

FARMERS' HOUSEHOLD WASTE DISPOSAL BEHAVIOR AND ITS INFLUENCING FACTORS IN DEVELOPING COUNTRIES: EVIDENCE FROM JIANGSU, CHINA

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Abstract. The improper disposal of household waste is a major reason for the deterioration of rural ecological environment in developing countries. As the main producer of rural household waste, farmers' behavior is very important to solve the problem. Based on the data of 671 surveys in Jiangsu, China, the influencing factors of farmers' household waste disposal behavior and their hierarchical relationships were determined by Logit-ISM model. The study finds that there are 7 factors that significantly affect household waste disposal behavior of farmers, among which Major domestic fuel, Clearance of centralized waste dump site and Neighbor's way of disposing household waste are the surface factors; Identifying capacity for pollutants, Major economic source and Availability of centralized waste disposal facility are the intermediate factors; Fixed-point waste disposal policy and its implementation effect is the deep-rooted factor.

Keywords: *farmer household behavior, Lewin's behavior model, Logit model, ISM method, sorted reachability matrix, interpretative structure model*

Introduction

The construction of ecological civilization has increasingly become a hot topic of common concern to mankind. All countries in the world are committed to exploring the road of harmonious coexistence between human and nature. Due to the dominant position of developed countries, relevant organizations and associations mainly focused on the prevention and control of industrial pollution and urban pollution (Petruaru and Gavrilescu, 2010; Gong et al., 2019), and less on rural environmental issues. However, for the vast majority of developing countries, rural areas are the largest hinterland of biological resources, carrying the majority of the country's population. Construction of rural ecological civilization occupies a more fundamental position. In the past, kitchen residues were the main part of rural household waste, which was recycled reasonably, resulting in little pollution to the surrounding environment. In recent years, with the rise of the economy in developing countries, the consumption structure of rural residents has changed greatly. As a result, the composition of rural household waste becomes more complex. Plastic products, electronic waste and other non-decomposable items are becoming more common (Hakami and Seif, 2015; Du et al., 2018). The original self-purification ability of rural areas can hardly play an effective role. The impact of household waste on rural ecological environment is becoming increasingly serious.

This phenomenon is particularly prominent in China. Due to the long-standing views of farmers, it is quite common for waste to be dumped at will, resulting in serious soil pollution (Zeng et al., 2018), water pollution (Zhang et al., 2013) and air pollution (Jin et al., 2006). Ultimately, the health of villagers has been damaged. It can be seen that the control of household waste discharge arbitrarily is a very important task. However, the current rural household waste management method is a government-dominant model, which marginalizes farmers and makes them spectators, passives and even adversaries. It needs to be deeply realized that farmers are not only the producers of household waste, but also the direct victims of the pollution. Farmer should be the core subject of the governance of rural environmental problems. However, previous studies mainly focused on the productive environmental behavior of farmers, and paid less attention to the impact of farmers' daily life behavior on the environment.

This paper analyses the impact of farmers' daily life behavior on the environment from their perspective, which is not only related to the quality of life of 900 million rural populations in China, but also directly affects the sustainable development of China's economy. Meanwhile, as a representative of developing countries, China's rural household waste disposal problem is a microcosm of the same problem in developing countries. This study can provide new ways for other developing countries to promote rural ecological environment construction.

Theoretical basis and variable selection

Theoretical basis

Since the 1960s, the process of industrialization and urbanization has been accelerating. Environmental protection has gradually become a consensus of mankind. Sociological circles have begun to pay close attention to this problem. In 1978, American sociologists Catton and Dunlap published their paper *Environmental Sociology: A New Paradigm*, which clearly pointed out that Environmental Sociology should focus on the interaction between environment and human society. Subsequently, the famous Japanese sociologist Torigoe Hiroyuki emphasized that the subject of environmental pollution is human itself. Meanwhile, Kurt Lewin pointed out that individual behavior is the product of the interaction between individual and environment. He put forward the famous Lewin behavior model, namely $B = F(P, E)$, in which B is human behavior; P is the internal condition and characteristics of an individual, E refers to the external environment. Lewin's behavior model provides a solid theoretical basis for people to explore human behavior including environmental behavior.

Variable selection

With the comprehensive study of scholars, based on Lewin behavior model, this paper analyses the influencing factors of farmers' household waste disposal behavior from the perspectives of personal and environment. Personal factors can be divided into physiological characteristics and psychological characteristics. Physiological characteristics are age, gender and cadre status; psychological characteristics include recognition of fixed-point waste disposal, perception of the surrounding environment, and knowledge of environmental protection. Environmental factors can be divided into family environment, social environment and natural environment. Family environment

includes education environment and business environment; social environment includes propaganda and education, incentive and punishment, policy system, organizational setting, infrastructure and social culture; natural environment in this paper mainly refers to geographical location. Variable selection and measurement are shown in *Table 1*.

Table 1. Variable selection and measurement

	Variable	Variable measurement and assignment
X1	Sex (Schahn and Holzer, 1990)	Male=0; Female=1
X2	Age(Yang et al., 2017)	18-24 years old=1; 25-34 years old=2; 35-44 years old=3; 45-54 years old=4; 55-64=5
X3	Cadre status(Yang et al., 2017)	Yes=0; No=1
X4	Cognition of the necessity of fixed-point disposal of waste (Bamberg, 2003; Oyekale, 2018)	Absolutely unnecessary=0; Unnecessary=1; Uncertainty=2; Necessary; Extremely necessary=3
X5	Cognition of the hazard of household waste disposal at will (Yokoo et al., 2018)	No influence=0; Less influence=1; Uncertainty=2; Some influence=3; Great influence=4
X6	Satisfaction degree of the sanitary environment of your villages(Wang and Kang, 2019)	Extremely satisfactory=0; Basic satisfactory=1; Uncertainty=2; Dissatisfaction=3; Extremely unsatisfactory=4
X7	Attention to environmental protection information(Arcury, 1990; Estrada et al., 2017)	Attention at all times=0; Constant attention=1; Occasional attention=2; Little attention=4
X8	Identifying capacity for pollutants(Milfont, 2012)	Extremely agree=0; Basic agree=1; Uncertainty=2; Disapproval=3; Extremely disapproval=4
X9	Family educational level(Poortinga et al., 2003; Ma et al., 2009)	Uneducated=1; Primary=2; Junior=3; Senior/Secondary=4; College/Undergraduate=5; Graduate and above=6
X10	Family annual income(Dorina, 2016)	Less than 50K=1; 50-100K=2; 100-150K=3; 150-200K=4; 200K or more=5 (1K=1000CNY)
X11	Number of migrant workers(Jiang and Yuan, 2013)	According to the specific data value of the survey
X12	Major domestic fuel(Han et al., 2018)	Coal=Wood=Straw and other wilting crops=0; Liquefied gas=Electricity=1
X13	Major economic source(Ma et al., 2009)	Farming income=0; Wage income=1
X14	Advocacy on the benefits of designated waste disposal(Steg, 2008; Hakami and Seif, 2015)	Frequent publicity=0; Occasional publicity=1; Unclear=2; Seemingly no=3; Completely no=4
X15	Call for fixed-point waste disposal(Miliute-Plepiene et al.,2016; Seacat and Boileau, 2018)	Frequent call=0; Occasional call=1; Unclear=2; Seemingly no=3; No call at all=4
X16	Management of discarding waste at will(Li et al., 2016)	Ignorance=0; Verbal warning=1; Notification of criticism=2; Fine=3
X17	Fixed-point waste disposal policy and its implementation effect(Refsgaard and Magnussen, 2009; D'Amato et al., 2016)	Yes, the implementation effect is good=0; Yes, but the implementation effect is not good=1; Yes, but no specific implementation=2; Not very clear=3; No relevant measures=4
X18	Inspection of fixed-point waste recycling(Hage et al., 2018)	Frequent check=0; Occasional check=1; Unclear =2; As if no check=3; No check at all=4
X19	Setting up of professional waste disposal departments or full-time personnel(Guagnano et al., 1995)	Never=0; Occasionally=1; Always=2
X20	Availability of centralized waste disposal facility (Young et al., 1990; Abbott et al., 2013)	Yes=0; No=1
X21	Distance to centralized waste disposal facilities(Jenkins et al., 2003; Struk, 2017)	Very close=0; Slightly distant=1; Far away=2
X22	Clearance of centralized waste dump site (Kuo and Perrings, 2010; Lee et al., 2017)	Irregular, Long intervals=0;Regular, low frequency=1;Regular, high frequency=2
X23	Neighbor's way of disposing household waste (Videras et al., 2012; Czajkowski et al., 2017)	Throw it in front of or behind the house=Pour into the riverside, roadside or ditch=Open storage=Open burning=Landfill nearby=0; Use waste as fertilizer=Sell off after classification =Transport to designated waste pool=1
X24	Distance to the city center(Huang et al., 2012)	Very close=0;Slightly distant=1;Far away=2

Sample characteristics and research method

Sample characteristics

The data used in this study are from the field survey of 128 administrative villages in 13 cities of Jiangsu. 800 questionnaires were sent out and 726 were recovered. After eliminating the invalid information questionnaire, 671 valid questionnaires remained, with an effective rate of 83.9%. According to the basic characteristics of the sample, 453 were women, accounting for 68%; population under 35 years old accounted for 72%; family members with the highest degree of university or above accounted for 35%; nearly half of the annual family income is 50,000-100,000 CNY. The household waste disposal behavior of sample farmers is shown in *Fig. 1*. Generally speaking, majority of rural households can properly dispose of household waste.

Research method

Logit model

There are two ways for household garbage disposal: random and proper, which belong to the typical binary variables. Therefore, Logit Model should be adopted. The derivation of the model is as follows. The actual reaction variable is y_k , with a value of 0 and 1. Explanatory variables are represented by x_k , and error is represented by ε_k . Assuming that there is a linear relationship between y_k^* and x_k , namely (*Eq. 1*)

$$y_k^* = \alpha + \beta x_k + \varepsilon_k \quad (\text{Eq.1})$$

There is a critical point c , when $y_k^* > c$, then $y_k=1$, when $y_k^* \leq c$, then $y_k=0$. Assuming that the critical point $c = 0$, the error term ε_k obeys Logistic distribution and its cumulative distribution function is $F(\cdot)$, and p_k is the probability of occurrence of case k , there is (*Eq. 2*):

$$\begin{aligned} p_k &= P(y_k = 1 | x_k) = P[(\alpha + \beta x_k + \varepsilon_k) > 0] \\ &= P(\varepsilon_k > -\alpha - \beta x_k) \\ &= F(\alpha + \beta x_k) \\ &= \frac{\exp(\alpha + \beta x_k)}{1 + \exp(\alpha + \beta x_k)} \end{aligned} \quad (\text{Eq.2})$$

After logarithmic transformation, the above formula can be transformed into *Eq. 3*:

$$\ln\left(\frac{p_k}{1 - p_k}\right) = \alpha + \beta x_k \quad (\text{Eq.3})$$

Among them, p_k is the probability of occurrence of case k . It is a non-linear function consisting of the explanatory variable x_k . When there are N independent variables, the binary regression model and its logarithmic transformation are shown in *Eq. 4* and *Eq. 5*, respectively.

$$p_k = P(y_k = 1 | x_{1k}, x_{2k}, \dots, x_{nk}) = \frac{\exp\left(\alpha + \sum_{n=1}^N \beta_n x_{nk}\right)}{1 + \exp\left(\alpha + \sum_{n=1}^N \beta_n x_{nk}\right)} \quad (\text{Eq.4})$$

$$\ln\left(\frac{p_k}{1 - p_k}\right) = \alpha + \sum_{n=1}^N \beta_n x_{nk} \quad (k=1, 2 \dots K, n=1, 2 \dots N) \quad (\text{Eq.5})$$

For this study, p is the probability of household waste disposal properly, $1-p$ is the probability of household waste disposal randomly; α is the constant of regression equation of various factors; β_i is the coefficient of regression equation of various factors; x_i is a variety of influencing factors; n is the number of influencing factors. Maximum likelihood (ML) is generally used to estimate the parameters. For case i , there is a distribution function (Eq. 6):

$$p(Y_i) = p_i^{Y_i} (1 - p_i)^{1 - Y_i} \quad (\text{Eq.6})$$

Then the logarithmic likelihood function is (Eq. 7):

$$\begin{aligned} l(\beta) &= \sum_{i=1}^n (Y_i \ln p_i + (1 - Y_i) \ln(1 - p_i)) \\ &= \sum_{i=1}^n \left(Y_i \ln \frac{p_i}{1 - p_i} + \ln(1 - p_i) \right) \\ &= \sum_{i=1}^n (Y_i (X_i \beta) - \ln(1 + \exp(X_i \beta))) \end{aligned} \quad (\text{Eq.7})$$

In order to estimate the value of β , we can derive the partial derivative of $l(\beta)$ over β and make it equal to 0 (Eq. 8):

$$\begin{aligned} \frac{\partial l(\beta)}{\partial \beta_1} &= \sum_{i=1}^n \left(Y_i - \frac{X_i \beta}{1 + \exp(X_i \beta)} \right) = 0 \\ \frac{\partial l(\beta)}{\partial \beta_j} &= \sum_{i=1}^n \left(Y_i - \frac{X_i \beta}{1 + \exp(X_i \beta)} \right) X_{ji} = 0, \quad j = 2, \dots, k \end{aligned} \quad (\text{Eq.8})$$

ISM method

ISM method can transform vague ideas into well-structured models by using people's knowledge as well as the help of computer (Warfield, 1974). The main steps of ISM method are as follows. Step 1: Drawing the corresponding digraph according to Boolean operation. Then, constructing adjacent matrix A. Where a satisfies Eq. 9. Step 2: Establishing the reachable matrix M. Operations are defined as Eq. 10. Step 3: Obtaining reduced matrix of reachable matrix. Step 4: The reduced matrix is processed hierarchically, and the interpretative structure model is obtained.

$$a_{ij} = \begin{cases} 1, S_i RS_j, R \text{ says } S_i \text{ has a relationship with } S_j \\ 0, S_i \overline{RS}_j, \overline{R} \text{ says } S_i \text{ has no relationship with } S_j \end{cases} \quad (\text{Eq.9})$$

$$\text{if } (A+I)^r = (A+I)^{r+I} \neq (A+I)^{r-I}, M = (A+I)^r \quad (\text{Eq.10})$$

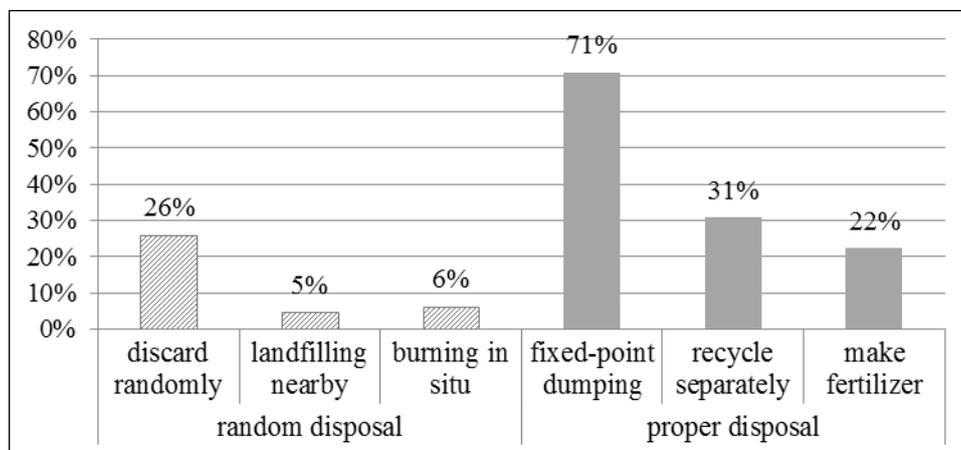


Figure 1. Household waste disposal behavior of sample farmers

Results and discussions

Logit model regression results

Firstly, we consider the relationship between all independent variables and dependent variables separately, screen out some variables that may not be meaningful, and then conduct multivariate analysis. Results shown in Model 1 in Table 2 indicate that variables that may have statistical significance include: X1, X4, X6, X7, X8, X12, X13, X14, X15, X16, X17, X18, X19, X20, X21, X22, X23, and X24. Secondly, after eliminating the insignificant variables, the variables other than X21 and X22 are put into the Logit model according to Forward: LR rules. As shown in Model 2 in Table 2, six variables have passed the significance test (Eq. 11).

$$y = \ln\left(\frac{p}{1-p}\right) = 0.602 - 0.368 \times X8 + 0.462 \times X12 + 0.623 \times X13 - 0.311 \times X17 - 0.735 \times X20 + 1.516 \times X23 \quad (\text{Eq.11})$$

The regression results show that: The stronger the identifying capacity for pollutants, the better the household waste can be properly disposed of. Farmers who choose traditional fuels are more likely to dispose waste randomly. Farmers with wages as the main source of livelihood are more inclined to properly dispose of household waste. The village has a fixed-point waste disposal policy and the implementation effect is good, farmers are more likely to show standard waste disposal behavior, and vice versa. Whether there is a centralized waste disposal facility is closely related to the farmers' household waste disposal behavior. If neighbors can take appropriate disposal ways, farmers themselves tend to adopt the similar ways.

Table 2. Logit model regression results

Factor	Model1	Sig.	Model2	Sig.	Model3	Sig.
	B		B		B	
X1	0.508***	0.006		0.111		
X2	-0.021	0.874	-	-		
X3	0.001	0.996	-	-		
X4	0.162**	0.015		0.446		
X5	-0.094	0.103	-	-		
X6	-0.287***	0.001		0.716		
X7	-0.337***	0.005		0.338		
X8	-0.347***	0.008	-0.368**	0.015	-0.500	0.006
X9	-0.175	0.118	-	-		
X10	-0.067	0.435	-	-		
X11	0.143	0.180	-	-		
X12	0.957***	0.000	0.462**	0.048	0.562	0.046
X13	1.254***	0.000	0.623***	0.007	0.825	0.002
X14	-0.564***	0.000		0.433		
X15	-0.644***	0.000		0.087		
X16	-0.585***	0.000		0.183		
X17	-0.587***	0.000	-0.311***	0.001	-0.171	0.170
X18	-0.603***	0.000		0.346		
X19	0.843***	0.000		0.797		
X20	-1.880***	0.000	-0.735***	0.005		
X21	-0.694***	0.003				0.231
X22	0.805***	0.000			0.508***	0.003
X23	1.987***	0.000	1.516***	0.000	1.341	0.000
X24	-0.573***	0.000		0.085		

In the above analysis, X20 has passed the significant test, so it is necessary to further test the significance of Distance to centralized waste disposal facilities (X21) and Clearance of centralized waste dump site (X22). Firstly, 546 data are obtained by eliminating the NONE data selected under the variable X20. Then the other five variables selected by multivariate Logit analysis are used as control variables, and X21 and X22 are used as independent variables. As shown in Model 3 in Table 2, X22 passed the significant test. The more timely the disposal of waste centralized dump site is, the more appropriate waste disposal behavior can be promoted. X21 had no significant impact on Y. In conclusion, seven variables, X8, X12, X13, X17, X20, X22 and X23, have significant effects on household waste disposal behavior of farmers.

ISM model analysis results

In order to further determine the logical relationship and hierarchical structure among the seven factors identified above, this paper uses S1, S2, S3, S4, S5, S6 and S7 to represent those seven significant factors, namely Identifying capacity for pollutants (S1), Major domestic fuel (S2), Major economic source (S3), Fixed-point waste disposal policy and its implementation effect (S4), Availability of centralized waste disposal facility (S5), Clearance of centralized waste dump site (S6) and Neighbor's way of disposing household waste (S7). Combining the experience knowledge of experts, the logical relationship among the factors is determined (Fig. 2a). V denotes that row elements influence column elements; A indicates that column elements affect row elements; O indicates that there is no relationship between rows and columns. Then, the reachable matrix is obtained (Fig. 2b). Seven factors can be divided into three layers.

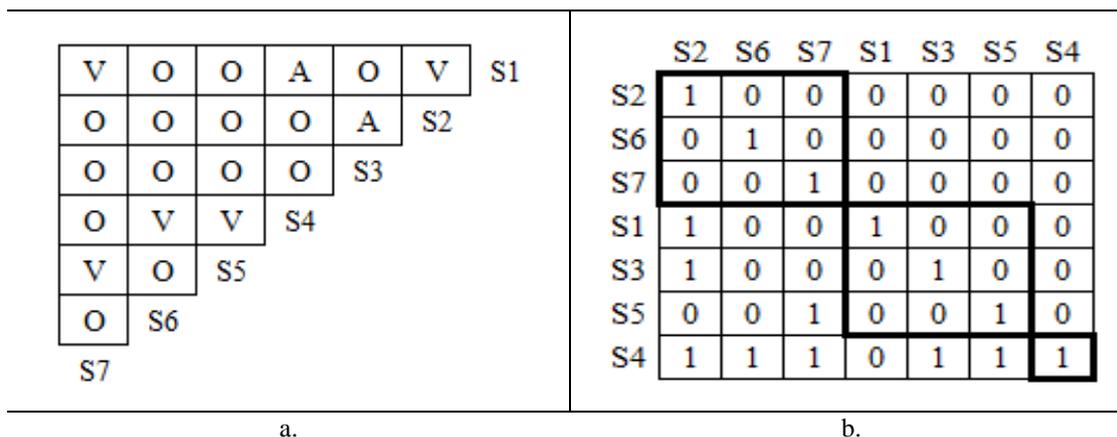


Figure 2. Logical relationship among the factors and sorted reachability matrix

As can be seen from Fig. 3, variables at different levels have different effects on Y. Specifically: At the bottom is S4, which runs through almost all the important parts of the model and becomes the deep-seated root cause of affecting household waste disposal behavior of farmers. S1, S3 and S5 are located in the middle layer, which are important factors affecting Y. Moreover, the influence mode of S3 has certain independence. At the first level are S2, S6, and S7, which have direct impact on farmers' household waste disposal behavior. Meanwhile, S2 is affected by both S1 and S3 from the middle layer, and S7 is affected by S5.

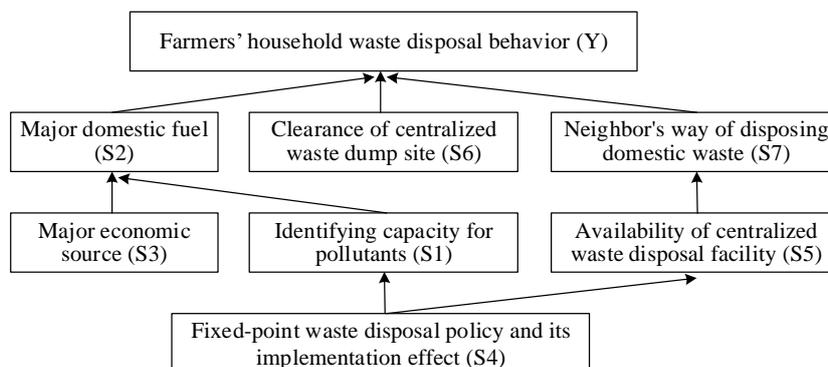


Figure 3. Interpretative structure model of influencing factors

Result discussion

As far as the physiological characteristics of farmers are concerned, Age (X2) and Cadre status (X3) have not passed the significant test, which is inconsistent with the research results of Yang et al. (2017). The reason may be that the development of the Internet has reduced the space-time distance, enabling everyone to receive information conveniently and timely, thus reducing the influence of individual differences. In univariate analysis, although Gender (X1) has a certain impact on the dependent variable, the impact of gender is weaker than other factors.

From the regression results of the psychological characteristics of farmers, only Identifying capacity for pollutants (X8) passed the significance test. On the one hand,

Jiangsu paid more attention to the problem of rural household waste disposal. It began to publicize the consequences of waste discarding at will earlier, giving farmers a certain understanding of fixed-point waste disposal. Therefore, the samples have a small difference in the recognition of the relevant factors. On the other hand, the impact of other variables representing farmers' psychological characteristics on Y may have been included in the impact caused by X8, so they failed to pass the significance test. In addition, farmers may have certain psychological pressure when filling in the questionnaires face-to-face. They fail to give an objective assessment of the environment, resulting in the insignificant of X6.

For the family environment, Family educational level (X9) failed to pass the significant test. The reason may be the education situation of rural students in China. In China, schools above junior high school are generally distributed in cities and towns with more developed economy. Rural students need to leave home for a long time, causing them to lack enough opportunities to influence others. Because of the petty farmer idea has not been completely eliminated in China, the improvement of economic conditions will not significantly promote farmers to adopt appropriate waste disposal behavior, resulting in the insignificant of X10. The reason why Number of migrant workers (X11) is not significant is that most families have less migrant workers, and the level of work is not very high.

In terms of social environment, the reason why X19, X14 and X15 are not significant is also because of Jiangsu has attached great importance to rural waste management, narrowing the gap between villages in terms of these factors. Meanwhile, propaganda, education and behavioral management measures can be regarded as part of the policy system. The impact of X14, X15 and X16 on dependent variable may have been included in the impact caused by Fixed-point waste disposal policy and its implementation effect (X17), so these variables have not passed the significance test, which is another possible reason why X19 is not significant.

The reason why Distance to the city center (X24) has not passed the significance test lies in Jiangsu's dense population. On the whole, the geographical space separation between rural and urban areas is not very large, thus the results of questionnaire show little difference in this factor, affecting the result of the significance test.

The intrinsic reasons for the influence of Major domestic fuel (X12) on Y are Major economic source (X13) and Identifying capacity for pollutants (X8). Families whose economic sources are mainly wages are relatively affected by the living habits of urban residents, and more likely to use modern living fuels. Moreover, farmers with wages as their main source of economy are more able to afford modern energy. Besides, the more familiar farmers are with environmental protection knowledge, the more willing they are to adopt pro-environmental behavior (Estrada et al., 2017), and more willing to use less polluted domestic fuels.

The impact of Fixed-point waste disposal policy and its implementation effect (X17) runs through the whole process. If the relevant policies can be promulgated and implemented, it can directly increase investment in waste centralized treatment facilities, increase the frequency of waste pool cleaning, and then promote farmers to adopt appropriate ways of household waste treatment. Meanwhile, X17 can promote the popularization of environmental protection knowledge in a wider range, so that more farmers are aware of the hazards of random disposal of household waste, and have the ability to identify pollutants. Therefore, they are more willing to make environmentally friendly behavior, such as using clean fuels.

Conclusions

Based on Lewin's behavior model and the data of 671 households in Jiangsu, this paper used Logit-ISM model to analyze farmers' household waste disposal behavior and its influencing factors. The results show that seven factors have significant effects on household waste disposal behavior, namely Identifying capacity for pollutants (X8), Major domestic fuel (X12), Major economic source (X13), Fixed-point waste disposal policy and its implementation effect (X17), Availability of centralized waste disposal facility (X20), Clearance of centralized waste dump site (X22) and Neighbour's way of disposing household waste (X23).

The stronger the ability of farmers to discriminate pollutants, the more willing they are to dispose of waste properly. Compared with the areas without fixed-point disposal policy of household waste, those have ones tend to show standardized disposal behaviour of household waste. In areas where centralized waste disposal facilities are available and can be cleaned in time, farmers tend to dispose of household waste properly. Using coal, wood and other traditional energy as main fuel and taking farming as the main source of livelihood have a certain negative impact on farmers' proper waste disposal behavior. Neighbors' disposal of household waste will have a strong assimilation effect on individual's behavior of household waste disposal.

At the same time, there are mutual influences among these seven significant factors. X17 is a deep-seated influencing factor, which has a root effect on farmers' household waste disposal behavior. X8, X13 and X20 are the middle factors. X13 has certain independent impact. X8 and X20 are the nodes that connect the deep factors with surface factors, and play a key intermediary role. X12, X22 and X23 have direct impact, belonging to surface factors.

Based on above conclusions, we put forward the following suggestions: First, establish a long-term mechanism of fixed-point treatment of rural household waste, strengthen the effect of policy implementation. Second, strengthen the propaganda of environmental protection knowledge, especially focusing on the popularization among farmers, and encourage them to replace traditional fuels with clean energy. Third, add waste collection and treatment facilities such as garbage cans, garbage tanks and garbage collection trucks, and clean up these facilities in time. Fourth, set up models, commend and reward villages achieving remarkable results in the treatment of household waste, giving full play to the exemplary driving effect.

Although this paper explored the influencing factors of farmers' household waste disposal behavior in Jiangsu Province and put forward the corresponding countermeasure proposals through qualitative and empirical research, due to time constraints and data acquisition constraints, the research still need to be further investigated. On the one hand, through the case study of typical villages, the impact degree of each influencing factor can be refined with the help of structural equation model, so as to further improve the effectiveness of the policy. On the other hand, future research can be done based on the theory of planned behavior (TPB) in social psychology, or from the perspective of A-B-C theory.

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