Application of the Principles of Landscape Ecology in Land Consolidation Engineering

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Abstract. Through the application of land consolidation, can greatly improve the rural land pattern, so that its land use efficiency can be continuously improved, which has an important role in the improvement of people's living standards, is the current we must pay attention to the content. But from a practical point of view, in the practice of land consolidation, there are still a variety of problems, many ecological environment related factors are not paid attention to, resulting in many unnecessary losses, hinder the sustainable development of the economy. As a new interdisciplinary subject, the application of landscape ecology in land consolidation can play a huge role, which is the necessary guarantee to improve the effect and value of land consolidation.

Keywords: Ecology, Landscape ecology, Land consolidation.

1. Preface
For a country, land resource is the most important natural environment resource, it is not only the basis of economic development, but also the key to people's survival, is every country, every people should pay attention to. With the rapid development of China's economy today, due to the continuous increase of population, land resources are facing increasingly serious pressure. Therefore, in order to link the pressure of land resources, it is necessary to reasonably apply land consolidation to carry out planning. From the point of view of land consolidation, it is a systematic and comprehensive process. In practice, all aspects of factors should be considered, especially to avoid damage to the original ecological environment. Through the application of landscape ecology in land consolidation, the sustainable development direction of land consolidation is pointed out.

2. Principle analysis of landscape ecology
From the perspective of landscape ecology, it is a new ecological credit system to study the relationships and dynamic changes among different subsystems of ecosystem in a large region. The main goal of its research is the spatial pattern of ecosystem and the process of ecological cycle on the spatial and
temporal scales in a large region. With the continuous development of land consolidation in recent years, landscape ecology has been applied more and more widely and has played an important role [1]. In practical application, it is based on the original land consolidation to further ensure the sustainable development of land, the diversity of life and landscape and ecological balance. As a systematic, comprehensive project, in the process of implementation of land consolidation, both water resources in the area in which the content of the soil and so on, it is easy to be affected, by the application of landscape ecology in the process, can effectively alleviate and eliminate by the negative impact of the ecosystem cannot only ensure the smooth completion of the land consolidation and rehabilitation, also can fully protect the original ecological environment, and to the diversity of ecological protection [2].

3. Main principles of landscape ecology planning and design for land consolidation

In the process of carrying out land consolidation landscape ecological planning, it is necessary to consider relevant factors in all aspects, so as to improve economic benefits, social benefits and ecological benefits as far as possible. Through the improvement of economic benefits, can bring more abundant crops and ecological tourism services, through the improvement of ecological benefit, can more scientifically planning the overall situation of the ecological landscape, through the improvement of social benefit, can improve the enthusiasm of the broad masses of farmers to active participation in land consolidation, and play a role. In practical application, four principles must be strictly followed:

3.1. Principles of landscape heterogeneity and ecological diversity

From the point of view of this principle, it is a fundamental principle in the process of ecological planning and design of land consolidation landscape. Specifically, landscape heterogeneity involves the spatial composition, structure and correlation degree of the project ecosystem. It can effectively combine landscape elements, landscape spatial gradient and shape, and can further map ecological diversity, strengthen its anti-interference level and avoid it being affected by various factors.

3.2. The principle of adapting measures to local conditions

In the process of land consolidation, different regions often have different characteristics. As an organic complex, geographical environment elements and ecological landscape factors are usually affected by various factors. Therefore, in the planning of land consolidation landscape ecology, it is necessary to combine the actual situation, carry out reasonable planning and design, scientifically complete the planning according to the specific needs, and make appropriate adjustments in practice.

3.3. The principle of combining short-term and long-term interests

Land consolidation is a powerful way of realize the long-term development, therefore, the finishing area residents must fully consider the short-term interests and long-term interests, as far as possible to combine the two, not only should pay attention to the immediate interests, also want to put the eyes of more long-term some, thus further realize the coordination of ecological balance and economic benefit.

3.4. Minimum-maximum principle

From the point of view of this principle, it is mainly manifested in the principle of minimum disturbance and maximum promotion. The minimum disturbance is to minimize the disturbance to the original ecological environment and system to avoid causing damage to the ecological environment, while the maximum promotion is to maximize the benefit promotion and minimize the impact of human on the ecological environment.

4. Land consolidation landscape biology planning and design objectives

The main reason why landscape biology is applied in land consolidation is to establish an ecological balance ecosystem with long-term development, stable system and perfect function. Meanwhile, this system also has the function of tourism. In terms of landscape ecology and land consolidation, there are mainly four theories related to them, which can be seen in the following table.
Table 1. list of principles of landscape ecological planning for soil consolidation

| The principle of the name | Instructions |
|--------------------------|-------------|
| Mosaic principle         | Matrix - plaque - corridor |
| Principle of heterogeneity | It refers to the spatiotemporal heterogeneity of landscape change during land consolidation |
| Principle of pattern ecological process | Pattern ecological process includes multi-scale ecological benefit, edge effect and ecological interleaved theory |
| Principle of spatial pattern of landscape | The theory of island biogeography, the theory of coincidence population and the theory of concentration and dispersion are included |

In the process of implementing land consolidation landscape ecological planning, different principles are not irrelevant, they are closely related, are closely related, are the key to achieve sustainable development of land resources. From a macro point of view, the landscape ecological planning objectives of land consolidation projects mainly have three points: First, improve the quality and utilization rate of cultivated land, and strengthen the grain yield of cultivated land, so as to obtain greater economic and social benefits as far as possible. Secondly, protect the environment in the finishing area, relieve the pressure on the ecological environment, scientifically develop water and soil resources, reasonably adjust the climate, do a good job of waste treatment, so as to improve the ecological environment to the greatest extent. Third, construct ecological landscape, provide better landscape for tourism, improve people's understanding of environmental protection, enable them to love nature, and then generate the consciousness of protecting nature and ecology, and play the role of ecological environment as a cultural service.

5. Effective measures for landscape ecology planning and design of land consolidation

5.1. Landscape ecological pattern planning and design
In the process of implementing the landscape ecological pattern planning and design, we must strictly follow the principle of improving and protecting the ecological environment and sustainable development. Under this premise, we should comprehensively manage the rural fields, water, roads and forests, optimize the farmland landscape as much as possible, and improve the traffic environment, so as to achieve scientific and reasonable planning. In the process of adjusting the ecological landscape, must understand and grasp the ecological value of the highest ecological landscape, such as reservoirs, kinds of lotus root pits or landscape, combined with the actual situation of the regional landscape, after reasonable optimization and broken landscape, enable it to become farmland landscape, it scattered broken landscape, it mainly involves the CanCiLin landscape, grassland landscape and so on. The value of landscape corridor in land consolidation area should be given full play as far as possible. In the vicinity of patches, the landscape of farmland roads, irrigation and drainage ditches and farmland shelterbelt should be reasonably arranged and planned. In the process of implementing land leveling, the fields should be set as horizontal grids, and the corresponding irrigation and drainage works should be set. For example, the rivers in the land adjustment area should be more used as the water source, and the ditches should be arranged by the way of adjacent ditches, roads and ditches.

5.2. Planning and design of landscape ecological patches
In terms of the planning and design of landscape ecological patches, in the actual design process, we should first do a good job in the classification of the landscape. According to the different functions, the landscape can be divided into paddy field, residential area, dry land, woodland and so on. If there is a high degree of landscape Mosaic in this area, it is necessary to properly enrich the species in this area according to the actual needs. In the planning and design, attention should be paid to the preservation of the original landform, and the specifications of the patches should be set scientifically, so as to avoid the situation that the area is too large and the pest control work is hindered. In the process of patch
design and planning, certain rules should be gradually formed, and the utilization efficiency of water resources and solar radiation should be continuously enhanced, so as to better realize the migration and diffusion of species.

5.3. Planning and design of landscape ecological corridor

As far as the planning and design of landscape ecological corridor is concerned, it involves irrigation and drainage ditch, farmland road and farmland shelterbelt landscape. As a kind of natural landscape, the design of standard corridors should be combined with patch design as much as possible. Generally speaking, in the planning and design of landscape ecological corridors, the design of irrigation and drainage channels should ensure the uniformity and connectivity of the layout to the greatest extent, and attach great importance to the smoothness of water circulation. In the water cycle, the channel corridor has three different grades: branch, bucket and farm. The branch channel uses the existing channel corridor to ensure that all parts of the farmland landscape can get sufficient supply of water resources. In addition, planting the turf on the slope of the drainage ditch can not only play the role of slope protection and soil consolidation, but also further improve the stability of the ecosystem.

6. Conclusion

To sum up, the application of landscape ecology in land consolidation can play a positive role in many aspects. It can realize the scientific planning of the ecological environment of the whole region, which is of great significance for the long-term development of land consolidation. With the continuous development of land consolidation, the application of landscape ecology in it has become more and more extensive, which will inevitably bring more opportunities for the sustainable development of rural areas.

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