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Study on Ecological Compensation System and Land Desertification Control

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Abstract The problems of desertification control in China are analyzed from the perspective of ecological compensation. Firstly, there is no guarantee of ecological compensation system in desertification control. On the basis of knowing land desertification connotation, the western region is taken as an example to analyze the serious consequence brought by land desertification, besides, the connotation and importance of ecological compensation are summarized, as well as the views related to resolve the benefit compensation of ecological environment in the world are introduced. The ecological compensation is mainly based on the compensation theory of public goods and the value theory of ecological environment, besides, it emphasizes using tax to realize internalization of resources external benefit. Secondly, lack of current ecological compensation system caused the low enthusiasm of people to take part in land desertification control, besides; the current relevant regulations of ecological benefit compensation in China are introduced. At present, the systematic and complete management method and relevant regulations related to ecological compensation of land desertification control have not been published yet, so the interest of governing subject is hard to be protected and the enthusiasms of controlling land desertification in forest and farm are seriously damaged. Based on this view, it is proposed that the desertification control should be closely combined with local economic development to construct the long-term mechanism for mutually promoting desertification control and economic development. Finally, some suggestions of constructing ecological compensation system in the process of controlling desertification are explored. Firstly, scientific development view is taken as a guidance to enhance the strength of ecological compensation legislation; Secondly, the ecological compensation mechanism is carried out approaches innovation; Thirdly, policy innovation of ecological compensation mechanism is realized; Fourthly, the *law of China for desert defense and control* is modified and the concrete regulations of ecological compensation is added to make the legalization and embodiment of encouraging measures for land desertification control.

Key words Ecological compensation system; Land desertification; Creative Conception; China

1 Land desertification needs the guarantee of ecological compensation system

The land desertification means that the non-desert areas shows environment change processes by taking wind-sand activity and desert-like landscape as main signs in arid area, semi-arid area and some semi-humid region, besides, the enhancement and expansion of desert environment and other land degradation processes of desert-like landscape in desert, because of the influences of human activity and natural factors^[1]. The problems of desertification in China are serious and the aggravation of desertification is not only influencing local productivity development directly, but also influencing the realization of goal of farmland preservation and national economic security. Taking western area as an example, the non-desert area including potential desertification area is 2.080 billion hm², which takes 2/3 of the desert area in whole country, besides, it is expanding with 100 thousands hm² every year. About 3.93 million hm² farm land, 4.93 million hm² grassland and 20 million km² railways are threatened by desertification. At present, 1/3 grassland has been degenerated and the black storm disaster caused by land desertification is frequent^[2]. The desertification land in Northwest China is 1.469 million km², which takes 56% of the whole country. The total desert area, gobi and desertifi-

cation land is 906 thousand and 8 hundred km², which takes 29.4% of the total 3.081 3 million km², besides, the desert is 65 thousand and 8 hundred km² which takes 38.3% of the desert (171 thousand and 6 hundred) in North^[3]. Although Southwest China has rich forest resources, the forest resources and ecological environment are seriously damaged by over denudation in recent years, so the land desertification is also serious.

The land desertification control is a complex system engineering which needs civil mobilization, policy support and system guarantee. Because only the perfect system guarantee can produce definite expected effect and guarantee the profit of desert governor. Aiming at the big social benefit and hard capital recovery of land desertification control, the importance of ecological compensation system is prominent among many prominent. The ecological compensation means that the country tax to the people who explore or use natural resources which causes the declines of ecological functions and gives economic compensation and non-economic compensation to the people who sacrifice their interests for improving, maintaining or enhancing ecological service function. The ecological compensation is an interest compensation mechanism and or a contradiction coordination mechanism. The interest compensation mechanism is realizing the interest transfer between central and local, local and local to realize reasonable benefit distribution through normative system. The interest compensation mechanism mainly represents as establishing a normative fiscal transfer payment system^[4]. There are two views about resolving the interests compensation problems of ecological environment, firstly, payment through public finance and secondly compensa-

Received: July 13, 2009 Accepted: July 28, 2009
Supported by Doctoral Fund of Lanzhou University of Science and Technology (SB12200801).

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tion through the means of marketization. Generally thinking, the ecological compensation through financial payment has many shortcomings in practice, for example, high agency cost, low efficiency in the use of funds and weak purpose. The ecological compensation is based on the compensation theory of public property and the value theory of ecological environment. During studying the capital source of public benefit forest resources, western economics theory advocates use tax to realize the internalization of external benefit of forest resources and resolve investment problems. The products provided by land desertification control is ecological service, while during the process of providing products, although the land owner can obtain some economic benefits, the more importance is carrying out more external benefit such as ecological benefit, environmental benefit, landscape benefit and social benefit. For example, the Central and Western Regions lose efficiency for seeking fairness and sacrifice partial interests for general interests, so the natural forest protection and conversion of cropland to forest are active and positive. Because this externality does not have market value and social capital characteristics so the market can not conduct compensation. Only through government macro-control, legal power and based on market, the tax method is adopted to levy ecological compensating tax on accepters of ecological services in the process of land desertification control, then the government subsidies and returns to management individual and management department for realizing value compensation of ecological efficiency^[5]. Obviously, a perfect ecological compensation system plays a key role for land desertification control.

2 The lack of current ecological compensation system leads low enthusiasm of people to take part in land desertification control

The environmental resources which people depend on for existence and development include land, forest, air, water and other natural ecosystems. As a natural ecological public product, they have all characteristics of public goods. The ecological compensation implements internalization of ecological protection externality through some policy means, resolve the free-rider problem of ecological products consumption through system design and resolve the reasonable return of ecological investors through system innovation. It is the important content of paid use of natural resources^[4]. The paid use of natural resources means that during the process of legally using natural resources, the users or natural resources beneficiaries should pay for the owner of natural resources or the people who pay costs for ecological protection. The *Forest Act of the PRC* (1998) has regulated that the country sets up forest ecological benefit compensation fund to provide the construction, tending, protection and management for forest resources and trees of shelter forest and special use forest which can provide ecological benefits. The *Implementing Rules of Forest Act of the PRC* (2000) has regulated that the operators of shelter forest and special use forest have the right to obtain ecological benefit compensation. Since 2001, national financial charges pay 1 billion yuan in 11 provinces to carry out pilots, besides; 30 billion

yuan has been used for public beneficial forest construction, natural forest protection, compensation of returning land for farming to forestry and desertification control program, et al. In 2003, the State Council has given the positive affirmation on forest ecological compensation in the *Decision of Expediting Forestry Industry Development*, however, until now, there is no systematic and complete management method of sandy land control and also no laws and regulations of sandy land control.

Under the condition of socialist market economy, the power source for the people or companies who take part in the land desertification control is the economic benefit produced by forest trees (although during the process, the ecological benefit and social benefit of environmental protection are also produced). In a word, the land desertification control in western region is always connected with the economic interests of agroforestry enterprise or forest enterprise, so the companies or individuals who take part in returning land for farming to forestry and land desertification control should be given more policy support, capital subsidies, tax preference, however, the reality is on the contrary, the land desertification control in China meets cost crisis and low benefit, besides, the profit of subject can not be effectively guaranteed. Therefore, the land desertification control and local economic development should be closely connected to establish a long-term mechanism, which can mutually promote land desertification control and economic development.

The beneficiary of forest ecological benefits is the whole society; the internalization of exterior economic effect is an important theory in market economics about economic regulation function and effect which government plays in market failure. When the national financial resources can not compensate or subsidize forest ecological benefits, the benefit object should be levied the compensation for ecological benefit and subsidy, which is not only in accordance with our situation and easily accepted by people, but also eliminating unfair distribution of social wealth to some extent. Therefore, accelerating the systematic and complete compensation, subsidy system of ecological benefit to increase the enthusiasm of folk force to take part in land desertification control and attract social funds to invest in land desertification control industry is the urgent affairs of desertification control in China. However the target advancement of policy making and hysteretic nature of concrete measures are seriously damaged the enthusiasm of agroforestry for land desertification control, so it hinders the development of desertification control industry in China and influences the realization of target of cultivated land protection and social sustainable development.

3 Innovative conception of ecological compensation system in desertification control process

3.1 Taking scientific development view as guidance and enhancing the power of ecological compensation legislation

Establishing the scientific development view, overall planning harmonious development between eastern and western regions, promoting ecological compensation understanding

of eastern areas to western region is a valuable public resources, the sustainable development can be realized by declining environmental pollution, compensating excessively used ecological environment, realizing internalization of environmental external cost during regional coordinate development and resource optimal allocation. The concept should be changed and it is clearly that the ecological compensation can not be defined as the economic compensation of the eastern and central region to the western region, because the easts, central and west are the community of economic development, so their economic interests and social interest are consistent. Realizing ecological compensation to the western region is good for national sustainable development and harmonious development among regions, besides, it is in accordance with the requirement of scientific development view and plays very important means to promote the construction of harmonious society^[6].

3.2 Approaches innovation of ecological compensation mechanism Firstly, the multi-level and trans-regional compensation balance mechanism of forest ecological benefits is constructed. On the national scale, the central government could consider levying on the ecological tax whole society. ; On the basin scale, the subjects of ecological compensation include country, society and regions. Secondly, the financial system of ecological compensation should be constructed. In order to ensure the actual application of compensation mechanism of forest eco-benefit, the key point is that the financial budget legal system of China should be improved to lay strong material bases for ecological compensation system of land desertification control. The system should be improved and developed from three aspects. Firstly, improving legislation and levying environment protection tax; secondly, strengthening legal management of environmental tax; thirdly, creating reasonable financial law budget system. Finally, the multilateral forest resources property right system should be constructed. Under market economy condition, the forest ecological construction in China is mainly depended on government and market, while the property right structure is the important system foundation which influences the investment efficiencies of government and market. In order to improve ecological compensation mechanism, the rights and interests of desertification governor should be confirmed in property right. According to the characteristics of land desertification control, such as particularity and capital recovery, the contracted time limit of sandy land, management and circulation of sandy land are expanded, on the based of uninfluenced desertification control, to give desertification governor free management right in control area. These are the only ways to encourage folk force to take part in land desertification control and increasing desertification control efficiency.

3.3 Policy innovation of implementing ecological compensation mechanism Firstly, the compensation fund should be given a reasonable profit space. If the compensation standard can reach the profit expectations, the current production manager will give up the investment in sandy land control, so the sandy land control will lose the attraction to potential capitals; secondly, the dual regulatory effects of government and

market should be carried out. The ecological environment construction of land desertification control does not only provide social benefit and ecological benefit, but also provide economic benefit. The land desertification control with taking recovering grass and forest as a main target should be depended on national capital input, positive policy measures and social enthusiasm. Secondly, the functions of organizer and supervisor of government ecological construction should be enhanced. The ecological construction, especially ecological construction in desert, is system engineering with strong policy and sociality, so it needs long term planning and sustained policy of government. The multi-policies such as administrative means, economic means and legal means are adopted to mobilize social forces to take part in land desertification control for establishing a long-term mechanism of land desertification control.

3.4 Revising the Law of Preventing and Controlling Sand of the PRC The concrete ecological compensation regulations should be added into the law to make the encouraging measures of land desertification control legalization and embodiment. The *Law of Preventing and Controlling Sand of the PRC* is a political program not an actual law, because it lacks maneuverability and concreteness. The 33rd regulation in the *Law of Preventing and Controlling Sand of the PRC* regulates that the State Council and governments at province, municipality city and autonomous region should manipulate preferential policies to encourage and support people and companies take part in land desertification control. The governments above country should give financial supports, finance discount and tax decrease to the people or companies who take part in land desertification control, according to national regulations and the area and difficulties of land desertification control. The people or companies who invest in land desertification control will be given exemptions, after they obtain some profits, some taxes will be decreased or exempted. However, there is no concrete regulation about ecological benefit compensation of sandy land control; the source and distribution of compensation payment have become the important factor which restricts sandy land control. Therefore, as an important system of sandy land control, the ecological benefit compensation should be clearly clarified in the *Law of Preventing and Controlling Sand of the PRC*, besides, the compensation payment source, compensation main body, compensation criterion and compensation object should be regulated to make the *Law of Preventing and Controlling Sand of the PRC* play a more role in sandy land control.

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生态补偿制度与土地沙漠化治理研究

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摘要 从生态补偿的视角分析了中国沙漠化治理中存在的问题。一是沙漠化治理缺乏生态补偿制度的保障。在厘清土地沙漠化内涵的基础上,以中国西部地区为例,分析了土地沙漠化带来的严峻后果。概述了生态补偿制度的涵义及其重要性,并介绍了国际上关于解决生态环境利益补偿问题的观点。生态补偿主要依据公共产品补偿理论和生态环境价值理论,强调利用税收实现资源外部收益的内部化。二是现行生态补偿制度的缺失导致群众治理沙地的积极性不高。介绍了国家现有的生态效益补偿的相关规定。目前,国家没有出台系统而完备的有关沙地治理生态补偿的管理办法和相关法规,治理主体的利益难以得到有效保障,从而严重挫伤了林农进行沙地治理的积极性。基于此,提出应把沙漠化治理与当地的经济紧密相结合,以建立沙漠化治理与经济发展相互促进的长效机制。最后,探讨了沙漠化治理进程中构建生态补偿制度的几点建议。一是以科学发展观为指导,加强生态补偿立法的力度;二是进行生态补偿机制的途径创新;三是实现生态补偿机制的政策创新;四是修改《中华人民共和国防沙治沙法》,将生态补偿的具体规定加入其中,从而使土地沙漠化治理的鼓励措施法律化、具体化。

关键词 生态补偿制度;土地沙漠化;创新构想

(From page 28)

我国农产品加工业自主创新体系研究

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摘要 简述了农产品加工业创新体系的重要性,提出农产品加工业创新体系是农产品加工业持续发展的主要途径。根据开放性原则、系统性原则、突出行业特色原则、动态原则和紧密合作原则构建多元化农产品加工业创新体系,分别为以农产品加工企业为核心,以自主创新为中心,以高校、科研机构、政府、中介机构、金融机构、农户为辅的农产品加工业创新主体系统和由知识创新、技术创新、知识传播和应用构成的农产品加工业创新运行系统。农产品加工业创新主体系统的各主体相互影响,其联系和约束主要依靠市场机制和非市场机制,其运行主要取决于知识技术创新体系、知识传播体系、制度保障体系和创新服务体系的运行绩效和整合程度,因此从这4个方面提出构建农产品加工业创新体系的建议。在保证农产品加工研发体系基础地位的同时,分析了农产品加工业技术创新推广、农产品加工业创新体系的制度保障、以大学为核心的知识传播和适应市场规律的农产品加工业创新服务4个子系统,并分别提出在这4个子系统中农产品加工业创新系统良性运行的措施,这对我国农产品加工企业提升竞争能力、应对金融危机影响具有重要意义。

关键词 农产品加工业;自主创新;创新体系