

Research on Farmland Protection and Economic Compensation in Major Grain Producing Areas: A Case Study of Anhui Province

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Abstract

As one of the 13 major grain-producing areas in China, Anhui Province undertakes the dual tasks of ensuring national food security and promoting regional economic development. At present, under the background of rapid urbanization and increasing pressure on farmland protection, establishing a scientific and effective economic compensation mechanism for farmland protection has become a key path to coordinate food security, ecological security and farmers' interests. Taking Anhui Province as the research object, this paper systematically sorts out the functional positioning, existing problems and operation logic of the compensation mechanism for farmland protection in major grain-producing areas through literature analysis, field research and case comparison based on the theory of farmland protection externalities and stakeholder theory. The study found that farmland protection in Anhui Province faces realistic dilemmas such as "mismatch between responsibilities and interests", "imbalance between costs and compensation" and "single policy tools": on the one hand, local governments face the dual constraints of fiscal pressure and development assessment in the balance of farmland occupation and compensation, and the enthusiasm of farmers as the main body of farmland protection is suppressed due to the low compensation standards and rigid methods; on the other hand, the current compensation policy focuses on the protection of grain production capacity, and the consideration of ecological service value and loss of farmland development rights is insufficient, and the application of market-based compensation means lags behind. By constructing a multi-compensation framework of "government-led-market-supplemented-social participation", the study proposes: first, to clarify the multiple subjects and objects of cultivated land protection compensation, to incorporate horizontal compensation between local governments, incentives for new agricultural operators, and protection of farmers' rights and interests into policy design, and to establish differentiated compensation standards based on grain output, ecological value and opportunity cost; second, to expand the source of compensation funds, explore market-oriented mechanisms such as cultivated land index trading and ecological product value realization, and integrate central transfer payments, local fiscal budgets and social capital investment; third, to improve the supporting measures of compensation policies, and to improve the effectiveness of policy implementation by establishing a dynamic monitoring system for cultivated land quality, strengthening performance evaluation of compensation funds, and cultivating a social supervision mechanism for cultivated land protection. The research conclusions provide a practical reference for optimizing the cultivated land protection system in major grain-producing areas and promoting regional coordinated development, and also provide new ideas for solving the institutional contradiction of "disconnection between protectors and beneficiaries".

Keywords

Major Grain-Producing Areas; Farmland Protection; Economic Compensation; Interest Coordination.

1. Introduction

Cultivated land protection is a core strategy to ensure national food security and a key foundation for achieving rural revitalization and ecological civilization. In recent years, with the acceleration of urbanization and industrialization, my country's cultivated land protection faces the dual pressures of "non-agriculturalization" and "non-grainization", and the problems of reduced cultivated land quantity, deteriorated quality, and weakened ecological functions have become increasingly prominent. The Central Document No. 1 of 2024 clearly proposed to "improve the 'three-in-one' protection system of cultivated land quantity, quality, and ecology", requiring the strengthening of the party and government's joint responsibility for cultivated land protection and the strict implementation of special protection of permanent basic farmland. As one of the 13 major grain-producing areas in the country, Anhui Province will have a cultivated land area of 83.9376 million mu and a total grain output of 83.69 billion jin in 2024, both of which are among the highest in the country.^[1] However, it also faces realistic challenges such as imbalance between cultivated land protection responsibilities and interests and imperfect compensation mechanisms.^[2]

2. Multi-dimensional Value Reconstruction and Strategic Significance of the Innovation of the Interest Compensation Mechanism in Major Grain Producing Areas

2.1. Solving the Dilemma of Interests in Unbalanced Regional Development

The formation of grain production and marketing patterns is influenced by a variety of factors. There are significant differences in economic development levels between major production areas and major marketing areas. Major marketing areas are usually more economically developed and have more resources to develop secondary and tertiary industries, while major production areas are subject to certain restrictions in their industrial development choices due to their heavy responsibility for grain production. In order to ensure national grain supply, major production areas have sacrificed some opportunities to develop efficient industries.

Innovating the interest compensation mechanism and establishing a provincial horizontal interest compensation mechanism for grain production and marketing areas can promote the reasonable distribution of interests among regions.^[3] The main marketing areas transfer grain from the main production areas, which is equivalent to transferring arable land, water resources and other industrial development opportunities. It is reasonable to give economic compensation to the main production areas. On the one hand, this compensation can alleviate the financial pressure of the main production areas, narrow the gap between the main production areas and the main marketing areas in economic development level and public service capabilities, and promote the coordinated development of regional economy; on the other hand, it also prompts the main marketing areas to pay more attention to food security responsibilities, support the grain production of the main production areas from the outside, and build a food security pattern of "holding the rice bowl together and shouldering the responsibility together".^[4] For example, the main marketing areas support the development of grain processing industry in the main production areas through capital investment and industrial cooperation, which not only guarantees their own grain supply, but also drives the economic development of the main production areas.^[5]

2.2. Promoting Sustainable Transformation of Farmland Protection

Traditional farmland protection policies focus on quantity control, and pay insufficient attention to the value of farmland ecosystem services. Innovative interest compensation mechanisms can monetize the ecological functions of farmland, such as carbon fixation and oxygen release, and soil and water conservation, through market-oriented means, and encourage major production areas to strengthen farmland ecological restoration and quality improvement.^[6] For example, the "cultivated land quality improvement + ecological compensation" model promoted by Anhui Province links compensation funds with ecological indicators such as soil organic matter content and fertilizer and pesticide reduction, guiding farmers to adopt green production methods. This mechanism can not only curb the trend of "non-grainization" and "non-agriculturalization" of cultivated land, but also promote the transformation of cultivated land protection from "passive constraints" to "active restoration", and achieve the coordinated improvement of ecological and economic benefits.^[7]

2.3. Building a Collaborative Governance Structure That Achieves Win-win Outcomes for All Parties

The protection of cultivated land in major grain-producing areas involves multiple entities such as the government, farmers, and enterprises, and differences in interest demands often lead to inefficient policy implementation. The interest compensation mechanism can build an incentive and constraint system of "protectors benefit, users pay, and destroyers are punished" by clarifying the rights, responsibilities, and interests of all parties. For example, credit interest subsidies and insurance subsidies are given to new agricultural operators participating in the construction of high-standard farmland, financial rewards are given to townships that strictly fulfill their responsibilities for the protection of cultivated land, and economic penalties are imposed on illegal occupation of cultivated land. This mechanism can not only enhance farmers' enthusiasm for protecting cultivated land, but also enhance the initiative of local governments in implementing cultivated land protection policies, and form a joint force for cultivated land protection with the participation of the whole society.

2.4. Strengthening the Institutional Foundation for National Food Security

Food security is an important foundation for national security, and the main grain-producing areas, as the core areas of my country's grain production, are of great importance. However, for a long time, the main grain-producing areas have faced the dilemma of low comparative returns from growing grain and small contributions to the fiscal budget, resulting in the widespread phenomenon of "high grain production, weak economy, and poor finance". This has seriously affected the enthusiasm of local governments to focus on agriculture and grain production and the enthusiasm of farmers to grow grain. Innovating the interest compensation mechanism for the main grain-producing areas can effectively alleviate the economic pressure in the main grain-producing areas, encourage local governments to increase investment in grain production, stabilize grain planting areas and output, and fundamentally consolidate the foundation of national food security. For example, by raising the financial subsidy standards for the main production areas and expanding the scope of subsidies, the fiscal revenue of the main production areas can be directly increased, so that they have more funds for agricultural infrastructure construction, agricultural science and technology promotion, etc., thereby improving the comprehensive grain production capacity.

3. Deep-seated Contradictions and Institutional Bottlenecks in the Construction of the Interest Compensation Mechanism in Major Grain-Producing Areas

In the process of promoting the food security strategy, although the interest compensation mechanism of major grain producing areas has formed a preliminary framework, it still faces structural contradictions and institutional obstacles in practice, which restrict its effective function. These contradictions are not only due to the interest game between different subjects, but also reflect the defects of the current system design in terms of power and responsibility matching, value accounting and policy coordination.

3.1. Unequal Power and Responsibility Lead to Insufficient Motivation for Local Protection

The main grain-producing areas bear the core function of ensuring national food security, but under the current system, there is a significant imbalance in the allocation of rights and responsibilities. From a cost-benefit perspective, the main grain-producing areas have restricted the non-agricultural use of land due to strict protection of cultivated land, resulting in limited supply of industrial land and compressed space for industrial development, while the low added value of grain production has further aggravated the pressure on fiscal revenue and expenditure. According to estimates, the agricultural output value of some large grain-producing counties in Anhui Province accounts for more than 30%, but the local fiscal self-sufficiency rate is less than 20%, forming a paradox of "the more grain is produced, the weaker the finances". At the same time, the externality of food security has led to the sharing of the protection results of the main producing areas by the whole country, and the compensation funds mainly rely on central fiscal transfer payments. The horizontal compensation mechanism has not yet been effectively established. Local governments have long been in a dilemma of "responsibility guarantee and outflow of benefits", making it difficult to form a sustainable endogenous driving force for cultivated land protection.^[8]

3.2. The Lag in the Value Accounting System Hinders Accurate Compensation

A scientific value accounting system is the basis for building an effective compensation mechanism, but the multiple values of farmland protection in the main production areas have not yet been fully quantified. The existing compensation standards are mainly based on grain output or cultivated land area, ignoring the ecological service value of cultivated land (such as soil and water conservation, carbon sink function) and the loss of development rights. Data from the Ministry of Natural Resources show that food production functions account for only 35% of the value of cultivated land ecosystem services in China, while ecological compensation accounts for less than 10% of the current compensation funds, resulting in a serious disconnect between compensation standards and actual contributions. In addition, there are significant differences in the quality and planting costs of cultivated land in different regions, but the "one-size-fits-all" phenomenon of compensation policies is prevalent. For example, the difference in cultivated land compensation standards between the northern Anhui Plain and the southern Anhui hilly areas in Anhui Province is less than 20%, which cannot reflect the true cost of cultivated land protection and weakens the incentive effect of compensation policies.

3.3. Lack of Market-Oriented Mechanism Restricts Capital Supply

At present, the interest compensation in the main production areas is still mainly government-led fiscal subsidies, and the market-oriented means are not fully applied, resulting in a single source of funds and low compensation efficiency. Although market-oriented mechanisms such as cultivated land quota trading and ecological product value realization have been piloted, they are constrained by regional barriers, imperfect trading rules and other factors, and the actual

results are limited. Taking the cultivated land occupation and compensation balance quota trading in Anhui Province as an example, the cross-city transaction volume within the province in 2023 only accounted for 18% of the theoretical gap, and the transaction price was significantly lower than market expectations, which could not form an effective capital feedback. In addition, the channels for social capital participation are not smooth, and financial instruments such as agricultural insurance and green finance are not fully applied in the compensation mechanism, making it difficult to meet the funding needs for large-scale cultivated land protection and quality improvement in the main production areas.

3.4. Insufficient Policy Coordination Weakens Implementation Effectiveness

The interest compensation for major grain-producing areas involves the functions of multiple departments such as agriculture, finance, and natural resources. Insufficient policy coordination has led to a fragmented compensation mechanism. Data barriers between departments have not yet been broken down, and data standards such as arable land quality monitoring, grain output statistics, and ecological value assessment are not unified, which affects the scientific nature of compensation decisions; compensation funds are scattered among different departments, and there are duplicate subsidies and coverage blind spots. For example, funds for high-standard farmland construction and subsidies for arable land fertility protection overlap in some projects. In addition, the inter-provincial horizontal compensation mechanism lacks top-level design, and the interest consultation and responsibility sharing mechanism between production and marketing areas has not yet been institutionalized, resulting in a lack of rigid constraints on the compensation of major sales areas to major production areas, and a large space for flexibility in policy implementation.

4. Practical Paths and Institutional Innovation for Optimizing the Benefit Compensation Mechanism in Major Grain-producing Areas

In the face of the structural contradictions and implementation difficulties of the current interest compensation mechanism, we need to base ourselves on the overall food security strategy, formulate systematic policies from the dimensions of system design, value accounting, market mechanism and policy coordination, and build a new interest compensation system with equal rights and responsibilities, scientific precision, and diversified coordination, so as to achieve a two-way improvement in the protection efficiency of major grain-producing areas and the momentum of regional development.^[9]

4.1. Establish a Hierarchical Compensation System with Clear Rights and Responsibilities

To solve the dilemma of unbalanced rights and responsibilities in the main production areas, it is necessary to establish a three-level compensation system framework with central coordination, horizontal coordination, and local implementation. At the central level, the functional positioning and compensation standards of the main grain production areas should be clarified through legislation, and compensation for cultivated land protection should be included in the implementation rules of the "Food Security Law", and a dynamic compensation mechanism linked to grain output, quality, and ecological contribution should be established. At the horizontal level, relying on the Ministry of Natural Resources and other departments, a unified national horizontal compensation platform for grain production and marketing areas should be established, and the "Provincial Grain Production and Marketing Interest Compensation Management Measures" should be formulated to clarify the quantitative standards for the main marketing areas to pay ecological compensation funds according to the net amount of grain transferred in.^[10] At the local level, the "field manager system + compensation list" system should be implemented, the effectiveness of cultivated land

protection should be included in the performance assessment of local governments, and a negative list of compensation funds should be established to ensure that funds are accurately invested in key areas such as high-standard farmland construction and soil fertility improvement.

4.2. Scientific Compensation Standards for Innovative Multi-Dimensional Value Quantification

Break through the traditional single output accounting model and build a three-dimensional value assessment system that includes economic value, ecological value, and development rights loss. In the economic value dimension, refer to the grain production cost and income data released by the Ministry of Agriculture and Rural Affairs to establish a dynamic monitoring model for production costs to ensure that compensation funds cover the cost of all factors such as seeds, fertilizers, and machinery; in the ecological value dimension, use the InVEST model to quantify the ecological service functions of cultivated land such as carbon fixation and oxygen release, soil and water conservation, and incorporate the ecological value per unit area into the compensation standard accounting; in the development rights loss dimension, use the land development rights assessment model to calculate the opportunity cost of the main production areas due to restrictions on non-agricultural development, and formulate differentiated compensation coefficients. Taking Anhui Province as an example, it is recommended that the compensation standard for the core grain-producing area in the northern Anhui plain be increased by 30%-50% compared with the southern Anhui mountainous area, reflecting the regional differences in the cost of cultivated land protection.

4.3. Building a Diversified and Coordinated Market-Based Compensation Mechanism

Break the government's single supply model and build a market-based compensation network of "indicator trading + ecological finance + social capital". In terms of indicator trading, improve the provincial cultivated land occupation and compensation balance indicator trading platform, explore the establishment of a national cultivated land protection quota trading market, and allow major production areas to obtain additional income through surplus indicator trading; in the field of ecological finance, innovate financial products such as "cultivated land protection income rights pledge loan" and "food security index insurance" to guide financial institutions to increase support for major production areas; at the level of social capital participation, promote the PPP model to implement high-standard farmland construction projects, establish an ecological product value realization mechanism, support the main production areas to develop green industries such as organic agriculture and ecotourism, and transform ecological advantages into economic benefits.

4.4. Improve the Cross-Departmental Coordinated Policy Implementation System

Establish a joint meeting system for multiple departments such as agriculture and rural areas, natural resources, and finance, formulate the "Coordinated Management Measures for Benefit Compensation in Major Grain-producing Areas", and realize data sharing, standard unification, and policy linkage. In terms of data integration, connect information systems such as agricultural production monitoring, ecological environment monitoring, and financial funds supervision, and build a big data platform for compensation in major grain-producing areas; at the level of standard unification, jointly formulate technical specifications such as arable land quality grade evaluation and ecological value accounting; in terms of policy linkage, coordinate and integrate agricultural projects such as arable land fertility protection subsidies, high-standard farmland construction funds, and ecological compensation funds, promote the "major project + task list" management model, and improve the efficiency of fund use. At the same time,

establish a compensation policy effect evaluation mechanism, use tools such as DEA models to carry out dynamic evaluation of policy implementation performance, and provide data support for system optimization.

5. Conclusion

This paper focuses on Anhui Province, a major grain-producing area, and discusses the issues of cultivated land protection and economic compensation. The study points out that Anhui Province faces practical difficulties such as "mismatch between responsibility and benefit" and "imbalance between cost and compensation" in cultivated land protection, local governments are constrained by both finance and assessment, farmers' enthusiasm for protection is suppressed, and the current policies do not consider the loss of ecological value and development rights, and market-oriented means lag behind. To this end, it is necessary to construct a multi-compensation framework of "government-led-market supplement-social participation", and put forward the paths of clarifying multiple subjects and objects, expanding funding channels, and improving supporting measures. This study provides a practical reference for optimizing the cultivated land protection system and promoting regional coordinated development in the main grain-producing areas, and also provides a new idea for solving the institutional contradiction of "disconnection between protectors and beneficiaries", which is of great significance for building a solid foundation for national food security.

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