Research on Construction of Agricultural Ecological Compensation Mechanism of Major Grain Producing Areas Based on Sustainable Agricultural Development

Dawei Zhao and Jinpeng Jiao

ABSTRACT

To promote the sustainable agricultural development, it is necessary to establish an agricultural ecological compensation mechanism suitable for the development of major grain producing areas, locate the target by analyzing the principle of the agricultural ecological compensation mechanism for the major grain producing areas and find out the key point for establishment of the agricultural ecological compensation mechanism, and work out the theoretical framework of the agricultural ecological compensation mechanism and evaluate the simulation operation effect of the agricultural ecological compensation mechanism. With a view to establishing the agricultural ecological compensation mechanism suitable for the development of the major grain producing areas, so as to really fulfill the sustainable agricultural development. ¹

KEYWORDS

Sustainable Agricultural Development; Agricultural Ecological Compensation; Ecological Compensation Mechanism

To ensure national food security, we must stabilize and increase grain output, and improvement of grain output depends on the improvement of grain growing enthusiasm, the enhancement of comprehensive grain production capacity, the sustainable development of regional economy and agriculture in the major grain producing areas. Under the market economy condition, to improve the grain growing enthusiasm, enhance the comprehensive grain production capacity, realize

¹Dawei Zhao, Jinpeng Jiao, Harbin University of Commerce, China.
the sustainable development of regional economy and agriculture in the major grain producing areas, a certain agricultural ecological compensation shall be made.

THE PRINCIPLE FOR ESTABLISHMENT OF THE AGRICULTURAL ECOLOGICAL COMPENSATION MECHANISM

The principle of government leading and multi-party participation. Introduce several market subjects including the main sales areas, consumers, enterprises and social organizations into the compensation system.

The principle of due consideration to efficiency and equity. According to the actual situation of the major grain producing areas, balance the compensation standards and the level of scale difference in the major grain producing areas, realizing giving priority to efficiency with due consideration to fairness during the implementation of compensation.

The principle of combining demand with reality. Establishment of the agricultural ecological compensation mechanism shall be based on fully considering the reality, to enable the basic content of the set compensation to be practicable and workable.

THE OBJECTIVES FOR ESTABLISHMENT OF THE AGRICULTURAL ECOLOGICAL COMPENSATION MECHANISM

The overall objective of establishment of the agricultural ecological compensation mechanism in the major grain producing areas is to realize the sustainable agricultural development, the short term objective is to maintain the agricultural ecological environment, i.e. to prevent soil erosion and agricultural ecological degradation through the fallow, conservation, farming and other reasonable agricultural production methods; the long term objective is to improve the agricultural ecological environment, i.e. to enhance agricultural sustainable development ability relying on chemical fertilizer reduction and other ecological compensation projects, to effectively ensure grain output and safeguard the security of national grain, agricultural products and ecology.

THEORETICAL FRAME OF THE AGRICULTURAL ECOLOGICAL COMPENSATION MECHANISM

Basic Frame of The Agricultural Ecological Compensation Mechanism

Establishment of the agricultural ecological compensation mechanism is the inevitable choice to realize the sustainable development of agricultural production, only by coordinating the relations between “development” and “protection”,

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“efficiency” and “justice” can the maintenance and appreciation of agricultural ecological capital be realized. Therefore, on the basis of following the objectives and principles of the agricultural ecological compensation mechanism in major grain producing areas, relative factors enabling the smooth operation of the agricultural ecological compensation mechanism are analyzed, which specifically include: by whom the compensation will be provided (subject of compensation), to whom compensation will be given (object of compensation), why shall the compensation be provided (basis of compensation), under what condition can the compensation be paid (scope of compensation), how to make the compensation (compensation mode, compensation payment model, compensation approach), how much shall be the compensation (compensation standard), source of the compensation funds, and the basic frame of the agricultural ecological compensation mechanism is shown in Figure 1.

Subject of Compensation And Object of Compensation

Subject of agricultural ecological compensation mainly includes three parts: government, society and farmers, and the corresponding compensations are government compensation, social compensation and self-compensation, during the compensation to agricultural ecology, the government compensation shall be primary, and the social compensation and self-compensation are secondary.

Object of agricultural ecological compensation includes four parts, i.e. farmers and organizations engaged in the construction of agricultural ecological environment, farmers in agricultural ecology area requiring adoption of corresponding agricultural ecological protection policy and cannot carry out normal production, farmers and relevant organizations using green environmental technology and producing green food products, scientific research units and agricultural technology extension personnel actively researching the agricultural ecological technology, popularizing the agricultural ecological technology.

Figure1. Basic Framework Diagram of the Agro-ecology Compensation Mechanism.
Compensation Range And Compensation Approach

Agricultural ecological compensation approach is classified into direct compensation and indirect compensation. In which the compensation approach of the direct compensation is mainly embodied on two respects, ① compensation for the treatment of saline alkali land and compensation for farmland waste control (mainly for the control of white plastic film); ② conservation tillage compensation, green food production compensation and ecological agriculture demonstration area compensation. The compensation approaches of indirect compensation mainly are the investment in development and utilization of rural clean energy (mainly straw), the investment in construction of irrigation and water conservancy facilities (including the investment in flood and water logging prevention and the investment in maintenance of irrigation and water conservancy facilities), the investment in R&D and extension of agricultural technology, the investment of technical project converted from compensation funds, and the investment in construction of the agro-ecological early warning system.

Compensation Standards

Theoretically, the service value of agricultural ecosystem can be used as the basis for determining the standard of agricultural ecological compensation, i.e. the compensation standard shall be the increment to the agricultural ecological system services value due to certain agricultural ecological management and protection and other behaviors. Overall, the lowest standard of agricultural ecological compensation shall be the sum of direct investment and opportunity cost, namely the income of the farmers which will not be lower than that under original production, living style after agricultural ecological compensation measures being taken.

(1) Compensation standard estimation for agricultural ecological direct compensation. The opportunity cost method, cost analysis method, shadow price method and the estimation method integrating the virtual water compensation, carbon absorption compensation and compensation for the decrease of content of soil organic matter can be adopted.

(2) Compensation standard estimation for agricultural ecological indirect compensation. The investment in development and utilization of rural clean energy (mainly straw), the investment in construction of irrigation and water conservancy facilities, the investment in R&D and extension of agricultural technology, the investment of technical project converted from compensation funds, the investment in construction of the agro-ecological early warning system.
Compensation Method And Compensation Payment Mode

Compensation method. Method of agricultural ecological compensation can be classified into fund compensation, physical compensation, technical and intellectual compensation, policy compensation, and "open source" compensation.

Compensation payment mode. Compensation payment mode can be classified into the compensation payment based on government and the compensation payment based on market.

The compensation payment based on government compensation payment directly provides ecological compensation to the compensation object by taking the government as the compensation subject, the ecological system service value will be purchased by the government and be provided to the user free of charge, including financial transfer payment, special compensation and direct investment.

Sources of Compensation Funds

The public finance budget funds of the government. Through setting up the special expenditure budget for construction of rural ecological environment in the financial expenditure budget of central government and local government, steadily increase the financial investment in agricultural ecological compensation by means of financial longitudinal transfer payment and horizontal transfer payment. Meanwhile, establishing the special funds for agricultural ecological compensation, to realize special fund for special use for the agricultural ecological compensation funds in public finance.

OPERATION OF THE AGRICULTURAL ECOLOGICAL COMPENSATION MECHANISM AND SAFEGUARD MEASURES

Operation of The Compensation Mechanism

According to the basic frame of the agricultural ecological compensation mechanism for major grain producing areas designed in this paper, the operation of the agricultural ecological compensation mechanism can be understood as: under the leadership of the government, on the basis of specified compensation scope, compensation path, compensation method and compensation standard, the compensation funds will be paid to the objects involved in the agricultural ecological compensation project through the government payment mode and market payment mode, the improvement of overall grain production capability is to be combined with the protection of agricultural ecological environment, forming a resource-saving and environment-friendly mode of agricultural production, realizing the service function increasing of the agricultural ecological system, promoting the sustainable development of agriculture, enabling the government to obtain the
economic and ecological benefits, enabling income increasing of farmers, increasing of grain output, to safeguard the grain security in China, as shown in Figure 2.

![Image](image.png)

**Figure 2. Operation of the Agro-ecology Compensation Mechanism.**

**Safeguard Measures For The Operation of Compensation Mechanism**

Strengthening financial supervision and management of agriculture supporting. Establishing the reasonable supervision and management system, implementing the synchronous supervision idea, strengthening financial supervision and management. Firstly, establishing the organization system of financial supervision and management. Perfect organization system of financial supervision and management is an important guarantee for the smooth operation of the compensation mechanism, establishing compensation funds committee, setting up the supervision agency for operation of the compensation mechanism, setting up the arbitration agency for the compensation mechanism. Secondly, improving the quality of financial supervision and management personnel. High-quality financial supervision and management personnel is able to increase the efficiency of financial supervision and management who can play an active role in the operation of the compensation mechanism.

Improving the supporting system. ① Increasing the investment in agriculture supporting science and technology, increasing the investment intensity in agricultural science and technology, promoting the independent innovation ability of agricultural science and technology; improving the agricultural insurance policy, developing and continuously perfecting agricultural insurance policies, adopting the double operation and management system. ② Standardizing the market of agricultural means of production. Control of the price of means of grain production can be realized by strengthening the market price supervision and the quality
supervision of agricultural means of production, to achieve the objective of stable grain production cost. ③ Implementing the agricultural land system reform, improving the rural land transfer mechanism. Actively promoting the legal transfer of the rural land contract right, vigorously promoting the rural land joint-stock production mode, encouraging the farmers engaged in non-agricultural business to transfer the land, realizing the improvement of agricultural land use efficiency and legal transfer of the rural land contract right, forming the management pattern of agricultural scale, industrialization.

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