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# Discussions and Recommendations about Establishing Agro-ecological Compensation Mechanism in Jiangsu Province

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**Abstract** Establishing agro-ecological compensation mechanism is the objective requirement for protecting agricultural ecological environment on the prerequisite of stabilizing and benefiting farmers, to realize protection in the process of development and promote development through protection. This study analyzed existing problems in the practice of establishing agro-ecological compensation mechanism in Jiangsu Province, including failure to form systematic compensation system due to limited technological reserve, failure to bring into play expected compensation effect due to scant attention, and failure to set up perfect input mechanism due to insufficient financing channel. In line with these problems, it came up with feasible policy recommendations, including strictly implementing top frame design for agro-ecological compensation and giving impetus to standardized and institutionalized work, building pilot demonstration area for agro-ecological compensation, setting up diversified agro-ecological compensation approaches, establishing long-term security mechanism for agro-ecological compensation, and strengthening propaganda and education of agro-ecological compensation. It is expected to provide reference for establishing agro-ecological compensation mechanism in Jiangsu Province, and also provide system guarantee for promoting ecological progress and agricultural modernization in Jiangsu Province.

**Key words** Agro-ecological compensation, Ecological progress, Agricultural modernization, Jiangsu Province

## 1 Introduction

The agriculture of Jiangsu Province is entering a new development stage. Grain yield realized historic breakthrough of growth for consecutive 9 years. It feeds about 79 million people with less than 1 mu farmland per capita. Constant growth of yield of agricultural products makes great contribution to stabilizing society, ensuring social supply, and increasing farmers' income. At the same time, there are serious challenges, such as excessive consumption of resources, and increasing environmental constraints. How to protect limited ecological resources in the process of development, how to build local ecological characteristics in the process of promoting agricultural modernization, and how to care about farmers' benefits at the same time of supplying quality agricultural products are all basic realities requiring innovating upon agricultural policies and mechanisms and reforming agricultural development concept.

When faced with sustainable development of agriculture, American and European developed countries usually solve the problem through improving laws and regulations, reinforcing standards and codes, optimizing structural distribution, and setting up ecological compensation<sup>[1]</sup>. Among these, optimization and adjustment of policy mechanisms play a great role in adjustment. Especially, as widely used "green box" policy, agro-ecological compensation combines compulsory requirement for ecological protection with voluntary act of farmers. It considers agricultural development, farmers' benefits and ecological protection,

thus it receives high opinion of society and gradually rises to policies and regulations to be complied with jointly.

Agro-ecological compensation mechanism is a type of institutional arrangement for protecting agricultural ecological environment, protecting and improving agricultural ecosystem at the sacrifice of personal or collective benefits<sup>[1]</sup>. In 2008, the State Council clearly stated that it is required to perfect agro-ecological compensation system and establish incentive mechanism favorable for protecting natural resources and species, such as farmland, water area, forest, grassland and wetland. In recent years, many scholars have made extensive theoretical researches on concept understanding, functional localization, framework system, and legal support in combination with actual national conditions<sup>[1–6]</sup>. In cooperation with EU, they have carried out studies on agricultural sustainable development and ecological compensation policy, conducted long time of practice in Jiangsu Province, and made extensive preliminary work for substantially promoting establishment of agro-ecological compensation mechanism. From the perspective of agricultural development and ecological protection, the conflict between limited environment capacity and constantly stabilizing and increasing yield, and the conflict between large-scale high efficiency and emission reduction have promoted innovation upon agricultural policy system and mechanism, and accordingly exploring establishment of agro-ecological compensation mechanism.

## 2 Establishing agro-ecological compensation mechanism is important content of innovating upon agricultural policy and mechanism

To promote agricultural modernization, the core is agricultural de-

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velopment, increase in agricultural efficiency and increase in farmers' income, and the key is innovation of system and mechanism. Innovation of agricultural policies and mechanism not only includes improvement of agricultural support and benefiting policies, major reform in agricultural management system, but also includes establishment of agro-ecological compensation mechanism. As an industry closely related to ecosystem, agriculture plays a very important role in ecological progress. However, ecological value of agriculture generally cannot be converted directly to economic income. As a result, ecological protection act fails to receive due economic incentive and destruction and occupation act are free from liabilities. Such distorted relationship directly dampens the enthusiasm for protecting agro-ecological environment, and leads to frequent occurrence of such bad acts as seeking after short-term economic benefits at the sacrifice of ecological environment. To tackle this problem, relevant government must formulate agro-ecological compensation mechanism as soon as possible, combine with agricultural support and benefiting policies, promote producers and operators to transform development concept, consider both immediate and long-term benefit, and set up multi-functional modern agriculture integrating production, life and ecology.

Establishing agro-ecological compensation mechanism is the objective requirement for protecting agricultural ecological environment on the prerequisite of stabilizing and benefiting farmers, to realize protection in the process of development and promote development through protection. In agricultural modernization indicator system issued by Jiangsu Province, agro-ecological environmental protection indicator is an important part. Thus, advancing agricultural modernization is also promoting ecological progress. At the context of integrating urban and rural development, and increasingly close relationship between agricultural and non-agricultural industries, it is recommended to summarize existing agricultural support and benefiting policies of Jiangsu Province, systematically establish agro-ecological compensation mechanism through top level design, optimize and adjust relevant interest allocation, promote the formation of pattern of "driving rural areas through urban areas and boosting agriculture through industries", and reduce predatory development and disruption of ecology, to provide system guarantee for promoting ecological progress and agricultural modernization.

### 3 Practice of Jiangsu Province in establishing agro-ecological compensation mechanism

As a large economic and agricultural province, Jiangsu Province has advantages in establishing agro-ecological compensation mechanism. Agricultural development and level and innovation of agricultural policy mechanisms and systems of Jiangsu Province take the lead in the whole country all the time. Some subsidy projects already have basic form of agro-ecological compensation, such as soil testing technology for formulated fertilization, subsidy for commercial organic fertilizer, reduction of chemical pesticide, and comprehensive use of crop straws. In recent years, in the practice

of controlling agricultural diffused pollution in Taihu Lake basin, Jiangsu Province has established three work measures with distinctive agro-ecological compensation color in agricultural production, farmers' life and rural ecology.

(1) Focusing on control of pollution from livestock and poultry raising, Jiangsu Province cultivated new responsible subjects, built livestock and poultry manure collection service system and centralized treatment center, and expanded livestock and poultry manure recycling platform. For livestock and poultry manure collection service system, it has improved rain and sewage separation, dry and wet separation facilities in small scattered livestock and poultry farms, solved problems of manure collection, fermentation and treatment, and fertilizer use, and greatly reduced costs for controlling pollution in livestock and poultry raising farms.

(2) Centering on construction of ecological circular agriculture, Jiangsu Province actively promoted clean agricultural production, recycling of wastes, reduction of chemicals, ecological improvement of agricultural parks, and has established the circular agricultural production mode with planting and cultivation industrial chain coexisting together. To encourage large planting households to use organic fertilizer and reduce use of chemicals, Jiangsu Province provided fund subsidy for acts of purchasing special vehicles for transporting livestock and poultry manure, compost making facilities, and restoration of farmland ecosystem.

(3) Centering on construction of beautiful countryside, Jiangsu Province launched ecological interception project of nitrogen and phosphorus loss in Taihu Lake basin and rural domestic sewage treatment project. These projects restored rural water environment and ecological system and gradually improved living environment. For rural domestic sewage treatment in scattered villages, it adopted the subsidy mode of quantity of farmer households and daily treatment capacity, as well as treatment standard. The provincial finance provides 2000 yuan/household, and the rest is assumed by local finance, without additional burden on farmers. Compared with rural working method of traditional agriculture, the above measures give prominence to social responsibilities of different entities in protecting ecological environment, and encourage entities to undertake more duties of reducing pollution and emission. In addition, Jiangsu Province provides support for related township government, agricultural enterprises, and specialized service system through special fund subsidy, environmental facilities and service supply, and agricultural skill training.

Reasonable arrangement and use of ecological compensation funds lay essential foundation for smooth progress of agro-ecological protection. Some areas of Taihu Lake basin in Jiangsu Province also carried out pilot demonstration conforming to public goods supply mechanism, working incentive mechanism, and long-term management mechanism. Take Wujin District of Changzhou City as an example, government departments actively changed their supervision function to service function, set up livestock and poultry manure pretreatment – specialized collection – centralized recycling use service system, and included operating cost into local

fiscal budget, providing highly operational reference mode for promoting pollution control and agro-ecological compensation of scattered breeding in rural areas<sup>[5-6]</sup>. In rural domestic sewage treatment, Wujin District took sewage control fund drawn from living water expenses of rural residents as basis, set up special fund for running of rural domestic sewage treatment facilities, and established long-term management mechanism for specialized regulation of enterprises, classified supervision of government communities, and institutionalized examination, rewards and penalties. Suzhou City actively carried out cooperation and exchange with EU and made exploration in agro-ecological compensation mechanism at the city level. In 2010, Suzhou City issued *Opinions on Establishing Ecological Compensation Mechanism (for Trial Implementation)* and *Interim Measures for Managing Special Funds for Ecological Compensation in Suzhou City*, which make clear ecological compensation for capital farmland, water source areas, important wetland and ecological welfare forest. In March 2013, Suzhou City issued *Opinions on Adjusting and Improving Ecological Compensation Policies*, which determines 400 yuan / mu compensation standard for paddy field included into the "four one - million mu" project. Besides, the *Ecological Compensation Regulations* of Suzhou City is already included into the legislation plan. Only in 2012, Suzhou City input 156 million yuan for ecological compensation, including 73.75 million yuan for 134 villages in water source areas along Taihu Lake and Yangcheng Lake and wetland villages, each village has disposable income up to 550 000 yuan. Through three years of practice, Jiangsu Province significantly raised agro-ecological environmental protection ability of key townships, promoted development of village-level welfare undertakings, and strengthened ecological protection awareness of grass - roots cadres and masses.

## 4 Analysis of existing problems

**4.1 Failure to form systematic compensation system due to limited technological reserve** Agro-ecological compensation of Jiangsu Province is still at early stage of development. The technological reserve for regulating establishment of ecological compensation system is inadequate, especially lack of strict and scientific basis in how to define objects, methods and standards of compensation. Most subsidy funds for projects already implemented depend on financial funds, thus there are problems of small application range, narrow compensation objects, single compensation method, and low compensation standard. As a result, it fails to form consistent and systematic compensation system and the institutional support is weak, accordingly it seriously obstructs play of its functions.

**4.2 Failure to bring into play expected compensation effect due to scant attention** The protection of agro-ecological environment is a long-term and complex systematic project. At present, ecological compensation in agricultural production fails to receive close attention, and some subsidies for agricultural production already implemented embody little concept of ecological com-

pensation. Suzhou City and Nanjing City have implemented ecological compensation for rice planting, but the compensation only remains at the early stage that the compensation can be obtained as long as the rice is planted. Instead, it fails to consider related recycling of agricultural waste and protection of farmland ecosystem. Therefore, their ecological compensation has limited material significance. Special funds for control of Taihu Lake basin in Jiangsu Province are set up from the perspective of ecological protection. However, since the superior finance adopts one-time construction subsidy, local areas lack auxiliary facilities and also fail to establish corresponding long-term security and incentive mechanism, leading to prominent problems, such as "not use after construction", and "not manage during use".

**4.3 Failure to set up perfect input mechanism due to insufficient financing channel** Agricultural ecological service function belongs to public goods, but it is difficult to solve the problem only relying on government input. In the present condition of imperfect agro-ecological compensation input mechanism, there is a wrong idea that agro-ecological compensation is financial subsidy, and local area leading practice is already unable to satisfy actual working demands. In this situation, government at the state and provincial levels should take legal, economic, technical and necessary administrative means, provide powerful policy support, set up diversified financing input channel, and provide security for agro-ecological compensation activities, to make up for shortage of financial allocations.

## 5 Policy recommendations for establishing agro-ecological compensation mechanism

With in-depth advance of ecological progress and agricultural modernization, agro-ecological compensation will receive more and more attention and get new development opportunity. Thus, it is recommended to sum up experience, make overall arrangement, and gradually set up general framework for implementation of agro-ecological compensation.

**5.1 Strictly conducting top level framework design for agro-ecological compensation to promote standardization and institutionalization of works** Firstly, it is recommended to sum up both domestic and foreign successful experience in agro-ecological compensation, and accordingly come up with agro-ecological compensation path suitable for Jiangsu Province. Secondly, it is required to issue guiding opinions on agro-ecological compensation, formulate agro-ecological compensation regulations in time, make clear subjects, objects, contents, and methods of ecological compensation, and provide theoretical guidance for local areas. Thirdly, it is proposed to set up leading organization, make overall scheme for agro-ecological compensation, and make clear division of duties, to promote works of agro-ecological compensation. Finally, it is expected to form a complete set of standardized and institutional ecological compensation system through top-level framework design.

## 5.2 Setting up pilot demonstration zone for agro-ecological compensation, to further explore experience and tackle problems

Relevant government should make effort to gradually incorporate agro-ecological compensation into key pilot projects of rural and agricultural reform. Besides, it is recommended to select typical areas in economically developed areas in accordance with actual local conditions, guide and consolidate various resources through policy, fund and technological support, and make comprehensive practice and exploration in working mechanism and institutional arrangement. Pilot demonstration areas should grope such key problems as compensation methods, compensation standards, fund source, operating mechanism, and performance assessment, to provide reference basis for popularizing the agro-ecological compensation mechanism at both state and provincial levels.

## 5.3 Establishing diversified agro-ecological compensation approach, to form high-efficient agro-ecological compensation mechanism

According to functions of different types of agro-ecological services, it is proposed to establish compensation approaches with combination of government purchase and reward and market operation, set up multi-channel financing input mechanism with combination of financial funds at all levels and shared by enterprises, farmers and consumers, set up comprehensive compensation mode with combination of physical object, technology, money and policy, and expand diversified compensation channel, including financial allocation, transfer payment, ecological project construction, and collection of ecological compensation taxes.

## 5.4 Building long-term security mechanism for agro-ecological compensation and enhancing propaganda and education of agro-ecological compensation

Firstly, it is recommended to set up information disclosure mechanism and public participation mechanism for agro-ecological compensation, to ensure high-efficient operation and public monitoring of agro-ecological compensa-

tion. Secondly, it is proposed to establish long-term performance assessment mechanism for agro-ecological compensation, incorporate it into performance assessment of government work, and make clear rights, responsibilities and benefits of agro-ecological compensation. Thirdly, it should bring into full play functions of social service organizations and reduce costs for implementing agro-ecological compensation. Finally, it is proposed to set up demonstration base of agro-ecological compensation, implement education and training projects of agro-ecological compensation, enhance propaganda and education of agro-ecological compensation, and lay solid foundation for implementation of agro-ecological compensation.

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