Background of Land Development and Opportunity of Land Use Transition

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Abstract In order to ease the contradiction between people and land and ensure the needs of construction land and farmland, this paper analyzes the demand and regional land development background, and points out the problems of the development of the land in China: late start of land development and utilization practices; declining back-up resources and sharply increasing costs; new resources and environmental problems brought about by development and utilization of land in some areas. This paper presents a new opportunity and strategy for land use transition: giving full play to the agricultural and geographical advantages of farming-pastoral area; carrying out water-saving technologies and intensive use of agricultural land in water-deficient areas, in order to achieve reasonable and efficient development and utilization.

Key words Background of land development, Development problems, Land use transition

1 Introduction

Land development is mainly the development and use of unused land; broadly speaking, it refers to the activity aimed at expanding the effective use scope of land or improving the land use due to the need of human production and human life by using certain economic instruments of modern science and technology. It includes the reclamation and use of unused land to expand the scope of land use, and also the consolidation of utilized land to improve land utilization and intensive management degree. With the development of industrialization, information technology, urbanization, marketization and internationalization, the relationship between people and land will continue to show tensions, and there will be exacerbating conflict between environment and resources. The use and management of land resources is facing a severe situation, and food security and ecological security issues have become increasingly serious. The conflicts between land and construction, between land development and protection will be inevitably intensified. Therefore, analyzing the background and situation of land development and use is critical for the development and utilization of land.

2 Background of land development

2.1 Background of land development needs In 1978, China's urbanization rate was only 17.92% (Fig. 1). "Urban Blue Book: China Urban Development Report NO. 5" published by Chinese Academy of Social Sciences on August 14, 2012 showed that China's urban population reached 691 million and urbanization rate reached 51.27 percent in 2011. The number of Chinese mainland's urban population exceeding the rural population for the first time indicates that China has ended the era with the rural society as the main body, and begun to the new urban era with urban society as the main body. The sharp increase of urban population causes expansion of urban construction land. The area of farmland continuously decreased from 1978 - 2008, and especially since 1996, the aggressive style urbanization process has led to substantial growth of urban construction land and sharp decline of farmland[1]. However, due to a large population, the per capita farmland is still short in China, and insufficient farmland will produce a series of problems. First, the food security problems will exist for a long time. By 2020, China's total population is expected to reach 1.45 billion, and around 2033, it will peak to 1.5 billion, so to ensure national food security, 1800 million mu of farmland must be guaranteed. The reduction of farmland, especially high-quality farmland, is unstoppable. Second, the ecological security issues become increasingly prominent. In some areas, the land degradation and damage are serious, especially in ecologically vulnerable regions of China. After years of control and protection, the ecological environment in ecologically fragile zones is improved, but there are also some outstanding problems. First, the grassland degradation and land desertification area is very large, and desertification has not yet been effectively curbed. In 2005, China had 1.74 million km^2 of desertification land, accounting for 18.1% of the land area. Second, many problems are still very prominent, such as serious soil erosion, frequent natural disasters, regional poverty, drought, water shortages, wetland degradation, and biodiversity damage.

2.2 Background of regional development In the eastern coastal areas, the rapid industrialization and urbanization process since the reform and opening up has promoted social and economic development, but it also brings about many resources and environ-

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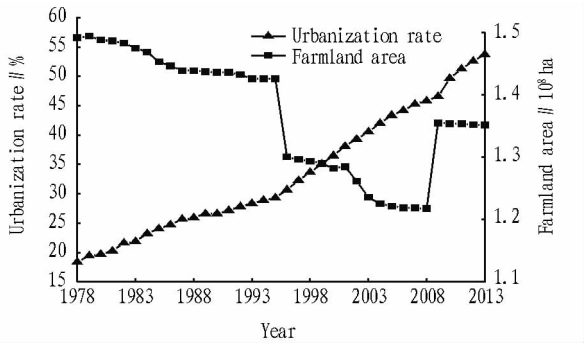

Fig. 1 The changes in urbanization rate and farmland area since the reform and opening up (1978 – 2013)

mental problems to the region. The non-agricultural occupation of considerable farmland and environmental pollution issues become serious, and the conflict between people and land is more serious than in central and western regions[3]. In the northeastern regions, the revitalization of old industrial bases is difficult in the new era. The reserve farmland resources in major grain producing areas are excessively developed, and the sustainable use of farmland and water resources is increasingly serious. In the central regions, in the context of urban-rural dual structure and urban biased development, the agricultural area is facing rural hollowing and further loss of endogenous development capacity brought by outflow of considerable agricultural labor forces, which further widens the gap between urban and rural areas[4]. In the western regions, the fragile ecology, rich resources and poverty are intertwined, and a lot of rural labor forces choose to work outside. The study areas are mainly concentrated in Shaanxi, Inner Mongolia and Ningxia. In Shaanxi Province, the Guanzhong area has a dense population and serried cities, and the land use conflicts are most prominent, while in southern Shaanxi and northern Shaanxi, the population density is small, cities are sparse and the land utilization rate is low, showing the problems of unreasonable land use layout and low level of regional coordination. 80% of the province's farmland and 70% of population are distributed in soil erosion areas. Inner Mongolia Autonomous Region is one of the most fragile ecological areas of China, and the ecological deterioration of the land has not been fundamentally controlled. The construction of water conservancy facilities, protective shelterbelts and soil improvement lags behind. The existing farmland is mainly arid, and the low-yielding fields account for more than 70% of farmland. The farmland investment is inadequate, the overall quality is not high, and the problems of land desertification, soil salinization, grassland degradation and soil erosion are serious. In Ningxia Hui Autonomous Region, with the rapid economic construction, the interference of human activities with the ecological environment intensifies, and the farming, forestry and animal husbandry land use conflicts are obvious in the southern loess hilly region. A large number of pastures are in the central sand zone where livestock management is extensive, land productivity is low and desertification is serious. Furthermore, in the southern mountain areas, the soil erosion and farmland fertility decline have led to soil salinization and land degradation, and the control measures are relatively weak.

3 The problems in land development and use

3.1 Late start of land development, consolidation and utilization The modern land development, consolidation and utilization started late in China, and the practice was implemented in the early days of foundation of New China, but it was not really emphasized until the 1970s[5]. In the 1980s, with the promotion and development of the rural contract responsibility system, the focus of land development and consolidation work turned to the adjustment of allocation of landownership and land use right. In the 1990s, the rapid socio-economic development led to sharp drop in the number of farmland resources. To effectively strengthen land management, the Ministry of Land and Resources was established in 1998, and the revised *Land Management Law* clearly stated carrying out land consolidation and implementing farmland requisition-compensation balance system. So far, the land development and consolidation projects that the state constructs have been throughout the country.

3.2 Dwindling reserve resources and sharply increasing cost The potential of reserve resources has a fundamental impact on the land development and use. During 2000 – 2003, the Ministry of Land and Resources implemented a new round of land resources survey project, and the survey results showed that there is 110 million mu of reserve farmland which is contiguous, capable of forming national land development and reclamation base, mainly distributed in the northern regions and western arid regions. According to estimation of Chen Yinjun[6], 66.5% of reserve farmland is concentrated in the northwestern arid and semi-arid regions; 5% of reserve farmland is concentrated in the ecologically fragile southwestern regions; only 28% of reserve farmland is located in Northeast, Huang-Huai-Hai areas, the middle and lower reaches of Yangtze River, Southeast and other regions. 110 million mu is the data in 2000, and if taking 3.4 million mu of reserve farmland to be annually reclaimed and developed during 1998 – 2007 determined by the Ministry of Land and Resources for calculation, it can be found that there was only 75 million mu of reserve farmland which was contiguous, capable of forming national land development and reclamation base at the end of 2010. Moreover, some scholars have recommended that taking into account the natural environment and ecological risk in arid area, the northeastern arid regions should not be regarded as China's reserve farmland resource base[7].

3.3 New resources and environmental problems in some regions In Inner Mongolia and the areas along the Great Wall, the Loess Plateau, Yunnan-Guizhou Plateau and other ecologically fragile areas, the adverse impact caused by the blind development and extensive operation has emerged: the soil organic matter content decreases; there is serious soil erosion, wind erosion and desertification[8]; the frequency and extent of floods are also exacerbated[9]. If we continue to conduct a new round of large-scale rec-

lamation of the northern natural grassland resources, coupled with abandoned and fallow farmland, it will further exacerbate the degradation of grassland ecosystems, resulting in adverse effects on the ecological environment[10]. In general, over the past few decades, China's land development and consolidation have played an important role in increasing farmland area, promote requisition and occupation balance, and improve farmland productivity. However, the current land development, consolidation and utilization are also facing a series of practical problems. First, the land development and consolidation planning system is not perfect, and the macro-control and guiding role of planning has not yet been fully realized; second, the management of projects and funds is not fully in place, and overemphasizing project reporting but neglecting implementation and management is common; third, the coordination among the departments needs to be further strengthened, and work efficiency should be further improved; fourth, the number of reserve resources is getting smaller and it is more difficult to develop; fifth, the traditional development model of "overemphasizing development, neglecting use, weak protection" has affected the ecological environment in ecologically fragile areas.

4 Opportunities and strategies for land use transition

Land use transition refers to the change in the form of land use in terms of time series[11]. The land use form is affected by the socio-economic development, and it also has an impact on the socio-economic development. The interaction leads to land use transition[12], and it is one of the manifestations of land use change. Currently, under the combined effect of natural endowments, market supply and demand characteristics, institution and other factors, China's land use orientation is clearly changed, and land use transition is accelerated, which is reflected in land use structure change, land use intensity change[12-13] and land use management system change. The connotation of land use transition becomes richer. There is a growing demand for land resources, but the land resources are increasingly short. This unprecedented internal pressure is bound to change the extensive land use model, promote economical and intensive utilization of land resources, strengthen the rational exploitation and protection of land resources, and promote the transformation and adjustment of land development and use in the new era.

4.1 Agricultural geographical advantages of farming-pastoral zone Farming-pastoral zone is the transitional zone between northern China's semi-humid farming areas and arid, semi-arid pastoral areas. Due to less rainfall, the soil moisture is always insufficient, and it can only meet the growth of drought-resistant grasses and drought-resistant shrubs. The natural environment is fragile, and the soil erosion is serious; the land resources are rich, but the quality is poor; there is a shortage of water resources, and agriculture is at the mercy of the elements[14]. Under the traditional self-sufficient peasant economy, farming-pastoral zone is an ecologically fragile and poor area with single industry. However, the unique climate, resource endowment and zero pollution advantages of farming-pastoral zone have provided important conditions for the development of modern characteristic high-quality agriculture. With the socio-economic development, social consumer demand for agricultural products is gradually transformed, and there is a growing consumer demand for high-quality characteristic minor cereals, fruits and vegetables, which has brought new opportunities for the agricultural and rural development in farming-pastoral zone. In accordance with the regional terrain characteristics and soil and water loss features, the farming-pastoral zone should pay attention to rainfed agriculture, water-saving irrigation techniques, afforestation practical technology, innovation and application of water-conservation ecological agriculture. It should also vigorously develop protection forest industrialization, water-preserving three-dimensional agriculture, and other typical rural characteristic ecological economic models[15], which can bring better socio-economic and ecological benefits. Thus, the land development and use of the region should be based on population control and agricultural economic development to optimize industrial structure, develop a diversified economy and increase farmers' income. It is necessary to coordinate the relationship between human and land, increase vegetation coverage, reduce soil erosion, and improve the regional ecological environment.

4.2 Water shortages and intensive use of agricultural land

A large population, water shortages and uneven distribution of water resources are China's basic national conditions. China's current per capita water amount is less than one third of the world average level, and in normal years, the national annual water shortage reaches more than 500 million m^3, and nearly two-thirds of cities lack water to varying degrees. Water shortages have restricted agricultural development, so it is necessary to have a profound understanding of water resource endowment characteristics, and actively adjust agricultural production structure, to promote intensive and water-saving development of agriculture. On the whole, the agricultural water use efficiency is not high in China, and there is a large space for saving water. Efficient use of water and land resources is a goal of sustainable development of agriculture. Agricultural water saving is a systematic project, including space and time adjustment of water, full use of natural precipitation, efficient use of irrigation water, and improvement of the plant's water use efficiency. Developing intensive and water-saving agriculture is an effective way to solve water crisis, ensure steady agricultural development of ecologically fragile farming-pastoral zone, and build modern agriculture. In the context of serious water shortages in farming-pastoral zone, agricultural structure adjustment is an important means to improve irrigation water use efficiency and water productivity. The adjustment of structure is not simply a change in "planting ratio", and it is necessary to focus on improving quality, efficiency and growth pattern, and take into account the sustainable development of agriculture and water resources.

5 Conclusions

In summary, with an increase in the urban population, China's

construction land also increases, and there is a need to change more farmland to construction land. Meanwhile, to ensure the food supply, the amount of farmland must be guaranteed, therefore, there is a growing demand for land development, and it shows different development issues in various provinces, autonomous regions and at zonal levels. At the same time, China's land development is facing late start of consolidation and utilization, dwindling reserve resources, soaring costs and new resource and environment problems arising from land development and use in some regions. Therefore, it is necessary to strengthen land use transition, improve land utilization, give full play to the agricultural advantages of farming-pastoral zone, and develop water-saving techniques in water-deficient areas, in order to achieve rational development, efficient use and effective protection of land resources.

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children. Besides, it is recommended to improve rural education system and improve course setting of rural schools. Course reform of rural elementary education should orient towards agricultural, rural and farmers' requirements. Rural education should be not only education of entering a higher school, but also education for strengthening agriculture, farmers, and rural areas. In addition, short of education fund has become a bottleneck of rural education development. Therefore, it is required to increase input of government to rural education, especially elementary education. Only in this way, it may be able to provide abundant funds for rural education, ensure rural education environment, stabilize teacher team, improve rural teaching quality, and also reduce risk of farmers in education investment, and improve enthusiasm of farmers for education investment.

3.5 Deepening understanding of rural farmers about education value and family education through many channels

It is recommended to deepen understanding of rural farmers about education value and family education through many channels, give prominence to nature of education investment, and provide support for employment of university graduates, and strengthen expectation of rural residents for education income. Besides, it is recommended to encourage parents to stick to combining soft and hard measures of education investment, prevent their shortsighted opinion influencing their investment in children education, and establish effective long-term incentive mechanism to encourage rural families to invest in children education. For example, it is feasible to provide direct living subsidies for labors of education investment, set up scholarship system, and give award for those perform excellent achievements. Government should improve rural policy environment and strengthen intrinsic drive of farmers for education pursuit.

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