Research on the Influencing Factors of Ecological Compensation Policy

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Abstract: As an effective measure to encourage people to consciously protect the environment, ecological compensation policy plays an important role in the realization of green development strategy. Based on the field survey data of Maoershan Nature Reserve in Lijiang River Source, the study on the overall situation of satisfaction, the heterogeneity of different types of village satisfaction and the mechanism of livelihood capital's influence on the satisfaction of ecological compensation policy shows that the overall level of livelihood capital of farmers in Lijiang River Source Nature Reserve is low, and the distribution of five kinds of capital is unbalanced, with human capital being the highest and social capital being the lowest. Most of the farmers in the protection area are satisfied with the ecological compensation policy, and the factors that have a significant impact on it include the provision of natural capital, financial capital, material capital, social capital, nationality, technical training, and whether there are compensation measures for not issuing compensation in time. Based on the empirical results, the following suggestions are put forward: first, the quality of cultivated land and forest land should be improved; second, the credit threshold of farmers participating in the policy should be lowered; third, the construction of grassroots governments should be promoted and the policy publicity should be strengthened; fourth, the compensation amount should be guaranteed and the compensation methods should be diversified.

Keywords: Policy Satisfaction; Subsistence Capital; Ecological Compensation

1. Introduction

Ecological compensation is one of the important contents of material and energy exchange between natural environmental system and human social system, and also one of the important means to protect the environment. There are many related studies in domestic and foreign literature. There are many expressions of "payment for ecological service system" in foreign literature, and it is believed that ecological compensation should meet four characteristics: reality, voluntary, conditional and additionality[1]. There are two types of ecological compensation subjects: the government and the users. The criterion of ecological compensation is based on the opportunity cost of ecological compensation[2]. Domestic literature on ecological compensation mainly focuses on the discussion of connotation, compensation standard and performance evaluation. In addition, the implementation effect of ecological compensation policy has also attracted wide attention. Some scholars evaluate ecological compensation policies at the macro level, while others evaluate them at the micro level[3]. Some studies have used the satisfaction index system to measure farmers' satisfaction with ecological compensation standards, and some scholars have indirectly reflected farmers' attitude towards compensation standards by evaluating the compensation willingness of forest farmers[4].

Under the framework of sustainable livelihood analysis, this paper will use the entropy method to calculate the livelihood capital of local farmers, and use the ordered probit model to analyze the impact of livelihood capital differences on policy satisfaction[5], so as to put forward targeted suggestions to improve the actual effect of ecological compensation policy, systematically promote the construction of ecological civilization, and improve the subjective initiative of farmers to participate in environmental protection[6]. It is helpful to realize the coordinated and sustainable development of economy, society and ecological environment of nature reserves, and contribute to the sustainable development of rural areas, which is of great practical significance to realize rural revitalization.

In the current empirical research on ecological compensation policy, most of the indicators only select the basic characteristics of the interviewed farmers, and few analyze them from the perspective of objective quantitative livelihood capital. The satisfaction of

ecological compensation policy in the protected area and its influencing factors were analyzed from three aspects of livelihood capital, livelihood mode and results. Lijiang River Source Nature Reserve is located in Guangxi Zhuang Autonomous Region, where Han and ethnic minorities live together, and the traditional cultural background of ethnic minorities will also affect livelihood capital and policy satisfaction. It is of great practical significance to promote the healthy development of nature reserves.

2. Data sources and research methods

The data used in this paper come from the field survey questionnaire on the ecological compensation policies in the Lijiang River Source area. Based on the distance between each village and the protected area, as well as the difference in the degree of impact, the survey area covers 14 administrative villages in the source area of Lijiang River.

The Sustainable Livelihood Analysis Framework (SLF) established by the UK Agency for International Development (DFID) is a quantitative framework to measure the ability of households to cope with environmental shocks and pressures in the context of vulnerability, and to maintain or improve their viability without destroying natural resources[7]. The framework of sustainable livelihood analysis regards farmers as the objects of subsistence in a fragile background, and they can use certain capital, which will affect their choice of livelihood strategies, resource allocation and use, and the ability to understand and accept exogenous policies. As an exogenous policy, ecological compensation policy has strong externalities and is difficult to produce long-term economic benefits.

Based on the sustainable livelihood analysis framework, referring to relevant papers and based on the actual research, "farmers' satisfaction with ecological compensation policy" is selected as the explained variable. Under the sustainable livelihood analysis framework established by DFID, natural capital, human capital, financial capital, physical capital and social capital are selected to form the livelihood capital index of respondents, and the livelihood capital index is constructed. The differences in livelihood capital of farmers are compared, and the second-level indicators of livelihood capital are used as the core explanatory variables, and personal characteristics, family characteristics, and the understanding and implementation of ecological compensation policies are selected as control variables.

3. Methods Empirical analysis

Under the framework of sustainable development, the entropy method is used to quantify the indicators of farmers' livelihood capital, and the weight of each indicator is obtained. The calculation formula for calculating the comprehensive score of livelihood capital is as follows:

$$Livelihood = 0.0822484*N + 0.027152*H + 0.344903*F$$
$$+ 0.101656*P + 0.44404*S$$

"N" refers to natural capital, "H" refers to human capital, "F" refers to financial capital, "P" refers to physical capital, and "S" refers to social capital, all of which are first-level indicators, thus constructing the quantitative results of various livelihood capital indicators for the surveyed farmers.

In order to ensure the accuracy and reliability of the model's estimated values, stata software is used to conduct multiple collinearity diagnosis on the independent variables. The simulation results show that the variance expansion factor (VIF) is within 10, so it can be considered that there is no collinearity problem between the independent variables.

The following table reports the regression results of the orderly Probit model for the impact of farmers' livelihood capital in the protected area on satisfaction with government ecological compensation policies. Model 1 only includes indicators of livelihood capital, while Model 2 adds gender, ethnicity, age, education level, and health status as personal characteristic control variables. Model 3 supplements income sources to further control personal characteristic variables. Model 4 adds policy characteristic control variables such as whether the policy provides technical training, whether compensation is paid, and whether there are remedial measures for non payment based on Model 3, Is the regression of an ordered Probit model for all variables. Model 5 selects the Ordinary Least Squares (OLS) method, and the variable selection is also consistent with Model 4 to test whether the research results are robust.

From the regression results, the P value of the regression results of the four models does not exceed 0.005, indicating that the overall significance P of the model is significantly lower than 5%, and the Pseudo R2 value shows an increasing trend, indicating that the explanatory power of the four models is gradually improving. Model 5's Prob>F=0.000 indicates that the model is also significant, and from the results, Model 4 is quite close to Model 5. From the test results, there is no multicollinearity problem between them, and

after continuously increasing control variables, the significance of livelihood capital indicators in the model remains basically unchanged, proving that the estimated results of this study have strong stability.

Model regression results

VARIABLES	Model 1 Y1	Model 2 Y2	Model 3 Y3	Model 4 Y4	Model 5 Y5
N1	0.7010***	0.6410***	0.6410***	0.7100***	0.5880***
	(-0.1850)	(-0.1870)	(-0.1870)	(-0.1890)	(-0.1550)
F2	-0.2330**	-0.2570**	-0.2570**	0.2970***	-0.2530***
	(-0.0951)	(-0.1030)	(-0.1030)	(-0.1030)	(-0.0854)
P1	0.0023**	0.0024**	0.0024**	0.0024**	0.0017*
	(-0.0011)	(-0.0011)	(-0.0011)	(-0.0012)	(-0.0009)
P3	0.4300**	0.3780**	0.3870**	0.4190**	0.3710**
	(-0.1750)	(-0.1770)	(-0.1780)	(-0.1790)	(-0.1480)
S3	0.9610***	0.9350***	0.9260***	0.7230***	0.5930***
	(-0.2060)	(-0.2070)	(-0.2080)	(-0.2120)	(-0.1750)
X1		-0.1720	-0.1730	-0.1890	-0.1520
		(-0.1280)	(-0.1280)	(-0.1280)	(-0.1060)
X2		-0.191**	-0.191**	-0.162*	-0.135*
		(-0.0968)	(-0.0968)	(-0.0974)	(-0.0807)
X3		0.0467	0.0456	0.0526	0.0360
		(-0.0556)	(-0.0557)	(-0.0561)	(-0.0466)
X4		0.0671	0.0640	0.0593	0.0379
		(-0.0556)	(-0.0559)	(-0.0562)	(-0.0467)
X5		0.0765	0.0753	0.0676	0.0561
		(-0.0487)	(-0.0488)	(-0.0490)	(-0.0405)
X6			-0.0218	-0.0176	-0.0175
			(-0.0428)	(-0.0430)	(-0.0357)
X7				0.3920***	0.3210***
				(-0.1080)	(-0.0887)
X8				0.3770**	0.3020**
				(-0.1490)	(-0.1220)
X9				-0.4170	-0.2600
				(-0.2890)	(-0.2360)
Observations	574.0000	574.0000	574.0000	574.0000	574.0000
LR chi2	41.8000	46.4500	47.6400	54.1700	R-squared = 0.1804
Prob > chi2	0.0001	0.0003	0.0003	0.0002	Prob > F =0.0000
Pseudo R2	0.1025	0.1139	0.1168	0.1328	Adj R-squared=0.1461

Note:* * *, * *, * indicate significant at the levels of 1%, 5%, and 10%, respectively. The standard error in parentheses is limited to space. This article only reports the core explanatory variables with significant regression coefficients.

4. Conclusion

First, the five types of livelihood capital are not the same in the whole population and among the five types of villages, and the overall level is low except for human capital. There is significant heterogeneity in different livelihood capital, especially physical capital and natural capital. This reflects that the livelihood capital of farmers in nature reserves is vulnerable as a whole, and the

differences between different livelihood capitals are common among different villages. Most farmers are satisfied with the ecological compensation policy, but not with the ecological public welfare forest policy, because local farmers will use forest resources to plant high cash crops, and the profits of these crops are much higher than that of cultivated land crops.

Second, among the core explanatory variables, natural capital, financial capital, physical capital and social capital can significantly affect farmers' satisfaction with ecological compensation policies.

In order to improve the actual effect of ecological compensation policy and the satisfaction of local residents, this paper suggests that the policy should be considered from the following aspects:

(1) Improving the quality of cultivated land and forest land. Through technical support means, farmers should be appropriately guided to do a good job in land conservation and improve land quality, while economic means should be used to guide farmers to plant crops with ecological value, so as to improve their natural capital level and environmental protection awareness.

(2) Lowering the credit threshold for farmers participating in the policy. Due to the implementation of the ecological compensation policy, farmers will not be able to plant crops with high economic value in a large area, nor can they cut forest land. If they want to switch to other industries or grow other crops, the support of the financial system is essential.

(3) Promote the construction of grassroots governments and increase policy publicity. At present, most farmers do not know enough about the ecological compensation policy, so it is difficult to make an objective evaluation of it. Therefore, it is necessary to do a good job in the construction of grassroots organizations, strengthen the service capacity construction of township governments, improve the service mechanism, improve the service efficiency, and improve the trust of farmers.

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