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Discussion on the importance of ecological protection in comprehensive land management

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Abstract

At present, the majority of land construction projects in China do not take ecological environmental protection as a consideration. Long-term land management experience from abroad, it is necessary to strengthen the land management of ecological thinking, land management should follow the principle of ecological priority, renovation of the focus should shift to land as the core of ecological protection, improving the farmland permanent continuous production capacity, optimize the structure of farmland ecosystem, protecting biological diversity and ecological balance.Therefore, the study on how to comprehensively consider the construction of land engineering projects from the perspective of ecology and sustainable development, and refine and standardize the relevant planning, design and management contents of land engineering projects, plays an important role in maintaining the structure and function of land ecosystem.Based on the experience of foreign countries and the reality of land remediation in China, this paper expounds the necessity of the ecological construction of land engineering, and discusses how to integrate the ecological concept into the process of land engineering so that the ecological land engineering construction can be operated and sustainable.

Keywords

Land consolidation; Ecological problems; Necessity; Design; measure.

1. Introduction

Land resources are the most basic material to maintain human production and life. China's limited natural resource endowment, rapid economic development and population increase have greatly reduced the area of cultivated land, and global problems such as soil erosion, land desertification, salinization, impoverishment, soil and groundwater pollution have not been effectively contained in China [1]. The proposal of land comprehensive consolidation project is to realize the new pattern of the protection of the quantity, quality and ecology of cultivated land as well as the effective improvement of the living environment and ecological environment, and finally to achieve the dynamic coordination of the harmonious development of man-land relationship [2]. At present, the land consolidation work carried out in China is mainly aimed at increasing the quantity and improving the quality of cultivated land, and the awareness of land ecological environment protection and land ecological construction is still weak [3,4].

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China's land consolidation has achieved remarkable results, playing an important role in ensuring national food security, promoting the construction of a new countryside and the integration of urban and rural areas, and promoting ecological progress. However, underexploitation of cultivated land reserve resources, uneven quality of human settlements, and lack of ecosystem protection and restoration technologies are still prominent problems in land consolidation work.

At present, with the improvement of people's material living standards, more and more attention has been paid to the construction of ecological civilization, and ecological environmental protection has become a hot topic concerned by scholars in the field of land consolidation engineering [5]. The aim of land consolidation project should be to shift from the traditional simple land consolidation to the combination of land and ecological protection, and attach importance to the ecological construction of land, which has an important role in promoting the implementation of the current policy of ecological civilization construction. In the process of land consolidation, there will inevitably be many direct or indirect, beneficial or harmful impacts on water resources, water environment, soil, vegetation, atmosphere, organisms and other environmental elements and ecological processes in the land consolidation region and its background region [6-8]. Based on this, combined with foreign experience and the actual development of China's land consolidation project, this paper analyzes and discusses how to integrate ecological ideas into the construction process of land consolidation project and the existing problems in the ecological construction of land consolidation project, in order to provide scientific guidance for the comprehensive realization of ecological construction of land consolidation project.

2. Present situation of land consolidation research at home and abroad

Land consolidation refers to the comprehensive consolidation of fields, water, roads, forests and villages by means of engineering and biological measures, so as to increase the area of effective cultivated land, improve land quality and utilization rate, and improve production and living conditions and ecological environment. In foreign countries, especially in European countries, the history of land consolidation can be traced back to the 16th century. Germany, Belgium, the Netherlands and other European countries carried out the land consolidation earlier and accumulated rich experience. In recent years, land consolidation in Asian countries, including South Korea and Japan, has also been developed rapidly [9]. Along with the rapid urbanization process of our country, the urban development and construction occupy a lot of land, the contradiction between supply and demand of the land is becoming increasingly prominent, since the late 1990s, the land renovation work in our country from start to push comprehensively, the land renovation has played an important role in promoting land resource reallocation, increasing land use efficiency and the sustainable use of land resource [10]. At present, land consolidation generally carried out in China is mainly aimed at increasing the quantity and quality of cultivated land, and new cultivated land area is obtained through land consolidation, unused land development and residential relocation [11]. At present, China's land improvement work has achieved remarkable results, especially in ensuring national food security, promoting the construction of new countryside and urban-rural integration, promoting the construction of ecological civilization and so on. However, under exploitation of cultivated land reserve resources, uneven quality of human settlements, and lack of ecosystem protection and restoration technologies are still prominent problems in land consolidation work.

At present, the world is increasingly concerned about ecological issues, and a series of laws and regulations have been issued to protect the environment and build ecological civilization. The United States began ecological and environmental legislation in 1872. In the UK, "governance"

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was the guiding principle in the policies and regulations of ecological and environmental protection in the 19th century, and after the 1970s, "prevention" was the guiding principle. In July 2007, new sustainable development indicators were introduced. In the 1990s, Germany amended its Basic Law twice to increase the content of environmental protection. France first put forward the concept of protecting the ecological environment and harmonious coexistence between man and nature in 1960 [5,12]. In 2005, the Environmental Charter gave a constitutional interpretation of ecological protection and sustainable development. In 1993, Japan promulgated and implemented the Basic Law on the Environment, incorporating ecological and environmental protection into it. The environmental and economic policies of the developed countries in the world include environmental tax, emission charge, ecological compensation, green finance and emission trading, etc., which have a great role in promoting the construction of ecological civilization. Land consolidation has been regarded as a work combined with biodiversity protection and ecological environment construction, which has become an academic hot spot in the world. Many European countries started earlier in this respect, and there have been many successful cases [13].

The research on ecological construction of land consolidation in China started late. There are few researches on land consolidation and ecological environment construction technology, and the technical support of ecological construction is very short in land consolidation practice. Our country urgently needs to construct the ecological construction technical support system of land comprehensive improvement from engineering, standardization, informatization and systematization [2,14]. In recent years, the core of land consolidation technology in China is landscape design and ecological consolidation technology. Land consolidation engineering technology is to solve the contradiction between the supply and demand of land and human beings, the use of engineering technology means to coordinate the relationship between people and land, research engineering measures, such as degraded land, saline-alkali land, wasteland, desert land and other unused and difficult to use land for comprehensive development, can be used by human land; The value and utilization of land resources will be improved through land consolidation engineering technology[15]. However, the protection and restoration of ecosystem in the process of land consolidation are the problems that must be considered in the construction of ecological environment.

3. The necessity of implementing ecological construction of land

Our land problems mainly include land degradation, land desertification, land salinization, land pollution and soil erosion. At present, 38% of the world's agricultural land has been degraded and 23% of the land is being degraded. Every year, 5 million to 12 million hectares of cultivated land are lost due to land degradation. About one third (48 million km^2) of the world's land is desert land, which is expanding at a rate of 60,000 km2 every year. The global saline-alkali soil area is about 960 million hectares. In the existing agricultural areas of the world, about 1/3 ~ 1/2 of the irrigated land is salinized. Land pollution includes chemical fertilizers, pesticides, heavy metals and oil pollution. About 150 million mu of arable land in China is polluted. One third of the world's land is seriously eroded, among which more than 25 billion tons of arable soil is lost [16].

Land is closely connected with social and economic activities. Land consolidation and land development determine the combination of social and economic structures. The development of large tracts of farmland suitable for agriculture will not only bring changes in regional economic structure and increase economic benefits, but also bring changes in social employment structure, so that people who used to make a living from animal husbandry and forestry will become farmers. The establishment of new cities will transform large areas of non-urban land into urban land, which will not only change the way of local land use and transform

the local economic structure from the primary industry to the secondary and tertiary industries, but also transform the local social employment from rural to urban, and make a large number of farmers become workers or engage in the tertiary industry. The deep development of agricultural land often brings the improvement of productivity, which affects people's consumption level and consumption structure [17]. The development of construction land leads to the occupation of a large amount of cultivated land, which will have a certain impact on the quantity and structure of agricultural land. The redevelopment of the old city may affect the population structure, cultural structure and social structure of the area. No matter what form of land development, it will bring changes in regional social and economic structure.

The implementation of land consolidation has increased the per capita cultivated land area objectively, which is conducive to the realization of the dynamic balance of cultivated land. After the development of land consolidation, small fields were transformed into large fields, and scattered plots were organized and used. The previous corners and corners were transformed into cultivated land of good quality, and the field traffic conditions were greatly improved, which promoted the modernization of agriculture. The supporting ditches improved the ability of agriculture to drain waterlogging and resist drought, and completely eliminated the "promising fields". Since farm manure can be easily reached in the field, the use of chemical fertilizer is significantly reduced, which saves money and beautifies the environment. Through afforestation, the construction of farmland forest network, improve farmland ecological environment, improve ecological benefits [6,9,18]. The new fields are neat, the flatness of the fields has been greatly improved, and it looks very beautiful. The ploughing layer thickness has been greatly improved than before. All these have greatly improved the condition of the natural system in the finishing area.

From the long-term experience of foreign land consolidation, it is necessary to strengthen the ecological consideration in land consolidation, land consolidation should follow the principle of ecological priority, and the focus of consolidation should be shifted to ecological protection with land as the core, so as to achieve the goals of improving the permanent and sustainable production capacity of agricultural land, optimizing the ecological structure of agricultural land, improving the quality of human living environment, protecting biological diversity and ecological balance. Land consolidation has been recognized and accepted by the society as an important way to supplement the cultivated land area, realize the balance of land occupation and compensation, improve production conditions and raise land productivity. However, at present, the land consolidation project in our country still stops in the comprehensive improvement stage of agricultural production infrastructure, focusing on the increase of cultivated land area and the construction of high standard basic farmland. The land consolidation process does not regard the land as an ecological system. From the perspective of sustainable development, the importance and necessity of protecting ecological environment in the process of land consolidation is not enough. Too much focus on short-term benefits [19]. In the face of increasing environmental problems and ecological degradation, strengthening ecological construction in the process of land consolidation has become an urgent need for the healthy and sustainable development of land consolidation.

4. Conclusion and suggestion

Land consolidation, as a means of engineering on the road of civilization and progress of human society, must follow the basic law of sustainable development, must be implemented from the perspective of sustainable land utilization and ecological sustainable development, and operate within the permissible limits of ecological environment. Ecological construction of land consolidation must consider in the planning, design, construction, late control and other processes into the ecological factors and biological engineering measures, so as to field, water,

road, forest, village and other comprehensive ecological consolidation, as far as possible to maintain the project area of water resources, soil, vegetation and other environmental elements of the background value of a good recovery state, not destroyed, the construction of biological channels, Maintain the original biological species to achieve regional biodiversity. Land consolidation should not change the natural ecology at will, still less should not be carried out by the force of construction machinery, and destroy the ecological system for the one-sided pursuit of economic benefits. Therefore, land consolidation will have an impact on the ecological environment of the region and even the biosphere, and a full understanding of these impacts will be conducive to the healthy, orderly and sustainable development of land consolidation.

The most significant feature of land ecological remediation is to effectively cross and integrate different fields such as planning, design, new materials, new products, new processes, information, monitoring and standards. Through system integration and independent innovation, ecological concepts are integrated into the whole process of land remediation project construction. The future land consolidation engineering technology will take improving land quality and ecological environment as the main goal, and realize the transformation from the emphasis on quantity to quantity, quality, ecological management and protection. The goal of ecological construction of land consolidation is to achieve the unified and harmonious development of economic, social and ecological benefits, taking the three factors into consideration. Therefore, while pursuing the economic and social benefits of the project construction, it is necessary to maintain and improve the local ecological environment conditions and prevent or reduce all kinds of pollution caused by the implementation of the project.

In order to truly achieve "protection in development, development in protection", we must adapt to local conditions, take the pursuit of ecological civilization as the ultimate goal, and the pursuit of production capacity must obey this goal. However, at present, China's land consolidation projects are still in the stage of comprehensive improvement of agricultural production infrastructure, focusing on increasing cultivated land area and construction of high-standard basic farmland. Land is not regarded as an ecosystem in land consolidation, and the importance and necessity of protecting ecological environment in the process of land consolidation are not well understood from the perspective of sustainable development. Too much focus on short-term benefits [14]. In the face of increasing environmental problems and ecological degradation, strengthening ecological construction in the process of land consolidation has become an urgent need for the healthy and sustainable development of land consolidation.

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