Evaluation of Farmers' satisfaction with Ecological Governance and its improvement path

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Abstract : As the participants and stakeholders of rural ecological governance, the evaluation of farmers' satisfaction plays an important role in improving the performance of government ecological governance. Based on the criteria of ecological civilization construction and customer satisfaction, this paper constructs an evaluation system of farmers' ecological governance satisfaction, which includes 34 indicators. Factor analysis is used to classify indicators, and IPA model is used to analyze the ecological governance plates that affect satisfaction. The research shows that the comprehensive satisfaction of rural ecological governance farmers in four towns of Changde City, Hunan Province is 3.6, which is basically recognized by farmers. The factors that farmers' demand is strong but does not meet the expectations are sewage treatment, chemical fertilizer and pesticide pollution treatment, ecological legal system implementation, government investment and other indicators. The evaluation section of restriction satisfaction mainly focuses on ecological environment, institutional culture and infrastructure, and finally puts forward suggestions from three aspects: ecological environment, infrastructure and farmers' sense of participation.

INTRODUCTION

With the rapid development of China's economy and society, the construction of ecological civilization has been paid more and more attention. Ecological governance is as important as a cornerstone for rural green development. Rural ecological environment is not only the basic condition for farmers to survive, but also the material basis for maintaining the sustainable development of agricultural production. At present, China is in a critical period of agricultural modernization. The purpose of this paper is to investigate farmers' satisfaction with rural ecological governance and analyze the path of governance optimization.

Ecological governance generally refers to the act or process of ecological governance, provided by the "government", including various institutions, actors and organizations involved in the formulation of environmental policies and management results. On the one hand, the resilience of the ecosystem is inseparable from the management and cultivation of the government (Adger W. 2018); the contradiction between environmental protection and economic development is inevitable. Such a situation can easily lead to a high degree of dispersion between the social economy and the natural ecology, and even a decoupled structure (Arnaiz-Schmitz C. 2018).

But environmental protection and rural development are not independent of each other, so policies must be made to solve these problems ((Parvathi P. 2018). On the other hand, ecological problems are not all public affairs, while the government plays a leading role in providing public goods, it also needs the joint participation of the public and the whole society. Stakeholder participation in decision-making may have many "positive" impacts on the environment (Newig J. 2018). When solving environmental problems, the key lies in choosing between alternative value systems and making value judgments ((A, R. M. 2015). Managers must observe the relationship between man and nature, listen to the concerns of stakeholders, and increase their participation enthusiasm (Constant, N. L. 2017). Empowerment and participation of actors may make the ecopark system fairer (Lockwood, M. 2010).

There are scholars (Jager. 2016) believes that the EU Water Framework Directive can make water governance in Europe more centralized and effective (WFD. 2016); (Koontz TM. 2014) stakeholders need to be encouraged to "actively

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participate" in the implementation of governance policies; there are still many studies based on the

Comparing the values of stakeholders with the values involved in actual governance can prove whether governance truly reflects people's values and aspirations (Schulz C. 2017). Pan-government theory shows that the interaction between society and ecology can change the environmental outcome (Brian C. Chaffin.. 2016). When formulating assessment criteria, farmers can not only be beneficiaries, but also have a potential impact on rural ecological restoration (Guida-Johnson B. 2017) . Observing the collaborative network characteristics of participants and stakeholders, what really affects the environmental effect is the actual action Of the actors (Bodin O. 2017).

BACKGROUND AND REVIEW

Most ecological governance studies are based on theoretical analysis, and some scholars analyze the governance effect through econometric data. It is very important for researchers, practitioners and decision makers to evaluate the effect of ecological governance.

However, there are few practical tools to carry out such tasks especially large-scale recovery programmes in complex social ecosystems. Agricultural systems should be recognized and accepted by all stakeholders, including local populations, with the help of the LTSER platform to find effective solutions for agricultural development and biodiversity (Bretagnolle, V. 2018).The social network analysis method is used to analyze the collaborative network of governance, and it is found that governance is not sufficient (Chen, H. 2017) . Study the degree of ecological restoration from different periods, and explore the effectiveness of governance (Li T. 2017) . At present, the research on the evaluation system of ecological governance is relatively simple. Quantitative assessment can be used as a management tool (Royo-Vela, M. 2009). In the process of performance evaluation, the degree of matching between model forecasts and data is very important ((Link J S. 2017).

This paper studies the performance evaluation of ecological governance, and the research object is the farmers in the production and life of rural areas. Through the perspective of farmers to analyze and explore the best way to improve the performance of ecological governance.

Customer satisfaction is to analyze and consider the needs of consumers from the point of view of customers. Customer satisfaction can affect loyalty to a product or service (Nam, J. 2011) . By applying it to the components of the evaluation index, we can effectively provide public services under the condition of truly grasping the needs of

positions of governance stakeholders.

citizens. The related research on ecological governance also discusses the importance of farmers' satisfaction to the governance of ecological environment. Residents' satisfaction is an important evaluation index of ecological governance performance of grass-roots government (Andreassen, T. W. 1994). If the eco-environmental problems that residents are concerned about are not solved, they will lose confidence in the government and reduce their satisfaction with (Phelan, A. A. 2017) .Some scholars combine the degree of environmental pollution with customer satisfaction as interval type 2 fuzzy sets to measure efficiency (X za, B. 2019).

Ecological governance should merge and unify the governance effect and the economic interests of farmers, ecological governance as a complex system work, the combination of these two aspects can achieve the long-term expected value.

In this paper, the governance objectives are classified and specified, and the construction of an evaluation index system from the perspective of farmers provides quantitative support or support for the effectiveness of ecological governance. at the same time, it also provides supervision and early warning tools for decision-makers and managers. It is of great significance both in theory and in practice to guide the improvement of China's ecological governance ability.

METHODS AND DATA
Regional Overview and Research Methods

Factor analysis is used to extract as many potential variables as possible (Shubbar, R. M. 2017) . It is often used to classify and combine variables again according to the shared variance (Yong AG.. 2013).In the SPASS software platform, the indicators of governance satisfaction evaluation system are classified systematically and scientifically by factor analysis, and then the comprehensive satisfaction of farmers is calculated respectively, and the score is analyzed by IPA analysis. According to statistics, as of May 2019, the treatment rate of urban domestic waste in Hanshou County is only 30%, that of Shimen Town is less than 82%, and that of the whole city's rural environment is only 7.38%, affecting the quality of life of farmers. This paper adopts the research method of field survey and questionnaire, and the data used in this paper come from the questionnaire survey conducted on farmers in four counties of Changde City, Hunan Province in September 2020.

Evaluation Index Construction

The construction of rural ecological governance indicators from the perspective of farmers can more directly reflect the realization process and

performance of local ecological governance goals. The research paradigm of environmental governance needs a scientific and standardized basis of (Mupepele A.. 2016). The effectiveness of the evaluation determines whether the system provides effective, robust, fair and sustainable results (Tikina, AV.. 2008). The nature of the focus issues described taking into account the diversity of stakeholders and the uncertainty of intervention outcomes (Li, W. 2016) . Combined with ecological standards and residents' preferences, various ecological schemes in the region are considered, (Yu, B. 2016). Focusing on the development variables of protected areas, rights, capacity, governance and economic income can effectively achieve governance objectives (Balint, P. J. 2006).

In order to strengthen the rural ecological governance and construction, Changde City has successively issued the "three-year Action implementation Plan for the renovation of Rural Human settlement Environment in Changde City (2018-2020)" and the "Changde Ecological Civilization demonstration City Plan (2016-2025)". We will steadily implement the "1686-year Plan" strategy from six aspects: space, economy, environment, life, system and culture to improve the rural ecological environment and do a good job in the war of rural ecological governance. Combined with the elements of customer satisfaction, such as "perceived value", "perceived quality" and so on, (Fu, X. 2017), the evaluation model of peasant household satisfaction is constructed.

In this paper, the evaluation of farmers' satisfaction with ecological governance refers to the subjective evaluation of whether ecological governance meets their needs by comparing their actual feelings (satisfaction) with expected expectations (importance).

Figure 1. Evaluation model of peasant household satisfaction
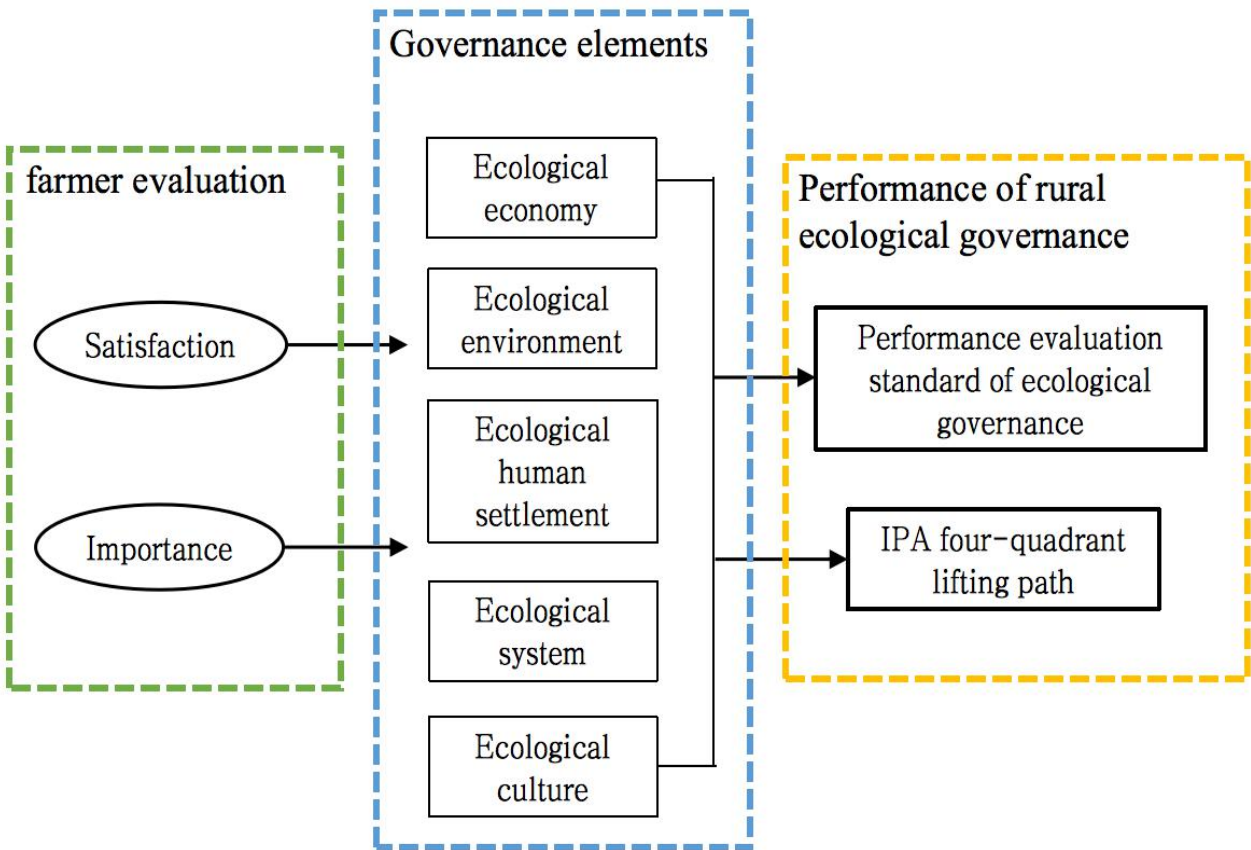
It is assumed that the dependent variable is farmers' satisfaction with rural ecological governance, and the independent variable is the evaluation factor that affects farmers' satisfaction with ecological governance. Through collating and collecting the evaluation indicators of ecological governance constructed by experts and scholars in the field and the related concepts, objectives and measures of ecological governance in Changde City, the specific indicators of the evaluation system of this study are summarized.

This paper constructs an evaluation index

system of farmers' ecological governance based on 34 specific indicators in five aspects: ecological economy, ecological environment, ecological human settlements, ecological system and ecological culture.

Table 1. Evaluation index system and weight of rural ecological governance farmers' satisfaction

Evaluation. Target layer	Criterion layer	Index layer
Satisfaction with rural ecological governance	Ecological economy	X1 Agricultural development， X2 Industrial development， X3　Service industry development， X4 New energy industry development
	Ecological environment	X5 Greening condition， X6 Air quality， X7 Drinking water quality， X8 Soil erosion control， X9 Soil pollution control， X10 Treatment of Chemical Fertilizer and Pesticide pollution， X11 Industrial pollution control， X12 Sewage treatment， X13 Treatment of human and poultry faeces， X14 Harmless treatment of domestic waste
	Ecological human settlement	X15 Building quality， X16 Building floor area， X17 Building decoration X18 Medical convenience， X19 Shopping convenience， X20 Traffic convenience， X21 Tap water facilities， X22 Drainage pipe facilities， X23 Power facilities， X24 Communication facilities X25 Garbage collection facility， X26 Cultural and recreational facilities， X27 Public toilet facilities
	Ecological system	X28 Implementation of ecological legal system X29 Intensity of environmental supervision X30 Government investment
	Ecological culture	X31 Educational resources X32 Cultural activities X33 Protection of ancient cultural buildings X34 Promotion of folk culture

Questionnaire Design and Number of Samples

Combined with the literature and the actual situation of the investigation area, the questionnaire of "Farmers' Ecological Governance satisfaction

Evaluation" is designed, which is divided into three parts: farmers' basic situation, rural ecological governance satisfaction evaluation and rural ecological governance importance evaluation. In this paper, "Likert scale" is used to measure satisfaction and importance. "1-5" means "very dissatisfied", "not quite satisfied", "basically satisfied", "quite satisfied" and "very satisfied" in turn.

Among the samples collected in this questionnaire, there were 312 males and 231 females, with a sex ration of 1.35 to 1.35; the age of the respondents was mainly over 41 years old, accounting for 51.57%; the educational level was mainly in junior middle school, accounting for 40.15%, followed by senior high school, accounting for 22.84%. The main occupation is farming, accounting for 46.60%, while farming and part-time work and self-employment account for 23.39% and 13.44% respectively, indicating that rural farmers' choice of occupation has gradually become extensive and diversified. The total sample size and proportion of the survey make it representative and can better reflect the level of farmers in Changde City.

Reliability and Validity Test

First of all, the use of SPSS analysis data is suitable for factor analysis, the results show that: KMO is 0.979 (KMO value ≥ 0.8), indicating that the validity of the research data is very good. Meet the prerequisite requirements of factor analysis, indicating that the data can be used for analysis and research. Through the Bartlett sphericity test, the approximate chi-square was 25801.384, and the significance was 0.000, indicating that the research data were suitable for factor analysis.

The reliability coefficient of Cronbach reliability analysis is 0.987, which is greater than 0.9, indicating that the reliability quality of this data is high and can be used for further analysis.

Extract Common Factor

Using principal component analysis, the eigenvalue is set to be greater than 1, and the variance is rotated to maximize the variance (Table 2). The variance contribution rate is 758%, 18.700%, 17.421%, 14.723% and 11.981%, respectively, and the cumulative variance contribution rate after conversion is 82.583%.

Table 2. Variance explanation rate table

Factor number	Explanation rate of variance after rotation		
	Characteristic root	Variance rate(%)	ExplanationCumulative explanation rate% (%)
1	6.718	19.758	19.758
2	6.358	18.700	38.458
3	5.923	17.421	55.879
4	5.006	14.723	70.602
5	4.074	11.981	82.583

When the absolute value of the factor load coefficient is greater than 0.4, it shows that the correlation between the research item and the factor is very strong, and the factor can extract the information effectively.

After determining that most of the information of the research elements can be extracted from the factors, the corresponding relationship between the finishing factors and the research elements is analyzed, and the common factors are summarized according to the table results of the rotating factor load coefficient.

Factor F1 : According to the analysis and classification of Table 3, nine indexes such as drinking water quality, soil and water loss control, sewage treatment, soil pollution treatment, pesticide and chemical fertilizer pollution treatment and industrial pollution have higher factor loads among the common factor F1. It mainly reflects the farmers' feelings about the treatment of the rural environment, so it is named "Ecological Environment".

Factor F2 : the seven indicators of ecological legal system, supervision, capital investment, educational resources, cultural activities, protection of ancient cultural buildings and protection of folk culture have higher factor loads. it reflects farmers' perception of the implementation of government policies and the strength of civilization construction, so it is named "cultural system".

Factor F3 : nine indexes, such as power facilities, communication facilities, tap water facilities, garbage collection, transportationand shopping convenience, have higher factor loads, which reflect farmers' demand for rural infrastructure construction, so it is named "infrastructure".

Factor F4： agricultural development, industrial development, service industry development and new energy industry development have higher

Factor F5： Finally, the five indicators of greening, air quality, housing quality, housing area and decoration in the common factor F5 have a

factor loads, which reflect farmers' perception of rural industrial planning and development, so they are named "economic development".

higher factor load, which reflects the farmers' demand for living conditions and environment, which is named "living conditions".

Table 3. Load factor table after rotation

Varrible	F_1	F_2	F_3	F_4	F_5
X_1	0.330	0.334	0.198	0.687	0.261
X_2	0.298	0.300	0.208	0.776	0.151
X_3	0.206	0.253	0.348	0.701	0.274
X_4	0.284	0.364	0.197	0.757	0.151
X_5	0.412	0.120	0.406	0.420	0.446
X_6	0.396	0.060	0.331	0.412	0.574
X_7	0.446	0.157	0.394	0.454	0.313
X_8	0.543	0.301	0.266	0.453	0.325
X_9	0.725	0.371	0.250	0.348	0.203
X_{10}	0.720	0.380	0.215	0.346	0.260
X_{11}	0.725	0.369	0.263	0.300	0.234
X_{12}	0.737	0.326	0.243	0.286	0.234
X_{13}	0.680	0.294	0.352	0.243	0.319
X_{14}	0.659	0.283	0.402	0.191	0.300
X_{15}	0.273	0.384	0.322	0.239	0.706
X_{16}	0.295	0.360	0.340	0.203	0.703
X_{17}	0.316	0.340	0.371	0.250	0.661
X_{18}	0.294	0.514	0.466	0.292	0.367
X_{19}	0.238	0.448	0.630	0.295	0.233
X_{20}	0.231	0.410	0.680	0.207	0.225
X_{21}	0.330	0.185	0.684	0.292	0.251
X_{22}	0.442	0.434	0.535	0.346	0.153
X_{23}	0.270	0.272	0.701	0.180	0.357
X_{24}	0.222	0.302	0.747	0.221	0.304
X_{25}	0.441	0.434	0.558	0.211	0.241
X_{26}	0.370	0.594	0.479	0.328	0.147
X_{27}	0.459	0.619	0.339	0.319	0.113
X_{28}	0.454	0.552	0.338	0.288	0.330
X_{29}	0.491	0.505	0.337	0.227	0.401
X_{30}	0.488	0.593	0.319	0.296	0.254
X_{31}	0.339	0.681	0.333	0.349	0.276
X_{32}	0.367	0.690	0.325	0.348	0.259
X_{33}	0.314	0.661	0.360	0.318	0.335
X_{34}	0.328	0.715	0.299	0.346	0.293

RESULTS

Analysis on the Satisfaction of Ecological Governance

After all the above evaluation indicators are recombined, a set of more scientific evaluation

index system of farmers' ecological governance satisfaction is reconstructed. Combined with the data of table (1) and formula (1), the weights of five common factors are calculated one by one.

$$W_i = V_i / \sum V_i \qquad (1)$$

W_i——Common factor weight;

V_i——Explanation rate of common factor variance;

$\sum V_i$——Cumulative variance explanation rate.

From the formula (1), it is concluded that the common factor weights of F1, F2, F3, F4 and F5 are 0.239, 0.226, 0.211, 0.178 and 0.146 respectively. After calculating the weight, the weighted average method is used to calculate the satisfaction of each common factor and the comprehensive satisfaction average of the whole evaluation index system. To sum up, Table 4 is as follows.

The comprehensive satisfaction of the evaluation index of this study is 3.6, indicating that the majority of rural residents are satisfied with the current rural ecological governance. According to the Richter scale, the average value of the evaluation indicated "approval" at [3.5, 5. 0]. Among them, the satisfaction of the common factor F5 "living conditions" is 3.785, which is the highest among the five common factors, while the satisfaction of F1 "ecological environment" is 3.416, indicating that farmers maintain a "neutral" attitude towards the governance of the ecological environment.

Table 4. Results of common factor analysis of farmers' ecological governance satisfaction evaluation index
Analysis on the Influencing Factors of IPA Satisfaction
Satisfaction and importance score statistics

Common factor	Evaluation index	Factor load	Factor weight	Common factor Weight	Common factor Satisfaction	average Comprehensive satisfaction
F1	X_7	0.446	0.078			
Ecology	X_8	0.543	0.095			
Environment	X_{12}	0.725	0.127			
	X_9	0.72	0.126			
	X_{10}	0.725	0.127			
	X_{11}	0.737	0.129			
	X_{13}	0.68	0.119			
	X_{14}	0.659	0.116			
	X_{27}	0.459	0.081	0.239	3.416	
F2	X_{28}	0.552	0.126			
Culture	X_{29}	0.505	0.115			
Institution	X_{30}	0.593	0.135			
	X_{31}	0.681	0.155			

	X_{32}	0.69	0.157			
	X_{33}	0.661	0.15			
	X_{34}	0.715	0.163	0.226	3.506	
F3	X_{18}	0.466	0.085			
Basics	X_{19}	0.63	0.115			
Facilities	X_{20}	0.68	0.124	0.211	3.712	3.6
	X_{21}	0.684	0.125			
	X_{22}	0.535	0.098			
	X_{23}	0.701	0.128			
	X_{24}	0.747	0.136			
	X_{25}	0.558	0.102			
	X_{26}	0.479	0.087			
F4	X_{1}	0.687	0.235			
Economics	X_{2}	0.776	0.266			
Development	X_{3}	0.701	0.24			
	X_{4}	0.757	0.259	0.178	3.581	
F5	X_{5}	0.446	0.144			
Human settlement	X_{6}	0.574	0.186			
Condition	X_{15}	0.706	0.228			
	X_{16}	0.703	0.228			
	X_{17}	0.661	0.214	0.146	3.785	

Figure 2. Average score of satisfaction of each index
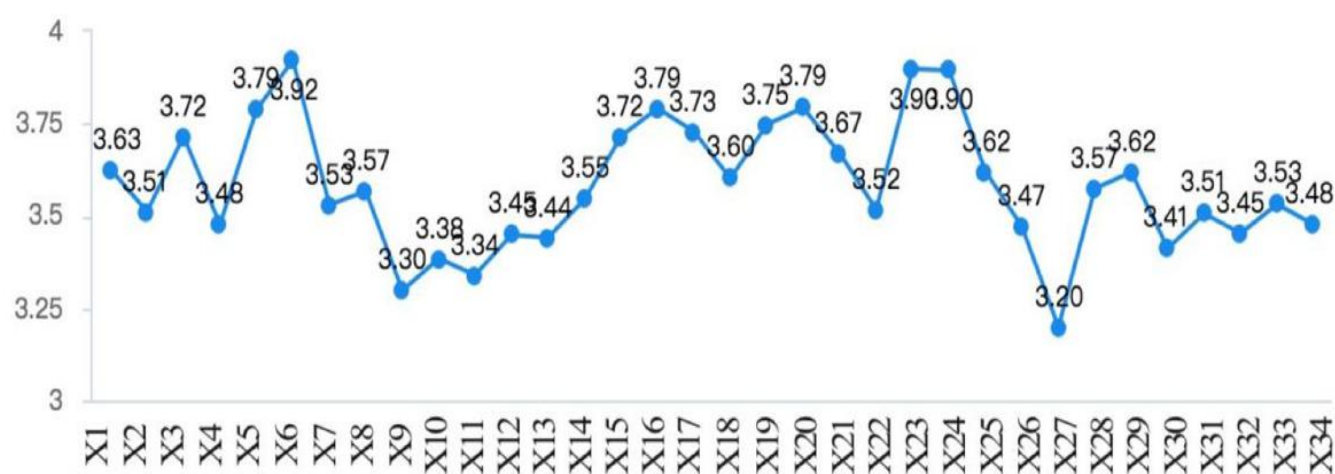
In order to fully reflect the differences in the evaluation of farmers' satisfaction with each index, the average satisfaction of each index factor is sorted out according to the results of the

questionnaire (see figure 2), and the comprehensive average satisfaction of each factor affecting rural ecological environment governance is calculated to be 3.583.

Among the 34 indicators of the evaluation system, the highest score of "air quality" is 3.923, reaching the "satisfactory" state in the Likert scale. this shows that Changde's air pollution control

work has achieved remarkable results and has been generally recognized by farmers, while the lowest is "public toilet facilities", which is only 3.20.

Therefore, in the process of rural ecological governance, we should pay more attention to the environmental facilities of public toilets and take further effective measures to improve, upgrade and optimize.

Figure 3. Average score of importance of each index
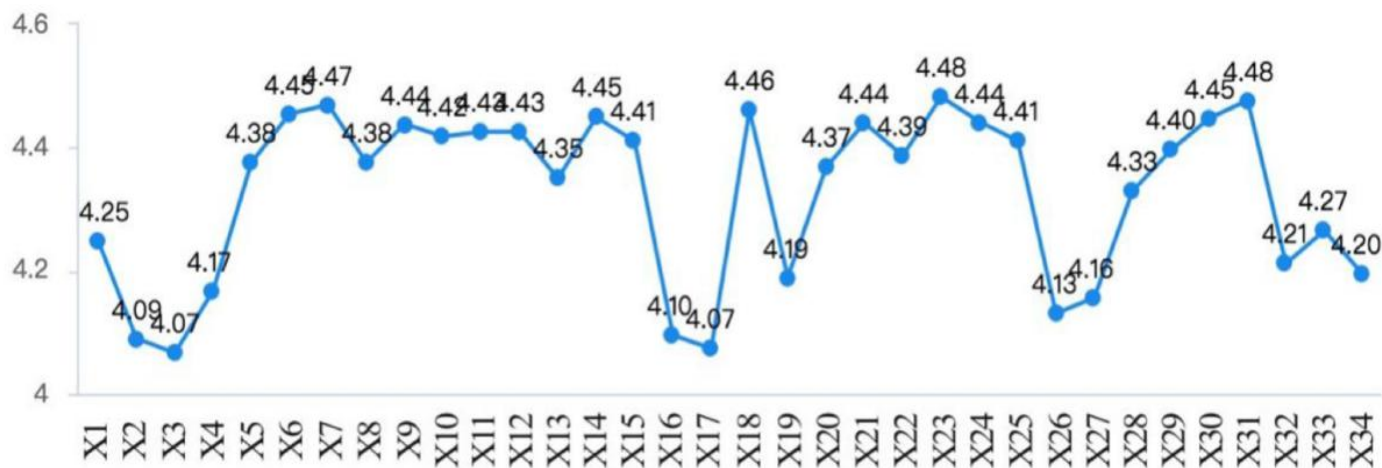
According to the results of the questionnaire, the average importance of each index is calculated (see figure 3). The final average score is 4.327, corresponding to the "importance" in the Likert scale, it can be seen that farmers have a higher overall evaluation of the importance of each index of rural ecological governance in Changde City.

The standard deviation of most indicators is between 0.7 and 0.8, and the maximum is 0.937, indicating that farmers have a small perception of the importance of each index. Although the scores of the 34 indicators are all above 4.00, it is not difficult to see the gap in the minds of farmers, in which the highest importance score is "power facilities", with an average of 4.483, and the lowest is "service industry development", which is 4.066.

Through the comparison of the data, it is found that the average score of importance evaluation is significantly higher than that of satisfaction (3.583), which shows that there is a big gap between the

rural ecological governance work in Changde and the expected effect in the hearts of local rural residents, which needs to be further improved.

IPA four-quadrant analysis

By using the method of IPA satisfaction-importance four-quadrant analysis, and comparing the importance and satisfaction of each index, we can directly find out the key factors that affect farmers' satisfaction with rural ecological governance, so as to improve the shortcomings and weak links in ecological governance.

Taking the satisfaction P as the horizontal axis and the importance I as the vertical axis, the four-quadrant diagram is drawn. After calculation, it is concluded that the point composed of the average score of satisfaction and the average score of importance is the coordinate origin (3.583 4.327), as shown in figure 4.

Figure 4. IPA four quadrant analysis chart
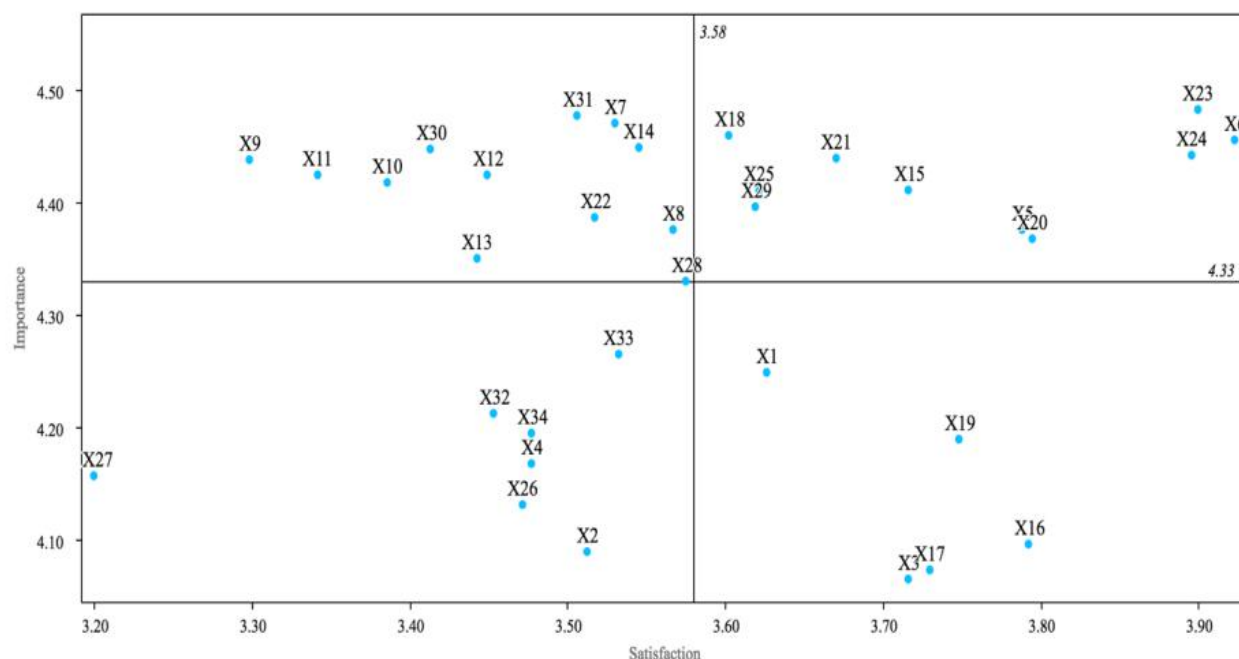
According to the analysis of figure 4, the first quadrant (p > 3.583) includes nine index factors: electric power facilities, air quality, greening, building quality, communication facilities, tap water facilities, garbage collection and disposal, convenient transportation, medical convenience and environmental supervision. this means that farmers in Changde generally attach great importance to it and give a high evaluation at the same time, in this case. It only needs to be maintained in the ecological environment management in the future development and construction stage.

The second quadrant (p < 3.583 I > 4.327) includes 12 index factors: drinking water quality, sewage treatment, chemical fertilizer and pesticide pollution treatment, soil pollution treatment, industrial pollution treatment, human and poultry manure treatment, pollution-free treatment of domestic waste, soil and water loss control, drainage facilities, educational resources, implementation of ecological legal system, and government investment.

It shows that these indicators are highly valued by farmers, but the current governance situation has not reached the expected level of farmers, and the degree of recognition of farmers is low. The managers of local governments and relevant departments should grasp these elements, shift the focus of ecological governance to these 12 elements, and improve the satisfaction of farmers by solving the actual problems.

The third quadrant (p < 3.583 I < 4.327) includes seven index factors: industrial development, development of new energy industry, cultural and recreational facilities, public toilet facilities, protection of ancient cultural buildings, cultural activities, and promotion of folk culture. It means that the satisfaction of farmers is not high, and they do not pay special attention to it.

In this regard, it is suggested that the relevant departments need not focus on these indicators in the future ecological governance work, but can not be ignored, the rural ecological governance should always be coordinated and coordinated.

The fourth quadrant (p > 3.583 I < 4.327) includes five index factors: agricultural development, service development, internal and external decoration, building area and shopping convenience. It shows that the local people think that these five indicators are not so important for the governance of rural ecological environment, but their satisfaction is very high. Therefore, the relevant departments do not have to deliberately pursue their development.

CONCLUSION

Combined with the above empirical analysis, the factors that affect the farmers' satisfaction with rural ecological governance in Changde City are mainly concentrated in the ecological environment, cultural system, infrastructure and so on. In order to effectively enhance farmers' satisfaction with rural ecological governance, the following should be done:

Improve the Efficiency of Ecological Management and Protect the Ecological Environment.

Environmental governance is the most important and basic part of rural ecological governance. "Green water and green mountains are Jinshan and Silver Mountains". Ecological governance should be guided by green development, and only by taking good measures to protect the ecological environment can we take the road of sustainable development. At present, there are still

water pollution problems caused by aquaculture and agricultural non-point source pollution in Changde City. In addition, water source protection is not in place and drinking water safety can not be guaranteed. First of all, we should carry out the treatment of environmental problems in accordance with local conditions. Through investigation and analysis, put an end to the prevention and control of pollution from the source.

Second, improve the supervision ability of ecological governance and improve the reward and punishment mechanism. Enterprises that seriously affect ecological quality should be punished accordingly, and local entrepreneurs and operators should develop aquatic products, livestock and poultry breeding and high energy consumption industries in a green and scientific manner. Third, protect and maintain wetlands and lakes, strengthen biodiversity protection, make rational use of the rich natural resources of various counties and townships in Changde City for scientific planning, and develop a harmonious rural ecological spatial pattern with regional characteristics.

Improve the Living Environment in Rural Areas and Strengthen the Construction of Infrastructure.

Rural infrastructure is not only the basic condition of rural economic development, but also the convenience and material guarantee of the life of the majority of farmers. First, improve rural infrastructure, increase investment in the construction of water and electricity, roads and communication networks, and promote the overall development of urban and rural areas.

Second, improve the living conditions in rural areas, scientifically and rationally plan the living space of farmers, and advocate a livable environment in rural areas with "convenient life, convenient transportation, scientific layout and humanistic characteristics"; third, improve the level of public services in rural areas, provide better quality and green public goods, and increase investment in science, education, culture, health, sports, etc. Fourth, improve the quality of rural community service, organize and carry out rich recreational activities, actively popularize science and knowledge, and promote the construction of rural talent team.

Strengthen the Propaganda of Ecological Governance and Enhance Farmers' Sense of Participation.

As the main body of rural ecological governance and the beneficiary of the achievements, farmers can understand and participate more in the ecological governance work in order to provide guarantee for the lasting and stable governance effect. First of all, strengthen the local propaganda

on the construction of ecological civilization. Through training, grass-roots workers will be deeply impressed by the objectives, aspects, and specific project measures of ecological governance, and then use radio, publicity posters, online official media and other forms to deepen farmers' understanding of ecological governance, and encourage more people in rural areas to actively participate in and participate in ecological governance actions.

The second is to improve the mechanism of farmers' participation. In the process of ecological governance, we should establish a deeper and closer relationship between the government and farmers, give farmers full autonomy and voice, enhance their sense of mission and social responsibility, and coordinate and promote farmers' participation in ecological governance.

DECLARATION OF CONFLICTING INTERESTS

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REFERENCE

1. Adger W , Hughes T , Folke C , et al. Social-Ecological Resilience to Coastal Disasters[J]. Science (New York, N.Y.), 2018,2005:1036-9.
2. Arnaiz-Schmitz C, Schmitz M F, Herrero-Jauregui C, et al. Identifying socio-ecological networks in rural-urban gradients: Diagnosis of a changing cultural landscape[J]. Science of the Total Environment, 2018, 612(jan.15):625-635.
3. Parvathi P , Nguyen T T . Is Environmental Income Reporting Evasive in Household Surveys? Evidence From Rural Poor in Laos[J]. Ecological Economics, 2018, 143(jan.):218-226.
4. Newig J , Challies E , Jager N W , et al. The Environmental Performance of Participatory and Collaborative Governance: A Framework of Causal Mechanisms[J]. Policy Studies Journal, 2018.
5. A, R. M. , & B, J. C. C. . (2015). From market failures to collective action dilemmas: reframing environmental governance challenges in latin america and beyond - sciencedirect. Ecological Economics, 120(15), 358-365.
6. Constant, N. L. , & Bell, S. . (2017). Governance, participation and local perceptions of protected areas: unwinding traumatic nature in the blouberg mountain range. Environmental Values, 26(5), 539-559.
7. Lockwood, M. . (2010). Good governance for terrestrial protected areas: a framework, principles and performance outcomes. Journal of Environmental Management, 91(3), 754-766.

8. Jager NW et al. (2016) Transforming European water governance? participation and river basin management under the EU waterframework directive in 13 member states. Water 8:1–22

9. Koontz TM, Newig J (2014) Cross-level information and influence inmandated participatory planning: alternative pathways to sus-tainable water management in Germany's implementation of theEU Water Framework Directive. Land Use Policy 38:594–604

10. Schulz C , Maitin-Ortega J , Glenk K , et al. The Value Base of Water Governance: A Multi-Disciplinary Perspective[J]. Ecological Economics, 2017, 131:241-249.

11. Chaffin B C , Gunderson L H . Emergence, institutionalization and renewal: Rhythms of adaptive governance in complex social-ecological systems[J]. Journal of Environmental Management, 2016, 165:81-87.

12. Guida-Johnson B , Zuleta G A . Riparian rehabilitation planning in an urban–rural gradient: Integrating social needs and ecological conditions[J]. Ambio, 2017.

13. Bodin O. Collaborative environmental governance: Achieving collective action in social-ecological systems[J]. Science, 2017, 357(6352):eaan1114.

14. Bretagnolle, V. , Berthet, E. , Gross, N. , Gauffre, B. , Plumejeaud, C. , & Houte, S. , et al. (2018). Towards sustainable and multifunctional agriculture in farmland landscapes: lessons from the integrative approach of a french ltser platform. Science of the Total Environment, 627(JUN.15), 822-834.

15. Chen, H. , Chen, T. , Yi, H. , Xu, X. , Chen, S. , &Chen, W. . (2017). Collaborative environmental governance, inter-agency cooperation and local water sustainability in china. Sustainability, 9(12), 2305.

16. Li T , Y Lü, Fu B , et al. Gauging policy-driven large-scale vegetation restoration programmes under a changing environment: Their effectiveness and socio-economic relationships[J]. Science of the Total Environment, 2017, s 607–608:911-919.

17. Royo-Vela, M. . (2009). Rural-cultural excursion conceptualization: a local tourism marketing management model based on tourist destination image measurement. Tourism Management, 30(3), 419-428.

18. Link J S , Browman H I . Operationalizing and implementing ecosystem-based management[J]. Ices Journal of Marine Science, 2017, 74(1):fsw047.

19. Nam, J. , Ekinci, Y. , & Whyatt, G. . (2011). Brand equity, brand loyalty and consumer satisfaction. Annals of Tourism Research, 38(3), 1009-1030.

20. Andreassen, T. W. . (1994). Satisfaction, loyalty and reputation as indicators of customer orientation in the public sector. International Journal of Public Sector Management, 7(2), 16-34.

21. Phelan, A. A. , Dawes, L. , Costanza, R. , & Kubiszewski, I. . (2017). Evaluation of social externalities in regional communities affected by coal seam gas projects: a case study from southeast queensland. Ecological Economics, 131(jan.), 300-311.

22. Xza, B. , Ying, W. C. , Jian, C. A. , Lw, D. , Sw, B. , & Bl, E. . (2019). Sustainable supply chain evaluation: a dynamic double frontier network dea model with interval type-2 fuzzy data. Information Sciences, 504, 394-421.

23. Shubbar, R. M. , Salman, H. H. , & Lee, D. . (2017). Characteristics of climate variation indices in iraq using a statistical factor analysis. International Journal of Climatology.

24. Yong AG, Pearce S. 2013. A beginner's guide to factor analysis: focusingon exploratory factor analysis.J. Tutor. Quant. Methods Psychol.9(2):79 – 94.

25. Mupepele A , Walsh J C , Sutherland W J , et al. An evidence assessment tool for ecosystem services and conservation studies[J]. Ecological Applications, 2016, 26.

26. Tikina, AV, Innes, & JL. (2008). A framework for assessing the effectiveness of forest certification. CAN J FOREST RES.

27. Li, W. , &Mauerhofer, V. .(2016). Behavioral patterns of environmental performance evaluation programs. Journal of Environmental Management, 182(nov.1), 429-435.