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Critical Elements and Theoretical Logic of Horizontal Transfer Payment System for Eco-Compensation: A Study Based on Grounded Theory

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Abstract. In recent years, how to coordinate the sustainable production and life of human society with the protection of ecological environment has become particularly important. This paper reviewed and analyzed the existing Chinese and English literature on Horizontal transfer payment system for eco-compensation (or hereinafter referred to as ECITPS), based on which this paper applied Grounded Theory to study the critical elements and theoretical logic of the System, exploring its formation process and logical procedure, and constructing a theoretical model of this System. It was found that the theoretical model of eco-compensation Horizontal transfer payment system is mainly divided into three stages, namely, the early, middle and late stages. Moreover, the logic of the ECITPS as a whole was the validation of PDCA Deming Cycle Theory, while the previous research on Horizontal transfer payment for eco-compensation was more focused on the specific object, with a lack of the overall macro understand of the theoretical framework for the system. Therefore, this paper assisted to promote the improvement of the ECITPS from the macro theoretical framework, and provided a reference idea for the development of the transfer payment field in the future period.

Keywords: eco-compensation, grounded theory, horizontal transfer payment, transfer payment system, eco-environment protection

1. Introduction

The frequent occurrence of natural disasters worldwide over the past few years has forced people to reflect on the relationship between environmental protection and the productive life of human society. How to achieve both eco-friendly and social economic development, this would be the issue in current stage of global development urgently need to consider clearly [1]. For example, in terms of carbon dioxide emissions worldwide, about 50 countries in the world have achieved peak CO2 emissions, accounting for about 36% of global emissions, and the international society has reached a consensus on achieving the goal of moving towards carbon neutrality, which has become a major trend in the social development of mankind [2]. At present, the world faced the predicament that the gap between human beings and nature continued to widen [3], and the conflicts among population, resources and environment were becoming more and more prominent [4]. In particular, as the world's largest developing country, China had the most populations accounted for 18% of the global total, while occupying 8.5% of the global arable land resources, 6.6% of the global renewable inland freshwater resources, 1.5% of the global oil reserves, 4.5% of the global natural gas reserves, and 13.3% of the global coal reserves [5].

Based on the above macro background, it was able to be found that the rational use of ecological resources was not only related to China's own sustainable development, but also closely related to that of global ecology. The Horizontal transfer payment for eco-compensation was conducive to the effective protection of ecological environment [6]. Compared with the vertical transfer payment system, it assisted to combine the actual natural conditions with the rational use of financial funds, that is, it was equipped with more advantages in solving the problems of financial equalization and externalities [7]. However, the current Horizontal transfer payment in practice showed many deficiencies, mainly reflected in the following aspects: most of the practice object was still concentrated in a relatively single level of lake and river treatment, the synergies of the Horizontal cooperation among the government authorities still remained to be improved, and eco-compensation system for effectively alleviating the poverty of the farming households was still to be considered [8], those which have been unsolvable for a long time should be explored into deeper roots. This paper applied the research method of Grounded Theory to summarize and sort out the critical elements and theoretical logic of the eco-compensation Horizontal transfer payment system, with a view to clarifying the mechanism of the System from

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the source, providing new ideas for the continuous improvement of eco-compensation, and promoting the improvement and optimization of the ECITPS's mechanism to provide referential assistance for the beneficial use of ecological environment.

The research contribution of this paper was mainly in the following two aspects: firstly, the research content has been innovative. For the first time, Grounded Theory was used to systematically summarise and sort out the practical path and the main performance of the eco-compensation Horizontal transfer payment system in various stages, to elaborate the implementation progress of the eco-compensation Horizontal transfer payment system in the current stage, and to provide reference for future research and practice. Secondly, the research theory has been innovative. The theoretical model of eco-compensation Horizontal transfer payment system was constructed. The current research on the eco-compensation Horizontal transfer payment system mainly focused on the practice study of some typical areas, with case analysis and empirical analysis, emphasis on the econometric analysis of the rational fund distribution. From an overall perspective, by summarizing and analyzing the existing practices, as well as abstracting the information on the implementation process of the system, a theoretical model of the eco-compensation Horizontal transfer payment system was drawn up, which would provide a theoretical framework for the improvement of the policy in the future.

Basically, this paper was divided into the following chapters: Chapter 1, Introduction, which mainly introduced the research background of this paper and the source of the research problem; Chapter 2, Literature Review, which discovered the deficiencies of the existing research by sorting out the existing research on eco-compensation Horizontal transfer payment; Chapter 3, Research Design, Category Refinement and Model Construction, which mainly introduced the research design and the specific content of this paper; Chapter 4, Explanation of the theoretical model for the ECITPS; Chapter 5, Conclusions and Revelations of this paper's research on the ECITPS.

2. Literature Review

In this section, the paper made a literature review on the current research status of eco-compensation Horizontal transfer payment system, which mainly included two parts, the first part was to sort out the generation of the system, which introduced the origin and development of the ECITPS. The second part was to sort out the current practical application of the ECITPS, and the specific content would be introduced in the following.

The Ecological compensation theory initially originated from the Federal Nature Conservation Act enacted in Germany in 1976, which implemented the policy of Eingriffs regelung to assess and review the construction, and required the implementation of corresponding compensation measures to mitigate the damage to the ecological environment [9]. As ecological protection became an increasingly important focus of people's attention, it was recognized that eco-compensation should be provided in conjunction with eco-protection. Payment for ecosystem services (PES) was a typical example, and was considered an effective policy in the area of ecosystem services protection, which has been increasingly applied globally [10].

After sorting out the existing studies related to the ECITPS, this paper found that they were mainly divided into two main types, the first was more representative study based on the local region, and the generation and distribution of the ECITPS was studied. [11] conducted an equilibrium game study on eco-compensation for basin of Linqu County, Shouguang City, and Qingzhou City, Shandong, China, which aimed to verify the reasonableness of the results derived from the economic optimal model and explored the conditions for the application of non-zero-sum game solutions in upstream and downstream region. The second type of studies mostly focused on specific areas in the ecological environment such as mining, rivers, grasslands, nature reserves and others, of which the Horizontal transfer payment was studied mostly targeting rivers and lakes, and less targeting air pollution.

For example, some scholars studied the water ecological services in the coal mine area of Mentougou, Beijing, China, and designed a new model for the assessment and compensation of water ecological services in the coal mine area based on the complex ecosystems theory, and it was found that the coal mine enterprises and the governments of Mentougou and Beijing should take the responsibility of compensation for the damaged mine area in different ways with specific proportions [12]. Other scholars [13] took the stakeholders of eco-compensation in water sources and downstream areas in southern Shaanxi, China as the research object, and on the basis of defining the property rights to water resources, proposed an eco-compensation model based on the auction of water rights that determined the price of water rights from maximization of the bidder interests, and emphasized the importance of pricing mechanism for water rights in auction, which promoted greater clarity in the definition, management and marketing of water rights.

With the increasing demand for water and serious ecological problems from rapid economic growth, [14] suggested that there was an urgent need for a BEC standard in Chinese river basins that comprehensively covered the flow of ecosystem services and the cost of ecological protection, and they designed a set of BEC valuation methodology combining Gross Ecosystem Product (GEP) accounting with Total Cost Accounting (TCA). This methodology has been applied to a cross-regional water transfer project involving Shanxi Province, Beijing and Xiong'an New Area.

In the study of grassland eco-compensation policy, [15] empirically examined the impact of grassland eco-compensation policy on herders' income by using the DID model based on data from 499 counties in Chinese herding provinces from 2000 to 2019, from the dual perspectives of income growth and disparity, and concluded that the grassland eco-compensation policy had a direct effect on increasing transfer income and an indirect effect on optimizing the allocation of labour and improving the scale of barn feeding. This practice of applying econometric models to the study of policy effects has become more common in recent years as well as one of the trends in the study of the effects of the ECITPS. Some other scholars [15] have built a multi-objective production

decision model for farmers by taking the World Heritage Site - Hani Terraces in Southwest China as an example, and analyzed the impacts of different compensation standards on planting decisions and welfare for farmers, and the results showed that paying attention to the importance of behavioural changes when designing and implementing eco-compensation would have a positive impact on the sustainability of the ecological compensation policy. [16] study, in a similar vein, focused on the importance of behavioural change and considered it as a central point in the study of influential factors of the ECITPS effects. The study applied the Theory of Planned Behaviour, a well-known theory in the field of social psychology, to the study of the ECITPS, taking the Danxia Mountain National Geopark in China as the object of the ECITPS to study the mechanism of tourism eco-compensation for the public, and finally concluded that environmental value and sensitivity were the key factors influencing the willingness to pay tourism eco-compensation. This study approach broadened the research perspective of the ECITPS and extended the theoretical foundation.

Based on the above content, it was not difficult to find that in the existing research on ECITPS, quantitative research was the main type on a specific ecological field and specific research objects, and the purpose of the research was usually to improve the fund utilization and policy effectiveness of eco-compensation Horizontal transfer payment. But there was a lack of studies that grasped the whole of the ECITPS from the macro level. This research status was formed in the complex ecological environment. However, different ecological areas had their own particularities, so it was difficult to form a universal framework of eco-compensation Horizontal transfer payments, if only studied from a certain geographical area or a certain kind of ecological environment, which would easily lead to an overly one-sided and narrow perspective in the field, that is, talking about things as they were and nothing else.

When a system failed to build a theoretical framework from a holistic perspective [17], it was insufficient on basis in the specific implementation of the system [18]. At present, the research in the field of ECITPS had such deficiencies, which could easily lead to the problems such as unclear flow of funds for ECITPS, low use efficiency, and difficulties in promoting the system, and it was not compatible with the core objective of promoting social ecological civilization construction [19], nor could it satisfy the urgent need for optimization of the ecological environment and the sustainable economic development in the current society [20, 21]. In order to improve the utilization rate of ECITPS funds, on the one hand, it was necessary to construct a system framework to clarify the implementation process; on the other hand, it was helpful to summarize the logical chain that effectively contributed the implementation and improvement of ECITPS, and promoted the theory to guide the practice. Therefore, this paper comprehensively collected and analyzed the Chinese and English literature in the field of ECITPS, and constructed a theoretical model of ECITPS by the Grounded Theory method in an attempt to sort out the theoretical framework and system logic of ECITPS, and to supplement and improve it on the basis of the above existing studies.

Overall, the theoretical model summarized the critical elements of each stage, and for one part, it clarified that the implementation stage of the ECITPS mainly included three sections, namely, the early stage, the middle stage and the late stage; for the other part, it provided the theoretical logic to support the reliability of the implementation for the ECITPS, so as to give a model paradigm for the ECITPS to be used as a reference. Standing to a broader research level, this study assisted to provide a reference for other types of Horizontal transfer system frameworks, and inform the construction of a broader system framework at the level of research methodology.

3. Research Design, Category Refinement and Model Construction

3.1. Research Methods and Sample Collection

As the most famous research method in the field of qualitative research, Grounded Theory emphasized the research construction of social special phenomena by using inductive methods in natural contexts. This paper studied the issue about critical elements and theoretical logic of ECITPS, which summarized the current situation of ECITPS, and then constructed the critical elements and theoretical logic of the current ECITPS. Therefore, this paper adopted the method of Grounded Theory to gradually codify the literature and other textual materials related to ECITPS. A series of 94 pieces of Chinese literature and 50 pieces of English literature were collected, totaling 144 pieces of literature, in this paper, 96 literatures, two-thirds of which, were randomly selected for sample coding.

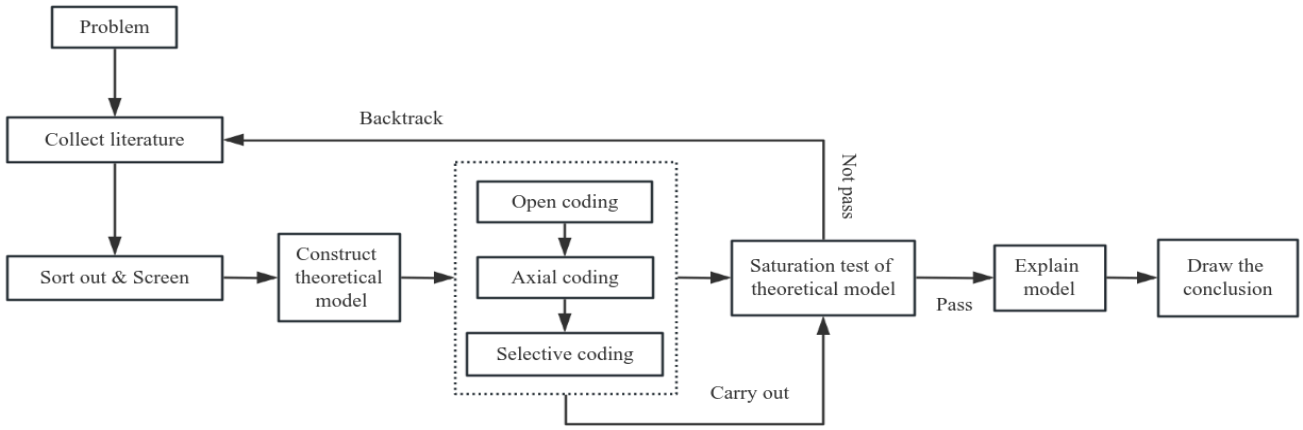

Figure 1. Research Approach

3.2. Refinement of Concepts and Categories by Open Coding

Open coding was the process of coding, tagging and logging to source material word by word from which the initial concepts and refined categories were developed [22]. Firstly, in this paper, 96 pieces of Chinese and English literature were organized and categorically coded to extract the original representative statements related to the eco-compensation Horizontal transfer payment to establish the initial concepts. After eliminating the original statements with the same meaning, 61 initial concepts were obtained. Secondly, this paper refined the category of the initial concepts, which was generalized by the aggregation of multiple concepts with the same point. In this paper, after continuous comparison, analysis and summarization, the concepts were merged and sorted out, for example, the concepts of "sharing the financial pressure of the central government", "the dilemma caused by the inadequate system", "consumption upgrading", etc. were coded and summarized into the category of "establishment reasons". Finally, 18 initial categories were obtained (referred to Table 1).

Table 1. Open Coding and Category Refinement

Initial category	Concept code	Original statement
Definition of concepts	Transfer of benefits	Eco-compensation Horizontal transfer payment was a kind of benefit transfer, because under the premise of unbalanced distribution of ecological environment benefits, the best channel to cross the barrier of solidified interests was to transfer benefits from the place of benefiting from eco-products or consuming natural resources to the place of supplying eco-products or natural resources, and there were three common ways of transferring benefits: "Removing maximum and minimum for averaging", "Resource sharing" and "Negotiating compromises".
	Measure for coordinated development	Eco-compensation Horizontal transfer payment was an important measure to promote the coordinated development of inter-regional socio-economic and ecological environment, and the formulation of compensation standards could not be completed overnight, which required the coordination of the central authorities and various local departments, supplemented by the linkage of relevant policies and systems to promote the digitization of information on eco-compensation, the intellectualization of operation modes, the visualization of funding dynamics, and the universalization of supervision and regulation.
Reason for establishment	Sharing the financial pressure of the central government	In the context of the new normal economy, the contradiction between government revenue and expenditure would become more serious, and the pressure on the growth of central fiscal revenue shall be very great. The establishment of the Horizontal transfer payment system for ecological compensation could explore the potential of local governments in terms of ecological expenditure and share the financial pressure of the central government.

	Dilemma caused by the inadequate system	On the contrary, the imperfect Horizontal transfer payment system for ecological compensation would lead to the dilemma of "environmental protection or enough food and clothing" for the supply of ecological products or natural resources.
	…	…
Basis for development	Legal and economic perspective	From the perspective of law and economics, the Kaldor-Hicks efficiency was used as a research approach to study the Horizontal transfer payment system for ecological compensation.
	Support for system establishment	The establishment of Horizontal transfer payment system based on ecological compensation to institutionalize, commercialize and maximize efficiency for ecological services was supported by verifiable theoretical foundations and facts.
	…	…
Source of funding	Compensation funds	The Horizontal transfer payment funds for ecological compensation could be divided into basic compensation funds and incentive compensation funds, and the incentive compensation funds were stepwise increased according to the comprehensive growth rate of ecological protection indicators.
	Taxes	Taxes levied by provincial and municipal governments could be used as special funds for eco-compensation Horizontal transfer payments, to be applied when involving inter-regional and inter-agency compensation.
Management elements	Determination of funding subject	The determination of the funding subject for ECITP depended on the size of the eco-compensation beneficiary scope, and theoretically all areas benefiting from the source of the Three Rivers (Yangtze, Yellow, and Lancang rivers) should be the subject of Horizontal transfer payment.
	Establishment of eco-compensation Fund	To improve the current ecological compensation transfer payment system, it is necessary to consider the establishment of an ecological compensation fund and clarify the status of local governments as the main body of negotiation.
	…	…
System participants	Establishment of a third party	The transfer of benefits in the form of "negotiating compromises" for ECITP required the central government to establish a special department as a third party
	Specialized department as a third party	The lack of coordination by a specialized national department as a third party would result in high gaming and transaction costs and difficulties in reaching agreements, seriously impeding the realization of ECITP.
	…	…
Practical examples	Jinsha River basin	At present, it was difficult to find a ready answer on how to establish the Horizontal transfer payment system based on ecological compensation in Jinsha River Basin from both foreign and domestic financial transfer payment practices.
	Three Rivers source basin	The establishment of an Horizontal transfer payment system for ecological compensation in the Three Rivers basin was a useful supplement to the fiscal policy.
	…	…
Individual level	Employment opportunities	The Horizontal transfer payment of ecological compensation promoted the increased ecological protection and restoration of the compensated areas, highlighted the advantages of environmental resources, and provided local farmers with employment opportunities for the development of rural home-stays, farmhouses and other rural tourism in the vicinity.
	Innovative sources of livelihoods	The key to whether the Horizontal transfer payment of ecological compensation could increase the income of rural households and narrow the urban-rural income gap lied in whether local governments could guide rural households to adjust their production structure and help them establish new sources of livelihood.
	…	…
Governmental level	Efficiency improvement of ecological service supply	Establishing and improving the Horizontal transfer payment system for ecological compensation was conducive to improving the supply efficiency of ecological services.

	Effective supply of regional ecological services	The establishment of a Horizontal transfer payment system based on ecological compensation was a useful attempt to solve the problem of effective supply of regional ecological services.
	…	…
Overall level	Narrowing the the urban-rural income gap	The Horizontal transfer payment funds of ecological compensation would attract capital to flow to rural areas, and narrow the income gap between urban and rural areas through the improvement of rural infrastructure, the transformation of agricultural structure, and the integrated development of thrice industries.
	Redistribution of ecological benefits	In order to eliminate the drawbacks of ecological benefit spillover, it was necessary to establish Horizontal transfer payment system for ecological compensation through the intervention of the government, so that the system could be institutionalized and developed, and its role in the redistribution for ecological benefits of relevant subjects should be fully played.
	…	…
Impact on the workforce	Income distribution of workers	The eco-compensation Horizontal transfer payment would create employment position while causing job losses, and both which would affect the income distribution of workers along with the adjustment in the labor market.
	Impact on social welfare	It was a question that need be answered for the establishment of ECITPS to determine the changes in total social welfare caused by the transfer among different groups of people as a result of the implementation of the new system.
	…	…
Impact on the industrial structure	Different kinds of industries	After the implementation of the Horizontal transfer payment system for ecological compensation (after 2011), the growth rate of employment in the tertiary industry has accelerated significantly, the growth rate of employment in the secondary industry has tended to be flat, and the employment in the primary industry has been still in a downward trend.
	Structure of the thrice industries	The eco-compensation Horizontal transfer payment funds were specially used to adjust the industrial structure and optimize the industrial distribution, and the local government refused the settlement of high-polluting and high-energy-consuming enterprises, eliminating or transforming traditional industries, so those methods would have an impact on the structure of the thrice industries.
	Urban or rural effect	Whether the ecological compensation Horizontal transfer payment would result in the "urban effect" crowding out the "rural effect", or would realize the double enhancement of urban and rural residents' incomes.
Social effects	Employment effect	The employment effect measured the impact of Horizontal transfer payment for ecological compensation on the behavior of micro subjects, which meant the direct impact on the employment of rural households.
	…	…
Income distribution	Transfer income of urban and rural residents	It should be noticed that Horizontal transfer payment for ecological compensation have widened the gap between the transfer incomes of urban and rural residents. Possible explanations were that the conversion of arable land to forest land reduced the area under food cultivation for farm households, and that agricultural subsidies changed with the land-use type. For households that have returned farmland to farmland, returning farmland could mean a decrease in transfer income.
	Micro individual income	The Horizontal transfer payment for ecological compensation could not only affect the micro individual income through the macro economy, but also affect the overall economic development of the region through the micro individual decision-making.
	…	…
Evaluation of system	Evaluation of effectiveness	In addition to theoretically analyzing the necessity of establishing and improving the Horizontal transfer payment system for ecological compensation, it was also necessary to judge and evaluate whether the system was worthy of implementation and the effect after implementation.

	Evaluation of the fund efficiency	The ecological compensation fund was established by local governments, and the central government no longer directly participated in the use of local government fro this fund, but would test and evaluate the benefits of its use.
	…	…
Current deficiencies at the institutional level	Single coverage area	At present, the Horizontal transfer payment for ecological compensation in water sources, intra-provincial and inter-provincial areas was only for the ecological protection of water basins, and the corresponding ECITPS has been formulated, but there was no relevant ECITPS for the protection of other ecological products and natural resources, such as minerals, forests and soils, so it could neither better balance the relationship between the suppliers and beneficiaries of these ecological products and natural resources, nor better solve the contradiction between residents' right to survival and development and environmental rights.
	Low coverage	At present, the Horizontal transfer payment for ecological compensation in urban water sources covered a minimal area, as a representative one, the compensation funds transferred from Beijing to Hebei Province for water source conservation.
	…	…
Predicaments at the practical level	Few pilot sites	Currently only a few provinces such as Zhejiang, Anhui and Guangdong have carried out the pilot of Horizontal transfer payment for ecological compensation in the province, while many other provinces have not yet.
	Lack of multi-provincial cross-border compensation	The Horizontal transfer payment for inter-provincial river ecological compensation only focused on a few river basins with Horizontal ecological compensation for water quality protection, and most of them were only cross-boundary ecological compensation for two provinces, so there was a lack of cross-boundary river ecological compensation for more than two provinces.
	…	…
Improvement ways	Reformation of incentive mechanism	Improvement of the financial system required supporting reforms in other areas, similarly, the improvement of ECITPS also required the reformation of the corresponding incentive mechanism.
	Negotiating determination on relevant matters	The establishment of a negotiation platform created conditions for the two sides to negotiate and compromise, determining the main body of negotiation as the local governments of the consumer place and supplier place of ecological products or natural resources and offering them the greatest degree of freedom, and the matters related to the transfer payment were determined by the negotiation, so that the two sides could make the most suitable gaming choice to improve the total social welfare under the guidance of the interest mechanism.

Data source: Summary of 96 Chinese and English literature

3.3. Main Categories Established by Axial Coding

Axial coding was the stage of analyzing and comparing the categories summarized by open coding, so as to extract the main categories. In the open coding stage, this paper has sorted out the original text into different types of conceptual coding and refined the initial categories. In the stage of establishing the main categories of axial coding, this paper further refined the 18 initial categories and summarized 6 main categories, namely: system conditions, system implementation, social benefits, factors influencing social development, system effects, and system improvement. Table 2 showed the main categories and the corresponding initial categories.

Table 2. Main Categories Formed by Axial Coding

Main Categories	Initial categories	Category connotation
System conditions	Definition of the concept	The definition of the concept referred to the results of the induction of the meaning of the Horizontal transfer payment system for ecological compensation based on different perspectives by scholars in the existing research.

	Reason for establishment	The reason for the establishment referred to the multiple imperatives of the existence of Horizontal transfer payment for ecological compensation as a system.
	Basis for formulation	The basis for formulation referred to the support of the conditions required if the Horizontal transfer payment for ecological compensation became a system.
	Source of funding	The source of funding referred to the access channel of funds in the Horizontal transfer payment system for ecological compensation.
	Management elements	The management elements referred to the main body, distribution and use methods of funds in the Horizontal transfer payment system for ecological compensation.
System implementation	System participants	System participants referred to the departments, institutions and other organizations that should participate in the implementation of the Horizontal transfer payment system for ecological compensation.
	Practical examples	The practical examples referred to the typical regions where the Horizontal transfer payment system for ecological compensation has already been implemented, and they have accumulated experience and become the object of analysis.
	Individual level	The benefits at the individual level referred to the benefits brought by the Horizontal transfer payment for ecological compensation to individual residents in social life after the implementation of the system.
Social benefits	Governmental level	The benefits at the governmental level referred to the benefits brought by the Horizontal transfer payment for ecological compensation to the government and other public authorities in social life after the implementation of the system.
	Overall level	The benefits at the overall level referred to the benefits brought to the whole society after the Horizontal transfer payment system for ecological compensation being implemented.
Factors influencing social development	Impact on the workforce	Impact on the workforce referred to the impact of Horizontal transfer payment for ecological compensation as a system on the labor force of different attributes in society after the implementation.
	Impact on the industrial structure	Impact on the industrial structure referred to the fact that the Horizontal transfer payment system for ecological compensation would have different impacts on structure of different-type industries after the implementation.
	Social effects	The social effects referred to the overall social effects caused by the establishment of the Horizontal transfer payment system for ecological compensation in the field of national economy.
System effects	Income distribution	Income distribution referred to the fact that after the implementation of the Horizontal transfer payment system for ecological compensation, the allocated funds would have different impacts on the income of residents with different attributes.
	Evaluation of system	Institutional evaluation referred to the evaluation for the social impact of ECITPS after the implementation.
	Current deficiencies at the institutional level	The deficiencies at the institutional level referred to the fact that the Horizontal transfer payment for ecological compensation as a system that required to be supplemented and improved.
System improvement	Predicaments at the practical level	In practice, the Horizontal transfer payment system for ecological compensation had difficulties such as few pilot sites, lack of multi-provincial cross-border compensation and linkage between upstream and downstream provinces, and absence of authority, enforcement and incentives measures.
	Improvement ways	The improvement ways referred to the practical problems found after the implementation of the ECITPS, which should be solved in a reasonable and effective way.

Data source: Summary of open coding and categories in Tab.1

3.4. Definition of core categories completed by selective coding

Selective coding referred to the systematic analysis of all the identified categories to define a core category, and string all other kinds together into a whole, encapsulating most of the research results into a broad theoretical scope. This paper took the Horizontal transfer payment system for ecological compensation as the core category, and formed a three-stage process of "early-middle-late" around the core category with a "story line" framework going: The system conditions of ECITPS provided a basis for its implementation, which is the foundation of the existence; After the implementation of ECITPS, it would cause certain social benefits and have an impact on some elements of social development, both of which were affected by the system, and on this basis,

the ECITPS would be improved and optimized; and the ultimate purpose was to reshape the system conditions and promote the ECITPS to conform to the times and meet the requirements of social development.

3.5. Saturation Test of Theoretical Model

In order to ensure the scientificity of the Grounded Theory research process and the accuracy of the research results, and to test the saturation of the theoretical model of the ECITPS, the last remaining one-third of the 144 pieces of collected Chinese and English literature, i.e., 48 pieces of them were re-encoded with open coding, axial coding and selective coding according to the steps described above. After comparative analysis, no new main category was obtained. Taken together, all the literature has been included in the six main categories that have been previously refined. Therefore, the theoretical model of the ECITPS constructed in this paper passed the theoretical saturation test and reached the theoretical saturation.

4. Theoretical Model Explanation of the ECITPS

4.1. The Theoretical Model of the ECITPS

Based on the above coding and analysis, this paper constructed a theoretical model of the ECITPS. According to the implementation process of the ECITPS, the model was divided into three parts: the early stage, the middle stage and the late stage. This section would introduce the structure of the model.

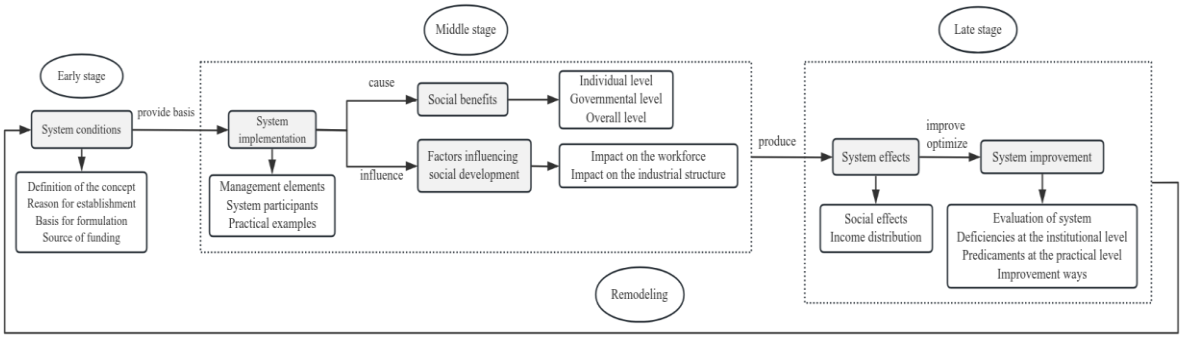

Figure 2. Theoretical model of Horizontal transfer payment system for ecological compensation

In the early stage, there was one main category of system conditions including four initial categories: "Definition of the concept", "Reason for establishment", "Basis for formulation" and "Source of funding", and in the middle stage, there were three main categories of System implementation, social benefits and Factors influencing social development. The main category of system implementation was composed of three initial categories: "Management elements", "System participants" and "Practical cases", the main category of Social benefits was composed of three initial categories: "Individual level", "Governmental level" and "Overall level", the main category of Factors influencing social development was composed of two initial categories: "Impact on the workforce" and "Impact on the industrial structure", and in the late stage, it covered two main categories of system effect and system improvement. The main category of system effect was reflected through two initial categories: "Social effect" and "Income distribution", and the main category of system improvement was composed of four initial categories: "Evaluation of system", "Deficiencies at the institutional level", "Predicaments at the practical level" and "Improvement ways".

It was worth explaining that the system conditions in the early stage provided a basis for the implementation of the system in the middle stage, and after the implementation of the system, it would cause social benefits and have an impact on the elements of social development. Subsequently, the Horizontal transfer payment for ecological compensation has entered the late stage, which has produced system effects, and on this basis, the system has been promoted through some improvement and optimization channels. The specific structure and overview of the theoretical model were shown in Fig. 2, and the dimensions and paths of the model would be described in the next section.

4.2. The Constitution and Dimension Connotation of the ECITPS Theoretical Model

4.2.1. System Condition

Based on the Grounded Theory, this paper concluded that the system conditions of ECITPS were consisted of four dimensions: definition of concept, reasons for establishment, basis for formulation, and source of funding.

The definition of the concept was based on the transfer of benefits and the means of coordinated development, which were the two aspects of the interagency transfer of ecological compensation. Because the significant difference between eco-compensation interagency transfer payment and other types of transfers was the cooperative relationship between inter-departmental inter-provincial or municipal authorities on ecological compensation, which inevitably involved the transfer of benefits between the regions. When this cooperative relationship was carried out in a good and orderly manner, it was a manifestation of the coordinated development of ecological protection among regions, and thus the eco-compensation interagency transfer payment could be regarded as a means of maintaining coordinated regional development.

The reasons for establishment covered three aspects: sharing the financial pressure of the central government, the dilemma caused by the inadequate system, and the upgrading of consumption. From the above elaboration, it was obvious that the ecological compensation interagency transfer payment was a means to maintain the coordinated development of the region [23], and when the inter-agency transfers between localities could be coordinated and mutually supportive, the financial pressure on the central government would be shared. At the same time, the system was not perfect at the beginning of the establishment, and it required to be improved with the transformation of productive forces and relations, when the existing system could not solve the current social dilemmas, it was necessary to form a new system to fulfill and thus building the institutional system. The development and improvement of the financial system has also experienced such a process. Influenced by the dilemma caused by the inadequate actual system, the establishment of ECITPS came into being. Moreover, with the continuous development of productive forces and production relations, social contradictions have undergone a new transformation [24], Especially when people realized that endangering the living environment would have extremely serious consequences [25], they paid more attention to consumption in the field of eco-environmental protection [26], prompting upgrading consumption of residents [27]. The basis for the formulation of ECITPS needed to be further explored, building on the above definition of the concept and the reasons for its establishment. The initial category mainly included three conceptual codes: legal and economic perspective, system establishment support, and establishment of local standards. The formation of a country's system required a reliable basis based on legislation [28], so if the ecological compensation interagency transfer payment was to become a reliable social system to safeguard people's livelihoods, it needed to be supported by legislation to enhance its seriousness [29]. On this basis, the ECITPS could realize the institutionalize, commercialize and maximize efficiency for ecological services, which reflected the support of its system establishment. At the same time, since the ecological compensation interagency transfer payment emphasized the inter-agency transfer payment between local governments, it was inevitable to establish local standards on reasonable construction. This also reflected in its focus on building content as a feature that distinguished it from other types of transfers. All above was the explanation of the basis for the formulation of the ECITPS.

The source of funding included two aspects: compensation funds and taxes. The ECITPS was mainly established for the ecological compensation interagency transfer payment, so financial compensation was an indispensable and important source of funding. Specifically, some scholars have pointed out that the fund of ECITP might be divided into basic compensation funds and incentive compensation funds, and that the incentive compensation funds and the incentive compensation funds were stepwise increased according to the comprehensive growth rate of ecological protection indicators [30]; On this basis, some scholars have pointed out that [31] the taxes levied by provincial and municipal governments could be used as special funds for eco-compensation interagency transfer payments, to be applied when involving inter-regional and inter-agency compensation. It could be seen that different scholars had different views on the multiple sources of the funding for ECITPS.

4.2.2. System Implementation

Based on the Grounded Theory, it was found that the system implementation included three main dimensions: management elements, system participants, and practical examples. Firstly, in terms of management elements, the critical management elements of a private sector included human, capital, material, information, managerial talents, etc., and the technical practice at the end of the last century showed that a variety of technologies had become an important resource in the private sector.

Secondly, because the participants of the interagency transfer payment system of ecological compensation include the establishment of a third party, a special department as a third party, and the guidance of national financial support, it was based on the synergy theory [32] that from the perspective of the self-organization of the system caused by the cooperation effect revealed, the third-party institutions would be able to make objective and fair evaluation and supervision of the implementation process and effects of the system [33], and the interagency transfer payment of ecological compensation had its particularity, and compared with other forms of transfer payment, more emphasis was placed on the relationship between the local inter-agency level, which required the establishment of a special department as a third-party participant to study and judge the particularity of the system.

Finally, as a public policy that was widely implemented all over the world, in order to avoid the problems of policy failure and inefficiency of the economic system after a period of operation [34], this paper drew on the systematic research on the "policy experiment" of China's "policy pilot" conducted by the German scholar Han Botian [35], in the face of complex and diverse ecological environments, pilots with different functions could be formed for different types of ecological environments, and the accumulation of these pilot experiences has formed practical cases for reference.

4.2.3. Social Benefits

Using the Grounded Theory to summarize the main categories of the existing research on the interagency transfer payment system for ecological compensation, it wa found that its social benefits mainly included three dimensions, namely, the benefits at the individual level (micro), the governmental level (meso) and the overall level (macro). Among them, the benefits at the individual level included the concept coding of employment opportunities, innovative livelihood sources, and full expression of interest demands; The benefits of the governmental level included the concept coding of four aspects: improving the efficiency of ecological service supply, the effective supply of regional ecological services, the coordinated development of ecological function areas, and the degree of financial effort; The overall level benefits included the concept coding of four aspects: narrowing the income gap between urban and rural areas, redistribution of ecological benefits, implementing sustainable development strategies, and social fairness and justice. Due to the fact that in the psychology of the self, the socio-ecological system of individual existence [36] could be divided into three basic types: micro-system, meso-system, and macro-system [37, 38].

Specifically, the benefits of the ECITPS at the individual micro level were aimed at what benefits the system would bring when people themselves existing as individuals. The ECITPS provided corresponding employment opportunities for people to earn a living when they were treated as individual individuals, and could increase the employment opportunities for rural tourism such as rural homestays and farmhouses in the vicinity [39], while innovating the source of livelihood so that they could gain a sense of security in the competition for survival.

Further, when people formed aggregated groups on the basis of individuals, it was the meso-system in this socio-ecological system. This meso-level system was a small-scale group of individuals, including their families, occupational environments, and other communities. The benefits of the interagency transfer payment system for ecological compensation in improving the efficiency of ecological serviced supply, the effective supply of regional ecological services, the coordinated development of ecological function areas, and the degree of financial effort were brought by the government, which was a meso-group composed of individuals, i.e., the benefits generated by the implementation of the system at the meso-level level of the government.

Finally, on the basis of each group as a meso-system, the broadest macro-system would be formed. This level was the broadest social system in the whole society, including culture, communities, institutions and organizations, and was no longer presented as a simple single group of government, but encompassed the social environment in which the whole system of society was located, and also included the supporting parts of culture and subculture. It was also the embodiment of the benefits of the ECITPS at the overall level. At this level, it mainly included the social benefits of narrowing the income gap between urban and rural areas, redistributing ecological benefits, implementing sustainable development strategies, and social fairness and justice.

In general, based on the above analysis, it could be found that the social benefits of the ECITPS were a vivid embodiment of the internal logic of the theoretical model of the social ecological system.

4.2.4. Factors Influencing Social Development

Labor factors and production factors were two important components that were indispensable for the overall development of society, and these two dimensions constituted the factors affecting social development by ECITPS. In today's society, the mode of production was gradually upgrading, and the optimization and transformation of the industrial structure were also undergoing profound changes. When a system was implemented in society, it would have an impact on various factors in social development as an exogenous shock. After the analysis based on Grounded Theory in the ECITPS, it was found that it mainly reflected in two aspects: labor force and industrial structure.

The impact of the system on the development of social labor factors was mainly reflected in three aspects: labor income distribution, social welfare, and farmers' productive life. Specifically, since there were "externalities" in the field of ecological and environmental protection, which arose because there was some form of deviation between the marginal costs and benefits of private individuals with that of society, and the key to eliminating the "externalities" generated by this deviation was that the government should adopt appropriate economic policies, which were specific taxing or incentives and subsidies to the economic parties. In view of this, the key to solving ecological and environmental problems was how to internalize the "externalities". The Horizontal transfer payment system for ecological compensation was a way to alleviate externalities by rewarding economic parties, as an inter-agency compensation method for eco-protection areas, it would have an impact on the income distribution of workers in the affected areas to a certain extent. Effective policies would alleviate externalities by affecting workers' income distribution. Economist Pigou has studied the problem of "externalities" from the perspective of welfare economics and found that the government's alleviation of externalities by taxing economic parties or giving incentives and subsidies would also have an impact on social welfare. Based on the above analysis, it could be seen that the ECITPS played a role in the process of transforming negative externalities into positive externalities, therefore, from the perspective of Pigou's research, the implementation of the system also had an impact on social welfare. When workers were directly affected by the direct impact of income distribution and the indirect impact of changes in the overall situation of social welfare, a chain reaction would also occur in their productive life. Farmers who received higher benefits than in the past would be more enthusiastic about promoting the implementation of the Horizontal transfer payment system for ecological compensation, otherwise those who would be more negative, burying hidden dangers and hindering the implementation of the system. It was worth explaining that most of the areas targeted by the ECITPS

were rural areas, because the natural resources were also relatively abundant in the areas where the primary industry was more developed, and it was necessary to overexploit and utilize their ecological resources and protect them in a scientific way.

In the analysis of the impact of the ECITPS on the industrial structure, it is mainly based on the impact of the policy on different types of industries and the impact on the adjustment of the thrice industrial structures. William Petty discussed the characteristics of three different types of industries in society in the theory of industrial structure change, arguing that commerce could obtain more income than manufacturing, and manufacturing could obtain higher income than agriculture. The continuous transfer of labor from low-income industrial sectors to high-income industrial sectors, i.e., the continuous transfer of labor from the agricultural sector to manufacturing and commerce, was the result of income differences between different industrial sectors. It could be seen that the three different types of industries had their own different characteristics, and they also had different impacts on workers' income. The implementation of ECITPS would naturally bring different policy impacts to different industries. At the same time, it had the nature of transfer payment, and as a way of capital compensation, it would naturally have different impacts on different types of industries, which would lead to changes in the income of labor engaged in different types of industries. Based on Kuznets's theory of industrial structure change, it was found that with the economic development of a country, the proportion of the primary industry in the whole national economy was in a downward trend; in the pre-industrialization stage, the proportion of the secondary industry in the national economy has increased significantly, in the middle stage of industrialization, the proportion of the labor force in the secondary industry has risen faster than its proportion in the national economy, and in the post-industrialization stage, the proportion of the secondary industry in the national income and the proportion of labor force have both declined, and the proportion of the tertiary industry has been rising. At present, the global mode of production was in transformation [40], and many developing countries should shift from rapid development to high-quality development [41], while the source of labor income was also gradually transitioning from the primary industry to the secondary and tertiary industries, and finally taking it the main of the tertiary industry. The ECITPS was conducive to promoting the smooth transition and transformation of industrial structure under the premise of protecting natural resources. In other words, if the majority of national income came from the consumption of natural resources and the environment, then the transformation and upgrading of the industrial structure achieved by sacrificing natural capital was not sustainable and cannot achieve high-quality development. It could be seen that the more a country's economy developed, the more attention should be paid to the accumulation and protection of regional natural resources. Therefore, the emergence of ECITPS was in line with the law of the times and social development, and was conducive to the adjustment of the thrice industrial structures.

4.2.5. System Effects

The system effects mainly included two dimensions: social effects and income distribution. In the dimension of social effects, there were four aspects: urban and rural effect, employment effect, structural effect, and triggering effect difference. The generation of the effects could be analyzed by drawing on the theory of social interaction effect.

As a public system, the ECITPS would inevitably have an impact on the inherent ties that had been formed between various social groups before the implementation. And based on the assumption of "embedded" personality in society [42], the effect of the implementation of the ECITPS would be mainly reflected in the two aspects of urban and rural areas, because at the social level, from the perspective of economic development and regional division, urban and rural areas were the two most prominent groups, and between the groups it was mainly concentrated in rural areas that oriented to the ECITPS.

Based on the perspective of social interaction research, some individuals required to adjust the direction of employment would be subject to the industries on the weaker impact of eco-compensation interagency transfer payment system. When a part of society made adjustments to its own employment direction, it would bring changes to the overall structure of the employment market, and the various components of society was in constant interaction. Once this change spread from individuals to groups, the industrial structure would need to be adjusted, thus triggering structural effects. However, subject to some objective factors, the eco-compensation interagency transfer payment system implemented in different regions and different social environments would produce different social interaction effects, which would lead to different urban and rural effects, employment effects, structural effects, and as a result, the effects on the society as a whole after the implementation of the system would differ, which would cause certain economic fluctuations and lead to differences in effectiveness.

Secondly, in the dimension of income distribution, there were three aspects: the transfer income of urban and rural residents, the micro individual income, and the income gap between urban and rural areas. The reason was that under the ecological protection policy, the main functions of some natural resources in urban and rural areas had changed after being affected by the system, resulting in a change in the income composition of some residents who originally relied on natural resources for productive life, and the income of the labor force who was originally highly dependent on the natural environment for their livelihood has been reduced, so they required to be assisted with the government's transfer funds, and the interagency transfer payment funds for ecological compensation have played a role here. As advocated by the New Cambridge School, appropriate subsidies should be given to poor families to help change the poverty status of low-income people [43]. Moreover, the cause of this poverty was the involuntary unemployment of the labor force after the impact of the policy, which meant that there was a certain structural unemployment. In this case, the region was in a state of underemployment, but the interagency transfer funds for ecological compensation could only alleviate this situation for a short time. However, in the long run, it would lead to the dependence of the region on transfer funds, which should cause more labor force being reluctant to work and relying on transfer funds. Give a man

a fish and you feed him for a day; teach a man fish and you feed him for a lifetime. After the implementation of the corresponding ecological protection policy, the region could apply the interagency transfer funds for ecological compensation to buffer the policy impact in the short term, but in the long run, it was still necessary to encourage the affected labor force to participate in employment.

As a result, urban and rural residents' transfer incomes and micro-individual incomes would show fluctuations in this process. However, if a place was more perfect in the construction of the eco-compensation interagency transfer payment system, tended to positively guide, and actively promoted employment, both of them would return to a stable state after short-term fluctuations, and contribute to the reduction of the urban-rural income gap after the promotion of full employment. On the contrary, if the construction of the eco-compensation interagency transfer payment system was not perfect, it could lead to drastic fluctuations in the transfer income of urban and rural residents and micro-individual income, thus further exacerbating the urban-rural income gap.

4.2.6. System Improvement

Based on the Grounded Theory analysis, it was found that the institutional improvement dimension of ECITPS was a process that required to continuously play its institutional role in the increasing of positive spiraling, which mainly included four dimensions: evaluation of system, current deficiencies at the institutional level, predicaments at the practical level, and improvement ways. It coincided with the two sections that C-Check; A-Action, Summary, Processing and Improvement in the Continuous Improvement Spiral PDCA cycle management model [44].

In the dimension of system evaluation, it mainly focused on three aspects: effectiveness evaluation, fund efficiency evaluation, and changes in total social welfare. In terms of effectiveness evaluation, it was conducive to making an objective judgment on the current implementation of the ECITPS, which was helpful to lay the direction for the improvement of the system when entering the PDCA cycle in the future stage. However, due to the overall dependence of transfer payment funds in many regions, the utilization efficiency of interagency transfer payment funds would directly affect the reliability of the implementation of the system. Therefore, after the evaluation of the overall system effect, it was necessary to further evaluate the fund efficiency of the interagency transfer payment for ecological compensation. As a social system, the implementation and formulation of policies for the eco-compensation interagency transfer payment were to create more benefits for the whole society, so it was necessary to examine the changes caused by the system in terms of social welfare, so as to judge the realization of the ultimate goal and the highest goal set by the public sector.

The two aspects of current deficiencies at the institutional level and predicaments at the practical level mainly correspond to the summary link in the PDCA cycle theory, which were summarized by the evaluation results of the ECITPS. In terms of current deficiencies at the institutional level, there were four main aspects: single coverage area, low coverage, lack of implementation standards, and lack of inter-provincial implementation standards. It was because that the current eco-compensation interagency transfer payment system was still implemented in the area dominated by rivers, and the trend towards increasing urbanization in recent years had led to the current implementation of the system in a single and small area of coverage [45]. As a result of regional differences and different characteristics of ecosystems, in some regions, there was still a lack of implementation standards at the institutional level, which led to the insufficient effect of interagency transfers, and caused the lack of inter-provincial implementation standards.

In terms of predicaments at the practical level, there were five main aspects: few pilot sites, lack of multi-provincial cross-border compensation, lack of linkage between upstream and downstream provinces, lack of authority and coercive force, and insufficient incentive measures. Among them, the lack of pilot projects is consistent with the existing problems of single coverage and small coverage at the institutional level, the lack of multi-provincial cross-border compensation and the lack of linkage between upstream and downstream provinces correspond to the existing problems of lack of implementation standards and inter-provincial implementation standards at the institutional level, and the lack of authority and coercive force corresponds to the existing problems of lack of legal constraints at the institutional level.

The improvement method corresponds to the improvement link in the PDCA cycle theory. It mainly includes three aspects: innovation incentive mechanism, negotiation and determination of relevant matters, and establishment of a system. Among them, the innovative incentive mechanism is mainly aimed at the dilemma that there are insufficient incentives in the interagency transfer payment system of ecological compensation in practice, and the negotiation and determination of relevant matters is mainly based on the lack of inter-provincial implementation standards at the institutional level, the lack of multi-provincial cross-border compensation at the practical level, and the lack of linkage between upstream and downstream provinces.

5. Conclusions and Shortcomings of the Study

5.1. Research Findings

This paper applied the grounded theory method to gradually code and systematically analyze a total of 144 relevant texts and literature on the Horizontal transfer payment system of ecological compensation, and draws the following conclusions:

The theoretical model of the Horizontal transfer payment system for ecological compensation mainly includes six main categories: system conditions, system implementation, social benefits, social development factors, system effects, and system improvement. At this stage, the impact of the Horizontal transfer payment system of ecological compensation is mainly reflected in two aspects, on the one hand, it will trigger social benefits, and on the other hand, it will have an impact on social development factors.

Based on the PDCA cycle model, it can be seen that the elements of institutional conditions correspond to the plan link, which occurs in the early planning stage of the generation of the interagency transfer payment system of ecological compensation, and the implementation elements of the system correspond to the Do link, which is in the middle stage of the specific implementation of the interagency transfer payment system of ecological compensation. The four dimensions of the improvement method correspond to the check and action links of the PDCA cycle theory, which are in the later stage of the implementation of the interagency transfer payment system of ecological compensation. In this way, the PDCA continuous improvement spiral framework of the interagency transfer payment system of ecological compensation has been formed, based on which the improvement and development of the system was realized in the process of continuously discovering and solving problems, which was also the embodiment of the reshaping of the initial system.

5.2. Deficiencies and Prospects

This paper analyzed and researched the textual data related to the Horizontal transfer payment of ecological compensation, although the comprehensiveness and completeness of the data were considered as much as possible in the process of collecting text data for encoding, and the principle of theoretical saturation was followed, there might still be a certain degree of subjectivity and emphasis in the release of data and information. In the future, the in-depth interview method could be used as a data source to further verify and supplement the theoretical model of the Horizontal transfer payment system of ecological compensation.

Disclosure Statement

The authors declare no conflict of interest.

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