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Household waste management is an important foundation for rural revitalization strategies. With the in–depth advancement of rural revitalization strategies in China, improving the participation level of farmers in household waste management has become a hot topic of social and policy attention. Using the survey data of farmers in four counties and districts of Shaanxi Province, China, this study explores the mechanism underlying the effect of institutional trust and environmental attitudes on the preferred method of rural households to participate in household waste management. The results show that institutional trust significantly impacts farmers' preference for payment–only and paying for work but has no significant impact on their preference for labor–only. Environmental attitudes have significant effects on their choice of labor–only, payment–only, and labor–and–payment. Therefore, the government must respect farmers' preferred methods to participate in rural household waste management, improve their institutional trust, and strengthen publicity and education to guide farmers to actively participate in waste management.

Key words: rural domestic waste management, participation method, institutional trust, environmental attitude

INTRODUCTION

With the rapid development of rural society and the economy and the continuous improvement of residents living standards, the production of rural household waste has increased sharply and has become the main source of environmental pollution in rural areas (Cui and Bluemling, 2018). In recent years, China's No.1 Central Document has continuously focused on rural household waste management, and the General Office of the CPC Central Committee, the Central Agricultural Office, and other departments have issued successive documents requiring the extensive mobilization of farmers to actively participate in centralized special actions to rectify rural household waste pollution. However, due to the strong externalities, regional nature, and public property rights of rural household waste management, there is inevitably insufficient public participation; moreover, it is difficult for the government's supply method to "target" demand (Liu and Guo, 2016; Wang *et al*., 2018). The effective promotion of farmers' participation in household waste management has become key to improving China's rural habitat and is a crucial step in promoting rural revitalization (Wei *et al*., 2011; Jiang and Zhao, 2020).

Theoretically, farmers' participation in environmental governance is an autonomous decision–making behavior under a certain institutional framework, and the implementation and effectiveness of institutional policies related to rural environmental governance determine the degree of farmers' trust in the system (Jia and Zhao, 2019). As the psychological basis of cooperative activities, the rational measurement of trust benefits is important in trusting subjects' decisions about whether to give trust (Li, 2020). Earlier studies show that the expectations of the effects of environmental governance directly or indirectly affect farmers' institutional trust and their willingness to participate (Nordlund and Garvill, 2002). It has become a mainstream view in political and academic circles that institutional trust promotes farmers' participation in environmental governance. However, research based on the behavioral economics paradigm suggests that institutional trust does not promote farmers' participation in environmental governance but can inhibit it. The theoretical community has no consensus on whether institutional trust promotes participation.

As a self–sustaining improvement behavior, farmers' participation in household waste management not only requires continuous input from all levels of government, but it must also be closely related to their environmental attitudes (Han *et al*., 2016). Research shows that environmental attitudes, such as individuals' tendencies in thinking, acting, and believing about the environment, can induce a change in farmers' perceptions of environmental issues and promote their cooperative behavior in environmental protection (Huang *et al*., 2017); whereas individuals with more positive environmental attitudes are more concerned about environmental issues (Wang *et al*., 2020) and have a higher willingness to pay for environmental behavior (Ye *et al*., 2021). Therefore, weak environmental awareness and the lack of an ecological civilization concept will, to a certain extent, inhibit farmers' enthusiasm to participate in household waste management and thus hinder the process of improving rural habitat environments (Jia and Zhao, 2019). It is important to pay attention to the influence of farmers' environmental attitudes on their willingness

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to participate in household waste management and its mechanism of action.

The system designed for farmers' participation in environmental management only provides the institutional environment; however, whether farmers agree is more important, as it directly influences the effectiveness of the system's implementation. As a quasi–public good, rural household waste management is currently mainly supplied by the government and rural communities, with a few pilot villages in which farmers participate by paying for it (Jia *et al.*, 2019). Previous studies show that at this stage, farmers are not highly motivated to participate in household waste management by paying for the services (Jia and Zhao, 2019; Zheng *et al.*, 2019; Liu and Wang, 2020). People are more willing to "pay" for environmental services in the form of labor than to pay for the service (Jin and Guo, 2011). In policy practice, the system of participation in household waste management has encountered resistance from many sides because of the separation from the actual needs of rural society and farmers. There are many problems such as farmers' low motivation to participate in household waste management, difficulty in collecting household waste management fees, and a low collection rate (Xu *et al.*, 2016; Yi, 2019). Given this, this study incorporates institutional trust and environmental attitudes into a unified analytical framework and uses micro–survey data from 592 sample farmers in Shaanxi Province to empirically analyze the factors influencing farmers' preference for participating in household waste management. A multivariate disordered logit regression model is used to provide an empirical basis for optimizing and improving farmers' participation in the rural household waste management system in China.

THEORETICAL ANALYTICAL FRAMEWORK

The trust–cooperation theory posits that trust is the foundation and premise of cooperation, and its strength determines the breadth and depth of individuals' implementation of cooperative behavior (Li and Yang, 2018). Institutional trust, as a kind of trust, refers to the public's reasonable expectation that laws and regulations and government agencies can achieve fair governance (Wei *et al.*, 2019). By establishing an internal constraint mechanism, institutional trust can effectively regulate and shape the order of rural society, thus effectively inhibiting opportunistic behaviors such as "free–riding" and avoiding the occurrence of phenomena such as the "prisoner's dilemma" (San and Sonia, 2013; Hartmann and Herb, 2014). Domestic scholars generally believe that institutional trust can be measured by farmers' trust in local government, laws and regulations, and village cadres, and have verified through empirical studies that there is a positive relationship between institutional trust and behavioral intentions (He *et al.*, 2015). From the perspective of farmers' trust in local government, Zhang *et al.* (2021) verified that institutional trust can effectively increase farmers' willingness to invest and the level of investment in household waste management.

Therefore, institutional trust plays an irreplaceable role in promoting farmers' participation in environmental governance, i.e., the higher the degree of institutional trust of farmers, the more optimistic they are about the prospect of waste management, and the more motivated they are to actively participate in household waste management.

Environmental attitudes are an important concept in the field of environmental protection behavior research, comprising a collection of emotions, beliefs, and behavioral intentions that individuals hold about environment–related activities or issues (Schultz *et al.*, 2004). It has been shown that environmental attitudes can directly or indirectly influence individuals' environmental behaviors. Huang *et al.* (2016) used cluster analysis to conclude that tourists' environmental attitudes have a significant positive effect on their environmental behaviors. Additionally, Guo *et al.* (2022) analyzed the psychological factors of growers and found that farmers with higher environmental attitudes are more willing to engage in pro–environmental behaviors. Wang (2020) found that environmental attitudes can indirectly influence residents' waste–sorting behavior through their willingness to target and perform, while Huang *et al.* (2018) concluded that environmental attitudes can indirectly influence environmentally responsible behavior through environmental behavioral intentions. Considering these findings, the clearer the farmers' awareness of environmental pollution problems, the more positive their environmental attitudes and the stronger their awareness of environmental protection; consequently, the more inclined they are to adopt green behaviors and actively participate in rural household waste management. In addition, farmers' awareness of the relationship between humans and nature and the extent to which they have their knowledge of environmental science (Fan *et al.*, 2016; Wang and Tou, 2021) tend to influence their attitudes toward environmental protection.

Although the above research has covered many aspects of environmental governance, most of it has focused on the analysis of factors influencing farmers' willingness or behavior to participate, and there is a lack of empirical research on their participation methods. Considering that farmers' participation in environmental governance is affected by both institutional trust and environmental attitudes, this study explores the influence of the two on farmers' preferred methods to participate in household waste management.

MATERIALS AND METHODS

Methodology

Most studies regard labor or payment as the main method of public participation in environmental governance (Cai and Zhu, 2015; Yuan *et al.*, 2016; Wang *et al.*, 2018; Han *et al.*, 2019; Zhao *et al.*, 2020), ignoring farmers' choice between labor and payment. Therefore, this study improves the choices and sets four options: no labor and no payment (hereinafter referred to as no participation), labor–only, payment–only, and labor–and–

payment. Because these choices are multivalued and disorderly, a multivariate disordered logit regression model is applied. No participation is defined as the control variable. Three generalized logit models are developed:

$$z_i = \alpha + \beta_i X_i + \mu \qquad (1)$$

The probability of farmer's choices to participate in rural household waste management is:

$$P_i = F(z_i) = F(\alpha + \beta_i X_i + \mu)$$
$$= \frac{1}{1 + e^{-z_i}} = \frac{1}{1 + e^{-(\alpha + \beta X_i)}} \qquad (2)$$

Its estimated formula is:

$$Ln\left(\frac{P_i}{1 - P_i}\right) = z_i = \alpha + \sum_{i=1}^{n} \beta_i X_i + \mu \qquad (3)$$

where $z=0$ indicates the choice of no participation, $z=1$ indicates the choice of labor–only, $z=2$ indicates the choice of payment–only, $z=3$ indicates the choice of both labor and payment; β_i represents the estimated coefficient matrix, X_i represents the matrix of explanatory variables, and μ represents the random error term.

Data Sources

The data used in this institute are drawn from a household survey conducted by a research group in Chengcheng County, Dali County, Taibai County, and Yangling District in Shaanxi Province in July and August 2019. The survey informs on the current situation of rural household waste management and their preferred participation method. Considering the research objectives, operability, and financial constraints, the research group randomly selected 17 administrative villages in four counties as research areas. To ensure the validity of the sample data, the research group conducted systematic training for the investigators and pre–research in the surrounding rural areas of Yangling to correct the questionnaire content. A total of 600 questionnaires were distributed by random sampling, and 592 valid questionnaires were retained after eliminating inconsistencies and missing key information, for an effective response rate of 98.7%.

Dependent Variable

The explanatory variable was farmers' preferred methods for waste management. These four choices, no participation, labor–only, payment–only, and labor–and–payment, were assigned as 0, 1, 2, and 3, respectively.

Table 1 shows that among the 592 sample farmers, only 6.93% of farmers are unwilling to participate in rural household waste management, 10.14% of farmers choose to participate only by labor, 20.95% choose to participate only by payment, and the remaining 61.99% choose to participate in the method of labor and payment.

Independent Variables
Institutional Trust

This study measures institutional trust by farmers' trust in local government, trust in laws and regulations, and village cadres. (He *et al.*, 2015; Zhang *et al.*, 2021). For any of the above questions, the answer options are "distrust," "general," and "trust," which are assigned the values 1, 2, and 3, respectively, such that the higher the score, the higher the degree of trust in the existing system of farmers and the greater the willingness to abide by rules and regulations, accept the guidance of village cadres, and participate in the village's environmental construction. This study used exploratory factor analysis to reduce the dimensionality of these three problems and identify institutional trust variables.

Environmental Attitude

Referring to Huang *et al.* (2019), environmental attitudes can be deconstructed into three dimensions: environmental emotion, environmental belief, and environmental concern, which are reflected in farmers' evaluation of environmental issues and their level of concern. Therefore, to understand the environmental attitudes of farmers more accurately and more directionally, this study combines the actual situation of farmers learned from the pre–survey and current rural environmental problems through farmers' emotional experiences of environmentally harmful behaviors, environmental worldviews, and environmental concerns. The degree of concern for environmental issues examines farmers' environmental attitudes in three ways. The specific problems include: (I) If I do something that wastes resources or pollutes the environment, I will feel very guilty; (II) Human beings should protect nature and live in harmony with nature; and (III) I will take the initiative to understand some of the current environmental problems. The answer options for the question are "Disagree," "General," and "Agree," which are assigned values of 1, 2, and 3, respectively. Dimension reduction treatment was also performed using exploratory factor analysis. The original indicators of the factor analysis are listed in Table 2.

Table 1. Distribution of Preferred Participation Mode in Rural Household Waste Management

Question	Categories	Freq.	Relative frequency (%)	Cumulative frequency (%)
Which way do you prefer to participate in rural household waste management?	0 = No participation	41	6.93	6.93
	1 = Labor–only	60	10.14	17.06
	2 = Payment–only	124	20.95	38.01
	3 = Labor–and–payment	367	61.99	100.00

Control Variables

Many studies have confirmed that gender, age, education experience, village position, a permanent population, and per capita annual income affect the preference of famers to participate in the waste management (Wen *et al.*, 2021; Zhu *et al.*, 2021; Zuo *et al.*, 2022). Therefore, this study selected gender, age, education level, and whether they were party members or village cadres as personal characteristic variables, and the number of permanent household residents and the per capita annual income of family members as household characteristic variables. Statistics show that the numbers of men and women in the respondents are similar; their average age is about 50 years; their education level is mainly junior and senior high school; the number of respondents who are party members or village cadres is small; the number of permanent residents of the interviewed family is about three to four people; and the per capita family annual income in 2018 was approximately 10,000 yuan.

The definitions and assignments of the above variables are detailed in Table 3.

RESULTS AND DISCUSSION

Considering the possibility of collinearity between variables, the variance inflation factor (VIF) was used to diagnose collinearity before regression. There is generally deemed to be no serious collinearity between variables when the VIF is less than or equal to 5. The results show that the maximum value of the VIF is 1.47 and the mean value is 1.17, indicating that the principle of independence between the variables is satisfied.

Regression Results

In this study, Stata 16.0 statistical software was used to conduct the multivariate disordered logit regression analysis, and the results are shown in Table 4. To test the impact of institutional trust and environmental attitudes on farmers' preference for participating in household waste management, core explanatory and control variables are gradually introduced into Regressions 1–3. The estimation results show that after introducing institutional trust, environmental attitude, and control variables simultaneously, the −2 times logarithmic likelihood function value of Regression 3 drops from 1201.303 to 1150.838, and Pseudo R^2 increases from 0.0251 to 0.0661. Compared with Regression 1, the explanatory power of the model was improved and Regression 2 was superior. In addition, the results of regressions 1–3 show that the parameter estimates and significance of the core explanatory variables were similar. The following analysis is based on the estimation of Regression 3.

Institutional trust has a positive impact on the

Table 2. Original Indexes of Exploratory Factor Analysis

Category	Description	Mean	SD
Institutional trust	Trust in the local government: 1 = Distrust; 2 = General; 3 = Trust	1.671	0.898
	Trust in laws and regulations: Assigned as above	2.306	0.878
	Trust in village cadres: Assigned as above	2.549	0.674
Environmental attitude	If I do something that wastes resources or pollutes the environment, I will feel very guilty: 1 = Disagree; 2 = General; 3 = Agree	1.358	0.656
	Human beings should protect nature and live–in harmony with nature: Assigned as above	2.441	0.806
	I will take the initiative to understand some of the current environmental problems: Assigned as above	2.927	0.324

Table 3. Data Description

Variables	Definition and assignment	Mean	SD
Dependent Variable			
Preferred participation method	0 = No participation; 1 = Labor-only; 2 = Payment–only; 3 = Labor–and–payment	2.380	0.925
Core Independent Variables			
Institutional trust	Principal component standardization score	0.000	1.000
Environmental attitude	Principal component standardization score	0.000	1.000
Family characteristics			
Permanent population	Actual population	3.647	1.727
Per capita annual income (yuan)	1 = 10,000 and below; 2 = 10,001 ~ 20,000; 3 = 20,001 ~ 30,000; 4 = More than 30,000	0.976	1.110
Personal characteristics			
Gender	0 = Female; 1 = Male	0.483	0.500
Age (years old)	Actual age	50.356	15.942
Education level	1 = Primary school and below; 2 = Junior high school; 3 = High school; 4 = High school or above	2.598	1.028
Party member or village cadre	0 = No; 1 = Yes	0.149	0.356

Table 4. Results of the Multinomial Logit Model

Variables	Regression 1			Regression 2			Regression 3		
	Labor–only	Payment–only	Labor–and–payment	Labor–only	Payment–only	Labor–and–payment	Labor–only	Payment–only	Labor–and–payment
Institutional trust	0.307*	0.705***	0.751***	0.292	0.691***	0.735***	0.280	0.662***	0.713***
	(–0.184)	(–0.172)	(–0.155)	(–0.185)	(–0.173)	(–0.157)	(–0.191)	(–0.178)	(–0.163)
Environmental attitude				0.411**	0.437**	0.554***	0.377*	0.460**	0.556***
				(–0.191)	(–0.171)	(–0.157)	(–0.203)	(–0.182)	(–0.169)
Permanent population							0.0716	–0.226*	–0.138
							(–0.124)	(–0.116)	(–0.107)
Per capita annual income							0.490*	0.584**	0.640***
							(–0.266)	(–0.248)	(–0.240)
Gender							–0.196	–0.276	–0.500
							(–0.441)	(–0.403)	(–0.376)
Age							–0.322*	–0.256	–0.397***
							(–0.175)	(–0.162)	(–0.153)
Education level							–0.0337	0.12	0.0591
							(–0.248)	(–0.225)	(–0.210)
Party member or village cadre							0.399	0.667	0.887
							(–0.782)	(–0.701)	(–0.669)
Constant	0.542**	1.318***	2.399***	0.657***	1.434***	2.512***	1.713	2.834**	4.420***
	(–0.229)	(–0.206)	(–0.192)	(–0.241)	(–0.219)	(–0.207)	(–1.338)	(–1.233)	(–1.157)
–2 Loglikelihood	1201.303			1188.569			1150.838		
LR (P > chi^2)	30.97 (0.000)			43.70 (0.000)			81.43 (0.000)		
Pseudo R^2	0.0251			0.0355			0.0661		

Notes: *The values in parentheses are standard errors; *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.*

choice of payment–only and labor–and–payment at the 1% significance level but has no significant effect on the choice of labor–only. This means that farmers who trust the system are more inclined to choose payment–only or labor–and–payment, which is consistent with the research results of Zhang *et al.* (2021) and Dong *et al.* (2020). A possible explanation is that the higher the level of farmers' recognition of the organization and coordination of the local government, the normative guidance of laws and regulations, and the competence of village cadres, the higher the level of trust in the current systems and policies related to household waste management in the village. The more optimistic the prospect of household waste management, the more willing farmers are to participate in rural household waste management in the form of payment–only or labor–and–payment. In addition, farmers with trust in the system are more likely to show reciprocity in collective action and believe that choosing to participate in the form of payment–only or labor–and–payment is more conducive to the success of collective action (Nordlund and Garvill, 2002).

The coefficients of environmental attitude variables passed significance tests at the 10%, 5%, and 1% levels and were positively correlated with farmers' labor–only, payment–only, and labor–and–payment choices, respectively; that is, all other things being equal, the stronger the farmers' emotional experience of environmental behavior, the deeper their knowledge of the relationship between humans and nature, and the higher their concern for environmental issues, the more likely they were

to choose to participate in household waste management, which is similar to the findings of Xu and Qiu (2016) and Wang (2020). A possible explanation is that with the rapid development of the economy, science, and technology in recent years a series of environmental problems, such as global warming, land desertification, and garbage disasters, have been aggravated, prompting people to pay attention to environmental issues. At the same time, governments at all levels and environmental protection organizations are trying to strengthen environmental education and popular science publicity through various methods to guide the public to form a correct attitude toward the environment. Therefore, when holding a positive attitude toward the environment, farmers hope that the ecological environment can be treated in a friendly manner and are more willing to take action to protect the environment and participate in rural household waste management.

The household resident population passed the test at a significance level of 10% for the payment–only option, and the coefficient was negative, indicating that when controlling for other factors, the smaller the household resident population, the more willing they were to participate in household waste collection by paying only. A reasonable explanation is that the smaller the permanent resident population of the family, the less labor capital and the higher the opportunity cost of participating in rural household waste management through labor; farmers will then be more inclined to pay instead of providing labor input. At the statistical levels of 10%,

5%, and 1% of annual household per capita income, there is a significant positive impact on labor–only, payment–only, and labor–and–payment options. A reasonable explanation is that farmers with higher per capita annual incomes generally have a higher demand for a good living environment and thus show greater enthusiasm for participating in rural household waste management. The age variable is statistically significant at the 10% and 1% levels and is negatively correlated with farmers' choice of labor–only and labor–and–payment, indicating that the older the respondents, the more likely they are to choose not to participate. A reasonable explanation for this is that older farmers are generally conservative in thinking, have poor physical strength, and have few sources of income. Therefore, they are more likely to choose not to participate in household waste management.

Marginal Effect Analysis

To identify the degree of influence of each variable on farmers' preference for participating in the choice of household waste management methods, this study further estimated the marginal effects of each variable in Regression 3, and the results are shown in Table 5. The results show that institutional trust significantly reduces the probability that farmers do not participate in household waste management and only participate in labor, and significantly increases the possibility of farmers choosing both labor and payment, while environmental attitudes significantly reduce the probability of farmers not participating in household waste management and significantly increase the probability of farmers choosing both labor and payment. In addition, when the permanent population of a rural household increases by one unit, the probability of choosing labor–only and payment–only increases by 1.90% and decreases by 2.03%, respectively; when the per capita annual income of a rural household increases by one unit or the probability of choosing not to participate and labor–only increases by one unit, the probability of payment decreases by

3.43% or increases by 3.77%, respectively. When the age of farmers increases by one unit, the probability of no participation and labor–and–payment increases by 2.00% and decreases by 3.62%, respectively. Therefore, the key is to give full play to the dominant position of farmers in rural household waste management and to cultivate and strengthen institutional trust and positive environmental attitudes.

Robustness Test

First, considering the impact of different regression models on the regression results, we replaced the multivariate disordered logit regression model with a multivariate disordered probit regression model for robustness testing. The results of Regression 4 in Table 6 show that after controlling for family and personal characteristics, institutional trust has a significant impact on farmers who choose payment–only and labor–and–payment but has no significant impact on farmers who choose labor–only; both labor–only and labor–and–payment households have very significant positive effects. This is the same as the result of Regression 3, confirming that the above analysis results are more robust.

Second, it is usually held that the physical fitness and income level of the elderly begins to decline in the "60th year," making them unwilling to engage in too much environmental protection behavior (He *et al.*, 2015). Therefore, environmental governance should be implemented mainly for working and income–age populations. To further test the influence of sample selection on the robustness of the estimation results, this study excludes the samples of women over 55 years old and men over 60 years old from the sample data. After controlling for family and personal characteristic variables, the statistics for the remaining 425 sample data points were re–calculated. The results of the multivariate unordered logit regression (see Regression 5 for results) show that when the elderly respondents in the sample are removed, institutional trust has a significant positive impact on the choice of payment–only and labor–and–

Table 5. Marginal Effects of Multinomial Logit Model

Participation method	No participation	Labor–only	Payment–only	Labor–and–payment
Institutional trust	−0.0359*** (−0.009)	−0.0307*** (−0.012)	0.0102 (−0.017)	0.0564*** (−0.019)
Environmental attitude	−0.0287*** (−0.009)	−0.0088 (−0.012)	−0.0043 (−0.017)	0.0417** (−0.020)
Permanent population	0.0072 (−0.006)	0.0190*** (−0.007)	−0.0203** (−0.010)	−0.0059 (−0.012)
Per capita annual income	−0.0343** (−0.014)	−0.0062 (−0.012)	0.0029 (−0.015)	0.0377** (−0.019)
Gender	0.0226 (−0.021)	0.0178 (−0.025)	0.0234 (−0.035)	−0.0637 (−0.040)
Age	0.0200** (−0.009)	0.0002 (−0.009)	0.0161 (−0.013)	−0.0362** (−0.015)
Education level	−0.0034 (−0.012)	−0.0089 (−0.015)	0.0127 (−0.019)	−0.0004 (−0.023)
Party member or village cadre	−0.043 (−0.038)	−0.0306 (−0.042)	−0.0139 (−0.049)	0.0875 (−0.060)

Notes: *The values in parentheses are standard errors; *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.*

Table 6. Robustness Test

Variables	Regression 4			Regression 5			Regression 6		
	Labor–only	Payment–only	Labor–and–payment	Labor–only	Payment–only	Labor–and–payment	Labor–only	Payment–only	Labor–and–payment
Institutional trust	0.166	0.411***	0.477***	0.318	0.749***	0.753***	0.202	0.706***	0.695***
	(–0.123)	(–0.116)	(–0.109)	(–0.246)	(–0.243)	(–0.222)	(–0.268)	(–0.251)	(–0.225)
Environmental attitude	0.240*	0.285**	0.373***	0.430*	0.442*	0.691***	0.402**	0.483***	0.579***
	(–0.129)	(–0.118)	(–0.112)	(–0.261)	(–0.248)	(–0.231)	(–0.201)	(–0.179)	(–0.165)
Control variable					Controlled				
Constant	1.019	1.703**	3.008***	2.975	4.747**	5.485***	0.971	0.814	2.418**
	(–0.806)	(–0.756)	(–0.724)	(–1.962)	(–1.875)	(–1.774)	(–1.363)	(–1.266)	(–1.163)
–2 Loglikelihood		1151.594			698.843			1162.701	
LR (P > chi^2)		(0.000)			59.77 (0.001)			69.57 (0.000)	
Pseudo R^2					0.0788			0.0565	

Notes: *The values in parentheses are standard errors; *, **, and *** indicate significance at 10%, 5%, and 1%, respectively.*

payment, but no significant effect on the choice of labor–only. This confirms that institutional trust and environmental attitudes can significantly increase farmers' preference for participating in household waste management, further indicating that the results of Regression 3 are relatively robust.

In addition, regarding the rural environment, farmers generally do not have direct dialogue with the government during the implementation of relevant systems and policies. Village cadres, as the "agents" of the government and farmers, bear the responsibility of conveying the spirit of government policies, assisting the implementation of specific measures, and reflecting the opinions and appeals of farmers. Therefore, this study selected only farmers' trust in village cadres to represent institutional trust. The results of Regression 6 show that the parameter estimation results for each variable are consistent with those of Regression 3. Therefore, the above tests confirm that the results of this study are robust.

CONCLUSIONS

Farmers are generators of rural household waste, and they are also the main force in waste management and the beneficiaries of treatment. Therefore, clarifying the mechanisms of farmers' preferred methods to participate in household waste management is beneficial for improving relevant systems and policies. Institutional trust, as a way for farmers to feel, evaluate, and anticipate the government's ability to govern and implement policies, has a significant impact on farmers' choices. Environmental attitudes can also affect farmers' pro–environmental intentions and behaviors through subjective constraints. Therefore, using micro–survey data from 592 rural households in four counties and districts of Shaanxi Province, this study empirically tested the effect of institutional trust and environmental attitudes on the preference of farmers to participate in household

waste management through a multivariate disordered logit regression model. The main results are as follows:

Rural households are more willing to participate in rural household waste management and are more willing to participate in the form of labor and payment. Among the survey samples, the proportions of farmers who chose not to participate, labor–only, payment–only, and labor–and–payment were 6.93%, 10.14%, 20.95%, and 61.99%, respectively, indicating that most farmers currently have a strong yearning for a better living environment and are willing to participate in rural household waste management to improve the living environment in rural areas.

Institutional trust significantly enhanced farmers' preference for participating in household waste management. The research results show that institutional trust has no significant impact on the choices of labor only but has a significant impact on payment–only and both labor and payment at a statistical level of 1%, indicating that trust in the local government, laws, and regulations, and village cadres is higher. The better farmers expect the effectiveness of household waste management to be, the more prefer they are to participate in household waste management by paying only or paying for labor.

Environmental attitudes significantly enhanced farmers' preference for participating in household waste management. The results show that the impact of environmental attitudes on the choices of labor–only, payment–only, and labor–and–payment is significant at the 10%, 5%, and 1% levels, respectively, indicating that among farmers who have a correct environmental worldview and can clearly understand environmental issues, awareness of environmental protection is stronger and enthusiasm for participating in the treatment of rural household waste is higher.

The permanent population and age had significant negative effects on the preference of farmers for the household waste management, and the per capita annual household income significantly and positively affects the

preference of farmers to participate in rural household waste management. Compared to low–income families, high–income families are more willing to participate in rural life in the form of labor–only, payment–only, labor–and–payment garbage management, and to devote time and energy to ensuring a better living environment.

To guide farmers to actively participate in household waste management and further promote the centralized improvement of rural human settlements, this study draws the following policy implications:

Improving farmers' participation system in rural household waste management. The single–participation method of rural household waste management is one of the main reasons for the low participation of farmers. Relevant departments should respect the needs and wishes of farmers and establish and improve a diversified farmers' participation system at the level of laws and regulations, which will play a decisive role in improving the effectiveness of rural household waste management and realizing a good vision of villagers' self–government.

Strengthening farmers' institutional trust and cultivating an environment of institutional trust. The local government should strengthen the governance system and governance capacity building and improve information transparency in the process of policy implementation; farmers should have a voice and sense of participation when formulating relevant laws and regulations; village cadres should perform their duties in earnest; go deep into the masses; improve the trust level of farmers in village cadres; cultivate an environment of trust in the system; and solidly promote household waste management.

Strengthen farmers' environmental education and guide them in forming correct and positive attitudes toward the environment. Governments at all levels should improve the environmental education system, strengthen environmental education for farmers through public service advertisements, cultural propaganda, and other means, and encourage farmers to further understand environmental pollution issues, especially the impact of household waste on the rural living environment and the entire natural ecosystem. This will enhance farmers' awareness of environmental protection, stimulate and guide farmers to form a correct environmental attitude, and increase their enthusiasm for participating in household waste management.

Give full play to the role of young people and small–scale families and actively guide farmers to start businesses and increase their income. Strengthening environmental education for young people and small–scale families can more fully mobilize their enthusiasm for participating in household waste management, and improve the level of environmental governance and governance benefits; the increase in household per capita income will increase farmers' requirements for the quality of the living environment and increase farmers' participation. Education is the internal driving force of environmental governance, reducing policy resistance, and realizing the smooth progress of rural household waste management.

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