# Analysis on Green Agriculture Policy during the Development of Eco-city in European Countries and the United States and Policy Recommendations

**Li QIN, Yang QI***

College of Economics and Management, Northeast Forestry University, Harbin 150040, China

**Abstract** Ecological agriculture is the important industrial foundation for building eco-cities, while green agriculture policy plays an essential role in promoting sustainable development of ecological agriculture. This paper analyzed the relationship between green agriculture policy and developing eco-cities and characteristics of green agriculture policies in European countries and the United States developing ecological cities. Besides, it summarized experience, in hope of providing beneficial reference for China developing eco-cities.

**Key words** Eco-cities, Green agriculture, Policy

## 1 Relationship between green agriculture policy and developing eco-cities

An eco-city is a city built in line with the principles of living within the means of the environment. The ultimate goal of many eco-cities is to eliminate all carbon waste, to produce energy entirely through renewable sources, and to incorporate the environment into the city; however, eco-cities also have the intentions of stimulating economic growth, reducing poverty, organizing cities to have higher population densities, and therefore higher efficiency, and improving health[1]. Healthy development of eco-cities will not be realized without support of related policies, while green agriculture policy plays an indispensable role in development of eco-cities.

**1.1 Green agriculture policy is the precondition for healthy development of eco-cities** Green agriculture policy encourages farmers to plant various crops, to improve soil and water quality, increase working efficiency, reduce greenhouse effect, and ensure farmers' income, and raise farmers' enthusiasm. To promote safety of agricultural products and benefit development of environment, farmers should select more organic fertilizer, biological pesticide, and mechanical weeding to replace chemical fertilizer, pesticide and herbicide. Western European countries and the United States often set green barrier, formulate eco-labeling standards for imported foods and certify pesticide testing standards, and any food with excessive residue of pesticide will be refused[2]. This not only increases competitive power of agricultural products, but also ensures national grain security.

**1.2 Green agriculture policy attaches importance to connecting agricultural production with environmental protection, which is the basis for solving agricultural environmental pollution and developing eco-cities** Green agriculture concerns demands of safe agricultural products and its quality assurance closely relates to natural environment. Due to externality of agricultural production, if using green agriculture policy to effectively restrict agricultural production, it will not destroy ecological environment. Through adjusting agricultural policy, it is able to restrain acts detrimental to ecological environment, encourage acts beneficial to ecological environment, so as to build better eco-cities. Therefore, effective green agriculture policy will promote ecological development of cities. Both are interdependent.

## 2 Current situation of green agricultural policy in European countries and the United States developing eco-cities

**2.1 Green payment policy of the United States** The United States formulated Green Payment program to provide huge subsidy for control of agricultural non-point pollution, combine protection of farmers' income and improvement of ecological environment. At present, this policy is widely implemented in the United States. In order to encourage farmers to voluntarily participate in various ecological protection subsidy program, the United States issued the *Farm Security and Rural Investment Act in* 2002. This Act includes commodity programs, conservation, trade, nutrition program, credit, rural development, agricultural research, forestry, and energy related to protection of agricultural ecological environment and relevant development projects. In 2002 - 2007, the subsidy amount of American government for agricultural ecological environment reached 22 billion USD, setting a new record in history, and from then on, American agriculture stepped to the road of sustainable development[3]. This no doubt plays an important role in promoting benign cycle of agricultural ecological environment. Compared with traditional agricultural subsidy, Green Payment of the United States can better adjust subsidy to flow to environmental protection, which is favorable for improving soil pollution, cultivating farmers' awareness of environmental protection, reducing use

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* Corresponding author. E-mail: qiyang526625@sina.com

of pesticide and chemical fertilizer, and protecting natural environment.

Adjustment of American green payment policy exerts great influence on development of eco-cities. (i) Through encouraging planting diverse crops and evaluating fallow farmland according to environmental protection standard, it is able to improve soil and water quality, reduce greenhouse effect, and improve suburban ecological environment accordingly. The United States supports farmers to select crops freely and allows farmers to plant other crops in 25% of their total farmland[4]. Every year, the total area of fallow farmland keeps unchanged, but farmers can adjust their fallow farmland according to environmental protection standard of Department of Agriculture, so farmers' fallow farmland area may be different from each other. (ii) It combines support of agricultural production with environmental protection. Whether farmers can obtain government subsidy and how much subsidy they can obtain depend on the situation of their environmental protection. Specifically, to obtain subsidy, farmers should satisfy two conditions: firstly, their acts are beneficial to ecological environment and the wild animal and plant resources, forest and vegetation in their farmland are good; secondly, in valid date, they should submit related reports to competent authorities, including test of soil, water, air and *etc.* (iii) It can bring into play market functions, improve agricultural environment and control agricultural pollution. Since the land market in the United States is free, as long as parties are voluntary and mutual beneficial, they have right to adjust their farmland area and fallow area. Through self – regulation of market, the United States reallocates planned area for production of commodity grain, controls agricultural pollution, and reduces damage to agricultural environment.

**2.2 Agricultural ecological subsidy policy of the European Union** Internal and external environment of the EU changes with establishment of common agricultural policy. The EU Committee reviewed environmental and ecological issue again and decided to completely reform the original *Agricultural Act*. In 1999, the EU Committee passed the *EU Agenda of* 2000, changing the common agricultural policy to "common agricultural and rural development policy", which attaches more importance to environmental protection. At Copenhagen Summit in 2001, the EU stressed that it is required to take low-pollution, low consumption and maintaining ecological balance as objectives, to mutually build ecological cities. In June 2003, the EU formally established the policy of coupling agricultural subsidy with environmental protection[5]. The EU put environmental protection at core place of agricultural subsidy policy system, and formulated a series of subsidy measures oriented towards environmental protection. Such reform of agricultural ecological subsidy policy plays an important role in control of environmental pollution. It effectively reduces damage of chemical fertilizer and pesticide to environment, controls erosion and degradation of farmland, and protects healthy development of ecological environment.

Smooth development of eco-cities can not do without contribution of the EU agricultural ecological subsidy policy. Firstly, it established agricultural ecological environment indicator system. In 2003, the EU issued the minimum standard agricultural ecological environment indicator system as programmatic document of the EU, to guide agricultural ecological environment subsidy[6]. Member countries annually evaluate their ecological impact and submit the evaluation results to the EU testing committee. The EU testing committee will provide subsidy according to ecological subsidy standard in combination with the reporting system. Secondly, it couples subsidy with environmental protection measures. Ecological subsidy standard complements each other with contribution of farmers to construction of eco-cities. If farmers contribute more to construction of eco-cities, they will obtain more subsidy; on the contrary, if they contribute less to construction of eco-cities, or even they do some acts against ecological construction, they will obtain less or no subsidy. Finally, farmers can select fallow farmland according to yield of agricultural products, so as to improve environmental pollution. The EU specifies that if farmers exceed yield for 92 tons within one year, they can select certain proportion of farmland to take as fallow farmland, and 30% of the losses incurred therefrom will be compensated by the government. Otherwise, they will be punished by government according to their damage to environment. However, farmers can plant non-food crops on their fallow farmland, to effectively stop deterioration of ecological environment and better develop eco-cities.

## 3 Major recommendations for China

From the above analysis, we can see that green agriculture policy plays an important role in the EU and the United States developing eco-cities. China should learn from successful experience of these countries and regions and find out proper green agriculture policy, to lay solid industrial foundation for development of eco-cities.

**3.1 Establishing green agricultural standard policy system suitable for development of eco-cities** Firstly, government should always put healthy development of eco-cities at the first place and establish green agricultural policy system suitable for development of eco-cities. Secondly, it should strengthen the improvement in laws and regulations of green agriculture, reinforce supervision and management mechanism of green agriculture, and improve original agricultural policies and measures harmful to environmental development. Thirdly, it is required to cultivate awareness of ecological environment protection, put the protection and improvement of ecological environment at the core place, so as to realize healthy development of green food industry. Fourthly, it should implement *Agriculture Law*, *Environmental Protection Law*, and other related laws and regulations, severely punish acts of destroying ecological environment, and always put protection of ecological environment at the first place. Fifthly, it is recommended to guide and encourage use of green fertilizer and biological pesticide to take place of "white pollution" and soil pollution due to pesticide residue. Finally, it should energetically practice clean production, strictly prohibit excessive output of waste water and

gas, and guarantee that those industrial enterprises with certain pollution will not be established in production field of green food. Environmental protection authorities should reinforce monitoring and supervision mechanism in compliance with laws, and carry out inspection and follow-up monitoring of soil, water quality, air and means of production periodically.

**3.2 Coupling agricultural subsidy with environmental protection, to promote development of eco-cities** Some areas suffered great losses due to use of biological pesticide and fertilizer. In the framework of Green Box policy, government should make proper economic compensation for producers who suffered great losses. This not only raises enthusiasm of producers, but also protects ecological environment. Firstly, it is recommended to make evaluation for green subsidy. To popularize and effectively implement green subsidy policy, before implementation, the Ministry of Finance will make systematic research, evaluation and comparison of green agriculture subsidy policy with original agriculture subsidy policy. Evaluation contents include subsidy income risk, financial subsidy amount, and pollution, *etc*. Secondly, it is recommended to set some mandatory conditions. For example, to obtain subsidy, farmers must survey wild resources, forest and vegetation conditions on their farmland, and promise not to pollute or destroy ecological environment. Also, they should submit soil, water, and air testing report to competent authorities regularly. Later, government should check farmers' report and actual situation of environmental protection, and determine if farmers can obtain subsidy or the subsidy amount according to evaluation standard. Finally, for farmers with excellent performance, government may provide low – interest loan or other encouragement measures apart from green subsidy. For environmental protection, government should also attach importance to subsidy for construction of agricultural infrastructure and strengthen construction of agricultural infrastructure with water conservancy projects and rural road as the core.

**3.3 Cultivating farmers' awareness of ecological protection and strengthening construction of eco-cities** Through popular science and mass media, it is expected to provide farmers with excellent education and training, to make farmers realize seriousness of agricultural vertical pollution and consciously participate in environmental protection. Related government should guide farmers not to be lured by external benefits, keep environmental protection firmly in mind, use more organic fertilizer, biological pesticide and mechanical weeding to take place of chemical fertilizer, pesticide and herbicide, so as to reduce pollution of chemical fertilizer, pesticide and herbicide to environment and residue to pesticide and herbicide in agricultural products, and ensure quality of agricultural products and reduce environmental pollution. In proper time, it should also formulate proper laws and regulations to encourage enterprises and farmers to adopt environment – friendly technologies, so as to reduce agricultural pollution, and promote sustainable development of agriculture and rural areas.

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