

# Thoughts on ecological value compensation in the process of non-agricultural land use

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## Abstract

Under the situation that the protection of cultivated land is becoming more and more severe, it is of great significance to carry out quantitative research on the ecological value of cultivated land to understand the magnitude of the external value of cultivated land and to deepen the quantitative methods and ideas of ecological value of cultivated land. Based on the analysis of the necessity of ecological value compensation in the process of agricultural land non-agriculturalization, and through theoretical research on cultivated land compensation standards, the impact of human activities on the service value of farmland ecosystems, and the accounting of farmland ecosystem service values, a targeted proposal is put forward. Improve the countermeasures and measures of the ecological compensation mechanism for cultivated land.

## Keywords

**Agricultural land non-agricultural; cultivated land compensation standard; farmland ecosystem service value; ecological value compensation.**

## 1. Introduction

Cultivated land resources are an important guarantee for national food security and the most important agricultural production material in the earth's living system, with various functions and values such as food production, climate regulation, space carrying, landscape optimization, and ecological services. Food security concerns people's living standards, social stability and solidarity, and the country's stable development. In recent years, the Chinese government has made great efforts to achieve food security through direct food subsidies, and the food security problem has been effectively alleviated, but the accompanying economic pressure has become a new problem. Based on this, the research on solving food security has become a hotspot of sustainable research on cultivated land ecosystem. Ecological compensation is aimed at the protection and sustainable use of ecosystem services, with economic means as the main method, to compensate, restore, and comprehensively control the damage or quality degradation of existing ecosystem functions due to human activities, as well as environmental pollution. The general term for a series of activities. Farmland ecosystem services, that is, the gross product of farmland ecosystems, refers to a series of services and benefits provided by farmland ecosystems and their ecological economic processes to humans and the environment they maintain for human survival. (natural resource endowment and agricultural biological interaction) and artificial activities (human improvement of the original cultivated land environment, including external inputs such as improved seeds, chemical fertilizers, irrigation, machinery, pesticides, etc. to improve system productivity) Human direct and indirect effects.

## 2. The Necessity of Ecological Value Compensation in the Process of Farmland Non-agriculturalization

The Eighteenth National Congress of the Communist Party of China emphasized the construction of ecological civilization in a prominent position, requiring the integration of ecological civilization into all aspects and the whole process of economic construction, political construction, cultural construction, and social construction, striving to build a beautiful China and realize the sustainable development of the Chinese nation. Subsequently, the "Opinions on Accelerating the Promotion of Ecological Civilization Construction" issued by the State Council refined the overall requirements and goals of ecological civilization construction, and proposed that by 2020, an ecological civilization system system featuring source prevention, process control, damage compensation, and accountability should be basically formed. , ecological protection red line, ecological protection compensation, ecological

The construction of key systems such as the environmental protection management system has achieved decisive results. The report of the 19th National Congress of the Communist Party of China emphasized the importance of ecological civilization construction, and proposed to strictly protect cultivated land, expand the pilot of crop rotation and fallow, improve the recuperation system of cultivated land, grassland, forests, rivers and lakes, and establish a market-oriented and diversified ecological compensation mechanism. Therefore, the research on ecological value compensation in the process of non-agriculturalization of farmland is a specific measure to implement the reform plan of the ecological civilization system of the Party Central Committee, and it is an inevitable requirement of land use management in the context of the new era.

## 3. The impact of human activities on the value of farmland ecosystem services

The national conditions of China with more land and less land determine that agriculture must continue to increase the grain yield as the development goal. However, the process of increasing land yield increases the pressure on cultivated land, and the structure of farmland ecosystems is destroyed, functionally degraded, and even destroyed. The situation is becoming more and more serious. The impact of human activities on farmland ecosystems is mainly manifested in unsustainable cultivated land use and urban construction occupation of cultivated land. On the one hand, due to improper or excessive use of chemical fertilizers and pesticides, soil degradation problems such as soil acidification and secondary salinization have occurred, resulting in the destruction of the ecological balance of cultivated land, the decline of soil fertility, and the safety of agricultural products. On the other hand, urban construction occupies a large amount of cultivated land, and due to limited reserve resources, it is difficult to "occupy one and make up for one, and make up for the superior" in a timely manner, which will significantly affect the service value of farmland ecosystems.

## 4. Farmland Ecosystem Service Value Accounting

As a semi-natural and semi-artificial system, cultivated land can provide necessary material services for human life and production through its own ecosystem process, that is, it has the value of supplying agricultural products and providing raw materials. Soil is an important prerequisite and foundation for the maintenance of farmland ecosystems. On the one hand, the farmland ecosystem can effectively prevent sediment deposition caused by rainfall erosion through the holding function of cultivated land, and on the other hand, through self-control and regulation, it maintains the fertility in the soil layer and promotes a virtuous cycle of nutrients. Therefore, the farmland ecosystem has the ability to reduce sediment. Sedimentation service

value and soil fertility maintenance service value. The biological metabolism in the cultivated land ecosystem can promote the ecological circulation of materials within the ecosystem, effectively prevent the pollution caused by the excessive accumulation of redundant substances, and at the same time, it can purify the atmosphere by absorbing SO<sub>2</sub>, dust and other substances in the atmosphere. Ecosystems have the service value of waste consumption and air purification. due to farming The crops are harvested every year, and the fixed carbon is returned to the atmosphere or into the soil. Therefore, the service value of soil carbon sequestration in cultivated land needs to be calculated..

## **5. Countermeasures and Measures to Improve the Ecological Compensation Mechanism of Cultivated Land**

### **5.1. Consolidate the data base of cultivated land resources**

The survey and monitoring data of cultivated land resources and environment are the basic basis for objectively evaluating the utilization efficiency of cultivated land resources and the environmental quality of cultivated land, and implementing the supervision, management and decision-making of cultivated land. Strengthen the construction of basic capabilities such as cultivated land resources and environmental investigation, monitoring, statistics, and information management platforms, strengthen the application of high-tech such as big data, artificial intelligence, and satellite remote sensing, implement full-process monitoring of cultivated land resources and environment monitoring activities, and improve the scientific nature of basic data. Accuracy and timeliness. Strengthen inter-departmental collaboration, improve the natural resource basic information platform, ecological environment monitoring network and basic information database, and realize the sharing of information resources. Establish a responsibility system for quality assurance of resource and environmental monitoring data, and improve the prevention and punishment mechanism for fraudulent investigation and monitoring data.

### **5.2. Establish systematic and dynamic ecological compensation standards**

According to the characteristics of cultivated land quality and productivity, formulate ecological compensation standards for cultivated land, and form a systematic ecological compensation standard system. Clarify and unify the ecological compensation standard and the accounting method for calculating the ecological service value of cultivated land, actively explore the quantitative evaluation system of cultivated land ecological compensation, and realize the refined management of linking the value of cultivated land per unit area with the ecological compensation of cultivated land. In the specific implementation process, the ecological compensation standard should be adjusted in a timely manner according to the effect of ecological and environmental protection of cultivated land, the strength of government financial support, and the actual social and economic situation.

### **5.3. Innovative ecological value compensation method**

Chinese scholars have studied ecological value compensation from different perspectives. The ecological value compensation standard is the core of the current research. There are three types of compensation methods: horizontal ecological compensation, vertical ecological compensation and market-oriented ecological compensation. However, the determination methods of ecological value compensation standards in my country are relatively simple, and there are mainly two types: 1) the equivalent factor method based on ecosystem service value; 2) the willingness to pay method based on ecological compensation stakeholders. And the existing research mainly focuses on the ecological value compensation system in each province and city, and there is no research on the national scale.

In future research, it is necessary to enrich the scale range of ecological value compensation research. It is necessary to strengthen large-scale macro research and explore regional micro research, which can provide guidance for the formulation of more scientific ecological value compensation systems for different regions. . Establish and improve three types of ecological compensation mechanisms, and scientifically and rationally determine ecological compensation standards.

## 6. Related Suggestions

At present, ecological value compensation has not been carried out in the process of non-agriculturalization of agricultural land in my country. However, with the deepening of ecological civilization construction, ecological value compensation in the process of non-agriculturalization of agricultural land should be an important task in land and resource management. The scientific quantification of compensation and how to operate it in practice are the hotspots of future research. In the practice of ecological compensation in my country, the standard of ecological compensation is relatively low, the intensity of ecological compensation needs to be strengthened, the supporting basic system needs to be accelerated, and the investment in ecological compensation needs to be strengthened. All localities should be encouraged to issue normative documents or regulations to continuously promote the institutionalization and legalization of ecological compensation.

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