

Analysis on the Urbanization in China and the United States

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Abstract: This article discusses urbanization in China and the United States, and show the differences in the developing paths and similarities in the challenges. The paper studies how China, as a developing country, expands its urbanization significantly in the past decades and how it responds to the challenges of urbanization. On the contrary, the United States, as a developed country, has already gone through what China is experiencing now. This paper finds that environment and infrastructure are the main issues both countries would face in urbanization. Policies in developed countries tend to focus on enhancing quality of life, green infrastructure, and sustainable urban design. However, governments in developing countries tend to be more concerned with resolving informal settlements, enhancing infrastructure, and controlling the fast growth of metropolitan areas; therefore, in pursuit of faster urbanization, they have not noticed the serious impact on the environment. As urbanization is a complex and multifaceted process affecting cities' development and surrounding areas, countries could learn from each other and design policies that suit their own development goals.

Keywords: urbanization, economic development, environment.

1. Introduction

Nowadays, the global economy is experiencing a period that is full of challenges and opportunities. Many countries focused more on their economic growth and the development of infrastructure. Their goals are to drive economic growth, foster innovation, and improve access to services and opportunities, ultimately enhancing the quality of life. Therefore, urbanization development seems to have become the key to developing a country's economy.

As late as 1900, there were just 43 cities with a population of more than 500,000 and only 16 with a population of 100,000 or more globally. However, since 1950, there have been nearly 400 major cities with populations of more than one million [1]. Such rapid urbanization undoubtedly brings significant economic benefits and development to developing countries. As the center of economic activity, cities can attract significant investments, enterprises, and labor. Urbanization has also promoted infrastructure construction, commercial development, and the expansion of the service industry. These industries will provide a large number of employment opportunities. As a result, residents' income levels and consumption capacity will increase, further promoting economic growth. This will also provide a stable source of income for low-income groups, help more people escape poverty, and thus narrow the wealth gap [2].

In general, cities have a great deal of influence over national economies. They are hubs for transportation and communication, essential for any country's economic development, and they offer

jobs and access to the best cultural, educational, and health services [2]. However, the environmental issues brought about by urbanization are also require attentions. Urbanization, along with industrialization, brings air pollution, water pollution and industrial waste. At the same time, it is also possible that the urban population becomes too high, resulting in a shortage of infrastructure.

Given the different economic systems of the United States and China, this article compares the similarities and differences in the impacts of urbanization between the two countries. The paper analyses how China, as a developing country, expands its urbanization significantly in the past decades and how it responds to the challenges of urbanization. On the contrary, the United States, as a developed country, has already gone through what China is experiencing now. It worth studying how the US overcome the problems generated during urbanization, and providing policy solutions for developing countries undergoing urbanization.

2. Urbanization in China

2.1. Overview of China's Urbanization

In the first ten years of the twenty-first century, China was one of the nations that is urbanizing the fastest worldwide. The urbanization rate (the ratio of the nonagricultural population to the total population) increased by 20% from 2000 to 2010. Since 1980, China has been committed to speeding up urbanization progress. China's urbanization rate rose from 18% in 1978 to 30% in 1995 and to 39% in 2002 [3]. From 2010 to 2023, as shown in Figure 1 below, China's urbanization maintained a relatively stable upward trend, rising from 43% to the current 66%. China has experienced an incredible rate of urbanization along with a range of economic reforms. China's urban landscape is significantly altered by the construction of new high-rise residential and commercial structures, massive industrial parks, urban infrastructure projects, and urban regeneration developments at a pace and scale never seen before.

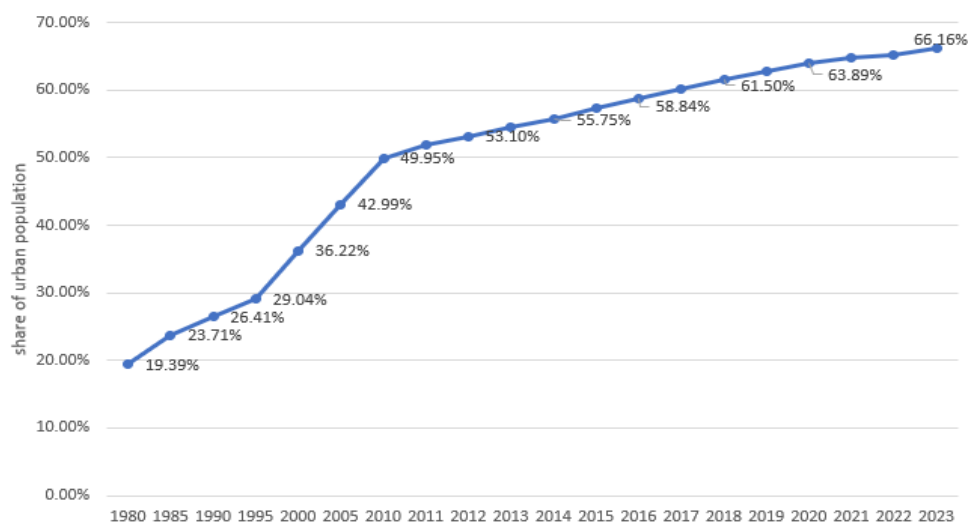


Figure 1: China's urbanization between 1980 and 2020 (Data Source: Statista).

This rapid growth stage has dramatically benefited the stakeholders financially. However, several issues with the environment, society, and governance are brought on by quick urbanization and economic growth. Many scholars have highlighted sustainable urbanization as a means of advancing the sustainable development of China's urban area in tandem with the country's fast urbanization process. Numerous Chinese cities have attempted to adopt sustainable urbanization from various

perspectives, and a wealth of experience has been amassed. Nevertheless, the attempts and methods have not yet solved all the problems in different aspects of urban development [4].

2.2. Challenges during Urbanization in China

Due to the economic growth brought about by urbanization, millions of Chinese people have been lifted out of poverty. However, China has struggled to fully profit from urbanization due to the country's tremendous industrialization and urbanization during the previous 50 years. Over the next 15 to 20 years, the population of Chinese cities is expected to increase by about 12 million yearly. An additional 255 million people are predicted to reside in cities by 2050. With such a large population, difficulties will arise, such as infrastructure and services failing to keep up with rapid urban population expansion, as well as depletion of essential natural resources, growing air pollution, and declining agricultural productivity.

China has the largest cities in the world and the highest urban density of any nation; therefore, providing enough infrastructure for its urban residents is crucial. China is making an effort to realign its public services to serve the country's expanding urban population. Essential resources for an efficient medical and health service include medical beds and a national index of the nation's capacity for providing health care. In all counties, the number of hospital beds per thousand people increased from 1.93 to 4.80 between 2000 and 2019. In 2019, this number was still below the national average, which was 6.3 beds per 1,000 people including counties and cities [5]. Furthermore, a sizable portion of the population—referred to as the "floating population"—moves to a different city without altering their household registration. It was recorded that, in 2017, 291 million people, including 244 million floating population, lived in Chinese cities that were not the exact location as their official citizenship registration [6]. Children of unregistered residents have difficulty accessing housing, healthcare, and education, along with other socioeconomic issues brought about by this situation. It is more difficult for migrant workers to assimilate into cities and become urban residents since they have less access to safety nets than other urban people.

Chinese cities significantly contribute to the climate change because of their high population density and activity levels. Cities in China are accountable for 85% of the nation's total carbon dioxide (CO₂) emissions, since coal powers 70% of the country's grid, and polluting businesses are centered there. Since January 1, 2016, China's ambient air quality standard (numbered GB3095-2012) has been in effect countrywide. The World Health Organization (WHO) advises China to meet the Phase 1 goal values for particulate matter 10 (PM₁₀), particular matter 2.5 (PM_{2.5}), and other pollutants because it is an upper-middle-income nation; these values are lower than those recommended for higher-income nations. Of the 338 cities at or above the prefecture level in 2018, 36% exceeded the nation's ambient air quality standards. China's PM_{2.5} concentration dropped from 43 micrometers in 2017 to 39 micrometers, although it was still 3.9 times higher than the WHO's recommended levels for the country. The air quality and environmental issues have been a massive struggle for the Chinese government for decades and have yet to be solved.

In China, one of the primary sources of land consumed for urban development comes from rural areas, causing concerns about agricultural output. Concerns regarding the detrimental effects of excessive farmland conversion, including urban sprawl and food security, have been voiced by numerous academics. In response to these concerns, the Chinese government declared that 1.2 million square kilometers of productive land must be kept for agricultural use nationwide. This is referred to as the "red line," and its objective is to ensure an adequate supply of farm products nationwide. Nonetheless, since 2000, China's agrarian acreage has sharply declined. The arable land area is perilously close to the "red line" [7].

3. Urbanization in the US

3.1. Overview of US's Urbanization

More than 80% of US residents lived in urban areas in 2020 as a result of early industrialization over the past 200 years. As early as the 1910s, there used to be larger proportions of people living in rural areas, but now, it is expected that over 90% will live in cities by the middle of this century. The US started to experience urbanization and industrialization in the 1830s when the Europeans immigrated to the continent. The US saw technical development and a reduction in the need for agricultural labor. As the central hub for immigrants, the Northeastern US became the most urbanized and productive area in the 19th century. Besides the increased population size, production capacities, and infrastructure also played a key part in the success of the Union's Civil War. Urbanization in the Northeast mainly happened in the 1870s, while the South experienced the change until the 1950s. By the 1910s, the US saw an enlarged urban population in the West and Midwest.

3.2. Challenges in US's Urbanization

Urbanization is crucial in converting rural lands for developing purposes in the US. This process usually involves deforestation, which can have a significant impact on forest ecosystems. Converting forests into cities can threaten forest ecosystems and destroy wildlife habitats. As well as the ability to purify air and water and prevent dust storms. Forest ecosystems include pure forests and urban forests. More and more buildings in forests will lead to higher fire suppression costs and potential loss of significant housing asset values.

In addition, urban areas tend to be warmer than their rural surroundings due to reduced vegetation, increased impervious surfaces, and waste heat from human activities. For instance, the daily mean temperature differences between forested and impermeable areas in Atlanta and Washington, D.C., are 2.0 and 3.3 °C, respectively. On the other hand, urban areas in arid regions, like Phoenix, are 2.2 °C cooler than the surrounding vegetation [8]. To solve this problem, US scientists invented the land surface parameterization (called SiB2) model. The SiB2 land surface model is intended to replicate the energy, water, and carbon exchanges between the atmosphere and the land surface. The SiB2 model functions independently of a connected atmospheric model when offline and driven by external meteorological data. Instead, it simulates land surface processes using pre-existing meteorological data, including temperature, precipitation, sun radiation, and wind speed. To estimate and forecast the ultraviolet heat island (UHI) effect, the SiB2 model can simulate energy exchanges between the atmosphere and the ground surface. Urban planners can reduce the UHI effect by implementing solutions like increasing green spaces or employing reflecting materials in construction by recognizing these patterns [8].

4. Discussion and Suggestions

Regarding urbanization and development, China and the US differ significantly. China is urbanizing at a relatively quick pace. The rate of urbanization has expanded from roughly 20% to over 60% since the Reform and Opening-up. The state typically leads China's urbanization policies, emphasizing economic growth and raising living standards. On the contrary, the US urbanization process is relatively constant, with a rate consistently surpassing 80%. The market is the primary force behind urbanization in the US, and policies tend to emphasize social fairness, sustainable development, and urban planning.

Rapid urbanization is viewed by the Chinese government as a critical component of economic development and modernization [9]. China has a centralized management style for its national system, with strict policy enforcement and well-defined development objectives like reducing poverty and

reviving rural areas. China's efforts to control rapid urban growth and redress social and economic imbalances are reflected in its urbanization policies, including land use rules and household registration reform. While land use regulations balance development and sustainability, household registration reform seeks to advance greater integration of immigrants into society and achieve equality. However, the US's development is a typical type of intensive growth mainly reflected in the Industrial Revolution in the late 19th century, which increased the productivity of specific regions and the vast growth brought about by increased population and resource production [10]. China's Qing Dynasty's conservative administration and isolationist policies prevented China from experiencing the same industrial revolution as the United States in the 19th century. Consequently, productivity gains were modest, and intensive growth trailed behind.

China can benefit from the US's urban planning and environmental protection experiences in terms of countermeasures and recommendations, such as building low-carbon cities and enhancing public transit networks. However, emerging nations are not always able to adopt industrialized nations' policies. For instance, it is challenging to recreate the high car dependence and low-density urban layout in the United States in developing nations. Due to their limited resources, developing nations should prioritize creating high-density urban models focused on public transportation, like China's urban rail transit system. China should modify and enhance policies following its current development and circumstances, such as guaranteeing social justice during urbanization and preventing resource waste and environmental strain from extensive urban growth.

5. Conclusion

Urbanization is the process by which urban areas expand, and the percentage of people living in cities rises. This article illustrates the harmful effects of urbanization and how it benefits the country's economic development. This paper compares the process and development of urbanization in China and the United States, the challenges encountered by the two countries, and the solutions to overcome them. At the same time, it also discusses what policies the United States, as a developed country, has that are worth learning from for developing countries such as China.

In terms of the rate of urbanization, China is much faster than the United States. Over the past 50 years, the proportion of China's population living in urban areas has increased from 20% to 60%, a shift that took over 100 years in the United States. However, China's rapid urbanization has brought about various environmental, demographic, and economic problems. Many of the issues facing Chinese cities today were seen in US cities in the past. For instance, US cities in the 1950s faced comparable environmental difficulties to those many Chinese cities now suffer from, such as smog and air pollution. However, due to differences in political systems and technological advances, the two countries have used different policies to address the challenges brought about by urbanization. In developed countries, policies often focus on sustainable urban planning, green infrastructure, and improving quality of life. In developing countries, however, policies focus more on managing rapid urban expansion, improving infrastructure, and addressing informal settlements. In conclusion, urbanization is a complex and multifaceted process affecting cities' development and surrounding areas. While urbanization brings many benefits, such as economic growth and improved services, it also brings challenges that must be addressed through effective policies and planning in both the developing and developed countries.

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