



Article Policy Cognition, Household Income and Farmers' Satisfaction: Evidence from a Wetland Ecological Compensation Project in the Poyang Lake Area at the Micro Level

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Abstract: The paper follows a field survey of 773 rural households in 14 towns in five prefectures (cities and districts) around the Poyang Lake, and uses a multivariate ordered logistic model to explore the factors influencing satisfaction with wetland ecological compensation policies (WECPs) from the perspective of rural households' subjective cognition of WECPs and income factors. The research shows the following. (1) the overall score for satisfaction of farmers with WECPs is 3.56, which indicates satisfaction between "fair" and "fairly satisfied," and there is room for policy optimization. (2) The subjective cognition of policies and the income-related factors have significant impacts on the satisfaction of farmers with WECPs. Among them, cognition of policy objectives, evaluation of compensation rates, timely distribution of compensations, government supervision, changes in household incomes and importance of compensation on households all have significant positive influences on policy satisfaction. (3) The degree of education, the proportion of household labor forces and the proportion of household non-agricultural incomes have a significant positive impact on the policy satisfaction of farmers. Therefore, in future policy implementation, we should strengthen publicity and guidance of the policy, raise compensation rates appropriately, strengthen government supervision, pay attention to rural livelihood, and establish an ecological compensation mechanism featuring fairness and long-term effectiveness.

Keywords: wetland ecological compensation; policy cognition; income-related factors; policy satisfaction; multivariate ordered logistic model

1. Introduction

Wetlands are unique natural complexes formed by the interaction between land and water, as well as the most biodiverse and ecologically functional ecosystems in nature [1–4]. Evidence suggests that wetlands can play an important role in addressing environmental issues, such as climate regulation, degradation of environmental pollution, flood storage, drought prevention, maintenance of biodiversity and others [5,6]. In recent years, with the booming population and the intensifying industrialization, wetlands have been excessively exploited and utilized. Ecological problems including the shrinkage of waters, has weakened capabilities of water storage and caused degradation of ecological functions, and the declining biodiversity seriously threatens China's ecological security and sustainable development [7,8]. To increase the economic incentives for wetland conservation, the Chinese government has implemented a series of ecological compensation policies in recent years [9]. For example, in 2014, based on the *Opinions of the State Council of the Central Committee of the Communist Party of China on Comprehensively Deepening Rural Reform and Accelerating Agricultural Modernization,* the government implemented a large-scale



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Copyright: © 2022 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). project that returned farmland to wetlands, and a pilot project that compensated for the ecological benefits of wetlands. Positive results were achieved after the implementation of ecological compensation policies: the livelihood of rural households improved [10], the area of wetlands expanded, and the ecosystem functions of wetlands were restored [11,12]. However, wetland shrinkage and ecological degradation are still common in China, and it is necessary to build upon the pilot experiences and improve the wetland ecological compensation policies [13,14].

As the ultimate implementers and direct beneficiaries of wetland ecological compensation, rural households' satisfaction with the policies depends on the difference between their needs and the benefits offered by the policies. Their satisfaction embodies a policy impact on their production and livelihood [15]. Evidence suggests that income is the most important factor influencing rural households' satisfaction with compensation policies [16,17]. Therefore, the extent to which the rural households' incomes are influenced by the compensation policy determine their satisfaction with the policies. At the same time, farmers' subjective cognition of the compensation policy, such as their understanding of the policy content and their evaluation of the policy effectiveness, can also affect their satisfaction [18,19].

Understanding the mechanisms behind rural households' satisfaction is vital for the sustainability of ecological compensation policies. However, compared to some developed countries such as the United States and Australia that have also introduced ecological compensation projects, developing countries such as China are still in the early stage, and the policy effects of ecological compensation projects remain to be discovered. In particular, there are still few studies based on micro-survey data. This paper attempts to use a novel dataset from a field survey in Jiangxi, China, to assess the impact of ecological compensation policies on rural households' satisfaction and influencing mechanisms in a quantitative way. The paper aims to provide a reference for improving wetland ecological compensation policies (WECPs).

2. Research Background

2.1. The Concept of Ecological Compensation

The ecological compensation implemented by the Chinese government in recent years can be regarded as a replica of the state-led PES mechanism. This mechanism encourages enterprises or individuals in sensitive areas to adopt more sustainable production and lifestyles through financial funds and project assistance. This approach has been widely used in the United States, Australia, Costa Rica and other countries, and provides a reference for coordinating economic growth with ecosystem services improvement. In regard to the structure of the compensation projects, the projects are implemented in a top-down manner with self-formed compensation compacts by local governments. Monetary compensation is still dominant, while non-monetary compensation methods such as industrial and project assistance are also implemented in different regions.

The government has great incentives to implement such ecological compensation schemes. On one hand, ecological compensation policies require quantifying the environmental costs of economic growth; those who damage the ecological environment must pay a corresponding price and those who protect the ecological environment receive an economic incentive. Ecological compensation represents a trade-off between economic and social development and ecological environmental protection. Therefore, ecological compensation and the PES mechanism share the same fundamental characteristics. On the other hand, ecological compensation has a different policy orientation from that of the PES mechanism. Since the 1980s, the share of agricultural production in China's national economy has been declining, and it is difficult to increase rural incomes through agricultural production alone. Therefore, the policymakers hope to enable farmers to improve their livelihood by adopting more eco-friendly agricultural production methods.

2.2. Rural Households' Attitudes and Influencing Factors

Rural households' attitudes toward the ecological compensation policy are related to the overall policy impact on their production and livelihood. Their attitudes directly influence their response and behaviors, which in turn impact policy effectiveness.

In recent years, there has been an increasing amount of literature on the issue of rural households' attitudes towards ecological compensation [20,21]. Research on willingness to participate and e satisfaction with the policy has been published [22,23]. Recent studies [24,25] have shown that farmers vary widely in terms of preferred compensation rates, compensation expectations and policy preferences due to cognitive heterogeneity. In addition, several studies suggest that economic, social and psychological features are related to satisfaction with the policy [26,27]. A study by Li et al. (2022) on grassland ecological compensation programs found significant differences in herders' policy satisfaction influenced by factors such as household income, payment cognition, and the size of household-owned grasslands [13]. Another study by Shen et al. (2022) on herders in Damao County, Inner Mongolia, showed that householders who were older and better educated, and who had lower incomes from livestock, larger grasslands and weaker social connections were more likely to participate in ecological compensation programs [28]. In southern China, forest ecosystems are the focus for ecological compensation projects. Thus far, several studies have highlighted factors that are associated with household satisfaction with forestry eco-compensation projects. A study by Zhang et al. (2019) on fallow forest return policies in tropical and subtropical China found that the farmers' willingness to participate was significantly influenced by the level of policy awareness and the area of fallow forests. If the farmer participated in other economic policies, he would expect a higher compensation rate compared with the current ones. Findings from several studies suggest that the age of householders, the proportion of income from forestry, the level of education, and the certificate of forest rights affect the level of satisfaction with the policy [19].

There is extensive literature on farmers' satisfaction with forest and grassland ecocompensation policies. However, few studies have focused on farmers' attitudes toward wetland eco-compensation policies. Given the importance of wetlands in China's ecosystems and the heterogeneity of farmers' livelihoods in wetland areas, it is necessary to conduct further research on the effects and factors influencing farmers' attitudes toward wetland compensation policies.

We constructed a multivariate ordered logistic model based on field research data from 773 rural households in 14 towns of five prefectures around the Poyang Lake area, with the aim of exploring how their subjective cognition and incomes impact their satisfaction with wetland ecological compensation policies. The paper is intended to provide a reference for improving wetland ecological compensation policies.

3. Data and Method

3.1. Data

We selected the Poyang Lake area as the target area. Located in the north of Jiangxi Province, the Poyang Lake is China's largest freshwater lake with rich biodiversity, as shown in Figure 1.

The lake serves as an important migration corridor and resting place for many rare migratory bird species. In 1992, the Poyang Lake Wetland was designated by China as a Wetland of International Importance, one of the first of six Wetlands of International Importance domestically. To protect the fishery resources and local ecology, the Poyang Lake has implemented a lake-wide fishing moratorium since 2002. In 2012, the provincial government issued the Regulations on the Protection of Wetlands in Jiangxi Province, clearly stating that people's governments above the county level should gradually improve the wetland ecological compensation mechanism. In 2014, China launched the first batch of pilot projects of wetland ecological compensation, and the Poyang Lake Reserve was among the pilot areas. Therefore, the Poyang Lake is a representative and typical study area.



Figure 1. Location of Jiangxi Province in China.

To make the research more representative, the research area was delineated to cover the prefectures and counties (townships) in the three core protection zones within the Poyang Lake watershed. Field research was conducted from 8–24 July 2019 in 27 villages from 14 counties (townships) in five prefectures (municipalities, districts) of Duchang, Lushan, Gongqingcheng, Yongxiu and Xinjian, as shown in Figure 2. Stratified random sampling was adopted in the research. Sample villages were randomly selected from counties (townships) in the three protection zones, and 26–36 rural households were randomly selected from each sample village for questionnaire surveys and face-to-face interviews. A total of 773 valid questionnaires was collected.



Figure 2. Location of The Research Areas and Poyang Lake Area in Jiangxi Province.

The sample characteristics and the distributions of the interviewees are presented in Table 1. As most householders are male, who know more about domestic livelihood assets and production operation, males account for 85.6% of all the samples. The average age was 55 years old, with the majority ranging from 45 to 55 years old (37.5%), and 30.7% of the interviewees were from 56 to 65 years old. Insufficiently educated as the interviewees might be (91.2% with secondary school degree or under), they fully understood the questionnaire,

and this did not compromise the questionnaire validity. Most interviewed households had three to five people (47.0%), and the average size of the interviewed households was four people. The per capita net income of the interviewed farmers was RMB 10,452, equivalent to approximate USD 1500, per year.

Indicator	Categories	Frequency	Relative Frequency
Gender	Male.	662	85.6
	Female.	111	14.4
Age	45~55 years.	290	37.5
C C	56~65 years.	237	30.7
Education	Above 65 years.	120	15.5
	Elementary school or below	477	61.7
	Junior High School	228	29.5
	Senior high school or technical secondary school	51	6.6
Permanent household size	Senior high school or above	17	2.2
	1 or 2 persons	263	34.0
	3 to 5 people	363	47.0
	6 people or more	147	19.0

Table 1. The investigation sample essential feature.

3.2. Variables Selection

The variables were selected with reference to the existing studies in the literature and the field research conducted therein. The dependent variable is the rural households' satisfaction with the wetland eco-compensation policies, which is an ordinal variable. The core variables are the impacts of subjective cognition of policies and incomes. Control variables include individual and household features. Subjective cognition is represented by five variables: cognition of policy objectives, evaluation of compensation rates, voluntariness of participation, timeliness of compensation disbursement and local government supervision intensity. Two variables, the impact of the policy on household incomes and the importance of compensations to the households, were used to capture the impacts on incomes of the policy. Individual characteristics were represented by three variables, namely gender, age, and education level. Household characteristics were represented by three variables: the proportion of labor force in the household, the proportion of non-agricultural incomes and whether the household operated transferred land. The descriptive statistical analysis and the expected direction of impact are specified in Table 2.

Table 2. Descriptive statistical analysis of independent variables and expected direction of impact.

Variables	Meaning of Variables and Assignment of Values	Mean.	S.D.	Expected Direction
Satisfaction	Satisfaction of surveyed farmers with the wetland ecological compensation policy (very dissatisfied = 1; not very satisfied = 2; fair = 3; fairly satisfied = 4; very satisfied = 5)	3.56	1.007	
Subjective cognition				
Cognition of policy purpose	Whether the farmers interviewed were clear about the purpose of the wetland ecological compensation policy (No = 0; Yes = 1)	0.69	0.461	+
Evaluation of compensation criteria	Interviewed farmers' rating of compensation rates (too low = 1; low = 2; fair = 3; high = 4; very high = 5)	2.15	0.769	+
Willingness to participate	Whether the farmers interviewed voluntarily participate in the wetland ecological compensation policy (No = 0 ; Yes = 1)	0.63	0.482	+

Variables	Meaning of Variables and Assignment of Values	Mean.	S.D.	Expected Direction
Timeliness of compensation payments	Whether the compensation was paid in a timely manner (No = 0; Yes = 1)	0.61	0.487	+
Government supervision intensity	Intensity of local government supervision (loosely supervised = 1; moderately supervised = 2; strictly supervised = 3)	2.16	0.773	+
Income-related factors				
Changes in household incomes	Importance of wetland ecological compensation policies for household production and livelihoods (1 = not important; 2 = barely important role; 3 = moderate; 4 = important; 5 = very important)	3.89	1.252	+
Individual characteristics				
Gender	Gender of respondent (Female = 0; Male = 1)	0.86	0.351	+
Age	Actual age of respondent (years)	54.98	9.886	+/-
Education	Elementary school or below = 1; Junior High School = 2; High school or secondary school = 3; High school or above = 4	1.5	0.739	+
Family characteristics				
Share of Workforce	Ratio of the number of labor forces to the total number of persons in the household	0.74	0.251	+
Share of non-agricultural incomes	Ratio of non-agricultural incomes to total household incomes	0.59	0.367	+
Whether the family operated transferred land	Whether the household actually operate any arable land that has been transferred in (No = 0; Yes = 1)	0.31	0.465	_

Table 2. Cont.

Note: "+" in the table indicates a positive correlation, "-" indicates a negative correlation and "+/-" indicates uncertainty.

3.3. Methodology

We used a multivariate ordered logistic model for estimation. Logistic regression is a type of generalized linear regression, usually used to analyze the relationship amongst categorical variables to predict the probability of an observer making a particular choice. The dependent variable in this study was satisfaction, which is an ordered categorical variable and, therefore, lends itself to analysis by the multivariate ordered logistic model. The model design is as follows:

$$y_{ij} = \begin{cases} 1 \text{ if customer i belongs to category } j \\ 0 \text{ otherwise} \end{cases}$$
(1)

where $i = 1, 2, \dots, N, j = 1, 2, \dots, m$.

$$y_i^* = \alpha' x_i + \mu_i \tag{2}$$

where $u_i \sim \text{Logistic}(\theta = 1)$, and y^* denotes the latent variable; x denotes the independent variable; α denotes the coefficient to be estimated, and μ_i denotes the random error term. The probability density function of the logistic distribution can be expressed as:

$$f(x) = \frac{1}{\theta} \frac{exp(x/\theta)}{\left[1 + exp(x/\theta)\right]^2}$$
(3)

Since y^* is an unobserved variable, it needs to be measured with observable values. The observed sample is divided into *m* classes as follows:

$$y_{i,m} = 1 \text{ if } y^* \in [\gamma_{m-1}, \gamma_m] \tag{4}$$

where $m^* \in N^+$.

According to Equations (1)–(4), it follows that:

$$P(respondent \ i \ belongs \ to \ category \ j) = P(y_{ij} = 1)$$

$$= P(\gamma_{j-1} < y_i^* \le \gamma_j) = P(\gamma_{j-1} < \alpha' x_i + \mu_i \le \gamma_j)$$

$$= P(\gamma_{j-1} - \alpha' x_i < \mu_i \le \gamma_j - \alpha' x_i)$$

$$= F(\gamma_j - \alpha' x_i) - F(\gamma_{j-1} - \alpha' x_i)$$
(5)

where *F* denotes the cumulative density function of the logistic distribution, Equation (5) is the multivariate ordered logistic model, and the parameters are estimated using the maximum likelihood estimation (MLE) method.

In this study, y_i^* is represented by "very dissatisfied = 1; not very satisfied = 2; fair = 3; fairly satisfied = 4; very satisfied = 5". The five responses in the Likert scale statement were combined into three items, i.e., "Fairly satisfied = 4" and "Very satisfied = 5" together indicating "High satisfaction". "Fair = 3" means "Fairly satisfied"; "Very dissatisfied = 1" and "Not very satisfied = 2" together means "low satisfaction". That is, when m = 3, Equation (4) can be expressed as follows:

$$y_{i} = 1, if y_{i}^{*} \leq 2$$

$$y_{i} = 2, if 2 < y_{i}^{*} \leq 3$$

$$y_{i} = 3, if 3 < y_{i}^{*}$$
(6)

In Equation (6), if $y_i^* \le 2$, the variable y_i is assigned a value of 1; if $2 < y_i^* \le 3$, the variable y_i is assigned a value of 2; if $y_i^* > 3$, the variable y_i is assigned a value of 3.

4. Results

4.1. Descriptive Statistics

The satisfaction of farmers with wetland ecological compensation policies is shown in Table 3. Among 773 surveyed households, 139 households were very dissatisfied or not very satisfied with the compensation policy, accounting for 18.0%. A total of 158 households, accounting for 20.4%, had a neutral attitude toward compensation policy, whereas 476 households, accounting for 61.5%, were relatively or very satisfied with the compensation policy. The response of "very dissatisfied", "not very satisfied", "fair", "fairly satisfied", "very satisfied" were respectively assigned the value of 1, 2, 3, 4, 5, and the average of farmers' policy satisfaction was 3.56. The number indicates that farmers' overall satisfaction with the wetland ecological compensation policy was between "fair" and "fairly satisfied".

This paper mainly reflects farmers' subjective cognition of wetland ecological compensation policy from the following five aspects: farmers' cognition of policy purpose, compensation rate evaluation, willingness to participate, whether compensations are distributed in a timely manner and government supervision. The statistical results are shown in Table 3. In terms of the cognition of the policy purpose, 69.5% of the farmers said they were aware of the purpose of the wetland ecological compensation policy, while 30.5% said they were not clear about the policy purpose. In the evaluation of compensation rates, 65.7% of the farmers thought that the compensation rates were very low or low, 32.5% of the farmers thought that the compensation rates were average and acceptable, and only 1.8% of the farmers thought that the compensation rates were high. The results indicate that farmers generally believed that the current compensation rates were low. In terms of whether the compensation was distributed in a timely manner, 61.3% of the farmers said that the compensation in a timely manner, while 38.7% held a different opinion. In terms of government supervision, 38.9% of the farmers believed that the local government imposed strong supervision, while 37.9% of the farmers believed that the supervision was moderate, and 23.2% of the farmers believed that the government's supervision was loose.

Table 3. Farmers' satisfaction with wetland ecological compensation policies, policy cognition and policy impacts on incomes.

Indicators	Category	Observations	Proportion (%)	Indicators	Category	Observations	Proportion (%)
Satisfaction	very dissatisfied	20	2.6	Whether compensations are	No	299	38.7
	not very satisfied	119	15.4	distributed in a timely manner	Yes	474	61.3
	fair	158	20.4		loosely supervised	179	23.2
	fairly satisfied	359	46.4	Government supervision intensity	Moderately supervised	293	37.9
	very satisfied	117	15.1	-	Strictly supervised	301	38.9
Cognition of policy purpose	No	236	30.5		Decreased	440	56.9
	Yes	537	69.5	Impact of household	Unchanged	296	38.3
Evaluation of compensation rates	Lower	166	21.5		Increased	37	4.8
	Low	342	44.2		No impact	31	4
	Moderate	251	32.5	-	Less impact	118	15.3
	Higher	14	1.8	 Importance of compensation to families 	Average impact	112	14.5
Willingness to participate	No	284	36.7		Higher impact	155	20.1
	Yes	489	63.3	_	High impact	357	46.2

Of the surveyed rural households, 56.9% thought that household incomes decreased after participating in the policy, 38.3% thought that household incomes did not change and only 4.8% thought that household incomes increased. The results indicate that most rural households believed that household incomes decreased after participating in the wetland ecological compensation policy. The policy has no positive impacts on household incomes, which is attributed to the low compensation rates for most farmers. On the other hand, 66.3% of the farmers said that the compensation policy had a relatively large or great impacts on the households' production and livelihood, and only 19.3% of the farmers said that the production and livelihood are closely related to the Poyang Lake wetland.

4.2. Analysis of Influencing Factors

To avoid the existence of multicollinearity among the independent variables that would distort the model estimation, SPSS 21.0, a statistical software suite developed by IBM for data management, was used for multicollinearity test before model estimation. In general, the larger the variance inflation factor (VIF), the more severe the multicollinearity among the explanatory variables; the closer the variance inflation factor is to 1, the weaker the multicollinearity. The test results show that the VIF values of all explanatory variables were between 1.082 and 1.260, indicating that all explanatory variables conformed to the basic principle of sample independence and could be used for regression analysis.

Multivariate ordinal logistic regression was performed by stata15.0, and a regression result was obtained. The results show that the cognition of the policy purpose, the evaluation of compensation rates, the timely distribution of compensations, the government

supervision intensity, the impacts on household income, the importance of compensations to the family, the educational level, the proportion of labor forces and the proportion of non-agricultural incomes, all passed the significance test. That is to say, the nine factors would significantly affect farmers' satisfaction with the wetland ecological compensation policy. To obtain a quadratic regression model, the stepwise backward regression method was used to sequentially eliminate the variables with the smallest z statistic in the equation until all the variables retained in the equation were significant at the 10% statistical level. Detailed results are shown in Table 4. The maximum likelihood ratios of the two models were both significant at the 1% statistical level, indicating that the model fitting is good.

Variables	Regression Results of the Primary Model			Regression Results of the Quadratic Model			
-	Coefficient	Standard Error	z-Value	Coefficient	Standard Error	z-Value	
Subjective cognition							
cognition of policy purpose	0.536 ***	0.177	3.02	0.562 ***	0.172	3.27	
evaluation of compensation rates	0.984 ***	0.117	8.41	0.984 ***	0.116	8.49	
willingness to participate	0.052	0.172	0.30	_	-	-	
whether compensations are distributed in a timely manner	0.409 ***	0.162	2.52	0.427 ***	0.161	2.66	
government supervision	0.539 ***	0.107	5.44	0.544 ***	0.105	5.18	
Income factors							
impact of household incomes	0.440 ***	0.151	2.92	0.455 ***	0.150	3.03	
importance of compensation to families	0.156 **	0.073	2.13	0.136 **	0.067	2.03	
Individual characteristics							
gender	0.158	0.236	0.67	-	-	-	
age	0.001	0.009	0.07	-	-	-	
education	0.245 **	0.125	1.96	0.248 **	0.114	2.17	
Family characteristics							
labor ratio	0.679 **	0.337	2.02	0.671 **	0.325	2.06	
non-agricultural income ratio	0.454 *	0.263	1.73	0.469 *	0.242	1.94	
whether the family has land transfer	-0.832 ***	0.169	-4.92	-0.866 ***	0.166	-5.20	
$LR = 221.15 *** Prob > chi^2 = 0.0000 Pseudo R^2 = 0.1535$				$LR = 217.10 *** Prob > chi^2 = 0.0000; Pseudo R^2 = 0.1507$			

Table 4. Estimation results based on ordered Logistic.

Note: *, ** and *** represent significant at the statistical level of 10%, 5% and 1% respectively.

4.2.1. Influence of Policy Subjective Cognition on Farmers' Policy Satisfaction

The cognition of policy purpose had a significant positive impact on policy satisfaction at the statistical level of 1%, and the results were consistent with the expectations that the farmers who learn better about the policy purpose are more satisfied with the wetland ecological compensation policy. Compensation rates evaluation had a significant positive impact on farmers' policy satisfaction, which is consistent with the expectations, indicating that the higher the farmers' evaluation of the current compensation rates, the higher their satisfaction with the wetland ecological compensation policy. Whether the compensation is delivered in a timely manner had a significant positive impact on farmers' policy satisfaction, which is consistent with the expectations. That is to say, farmers who believed that the compensation is distributed in a timely manner were more satisfied, which is in line with common logic. The government's supervision had a significant positive impact on farmers' policy satisfaction, which is consistent with the expectations, indicating that the stricter the government's supervision, the higher the farmers' satisfaction with the policy is. Due to the lack of strict government supervision, behaviors such as "grazing without permission" and "fishing without permission" still occur in the process of policy implementation, which to some extent causes social injustice and dissatisfaction among farmers.

4.2.2. The Influence of Income Factors on Farmers' Policy Satisfaction

From the perspective of income factors, the impact of household incomes and compensation had a significant positive impact on the policy satisfaction of farmers at the statistical level of 1% and 5% respectively, which is consistent with our expectations. After farmers participated in the policy, those whose family income increases were more satisfied with the policy, and the farmers to whom the compensation is more important were more satisfied with the policy. Overall, the income factor had a significant positive effect on farmers' policy satisfaction.

4.2.3. The Influence of Control Variables on Farmers' Policy Satisfaction

In regard to individual characteristic variables, farmers' education was significant at the statistical level of 5%, and the level of education was positively correlated with farmers' satisfaction, which is consistent with our expectations. This indicates that farmers with higher education level are more satisfied with the wetland ecological compensation policy, which may be because they are more likely to have higher awareness of ecological protection, acceptance of the policy, and cognition of the policy, and thus are more likely to understand the benefits brought by the policy implementation. Gender and age did not have a significant impact on farmers' policy satisfaction. From the perspective of family characteristics variables, the proportion of family labor force was significant at the statistical level of 5%, which is in line with the expected direction of impacts. The proportion of household non-agricultural incomes was significant at the statistical level of 10%, and the proportion of household non-agricultural income was positively correlated with farmers' satisfaction, which is consistent with our expectations. The analysis shows that the higher the proportion of non-agricultural income of farmers, the more satisfied they are with the wetland ecological compensation policy. A possible reason is that as rural household incomes are less dependent on natural resources, their production and livelihood are less affected by the wetland ecological compensation policy, and they are more likely to accept policy implementation. Whether households have land transfer was significant at the 1% statistical level, consistent with our expectations. That is, the more land farmers rent, the lower their satisfaction with the policy. In current wetland ecological compensation projects, the compensation policy for migratory bird habitat protection provides that the compensation receivers are arable landowners and the community. In reality, many farmers have transferred rural land. Especially for farmers who lease-in rural land, their crops have been damaged by migratory birds and other wild animals, but they cannot be compensated. Nonetheless, the farmers who lease-out the land do not actually cultivate the land but receive compensation. This results in low compensation efficiency. During the investigation, some farmers expressed their dissatisfaction with the policy and believed that the compensation should be distributed to the actual operators of the land, rather than the arable landowners.

5. Discussion

The subjective cognition of policies refers to farmers' cognition of the function and structure of the policy process and policy system. When the wetland ecological compensation policy is implemented, farmers have a subjective cognition of the policy content and implementation. Farmers are the most basic behavior decision-making units in rural society. Their subjective cognition is an important premise for their conscious compliance to the policy, and an important factor behind their policy satisfaction. The corresponding relationship between policy subjective cognition and policy satisfaction can be better understood

to improve wetland ecological compensation policies. Through the investigation, we found that most farmers were not clear about the purpose and details of policy implementation, and were dubious about the fairness and transparency of policy implementation. Some farmers also proposed that the compensation was not delivered on time.

Therefore, during policy implementation, the government should pay special attention to policy publicity, improve the fairness and transparency of government services, and be fair and transparent in compensation distribution and violation handling. At the same time, a robust financial expenditure channel for ecological civilization construction should be established not only to ensure that compensation funds are in place, but also to enhance farmers' sense of fairness, trust and compensation gain. In addition, the effect of policy implementation is also an important factor affecting farmers' policy satisfaction. In view of the problem that more than half of the farmers in the surveyed areas believed that their incomes would decline after compensation, it is necessary to pay attention to the setting of compensation rates, to expand the sources of compensation funds in combination with the 'multi-channel fundraising' proposed in the Pilot Plan for Ecological Comprehensive Compensation, and to continuously rationalize the compensation scope and rates according to the economic level of the compensation area. Meanwhile, the compensation receivers should be changed to the actual operators of the farmland, rather than those entitled to the cultivated land. Further, the government should pay attention to the subsequent livelihood development of farmers and explore more diversified compensation methods. Eco-industries with economic benefits may be developed in combination with compensation projects, which can effectively supplement the cash compensation under low current rates. The government should also use policies to support farmers' labor export and entrepreneurship and promote the development of follow-up industries in agricultural areas. Indispensably, a comprehensive compensation model including financial subsidies, industrial transfer, talent training, and technical assistance to develop local eco-friendly industries, should be established in a coordinated manner to better leverage policies and incentives.

It is worth noting that, according to the statistical results, although 56.9% of farmers believe that the policy has reduced their family incomes, 61.5% of farmers are still satisfied with the policy. The reason may be that farmers' policy cognition has a greater impact on their policy satisfaction than their incomes. According to the hypothesis of 'ecological economic man', farmers in the ecological economic system will pursue the ecological rationality of ecological value while paying attention to the economic rationality of 'costbenefit'. When farmers understand the ecological value, social value and economic value of the wetland ecological compensation policy, they may choose to sacrifice their personal economic interests and support the policy implementation. The results also show that 78.1% of the surveyed farmers are fairly willing or very willing to support wetland protection. Therefore, policy promotion should not only pay attention to the economic impacts on farmers, but also to the cultivation of farmers' ecological awareness. Therefore, farmers can go beyond 'economic rationality' to 'ecological rationality', which plays an important role in ensuring the effective implementation of the policy.

6. Conclusions and Policy Implications

6.1. Conclusions

Based on the field survey data of 773 farmers in 14 townships in five counties of Poyang Lake area, we used a multivariate ordinal Logistic regression model to study the farmers' evaluation of wetland ecological compensation policy and the influencing factors. The main conclusions are as follows.

First, the overall score for farmer satisfaction with the wetland ecological compensation policy was 3.56, indicating the satisfaction between 'fair' and 'fairly satisfied'. A total of 61.5% of the surveyed farmers expressed satisfaction with the wetland ecological compensation policy.

Second, subjective cognition of the policy and the income-related factors have a significant impact on farmers' satisfaction with the wetland ecological compensation policy.

Among them, the cognition of policy purpose, the evaluation of compensation rates, the timely distribution of compensations, the supervision of the government, the household incomes, and the importance of compensation to the households all have a significant positive impact on the family. To conclude, clearer understanding of policy purposes, satisfaction with compensation rates, on-time distribution of compensations, more rigorous supervision, increased household incomes after involvement into the policy, and more importance of the compensations to the households, contribute to higher satisfaction with wetland compensation policies.

Third, the education level of farmers, the proportion of household labor force, the proportion of household non-agricultural incomes and whether there is land transfer involved, all have a significant positive impact on the policy satisfaction. That is, the higher education level and lower dependence of household livelihood on natural resources contribute to easier acceptance and more satisfaction with wetland ecological compensation policies.

6.2. Policy Implications

First, it is necessary to further optimize the policy according to rural needs. Farmers' overall satisfaction with the wetland ecological compensation policy is between 'fair' and 'relatively satisfied', and the policy can be optimized. Based on the opportunity costs of participation in the policy and the willingness to be compensated, the compensation rates should be appropriately increased, and the compensation receivers should be changed to the actual operator of the cultivated land. Compensations should also be distributed on time to ensure that the rural household incomes will not decrease as a result of participation into the wetland compensation policy. The government should strengthen supervision, establish an ecological compensation mechanism that takes into account fairness and long-term effectiveness, and coordinate the multiple functions of wetland resources. These measures are conducive to the coordinated development of population, resources and environment around the wetland.

Second, it is important to adopt a more flexible and effective approach to policy advocacy. Some farmers do not know the purposes of wetland ecological compensation policies. The government should strengthen the targeted publicity of relevant policies. By means of radio, slogans, TV, WeChat, and training, the government can broaden more channels to improve farmers' awareness of policies, popularize the objectives and compensation details. By doing so, farmers should realize that wetland protection is beneficial to the sustainable development within the region, as well as to their future livelihood and living environment. Consequently, farmers' subjective cognition of compensation policy will be gradually improved, and the accuracy and effectiveness of policy implementation will be enhanced.

Third, policy makers should focus on the sustainable development of rural livelihoods. The policymakers should increase farmers' skills training, enhance their ability to earn a living, reduce their dependence on wetlands, and diversify their sources of livelihood to cope with the traditional 'single livelihood source'. These measures are conducive to alleviating the pressure of economic development on wetland ecology, and coordinating three goals of wetland ecological protection, livelihood transformation and rural income increase.

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