain formula (3):

$$\begin{aligned} P(y=0) &= P[(\alpha + \beta x + \varepsilon) > 0] \\ &= P[\varepsilon \leq (\alpha + \beta x)] \\ &= F(\alpha + \beta x) \\ &= \frac{1}{1 + e^{-\varepsilon}} \end{aligned} \tag{3}$$

When expanding a single variable x into multiple variables to form a sequence, the mathematical representation of the logistic regression model is shown in formula (4):

$$\ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \sum_{j=1}^{k} \beta_j x_{ij} \tag{4}$$

In the formula, x_{ij} is the element in the i th row and j th column of matrix X, β_0 is the intercept term, and β_j is the regression coefficient of the variable in logistic regression. The probability of risk occurrence is calculated as shown in formula (5):

$$P_i = \frac{\exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})}{1 + \exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})} = \frac{1}{1 + \exp(-\beta_0 - \sum_{j=1}^{k} \beta_j x_{ij})} \tag{5}$$

Logistic regression uses maximum likelihood estimation to estimate the coefficients of each independent variable and their statistical significance. Maximum likelihood estimation refers to parameters that make the predicted values as consistent as possible with the observed values. The model does not require the sample data to follow a normal distribution, and the larger the sample size, the closer the predicted values are to the observed values.

The likelihood estimation of the logistic regression model is shown in formula (6):

$$\begin{aligned} L(\beta) &= \prod_{i=1}^{n} p_i^{yi} (1 - p_i)^{1-yi} \\ &= \prod_{i=1}^{n} \left(\frac{\exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})}{1 + \exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})} \right)^{yi} \left(1 - \frac{\exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})}{1 + \exp(\beta_0 + \sum_{j=1}^{k} \beta_j x_{ij})} \right)^{1-yi} \end{aligned} \tag{6}$$

The maximum likelihood estimate maximizes the probability of the likelihood function occurring. For ease of calculation, it is adjusted to the minimum of the negative logarithm of the likelihood function, as shown in formula (7):

$$\min_{\theta} J(\beta) = -\ln(L(\beta)) = \sum_{i=1}^{n} [y_i \ln p_i + (1 - y_i) \ln(1 - p_i)] \tag{7}$$

Methods for testing logistic regression models:

(1) Hosmer-Lemeshow test

The Hosmer-Lemeshow test (H-L test) is a method for testing the goodness-of-fit of a logistic regression model, primarily applicable when there are many independent variables. The data is grouped based on the predicted y values, and the goodness-of-fit test is conducted by calculating the χ^2 values for each y value group.

The formula for the H-L statistic is as follows:

$$HL = \sum_{g=1}^{G} \frac{y_g - n_g \hat{p}_g}{n_g \hat{p}_g (1 - \hat{p}_g)} \tag{8}$$

In the equation, n_g represents the number of samples in the g th group, y_g — the observed data in the g th group, $\hat{p}_g$ — the predicted probability of the event occurring in the g th group, and $n_g \hat{p}_g$ — the sum of the predicted probabilities in the g th group.

The number of correctly predicted events (i.e., predicted values matching observed values) in each group is summarized using the χ^2 value, which is then compared to the $\chi^2(G-2)$ distribution. A non-significant χ^2 test indicates good model fit, while a significant test indicates poor fit.

(2) Information measurement indicators

Information measurement indicators are also used to test the goodness of fit of the logistic regression model. The most commonly used is the Akaike information criterion (denoted as AIC). The definition is shown in formula (9):

$$AIC = \left(\frac{-2L\hat{L}s + 2(K + S)}{n} \right) \tag{9}$$

The definition of the SC index, which is a modification of the AIC, is shown in formula (10):

$$SC = -2L\hat{L}s + (K + S) * \ln(n) \tag{10}$$

The SC indicator adjusts for the effect of changes in the observed quantity $-L\hat{L}s$. The smaller the value of SC, the better the model fit.

IV. Results and Analysis

IV. A. Statistical analysis of willingness to relinquish homestead land

IV. A. 1) Basic Information on Farmers' Homestead Sites

The basic situation of residential land plots for surveyed households is shown in Table 1. 97.20% of surveyed households own one residential land plot, while only 2.80% own two plots, indicating that the phenomenon of "multiple residential land plots per household" is relatively rare in the surveyed area. Additionally, the vast majority of residential land plots are used for self-residence, accounting for 93.46% of the total. There are no plots used for rental purposes. 5.61% and 0.93% of the residential land plots exhibit partial or complete idleness, respectively. 86.92% of residential land plots have an area between 100 and 200 square meters. Those with areas less than 100 square meters and greater than 200 square meters are relatively rare, accounting for 10.75% and 2.34%, respectively.

Table 1: The basic situation of the farmers' homestead

Feature	Options	Number of farmers	Proportion /%
Homestead number	1	208	97.20
	2	6	2.80
	≥3	0	0
Homestead usage	Self-dwelling	200	93.46
	Rental	0	0
	Partially idle	12	5.61
	Completely idle	2	0.93
Homestead area/m^2	<100	23	10.75
	100~200	186	86.92
	>200	5	2.34

Table 2 shows the level of understanding among surveyed farmers regarding the homestead land policy. Farmers' understanding of the homestead withdrawal policy is relatively low, with over 51.87% of the surveyed farmers having no knowledge of the national homestead policy, and 48.13% having only partial knowledge. Additionally, the surveyed farmers' understanding of homesteads is significantly misinformed, with over 52% believing that homesteads can be bought and sold, a figure close to the number of farmers who have no knowledge of the national homestead policy. Regarding the ownership of homestead land, surveyed farmers exhibit significant cognitive biases. 71.96% of farmers believe that the ownership of the homestead land they reside on belongs to individuals, while only 18.69% of respondents believe that homestead land is collectively owned. Therefore, the government still needs to strengthen publicity and education regarding homestead land laws, regulations, and policies among farmers.

Table 2: The cognition of homestead policies in the survey

Feature	Options	Number of farmers	Proportion /%
Know the homestead policy	Complete understanding	0	0
	Partial understanding	103	48.13
	Have no idea	111	51.87
A homestead can buy and sell	Yes	112	52.34
	No	102	47.66
Homestead property	Nation	20	9.35
	Village collective	40	18.69
	Individual	154	71.96

IV. A. 2) Willingness to relinquish residential land and compensation methods

Table 3 shows the willingness of the surveyed farmers to withdraw from their homesteads. There were 61 rural households who were willing to quit the homestead, accounting for 28.50% of the total number of surveyed households. The main reason for withdrawal was "idle houses and little effect", accounting for 39.34% of the withdrawal ratio, followed by "wanting to live elsewhere", accounting for 24.59% of the withdrawal ratio, 14 farmers who wanted to quit the homestead in exchange for "the ideal compensation amount", accounting for 22.95% of the category, and 9 farmers who quit the homestead due to "backward rural conditions", accounting for 13.11% of the total number of people willing to quit.

Among the survey respondents, 153 individuals (over 70% of the total) expressed unwillingness to relinquish their homestead land. The primary reasons cited were "having grown accustomed to living here," "inconvenience in farming after

relinquishment," and "desire to leave the land for future generations." Among these, the highest proportion chose "accustomed to living here," accounting for 34.64%, followed by those who believed "farming would be inconvenient after relinquishing the homestead," representing 21.57% of those unwilling to relinquish, and another 19.61% of survey respondents believed the homestead should be left for the next generation to live in. 18.95% of the surveyed farmers refused to relocate due to "inability to purchase a new home," and 5.23% hoped to relocate after the homestead land appreciated in value. This indicates that farmers in the study area have a high degree of dependence on homestead land, which is related to the underdeveloped economy and high proportion of the primary sector in traditional agricultural regions.

Table 3: The withdrawal will of the farmers' homestead

Will	Reason	Number of farmers	Proportion(will)/%	Proportion(total)/%
Willing	Want to go somewhere else	15	24.59	7.01
	Idle house	24	39.34	11.21
	Ideal compensation	14	22.95	6.54
	Rural conditions lag	9	13.11	3.74
Unwilling	Inability to buy a new house	29	18.95	13.55
	Habitually live here	53	34.64	24.77
	No convenience of farming	33	21.57	15.42
	Wait for appreciation	8	5.23	3.74
	For the next generation	30	19.61	14.02

The most pressing concern for farmers during the process of relinquishing their residential land is how to receive appropriate compensation, which is influenced by various factors such as location, household income, and educational attainment. The willingness of farmers to relinquish their residential land and the preferred compensation methods are illustrated in Figure 3. The most widely accepted compensation method among survey respondents in the study area was resettlement compensation, with 146 people choosing this option, accounting for 68.22% of the total. The second most popular option was "depending on the actual compensation amount," chosen by 17.29% of farmers. The fewest number of farmers were willing to accept economic compensation, with only 31 people choosing this option, accounting for 14.49% of the total.

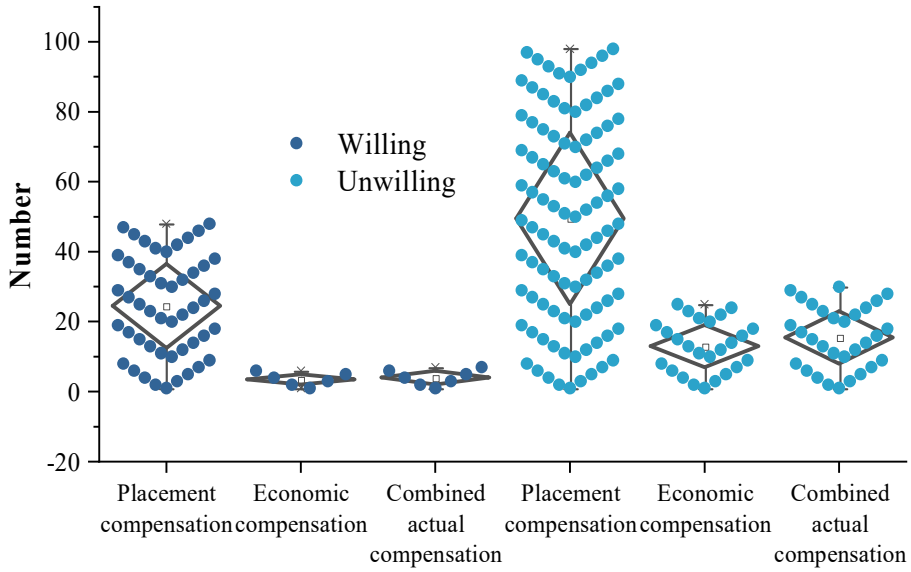


Figure 3: The withdrawal will and compensation of the farmer's homestead

IV. B. Analysis of Factors Affecting the Willingness to Give Up Homestead Land

IV. B. 1) Model Construction

Farmers' willingness to relinquish their homestead sites is the dependent variable P, which can be divided into two categories: "willing to relinquish homestead sites" and "unwilling to relinquish homestead sites." This is a typical binary choice problem. The factors affecting farmers' willingness to relinquish their homestead sites are x_m. Therefore, a binary logistic regression

model is used to describe the relationship between the independent and dependent variables. The specific model is as follows:

$$P = \frac{Exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_m x_m)}{1 + Exp(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_m x_m)} \quad (11)$$

In the equation, P represents the probability of willingness to relinquish homestead land. In this study, when farmers are willing to relinquish their homestead land, P is set to 1; when farmers are unwilling to relinquish their homestead land rights, P is set to 0. β_0 is a constant value representing the natural logarithm of the ratio when all independent variable values are 0. x_m represents the factors influencing farmers' willingness to relinquish their homestead rights. β_m is the partial regression coefficient, indicating the extent to which x_m influences P.

IV. B. 2) Analysis of Results

Binary logistic regression analysis was conducted using SPSS 24.0 to obtain the parameter estimates for the factors influencing farmers' willingness to relinquish their homestead sites, as shown in Figure 4. *, **, and *** indicate significance at the 10%, 5%, and 1% levels, respectively. The results show that the chi-square value of the Hosmer and Lemeshow test is 6.518, with a significance value of sig = 0.637, which is greater than 0.05, indicating that the model fits well and the data is suitable for further analysis.

(1) Regional characteristics

The terrain conditions of the village (X2) have a significant negative impact on farmers' willingness to relinquish their homestead land. The significance value P = 0.067 is significant at the 10% significance level, with a regression coefficient of -0.454. Compared to hilly and mountainous areas, plain and plain-hilly regions have more convenient transportation and more developed economies. Farmers in these areas have more diverse income sources, higher income levels, stronger ability to accept new things, and more open-minded attitudes, leading to a stronger willingness to withdraw from homestead land.

(2) Farmers' personal characteristics

Educational attainment X4 has a significant positive impact on farmers' willingness to relinquish homestead land. The significance value P = 0.074 is significant at the 10% significance level, with a regression coefficient of 0.393. The main reason is that the higher the educational level of farmers, the more resources they have access to, the broader their horizons, and the easier it is for them to break away from traditional rural life, resulting in a higher willingness to relinquish homestead land.

(3) Household characteristics

Annual household income X5 has a significant negative impact on farmers' willingness to relinquish their homestead rights. The significance value is P=0.039, which is significant at the 5% significance level, with a regression coefficient of -0.637. Compared to the property value of homestead land, farmers with higher annual household income place greater emphasis on the emotional value of homestead land and do not expect to improve their quality of life through compensation obtained by relinquishing homestead land rights, thus tending to retain homestead land rights.

(4) Homestead Land Characteristics

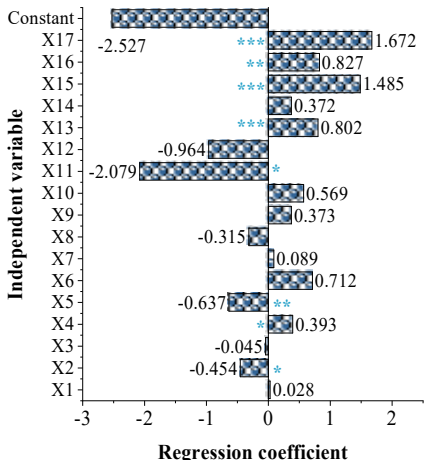
Homestead land utilization status X11 has a significant negative impact on the willingness to relinquish homestead land. The significance value P = 0.061 is significant at the 10% significance level, with a regression coefficient of -2.079.

(5) Cognitive characteristics

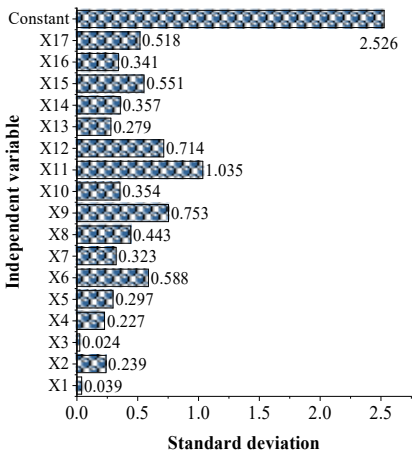
Farmers' perceptions of whether homestead land can be bought and sold X13 and whether they correctly understand the ownership of homestead land X15 have a significant positive impact on the willingness to withdraw from homestead land, both significant at the 1% significance level. The main reason is that farmers who believe homestead land can be bought and sold have a certain level of understanding of the property attributes of homestead land and hope to obtain corresponding benefits through homestead land withdrawal, thus exhibiting stronger withdrawal intentions. Farmers with a correct understanding of homestead land ownership can more accurately estimate the benefits and risks of homestead land withdrawal, facilitating the making of reasonable decisions.

(6) Living security characteristics

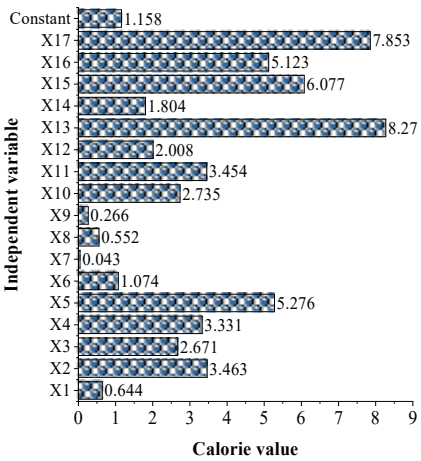
The type of insurance participation X16 and whether the household already owns a house in the town X17 have a significant positive impact on the household's willingness to withdraw from homestead land, with regression coefficients of 0.827 and 1.672, respectively. The more types of insurance a household participates in, the more secure their livelihood becomes, reducing their reliance on the protective function of homestead land and thereby increasing their willingness to withdraw from it.



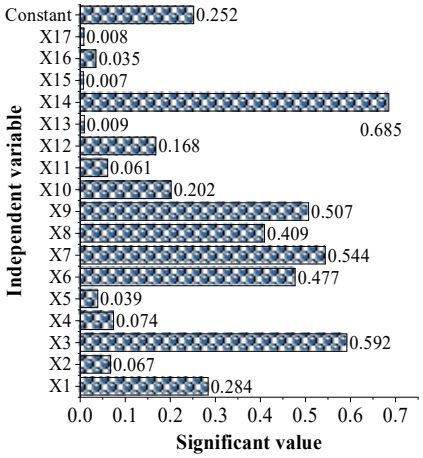
(a) Regression coefficient



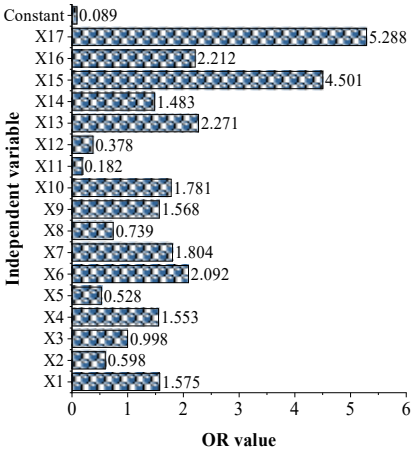
(b) Standard deviation



(c) Calorie value



(d) Significant value



(e) OR value

Figure 4: Parameter estimation of the model

V. Alleviating the withdrawal of residential land in traditional agricultural areas

Based on the statistics on the willingness to relinquish homestead land in traditional agricultural areas and the analysis of the factors influencing such willingness presented in the previous section, the proposed mitigation pathways for the relinquishment of homestead land in traditional agricultural areas are illustrated in Figure 5.

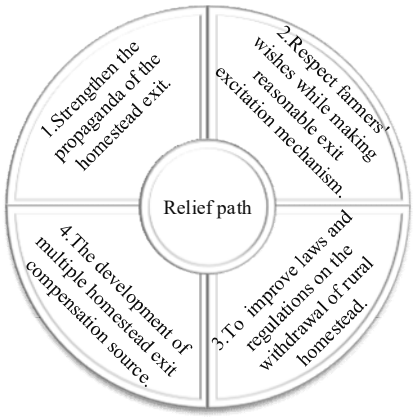


Figure 5: The relief path of the traditional agricultural district homestead exits

V. A. Strengthen publicity on the withdrawal of rural homestead land

All levels of government and grassroots self-governing organizations should take responsibility for promoting the rural homestead withdrawal system, ensuring that farmers understand what rural homestead withdrawal entails and are familiar with the relevant policies. This will help eliminate misconceptions about the system and enable farmers to recognize the advantages and benefits of the homestead withdrawal mechanism, as well as feel that their rights are respected and protected. For farmers who wish to withdraw, especially those who have already relocated to urban areas, relevant departments should actively cooperate and provide professional guidance.

V. B. Establish reasonable exit incentive mechanisms

By publicizing typical cases of homestead land withdrawal, farmers can be guided in a reasonable and positive manner, their thoughts can be fully understood, their wishes respected, and they can be encouraged to voluntarily withdraw their homestead land. At the same time, establishing a reasonable incentive mechanism for withdrawal can effectively address the issue of farmers' weak willingness to withdraw. Different withdrawal schemes should be implemented for different types of farmers. First, for farmers willing to relocate to urban areas, a combination of withdrawal compensation and improved social security systems should be adopted. For farmers planning to settle in large cities, the policy focus should be on providing appropriate withdrawal compensation. For farmers planning to settle in medium-sized or small towns, the policy focus should be on improving basic public services in urban areas, namely enhancing the social security system. Second, for households that have multiple homestead sites or exceed land use standards, a combination of paid use and withdrawal compensation should be adopted. For households exceeding homestead land use standards, withdrawal can be guided through the establishment of constraint mechanisms. Third, for non-farm households, withdrawal compensation should be the primary focus. Non-farm households no longer prioritize the social security functions of homestead land, so the policy focus should be on determining appropriate withdrawal compensation.

V. C. Establish and improve laws and regulations

On the one hand, it is necessary to clarify issues such as the ownership of homestead land, farmers' rights and interests, and post-withdrawal guarantees in substantive terms to protect farmers' rights and interests from infringement and effectively guarantee farmers' right to housing so that they have a place to live after withdrawal. On the other hand, it is necessary to improve the procedures and steps for each stage of the withdrawal of rural homestead land and increase farmers' participation in the withdrawal compensation process, while also strengthening supervision of the withdrawal process.

V. D. Developing Diverse Sources of Compensation Funds

Insufficient compensation funds during the process of exiting rural homestead land are primarily due to the fact that funding sources are predominantly limited to government fiscal funds. Overreliance on government expenditures will hinder the rational utilization and activation of the economy during the rural homestead land exit process. Therefore, expanding the channels for compensation funds and developing diverse funding sources is of critical importance. In economically developed regions, where demand for construction land is high, the implementation of “land consolidation vouchers” can be considered, utilizing the buying and selling of construction land quotas to achieve the purpose of reserve fund accumulation. For relatively underdeveloped regions, surplus residential land can be converted into farmland for external contracting, with compensation funds for the withdrawal of rural residential land obtained through contracting fees. Additionally, introducing private capital to enrich the support for withdrawal compensation funds is also a viable approach.

VI. Conclusion

The idleness of residential land is a critical issue that must be addressed in the current process of rural revitalization. This paper explores the practical challenges faced in the withdrawal of residential land in traditional agricultural areas. A theoretical model is constructed, and after collecting data, an analysis is conducted on the basic factors influencing farmers' willingness to withdraw residential land. A binary logistic model is then used to identify the factors influencing farmers' willingness to withdraw residential land, and finally, a solution path for the withdrawal of residential land in traditional agricultural areas is proposed.

(1) Currently, the withdrawal of homestead land by farmers faces challenges such as insufficient compensation funds, lack of motivation to utilize homestead land after withdrawal, obstacles to the urbanization process of farmers, and psychological barriers to the withdrawal of idle homestead land.

(2) Farmers have a low level of understanding of homestead land withdrawal policies, with 51.87% of surveyed farmers having no knowledge of national homestead land policies. Additionally, surveyed farmers hold significant misconceptions about homestead land. Over 70% of the surveyed farmers are unwilling to withdraw from their homesteads, with the main reasons being “accustomed to living here,” “inconvenience in farming after withdrawal,” “desire to leave it for the next

generation," and "inability to purchase a new home," accounting for 34.64%, 21.57%, 19.61%, and 18.95% of the total, respectively. Farmers' educational attainment (0.393), whether homestead land can be bought and sold (0.802), and their understanding of ownership status (1.485), participation in insurance programs (0.827), and whether they already own housing in urban areas (1.672) have a significant positive impact on willingness to relinquish. Conversely, the terrain conditions of the village (−0.454), annual household income (−0.637), and the utilization status of homestead land (−2.079) have a significant negative impact.

(4) Challenges in the process of rural homestead land withdrawal can be addressed by strengthening publicity and promotion, fully respecting farmers' intentions and establishing exit incentive mechanisms, improving relevant laws and regulations, and developing diverse sources of compensation funds.

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References

[1] Ma, Y. (2022). Obstacles and Countermeasures to the Revitalization and Utilization of Idle Agricultural Houses in the Context of Rural Revitalization--Take Nanzhanglou Village in Shandong Province as an Example. Academic Journal of Humanities & Social Sciences, 5(18), 76-81.

[2] Qin, C., Han, H., Zhang, J., & Dong, K. (2022). The effect and optimization path of the revitalization and utilization of idle homestead in rural areas. Scientific Journal of Economics and Management Research Volume, 4(6), 204-210.

[3] Jiang, S., & Gan, Z. (2020). The current situation and management of idle rural homesteads in China-based on a survey in Jiangxi province. Public Administration, 22(1), 109-118.

[4] HU, Y. G., YU, Y. Y., WANG, C., & WU, X. (2019). The effective threshold of compensation for the voluntary withdrawal from rural homestead: Empirical research based on the reform of pilot city in Yicheng city. Journal of Natural Resources, 34(6), 1317-1330.

[5] Liang, F., Wang, Z., & Lin, S. H. (2022). Can land policy promote farmers' subjective well-being? A study on withdrawal from rural homesteads in Jinjiang, China. International Journal of Environmental Research and Public Health, 19(12), 7414.

[6] Liu, R., Jiang, J., Yu, C., Rodenbiker, J., & Jiang, Y. (2021). The endowment effect accompanying villagers' withdrawal from rural homesteads: Field evidence from Chengdu, China. Land Use Policy, 101, 105107.

[7] Pengjuan, S. (2019, December). Paid Withdrawal and Optimal Utilization of Rural Homestead. In 2019 Annual Conference of the Society for Management and Economics (Vol. 4, pp. 305-309). The Academy of Engineering and Education.

[8] Tang, P., Chen, J., Gao, J., Li, M., & Wang, J. (2020). What role (s) do village committees play in the withdrawal from rural homesteads? Evidence from Sichuan Province in Western China. Land, 9(12), 477.

[9] Chen, H., Zhao, L., & Zhao, Z. (2017). Influencing factors of farmers' willingness to withdraw from rural homesteads: A survey in Zhejiang, China. Land Use Policy, 68, 524-530.

[10] Liang, F., Lin, C., & Lin, S. H. (2022). Farmers' livelihood, risk expectations, and homestead withdrawal policy: Evidence on JinJiang pilot of China. International Journal of Strategic Property Management, 26(1), 56-71.

[11] Sun, Y., & Xu, J. (2018, July). Analysis on Withdrawal of Rural Homestead in China under the Background of Urban and Rural Overall Development-A Case Study of Centralized Residence. In 2018 International Seminar on Education Research and Social Science (ISERSS 2018) (pp. 482-485). Atlantis Press.

[12] He, Y., & Tang, P. (2023). Understanding the role (s) of social networks in the transition from farmers' willingness to behavior regarding withdrawal from rural homesteads: A research study based on typical regions of Sichuan Province. Land, 12(8), 1505.

[13] Shi, R., Hou, L., Jia, B., Jin, Y., Zheng, W., Wang, X., & Hou, X. (2022). Effect of policy cognition on the intention of villagers' withdrawal from rural homesteads. Land, 11(8), 1356.

[14] Dou, J., & Liu, H. (2020, December). The change of Rural Homesteads Withdrawal Policy from the perspective of Punctuated-Equilibrium. In 2020 3rd International Conference on Humanities Education and Social Sciences (ICHESS 2020) (pp. 1129-1134). Atlantis Press.

[15] Xia, T., Carayannis, E. G., Sindakis, S., Showkat, S., & Kanellos, N. (2024). Technology transfer for sustainable rural development: evidence from homestead withdrawal with compensation in Chengdu–Chongqing. The Journal of Technology Transfer, 49(1), 303-333.

[16] Peng, S., & Wang, L. (2025). Does participation in social security increase Chinese farmers' willingness of homestead withdrawal?. Land, 14(3), 461.

[17] Gao, J., Song, G., & Liu, S. (2022). Factors influencing farmers' willingness and behavior choices to withdraw from rural homesteads in China. Growth and Change, 53(1), 112-131.

[18] WANG, L., DING, X. Q., XU, D., & TAN, Y. Z. (2025). The mechanism of homestead withdrawal in metropolitan areas under the Social-Ecological System analysis framework: A case study of Chang'an town, Haining city, Zhejiang province. JOURNAL OF NATURAL RESOURCES, 40(3), 712-727.

[19] Tang, P., Tan, L., Gao, J., Li, M., & Zhang, S. (2025). Social networks matter for villagers' withdrawal from rural homesteads: An empirical analysis of Sichuan in western China. Habitat International, 156, 103305.

[20] Zhang, S., Chen, W., Li, Q., Shi, H., Xu, W., & Shao, Z. (2025). Effects of Spatial Accessibility on Farmers' Willingness to Withdraw from Rural Homesteads in China. Journal of Urban Planning and Development, 151(2), 04025018.

[21] Gu, H., He, Y., Wang, B., Qian, F., & Wu, Y. (2023). The Influence of Aging Population in Rural Families on Farmers' Willingness to Withdraw from Homesteads in Shenyang, Liaoning Province, China. Land, 12(9), 1716.

[22] Gao, J., Cai, Y., Wen, Q., Liu, Y., & Chen, J. (2023). Future matters: Unpacking villagers' willingness to withdraw from rural homesteads in China. Applied Geography, 158, 103049.

[23] Wang, Z., Liang, F., & Lin, S. H. (2023). Can socially sustainable development be achieved through homestead withdrawal? A hybrid multiple-attributes decision analysis. Humanities and Social Sciences Communications, 10(1), 1-18.
[24] Dong, G., Ge, Y., Cao, H., & Zhai, R. (2022). Withdrawal and transformation of rural homesteads in traditional agricultural areas of China based on supply-demand balance analysis. Frontiers in Environmental Science, 10, 897514.
[25] Xingyu, L., & Yukun, G. (2022). Research on the function evolution and driving mechanism of rural homestead in Luxian County under the" Rural Revitalization". Procedia Computer Science, 199, 969-976.
[26] Qian, Y., Yang, Q., Zhang, H., Su, K., Zhang, H., & Qu, X. (2022). The impact of farming households' livelihood vulnerability on the intention of homestead agglomeration: The case of zhongyi township, China. Land, 11(8), 1322.
[27] Lu, M., Guo, B., & Li, J. (2024). Using the Extended Theory of Planned Behavior to Explore the Effect of Farmer Differentiation on Their Intention to Revitalize Idle Homesteads: Empirical Evidence from Shaanxi, China. Sustainability, 16(18), 8252.
[28] Huang, X., Li, H., Zhang, X., & Zhang, X. (2018). Land use policy as an instrument of rural resilience–The case of land withdrawal mechanism for rural homesteads in China. Ecological Indicators, 87, 47-55.
[29] Qi, W., Li, Z., & Yin, C. (2022). Response mechanism of farmers' livelihood capital to the compensation for rural homestead withdrawal—empirical evidence from Xuzhou City, China. Land, 11(12), 2149.
[30] Xie, Y., Ke, S., & Li, X. (2023). Psychological resilience and farmers' homestead withdrawal: evidence from traditional agricultural regions in China. Agriculture, 13(5), 1044.
[31] Song, L., Lyu, P., & Cao, Y. (2021). Multi-party game and simulation in the withdrawal of rural homestead: Evidence from China. China Agricultural Economic Review, 13(3), 614-638.