The Urbanization Pattern of China in the 21st Century*

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The 21st century is referred to as a “century for cities” or “era for cities”, and China has also speeded up its process of urbanization. It is very important to choose a scientific urbanization pattern to exert the function of cities and realize our dream for China to become a powerful modernized country. It is concluded from history since 1800 that the pattern of the world urbanization has transformed from “extensive” to “intensive”. However, it is still an extensive pattern in China, and there are many problems behind the splendid achievements, reflected on the urbanization process of the country since 1949. Today, sustainable development and the knowledge economy are the themes of the cities; it is inevitable to change China’s urbanization pattern. Employing the law of inter-conversion between quality and quantity, the paper points out that the urbanization of China should concentrate not only on quality but also on quantity. High quality and multi-form urbanization pattern is an inevitable choice of China, and the development of the region can also be exalted by the radiation of the cities. But what is the real meaning of the new pattern? What is its difference from the western countries? The paper discusses its content according to the reality of China.

Keywords: urbanization pattern, multi-form, intensive, China

The 21st century is referred to as a “century for cities” or “era for cities”, and China has also speeded up its process of urbanization, which will bring massive influence to the economic development of the country and also to the world. Joseph E. Stiglize, a winner of the Nobel Prize on Economy, said that “The urbanization in China and the development of high technologies in the United States will be two major subjects with a profound effect to the development of all mankind in the 21st century” (L. Y. Wu, W. J. Wu, & T. H. Wu, 2003); Chen Shupeng, an academician, also emphasized that the urbanization, as the main rhythm of modernization, is becoming the power and source to drive the regional economy growth in China (He & Meng, 2002). During this key stage of rapid economy development and swift growth of urbanization in China, to

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determine a scientific and appropriate pattern of urbanization by borrowing the historical experience and lessons of developed countries will be of great and far-reaching historical significance and realistic importance to sustaining rapid and healthy development of cities in the whole country and to realizing the goal of building a well-off society in an all-round way.

Evolution Law of Urbanization Patterns in Developed Countries

The so-called urbanization pattern consists of the essential characteristics, main route, main direction, and driving mechanism of urbanization defined from the overall and long-term strategic point of view. As with the pattern of economic development, the urbanization pattern varies in different regions and during different periods. Selection of the urbanization pattern in the new century cannot be made without a global view. An overview of the law of overall development of urbanization in developed countries shows that the urbanization pattern is rapidly changing from extensive to intensive type.

The Driving Mechanism for Urbanization Is Changing From Industrial Economy to Intelligent Economy and Tertiary Industry

It is unquestionable that in either developed countries in the West or developing countries, the neoteric urbanization was basically the migration of rural population to cities as driven by industrialization. The industrial revolution taking place in the mid 18th century, especially the invention of steam engine gave birth to the first group of industrial cities, starting a totally new period in the history of city development. After that, every major technological breakthrough by mankind resulted in new industrial sectors, pushing ahead the development of cities. During the entire middle period of industrialization in developed countries, the correlation coefficient between industrialization and urbanization remained high, both being almost two parallel rising curves. This coefficient was 0.985 in the UK during 1841-1931, 0.970 in France during 1866-1946, 0.967 in Sweden during 1870-1940, and 0.997 in all developed countries. However, during the recent half a century, with the rising of intelligent economy of the network information society, and the development of the city hub economy, the extensive application of high technology represented by the information technology has become an important motivational force in the development of cities (Xu, 2003). As a result, cities have changed from product manufacturing centers to service centers, information centers, business and commercial centers, becoming the “brain” for the development of regional economy.

The Expansion Pattern of Cities Have Changed From Extension Type to Intension Type

With the gathering of population in cities, expansion of cities space would become an inevitable choice. In the early period of city development, the expansion of city space was a simple spreading pattern. With the occurrence of many problems in cities, the expansion pattern of cities changed greatly, from the extension type with low efficiency to the intension type with higher quality and efficiency. Firstly, the orderless development was replaced by planning, control and the macroscopic control of government in city development was increased. Secondly, the spreading and widening was replaced by tapping internal potentials, sustainable development and smart growth has been advocated. In extra large cities, the favorable circulation of city aggregation (concentration)—inverted urbanization (organic evacuation)—re-urbanization (concentration again) has appeared, and satellite cities with relatively complete functions have been built. Thirdly, two-dimensional development (see Figure 1a) has given way to four-dimensional development (see Figure 1b), from pure planar construction (two-dimension) to stereo expansion, with the time dimension as the emphasis, and space has been

reserved for the dynamic development of cities from the strategic point of view. More and more skyscrapers and the proposal to build urban underground expressways made by academician Qian Qihu are both examples of multi-dimensional development.

Figure 1a. Planar development pattern of neoteric cities. Figure 1b. Four dimension development pattern of modern cities.

From Production Cities to Ecological Cities

After the industrial revolution, cities were centered on and driven by the development of industrial and mining enterprises, thus becoming the main sources of regional pollution, while becoming the main carriers of industrial development. When people become daily aware of environmental protection for cities and of the sustainable development, improving the environment in cities has been included as an important subject from planning to the construction. From production to consumption, corresponding concepts have been formed in various fields, for instance, clean production and green industry during the process of industrialization, the ecological city and optimum inhabitation environment in the construction of cities, and the recycling economy and green consumption in daily production and living. Correspondingly, cities are changing from production-consumption-ecological cities. In developed countries, the speed of urbanization has been continuously lowering, while the living quality in cities is becoming improved. See Table 1.

Table 1

Growth Speed of World Urbanization From 1800 to 1998

Period	1800-1850	1850-1900	1900-1950	1950-1998
Annual average growth rate (percentage)	0.08	0.14	0.29	0.46

From Large Cities Taking the Main to Coordinated Development of Large, Medium, and Small Cities

In general, the urbanization of the world has exceeded 50% and is still in rapid growth. However, the trends and patterns of development are different in countries with different levels of development. Because of the powerful pulling up by developing countries, large cities are still increasing sharply in number. However, it is known by surveys, the urbanization process in developed countries over the past 200 years that, during the initial and early medium periods, aggregation dominated, and large cities took the lead in their development by aggregation. After the late medium period, with the enhancing radiation and driving power of large cities and the appearance of city diseases, medium and small cities prevailed, hence becoming the situation of coordinated development of large, medium, and small cities.

Retrospect of Existing City Development Pattern in China

Since the founding of New China, urbanization in China has experienced four stages: restoration development—inverted urbanization—stable development—and high speed development (see Table 2). The urbanization in China in the real sense was started only after reform and opening-up, and the urbanization pattern with Chinese characteristics was formed at the same time, i.e., the extensive development pattern with small cities and towns dominating.

Main Characteristics

Small cities and towns dominating. The Chinese government adopted the practice of “controlling large cities and developing small cities and towns” early in the 1950s. Since the reform and opening up, a number of patterns for city development have been proposed in China, all emphasizing the development of small cities and towns. In 1980, the State Construction Commission put forth the policy for city development—“controlling the scale of large cities, developing medium cities in a rational way and actively developing small cities”. In the “Law of the People’s Republic of China on City Development” promulgated in December 1989, the policy of urbanization was modified as “strictly controlling the scale of large cities, and actively developing medium and small cities”. During the 8th Five-Year Plan period, the number of large and extra large cities increased from 59 to 75, by only 27%, while that of medium cities increased from 117 to 192, by 64% and that of small cities from 291 to 373, by 28%. Small towns have increased at high speed, from 2,173 in 1978 to 19,881 in 2012, by 814.9%.

Characterized by administrative regulation and control. From the early 1950s to the 1980s, the speed and scale of urbanization in China were strictly planned and controlled by the government. The total urban population was a main target of plan control, and the household registration system became a serious obstacle to the development of cities. In the recent decade or more, the urbanization process was obviously characterized by change of systems. The urbanization was governed by the function of market as well as the direction by government, and in particular, the direction behavior of government was quite obvious in the review and approval and the restrictions to city planning (S. C. Wang, Y. Q. Wang, & Liu, 2003).

Industrialization has been the main driving force. Over a long time in China, cities have been basically defined as production centers, and especially during the 30 years after the founding of New China, people always emphasized converting consumptive cities to productive cities, which in turn came to industrial cities. During the early and medium periods of industrialization, development of industries in cities played a decisive role in pushing ahead the urbanization in China, especially the development of small cities and towns. In the meantime, the unreasonable layout of “having fire and smoke from every household” has brought serious pollution to the urban and rural environment.

Extensive development for sole speed. Because of rapid economic development and restorative and compensative growth of urban population, the urbanization development in China has gradually accelerated since the reform and opening-up (see Table 2). From 1978 to 2014, the urbanization rate of China increased from 17.9% to 54.77%, or 1.02 percentage points per year, being over 10 times that in the period from 1958 to 1978 (see Table 2). Especially from 1996 to 2014, the annual growth rate was as high as 1.41 percentage points (compared with an annual growth of 0.5 percentage point in urbanization rate during the high speed urbanization period of 1860 to 1920 in the United States). But in the meantime, the infrastructure in cities was seriously lagging behind, with large cities overloaded operating and small cities developing slowly. The

prevailing pattern of “one commercial street, one market and one thousand non-rural populations” was also lacking in attraction and gathering power.

Table 2

Comparison of Four Urbanization Phases in China

	Restorative development	Turbulent period	Steady development	Rapid development
Period	1949-1957	1957-1978	1978-1996	1996-2014
Urbanization rate (%)	10.6-15.9	15.9-17.9	17.9-29.4	29.4-54.77
Total growth in urbanization rate	5.3	2	11.5	25.37
Annual average growth (%)	0.66	0.095	0.64	1.41

Note. Source: Sorted out from “China Statistics Yearbook 2014”.

Existing Problems

The existing urbanization pattern in China has its obvious characteristics, and it has also brought relatively serious problems while promoting the urbanization process in China. The Minister of China Construction Wang Guangtao has pointed out that, since the reform and opening-up, great achievements have been obtained in the urban construction in China, but there are still some problems that should be solved step by step in the course of reform and development.

The city systems have lost balance in structure and weakened in function. Although China has been adopting the policy of developing small cities and towns continuously, large cities are being expanded dramatically as driven by benefit mechanism. Xu Kuangdi, director of China Academy of Engineering, pointed out that in recent years, a total population of about 200 million rural people has flocked into cities, mainly to large cities, and only 10% of them have flocked to medium and small cities. This movement has resulted in serious loss of balance in city system structure. Firstly, the city scale and structure are not coordinated. There are too many large cities but shorts of small cities, thus lowering the overall radiating and driving function of the city and town system as a whole (see Table 3). Secondly, the city space structure is not in balance. The space difference in the development of cities in the eastern, central, and western parts of the country is obvious and is being continuously enlarged. Thirdly, the industrial structure in cities is not reasonable. In many cities, virtual upgrading and homoorganicity of industries has occurred, unreasonable system for division of industry has been formed among large, medium, and small cities. The extra large cities, which are at the top of the city system of China, although at the equal population scale and regional space size as the top cities in developed countries, are much lower in terms of economic structure level, comprehensive strength, and efficiency indicators.

Table 3

Number of Cities of Different Sizes in China in 2013

	Grouping by population in urban area					Number of towns (for comparison)
	Super city over 2 million	Extra large city 1-2 million	Large city 500,000-1 million	Medium city 200,000-500,000	Small city below 200,000	
Number	47	86	103	52	2	19,881
Percentage (%)	16.2	29.7	35.5	17.9	0.7	—

Note. Source: National Bureau of Statistics of China. China Statistical Yearbook 2014.

The ecological environment is worsening with outstanding contradiction in resources. Due to the development of industries and high degree of population gathering, the discharge of various pollutants has increased sharply, resulting in environmental problems which are difficult to be solved, such as pollution to the atmosphere, rubbish surrounding the cities, short supply of water resources, noise, light and magnetic pollution, posing serious threats to the urban ecological environment and safety. According to statistics, 78% of the river sections flowing through cities are not suitable as potable water source, the underground water of more than 50% of cities has been polluted. More seriously, different types of pollution have been spread from cities to small cities and towns and rural villages.

City construction is out of order and the unique features of cities have gradually been lost. China has a vast land and a long history, and the splendid culture of 5,000 years has deposited in cities, the miraculous natural landscape has molded the images of cities, basically forming unique features in different cities. However, the extensive construction during the recent decade has resulted in the complete destruction of the carrier of historical civilizations, the natural landscaping no longer exists, and characteristics of national culture and regions have gradually disappeared. Moreover, the construction pattern and pace of all cities in the country, large, medium, or small, have been basically the same, with prevailing “cloned” landscaping in cities, from central business district to developing zone, from streets with buildings of European styles to large squares with lawns, from forest of tall buildings to expansion of new districts. All cities now have the same appearance, and the identifiable features of cities are missing.

The urban and rural relationship is not harmonious, with obvious two-form structures. Urban and rural areas, as the main gathering places of human beings in their lives, are complementary to and supporting each other. However, in the course of city development in China, the contradiction between urban and rural areas has been sharp at all times, with gaps between cities and countryside enlarging daily, the question of “agriculture, rural areas and farmers” is outstanding. Some experts pointed out that the advancement of cities in China was a result of exploitation of the rural areas, and in some sense, we can say that the “so advanced cities” is the cause of “so backward countryside” (National Condition Analysis and Research Group of the Chinese Academy of Sciences, 1994). According to statistics by some experts, since the reform and opening-up, large amounts of land have been occupied for expanding cities and construction of roads, airports, water conservancy facilities, and mines, especially for the construction of development zones. However, farmers and village collectives have got very little compensation in the end, and the losses to farmers in the land requisition alone are as high as 2 trillion yuan. Moreover, the unreasonable concentrated use of rural land has deprived the farmers of the last barrier in their lives—the land, but they cannot enjoy policies as urban dwellers, such as minimum income guarantee. As a result, the broad rural areas remain in poverty, and cannot provide powerful support to the healthy development of cities.

Development Pattern of Urbanization in China in the New Century

Requirements by the Times for Urbanization Pattern

Following the trends of the world and conforming to the actual conditions in China. The background, conditions, and history of urbanization in China are substantially different from those of developed countries. Therefore, selection of the urbanization pattern in China must be made on the basis of combining the actual development conditions at present and the development trend, and follow the three major trends in the world today, i.e., adapting to the requirements by the era of intelligent economy, participating in the intensive

competition for economic globalization, and accepting the concepts and actions of sustainable development (Wu et al., 2003). In the meantime, we should take positive actions to adapt ourselves to the requirements of the times for the popularization of IT and network technologies at present. Premier Li Keqiang put forward the concept of new urbanization.

Making progress in both quality and quantity, and taking quality as the main. In the 21st century, the period of high speed urbanization has come in China (Hu, 2003). History has proved that the quality of urbanization during this period is of vital importance. Urbanization is a process of quality and quantity in dialectic unification. The expansion of area and population of cities is a process of expansion of quantity, while the construction of modernized ecological cities is a process of improving quality. It can be known from summarizing the law of city development in the world that, urbanization is essentially the common demonstration of “quantity” and “quality”. Development of cities demands both speed and the associated quality. Urbanization cannot do without quality, while poor quality will lose the essential significance of urbanization (C. X. Wang, Yao, & X. S. Wang, 2004).

Conforming to laws of city development. Progress of urbanization has its own laws. On one hand, cities are the crystal of human intelligence, and the urbanization should adapt to the development level of economy and conform to the efficiency laws of economic activities. On the other hand, cities must conform to natural laws as organic parts of the nature (Yao & Hu, 2002). Mr. Zhou Ganshi, an academician of both China Academy of Sciences and China Academy of Engineering, pointed out that we should further deepen our knowledge on the laws of urbanization, raise the quality level of urbanization, and create urbanization patterns with our own characteristics.

Patterns of Urbanization in China and Their Connotation

In the new century, the urbanization pattern of multiform, intensive, and coordinated development should be adopted for the urbanization in China, based on the laws of urbanization in the world and the experience and lessons of urbanization in China during the past decades.

Multiform. China has a vast area, and in different regions, natural factors, humanistic conditions, economic levels, and infrastructures differ greatly. Therefore, the urbanization in China must follow the requirements from population density, industrialization, the development of IT technology, and service industry, the demand for land utilization efficiency and the requirements of economic globalization, and adapt to the natural conditions and the demand for economic and social development. The size of cities should adapt to the actual conditions, and large, medium, and small cities should be developed in parallel with small towns in multiform and in a coordinated manner (Wang, 2003; Zhu, 2003). The special features of each city and each area should be taken into consideration at appropriate time and in the light of local conditions. We must also exercise our inventive minds to solve matters in the urbanization in a creative way (Wu, 2002).

Intensive type. Scale economy and aggregation effect should be the fundamental features of cities (Zhu, 2003). Although the development of China has its special features, the general law of urbanization cannot be resisted. In particular, China has a large population with relatively less land, and the amount of various resources per capita is very low, therefore we have more reasons to adopt an urbanization development pattern of the resources saving type. We must bring into full play the scale efficiency of all types of cities, minimize the use of land, and obtain the maximum output with minimum input. In recent period, the economic efficiency should be taken as the main with due consideration for social and ecological efficiency. The social efficiency

should be taken as the main in the medium period while the ecological efficiency is taken as the main in the long-term development. In the meantime, we should be vigilant to various problems in the protection of water and soil resources, and in the construction of cities (Yao et al., 2003).

Coordinated development. Cities cannot develop well only by themselves. The relations of all aspects must be coordinated in the course of urbanization. First, attention should be paid to the coordination of city and town structures, to form fairly complete city systems with high growing capacity, so as to absorb the largest rural population and produce the maximum economic and social efficiency. The second is the coordination and combination between urban and rural areas. If the urban and rural relationship in the 1950s was characterized as the urban area being an excessive burden to the rural area, the situation today is just opposite, as now the rural area has become an excessive burden to cities. Only if rapid development has been achieved in the rural area can it form a huge pushing force to the urbanization. The third is the coordination of market and planning. Market should play the dominating role and planning should be in an auxiliary position.

Main Contents of Urbanization Patterns of China

At the national level, there are many patterns for urbanization. In the course of urbanization, different areas must choose the patterns which are suitable to their own in the light of local conditions.

Coordinated development of large, medium, and small cities in city scale and structure. According to the central area theory by Christaller, the regional city and town system is normally in a pyramid structure. In China, even if an absolute pyramid structure cannot be formed due to regional differences, the laws of growing and development of cities cannot be resisted. In either a pattern with small cities and towns dominating, or a pattern with a large city dominating, we should not go away from the theme of the times in the present economic development period of China to take economy as the central task and the lives of people as the fundamental starting point. As cities of different scales have their respective advantages and functions, in the scale structure of cities, large, medium, and small cities and small towns should develop in coordination, to form a complete city and town system structure. It is clearly pointed out in the report to the Sixteenth National Congress of the CPC (Communist Party of China) that: "It is essential to raise the level of urbanization gradually and persist in the coordinated development of large, medium and small cities and small towns along the path to urbanization with Chinese characteristics". Mr. Lu Yongxiang, academician of the Academic of Science of China, also made it clear and put it as "We can only take the development pattern of combining the large, medium and small cities first"¹.

Combination of centralization and scattering in city layout. China differs greatly in the east and west regions in terms of economy, social development level, natural conditions, and urbanization are all at different development stages in these regions. Therefore, we cannot follow the same development pattern for urbanization in different regions, and should pay attention to the study of development of urbanization and reasonable layout from a regional point of view. In the east region with a fairly developed economy, a good foundation has already been laid for urbanization and groups of cities of all types are rising, small cities and towns are being constructed everywhere, and extra large cities have started to play the radiating and driving function. Urbanization characterized by developing small cities and towns should be changed to that—emphasizing modernization (Hong & Chen, 2000). Therefore, we should adopt the strategy of taking the

¹ Lu, Y. X. (2003). Study on modernization has strategic and global significance. *Science and Modernization*, No. 1. (No. 904 in total).

medium and small cities as the dominant sector, making full use of the division of industries in central cities in the region, actively expanding the scale of small cities and towns, increasing the supply to cities, enhancing the city functions, and increasing the overall competition capacity of the region with the development of the hinterland. And at the same time, improving the quality of central cities. In the West, as the natural ecological volume is low, the pattern with large cities dominating should be adopted, to increase the population bearing capacity of land with the scale economic efficiency of large cities.

Combination of single-center spreading pattern with dual/multi-center development in the space expansion of cities and towns. There are different patterns for expansion of cities due to different natural and geographic conditions. Mainly they include single-center spreading pattern and multi-center enclave pattern. In the future, these two patterns will coexist in harmony. In the developed provinces and municipalities in East China, industries have been developing rapidly thanks to its profound economic foundation. In most large cities, planning and construction of “dual-center”, “main-auxiliary” cities or satellite cities have started. For example, in Shenzhen, the planned structure of “one municipality with a number of cities with all stars surrounding the moon” has formed. This pattern is particularly suitable to famous historical and cultural cities. For medium and small cities in western region of China which have not reached the scale economic efficiency or where the industrial foundation is comparatively poor, the spreading structure should be further adopted with proper planning being made. For every specific city, its history and culture should be studied in depth and respected, and its feasible space development pattern should be designed according to the changing social and economic structures (Wu, 2002).

Combination of industry leading type with service leading type in the development driving force for cities. Industries are the fundamental driving force for the development of cities, and are the source of radiating power and gathering power of cities. In the change of urbanization patterns, industries in cities should take the lead to realize the conversion from extensive growth to intensive growth, to provide material guarantees for the high quality development of cities, and to give space for the industrial development in rural areas. As most cities in China are presently still in the medium stage of industrialization, to the majority of cities, industrialization should still be taken as the main economic body of the cities and the important force to promote employment while multiplying the forms of driving force for cities. Industrialization will lead to urbanization, and urbanization will inevitably push the economic society into the senior stage of modernization and informationization (Yao, Chang, & Zhu, 2001). However, to metropolitans such as Shanghai and Beijing, the service sectors with the IT industry, banking, and insurance as the main have become the largest industrial sectors and leading motive force for urbanization, and are shouldering the heavy task as the core of city groups and as world-class cities.

Shifting from pure production city to city with production, living and ecological functions in terms of city functions. Eventually, the purpose of urbanization is to raise the living quality of people. Development of production and consuming cities has met the material demand of the people, but cannot meet their demand for multiform spiritual and environmental demand in the new stage of development. To each city, the functions of the city will shift when it is shifting from a pure producing city to one with harmonious coordination of production, living, and ecology, for “everlasting development with due considerations to production, living and ecology” (Gu, 2002). As pointed by Mr. Li Xiankui, if the first stage for the construction of cities at the beginning of reform and opening up was a stage to make up the past debts and lay foundations for future development and therefore stress was laid on quantity and scale, the second stage starting in recent years should

be a comprehensive development stage with due emphasis placed on science and technology, humanistic aspects, ecology, quality, environment, and urban arts (Li, 2001). Moreover, with the rapid economic development, the overall ability of human beings to protect the environment is also in the rising trend, and the intensity of damage to the environment shows a trend of first increasing and then descending (see Figure 2). In this way, we have the internal motive mechanism and material guarantee to make the best habitation environment and build the “landscape city” (Gu, 2003).

Figure 2. Law of environment and economic development and status in China.

Conclusions

According to the world city development law and movement, the currently prevailing urbanization pattern with small cities and towns as the primary in China can no longer meet the requirements of city development in the new century. Therefore, we must take new patterns for urbanization as early as possible, to ensure the sustaining, rapid, and healthy development of cities.

In the new century, China should take the urbanization pattern of multiform, intensive, and coordinated development. While emphasizing the differential development in regions, the economic, social, and ecological efficiency of urbanization should be raised according to the actual conditions in China, and coordination between different regions, between urban and rural areas, and among cities and town systems should be guaranteed, to realize our dream of regional sustainable development (Wang & Zhou, 2002).

Selection of specific development patterns for different cities should be based on local conditions. At the national level, there should not be a unified pattern of urbanization in China. Different cities should have their suitable scale, direction of expansion, layout structure, and driving force mechanism according to their own economic ability, natural conditions, and other factors, provided they must not go against the economic and natural laws.

The key to the change of urbanization patterns lies in the government. Change of urbanization pattern is a systematic engineering project involving many aspects in a broad space and time scale, and facing many problems. Among all the seven major issues put forth by the Minister of Construction of China Wang Guangxi that should be solved in the development of cities in China, the government takes the leading position.

Therefore, the key to the change of urbanization patterns still lies in the governments at all levels, and the planning, management, and regulation and control of cities should be strengthened.

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