

# Land Consolidation: An Approach for Sustainable Development in Rural China

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Since China initiated economic reforms and an open-door policy in 1978, rural China has made remarkable achievements during the past three decades. The GDP of rural China increased from 2.8 trillion yuan (1 U.S. dollar = 6.7 yuan) in 1996 to 8.8 trillion yuan in 2008, with the annual growth rate at around 10%, and the average annual income per capita in rural China reached 4,761 yuan in 2008, with the growth rate of 8%. However, there are still many biophysical, socio-economic, and political problems or constraints that need to be solved or taken into account for sustainable development in rural China. Among them, rural land issue has always been a concern of the Chinese government and people (Long et al. 2010).

## RURAL CHINA LAND-USE ISSUES

A shortage of cultivated land resources is the most significant challenge facing rural China's development and the drastic loss of valuable cultivated land has caught the attention of the central government (Lin and Ho 2003). Concomitant to the annual GDP growth averaged at about 10% during the past three decades, China's cultivated land has been decreasing continuously. According to statistical data released by the Ministry of Land and Resources of China (MLRC), total cultivated land decreased approximately by 8.35 million ha between 1996 and 2008. It is widely accepted by many researchers that when cultivated land per capita is less than 0.17 ha, food security will be threatened. However, China's per capita cultivated land in 2008 was a mere 0.09 ha, which was lower than the world

average of 0.236 ha by more than 50%. Urban-related industrialization is well known to be one of the most important driving forces of the decreasing cultivated land (Xu 2004).

The fragmentation of cultivated land can be observed due to construction on land of the country, which often results in problems of increased labor time, land loss, restrictions to irrigation access, and such operational difficulties as those associated with pest control and land supervision. In addition, intensive agriculture, and the overuse of fertilizer and pesticide has resulted in serious environmental problems such as water pollution, degradation of soil quality, and a decrease in the number of wild animals and plants. The environmental impact of cultivated land changes will threaten the sustainability of food production. Studies have shown that food production capacity has continuously been reduced by the degradation of land quality (Yang and Li 2000).

While most attention has been paid to cultivated land in China, few people have noticed the changes in rural settlement. In fact, rural settlements are most representative to depict China's rural development. Between 1996 and 2008, the rural population decreased by approximately 129 million, while the increment of the rural settlements was 100,000 ha, and the rural settlement per capita increased from 193 to 230 m<sup>2</sup>. This accounted for 51.84% of China's total construction land in 2008. These new increased rural settlements have two characteristics: on the one hand, nearly 90% of the increased rural settlements occurred at the expense of cultivated land (it is not difficult to find that large amounts of cultivated land are occupied by new rural settlements in current rural areas of China); on the other hand, most of the increased rural settlements are on a small-scale and are widely scattered, due to the lack of

scientific planning of the town or village, which resulted in a serious waste of available land resources.

## DEVELOPMENT OF LAND CONSOLIDATION IN RURAL CHINA

Land consolidation may improve land productivity and possibly also the total factor productivity if it induces and enhances technical progress. Through land consolidation, land quality and irrigation system are improved and land fragmentation is reduced, which subsequently lead to increases in agricultural productivity.

In Western Europe, land consolidation is often part of a wider regional development program for rural areas, which includes improvements to agricultural production, employment, taxation policy, infrastructure, public facilities, housing, and the protection of natural resources (Pasakarnis and Maliene 2010).

Despite the fact that land consolidation practices in rural China have a long history and can be traced back 1066 B.C., the modern land consolidation implementations started in the 1950s (Wang 1997). At that time, land consolidation mainly comprised readjustment of land tenure, including land rearrangement, renovation of drainage systems, the building of local roads, and so forth, for the purpose of enhancing land use.

Currently, the Chinese government has come to realize that land consolidation is an effective countermeasure for ensuring economic vitality of the rural areas, changing the aim of land consolidation from being agricultural/farm-focused to being a tool to cover public demands for access to land and to resolve the resultant land-use conflicts.

In order to better perform the land consolidation, in 1997 the MLRC set up a new agency, the National Land Consolidation and Rehabilitation Center (NLCRC), which was to be responsible for land consolidation. Its tasks included: initiating the national land consolidation project, offering technical guidance in the implementation of local land consolidation, managing the funds for land consolidation and rehabilitation, and conducting engineering and technology research in land consolidation and rehabilitation fields. Also, each province and municipality set up a regional Land Consolidation and Rehabilitation Center in succession to assist the NLCRC in conducting land consolidation countywide.

In the late 1990s, the NLCRC launched the 1st Ten-Year (2000–2010) national-level land consolidation program, which aims to consolidate fragmented and underused land, reclaim wasteland or land damaged by mining or natural disasters, and develop unused land resources with the prerequisite of guarding against desertification and soil erosion. By the end of 2006, 2,320 projects of land

consolidation in eight sets were arranged by the MLRC, the total building size of these projects was 16,258 km<sup>2</sup> with an increased arable area of 3,726 km<sup>2</sup> in planning, and it took an aggregate investment of 29.79 billion yuan (Gao 2008).

However, it must be noted that for a long time there has been no special law to regulate land-consolidation activities. It was not until 1998 that land-consolidation legislation was adopted by the State Council as part of the extensive amendment of the new Land Law. The detailed provisions for implementation of land-consolidation projects are regulated in a governmental resolution of 1999.

In 2005, the MLRC adapted an innovative land-management policy “linking up the increased urban construction land with the decreased rural settlements”, which means that, at a county level, the increased urban construction land for future urban development should be no more than the decreased rural settlements (Long et al. 2009). At the same time, the decreased rural settlements should be turned into cultivated land through carrying out land consolidation so that the volume of construction land in the county does not increase, and to keep the quantity and quality of local farmland stable, so that it does not decrease, and finally to form a rational land-use pattern.

This policy was advocated because it satisfied the governments’ needs for the construction land, which is necessary for ensuring future economic development. It also plays an important role in rationalizing the rural land-use pattern and building new countryside. After the implementation of this policy, the appearance of rural settlements has changed from “dilapidated and disorderly” to “clean and tidy” (Fig. 1).

Since the application of land consolidation in 1999, it is estimated that at least 2.5 million ha of cultivated land have been saved through land consolidation, and the increased grain production is equal to the output of 2.7 million ha of cultivated land. However, China’s land consolidation with the primary purpose of saving farmland is still at a low level.

Land consolidation is an excellent tool for promoting the primary production of food staples, improving working conditions in agriculture and the living conditions of people living in rural areas in the course of coordinating urban and rural development. The past decade was a period when rural China’s economy boomed and there was a huge demand for land. The practice of land consolidation in China has clearly demonstrated that it can be an effective and active land-management instrument for addressing the problems associated with rural sustainable development.

At the end of June 2010, Xu Shaoshi, the secretary of the MLRC, announced that the 2nd Ten-Year (2011–2020) national-level land-consolidation plan would be launched soon, with the aim of keeping no less than 120 million ha

**Fig. 1** The effects of land consolidation. The peasants that lived in the dilapidated dwellings (a) moved to new apartments (b) that were built by the local government after land consolidation; c and d show that by land consolidation, barren and sparse vegetated land was converted into cultivated land



of cultivated land to ensure food safety for its population of 1.3 billion. From 2011 to 2020, China's rural economy is expected to maintain steady growth, so there is still a long road ahead for land consolidation to facilitate the agricultural and rural development in a sustainable way.

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