



# Strategic adjustment of land use policy under the economic transformation

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## ABSTRACT

China is experiencing a huge change in its social, economic and ecological development. It has entered a transformational period of the “new normal” of its economy while its gravity center of the grain production presents a northward trend caused by global climate change, with ecological civilization construction proposing an unprecedented urgent request regarding the optimization of territorial management and the reconstruction of production, living and ecology space. Due to China's new normal, new ideas and countermeasures are needed to develop land use patterns and policies to adapt to China's strategic transformation. Regarding the challenges to land use during the transformation, this paper explores the strategic adjustment of land use policy in China's new normal and proposes the optimization of urban-rural spatial structure with a focus on urban-rural coordinated development in future land development by land engineering and land consolidation. Utilizing China's second largest economy is the key to finding solutions in the adjustment of land use and policymaking during economic transformation, whereas healthful and reasonable urbanization serves a vital role in building a harmonious society. Continuous work by government at all levels to reform land systems and research of land use by different divisions should be adopted according to local conditions.

## 1. Introduction

The rapid growth of urban populations results in rapid urban expansion (Li et al., 2013). Urban proportion of the world population is projected to be 67.2% in 2050 based on a forecast by the United Nations (2012) (Song et al., 2015). China, as the largest developing country, has undergone rapid urbanization at an unprecedented rate over recent decades of Open and Reform Policy in 1978 (Liu and Yang, 2015; Bai et al., 2014) due to the largest flow of rural-urban migration (Zhang and Song, 2003) and rapid economic development and population growth (He et al., 2014; Normile, 2008; Liu et al., 2012). During the transition from traditional agriculture society to modern society and from a planned economy to a modern market system, the urbanization rate increased from 17.9% to 52.6% during 1978–2012 (Bai et al., 2014), whereas the urban population increased from 170 million to 710 million during the same period (Chen, 2007; Li, 2014). Built-up area increased nearly fivefold, from  $7.44 \times 10^3 \text{ km}^2$  to  $4.36 \times 10^4 \text{ km}^2$  from 1981 to 2011 in China (Ministry of Housing and Urban Rural Development of PRC 2011, 2012), while its center of gravity was located in the east and spread to the Midwest with accelerated expansion (Liu et al., 2014a,b). Besides, China's arable land has witnessed increased volatility since 1949, peaked at the late of 1980s and then decreased in a fluctuation way (Shi et al., 2006); Area of arable land increased in northern China while decreased in south, and the quantity had a slight

change. Meanwhile, the center of gravity of arable land moved from northeast to northwest during 1990–2010 (Liu et al., 2014a,b).

The rapid development of industrialization and urbanization, similar to that in other countries in East Asia such as South Korea and Japan (Liu et al., 2010b), has not only promoted regional economy and enhanced international competitiveness but also significantly influenced regional land use and land cover change and affected transformations of regional rural-urban relationship and industry-agriculture relationship, which has produced issues such as a continuous decrease in cultivated lands and an increase in the number of land-lost farmers and migrant-workers, abandoned high-quality farmland, substantial rural non-agriculturalization, rural exodus and hollowing, rural poverty (Liu, 2007). These problems have drawn significant attention from political and academic spheres regarding issues of arable land protection, food security, poverty alleviation and sustainable land use, as well as land consolidation and land engineering in China. At present, an increasing number of research has focused on the social and environmental consequences of urbanization in urban areas or on estimation of the impact of urban expansion on soil resources (Appiah et al., 2014; Buyantuyev and Wu, 2012; Chen, 2007; Deng et al., 2009; Lambin and Meyfroidt, 2010; Mohan and Kandya, 2015; Ren et al., 2003; Tan et al., 2005; Xiao et al., 2006; Poumanyong and Kaneko, 2010). However, studies about land use policy adjustment facing the potential

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implications of urbanization from an integrated perspective are still rare (Siciliano, 2012).

Currently, China has entered a transformational period of the “new normal” of its economy, which refers to an economy that has entered a new phase that differs from the previous high-speed growth pattern. This new normal of China's economy has emerged with several distinctive features. First, the economic growth decelerated from a high rate of approximately 10% to approximately 7%–8%. Second, the economic structure is constantly being improved and upgraded and the gap between urban and rural areas will be gradually narrowed during this transformation. The service industry will gradually become a pillar of our national economy, and the share of people's incomes occupying the national economy will be larger. Third, the economy will transfer from a productive investment-driven growth model to an innovation-driven growth model (Xi, 2014). The new normal began in 2011 and will continue until approximately 2025 (Zheng, 2014; Zhang, 2016). The new normal, as a new trend, features sustainable, mid-to-high-speed growth with higher efficiency and lower costs; previous extensive and inefficient land use does not satisfy China's demand of economy development in the new normal state. The land system is a fundamental institution that affects a country's total economic development. Rural development and land issues remains a top priority in China's economy development. Global climate change has caused a northward trend in China's gravity center of the grain production from 1990 to 2014. Ecological civilization construction proposed an unprecedented urgent request regarding the optimization of territorial management and the reconstruction of production, living and ecology space. Due to China's new normal, new ideas and countermeasures are needed to develop land use patterns and policies to adapt to China's strategic transformation. This paper aims to comprehensively summarize land-use characteristics and problems and discuss the challenges to land use in this transformation period in China and proposes the main countermeasure in innovating land management and policymaking to guide sustainable land use and management and adapt to a strategic transformation.

## 2. Land-use characteristics and problems in China

Problems in urban-rural spatial structure and food security have been the hot spots of land use research. The urban-rural spatial structure, which reflects the superficial problems of land utilization, generally appears as inefficient use and scattered distribution, as well as a significant land vacancy. A scattered spatial structure is unable to support the industrial agglomeration and integration of industry and cities, which creates serious tri-cities problems, such as a “ghost town” (work place, empty building after work, deserted at night), “sleeping city” (residential area without industry, deserted during the day), and an “empty city”, which are characterized by real estate investment and land occupation in the new district and deserted areas during the day and night. Emerging “rural diseases” include population outflow, abandoned land, industry recession, culture decline, and environmental pollution in the degrading countryside, while urban diseases, such as congestion, air pollution, property bubbles, high living costs, and land waste, occur due to an overexpansion of urban areas.

### 2.1. Aggravated land change for non-agricultural use and sustained decrease of cultivated land area

Over recent decades of the Open and Reform Policy of 1978, urbanization in China has occurred at an unprecedented rate (Liu and Yang, 2015; Bai et al., 2014). Premier Li Keqiang noted that China has accelerated the pace of industrialization and urbanization, with an increase in urban population from 170 million to 700 million and an increase in the urbanization rate from 17.92% to 54.77% since the launching of the reform and opening up program more than 30 years ago by the EU-China Partnership on Urbanization in 2015. With the

rapid development of industrialization and urbanization, the demands of national infrastructure, construction of township enterprises, industry and commerce have caused an aggravated land change for non-agricultural use. Statistics reveal increase in the areas of residential land, industrial land, commercial land and traffic land. Land requisition causes a continuous reduction of cultivated land area, which also approaches the “red line of 1.8 billion mu (120 million hectares)”. Every percentage point increase in the urbanization rate indicates that the rural population in China of more than 13 million will move to urban areas and 2.87 million mu land will be occupied (Yan, 2013). Although land acquisition is not the main reason for the decrease in arable land, it significantly exacerbates the decline of arable land in China and produces a substantial increasing in resource security and food security risks. According to land use statistics, the total quantity of construction land conversely changed compared with the change in the total quantity of cultivated land from 2009 to 2014, that is, construction increased by  $311.46 \times 10^4 \text{ hm}^2$  during this period, whereas arable land only decreased by  $32.72 \times 10^4 \text{ hm}^2$ , which indicated that the net increase rate of construction land and the net decrease rate of arable land decreased in the past five years (Fig. 1).

The supply guarantee of construction land has effectively promoted a rapid growth of China's economy. From 2006–2014, there was a total of  $378.70 \times 10^4 \text{ hm}^2$  land acquisition ( $42.08 \times 10^4 \text{ hm}^2$  each year) and arable land loss accounted for 46.04% (Fig. 2). The China government has been very strict in ensuring that the total amount of arable land is maintained at a fixed level (“red line”); however, the supply of construction land has not been reduced. After economic development steps into the new normal, the former extensive growth in land use confronts urgent profound adjustment. The supply of construction land exhibited a continuous decreasing trend in 2014, with a decrease of 30% in industrial mining warehouse land use, a decrease of 25% in real estate land, and a small fluctuation of other types of construction land. The pressure between supply and demand eased to some extent and the economic and intensive utilization of land urgently needs to advance to a more extensive range and level.

### 2.2. Insufficient investment development strength with construction land vacancy and insufficient use

In the process of rapid urbanization, urban construction land in China has excessively expanded, and the per capita construction land has stabilized. The disordered sprawl of a new city or new district further contributes to urban expansion. Insufficient investment also causes construction land vacancy and inefficient use while the intensity of existing construction land, the floor area ratio and output of land economic benefits are low. China's area of construction land per capita in urban areas was  $129.57 \text{ m}^2$  in 2014, which significantly exceeds the national standard ( $85.1\text{--}105.0 \text{ m}^2$ ) and is significantly higher than the construction land per capita of developed countries ( $83.3 \text{ m}^2$ ) (Fang,



Fig. 1. Built land and arable land use change in China, 2009–2014.

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