



Views & Comments

The Progress and Grand Challenge of Urbanization in China

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This article presents a brief review of the process and grand challenge of urbanization in China today.

1. China's urbanization amid high economic growth

Over the past few decades, China's economy has maintained rapid growth, with an average annual gross domestic product (GDP) growth rate of more than 10% (Fig. 1 [1]). In recent years, the Chinese economy has entered a "new normal," in which the GDP growth rate has slowed but remained stable at around 7%. Rapid development and urbanization in China supplement and promote each other, enabling 400 million people to live in cities and enjoy the modern urban life.

For most of its long history, China has been a traditional agricultural country, with 90% of people living and farming in rural areas and only 10% living in cities. Until the 1970s, this proportion remained almost unchanged, and at present, the majority of middle-aged people, their parents, and their grandparents still live in rural areas.

After 1978, however, due to the demand for labor for economic development, the labor force began to flow from rural to urban areas. Rough estimates put the growth rate of the urban popula-

tion at almost 1% per year, which means that 10 million people move from the countryside to cities every year (Fig. 2 [2]). By the end of 2012, China's urbanization rate had reached 52.57%, or a population of 0.71 billion.

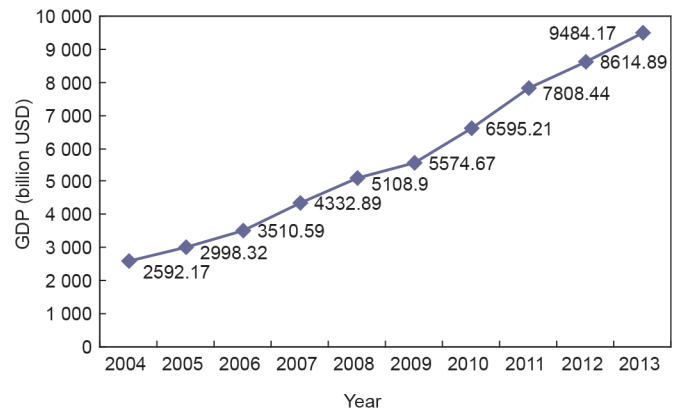


Fig. 1. Gross domestic product (GDP) in China from 2004 to 2013 [1].

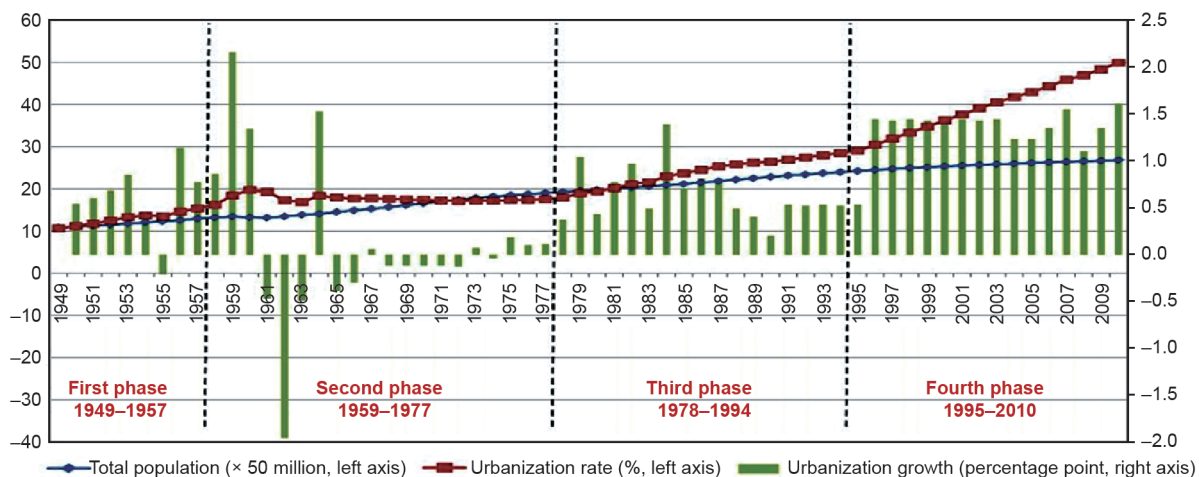


Fig. 2. Four phases of urbanization in China from 1949 to 2010 [2].

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2. Logistics and passenger flow drive large-scale infrastructure construction

In the process of rapid urbanization, logistics and traffic surge have led to massive urban infrastructure construction. For example, prior to 1979, China's highway networks were not developed; however, after over 30 years of development, China's total expressway mileage reached 104 000 km by the end of 2013, exceeding the US mileage of 92 000 km and ranking first in the world. China's railway construction has also witnessed rapid growth. By the end of 2014, China's operated railroad reached 112 000 km, ranking second in the world. China's high-speed railway, operating at more than $300 \text{ km}\cdot\text{h}^{-1}$, will cover 16 000 km and rank first in the world (Fig. 3).

With my own family living in Shanghai, I am especially impressed with the convenience brought about by the high-speed railway. In the past, it took two hours to travel from Beijing to Shanghai by plane. However, due to weather conditions, regulatory control, and other reasons, flights were frequently delayed. It now takes only four hours to travel from Beijing to Shanghai by high-speed railway; and the trip is very convenient and efficient, with no delays.

3. Changes and problems from the development of the automotive industry

China has become the world's largest producer and consumer of cars. In 2014, China produced 23 722 900 cars and sold 23 491 900, ranking first worldwide for six consecutive years. The growth in this industry has led to both industrial development and improved travel within China. Looking back, most people in Beijing 25 years ago used bicycles as a means of transport. At that time, bicycles made up 70% of urban transportation vehicles. Even the former US President George H. W. Bush and his wife Madam Barbara Bush rode bicycles in Hutong (old lane) areas in Beijing when he worked as the Chief of the US Liaison Office in Beijing in 1970s. Foreign friends of China joked that it was "a kingdom of bicycles."

Of course, the rapid development of the automotive industry has also introduced significant problems. Every year, during National Day and the Spring Festival, there are seven days of holidays. Many people choose to travel by car during this vacation, and traffic becomes extremely heavy, leaving people waiting for long periods of time at the entrances of highways (Fig. 4 shows the situation in Shanghai). Even the overpasses are usually



Fig. 3. New test model of $500 \text{ km}\cdot\text{h}^{-1}$ super high-speed train. Photo was provided by CRRC Corporation Limited.

blocked by excessive numbers of cars. Thus, the question of how to ease the pressure on urban traffic is a major challenge for city leaders and managers.

4. China's urbanization faces environmental restrictions

China possesses 20% of the world's population but only 7% of the global arable land; and China's water resources per capita are only 28% of the global average (Fig. 5). According to the 2009 United Nations statistics, more than 400 cities in China have insufficient municipal water supplies, and 110 cities suffer water shortages. Resources such as timber, minerals, oil, and natural gas are also scarce. It is impossible for China to use rich resources to support its many people as well as supporting societal development, so urbanization must be accomplished in an environmentally sustainable manner.

5. Severe air pollution in urban areas of East China

Industrial and social developments have resulted in a certain degree of air pollution. In recent years, large-scale air pollution incidents have occurred at times in East China, especially in regions near Beijing and regions with relatively rapid economic development. In 2014, large-scale smog incidents occurred repeatedly in such regions. In January of 2015, the number of severe smog days (Class VI pollution) in Beijing reached 14 consecutive days (Fig. 6).

6. New urbanization must strengthen infrastructure and overcome "city diseases"

In the past 20 years, China's urbanization has been oriented

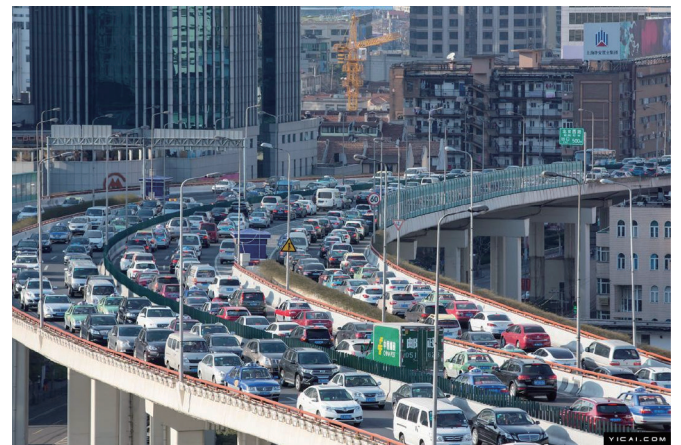


Fig. 4. Traffic congestion in Shanghai. Available from: http://news.315.com.cn/20150827/100536116_8.html#pictures.

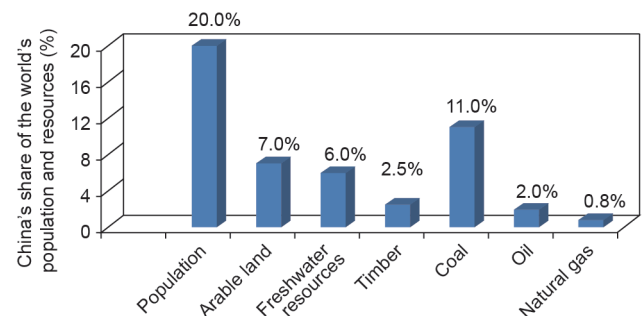


Fig. 5. China's share of the world's population and resources.

by the construction of iconic facilities such as central business districts (CBDs) and industrial parks in order to attract investment. However, the construction of urban infrastructure has often lagged behind. Although the investment in infrastructure in China's major cities is enormous, the construction of underground drainage systems has often been neglected, with serious consequences. For example, Beijing witnessed a rainstorm event on July 21, 2012 that flooded many areas of the city, causing 79 deaths and economic losses of 11.64 billion CNY (Fig. 7).



Fig. 6. Beijing National Stadium (Bird's Nest) on a smog day. Available from: <http://epaper.hljnews.cn/shb/20151202/163010.html>.



Fig. 7. Flooding in Beijing on July 21, 2012 caused deaths and serious economic losses. Available from: <http://www.weather.com.cn/zt/kpzt/696656.shtml>.

7. New urbanization must inherit historical and cultural elements and achieve diversity

Many small Chinese towns and villages have maintained a pleasant natural landscape and cultural characteristics of their ethnic regions, remaining beautiful and quiet (Fig. 8). At the same time, however, many of the metropolitan regions resemble each other. For example, large cities such as Beijing, Shanghai, and Hong Kong look very similar and lack major differences.



Fig. 8. Many small Chinese towns have retained their cultural characteristics. Available from: <http://www.wuzhen.com.cn/cn/tupian.aspx?cid=88>.

Culture is the spirit and soul of a nation. Protecting and developing the national culture and promoting cultural revival should become an important responsibility of urban construction. Therefore, we should retain some of the characteristics of the national culture in city designs, and large cities should include buildings with Chinese characteristics and a cultural heritage.

8. Conclusions

China faces many other challenges with urbanization that have not been discussed here. How do we deal with these challenges? Speakers at the Global Grand Challenges Summit in Beijing in September 2015 shared a wide range of new ideas and methods to address these and other issues. As city planners, engineers, architects, governments, and other actors work on urbanization in China, new answers will have to be found through both innovation and cooperation.

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