

Environment Problems of City Development in China

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Abstract

Environmental issues in the process of rapid urbanization are critical to the sustainability of China. Compact cities, characterized by relative high density, mixed land-use and pedestrian-oriented habitation, have been proposed as one solution for sustainable urban planning. However, given the fact that Chinese cities are characterized by high population densities, the applicability of a more compact solution to expanding cities in China remains questionable. Essential to the decision-making is a deeper understanding about the relationship between urban compactness and the sustainable environment of the cities. This study is proposed for an evaluation about the urbanization and urban development in China's context from environmental perspective, especially with respect to atmospheric environment, water resources, waste pollution, and noise problems.

Keywords

Environmental Issues, Rapid Urbanization, China, Styling, Pollution

1. Introduction

Following the initiation of the reform and opening policy, urbanization in China increased in speed [1]. By the end of 2013, population lived in urban areas are 53.7% of the total, a rate that rose from 26% in 1990 [2] [3]. According to official forecast, the urbanization rate will reach 60% by 2020 [4] [5].

Urbanization, in turn, is reshaping both the physical environment and the cultural fabric [6] [7]. Take, for example, the issue of pollution [8]. Huge cities place huge demands on the environment [9]-[11], but high-density living conditions also present opportunities for improving efficiency of energy usage [12] [13].

According to World Bank indicators when evaluating the level of urbanization [14], the current level of urbanization in developed countries has reached about 80 percent [15], close to the world average of 50% [16] [17],

the average level of developing countries was 42%, while China's level of only 36%. Click here to evaluate the level of urbanization in China is in the low to mid-level transition period.

2. Urbanization and Urban Development in China

China is the world's largest developing country, since the reform and opening up, the rapid development of urbanization [18] [19], but China's urbanization process is not completed in the case of industrialized carried out [20]. Before the reform and opening up, industrialization and economic development is relatively backward [21], China's urbanization development stage is almost at a standstill [22]. China's urbanization rate increased from 28 percent to 45 percent only 15 years, and to increase by 1% per year rate of increase in 2035 will reach about 75%. China's urbanization process is much faster than the developed countries in Europe and America [23]. In this regard theorists and politicians have given great attention (Figure 1).

Regional imbalances between urban development in China, the overall presentation "ladder" shape [24]. China is currently the main urban development in large cities, small towns development is highly uneven [25], most of the small city on the structure and function but also meet the requirements, pollution, traffic planning unreasonable; although cities can provide more resources and effectiveness, but development of big cities, unreasonable structure increasingly prominent contradiction city needs to provide resources and people's deterioration.

The rapid increase in the number of cities, on the other hand, there were many large cities, large cities, and many cities in the contiguous spread from urban agglomerations, belt. This is the main feature of Chinese urban spatial structure [26]. A large piece of residential areas, industrial parks, development zones in the city and other cities New Rising edge. The new industrial space, commercial ecological zones, new living space have emerged, but also spawned the formation of rapid transit network. New newly formed space is bound to expand in the open; some with concentric expansion, there are axial extension, more multi-core expansion, affecting the entire city morphology. China is in the late stages of industrialization and urbanization accelerated development, construction and development of a large number of industrial parks and development zones, making the high consumption of resources and energy [27], the overall deterioration of the environment has not been fundamentally reversed the trend, the development of unbalanced, uncoordinated and not continuing problem is more prominent.

3. Environmental Issues of Urban Development Environment in China

Large scale development of China's urbanization is uneven regional development (Figure 2). Many problems brought about the development process of urbanization have emerged [21]. Urbanization process, a lot of the rural population into the cities, and the influx of urban population should enjoy the benefits have not been protected [22]. In the process of urbanization in the city should be able to solve the employment problem caused by the increase of urban population, housing issues, transportation issues [23], education, health problems and infrastructure issues [28]. But the ability to accommodate a population of each city is limited, almost become saturated urban issues in residence, employment, housing, education, health care, pension, insurance, transportation,

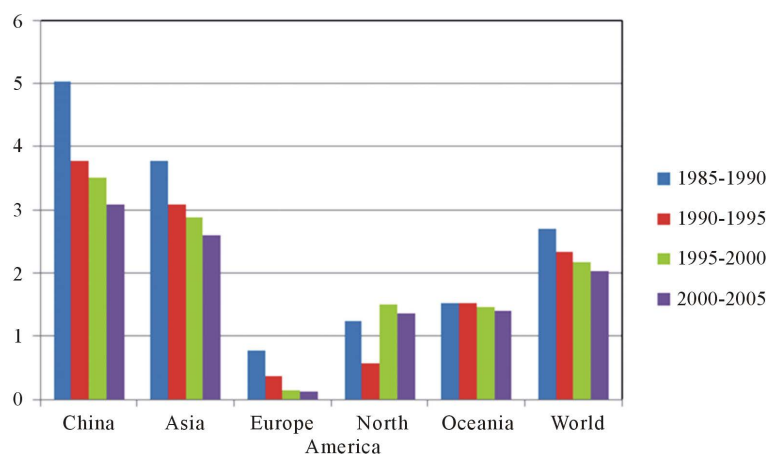


Figure 1. Urban population growth in China, comparing with continents and world (%).

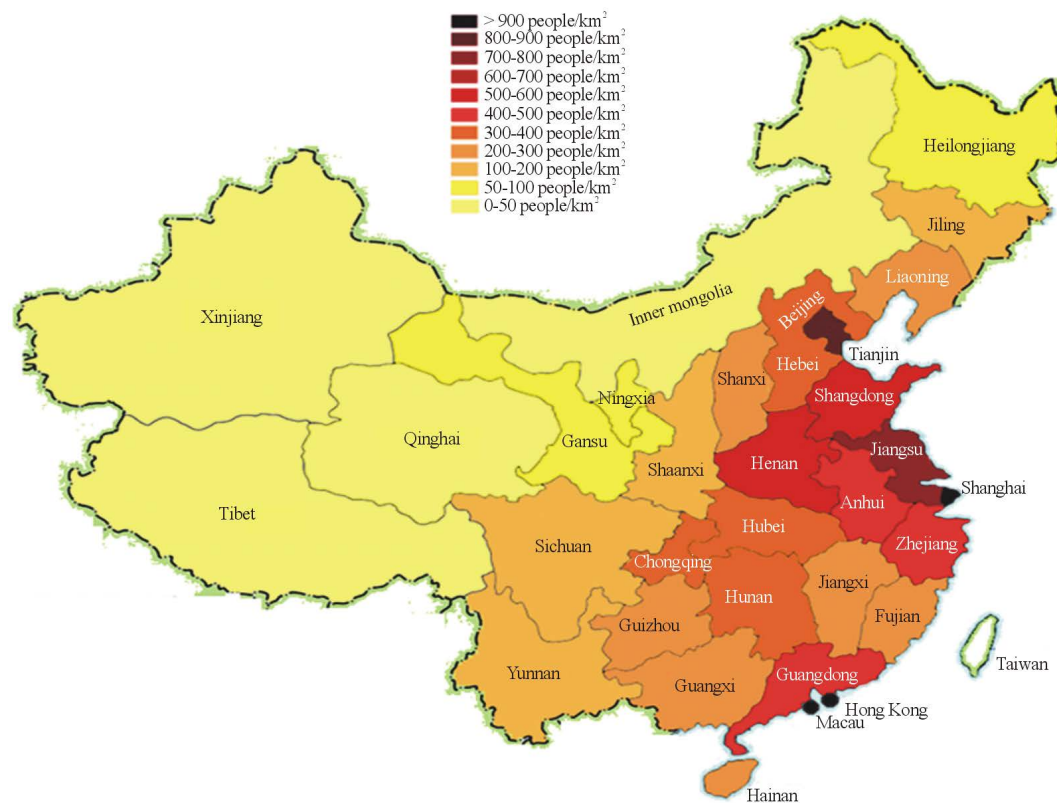


Figure 2. Population density of China.

production and management, and other prominent cultural life is particularly serious [24]. Urbanization in the presence of this series of questions, with the regulation of national policy, guidance, there will be room for improvement. However, the process of urbanization in energy consumption caused by environmental problems have been imminent, more serious environmental problem in the short term is irreversible process, of particular concern.

3.1. Impact of Urbanization on Atmospheric Environment

Urban air pollution is excessive expansion and rapid growth of the economy spawned a more prominent environmental issues [25] [26].

At present, China's urban ambient air quality is in heavier overall pollution levels [27]. The main pollutants are dust and sulfur dioxide [29]. Urban air pollution in winter and spring, heavier, summer, autumn light [30]; northern city of dust, dust pollution is heavy [38], heavy southern city of sulfur dioxide pollution, acid rain damage widening [28] [31]. Overall, the northern cities are more important than the southern cities [32].

Meanwhile, with the increasing number of cars in the city [33], environmental pollution caused by automobile exhaust has become increasingly serious [34] [35]; the atmosphere is facing the dual pressures of smoke pollution and car exhaust pollution [36]. In some cities, automobile exhaust emissions accounted for 35 percent of urban air pollution, some even more than 50%, to prevent and reduce vehicle exhaust pollution has reached a critical state. Potential danger of photochemical smog caused by vehicle exhaust could erupt at any time [37]. At present, some Chinese large and medium cities in the hybrid vehicle exhaust soot and pollution.

In addition, urban heat island effect, urban average annual temperature increase, increase in temperature days, the city is also a fall in atmospheric visibility outstanding performance deterioration of urban atmospheric environment [38].

World Urban Air Quality Report 2011 released by the World Health Organization, China 31 capital cities, the air quality of the best sea, in 1082 the city of all surveyed ranked only 814, ranked No. 978 in the four municipalities Shanghai bit, the rest were in 1000 after the city overall air quality is poor [39].

3.2. Impact of Urbanization on Water Resources

Reduce the amount of water. Water pollution is also a city of over-expansion and rapid economic growth in the birth of the environmental problems [40] [41]. With the increase of urban population, industrial and agricultural water use and the amount of water needed for life is also increasing [42] [43]. China is not rich in water resources per capita, regional distribution is not uniform [44] [45], and a large inter-annual difference during the year is also unpredictable [46] [47]. The existing more than 600 cities in China, about 400 cities short of water, there are more than 100 cities severe water shortages, water shortages more than 60 million/m³ per year [48]. Urban water shortages caused by overload, the overall function decline [49] [50]. This is a limited resource, not only has not been effectively utilized, but often appears wasting water, water pollution phenomenon. More serious is irresponsible to indiscriminate discharge of industrial and domestic sewage, in recent years, the total national average wastewater enterprises in more than 100 million t per day. Among them, there are more than 80 percent of the wastewater did not get any treatment, or after a certain treatment, though, but still in line with the national emission standards. More than 90% of urban polluted waters, nearly 50% of key urban water do not meet drinking water standards. Indiscriminate discharge of waste water not only makes the original contamination of rivers and lakes of water, and gave a lot of creatures brought great harm, and therefore around the country more than two thirds of the city there will be a shortage of water. Consequences of urban water shortage in many cities is extensive use of groundwater, making lowering the water table, groundwater space destroyed, lose the ability to regenerate, the city always at risk of land subsidence.

3.3. Impact of Urbanization on Waste Pollution

Garbage polluting the environment is the more prominent urbanization problems [51]. With the urban population is growing, the amount of waste increases, according to experts, statistics 668 cities nationwide per capita production of 440 kg of solid domestic waste, accounting for more than a quarter of the world total. Now urban lifestyle has been “saving” to “abandon” change, waste production is growing, and at a rate of 8 to 10 percent annual growth, more than the world average growth rate (8.42%). At the same time, waste disposal means generally lag behind, simple incineration, landfill, or even open dumps, causing huge economic losses, aggravated garbage siege phenomenon, and secondary pollution, long-term difficult to eliminate.

3.4. Impact of Urbanization on Noise Problems

Noise problem has been from the peaceful countryside to the bustling city of significant sign [52]. Environmental noise pollution in China is in addition to air pollution, water pollution, and the third largest environmental hazards. In the city, it has raised to the first major environmental hazards trend [53].

At present, nearly half of China’s urban regional environmental noise pollution levels in the middle 33% of the urban part of light pollution [54]. Living among a wide range of noise, and was widening, traffic noise to disturb the largest living environment, construction noise nuisance is serious. The impact of the urban environment in a variety of noise sources, industrial noise accounted for 8% to 10% [55], about 5% of construction noise, traffic noise is about 30%, or about 46 percent of social life noise.

4. Conclusion

Generally speaking, the analysis findings of this paper are in conjunction with the mainstream arguments of urbanization and urban development in China. However, the influences of urban compactness on studied environmental attributes are simply for being much less significant as had been expected. The explanation can be that general environmental quality of any city is usually a function of assorted social, economic, climatic, topographical, and institutional variables; the explanation power of density variables can be overwhelmed. Also, uncertainties with regards to multi-directional interaction of urban development variables, like urban form, population scope, density and their diversified effects on urban environmental performance bring about the complexity from the relationship.

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