

Research on the Impact and Strategy of Urbanisation on Sustainability in Hangzhou of China

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Abstract: Urbanization is a vital component of a country's modernization and economic growth. However, the rapid pace of urbanization in today's world has led to significant sustainability challenges. These challenges, stemming from unsustainable urban development models, pose serious threats to the future viability of cities. This paper delves into the intricate relationship between urbanization and sustainability by examining data on the current state of urbanization. Focusing on Hangzhou—a city that exemplifies rapid urbanization in China—this study explores the dual impact of urbanization on economic and social development. While urbanization has undeniably contributed to Hangzhou's economic growth and social advancement, it has also introduced critical environmental and social issues. These challenges, if left unaddressed, could undermine long-term urban sustainability. Consequently, this paper not only highlights the negative repercussions of urbanization but also proposes innovative models and solutions aimed at fostering sustainable urban development. By doing so, it seeks to contribute to the broader goal of achieving balanced and enduring urban growth.

Keywords: Urbanisation, Sustainability, Economic development, Ecological environment, Society.

1. Introduction

1.1. Research Background

Urbanization is one of the most significant changes occurring in human society today, an inevitable trend of human economic and social development, and a necessary path to modernization [1]. As the second largest economy in the world, China's developed economy cannot be separated from the contribution of urbanization. China's urbanization rate has increased from 17.9% in 1978 to 60.6% in 2019 and will reach 70% in 2030 [2]. The dramatic increase in the urbanization rate means that more and more people are migrating from rural to urban areas and contributing to the development of urban economies. In addition, the increase in urbanization rate also means that more area of the country is being used for economic development. Undoubtedly, a larger urban population and a larger urban area will have a positive effect on the economic development of the region. However, social and environmental problems have arisen in China as the country has become more and more urbanized. This pattern of development only meets the needs of the present generation but is detrimental to the development of future generations. Failure to take into account the social and

ecological problems arising from urbanization is an act that runs counter to the goal of sustainable urban development. Therefore, sustainable urban development should be strictly observed by all cities.

1.2. Literature Review

Li pointed out that the traditional mode of urban development (unsustainable urban development) has led to problems such as environmental pollution, resource depletion, irrational urban industrial structure, and outdated infrastructures, which have constrained the healthy development of cities [3]. Therefore, this traditional urban development model needs to be replaced by a sustainable urban development model. Scholars such as Rasoolimanesh have shown that the goal of sustainable urbanization is to achieve a balance between economic, environmental and social needs and that the process of urban development involves the appropriate use of resources, the protection of the natural environment, and the fulfilment of basic human needs, etc. [4]. Some scholars have analyzed the urbanization rate of China's Yangtze River Economic Belt as 64%, which is basically the same as the national average [5]. However, most of the cities in the Yangtze River Economic Belt exhibit unsustainable urbanization, but the number of cities exhibiting sustainable urbanization is gradually increasing [5]. Many cities in China face many problems in developing urbanization. There are many problems, such as insufficient planning and lack of science, small size and the number of cities, shortage of resources, low-grade cultural facilities, lack of advanced culture, urbanization lagging behind industrialization, and so on in the new period of sustainability urbanization [3]. Ochoa and other scholars have identified the active promotion of public participation, the creation of more employment opportunities, full cooperation between government, private enterprises, and non-governmental organizations (NGOs) and the development of environmentally sound technologies as effective ways of achieving sustainable urbanization [6]. Therefore, the goal of sustainable urbanization requires the joint efforts of all sectors of society.

Nowadays, when all countries and regions are struggling to develop their economies, most scholars mainly study how to urbanize or how to develop the economy of the cities but neglect the problem of unsustainability brought by urbanization. Few scholars have studied the negative impacts of urbanization on society and the environment and the recommendations and strategies to address these problems. Therefore, this paper not only elucidates the positive impacts of urbanization but also points out the problems of unsustainable development and puts forward effective suggestions and solutions.

1.3. Research Framework

This paper will use Hangzhou as an example and background. Firstly, this paper will introduce the city of Hangzhou and its current development. Secondly, Hangzhou will be used as a background to analyze the positive impacts of urbanization on the economy and society. In addition, the problems that urbanization brings to society and ecology are indicated. Finally, the author will provide suggestions and strategies for sustainable urbanization development to improve the unsustainable status quo.

2. Case Description

Currently, Hangzhou is in the mature urbanization stage. In 2021, Hangzhou's resident population was 12.204 million, of which the urban population exceeded 10 million for the first time, reaching 10.203 million, and the urbanization rate increased to 83.6%, which is higher than that of the whole country and the province by 18.9 and 10.9 percentage points, and higher than the average of the world's high-income countries (81.8%), and close to that of the United Kingdom (83.9%), United States (82.7%) [7]. This shows that Hangzhou's urbanization rate is located at a high level. In addition,

Hangzhou has a good industrial structure and has successfully transformed its industrial structure. In 2020, the city's total employed population was 7.484 million, of which 303,000 were employed in the primary industry, accounting for 4.1 per cent; and the proportion of non-agricultural employment was 95.9 per cent, which is 19.5 and 1.3 percentage points higher than the country and the province as a whole [7]. The high level of non-agricultural employment-population ratio means that Hangzhou has been in the transition to the manufacturing industry, service industry, and other non-agricultural industries, which have obvious results. The increase in the proportion of non-agricultural employment in Hangzhou means that more and more people in the city are moving from rural to urban areas and working in the industrial and service sectors. In addition, from a spatial point of view, Hangzhou's urban area continues to expand. Hangzhou is striving to promote the urban spatial development strategy of 'expanding in the south, adjusting in the north, expanding in the east and optimizing in the west', and accelerating from the 'West Lake Era' to the 'Qiantang River Era' [7]. These policies give Hangzhou more land to develop the economy and bring more available resources to the city. 2000-2021, Hangzhou city area from 683 square kilometres to 8,289 square kilometres (the second land use survey data), more than Shanghai, Nanjing to become China's largest city in the eastern part of the urban area [7]. This large amount means that Hangzhou has richer land resources than other cities. This plays a crucial role in promoting the development of urbanization.

3. Analyze the Impacts and Problems of Urbanization on Sustainability

3.1. Positive Impacts of Urbanization on Economy and Society

Cities around the world have been vigorously promoting the development of urbanization, which has undoubtedly brought about a large number of positive impacts on the economy and society. Hangzhou is a more economically developed city in China. The impact of urbanization on the economic and social sustainability of Hangzhou is enormous.

3.1.1. Positive Impact of Urbanization on Economy

With the development of urbanization, more and more people from rural areas flow to cities. As a result, cities have gathered a large number of labour, capital and technological resources, providing a strong impetus for rapid economic growth [8]. From the perspective of labour force, a large number of people who were originally engaged in agriculture in rural areas have moved to cities and engaged in industry or services. This not only allows more people to work in more efficient jobs and increases the gross domestic product per capita but also contributes to the transformation of industries and boosts economic growth. In addition, cities usually have a better investment environment than rural areas, and for example, many cities establish industrial parks to provide space for industrial development. Hangzhou has a large number of industrial parks, including the electronic information industry, the biomedical industry, and the new energy industry. This provides a clustering effect for enterprises, which leads to better industrial development. In five years, Hangzhou's total GDP increased from RMB 1.5 trillion in 2019 to RMB 2.0 trillion in 2023 [9]. Hangzhou's economic growth is closely related to urbanization. Therefore, there is a positive correlation between urbanization and economic growth.

3.1.2. Positive Impact of Urbanization on Society

Along with urbanization, society also gets good development. Firstly, when a large number of people flock to the cities to work, more people will work in the industry and service sectors, which usually have higher salaries compared to agriculture, resulting in a higher standard of living for the people. Secondly, urbanization is accompanied by an increase in infrastructure. Urbanisation provides better

access to healthcare, which greatly improves the health of the population. From the perspective of education, cities have more school resources. This enhances the level of education of the people, reduces the illiteracy rate, and facilitates the development of talent.

3.1.3. Positive Impacts of Urbanization on the Economy and Society Together

The advancement of urbanization has led to the development of villages and underdeveloped areas. The population gathered in towns and cities obtains wealth through investment or labour, breaking the traditional urban-rural dual system, accelerating the circulation of wealth between urban and rural areas, and effectively promoting the development of underdeveloped or peri-urban areas [7]. As peri-urban areas have the advantages of space and transport, they provide accommodation for people in towns and cities, thus driving the economic and social development of peri-urban areas [7]. In addition, a large number of rural people are employed in towns and cities, acquiring wealth through their labour, and the return of wealth drives the development of less-developed areas and the expansion of urban culture [7]. This model not only provides employment for a larger rural population but also drives the rural economy and removes the divide between urban and rural areas.

3.2. Negative Impacts of Urbanization on the Environment and Society and the Resulting Problems

However, the development of urbanization is a double-edged sword. While reaping the benefits of urbanization for the economy and society, the disadvantages of urbanization also continue to emerge. The problems arising from the unsustainable development of urbanization are not only reflected at the social level but also, more significantly, in the ecological damage caused by urbanization.

3.2.1. Environmental and Ecological Problems Caused by Urbanisation

The impact of urbanization on the natural environment is mainly manifested in land use and ecosystem damage [10]. In order to develop the economy, a large amount of land in cities has been developed for the construction of residential, highway, commercial and industrial land, which has led to the destruction of large areas of forests and agricultural land and threatened the habitats of animals, thus reducing biodiversity. Also, urbanization has led to large areas of land surface being covered with concrete and asphalt, reducing soil permeability and increasing the risk of urban flooding [10]. As the urban population rises, so does the use and pollution of water resources. With the destruction of forests and the increase in traffic emissions due to the increase in population, there is a consequent decrease in air quality, affecting the health of the population as well as contributing to the greenhouse effect. The environmental and ecological harm caused by this unsustainable pattern of development is therefore significant.

3.2.2. Negative Impacts of Urbanization on Society and the Problems

First of all, in the process of urbanization, the problem of insufficient coverage of public resources has arisen in many areas. Hangzhou's urban construction and the provision of public products lag behind the development of urbanization, which directly leads to the low per capita occupancy of all kinds of public facilities in Hangzhou, exacerbating the contradiction between the supply and demand of high-quality social resources such as education and health, and affecting the quality of urban life, for example, the per capita area of stadiums, per capita area of green space in parks, and other indicators are all lower than the provincial average level [7]. Therefore, the insufficient coverage of public resources can lead to a decline in the living standards of urban residents. In addition, some scholars have pointed out that the development of Hangzhou's urban system is not balanced enough,

and the population and industry are too concentrated in the central urban area, which is a problem encountered by many cities in their development [7]. Hangzhou's city centre, the uptown area, has seen a 28.2% population growth in the ten years from 2010 to 2020, and the population density has exceeded 10,000 people per square kilometre, which is 15.3 times higher than the city's average [7]. In contrast, the ten-year population growth rates of Lin'an, Jiande, and Tonglu are 12%, 11.7%, and 2.8%, respectively, which are more than 25 percentage points lower than that of the city, and the population densities are all less than 250 people/square kilometre [7]. Therefore, when a large number of people from the countryside influx into the city, it will result in an over-aggregation of the population. This situation is mainly reflected in traffic congestion. This may affect the lives of urban dwellers.

4. Strategies to Address Sustainability Issues Arising from Urbanization

4.1. Strategies to Address Environmental and Ecological Problems Caused by Urbanization

Due to the vigorous construction of cities for urbanization and development, a large amount of land has been developed for economic development. However, animal habitats have been deprived in the process of urban development, leading to a drastic decline in biodiversity. In order to prevent the destruction of biodiversity, the government should build urban ecological gardens to provide habitats for animals. Ecological gardens, as part of urban green infrastructure, not only provide recreational space for urban residents but also provide habitats for wildlife in the city, which promotes the maintenance and growth of urban biodiversity [11]. In addition, the design of green corridors in urban ecological networks is crucial for maintaining urban biodiversity [11]. These green corridors not only connect dispersed green spaces in cities, such as nature reserves and parks but also facilitate gene flow and species migration between wildlife populations [11]. Instead of destroying biodiversity in urban development, this also increases the diversity of urban ecology. Secondly, increasing the area of green space can effectively improve soil permeability and mitigate the risk of waterlogging due to urbanization. In addition, increasing green areas can also improve air quality and slow down the greenhouse effect caused by urbanization. A more direct and effective way to reduce the greenhouse effect is to reduce greenhouse gas emissions. In the course of economic development, the process that produces the most serious greenhouse gases is industrial production. Therefore, the government should strictly control and limit the emission of greenhouse gases in industrial development. Another strategy to reduce greenhouse gas emissions is to promote clean energy, which includes hydroelectric, wind, solar, and tidal energy. At the same time, in the process of urbanization, the use of environmentally unfriendly modes of transport is very common. Therefore, promoting low-carbon transport is a necessary way to reduce air pollution, for example, by promoting the use of clean energy transport such as new energy vehicles.

4.2. Strategies for Solving Social Problems Caused by Urbanization

For the problem of insufficient coverage of public resources due to the increase in the urban population, the government should increase investment in public facilities, such as building more schools and hospitals to improve the quality of life of the residents, because good public resources can attract more people, including the rural population, or outsiders to live in a city. And this can also attract more talent to work in the city. In addition, a common phenomenon in many cities nowadays is that population and industries are too concentrated in the central city, which makes the central city crowded and causes inconvenience to residents. In this regard, the government should focus on synergistic promotion to build a new model of more shared urbanization [7]. There are two specific programmes to solve the problem of over-aggregation of population and industry. Firstly, the rational layout of industries in small and medium-sized towns and cities and the formation of an industrial

layout orientation that is conducive to inter-regional synergistic innovation [7]. This means that different industries and fields should be allocated to different regions to achieve efficient development. Population agglomeration is obviously affected by industrial layout, and to make population flow more reasonable and balanced, industrial layout and infrastructure construction must be reasonably planned based on ecological and environmental conditions so as to bring the development of each region into a virtuous cycle [7]. Taking Hangzhou as an example, Hangzhou city district focuses on new high-tech industries such as digital economy, forming an industrial structure mainly based on production services and high-end manufacturing, and the two districts, three counties (cities) and a number of small and medium-sized towns should undertake industrial transfer and strengthen the manufacturing base [7]. Secondly, optimize the population layout of urban and rural areas, guide the urban population and rural population to gather in small towns, relieve the problem of crowded population in urban areas and reduce the pressure of land, ecology and environment in the countryside. Moreover, the increased population can also develop industries in small towns.

5. Conclusion

5.1. Key Findings

This paper has examined the impacts and problems of sustainability in the context of rapid urbanization and proposed solutions to the problems that arise. Firstly, the paper analyses the impact of urbanization on the economy and concludes that the increase in the urban population and the increase in industrial parks in the cities have driven economic growth. It also concludes that there is a positive correlation between urbanization development and economic growth. Secondly, urbanization has had many positive impacts on society as more people are engaged in higher-paying occupations, and people enjoy better infrastructure. With the rapid movement of people between urban and rural areas, urbanization has led to the development of rural and less-developed areas. In addition, a large amount of land has been used for economic development in order to achieve rapid economic growth. However, this greatly destroys animal habitats and leads to a decrease in biodiversity. Excessive destruction of forests and development of land also increases the risk of urban flooding and contribute to the greenhouse effect. The most important solution to this problem is to increase the amount of green space by building urban ecological gardens. At the same time, due to the large number of people moving to cities or city centres, cities are facing the problem of insufficient coverage of public resources and over-concentration of industry and population, which reduces the quality of life of urban residents. Therefore, cities should increase the construction of public facilities. In addition, cities need to focus on synergistic promotion of urban and rural areas to create a new model of more shared urbanization.

5.2. Research Significance

In today's rapid economic development, the problem of unsustainability due to urbanization is becoming increasingly serious. Even though many government departments are aware of this, it is still a great challenge for the future development of cities. This paper identifies the shortcomings in sustainable urban development and gives solutions that can be used for reference. Therefore, it plays a positive role in sustainable urban development.

5.3. Limitations

This paper mainly used secondary data on urbanization and lacked primary data; however, this may be limiting. Therefore, for future research, the researcher could obtain primary data through surveys or interviews to ensure that this study is comprehensive.

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