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Development Process and Types of China's New Towns and New
Areas. The case of the Xiongan New Area

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Abstract

In the history of urban construction in the modern world, the development and construction of the New Town has occupied an important position. In particular, since the Second World War, the pace of global urbanization process has accelerated and the population has gradually gathered in cities, and metropolitanization has also gradually become a mainstream trend in the post-war world, and the new town's function planning, spatial form, geographical distribution, and construction methods are also more and more scientific and refined.

Since the implementation of reform and opening up policy (beginning in 1978), China's economic and social development has witnessed earth-shaking changes in the past 40 years. Of course, China's urbanization movement has also been liberated from the wrong socialist planned economy, and it has developed rapidly over the past few decades. There is no doubt that all types of new towns and new areas have become the crucial carriers for supporting and bearing the population and industries. Unfortunately, due to the lack of guidance and management of a scientific, systematic urban planning system, the new town movement in China has encountered quite a number of problems in the course of trial-and-error, such as the environment pollution, the traffic jam, the urban-rural gap, the social welfare, etc.

Therefore, I take full advantage of the opportunity - the establishment of Xiongan new area in April 1, 2017, announced by the China's central government, and researched the typical characteristics of the new city in China by studying the nature of China's new town, urban layout, spatial form, development management and construction methods, planning and design, to sum up the successful experiences and problems in the planning and construction of the new town. At the end of the thesis, which aims to investigate the planning and construction of Xiongan new area, to rationally analyze and speculate the possible development patterns and development trajectories in the future.

In a word, the entire dissertation will focus on answering and solving three questions of urban development in China: (1) How have new town policy evolved in China; (2) What are the methods and influences of previous new area system on regional development and economic; (3) How the Xiongan new area could achieve sustainable and coordinated development in the future.

Key words: New Town Movement, State-Level New Area, Xiongan, construction theories, master plan, characteristics, development problems and process.

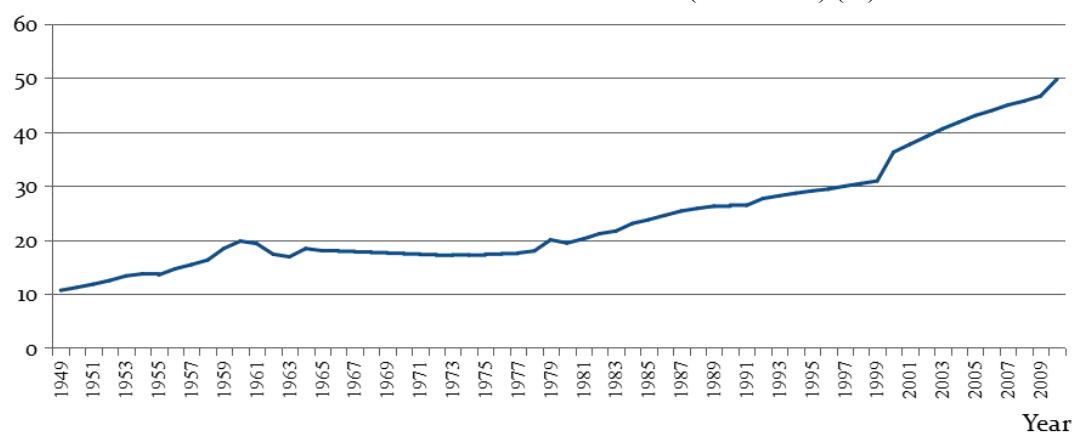
1 Introduction

1.1 Research background

1.1.1 The rapid urbanization

China has become the world's largest urban nation, with over 600 million urban citizens today, ever since China reformed and opened up to the world in 1978, there were immense changes that have taken place in structure and system framework of society, economy and space. The service industry has entered the fast development track and the economic structure is speedily adjusting. Millions of farmers left their land and switched their social division to transform into a new kind of urban dwellers.

Table 1.1 Rate of Urbanization in China (1949-2010) (%)



Source: National statistical bureau.

Based on the table, the whole Chinese modern urbanization process is divided into two phases. Before economic reform (1949-1979), the urbanization rate was below 20% in a long-term; by contrast, during the post-economic reform period (since 1980), the rate ran by small steps, and gradually up to about 50% in 2009, and eventually exceeded it in 2011. In particular, after 2000, with China's accession into WTO (World Trade Organization) and a series of further socialist institutional reforms, the general pace of urban development in China has accelerated steadily, and according to the forecast of the China's national new-type urbanization plan (2014-2020), the rate of urban permanent residents will reach 60% by 2020, which means that the urban population will continue to expand in the future, bringing not only a large amount of workers, but also the transformation and upgrading of industrial structure and urban form to provide the impetus for social changes.

1.1.2 Innovation of urban development mode in China

Actually, since 1949, China's industrialization and urbanization kept pushing forward, on the basis of the overview of China's urbanization process, it can be characterized by three main waves. Particularly, the reform and opening-up starting from 1978 has had a profound effect on the advancement, initiating factors and modes of urbanization. Since 2001, China has been involved in the growth system of global capitalism. Under the impetus of globalization, the third wave of urbanization disrupted the original urban relations, and the emergence of new towns challenged the traditional urban status to become a new social, cultural and economic activity center. As China continues to integrate with the globalizing economy, its competitiveness will increasingly be

driven by the capacities of its metropolitan regions to improve the productivity of enterprises in ever-widening supply chains (table 1.2).

Although China has achieved a huge proud success in the past decades, at the same time, the conflicts between rural and urban development deteriorates and social migration is rising, as well as resource consumption becomes severe rapidly in volume and environmental pressure continues to increase, such as the unequal social welfare in migrant rural workers, the regional imbalance development, the low efficiency of urban construction land utilization, and a series of ecological environmental pollution etc.

The inadequacies of the current system for urban growth have already been recognized by China's government, and gradually began to introduce relevant policies to explore the urban sustainable development. To some extent, the new town planning can serve as a means by which the state regulates spatial production and spatial distribution.

Therefore, the Xiongan New Area came into being as a state-level pilot for seeking the regional synergetic development and urban sustainable development in densely populated areas.

Table 1.2. The three main waves of urbanization in China

Period	Description
1950-1978: Counter-urbanization	Political 、 institutional and economic arrangements to limited the urban-rural linkage, including the delivery of urban youth to countryside to work on the farms, the institutional arrangement is the household system (Hukou -- a system of household registration in China), and the elaboration of development strategy with the priority of industrialization(especially in heavy-industry area).
1978-2002: Reform and opening-up	Urbanization based on industrialization in rural area and development of small cities and towns
Since 2003:Globalization	Transforming to urbanization based on coordinated development of towns and cities of various scale

Source: Lu Daodao, The process of urbanization and spatial expansion in China.China's urban economy: 2007 (10) :14-17

1.1.3 The establishment of Xiongan New Area

On 1 April, 2017, Chinese government eventually announced to establish a "Xiongan New Area" in Hebei province. It will span three counties, Xiongan, Rongcheng and Anxin, which are situated in the center of the triangular area formed by Beijing (about 120km), Tianjin and Baoding (both about 110km).

The creation of the XNA was “a significant historical and strategic choice” and “another new district with national implications following Shenzhen and Pudong”.

-BEIJING, April 1.2017,Xinhua new agency(editor: Meng Lijing, Xiao Xiao).

The report reveals the importance of this initiative from the macroperspective, which will undertake China's future economic, social and political reform and development. Thus, the main purpose of Xiongan is to explore a new model of optimized development in densely-populated areas, and house many non-government facilities or non-capital functions, including markets, schools, research institutions and hospitals, which would be relocated from Beijing to ease its continuously rising urban pressures and promote the coordinated development in great

Beijing-Tianjin-Hei (BTH) region.

1.2 Research motivation

The decision of the Xiongan new area, as my study area, is an occasional chance, when I was working as an intern in the CAUPD (China Academy Urban Planning & Design). Suddenly, in April 1, 2017, the China's State Council made an important choice with historical significance to build a new area in Xiongan. At that moment, this topic seems to be a public topic that continues to ferment nationwide. Therefore, I actively took part in a research programme concerning the rural aspects, and then I made a comprehensive investigation with other CAUPD's colleges on the actual situation and existing issues of Xiongan's three counties, including Xiongan, Anxin and Rongcheng. Attributing to the fruitful on-site research during the internship, as well as the relevant academic lectures, seminars and specific project plans, and the support of Prof. Marco Santangelo, we jointly push forward the further studies of this hot-point region which I first put forward within my research report about Xiongan's urban-rural relations and spatial morphology.

Another reason for the choice of the Xiongan new area is that it will play an important role as a junction to facilitate the coordinated development of the BTH urban agglomeration. Although the resources are distributed in an imbalanced manner in this region, and the economic gap between them is quite huge, as long as the Chinese central government decided to promote this thoughtful programme, just like the Shenzhen Special Economic Zone (SEZ) and Pudong new area in the past decades, it will become a star city in tomorrow, and will be full of investment opportunities and wealth.

1.3 Research questions and aims

The research background demonstrates the importance and necessity of new-type urban sustainable development in China, especially when dealing with the ever-enlarging urban-rural inequalities, social imbalance and human-environment conflicts. This thesis aims to analyze the practical application of new town theory in China and its initiative development, to investigate the different kinds and characteristics of existing urban new areas, to summarize China's experience and mistakes in the construction of the new town and new area, and to explore the possible ways of achieving integrated and sustainable development in Xiongan new area.

In general, the new towns represent a wide concept that can be broadly used to refer to all kinds of urban functional new districts, which were constructed after the Shekou Industrial Zone in Shenzhen. The new areas in China, which are a kind of new urban news, are given special economic and development support by the central government or regional government.

This general theme can be rendered through three specific research questions, namely:

(1) How have new town policy evolved in China?

This research question calls for a comprehensive understanding of new town policy and its development with China's characteristics in the past decades. The evolution of new town constructions in China is basically attributed to political, institutional and economic factors in the centrally-planned economy (1949-1977), market economy (1978-2002) and globalized economy (since 2003). A historical review of the progress of new town's growth can, therefore, provide the fundamental recognition, the basic definition and the radical functional structure of

how new town policies in China emerged and developed at different stages.

(2) What are the methods and influences of previous new area system on regional development and economic ?

Since the implementation of reform and opening-up policy nationwide was promoted by Deng Xiaoping, the resource flows and agglomeration conducted by both political and market forces exerted a great influence on regional development in China, in particular, though the demographic, economic, and environmental changes experienced by urban and rural areas. Thus, the traditional spatial urban fabric has derived a new relation on regional scale--new town and new area(in general,), based on the beneficial experiences and inevitable shortcomings in the former exploring period of new town policy, we will target a possible direction for China's new-type urban development in the upcoming new waves of urbanization.

(3) Whether the Xiongan new area could achieve sustainable and coordinated development in the future?

This research question has a basis in the research findings generated by addressing the first and second questions. Implications for Xiongan making and planning are to be derived through the historical review and analysis of influences in the study area. As a "Millennium Program", the establishment of Xiongan new area represents a great ambition of China's government to guide the urban development with functional upgrading and method transformation, and finally to realize the great rejuvenation of the Chinese nation. Therefore, in this chapter, with a huge questions of decision making, through the analysis of the existing conditions (internal and external), policy orientation and probable master plan of initial area in Xiongan, it contributes to predicting and seeking a way of achieving rational urban development for Xiongan's concrete construction in the near future.

1.4 Research methodology

My thesis indicates that China has undergone an unbelievably fast development in its domestic socio-economic construction. As a result, the prospect growth of new towns as a most vibrant part of the social progress particularly since the end of 1980s, grasped the opportunity in the globalized context to show a new-type urban model that could indeed have become an inspiration for developing cities all over the world.

The main work of the dissertation consists of three parts: firstly, I will make a detailed summary of the definition of China's new town, the historical development process, the classification and spatial distribution, the development issues and innovations from the perspective of history and criticism; secondly, I will make an in-depth study and examination of two most typically successful new town in China - Shenzhen and Pudong, aiming to approach the reasonable development path for Xiongan new area; in the last part, I will endeavor to sum up and analyze the current location, transportation, industries, population, and natural resources of Xiongan new area. And according to the official documents and related plans, I will provide some reasonable speculations and suggestions for the future development of Xiongan as well.

The purpose of this dissertation is to explore the developing possibility and prospect of Xiongan new area, built on a number of exiting successful or failed practical cases both in China or in other development countries, through the concrete reality of the basic concept, the review of historical process, the summary of frontier theory, the analysis of new town's pattern, and the means of planning and development approach.

The research methods of urban development are the starting point in selecting the factors. Nevertheless, the objective of this research is not to draw a blueprint to guide the urban construction of Xiongan new area or other Chinese new towns in the future, on the urban aesthetic, fabric, management, disciplines, etc. These factors are chosen for their unique contributions to influencing the urban development potential, and towards understanding the inner value of cities.

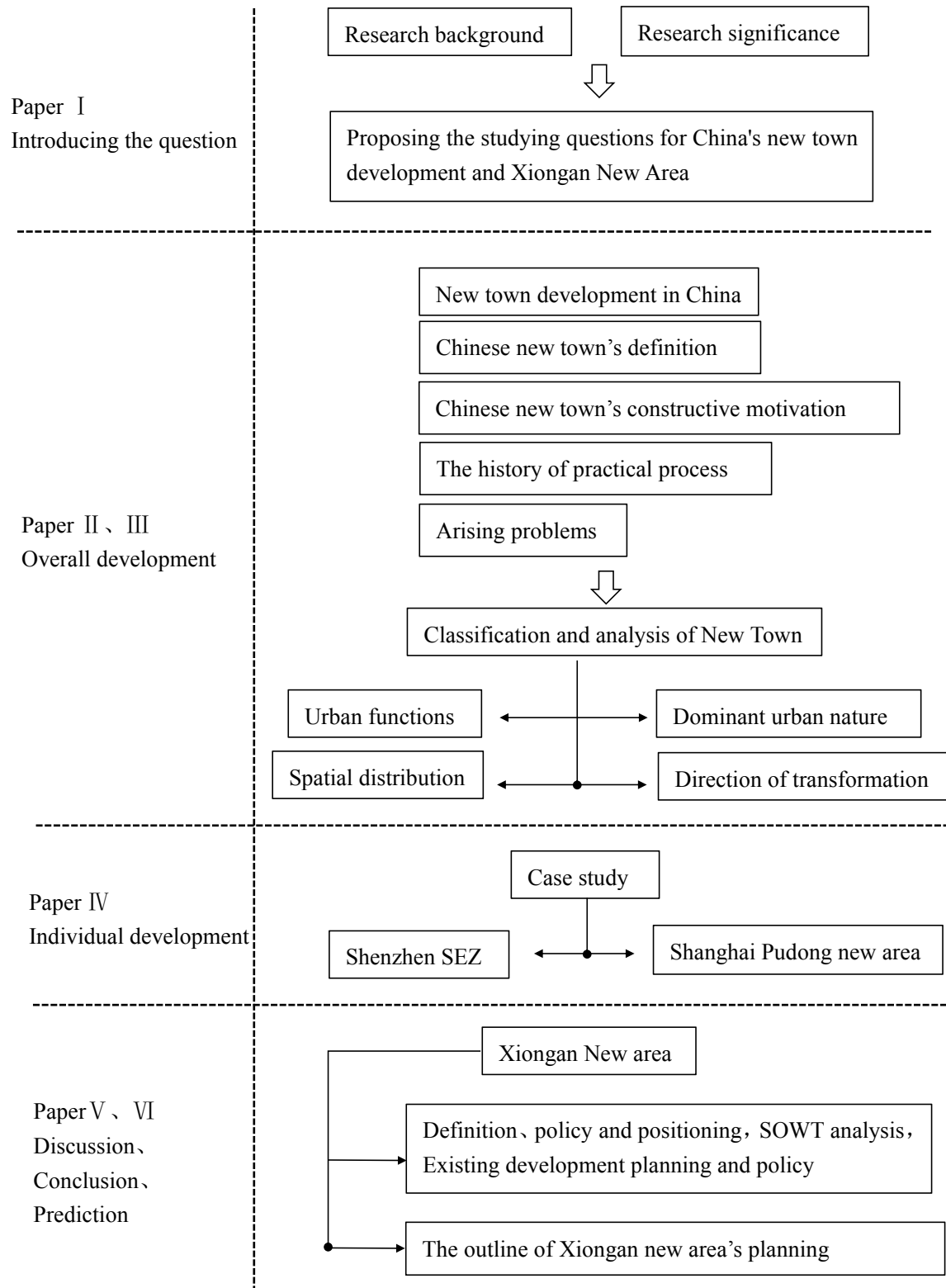
To obtain the external opinion of the Xiongan new town development in the future, I sought out scientific articles that criticize the issues of China's development pattern as being insightful and impractical, emphasizing the need of change in future planning approaches.

In addition, the literary analysis also includes a large sum of theses, statistical yearbooks and papers, which refer to the combining of macroeconomic policies, the market-oriented reforms and land system changes in China. In terms of the empirical data collection, I mainly focus on the collections and classifications of the new town construction in China, especially in coastal developed regions and inland metropolis. At the same time, I made the best of the opportunity in Beijing and Hangzhou to conduct a field investigation in Xiongan new area, Shanghai Pudong area and Nanjing Jiangbei new area, when I took the project here, which will provide the real evidences for empirical research, combining with the actual success or failure of its construction experience.

1.5 Thesis structure

This thesis is made up of the cover essay and six chapters. The cover essay integrates the research background, aim, methodology, theory, research findings, and the discussion. The structure of the thesis will be shown in Fig 1.1. The first part of the thesis includes paper I which provide the research motivation and the studying issues. The second part involves Paper II and III, which reveal the overall development of new town and new area in China, including the spatial distribution, the historical evolution process, the successful model and the influences of urban-rural relations. There is only one paper IV in the third, I select two typical new towns -- Shenzhen SEZ and Shanghai Pudong new area that have played a significant turning point in the development of China's cities to evaluate the implemented condition of new town policy from the aspects of urban scale, urban planning, urban structure, land use, transformation, regional impact and economic development. Finally, based on the fruitful conclusions gained from the previous papers, combining with strategic significance and objectives, political orientation, existing natural, environment, economic conditions (SWOT analysis) and so on. The last part consists of paper V and VI that will underline the implications for Xiongan new area's policy making, urban master plan and regional integrated planning, as well as the potential possibilities of urban accessible industries and main function in the future (Fig 1.1).

Fig.1.1 Research structure and constitution



2 Definition, motivation and development process of China's New

Town

2.1 Definition

The official definition of "New Town" in China starts from the "Outline of the 12th Five-Year Plan(2011-2015) for the National Economic and Social Development of the People's Republic of China", which is a new concept proposed in light of the actual development of Chinese cities. As a new thing in the process of rapid urbanization, China's new town movement has clearly temporal characteristics with the order of first construction, second planning and last research.

Based on the systematically review on the origins and theoretical development, evolution, of new towns in developed countries and regions, and the main modes of urbanization, and combining with the laws, characteristics and overall strategic framework of China's urbanization process, and referring to the "Research on National New City and New Area of Shanghai Jiaotong University in 2010 Report ", Chinese new towns are initially divided into broad and narrow sense of the two areas.

2.1.1 The broad sense of new town' s concept and interpretation

Broadly, it may be defined as the new urban centers established after 1979 (Shekou Industrial Zone in Shenzhen), in the original rural areas in various provinces and cities of China, with independent administrative agencies and multi-functions (such as industrial, commercial, residential, residential, cultural and recreational activities) .

In 1979, it was the time for China to establish the Shekou industrial park as the first generation of modern new town. Actually, industrialization was the core force and leading mechanism during the China's initial stage of urbanization, and as the pioneer factor of Chinese urban expansion, it is closely related to ensuing gradual evolution of diverse multi-functional new towns.

From the dominant industry point to consider the broad sense of new town, which includes not only single-functional districts, such as industrial parks, high-tech industrial zones, and university towns, but also contains some comprehensive urban areas with various functions such as residential, industrial, commercial, community service and cultural entertainments.

Although this definition is more extensive , it is consistent with the comprehensiveness and diversity of the China's economic development, revealing the laws and characteristics of China's new town movement in recent years and now. Because the construction of new area in China has gone through a tortuous path from "single function" to "integrated urban area". many new urban areas are still in the process of evolution and upgrading from the former to the latter.

In addition, a well-established administrative institution is the another basic identification and characteristic of the construction of the new towns in China. Compared with the private capital oriented development models in many developed industrialized countries, the construction activities of Chinese new town which are generally built under the government' s intervention, and are divided into districts and sub-projects for real estate market to develop it, and eventually become independent urban units.

Combined with the above analysis, Chinese new towns generally have the following basic elements in broad sense(Liu Shilin, 2016):

- 1、 Judging from the time span, it is mainly limited to the establishment of first industrial park - Shekou Industrial Zone in 1979;
- 2、 From the perspective of geographical location, it is mainly confined to the original rural areas;
- 3、 From the perspective of production and lifestyle, the primary industry was replaced by the second and tertiary industry with the new economic growth mode, and the modern urban lifestyle instead of the traditional rural lifestyle ;
- 4、 From the perspective of regional urban functions, it may include one or more economic functions, such as development zones and industrial parks, as well as other new towns with complex functions of residence, commerce and trade, leisure and tourism;
- 5、 From the management point of view, it is very important for a new town to have an independent administrative agency, and the government usually plays a crucial role in the development of new towns;
- 6、 In terms of types and scopes, it mainly includes various new areas and towns with modern urban functions.

2.1.2 The narrow sense of new town' s concept and interpretation

The narrow sense of new town refers to , since the establishment of Pudong new area in 1992, the new integrated urban centers of China with relatively independent and large autonomy in administrative, economic, social and cultural areas outside the original central urban area.

Due to the strong independence and comprehensiveness of urban functions, after more than 20 years' development, Pudong new area has become the mainstream trend of the transformation and upgrading of the new towns and a reasonable example for China's big cities to alleviate urban problems. The definition of narrow sense of new town not only reveals the developed laws and trend of new towns in our country, but also regulates the developed methods, scale, theories and mechanism to improve the quality of development.

In addition to the general characteristics of general new towns, the narrow sense of new town has the following features (Liu shilin, 2013):

- 1、 In time span, it mainly emphasizes the approval and construction of the first national urban new area in 1992--pudong new area, which is also a prelude to the construction of China's large-scale new towns, and a time period for the rapid development of China's urbanization, metropolitanization and urban agglomerations.
- 2、 Being independent from the mother city (outside the original urban center), mainly built and developed on the basis of the original rural.
- 3、 Usually, Chinese new town is generally associated with some national or provincial special policies and strategic plannings. Therefore, it has relative independence and greater development autonomy in light of administration, economy, society and culture.
- 4、 From the perspective of spatial structure, it contains one or more urban functional units, such as university town, high-tech park, industrial park, etc. The relationship with the mother city is mainly reflected in the administrative management.

2.1.3 The relationship of new town, new district and new area in China

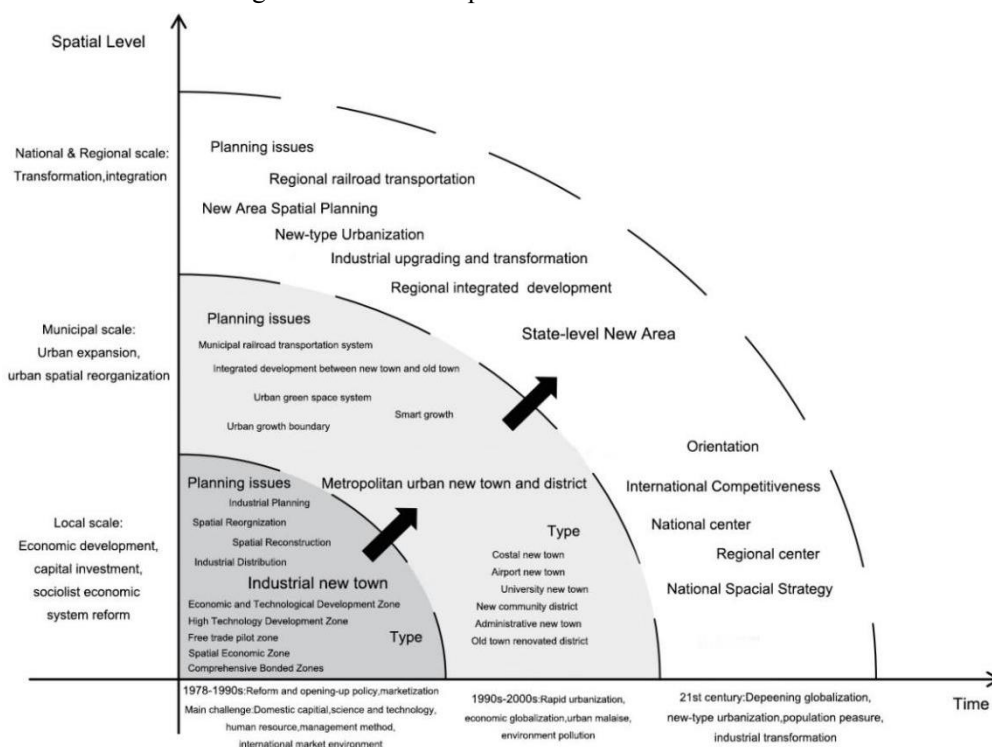
In the past 30 years, under the macro background of economic, capital, science and technology globalization, China has experienced rapid industrialization and urbanization process. The key to this process is not the rise of new towns, but the growth of existing cities, including

transformation 、 innovation and regeneration of old urban districts and development of new urban districts. Among them, the new urban districts are main carriers of urbanization in recent years. The new urban districts can be classified into different levels according to their functions in national and regional development.

Since the reform and opening-up of 1978, with the continuous evolution of a series of national strategies, China's new town shows some obvious phased characteristics at different spatial scales (regional, city, local) (Figure 1):First of all, the industrial development zones, metropolitan new districts and state-level new areas are considered as three widely accepted concepts that emerged in large-scale practice in different periods, corresponding to the three characteristics of each space development phenomenon of China respectively. These three different phases of new town not only reflect the continuity of time series, but also have the difference in the spatial scale, and gradually form a relatively completed new town development system with diverse development goals, construction patterns , etc. Secondly, for the three spatial concepts in regional , municipal and local level, in essence, they are a series of practical geographical entities with flexible boundaries and multiple perspectives , but the relationship of development process in the spatial scale is gradually progressive and evolving (Fig.2.1).

In a word, the new town can be seen as the general terms of all newly built-up areas of these three-generations in China. Furthermore, the national-level new areas are approved and planned by the State Council of China , as well as a kind of comprehensive functional area that undertakes major development and strategic tasks for reform and opening up. Compared with other new districts such as economic and technological development zones and high-tech development zones, the new areas will implement a more open, flexible and preferential special policy. (Yang Dongfeng, 2017).

Fig.2.1. The development of new town in China



Source: Yang Dongfeng, Liu Zhengying, "Exploring History and Mechanism of Chinese New Areas in Recent 30 Years". *International urban planning*, 2017(2): 26-34. ISBN: 1673-9493 (2017) 02-0026-08.

2.2 The background and motivation of construction

From the history of the theory and practice of new towns in the world, it can be seen that along with the continuous development of urbanization, the advanced forms of urbanization such as sub-urbanization and metropolitanization gradually have emerged, and naturally, the new town construction activities are reasonable choices to solve the urban development problems. And from Howard's Garden City to today's various styles of new town, all of them are evolved into a sustainable mode - "finding problems - solving problems - finding new problems" to match our needs (Huang Shengli, 2003).

However, the phenomenon of New Town Movement is not confined to urban areas. Behind any urban phenomenon or urban pattern, many are closely rooted in various factors, such as technological progress, productivity development and social needs. Due to the differences between the stages of social development and the structures of social organizations in a certain period of time, the main contradictions of socio-economic progress jointly determine the major directions for urban development, as well as for the development and construction of new towns. The dynamic factors summarized below will also be elaborated in combination with the different stages of China's social and economic characteristics.

2.2.1 Domestic economic and social development

The macro background of new towns refer to the overall economic and social development of China. Since the foundation of PRC (People's Republic of China), China has undergone three main turning points. It can be divided into three stages: 1949-1977, the early stage of social liberation; 1978-1990, the preliminary stage of reform and opening up; 1990-, the rapid development stage. In a word, the urban construction at any time is to meet the needs of social and economic development, and the new town movement embodies the people's pursuit for the new economy, new urban space and new living environment. Overall, due to the limitations of material conditions and cognitive concepts, China has experienced a course of development from "Centered on economic construction" to "Grasp both material and spiritual civilization at the same time and attach sufficient importance to both" (Deng Xiaoping, 1992). With economic development, the demand for social development has correspondingly increased, since 1990s, the comprehensive development of economy and society has become the national development goal.

In the early period of liberation, in order to rejuvenate the economy of a socialist country, the development of heavy industry will be vigorously promoted as the focus of economic construction. During the initial period of opening up, how to arrange the attracting capital and investment has become the most important economic factor for urban expansion. As the deepening of the degree of opening up, the urban hardware and software supporting service facilities in the investment area becomes more and more important. Under these circumstances, Chinese cities began to explore their own advantages and actively created investment conditions. While increasing the infrastructure construction, they have also focused on improving the urban environment as the new direction of new town construction to enforce the competitiveness and attractiveness (Wang Rong, 2006).

2.2.2 Globalization

Globalization, along with China's regional opening up and development policy, has increasingly

affected social and economic progress. In the global competitive environment shaped by globalization, a new type of suitable production space was created for activities such as production, service, work and life. And then, starting from the special economic zones, open coastal cities and state-level new areas have been established one after another.

In the 21 century, with the implementation of various national development strategies, most China's cities from east to west have formed a comprehensive development pattern and gradually deepened the integration of the global economy. With the economic globalization, influenced by postmodernism and deconstructionism, the constant reconstruction of space has strengthened its diversity and complexity, and urban space has been reshaped during this reform process. As a new productive space for human society, new town has been emerging in recent years in China. Consequently, foreign investment and international capital has also become an important participator in the construction of China's new towns, which are actively involved in urban renewal, infrastructure supply and real estate development etc (Luo Xiaolong, 2009).

2.2.3 Marketization

After 1992, due to the China's central government policy to establish "a socialist market economic system", it has brought profound changes to the relationships between the central and local governments, urban space recreation and social governance. Since then, the government is no longer the unique subject, and the power of the market mechanism can not be ignored, and the market function is playing a more and more important role in the construction of new towns in China. Market-based economic growth and urban development have diversified and specialized the urban economic structure and land-use patterns.

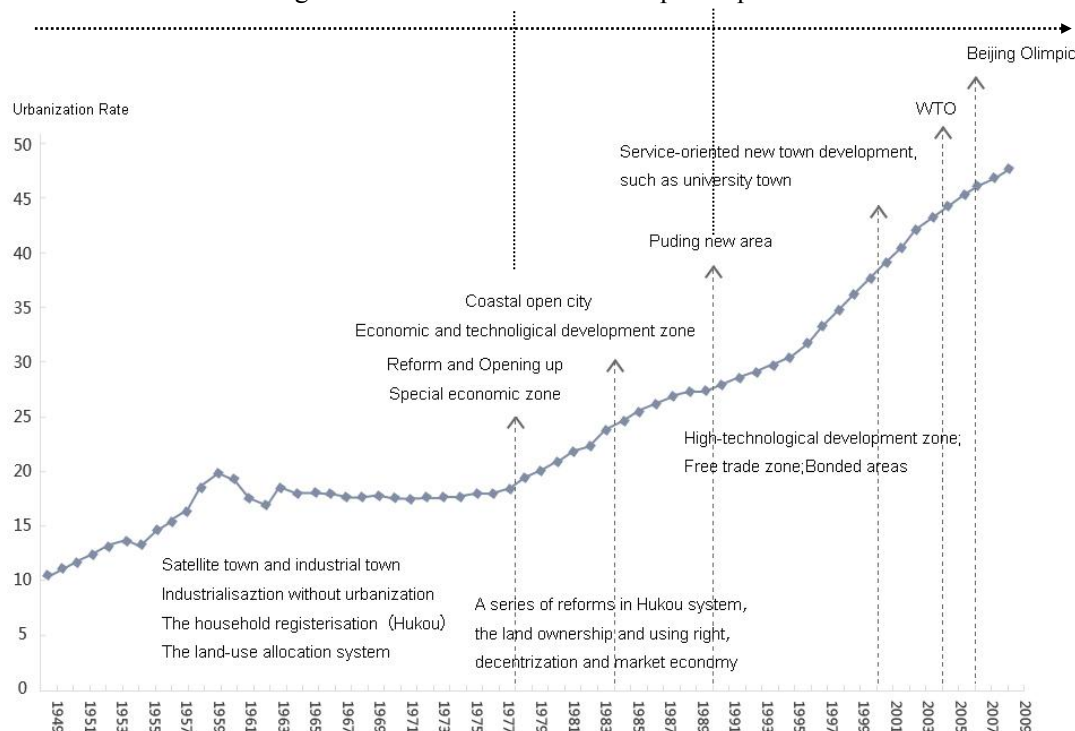
At the same time, it also expands the channels of investment for new towns development, and a large number of private capital, collective capital and international capital began to flow into the market-oriented new town construction activities that greatly enhanced the vitality of the urban economy (RLJ, 2002). Such as the successful showcase in Shenzhen Special Economic Zone, Suzhou new area and Tianjin Binhai new town (Wu Chengyue, 2014).

2.3 The historical review of new town movement in China

As mentioned above, despite the constant adjustment of the urban development strategy with the background of the times in every period, the cities can see the trace of "New Town Construction Theory" in every stage of development, no matter the production-oriented satellite towns and independent industrial towns before 1978, or the new urban areas, special economic zones, new development zones, high-tech zones etc. emerged after the 1980s.

Through a comprehensively summarized and classified on China's urbanization, with reference to the study of Chinese Academy of Sciences and Prof. Ye Jiaan, this chapter consists of stages of China's new town construction (Fig. 2.1): 1949-1978, the satellite town construction period (planned economy period); 1978-2000s, the modern new-type town initial construction stage (market economy period); and after the 2000s, the rapid expansion phase (globalization economic period). At present, China has gradually entered into a crucial transitional development and economic restructuring period regarding the construction of new towns, which is also in accordance with the overall urbanization trend in China (Table 2.2).

Fig.2.2 China's new town development process



Source: Redrawn by author based on the report of China's New Town (1979-2009), written by Wu Tinghai.

Table 2.1. Review of China's new town construction

Period	Background	Purpose	Development pattern
Before 1978	The initial construction of socialism, including economic, social and cultural reforms Urban reconstruction after sino-japanese war.	Creating a complete industrial system , especially for heavy industry.	Government-led construction with nationwide support of manpower and material resources
1978-2000	Opening up policy Exploring the way of creating socialism market economy	Drawing foreign capital and business	Government-led construction and social capital participation
2000s-	Rapid urbanization	Accelerating urbanization and providing housing and employment opportunities	Government management, diversified construction investment

Source: Lu Yinhui, Cao wenming. "Historical review of foreign new town construction". Journal of Yinshan, 2005

2.3.1 The construction of industrial satellite towns and cities before 1978

From the 1950s to the late 1970s, most of the early Chinese new town's spatial dimensions showed as the industrial-oriented satellite towns. Regarding the special domestic and international situation at the beginning of new China's founding, our country was deeply influenced by the planned economy system of the Soviet Union. The development of heavy industry and the reconstruction of industrial productive cities became the key methods to guide the urban

development and revitalization in the early days. Hence, many industrial satellite towns and new villages for workers were built in a short time. And then, China fell into a retrogressive development period, directed by the Party Central Committee's erroneous economic policies and rash advance thoughts. Due to the Chinese cities' development severely being separated from the real economic base, and pursuing the urban image projects and the fictitious prosperity of socialist cities blindly, for instance, the increased urban land-use, the rapid expansion of urban area, the misleading urban construction standard, the occupation of open space etc. Moreover, in 1965, the State Council implemented an unscientific proposal to instruct the general urban reconstruction activities, namely "the three lines". As a result, industrial construction in this period led to a large number of isolated satellite cities with low efficiency, disarrayed layout and seriously outdated service facilities, however, most of industry-oriented satellite towns formed a self-service system, which provided a couple of basic social and commercial functions, such as market, stores and small hospital.

And then, China entered the blank development period of "Great Leap Forward (1958-1960)." Under the erroneous economic policy guidance of the China's communist party, influenced by the fraudulent ideas, there has been anomalous growth in Chinese urban areas that departs from its economic foundation, for instance, the urban planning standards and scale greatly increased; the scale of urban land has expanded dramatically; a large number of industrial districts had been distributed around the city; within the city, green space, open land and even residential reserve land were used to develop heavy industry, which caused great confusion and loss to the China's economy and urban construction.

In 1965, the central government implemented the "three lines" policy to eradicate situation of chaotic economic development. Unfortunately, due to the lack of scientific theory and ineffective follow-up management, in order to response with the principle of "decentralization and concealment", all local governments were led to severely pay more attention on viewing urban projects and laying out industrial projects once again. Industrial construction in this period led to a large number of isolated satellite cities with low efficiency, disarrayed layout and serious service facilities, and the residents seriously relied on the "mother city", it is hard to be defined as new town in terms of urban functions.

Although the development of the satellite towns experienced twists and turns, as an initial type of urban construction in China, it has promoted the development of industrialization. At this stage, the Gross value of industrial output of China increased from 11.98 billion yuan in 1952 to 160.7 billion yuan in 1978, while the gross domestic product increased from less than 100 billion yuan in 1955 to 365.4 billion yuan in 1978, which laid a solid material foundation for the next step of new town construction (Fig.2.3).

Fig.2.3 China's Gross Domestic Product and the Gross value of industrial output



Source: Drew by New China national statistical yearbook 1949-2009.

2.3.2 The new town development of the embryo stage (1978-2000)

After the reform and opening up policy, China established the development policy that centered on economic construction, which became a remarkable symbol of modernization and the prologue of new town construction in this spacial period. With the opening up policy spread from the local to the whole, the foreign capitals and high-tech experts also played crucial role for economic development and urban expansion, such as the urban industrial transformation, the rural surplus labor force entering into the city, and the rising of urban population and built-up cities (Fig.2.4 & Fig.2.5).

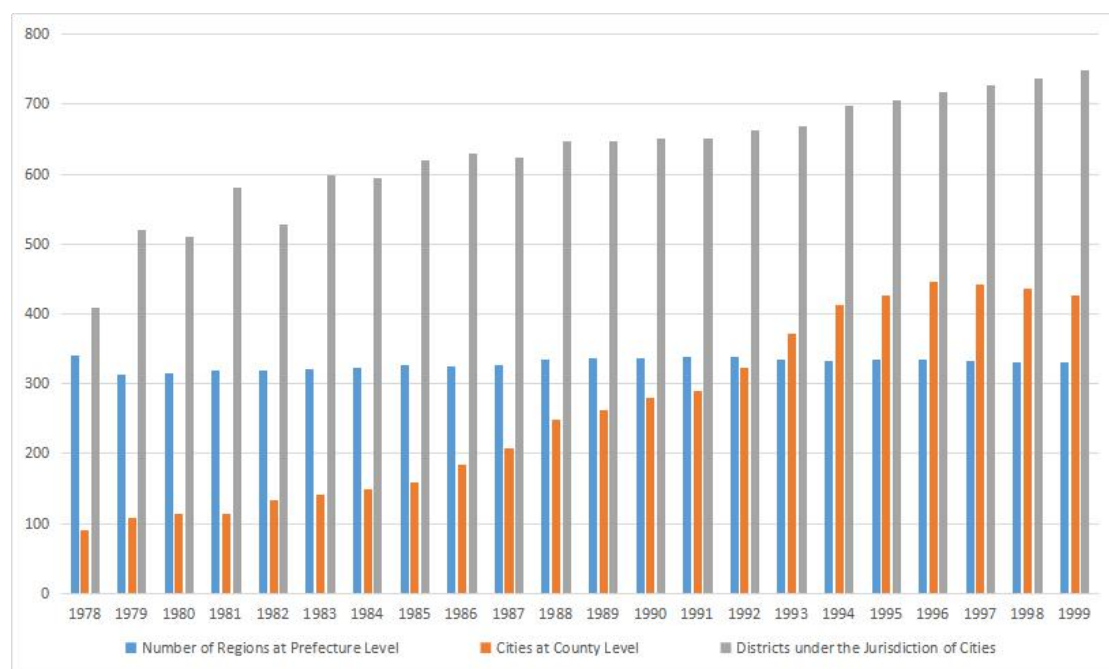
Naturally, the new town policy was adopted by all levels of Chinese government, as a means of expanding urban space and carrying out economic construction hence, the various types of economic-oriented development zones were quite popular in this stage. Firstly, China opened four special zones in 1979 and added 14 coastal port cities by 1984.

In the mid-to-late 1980s, starting from Yangtze river delta area, Pearl River delta area, and BTH region, a number of development zones with distinctive functional features were built in the coastal provinces and metropolitan areas. As of 1991, a total of 26 state-level high-tech industrial parks (development zones) and 54 state-level economic and technological development zones have been established. Such development zones are located in small and medium-sized cities and towns with advantageous geographical conditions, good economic development foundation and labor-intensive areas, and have become a type of urban spatial reorganization and expansion of regional development space. For example, Shekou Industrial Zone, as the first new zone under development and construction in Shenzhen SEZ, has rapidly grown into an outward-oriented industrialized new town through the preferential policies and flexible pragmatic development strategies given by the state, which has completed the transition from a poor fishing village to an international recognized city in south China.

After Deng Xiaoping's southern tour speech in 1992, the Chinese socialist economic construction started a new round of growth. The system of gratuitous transfer of government lands has replaced

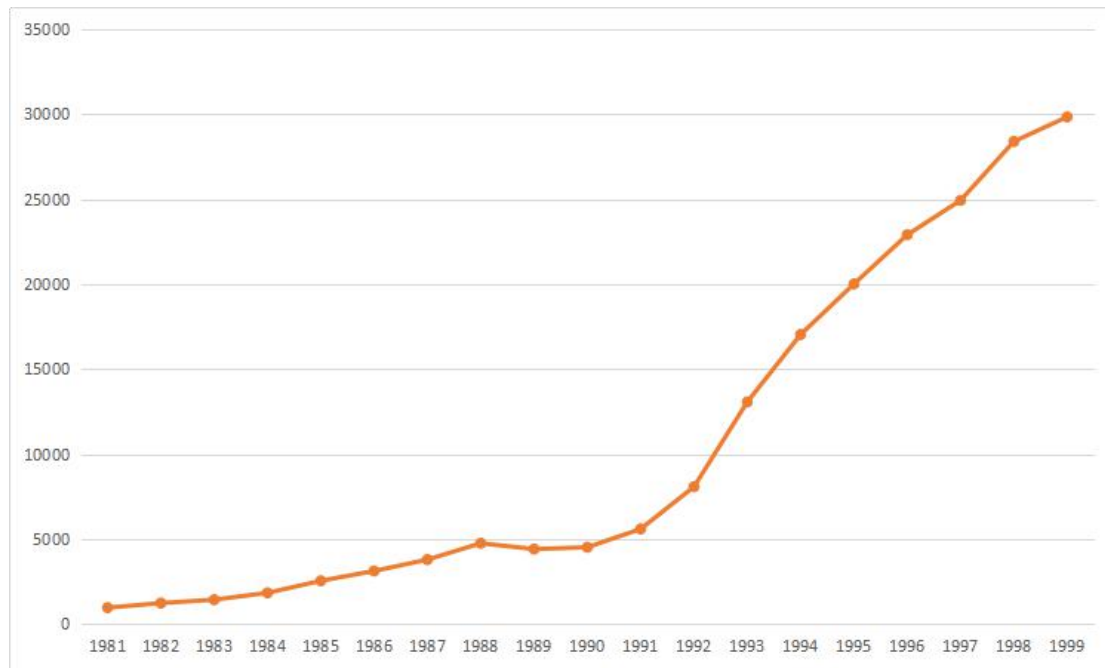
by the more market-oriented land-use system as well. In order to seek new points of economic growth, many Chinese cities have learned the beneficial experience from the coastal regions to set up economic development zones and high-tech development zones in the suburbs. Another transformation direction is Shanghai Pudong new area that was positioned in building China's new generation of export-oriented, multi-functional and modernized new area, to further accelerate the pace of reform and opening up. Since then, all over the country has modeled on Pudong New Area to establish a new urban area to connect the outside world, as well as firmly grasped the preferential policies given by the central government to formulate corresponding local development strategies. These new metropolitan areas are rapidly becoming export-oriented industrialized metropolis with new commercial functions, such as Pearl River New City in Guangzhou and Metro in the north of Jiaozhou Bay in Qingdao. Shortly, these new urban areas have grown into modern industrial, commercial, technological and innovative new towns with different features, such as Guangzhou Pearl River new town, Beijing Yizhuang new town, and so on. In the mid-to-late 1990s, with the deepening of marketization, the market mechanism and policy system were more closely integrated, investment-driven growth and "space production" took place all over the country (Zhang wei, 1993).

Fig.2.4 The increase of Chinese cities from 1978 to 1999



Source: The new China's sixty yearbook

Fig.2.5 The social completed Investment in Fixed Assets:1981-1999



Source: Redesigned by author. Compiled by the new China's sixty yearbook, elaborated by the China's National Bureau of Statistics

2.3.3 Exploration, transformation and innovation (2000-)

Since the 2000s, the rate of urbanization and the reorganization of urban space in China have been accelerated, and the changes in the geographical space of metropolitan areas were particularly remarkable, which began to come in to a transition period one-way agglomeration to centrifugal dispersion. The urban population, industry and commerce have been transferred from the inner city to the outside areas while the central urban area was expanding, resulting in the so-called. with this inevitable trend of urbanization,

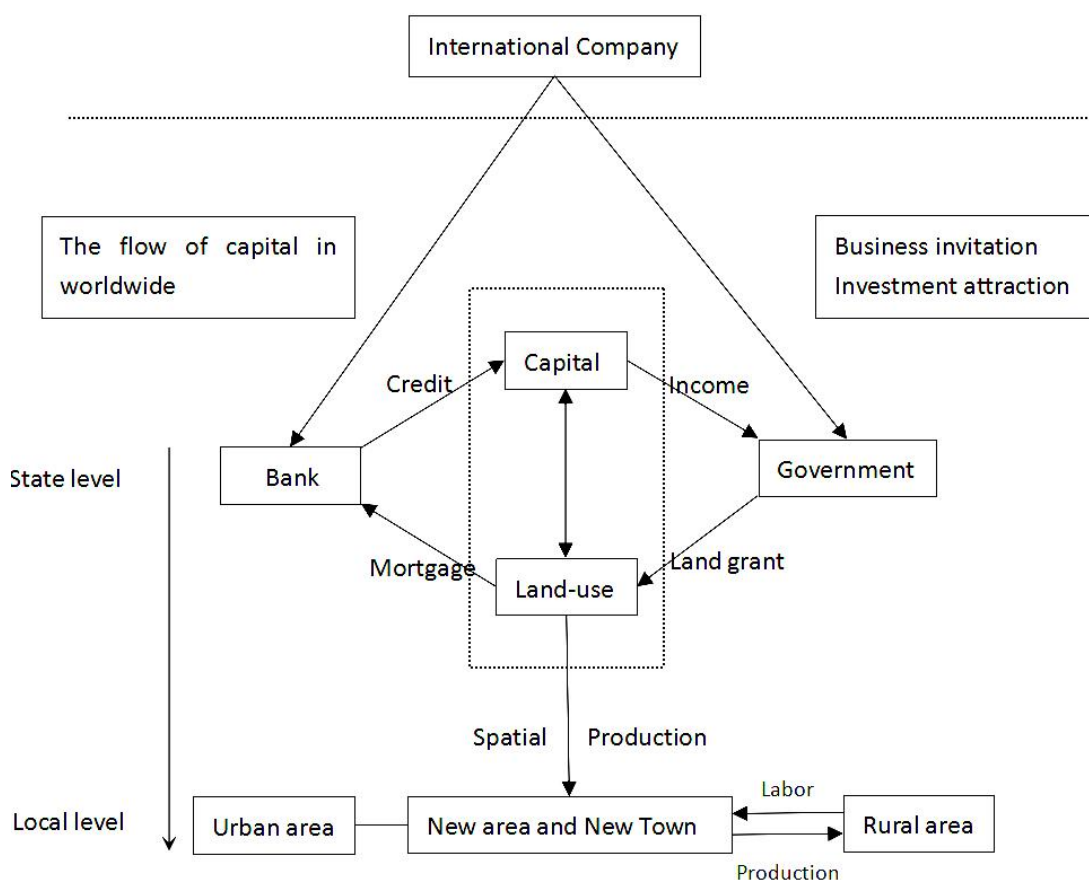
Many major Chinese cities have suffered from a series of significant adjustments and restructuring in urban functions during the process of sub-urbanization, always accompanied by with the improvement of regional transportation network, and the emergence and development of new peripheral urban expansive modes with more and more completed urban functions. The transformation of urban space has started to shift from the same spatial layer with a core-concentric circle to multi-nuclear and multi-polar geographic space, in particular, some megacities (such as Beijing, Shanghai) are evolving towards a great trans-regional metropolitan area in the future, consequently, the focus of urban construction has converted from the central urban area to the wide suburban areas, and the metropolis has realized the gradual upgrading in urban spatial structure from "one-core" to "double-core" and "multi-core", which spawned numerous new towns on its periphery. For example, in the 2004-2020 vision of the Beijing's master plan explicitly put forward to transfer over-crowded non-capital functions and population to the suburbs, it determined 12 satellite towns as the breakthroughs and sub-urban core centers in outer suburban districts, and, based on the existing development foundation to focus on 10 urban surrounding cites in inner suburbs; Shanghai proposed a four-level urban system, namely "central

urban area,new town-central town-towns",to encourage the development of new towns during the 15th Five-Year Plan.

Recently,under the background of rapid urbanization,the local governments, in order to achieve a comprehensive economic and political growth,and driven by the utilitarian psychology that quickly demonstrated their achievements during their term of office,tries to facilitate the construction of new urban areas and new towns through major public infrastructure projects and special policy support, a number of special "new town" has emerged in suburbs as a new trend.commonly known as the university town, science and education new town,airport town and high-speed railway new town,etc.

In addition to the transformation of urban structure,with the more and more flexible and market-oriented financing methods, land-use patterns and development means also jointly contributed to the continuous renovation of new town's building(Fig.2.6).On the one hand,urban management, land capitalization and entrepreneurial cities have greatly promoted the expansion of urban space. On the other hand,the subject of investment on new town's development gradually centered on capital and land ownership that broke the previous institutional extent but still under the government's leadership,a huge amount of private capital and foreign capital's refill, greatly pushing forward the development of the new areas. Of course, there have also been some social conflicts ,such as high house price,the imbalance between supply and demand,wasting of resources (Wu Tinghai,2011).

Fig.2.6 The framework of new town' s construction after 2000



Source: Wu Tinghai, Yang Baojun, "China's new town:1979-2009".*Journal of Urban and Regional Planning*,2011,No.2:19-23.

2.4 Problems of construction of new town in China

As an important spatial carrier for promoting sustainable economic development in the process of urbanization, the construction of new town has always been an important mean for the Chinese government to realize national modernization, industrialization and urbanization. Recently, the new town planning has made tremendous progress both from the aspect of theory and practice, but due to the restriction of weak urban foundation, poor infrastructure and unscientific theoretical system, etc., causing many a number of environmental, social and cultural problems.

2.4.1 High planning standard, large planning and investment scale

In some places, the local governments ignore the reality to plan and construct the new town blindly, which have resulted in the appearance of "Ghost Town". These new towns include coastal towns, airport towns, metro towns, high-speed railway towns etc. In particular, under the inspiration of new town movement from megalopolis, some small and medium-sized cities have planned tremendous "ecological" and "low-carbon" new towns to extend the urban scale. After 2000, most of new towns have adopted a higher international construction standards and frontier urban theories, such as eco-town, smart city, science and technology city and commercial town. For example, Guangzhou Nansha new Area proposed the ratio of urban green space not less than 60%, which obviously does not meet the actual needs of the city.

2.4.2 Low efficiency land-use and single development pattern

China has 26% of industrial land, with some cities even over 40% in eastern coastal area, compared with only 7% and 2.7% in developed countries. At present, more than 5,000 square kilometers of urban construction land for industrial and mining projects are in the state of inefficient utilization, accounting for 11% of the urban built-up areas in China. Hence, the confused spatial layout and low spatial utilization efficiency have become a more common phenomenon.

China's new city investment is excessively dependent on real estate investment, and with insufficient industry investment, market mechanism has not played any role in the land resource allocation of new town. From the perspective of land supply, the residential, commercial, higher education and administrative office land with single urban function could not provide stable employment to attract and gather the population, and it is difficult to continue to nurture the productive and service functions of the new towns. Secondly, because of the insufficient industrial investment and planning, which cause the construction and development of the new towns lacking intrinsic motivation and effective support, it is difficult to form a competitive industrial system in the short time.

2.4.3 Duplicated types of industries and homogenized functional orientation

Some new towns in China rely on traditional industries, while the lack of cultural and creative industries and the advanced service industries, it makes them difficult to form a high-urbanized quality of life and attract enough population to work here. Part of new towns depend on state-owned enterprise and foreign-capital enterprises, or on few large-scale sino-foreign joint ventures, but lacking of the participation of few small and micro private enterprises is not conducive to foster an environment for innovation and entrepreneurship.

In addition, due to the lack of top-level designs and regional cooperation during the process of

industrial planning and investment, local government does not have a thorough understanding of their advantages for developing characteristic new towns, the overlapping phenomenon of new town's positioning is once obvious. For example, in BTH (Jing-Jin-Ji) metropolitan area, the governments at different levels have successively developed a number of coastal new towns, including Binhai new area, Caofeidian new area and Bohai new town, all of which aim at low-end industrial and traditional manufacturing industries, especially in chemical, steel, energy, shipbuilding, oil exploitation and other environmental pollution-based industries.

2.4.4 Outdated public service and prominent social conflicts

Chinese new towns usually tend to focus on the construction of large-scale communities, traffic systems and other hardware infrastructure, while ignoring the improvement of basic living facilities and services, such as in high quality schools, hospitals, catering, entertainment and so on. And residents live in a concentrated, closed and strong introverted environment, further increasing the difficulty of migrant population to integrate into the new urbanized environment to cause security risks between different social class.

2.4.5 The unilateral emphasis on economic development has caused serious damage to the natural environment

Local governments partly pursue the economic growth to sacrifice the ecological environment when new town movement spread around the country. The following major problems exist in handling the relationship with local nature and history: firstly, the destruction of local natural and ecological landscape is too large. In some places, the large-scale relocation of mountains and reclamation, and the creation of artificial landscape, such as lake making, undermining the original natural ecological environment in the area, such as Lanzhou new area and Yan'an new area, etc, flattening dozens of hills to increase the new urban development space, resulting in serious ecological damage. Secondly, pollutant emissions from industrial parks have not been properly managed and controlled. Waste gas, water, residue and other non-compliance emissions, resulting in the surrounding environmental pollution. Thirdly, economic development is prioritized to take into account without the enough protection of local cultural, ecological and historical resources. In addition, the Chinese governments pursue the image projects while disregarding the actual demand. For instance, in order to pursue the speed and quantity of construction activities regardless of the quality of the facilities, they result in repeated construction and secondary damage to the fragile ecosystem (Fengkui, 2017).

2.4.6 The lack of top-level design and clear constructive standards

The national ministries and commissions from their own administrative authorities to promote the establishment and development of the new towns, they lack effective policies and regulations to support the follow-up management. As a result, the local governments have experienced serious deviations in understanding the policy of urbanization advocated by central government, and attempting to promote urban development through the construction of new towns. Moreover, because of the administrative barriers and the lack of regional cooperation, a large number of homogenized new cities emerged in China, especially in past 20 years, which caused a huge waste of national resources.

3 The development status and comprehensive analysis of new town and new area in China

The previous chapters analyzes the background, the law of holistic development and the historical process of new town's development, and summarizes several common problems in the current new town constructive system. This chapter will launch the research on China's new town from following aspects, including the feature, spatial structure, functional evolution and constructive mechanism, attempting to investigate the individual rules and characteristics of each type.

From the view of practical experience on new town's construction both at home and abroad, the planning and establishment of new towns are closely associated with the stage of social development and the real level of urbanization (regarded as the population concentration and proliferation). Actually, new town's construction would only succeed if it conforms to the demands of urban spatial reshaping and urban economic redevelopment.

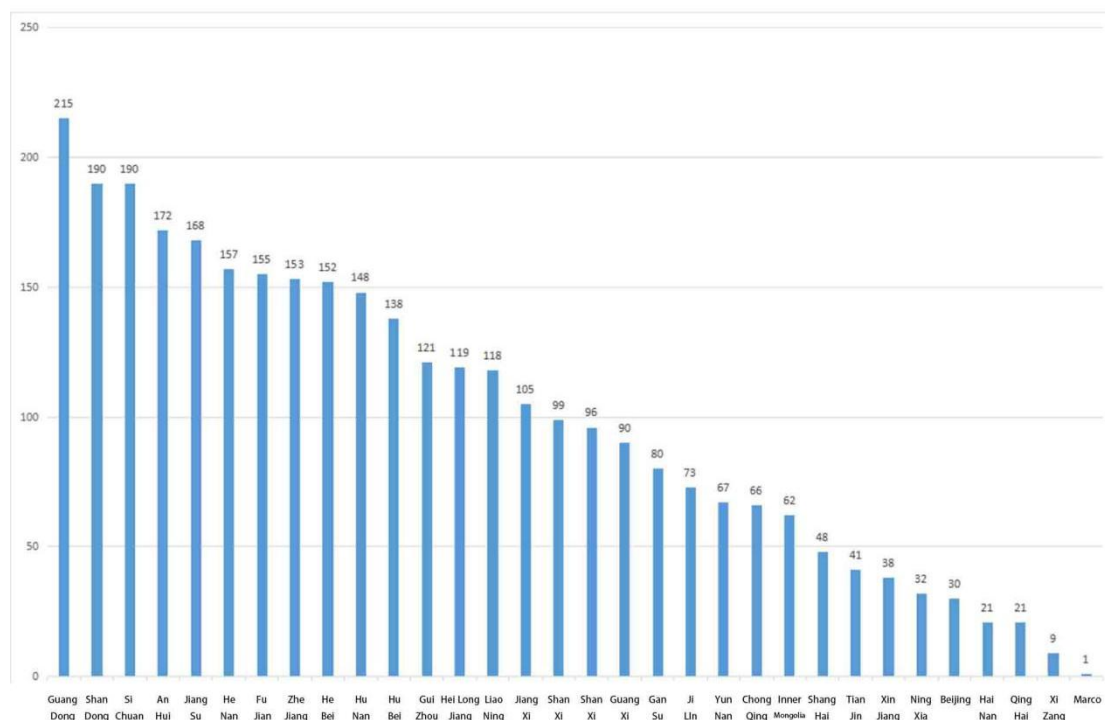
Consequently, as a reasonable choice for the spatial optimization of metropolis, the development of new towns have gradually shifted urban growth from a disorderly urban sprawl to a standardized development, which went through the transformation and upgrading of urban economic structure, functional adjustment and the further expansion of urban space. In the end, gradually breaking out the developing limitation of "mother city" and solving a series of urban diseases, and ultimately achieving the sustainable development for entire metropolitan area.

3.1 The overview of new town's development

China's new town and area, an important support for industrialization and urbanization, has established a huge relatively complete system. As of May 2016, the total number of new towns at the county level and above has exceeded 3,500, and, of which there are 19 state-level new areas (including Xiongan new area) and about 500 state-level Economic and Technological Development Zone (ETDZ), High Technology Development Zone (HIDZ), Comprehensive Bonded Zones, Border Economic Cooperation Zones and Export Processing Zones, etc. There are also over 1,600 provincial-level industrial parks; more than 1,000 large-scale municipal industrial parks; and tens of thousands of various industrial-oriented parks and districts under the county level.

As an engine for promoting national economic development and regional coordinated development, the state-level new areas, diverse ETDZs and HIDZs have gradually become the mainstreams of urban development, as well as play a key role in promoting the innovation of national socialist economic structure. In addition, from the viewpoint of spatial distribution, they are consistent with the main form of China's contemporary urbanization. According to Fig 3.1, the number of new town above municipal level in the provinces of eastern, central, western and northeastern China is 1173, 819, 872 and 310 respectively. Among them, about 50% of new towns were concentrated in seven major urban agglomerations, such as the Yangtze River Delta, the Pearl River Delta, the Beijing-Tianjin-Hebei Region, the Chengdu-Chongqing Region, the Central Plains, the Wuhan-Changsha-Nanchang region and the Harbin-Changchun-Shenyang region (Fengkui, 2017).

Fig.3.1 Quantity statistics of new towns and new area in 32 provinces and province-level municipalities (Taiwan is not included)



Source:1、The official website of Ministry of Commerce of the People's Republic of China:

<http://www.mofcom.gov.cn/xglj/kaifaq.shtml>.

2、The official website of China's Economic Development Zones:<http://www.cadz.org.cn/>.

3.2 The classification and analysis of new town

Since the foundation of PRC, the new town construction system has undergone a major innovation from the stage of small-sized satellite town and industrial residential town as the main types, to various industrial parks as a mainstream after the reform and opening up. With the explosive economic development and the gradual ascending urbanization rate, after the 21st century, the characteristics of China's new town are more abundant.

In the following, I will try to synthesize the research and studying with various countries' scholars from the perspective of new town's attributes, functions, and the role in the coordination of regional economic development played by its spatial distribution, based on the historical development stage, this paper will analyze the existing types of new town in China deeply.

3.2.1 Classification by constructive property

From the functional independence to investigate the property of the new town, which can be divided into two types:

3.2.1.1 Specialized semi-independent and semi-service new town

The industrial new cities and satellite towns at the beginning period of China, and the varied modern new towns established since the 1978 (such as the university new town、ETDZs and HIDZs of initial phase、airport new towns), all belong to the terms of semi-independent new town, which are defined as specialized economic districts or urban agglomerations with relatively

single economic、institutional innovation growth or policy supporting. The reason why it is called "semi-independence" is that it focuses on the demand for space for economic development, and gradually expands urban scale based on one or several leading and comparative industries without establishing relatively perfect political and cultural systems, as well as the social service facilities, therefore, some or all of these demands depend on the ‘mother city’ closely.

However, with the gradual soundness of urban functions and the diversification of economic categories, these new towns are moving toward a completely independent new town with self-sufficient and self-service urban functions, for example Suzhou new district, Wuxi new district.

3.2.1.2 Multi-functional independent new town

New town’s functions include a number of functions in terms of economy, society, culture and so on, not only being as sleeping city with residential function or a container transferring the over-concentrated population and urban industries from metropolis, but also a great opportunity to complete the upgrading of original backward industrial system and the restructure of urban unsustainable spatial organization with regional urban-rural integrated development, and eventually to realize the unity of urban organic evacuation and regional urban functional reconstruction.

At present, in order to avoid the problem of semi-independence new towns troubled by many obstacles existing in urban productive function and living function with sound service facilities, this kind of multi-functional new towns with diversified economic and social functions and strong self-reliance, approaching to the balance of working and living, is gradually becoming the mainstream of the construction, transformation and upgrading a new generation of new town. For instance, the urban new area (Shanghai Pudong)、new urban sub-center (Beijing Tongzhou) and SEZ (Shenzhen).

As mentioned above, while the urban functions are being improved, the comprehensive new towns gradually break the shackles of the original administrative boundaries in terms of the simultaneous promotion of administrative level and management authority (Hao Shouyi, 2016), and gradually differentiated themselves within the new generation of a single function or semi-independent new towns (Table 3.1).

Table 3.1 The comparison of semi-independent and Multi-functional independent new town

		Specialized semi-independent new town	Multi-functional independent new town
Difference	Spatial scope	Basically, not breaking the original administrative boundaries, located at the urban area or suburban area with a smaller scale	Basically, breaking out the original administrative boundaries, and the panning area has expanded
	Function	Focusing on the economic and institutional innovation growth within the single area	Involving a wide range of functions
	Institutional advantage	External supply	Internal institutional innovation
Connection	Institution	Both implementing specialized economic policies, political decision and management methods	
	Space	Transformation、differentiation and integration	

Source : Hao Shouyi,Cao Qingfeng."Study on Chinese state-level new area".*Guizhou Social Sciences* , 2016(2):26-33.

3.2.2 Classification by functions and industries

Through the summary of the above new towns, the study finds that the development of new town is not only confined to the construction of material space, but also includes the planning of social and economic strategy development, especially to the guidance of industrial development.

What's more, the development of new town has a great connection with the main urban central area in terms of spatial relations, functional orientation and regional territorial patterns.

Therefore, the classification of new town in the section is mainly considered on the areas of the types of main industries, service objects, formation mechanism, dominant function and future development trend, and it can be divided into four types, roughly: the special economic zone, the industrial new town, the new urban area, and the new urban built-up area or large-scale construction projects supporting new town (Wu dengyue, 2014).

① Special economic zone. SEZs are located within China's national borders, and it is an area in which business and trade laws are different from rest areas of the country to encourage businesses to set up in the zone, financial policies are introduced (Chee Kian Leong, 2007).

② Industrial town. In general, these kinds of industry-oriented towns are based on the EIDZs, HIDZs, industrial parks or other economic development zones with several characteristic pillar industries, after the transformation and upgrading of the formation, being a urban unit with certain urban functions and operating as a relatively independent new town, which is the product of the development of urbanization to advanced stage.

③ Urban new area. In general, the concrete construction and development projects are guided by the governments to undertake the transfer of industries and population from central urban area, as well as a new regional nuclear where the urban comprehensive economic activities with financial, trade, communication, and business office are highly centralized and completed service facilities are attached. As for the urban layout, more will be considered how to boost the regional integrated development through the construction of a new district, becoming a new regional growth pole with strong economic radiation effect and changing the development trend of the whole region.

④ Defined as a new construction district and urban renewal district formed by the regionalization of urban development, or relying on the social, cultural and natural resource to build certain construction projects, and gradually developed a new urban space with urban functions and natures, such as subsidiary administrative center new town, TOD (Transit-orientated development) new town, university new town and tourist resort new town.

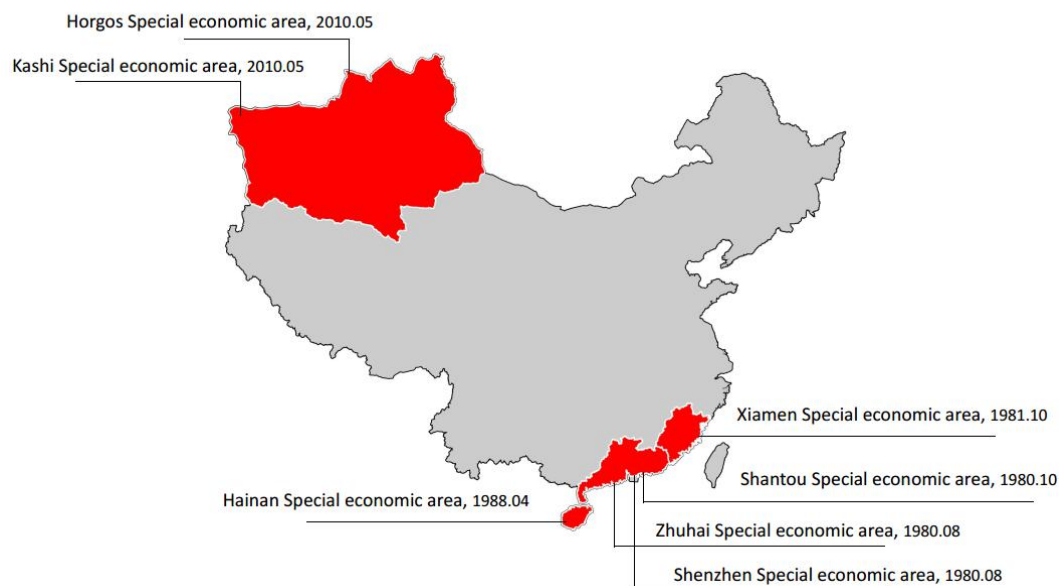
The above four types basically cover the main constructive type of new town in our country, as well as represent the potential evolved in direction in the near future. However, as a kind of common phenomenon in the process of rapid urbanization, there are many unpredictable possibilities and mobilities on new town's development as well, which needs further long-term research.

3.2.2.1、Special Economic Zone

At the beginning of reform and opening up, in order to explore the development of a socialist market economy, SEZ, as a pilot to break through the development dilemma, given special (more free market-oriented) economic policies and flexible governmental measures to attract

foreign investment and technology without the authorization of the Chinese central government in Beijing. Since 1980, China has established special economic zones in Shenzhen, Zhuhai and Shantou in Guangdong Province and Xiamen in Fujian Province, and designated the entire province of Hainan as a special economic zone. After that, the Chinese central government seeks to capitalize on international trade and border-trade between the independent states of former Soviet Central Asia and Russia, in May 2010 and June 2014, the PRC designated the city of Kashgar and Horgos in Xinjiang as a border SEZ in north-west China (Fig.3.2). In some sense, the details of SEZ can be divided into Export Processing Zones, Free Zones, Free Ports, Free Trade Zones, Residential area, Industrial Estates and Industrial Estates.

Fig.3.2 Special Economic Zone



Source: The official website of China's Economic Development Zones: <http://www.cadz.org.cn/>.

3.2.2.2 Industrial new town

At present, a large number of ETDZs、HTDZs in China has transformed into industrial new towns or are facing urban functions restructuring, but academicians has not yet put forward a unified definition for it.

The industrial new town is described in this paper as a form of urban organization, which is a new urban spatial morphology combining industrial development and urban development. It usually consists of industrial parks, ETDZs, HTDZs and other industry-oriented development districts.

As a result of the Chinese government's national strategy of promoting reform, opening up and economic restructuring, all kinds of industrial new towns are in a leading position for promoting the urban economic development. It is also the product of diverse development zones reaching a certain senior stage, and has also become an active pursuit target and strategic choice for many of these (SiSi Liang, 2011).

Since 1978, Deng Xiaoping's reform policies opening China and signalling a shift towards further integrated economies with internal and external capital, China has gradually formed a pattern of opening up from spacial economic zones to coastal cities, and continuing to infiltrate to

the mid-west inland cities with gradient. Hence, the diverse types of industrial zones has become a frontier to contain the national objectives of guiding the economic institutional reform, attracting the capital and re-organizing the industrial production. After the first national ETDZ set up in Shenzhen SEZ, five kinds of development zones with different administrative levels appeared, including national, provincial, municipal and local level. These kinds, each with a varied mission, developed sequentially and are currently consistent with different phases of economic development. They are: the economic technology development zone, the HIDZ, the tax-protected zone, the export-processing zone, and the border economic-cooperation zone (Table.3.2).

Table.3.2 Five Development Zones in China

Name	Feature
Economic Technology Development Zone	Attracting economic domestic and global capital through preferential policies, focusing on traditional industries, especially manufacture and processing
High-Technology Industrial Zone	Shifting from labor-intensive industry to high-added and initiative industry
Tax-Protected Zone	Under custom supervision and tax protection policy, focus on logistics
Export-Processing Zone	Favorable taxation policies to attract foreign investors in ports or airports.
Border Economic-Cooperation Zone	Specific border areas to develop transnational trade

Source: Sisi Liang, "Physical Planning Strategies of National High Technology Industrial Development Zones in China", 2011:17-21.

Fig.3.3 The China state-level ETDZs

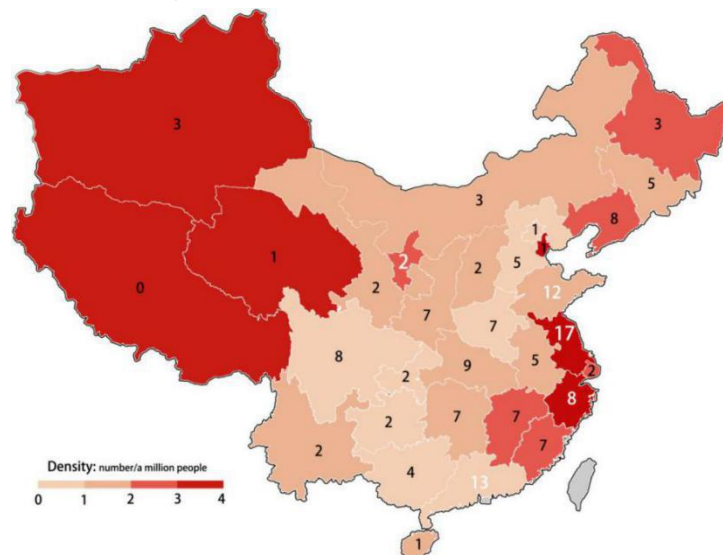


Fig.3.4 The China state-level HIDZs

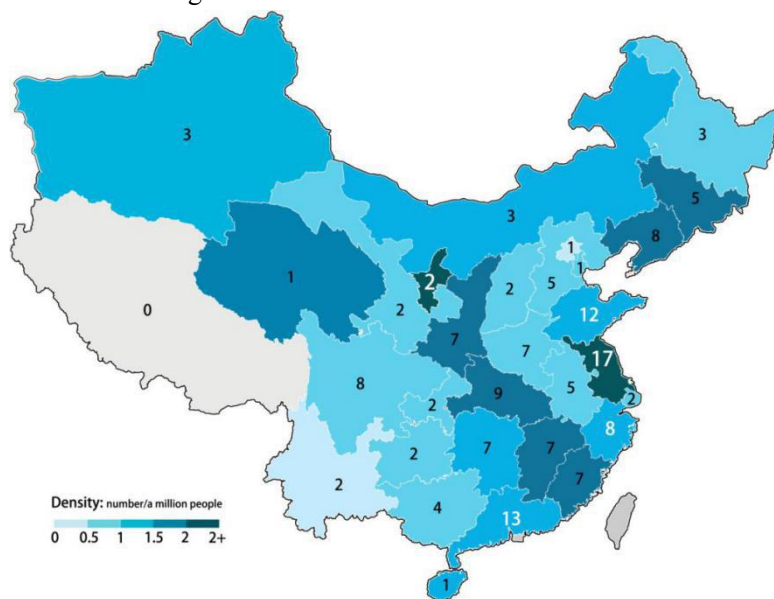
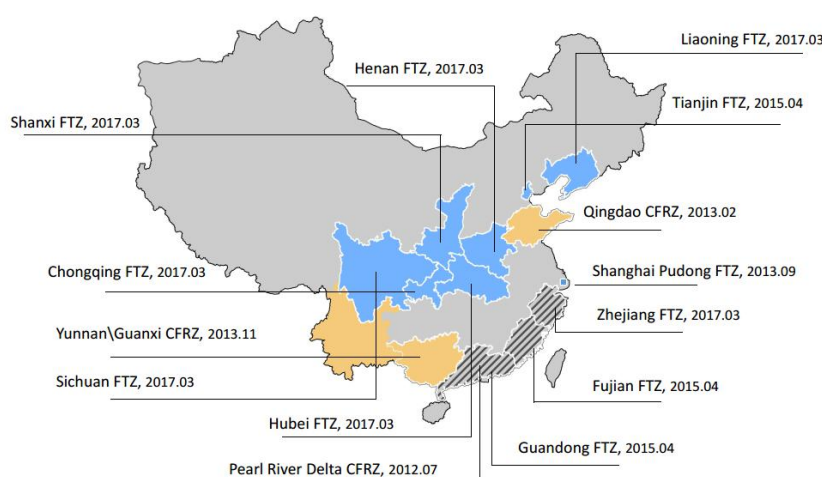


Fig.3.5 The China's state-level Free trade pilot zone (FTZ) and CFRZ (Comprehensive financial reform pilot zone)



Source: The official website of China's Economic Development Zones: <http://www.cadz.org.cn/>.

3.2.2.3 Urban new area

As mentioned above, the urban new area as a rational solution to settle the conflicts of urban spatial development and regional imbalanced development, which is a mixing result of sub-urbanization and metropolitanization development. It is an important carrier to undertake the transfer of industries and population from central urban area, as well as the innovative platform of urban function adjustment and industrial structural upgrading. In general, urban new area is a urban integrated economic district with multiple functions, composed by industrial, commercial, financial, cultural functions and so on (Lu Dadao, 2003).

In China, the urban new area is made up of three levels: state, provincial and regional level (including municipal level and county level). Due to the huge differences between the new areas at diverse administrative layers, such as the positioning, the significance and the preferential policy,

and Xiongan new area is one of the core problems to discuss in this dissertation,therefore, this paragraph will focus on the state-level new area.

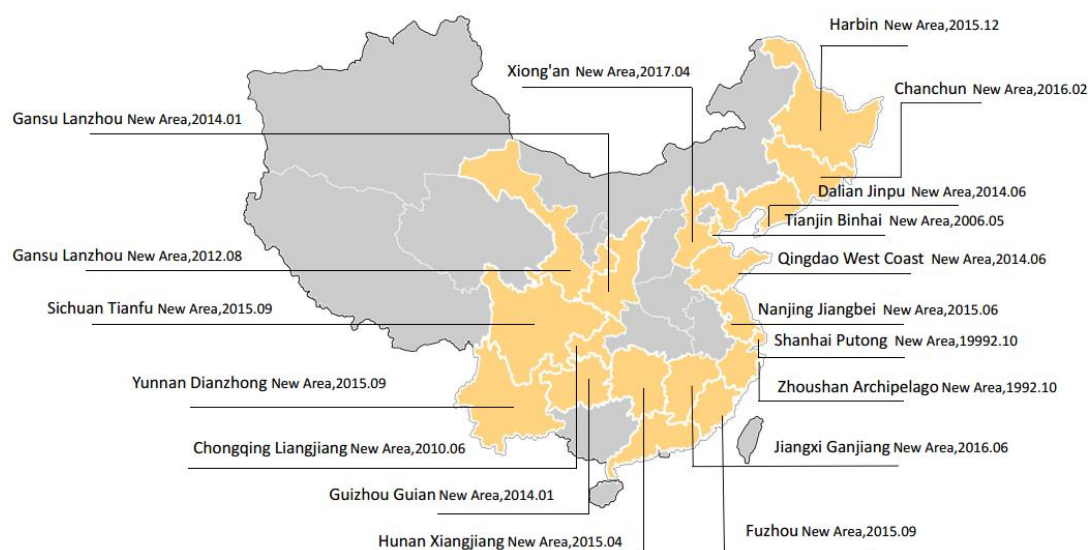
The state-level new areas,of which the development course can be said to be the epitome of the process of China's reform and opening-up. to some extent,are endowed with vital functions of the service for country strategy,coordinating regional development and the trial implementation of policy in advance.As an important carrier for reflecting the country's will, the establishment time,the political grade,the strategic nature and the regional distribution of the national-level new areas demonstrate the reform of the China's economic structure,which has moved from a “crossing the river by feeling the stones” to a deep-water area,and the regional development policies has undergone a transition from the unbalanced development to coordinated development as well. (China's National Development and Reform Commission,2015).

So far, 19 national new areas (Table.3.6) have been approved by the State Council with different development orientations planned from the perspective of national strategy.

Regarding the Fig.3.6,it is easy to see that since the reform and opening up policy,the development process of state-level new areas has experienced three phases obviously:1992-2009,2010-2013 and 2014-, which are also consistent with the gradual opening trend of China's economy from the southeast coastal regions to the inland regions .Among them, the first phase only approved the establishment of 2 state-level new areas, it had the fewest number, but the best development conditions, which had the most significant leading role for national and regional development. In the second stage, the number of state-level new area was increased for 4. In the third stage, the approved new areas had the largest number and the heaviest density.(Chendong,2016).

According to the spatial distribution, 19 state-level new areas are all distributed on the three economic gradients of China (east,middle and west),and all of them are located in the China's territorial strategic development planning axis of "two horizontal and three verticals" (China's Major functional oriented zoning , 2011). These are an important support point for China to implement the strategy of main functional area planning, new-type urbanization and regional balance development, which also plays a prominent role in terms of regional competitiveness and influence (Fanjie,2013).

Fig.3.6 The distribution of state-level new area



Source: The official website of China's Economic Development Zones:<http://www.cadz.org.cn/>.

The land area of the state-level new area is significantly larger than all types of state-level development zones, and usually contains several counties, municipal districts and other urban function districts. The largest one is Jinpu New Area, Dalian that covers an area of 2 299 km², almost the sum of the area of various national development zones. And the smallest one is Gansu Lanzhou new area that covers an area of 800 km², which is 11.43 times, 3.45 times and 72.73 times of the land area of the largest national ETDZs, HIDZs, and Comprehensive Bonded Zones respectively. The construction of state-level new areas usually relies on metropolis or some regional center cities, with complete infrastructure, social service system and sound economic base. The state-level new areas are also the overlay areas of various preferential policies, for example, there are 5 of them (or located) in the CFRZ, and 13 state-level new areas have at least one national-level ETDZ or HIDZ. In particular, Pudong, Binhai and Shenzhen have both the preferential policies of FTZ, Trade and Finance Zone, Export Processing Zone, etc (Table.3.3). Hence, there are significant differences in the development level between them, the maximum value of population and GDP are respectively 11 times and 43 times of the minimum (Chendong, 2016).

In addition, based on the Table.3.4, it is easy to find an interesting phenomenon that most of the spatial structure planning adopt the multi-center network urban layout: one urban main core and several functional districts or belts, which indicate the theory and method of China's urban planning beginning to get out of the shackles of the traditional development model with single urban center. From the view of functional orientation, the average land area of 19 state-level new area is about 1,500 square kilometers. that means its role can not be simply defined as an industrial zone or other new town with single urban functions, but should be positioned as a starting area or test area to meet the needs of future urban development with various functions, such as production, living and ecology. Therefore, the role of state-level new areas is often strategic and long-term, with the core capacity of supporting major national and regional development strategies.

Although the Chinese government made a high valuable proposition for these new areas, it is constrained by some realistic factors, such as domestic economy, productivity, science and technology. The industrial orientation has not got rid of the traditional high-consumption and high-pollution heavy industries, and there is a lack of exploration of a new-type of urbanization that emphasizes human-centered philosophy. Moreover, the different perspectives and priorities on recognizing state-level new areas and the lack of effective communication and cooperation between the Chinese central government and local governments has resulted in quite a lot of overlapping industries in these new areas that have been approved so far, such as new energy and materials industry, high-end service industry (Table.3.4).

Table.3.3 19 approved China's state-level new areas

Name	Regional location	Population /10000 People	GDP/ billion Yuan CNY	GDP per capita / CNY	Planning area / Sq.km	Planning Population/ 10000 People	Land-use scale/ Sq.km (Mian index-Urban development land)	Details
Pudong (1992)	Shanghai, Yangtze River delta area	555.0 (2016)	873.1 (2016)	157325	1,210.4			Including 39 towns and 4 economic district,namely: Lujiazui Trade and Finance Zone Zhangjiang Hi-Tech Park Waigaoqiao Free Trade Zone Jinqiao Export Processing Zone
Binhai (2006)	Tianjin, Jing-Jin-Ji metropolitan area	299.42 (2016)	665.4 (2016)	334,056	2,270 (880 sq mi)	By 2020: 300 By 2030: less than 400	By 2020: 510	Including 19 subdistricts 、 7 towns, 9 economic districts and 1 main port: Binhai HIDZ Binhai CBD Tianjin ETDZ Tianjin Free Trade Zone Dongjiang Bonded Port Area Sino-Singapore Tianjin Eco-city Tianjin Harbor Economic Area Tianjin international port
Liangjiang (2010)	Chongqing, Southwest area	240 (2016)	226.1 (2016)	94208	1,200	By 2020: 400	By 2020: 610	Spanning 3 counties , including 33 towns and 3 economic districts, namely: Chongqing two-way inch beach Bonded port Area Liangjiang ETDZ

								Chongqing HIDZ
Zhoushan Archipelago (2011)	Zhejiang province, Yangtze River delta area	115.8 (2016)	122.8 (2016)	106089	1,440 (22,200 sq mi)	By 2030: 180 (total residents) /120 (the residents of central area)	By 2030: 131.3 (central area)	Including 4 countries, and four main functional areas: Zhoushan ETDZ Zhoushan Free Trade Zone Zhoushan Bonded Port Area Zhoushan Archipelago International Port
Lanzhou (2012)	Gansu province, Northwest area	151.6 (2014)	14.28 (2016)	106204	806	By 2020: 60 By 2030: 100	By 2020: 80 By 2030: 170	Involving 2 counties and 6 towns
Nansha (2012)	Guangdong province, Pearl river delta area	68.74 (2016)	127.8 (2016)	186079	803	By 2020: 200 By 2025: Less than 300	By 2025: Less than 300	Spanning 2 counties, including 5 economic districts: Nansha ETDZ Costal low-carbon economic area Nansha Binhai eco-urban new town Spatial expansion area Nansha Free Trade Zone Nansha International Bonded Port Area
Xixian (2014)	Shanxi province, Northwest area	150.0 (2015)	43.2 (2015)	28800 (2015)	882	By 2020: 156 By 2030: 272	By 2020: 179 By 2030: 272	Spanning 2 cities, including 7 counties and 23 towns
Gui'an (2014)	Guizhou province, Southwest area	73 (2014)	240 (2016)	32877	1,795	By 2020: 90 By 2030: 200	By 2020: 94.5 By 2030: 220	Spanning 2 cities, including 4 counties and 20 towns
Qingdao West coast (2014)	Shandong province, Jiaodong metropolitan area	151.59 (2016)	287.10 (2016)	189397	2,096 (5,000 sq mi)	By 2020: 280 By 2030: 410	By 2030: 448.83	Including 1 county,22 towns ,18 urban functional areas(2 state-level and 4 provincial-level): Qingdao ETDZ Qianwan Bonded Port Area Jiaonan ETDZ Qingdao Harbor Economic Area

								West costal international tourist resort Langyatai tourist holiday resort
Jinpu (2014)	Liaoning province, Northeast area	158.0 (2013)	225.0 (2016)	145316	2,299	No data	No data	Spanning 2 counties, involving 31 towns, 4 industrial districts and 2 new towns. Dalian ETDZ Dalian Bonded port Area Puwan economic development zone Jinshitan national holiday resort
Tianfu (2014)	Sichuan province, Southwest area	325.0 (2014)	181.1 (2015)	55723 (2015)	1,578	By 2030: 580-630	By 2030: 650	Spanning 3 cities, including 7 countries and 37 towns
Xiangjiang (2015)	Hunan province, Central China area	135.65 (2016)	180.1 (2016)	132777	1200	By 2018: 149 By 2020: 160.9 By 2025: 202.6	By 2018: 140 By 2020: 152 By 2025: 190	Spanning three counties,including 3 national-level industrial parks and 2 provincial-level economic development zones,namely: Changsha High and New Tech Development Zone, Ningxiang ETDZ Wangcheng ETDZ
Jiangbei (2015)	Jiangsu province, Yangtze river delta area	170.1 (2014)	183.96 (2016)	106868	2451	By 2030: 300-350	By 2030: 350 (Rural Development area: 96)	Spanning three counties , including 22 towns , and five economic district: Nanjing ETDZ Nanjing Cross-Strait Tech-industry Park Nanjing Chemical Industrial Park Pukou ETDZ (Provincial-level) Liuhe ETDZ (Provincial-level)

Fuzhou (2015)	Fujian province Southeast area	155.5 (2014)	120.0 (2015)	77170 (2015)	1892	By 2020: 175 By 2030: 220	By 2030: 234 (Rural Development area: 54)	Spanning 4 counties, 26 towns, 7 state-level and 3 provincial level economic development zones.
Dianzhong (2015)	Yunnan province, Southwest area	60.0 (2014)	50.11 (2016)	83518	482	No data	No data	Involving 3 counties, and 1 state-level and 2 provincial level economic development zones.
Harbin (2015)	Heilongjiang province, Northeast area	70.0 (2014)	70.0 (2015)	100000 (2015)	493	By 2020: 100 By 2030: 220	By 2020: 199 By 2030: 280	Involving 3 counties.
Changchun (2016)	Jilin province, Northeast area	47.0 (2014)	103.5 (2016)	220213	499	No data	By 2020: less than 87.5	Involving 3 counties, four urban functional areas: Changchun HIDZ Beihu technological development park Changde economic development area Airport economic development area
Ganjiang (2016)	Jiangxi province, Central China area	65.0 (2015)	57.0 (2015)	87692 (2015)	465 Initial area : 100	No data	No data	Involving 4 counties.
Xiongan (2017)	Hebei province, Jing-Jin-Ji metropolitan area	104.71 (2016)	20.05 (2016)	19152	No data	No data	No data	Including 3 counties,namely Xiongxian,Anxin and Rongcheng

Source: 1、China National Development and Reform Commission: http://www.ndrc.gov.cn/zcfb/zcfbtz/201504/t20150423_689064.html.

2、Cao Yun.A comparative study of the state-level new areas in China. *Social Sciences Academic Press,2014:9-37.ISBN: 9787509763551*.

Table.3.4 Strategic Orientation and Policy Characteristics of 19 China's state-level new areas

Name	Functional orientation	Industrial orientation	Spatial distribution
Pudong	Center of international finance,international shipping center,international economic center,and international trade center	Information technology,new energy automobile,,high-end manufacturing, production,bio-medicine,finance,insurance, modern logistics,exhibition,tourism, information service,	
Binhai	Gate to the outside world in northern China,base of modern manufacturing and development transfer,north China international shipping center,and international logistics center	Electronic information,aerospace,petroleum and chemicals,equipment manufacturing,new and high technology industries	One urban central area , two sub-urban areas , one Hai river-line urban development axis, one marine economic development belt, and seven urban functional areas(Master plan 2005-2020)
Liangjiang	Urban-rural comprehensive reform experimental area of China,important inland base of modern manufacturing and service,economic center of the upper Yangtze River,financial and innovation center,important inland gateway to the outside world , demonstration window of scientific and sustainable development	Rail transport, electronic, equipment, new energy automobile, national defense industry, electronic information	One urban center,six modern urban new towns, eight industrial cluster platforms and four belts
Zhoushan	China's commodity storage and transportation center,processing and trade transit center,important marine gateway to the outside world in the east China,demonstration area of scientific protection and development of seas and islands in China,important base of modern marine industry in China,leading area of coordinate development of land and sea in China	Port and navigation logistics,shipbuilding,marine engineering equipment,marine tourism,ocean fishing industry	One central urban body: Zhoushan island(main urban center) One circle: Harbor-aviation logistics central circle Five archipelagoes with diverse industrial functions and nine city groups
Lanzhou	Important economic growth pole in northwest China,important national	Equipment manufacturing petroleum and	Ten urban functional areas (including

	industry base,important strategic platform open to the west,demonstration area of undertaking industrial transfer,ecological environment restoration	chemicals,bio-medicine,new materials,new energy,cultural innovation	four main functional area) , two eco-agricultural and forestry area , and three green corridors.
Nansha	GHM high quality living community and model of new urbanization,modern industry highland dominated by production servicing business,comprehensive service hub on the world's advanced level,innovation experimental zone of social management service,GHM demonstration of comprehensive cooperation,a regional transportation hub and a shipping logistics hub	High-end and modern service,technology intelligence industry,advanced manufacturing base for cars,ships and high-end equipment ,high-tech industries	One urban center , three urban cluster (north, west and south) , one axis and four main functional areas
Xixian	Important hub open to the west in China,new engine of west China's development,and paragon of urban-rural urbanization with Chinese characteristics	Low-carbon and energy-saving environmental protection industry advanced equipment manufacturing industry,high-tech industry, modern services,airport industry,warehousing logistics industry,ecological cultural tourism	One river: Wei river Two historical cultural belt Four urban development axes Five urban new towns
Gui'an	Inland new highland of open economy in China,experimental area of innovation development,cluster of high-end service industries,international tourist resort,leading areas of ecological civilization construction	Information industry,digital industry,special equipment manufacturing,high-end cultural longevity tourism,high-end services	One urban central function cluster , one eco-cultural protection area , one characteristic function area , six urban new towns and two industrial development district
Qingdao West coast	Leading area of Chinese marine science and technological innovation freedom,strategic support base of deep see development,innovation demonstration area of civil-military integration,leading area of marine economic international cooperation,experimental area of land and sea integration.	Marine equipment manufacturing marine transport logistics,marine cultural tourism,sea creatures,marine new materials,sea water desalination,marine new energy,blue finance	One CBD, two port, multiple industrial function districts , and two functional belt connect the entire area.
Jinpu	Strategic highland in China open to and cooperative with northeast Asia,important growth pole in leading northeast China to a	Information industry,bio-medicine,new materials,new energy,high-end equipment	Two core: Puwan urban central area

	comprehensive revitalization,leading area of transforming development mode of old industrial area,demonstration area of system and mechanism innovation and self innovation,leading area of new-type urbanization and urban-rural integration development.	manufacturing industry,petroleum and chemicals,modern services	Jinzhou urban central area And seven sub-urban functional districts
Tianfu	Focusing on the modern manufacturing,the cluster of high-service industrial,and international modern urban new area with livable and good working conditions	Electronic information,car manufacturing industry,new energy,new materials, bio-medicine,and financing industry.	
Xiangjiang	a leader in Two-Oriented (energy-saving and environmental-friendly) society construction, a high-end and quality new town ,a new engine for modern industry,and a new economic growth base for creative industries,	modern services, advanced manufacturing, ecological tourism and modern agriculture	One central urban area, three urban sub-center area , and multiple urban functional points
Jiangbei	China's important technology and science innovation center,advanced manufacturing base, a demonstration area for new-type urbanization, a cluster of modern industries in the Yangtze River Delta region and a major platform for opening-up and cooperation in the Yangtze River Economic Belt.	Intelligent manufacturing,life health industry,New materials,advanced rail transit equipment manufacturing, modern logistics,and high-tech service	One urban belt along the Yangtze River, six industrial cluster zones ,and three ecological protection corridors
Fuzhou	Exploring the path of new urbanization with livable ecological environment,leading the open development,forging an important communicative platform for forging close exchanges and cooperation with Taiwan,and a modern industry highland in the west side economic zone of Taiwan Straits	Modern logistics,finance,electronic business, service outsourcing,tourism,exhibition, high-end commerce,headquarter Economy	One core:Mawei new town Two wings : south urban development area and north urban development area Three regional expansion axes and nine city groups
Dianzhong	A strategic point of China's radiation center facing to south and southeast Asia,a new economic engine of Yunnan,a urban-rural comprehensive reform experimental area of southwest China,and a leading area of reform and institutional innovation	Bio-medicine,bordering finance,petroleum industry,electronic information,advanced equipment manufacturing industry,modern logistics	Four main functional urban areas: Urban construction area Industrial development area Historical and cultural area Ecological protection area

Harbin	A new comprehensive China-Russia cooperation area,a new economic growth pole in northeast China,a representative area of the transformation old industrial base,a cluster of characteristic international cultural tourism	Advanced equipment manufacturing ,green food industry,high technological information,bio-medicine,new materials,and modern commercial industry	One urban central area , one Songhua river-line modern industrial service belt , three city groups , two transportation junction and multiple urban plates
Changchun	A demonstration plot with an open and innovative industry system,a new and powerful engine for the economic development in northeast China,	Optical electronic information, biological medicine,new materials and energy,advanced equipment manufacturing, modern agriculture	Two ports, four commercial centers, 10 industrial zones, three economic pillars
Ganjiang River	A important pillar to promote the development of the Yangtze River economic zone and central China,a opening up highland of inland areas,an advanced manufacturing base of central China	Internet ,modern advanced service,smart manufacturing,new energy,new materials,new information technology	Two industrial corridors,one green ecological town blet,and four urban development cluster
Xiongan	A centralized and non-capital-capitalized bearer of Beijing, must be built into a high-level socialist modern city, a Beijing-Tianjin-Hebei world-class urban agglomeration, a new engine of a modern economic system, and a national model for promoting high-quality development		One main, five auxiliary and multiple urban nodes

Source:1、Cao Yun.A comparative study of the state-level new areas in China. *Social Sciences Academic Press*, 2014:140-180.ISBN: 9787509763551.

2、Xian-Xianyang Research Institute. Positioning research of China's state-level new areas.

3、Li Yunxin, Jia Donglin, Spatial and Temporal Distribution,Strategic Orientation and Policy Characteristics of National New District:A Policy Text Analysis Based on the Overall Plan of New District.*Journal of Beijing Administrative College*: 22-31.

As the frontier position of China's urban spatial growth and the type of most heterogeneous spatial development at this stage, most of the new areas have a large planning area, including multiple counties or functional areas, and have a certain industrial base and population size; from the perspective of functional positioning, the new area has assumed the role of industrial center, innovation center and technology center, and a new economic engine to promote regional development; in terms of urban planning and spatial development structure, most of new areas adhere to the people-oriented, sustainable and green development concept, and the “one core + multiple functional nodes” development model is increasingly becoming the mainstream choice for new area's planning.

3.2.2.4 Urban new built-up district

As we all known, the core driving force for urban development lies in the flow and accumulation of capital. Since 1978, with the accelerating process of modern urbanization and a steady opening-up socialist market economy, a large number of rural population and social capital have poured into the cities. Consequently, with the continuous disintegration of the household registration system and the resource quotation system, the functions of the traditional urban areas have undergone a series of fundamental changes in terms of urban development and construction; such as the emergence of large-scale commercial facilities, public infrastructures and housing projects, and some of them have integrated with the original urban area or have formed an independent urban center gradually.

In particular, many new urban districts set up by diverse levels of China's governments under the guidance of non-monocentric urban center strategy since 2000, China is in a period of rapid economic and urbanization. There is an expanding space for urban construction at all scale levels, and the pressure on the development of large and medium-sized cities is particularly intense.

After the capital and technological accumulation in the initial stage of reform and opening up, the Chinese cities enter into a new century to extend urban scale with the rapid development of urban spatial construction, especially for the large and medium-sized. In order to overcome the problems that exist in the single-center urban model commonly, in recent decades, many large cities in China have been pressured to evacuate the severely concentrated urban resources or rehabilitate the historical urban districts as a new urban center, and finally, they will be a multi-center urban network with its old town.

Therefore, the establishment of a new urban center has become a rational choice to solve the contradictions of urban spatial structures slowly. In short, as a new urban functional unit, it can be found in the urban skirts or in the old built-up districts of urban renewal and infrastructural facilities renovation, and has expanded, based on new special policy support and industrial opportunities or the original industrial innovation. Usually, in the early stage of construction, these kinds of urban district were mainly invested by local governments and operated by private capital in the latter period.

3.2.3 Classification by development and management model

Analyzing it from the management model of development, there are three main modes of TOD, SOD and AOD.

1、TOD (Transit - orientated development) model:

With the information superiority brought by the planning monopoly, the governments arrange the

related programs and projects in the planned area firstly, and try to attract the subsequent population and capital to boost the growth of whole new town through the large-scale infrastructure construction (especially the public transportation infrastructure). In addition, the government's construction funds largely come from the sale of the well-developed land, using the differential land rents to balance the shortage of construction funds. For instance, all kinds of high-speed railway new towns, airport new towns, etc.

2、SOD (Services-oriented development) model:

The governments utilize the advantages of administrative monopoly to promote the transfer of administrative, commercial, educational, cultural and other functions. With the new town's basic infrastructure and social service facilities simultaneously completed, there will further increase in the land price gap between "raw land" and "cultivated land". As a result, the governments will obtain the enough land fund for the follow-up new town's construction and management activities. At present, this kind of development model is the mainstream choice for new town's planning and development in China.

3、SOD (Anticipation-oriented or "PPP" development) model:

By pre-releasing planning information in some areas, the government guides the private capital to carry out some relevant pre-investment projects in the early stage and participate in the follow-up developing works actively, and to form a peripheral environment in line with the planned objectives as soon as possible, so that the government can realize the original intention of planning and construction with less investment at the most appropriate time. For example, Guan industrial new town.

3.3 New town's spatial position and morphological characters

3.3.1 New town's spatial distance

The spatial distance is an important factor for new town's location model. The rational layout of the new towns will avoid the constant engulfing of urban expansion from the mother city effectively, but ensure that the new town is located in the convenient commuter circle of the mother town, which will help the transfer of over-concentrated urban functions and resources to the new towns.

It is generally believed that the reasonable distance between the new town and the central city is 20-50 kilometers, which must be supported by mass transit system to link the economic and social activities between them, even the self-service or self-contained new towns also need to have a convenient contact with their mother city. Hence, at the initial stage of construction, according to the planning scale, nature and function of the new new, it is better to plan expressways, high-speed railways and other public projects with mass transit capacity nearby and implement them ahead of schedule. This will help small and medium-sized towns to give full play to their advantages and attract population and industries to settle here, and promote the new districts and towns to transform towards a comprehensive cities with multiple urban functions.

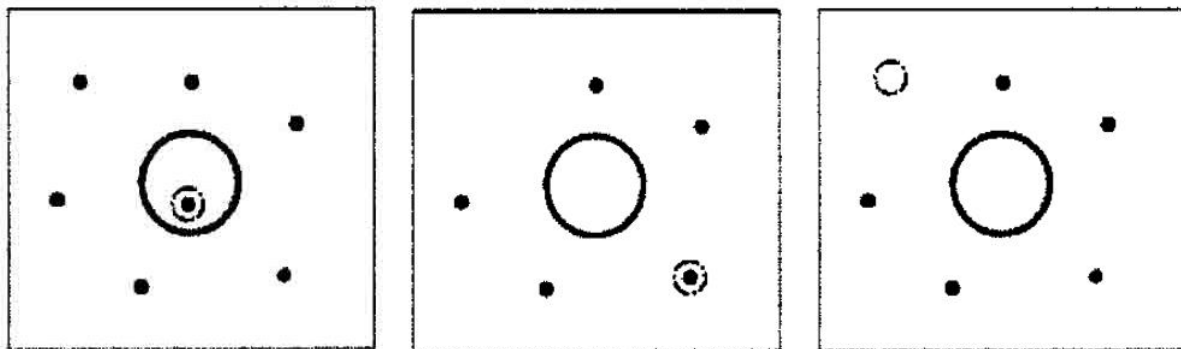
3.3.2 New town's spatial location

The overall character of the new town in the spatial position is quite leapfrogging, in other words, the large-scale investment construction will be conducted outside the existing built-up area to guide the population and industries to gather in these newly-developed districts.

Specifically, the spatial selection of new town's location can be divided into three types:

1. This kind of new towns or new districts are situated in urban areas, and mainly involved in the urban reconstruction, old city renewal and other redevelopment projects.
2. Based on some well-developed towns that are located in urban suburbs or in the same metropolitan area to carry out a series of re-planning and redevelopment programs.
3. As a new stronghold for coordinating and promoting the balanced development of urban regional economy, such new towns generally are located in urban outskirts to develop and build in the future.

Fig.3.7 The spatial distribution of Chinese new town (Arranged from left to right)



Source: Redesigned from Huxiaoming's dissertation-Exploration of Motivities and Characters of Chinese New Town(2006).

Usually, the above three kinds of new urban location are mainly determined by the following considerations: firstly, how to utilize the existing basis of infrastructure efficiently, to minimize and renovate the cost of demolition, and to protect the original urban layout and landscape; secondly, choosing a new area in the suburbs to develop what will be more conducive to the coordination of the overall urban functions and resources, but the basic investment for public infrastructure and other necessary social facilities is huge in the initial stage of construction.

In fact, from the choice of the location of the new city for our results, there are three ways. From the result of the location of China's new town, there are all three above types. In a nutshell, because the first type of new town is located in the urban central area, the development cost is high, the development scale is relatively small, and the demand for the comprehensive utilization efficiency of land is high. The second type of new towns are mainly situated in large cities, such as Shanghai's Songjiang new town, Beijing's Yizhuang new town. The main reason is that the original towns and districts are more easily affected by the economic, cultural and social radiation functions from the nearest metropolis, and they already have relatively completed infrastructure and certain functional bases. The third type of new towns appear in some rapid developing small and medium-sized cities or in some national central cities with great strategic value, which limited the weak urban development foundation or challenged natural environment. For example, the Lanzhou new area.

3.4 Conclusion - the newest trend of new town's transformation

In the past few decades, China has made a large number of great achievements in urban construction, but, as mentioned in Chapter 3, there are still many problems in the development of China's new towns, such as the unbalanced regional development, the environmental

degradation ,the urban congestion and other urgent urban issues.Of course, in recent years, the Chinese government has promulgated some guidelines that attempt to restore the normal order of urban construction activities.Combining some recent cases, it is not difficult to summarize some reasonable experience.

3.4.1 Urban spatial structure:the transformation of a single-center urban model towards a multi-centered urban network

The planning and construction of the new towns and new districts have gradually disintegrated the traditional urban spatial structure in terms of geography, and which slowly became another new urban functional unit.In general,most of the traditional urban network is a single-center city circle model,but with the speeding up up of urbanization and industrialization process, a large number of population and resources are packed into major cities.The original urban structure can not meet the needs of a highly-concentrated population.Thus, in order to expand over-crowded urban space and accommodate the overspilled population and economic activities that are still gathering in the metropolitan areas,it is necessary to create some new towns outside the original old city,which will form a new multi-center and network-based space structure.

In recent years,there are many big cities in China, such as Shanghai, Beijing, Guangzhou, Chengdu and Nanjing, have planned a number of urban sub-centers or new towns to evacuate over-centralized urban functions and populations,which greatly improved the fairness, diversity and livability of cities.For instance,the Chengdu Urban Master Plan clearly states that "the cultivate a multi-center,clustered and networking urban development pattern with one axis, two cores and six corridors".Nanjing proposed "to create an open urban development pattern with the Yangtze River as a main axis, the historical urban area as a core,and multi-center urban structures" (Fig.3.8).It can be foreseen that the new type of urban spatial framework with multi-cells and multi-clusters will become a trend for urban expansion in a long time in the future.

3.4.2 Livability, ecology, low carbon and sustainability

Although,there are a plenty of differences in China's new news in terms of scale,environment,population, industries and so on, but as a new concept,new trend and new strategy,the livable, ecological and low-carbon idea have become more and more popular and gradually accepted by China's government.

For example, Pudong New Area formulated a series of urban development programs as early as in the 1990s, combined with the urban traffic planning network to arrange a number of comprehensive urban subdivisions reasonably,which are separated by large public parks and green open spaces between them.At the same time, these district are also considered thoroughly with the socio-economic condition,urban sustainable development and coordinated urban ecological environment network.Such a forward-thinking and insightful open urban layout,has greatly optimized bearing capacity of eco-environment in Pudong new area.Tianjin Binhai New Area proposed "improving the ecological environment and building an ecological demonstration plot".In addition,the construction of new towns in regional and municipal level planning are moving closer in this direction,such as the Nanjing Longpao new town master plan (2012-2030) put forward the "ecological priority strategy";"Nanjing Banqiao new town master plan (2010-2030)" proposed "low-carbon and green priority strategy" and so on.It can be fully affirmed that the pursuit of livable, ecological and low-carbon will become the core target and development

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3.4.4 Integration of urbanization and industrialization

In some new towns, the degree of industrial clustering and population agglomeration is not high, with the imperfect public service facilities or basic infrastructure, which are the main reasons for the emergence of so-called "ghost town" and "sleeping town" in some places. In other words, the spatial structure and urban planning of cities are important, but for a city, it can not depend solely on the accumulation of population, a healthy, sustainable, dynamic driving force mechanism is the city's core value.

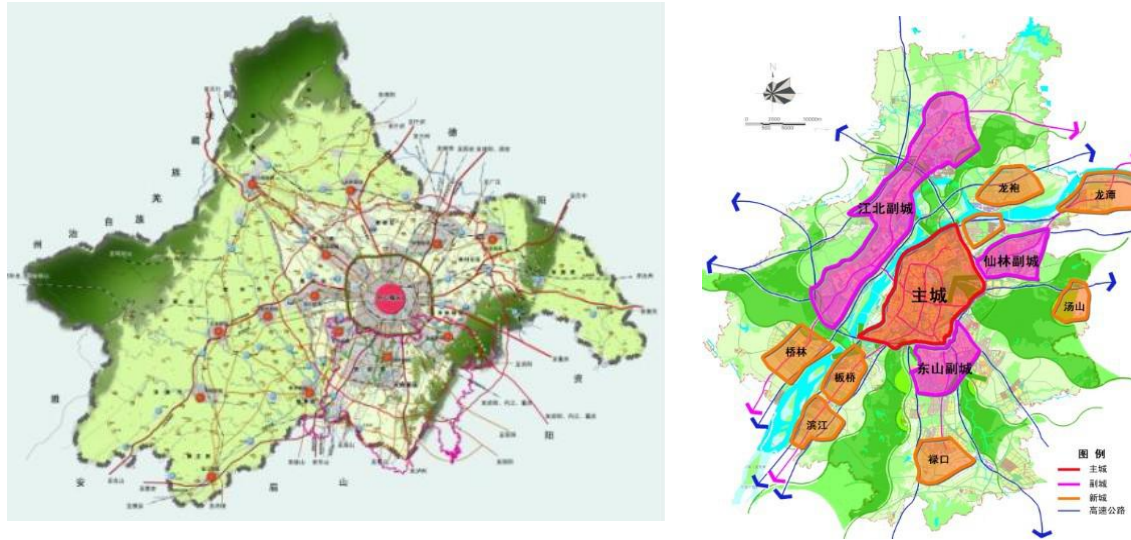
As early as in the 1990s, the Chinese central government began to take an experiment with the innovative development model of the combination of industrial and residential function in Pudong new area. At the beginning, Pudong new area established some large-scale industrial urban units based on industry-led strategies, such as the Lujiazui Financial and Trade Zone, Waigaoqiao Free Trade Zone, Jinqiao Export Processing Zone and Zhangjiang Hi-Tech Park and other famous development zones.

Since 2000, the newly planned and built new towns in China will pay more and more attention to the importance of industrial base as the economic development's core power in the future, and the industrial planning has also become an important part for the local government to develop the economy. On July 9, 2015, the National Development and Reform Commission of China promulgated the "Notice on launching the relevant work to construct the demonstrative zone with the urban Production Integration", which reveals the necessity to put forward the industrial park from a single production-oriented economy into an integrated urban economy.

In addition, by solving the mass commuting behavior caused by the separation of living and employment in metropolitan area, and creating positive conditions for solving the traffic congestion, serious environmental pollution and high housing prices, they truly realize the target of

evacuating the over-agglomerated population and resources from the old areas.

Fig.3.8 Chengdu (left) and Nanjing (right) urban spatial structure



Source: 1、Chengdu Master Plan: 2016-2030.<http://www.cdgh.gov.cn/>

2、Nanjing Master Plan: 2011-2020.<http://www.njghj.gov.cn/>.

4 Case study: Shenzhen Special Economic Zone and Pudong New Area

4.1 China's first special economic zone - Shenzhen Special Economic Zone

4.1.1 Introduction

Shenzhen is a major city and an important part of the Pearl River Delta Region, which is located in the south of Guangdong Province along the coast of the South China Sea, between Guangzhou and Hong Kong (one of the Chinese Special Administrative Regions). Shenzhen once was a small village with a population of less than 30,000, but now is a modern city with a population that exceeds 12 million in less than 40 years. Shenzhen has made significant progress that many cities would have made in several hundred years, which is a typical example of fast growing new cities.

Thanks to Mr. Deng Xiaoping, who is a chief designer and core leader to push forward the China's socio-economic reform and the "open-door policy" (Deng Xiaoping, 1978). With his efforts, in 1980, Shenzhen was designated as China's first Special Economic Zone (the other four approved SEZs are Zhuhai, Shantou, Xiamen, and Hainan) by the Chinese central government. In that chaotic period, especially after the death of Mao Zedong and just the ending of the Great Cultural Revolution, how to reconstruct the Chinese democratic political order and revitalize the socialist market economy with Chinese characteristics called for an immediate answer. There is no doubt that Shenzhen has become an experimental ground for the China's practice of market capitalism within a community, especially in economic transition, since Shenzhen is quite close to the then rapidly growing Hong Kong and Macao (Yue-man Yeung, 1992).

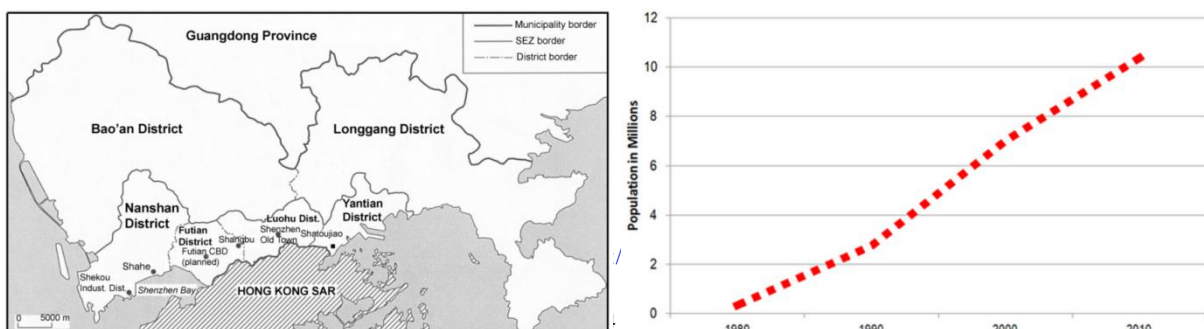
The SEZ allowed for alternative, generally market oriented reforms, with the end of improving economic growth. In fact, the SEZs were also intended as "a window of technology, management, knowledge and foreign policy. We can import technology and learn various kinds of knowledge, including management techniques. The SEZs will also be a base for economic opening and a nurturing ground of human resources, hence expanding our external influences." (Deng Xiaoping, 1998)

4.1.2 The Administrative divisions and urbanization

At the beginning, the area of Shenzhen SEZ was just 327 sq km, an administrative line - the second line, separating the SEZ in two parts (inner SEZ area and outer SEZ area). The first part covers the current Luohu, Futian, Nanshan and Yantian districts, and the second part includes the re-established Bao'an district and Longgang district. In July 2010, the second line was removed and the SEZ extended to the whole territory. In retrospect of the spatial evolution, the second line has become an important boundary distinguishing the different land use features (Fig. 4.1).

Fig. 4.1 The location of Shenzhen Municipality and SEZ in 1980 (Left).

Fig. 4.2 The population of Shenzhen: 1980-2010 (Right)



2、 <https://en.wikipedia.org/wiki/Shenzhen>.

3、 "Age Composition and Dependency Ratio of Population by Region (2004)". China Statistics 2005. Retrieved 5 July 2010.

Moreover, in 2007, 2009 and 2016, approved by the China central government, the Shenzhen Municipal Government has set up four new functional areas respectively, the Guanming, Pingshan, Longhua and Dapeng new area.

Through strong government planning and infrastructural development, Shenzhen has become one of the largest cities in the Pearl River Delta region, which itself is an economic hub of China, as well as the largest manufacturing base in the world, and saw an average annual population growth around 30% for the next 3 decades. Going back to the entire history of human civilization, there wasn't urban area could be created as fast as Shenzhen. A little more than a fishing village in 1979, by the newest 2016 census, Shenzhen registered 11.90 million inhabitants, which is also a unique city in China where 70% of people come from outside of the city.

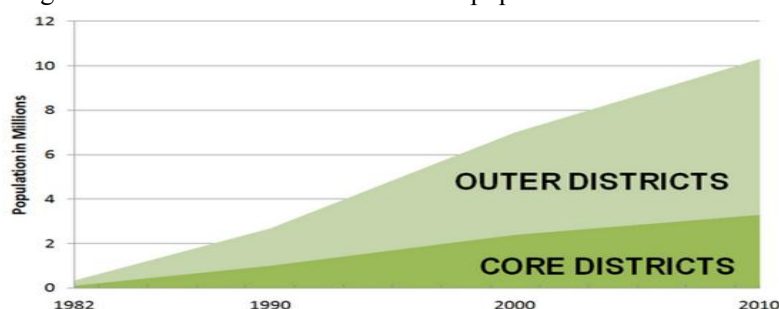
As mentioned above, due to the continuous development of economy and society, Shenzhen is geographically divided into two regions, the outer rural area and the inner urban area (the original SEZ administrative area).

Shenzhen's Core (the inner districts): Unlike the fast growing, but much smaller new urban areas of the United States (for example Phoenix, which is largely a low rise, dispersed expanse of suburbanization), Shenzhen has developed a dense central business district. Even though Shenzhen started the decade of the 1990s with little more than 1,000,000 residents, by 1996 it had the fourth tallest building in the world, the Shun Hing Tower. Like Shanghai and Chongqing (and unlike most Chinese urban areas), Shenzhen has a highly concentrated central business district.

Outer Areas Growing Faster (the outer districts): The three central districts (the Futian, Luohu and Nanshan district) grew from 2.4 million to 3.3 million population between 2000 and 2010, a rate of 38 percent. However, as is natural for a growing urban area, most of the growth was in the outer districts, which grew from 4.6 million to 7.0 million, a growth rate of 52 percent. Thus, nearly three-quarters of the growth was on the periphery (Fig.4.3). Population growth in the earlier 1990 and 2000 period was slightly less concentrated in the outer area (68 percent). But overall population growth has begun to slow down, with Shenzhen adding 3.3 million new residents, compared to 4.3 million between 1990 and 2000.

Overall, it is estimated that the Shenzhen urban area (area of continuous development) has a 2012 population of 11.9 million, with a land area of 675 square miles (1,745 square kilometers). The population density is estimated at 17,600 per square mile, or 6,800 per square kilometer, approximately 10 percent less denser than the average urban area in China. Shenzhen is about one quarter the density of Hong Kong and double the density of Paris.

Fig.4.3 Shenzhen inner and outer area population (1982-2010)



4.1.3 The main policies and plans:1980s-2015

The Shenzhen SEZ, was designated by the central government as “ a ‘window’ for observing global trends in economic, technological, and scientific development; an ‘experimental ground’ of reforms; and a ‘school’ for human resources training”. Shenzhen was given a “bridging” function(Deng Xiaoping,1984): to unite with the domestic front and to foster economic cooperation and technology inter-flow with foreign countries (Wai yin nei lian). This program has been implemented more or less under the auspices of the central planning system. The latter system is famous for producing plans, ranging from five-year economic plans and annual plans to master layout plans. It is also supposedly the norm that master plans are formulated on the basis of city and population and land area targets furnished from above, after consideration of national economic five-year plans, resulting in the famous Chinese saying that “urban planning is the continuation and integration of national economic planning”. In other words, paralleling the growth of Shenzhen over time as an SEZ was the formulation of a few five-year and master plans. Table.4.1 has listed some of these plans in chronological order. Since the form and contents of the various plans differ as a function of the concerns prevailing during a particular time period, it is the goal of this section to document the changing rhetoric. For simplicity, we have divided the past two decades into three phases. Thus, the discussion is divided into three subsections to elaborate on three sequential iterations in the “feedback loop” of rhetoric-reality.

In fact, in order to create a friendly and convenient investment environment for foreign capital, the local authorities and the central government have instituted favorable policies that were previously only available in the SEZs. These favorable policies have a number of characteristics that set the SEZs apart from other areas of China. Firstly, a significant proportion of enterprise ownership is non-state-owned, being instead Chinese-foreign equity joint ventures, Chinese-foreign contractual joint ventures and exclusively foreign-owned enterprises (the "foreign capital enterprises").

Secondly, the economic system within the SEZs is more market-oriented than is the rest of China. Third, preferential tax regimes are available to foreign capital enterprises, the enterprise income tax rate can be as low as fifteen percent-with exemptions from customs duty and consolidated industrial and commercial tax also available. Finally, foreign capital enterprises in the SEZs are given a great deal of autonomy in the operation and management of their businesses, without suffering much interference from the central and local governments. Such enterprises generally enjoy expedited government approval proceedings that are much simpler than those existing elsewhere in China.

Table 4.1. Socio-economic development and urban spatial plans in Shenzhen:1980-2015

Year	Main features and planning document
Phase 1: 1980–1985	1、Rapid development of domestic economic linkages 2、Outward processing industrial activities
1980	Draft Master Layout Plan
1981–1985	Sixth Five-Year Plan
1982	Shenzhen Socioeconomic Outline Plan (SSEOP)
1982	The First Master Layout Plan
Phase 2: Mid-1980s to mid-1990s	1、Export-oriented economy through attracting foreign direct investment 2、Economic restructuring toward high-tech and tertiary-sector development

1986-1990	Seventh Five-Year Plan
1986	Second Master Layout Plan
1989	The Comprehensive Report on Modifications of the Second Master Layout Plan
1991-1995	Eighth Five-Year Plan and the Shenzhen Socio-economic 10-Year Development Plan
Phase 3: Mid-1990s to mid-2010s	1、Planning control extended as Longgan and Bao'an Counties were turned into Districts within the Shenzhen Municipality in 1993 2、A need to reinvent in Shenzhen in the face of mounting competition within China and in the global economy 1993 Review of Master Layout Plan started. 3、Shenzhen was home to the Provisional Legislative Council in 1996 4、Shenzhen's rural-urbanization process started in 2004
1995	Municipal Government approved the Outline for Modifying the Shenzhen Master Layout Plan
1996-2000	Ninth Five-Year Plan 1996 Draft Third Master Layout Plan
2000	Third Master Layout Plan approved by the State Council
2001-2005	Tenth Five-Year Plan
Phase 4: mid-2010s onward	1、The Shenzhen Special Economic Zone was expanded to include all districts in 2010 2、Shenzhen 2030: strategic development planning was implemented, becoming the first statutory city's strategic development planning in mainland China
2006-2010	Eleventh Five-Year Plan
2008	The State Council approved the Outlines for Reform and Development Planning of Pearl River Delta Region
2009	The State Council approved the overall plan for comprehensive reform in Shenzhen
2010-2020	The newest Master Layout Plan approved by the State Council
2011-2015	Twelfth Five-Year Plan

Source: 1、Mee Kam Ng & Wing-Shing Tang, The Role of Planning in the Development of Shenzhen, China: Rhetoric and Realities. Eurasian Geography and Economics, 2004, 45, No. 3, pp. 190-211.

2、Development and Reform Commission of Shenzhen: <http://www.szpb.gov.cn/>.

4.1.4 The Role of urban planning - Shaping a Multicentric, Clustered Belt Structure

Since the China's reform and opening-up policies were completely implemented, Shenzhen (or Shenzhen SEZ as called at the beginning) as the first modern sense of the new district, the great success of Shenzhen's urban development and construction activities, has played an important role for indicating a series of rational and available ways in China's urban development and economic transformation process in the past three decades.

However for a city that experienced the type of rapid growth, it was very fortunate to have had forward thinking city officials and planners to help manage its success. Shenzhen officials remarkably were able to implement a total of three master plans within the span of 30 years, since 1980, which are 1986's Master Plan、1996's Master Plan、2007's Master Plan. The contents and characteristics of the three master plans are interpreted to show how the linear-cluster city model has been executed in different developing contexts and their impacts on the urban structure of Shenzhen (Table.4.2).

In addition, as a master plan to promote and guide the general urban development, based on the

international situation and the actual development needs, it has adjusted for many times. Taking into account the political, economic and cultural features in the past period, Shenzhen City, the development of urban planning has gone through three periods.

Table.4.2 The related master plan of Shenzhen SEZ

Edition	population scale (/10,000 people)	Land scale (/sq.km)	Spatial structure
1986 Shenzhen SEZ master plan (1986-2000)	110 (2000)	122 (2000)	Belt shape + multi-center + Cluster
1996 Shenzhen master plan (1996-2010)	430 (2010)	480 (2010)	Development axes + Belt shape + gradually progressive Note:1、 The first urban master plan was approved By the Sate Council 2、 Urban planning area extended to the entire city
2010 Shenzhen master plan (2010-2020)	1100 (2020)	890 (2010)	Three development axes + Two belts + Multi-center

Source: 1、 Urban planning board of Shenzhen: <http://www.szpl.gov.cn/szupb/>.

2、 The master plan of Shenzhen in 1986, 1996 and 2010.

4.1.4.1 The initiation of urban development led by the 1982 and 1986 SEZ Master Plan

The 1982 SEZ Master Plan is the first version of master plans in Shenzhen, which just contained the scope of Shenzhen SEZ. According to the nature geography, Shenzhen is the ideal space for urban development that nearby Shenzhen River (Opposite is Hong Kong, Kowloon island), the Pacific Sea, and surrounded by hills. This plan proposed a multicenter+cluster+belt urban structure, composed of Nantou Cluster, Luohu-Shangbu Cluster and Shatoujiao Cluster. The three clusters were connected by a major trunk road - Shennan Road, from west to east. Following this plan, the structure of the city began to develop towards a multi-centric pattern, which became a rudiment of today's structure.

Fig.4.4 The Spatial Structure of 1982 SEZ Master Plan



Source: The Urban and Rural Planning Bureau of Shenzhen: <http://www.szpl.gov.cn/szupb/>

Based on the general planning framework, Luohu-Shangbu cluster is the most important construction area assigned by the Shenzhen municipal government, which was valued by the geographical core of the Shenzhen SEZ and also close to the border with Hong Kong as well. The SEZ authority contributed to developing this area into a commercial centre to cultivate cross-border trading. Since then, Luohu is the only land port to Hong Kong, where most investment came from.

Another main area is Nantou Cluster, which contains the Shekou Industrial District in the west end area. As the first new economy-oriented area early in the 1970s, the Commercial Investment Bureau was already at an advantage in attracting foreign investment. Under its management, the Shekou Industrial District in the early 1980s had already appeared to be very dynamic in attracting Sanzhiqiye rather than Sanlaiyibu (a preferential policy for foreign-funded enterprises to promote coordination between local enterprises and foreign-funded enterprises) enterprises, which were a distinctive contrast to Shangbu. Admittedly, its success also highly depended on the assistance from the local authority of the Bao'an County, the provincial authority of Guangdong, and especially, after the establishment of the Shenzhen SEZ, the SEZ authority, for infrastructure provision.

A new plan was released in 1986 to replace the 1982 SEZ Master Plan. In this plan, the urban structure was further reassured and enhanced, and meanwhile, this plan assumed the function of facilitating the sustainability of industrial development. Compared to the 1982 master plan, the 1986 master plan had a more strategic view on urban land use and infrastructure provision to ensure high-standard urban development in Shenzhen. The plan also had an estimation of 0.8 million permanent dwellers and 0.3 million floating population occupying 123 sq km of urban land for the year of 2000 (Shenzhen Bureau of Construction, China Academy of Urban Planning & Design, 1986).

A belt-shape spatial layout of six developing clusters could be distinguished in the plan, which was designed from east to west are: Eastern Area, Luohu Area, Futian Area, Shahe Area, Southern Area (Nantou), and Sea Reclamation Area. The SEZ authority subdivided the general goals into these functional areas, which oriented to a practical development topic in the future.

Table.4.3 The functional positioning of Shenzhen SEZs' urban districts

Nantou	Developing commercial and industrial function
Shahe Area	Accommodating comprehensive land uses ranging from industry, tourism, real estate and commerce
Futian	Being a new city center with administration and commercial functions
Luohu	Retaining its function for commercial and residential use
Eastern Area	Developing into a major industrial area

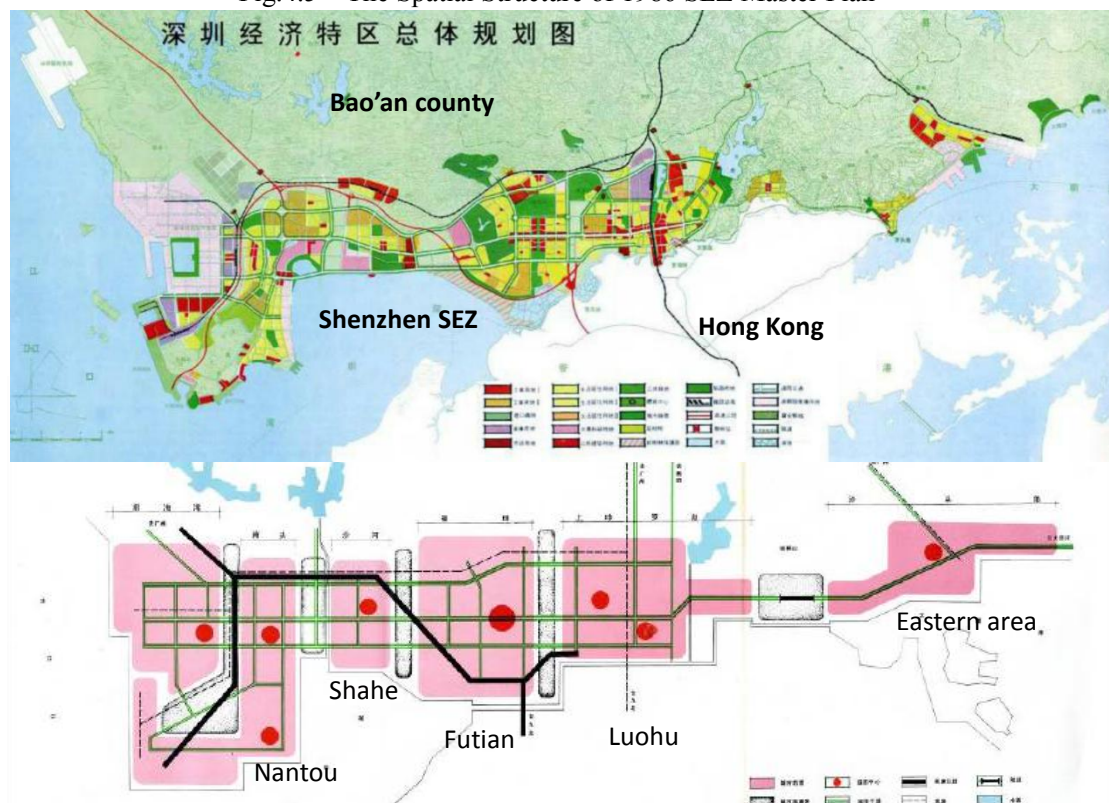
Source: Shenzhen Bureau of Construction, China Academy of Urban Planning & Design: The General Urban Planning, 1986.

In the plan, it was also determined that the SEZ would mainly develop technology and capital intensive enterprises and reject those that would bring about environmental pollution. To facilitate industrial development, this plan designated fifteen industrial zones of various sizes to develop electronics, light industry, building materials, machinery manufacturing and textile industries. At

the same time, the plan also provided sufficient land for residential use, which included 179 residential areas covering a total area of 3,042 mus, with various building and population densities. To create a beautiful urban environment, the plan allocated 22 municipal or district level public parks, 5 Litchi orchards, a 140 km long green belt along the roads, and 10 tourist destinations, which set out a framework for transforming the city into a contemporary garden city.

1986's Master Plan is a very ambitious and over-seeing plan, not only because of the linear + clusters urban shape, but also due to its bold assumptions. Actually, at this stage, urban expansion mainly took place within the second line. Therefore, several bold assumptions have been set up in 1986's Master Plan. Firstly, the population of Shenzhen at the end year of the plan would be 1.1 million people, 5 times than the population in Shenzhen in 1986. Secondly, the public facilities and infrastructure construction should be more visionary and the capacity of public facilities and infrastructure should maintain 1.5 million people's daily urban life. Moreover, the capacity of public transport is designed to accommodate 2 million populations. These bold assumptions and the linear&clusters urban modal guaranteed that Shenzhen could still operate well, even if the actual development was more dramatic than the over-seeing planners' prediction. The population of Shenzhen had already achieved 2.4 million at 1996, which is 10 times than the population in 1986, double the time than the planned population. The oversize population has stressed great pressure on urban daily operation. Futian Cluster and Xiasha Cluster have to start developing before the scheduled year. However, as the area of each clusters are strictly controlled, the public space and greenbelts were kept and not occupied by new constructions; as the public facilities and public transportation is designed to contain 2 million population, Shenzhen operated well and did not go into chaos during the planed years.

Fig.4.5 The Spatial Structure of 1986 SEZ Master Plan

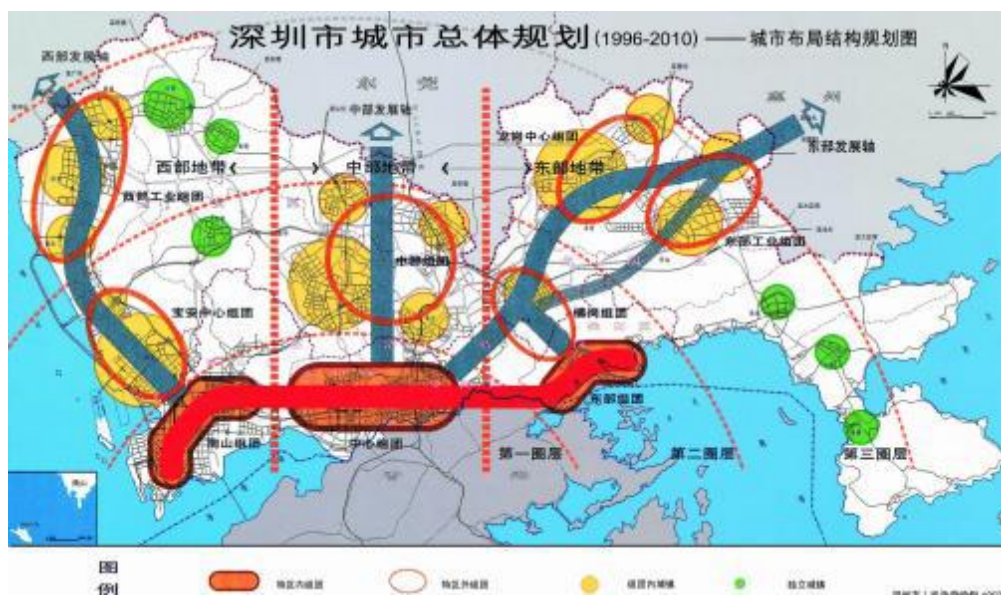


Source: Shenzhen Bureau of housing and urban rural development, China Academy of Urban Planning & Design: The General Urban Planning, 1986.

4.1.4.2 The second generation Master Plan in 1996

The developing context of 1996's Master plan is totally different from that of 1986's Master Plan. While the area of Shenzhen in 1986 is only 327 square kilometers, the area of Shenzhen in 1996 has expanded to its current area - 1951 square kilometers. The rest 1623 square kilometers area is not rural land but urban sprawl area. More than half of rural lands had been occupied illegally by millions of illegal buildings because of the lack of a united plan and a strict land control system, thousands of high energy-consuming factories were built-up and urban pollution become worse and worse, especially the rivers in the politic govern region were serious polluted. The development context in 1996 certainly was not as ideal as 1986's Master Plan. Some necessary revisions of linear clusters urban modal were made to accommodate the new changes. Firstly, the planned area had expanded to cover the whole politic govern region of Shenzhen. In order to promote the urban environment of the new added area, the first urban-rural plan in China was made in the 1996's Master plan, where the nature reservation area and non-development area are protected by using urban growth boundary method. More than 1000 square kilometers land of total 1951 square kilometers land are protected as the farmlands and ecological lands. No constructions were permitted in the farmlands and ecological lands and the existing constructions were planned to break down step by step within a 10 year period. Secondly, the appearance of the linear + clusters urban modal had changed while keeping the core idea of a grow and sustainable city(Figure.4.6). The original 6 clusters in the 1986's master plan were divided into 3 clusters and were emphasized as the core developing corridor. Three radical developing corridors expanded from the core developing corridor were designed to guild the development in the new added area. Each developing corridors has 4-5 growth hubs, which would concentrate on new developments in future.

Fig.4.6 The Urban Structure of The Master Plan of Shenzhen 1996-2010



Source: Shenzhen Bureau of housing and urban rural development, China Academy of Urban Planning & Design: The General Urban Planning, 1996.

4.1.4.3 The Master Plan 2010-2020 in transformation stage

In 2006, the Shenzhen government began to compile “The Master Plan of Shenzhen 2010- 2020” after the approval of The Ministry of Construction (now The Ministry of Housing and Urban-Rural Development). After ten-years of construction guided by “The Master Plan of Shenzhen 1996-2010”, the urban structure of Shenzhen has been generally formed. The land use in the SEZ has been relatively arranged as planned; however, the non-SEZ has confronted a serious problem of extensive land use. Therefore, this plan pays more attention to urban intensification in the non-SEZ and an enhancement of the urban structure proposed in the 1996 master plan. A significant feature of this plan is the highlight of the three hierarchical levels: municipal level, district level, and cluster level and, correspondingly, three levels of the development poles are distinguished.

In July 2010, the second line was removed and the SEZ extended to the whole city territory. In this context, the land resources of the previous non-SEZ will have more development potential. To protect the city environment, the Shenzhen authority also made up a plan to set up a construction boundary called “Ecological Control Line” and the state government also controls the urban expansion of Shenzhen by putting a limit on the quantity of developing land. Under the trial-forces, Shenzhen does not have enough space to support future urban development. The only approach that Shenzhen can take is urban intensification of the previous non-SEZ.

In this plan, the cluster centers and the district centers outside the second line are significant to Shenzhen’s development. Yet, the developing levels of these proposed centers were very low and there are many empty areas among existing construction areas. During this planning period, the infrastructure provision of these centers will be enhanced and these empty areas will be integrated with the existing areas.

4.1.5 Conclusion

Shenzhen’s rapid development is a microcosm of great success of Chinese economic and political transformation in the past 40 years. Shenzhen Special Economic Zone is a "test field" for Chinese national socialist market economy, a successful paragon for the Chinese government to explore the development of Chinese characteristic socialist urban system, in particular , which is also a opening-window to attract foreign capital, to import advanced technology, and to introduce advanced management methods. Therefore, when we summarize the characteristics and laws of Shenzhen's economic development in the past 40 years, generally, the Shenzhen’s urban function and position have changed four times , Shenzhen has completed a transition from agricultural society to industrial society, and gradually grows into a well-functional special economic zones.

In addition, as a master plan to promote and guide the general urban development, based on the international situation and the actual development needs, it has adjusted for many times. Taking into account the change of political, economic and cultural features in the past period, the development of Shenzhen has gone through three periods.

Table.4.4 The transformation of urban development in Shenzhen

Period	Phenomenon	Content
The initial development stage : 1980s-1990s	1、 Special Economic Zone established 2、 Industry is rapidly increasing 3、 The diversification of investment	1 、 The target is focused on the construction of a comprehensive industrial special economic zones 2 、 Located on the main urban spatial development direction and flexible belt shape structure 3 、 Arranged a great number of important infrastructure programs
The accelerated development stage : 1990s-2000s	1、 Rapid economic growth 2、 Urban population agglomeration 3、 Urban space expansion	1 、 Target Location: Being a important economic center city in South China 2、 Determining the SEZ as the core, and coordinated the East, middle and West three transport corridor circles , along with the gradually progressive expansion path 3 、 Determining the development of spatial structure and functional layout for the entire city of Shenzhen,
The transformation and innovation stage of development : 2000s-	1、 Industrial agglomeration development 2、 Industrial transformation optimization 3、 Limited urban development land-use ecological environmental	1、 Target Location: National economic center and international city 2、 Guiding the layout of urban space and restricting the city development scale with scientific theoretical system 3、 Building a resource - saving and environment - friendly cities, to realize urban sustainable development 4、 Promoting the transformation of economic development mode,adjusting and optimizing the industrial structure, improving the public service facilities and urban functions

Source: 1、Hang Zhou,Redevelopment of Urban Village in Shenzhen.*University of Massachusetts Amherst* ,2014: 25-34.

2、Mee Kam Ng & Wing-Shing Tang, The Role of Planning in the Development of Shenzhen,China: Rhetoric and Realities.*Eurasian Geography and Economics*, 2004, 45, No. 3, pp. 190-211.

After more than 30 years of development, Shenzhen has become an important economic center,a major manufacturing base , a financial and commercial center , a scientific and technological innovation center and an international city of China.In 2017, Shenzhen's GDP totalled \$347.4 billion, surpassing that of Guangzhou and Hong Kong for the first time since 1978, and ranked 3rd among the 659 Chinese cities, second only to Shanghai and Beijing.And according to the Global Financial Centers Index, Shenzhen is also ranked as having the 22nd most competitive financial center around the world (Long Finance,2016).It's key position will allow Shenzhen to become the leading economic engine in Pearl River Delta Economic Region and in China's Greater Bay Area Initiative (including Guangdong province,Hongkong and Macao) .

In addition to the linear + cluster urban structure, there is another concept of creative application in Shenzhen's urban design, which is the idea of transferring CBD.The Huaqiangbei Center,the Futian Center and the Seafront Center was designed to be the operating CBD of Shenzhen in in the 1986's,1996's and 2007's Master Plan successively.In the 1990s, Shenzhen was reconstructed

with a Shenzhen Speed "one high-rise a day and one boulevard every three days". The Shenzhen's rapidly evolving skyline is considered the best in China, even in the world. Currently, it boasts of 59 buildings at over 200 meters high, including (with 599 m tall) and .At present, including the Ping An Finance Centre (599m, the second tallest building in China), the Kingkey 100 (442m), China Resources Headquarters, Riverfront Times Square, China Chuneng Tower, Hanking Center, Hon Kwok City Center, Chang Fu Jin Mao Tower, Zhongzhou Holdings Financial Center, East Pacific Business Center, One Shenzhen Bay Tower 7 and Shum Yip Upperhills, among others.

Fig.4.7 Skyline of Futian and Luohu CBD area



Source: <https://en.wikipedia.org/wiki/Shenzhen>.

4.2 The oriental pearl of China - Pudong new area, Shanghai

Pudong New Area (Pudong Xinqu), is a first state-level new area and a sub-provincial area in Shanghai, which was conceived to be a brilliant model facing Chinese economic development problems, and has exerted influence to many other Chinese cities. It directly corresponds with successful urban development criterion defined by Chinese authorities and is also located within one of the most populated and developed cities in mainland China.

Pudong covers a huge triangle-style area from the east side of Huangpu River to the mouth of Yangtze River, which directly faces Puxi's historic bund. On the north side, it is opposite to Chongming Island. On the south side, it is connected with Fengxian District and Minhang District. In addition, Pudong comprises a territory area of 1210 square kilometers (the majority of eastern Shanghai), with a population of 5 millions (2010), which also consists of 13 communities, 24 towns and 1 natural reserve.

Pudong represents the whole Shanghai and the past 30 years' achievements of Shanghai in aspect of economy and reform. As a new economic engine of China, majority of Shanghai modern city landmarks are located in this district, including the Oriental Pearl Tower, the Jin Mao Building, and the supertall Shanghai World Financial Center 494. m. and Shanghai Tower (projected to reach 565.6 m or 1,856 ft). In some way, Pudong has grown one of the most important financial hubs in the world.

However, Chinese state-level new area policy in Pudong is different from that of Shenzhen SEZ in 1980s or other industry-led districts, such as some industrial development parks. Special economic zones generally shoulder a role just like a sponge, utilizing a variety of favourable policies to absorb foreign or domestic investment, yet the new area will have to release its energy to promote

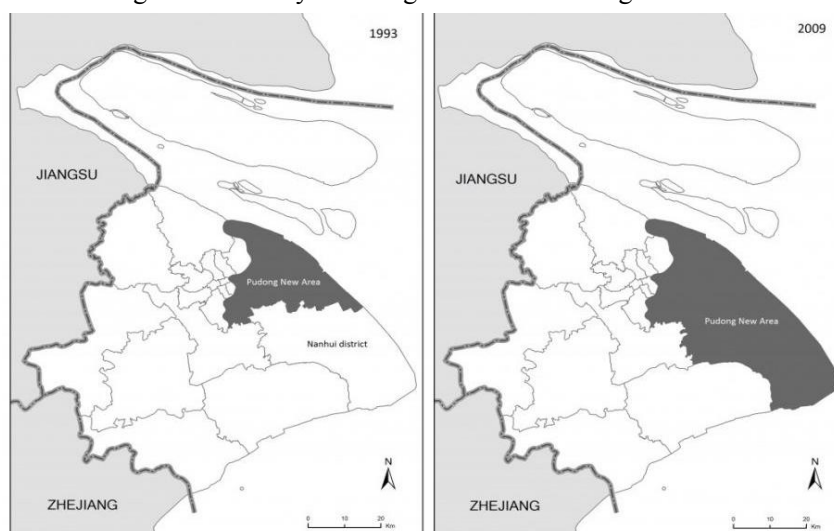
the coordinated development with the surrounding backward regions , instead of relying on national unbalanced prior to development policies to form an economic hell to damage the interests of other cities (Xie Guoping, 2013) .

4.2.1 The history of Pudong new area

Pudong new area is now considered the very epitome of an export-oriented, modern new urban district, and is synonymous with both China's economic reforms and prosperity and Shanghai's modernization and prestige as center of world commerce. But in fact, due to the natural geographic and administrative management barrier--the Huangpu river, which divides the Shanghai city in two parts, Puxi and Pudong, and the lack of sufficient basic infrastructure to achieve the cooperative development between the two areas along the bank of river, Pudong's social and economic development has lagged behind relatively as an unknown part of the east deserted area of Shanghai. Until 1990, China State Council officially announced to open a new area to deepen the economic reform and expand the opening-up policy scope, Pudong was fortunately designated as a special economic new area to strengthen the economic of Shanghai. and since then, Pudong got a fantastic development.

Over the past decades of years of development, Pudong's administrative area and urban functional structures has undergone a number of adjustments to adapt to the new environment, according to the constant change of growth needs and urban strategic objectives. On April 24, 2009, Nanhui District was approved to be a new part of Pudong New Area (Fig.4.8) . And on April 27, 2015, People's Government of Pudong new area began to work with China (Shanghai) Pilot Free-Trade Zone Administrative Committee. And the whole economic structure of Pudong was highlighted with the modern service industry and high-tech industry. The internationally famous Lujiazui Finance and Trade Zone, Zhangjiang High-Tech Park Zone, Waigaoqiao Bonded Zone, Jinqiao Export Processing Zone and Yangshan Bond Port Zone are located in this new area. Pudong is the important transportation hub of Shanghai, on the coastline and river-line, the Yangshan Deep water Port, Waigaoqiao Harbor and Pudong International Airport are the three transportation landmarks indeed. In particular, in 2010, Shanghai World Expo hosted, and Pudong was the location of main pavilions (Carolyn Cartier, 2015).

Fig.4.8 The city of Shanghai and the Pudong New Area.



Source: Carolyn Cartier, "The Territorial City II—Shanghai Pudong", 2016.

Website: <https://www.thechinastory.org/2016/01/the-territorial-city-ii-shanghai-pudong/>

4.2.2 The significance and orientation of Pudong new area

The transition towards the market “socialism” and a transnational economy since 1978, as well as an understanding of the inevitable results of such a move to the socialist system, have not deterred the newly converted. Deng Xiaoping and his more pragmatic colleagues have recognized the need for a more open policy, especially those related to the international community.

The plan represents the final implementation of the “Pudong long-term cherished scheme” which “further demonstrates the determination of the nation to open a wider door to the outside world”. It also represents “the dreams of the people who cherished lofty ideals to build the country into a modern nation”. The Pudong’s policymaker hope that the continued viability will depend not only on investment but also was absolutely essential to China's development, and they planned accordingly (Kerrie L. Macpherson, 1994). Deng Xiaoping also challenged his comrades to regard the development of Pudong as an opportunity to “liberate our thinking” rather than “straitjacketed by predetermined ideas” (Jin bao yuekan, 1991).

Shanghai, by virtue of its status, achieved over a scant 150 years, as China's premier industrial and financial center as well as the focus of the country's most influential political and intellectual activity, has been foremost amongst them. In 1991, Shanghai's urban development ushered in a time of great change. This is based on the strategies and policies of Chinese central government that ‘with the opening up of Pudong new area as a driving force, and the cities of Yangtze River will be further developed, in order to shape Shanghai jointly as an international economic, finance, and trade centre and thus bring along new leaps of regional economy in the Yangtze River Delta and the whole Yangtze River Valley’ (Comprehensive Plan of Shanghai, 1999). There is no doubt that Shanghai has become China's economic engine with a huge influence on neighboring cities, especially in Yangtze River Delta economic region, including Jiangsu province, Zhejiang province, Anhui province and Jiangxi Province. Hence, another task for the Pudong new area is to reduce the unbalanced development and to promote the regional economic integration. Just like the Chen Wanyou (Governor of Jiangsu) said, “The Yangtze River is like a great dragon. The head of the dragon is Pudong. The dragon's body is Jiangsu, Anhui and Zhejiang Province. If the head moves, the body must with it”.

4.2.3 Motivation for Pudong's development

4.2.3.1 External factors--Rapid promotion of economic globalization

At the end of the 20th century, with the rapid advancement of economic globalization, Asian backward countries grasped the rare opportunity to undertake the industrial transfer and division of labor from developed countries, which became a shining spot in that unprecedented period. And at the same time, the worldwide economy's tendency came into a new round of industrial structure re-adjustment, high-tech industries started to replace traditional industries, and gradually has become a new strong economic growth engine, which developed countries focus on chasing the emerging industrial sectors, and the general industries rapidly transferred from developed countries to developing countries and regions, especially to the kind of developing countries' urban areas, which equips the large potential market capacity, rich labor force, production supporting capacity, high efficient government and so on.

In order to undertake the industrial shift, technology diffusion and capital input of transnational corporations from developed countries, the Chinese central government has made a strategic choice to develop and open up Pudong new area in time, as it moves toward a comprehensive

multi-functional urban center to contribute to the China's overall progress in the 21 century.

4.2.3.2 Internal factors--Domestic reform has entered a new stage

As we all know, in the early 1980s, the State Council set up five special economic zones such as Shenzhen, Zhuhai, Shantou, Xiamen and Hainan according to the superior geographical locations, which are close to Hong Kong, Macao and Taiwan, and vigorously adopted the "Sanlaiyibu" policy to attract the processing trade industries, which contributed to a great investment in these related areas.

① The further expansion of opening up policy scope

However, from the late 80s, by the marked impact of international market changes and the disintegration of Soviet Union and other socialist European countries, the previous orient-exported processing industries, with low technical value added, the lack of coordinated development both related industries and large land consumption have gradually appeared. Therefore, the central government began to introduce foreign advanced technology to promote the domestic state-owned enterprises, collective enterprises and foreign-funded enterprises in full cooperation; Except that, in order to further open up the surrounding vast areas of Shanghai, one of China's important economic center--Yangtze River Delta urban agglomeration (including Jiangsu, Zhejiang, Anhui province and Shanghai city). Naturally, as a crucial development leader, Pudong also undoubtedly assumed the new opening mission of China's socio-economic reform pilot.

② Expansion of Shanghai

On the other hand, with the preliminary development in the past decades (since from the programme of "Great port of Pudong", proposed by Dr. Yatsen), Shanghai has become an important regional center of economy, finance, trade and shipping. Therefore, with the rapid progress of urbanization and the expansion in urban areas, since 1980s, the policymakers and manager of Shanghai began to study how to extend the area of Shanghai to relieve the pressure from the high population density, short supply of housing, the limited downtown area etc. There is no doubt that Pudong new area is the best choice to relieve the necessary of urban potential development land-use in the future, and in particular, it will play a much more significant role in Shanghai's urban construction and regional economic development and management (especially for the Yangtze River valley).

4.2.4 The pudong of open door policy - rebuilding a world-class new city

The Comprehensive Plan of Pudong New Area released in 1991 expanded and almost doubled Shanghai's urban territory across the Huangpu River. With the experiences accumulated in the planning and building of the developed cities, Shanghai Municipal Government took the objective of making a internationalized and modernized development in the future, in the words of its boosters, will ensure a high quality standards that will be enhanced in the planing phases of 30 to 40 years or more, and will create a total area of 177 square k m² (out of the total of 350 square kilometers), which is equivalent to the size of Shanghai's existing urban center. based on the guideline of initiative urban planning compilation method by arranging the plans into three axis (Fig.4.9).

① Huangpu River axis, which connects the urban area along the river, and the riverside open spaces;

② Lujiazui CBD - Central park - International Airport axis, which extends the traditional axis in

the west of Shanghai into the hinterland of Pudong; the destination is replaced by Lingang New City when Nanhui District is combined into Pudong New District;

③ Seasides axis, which connects the harbours in Waigaoqiao, International Airport, Lingang New City etc.

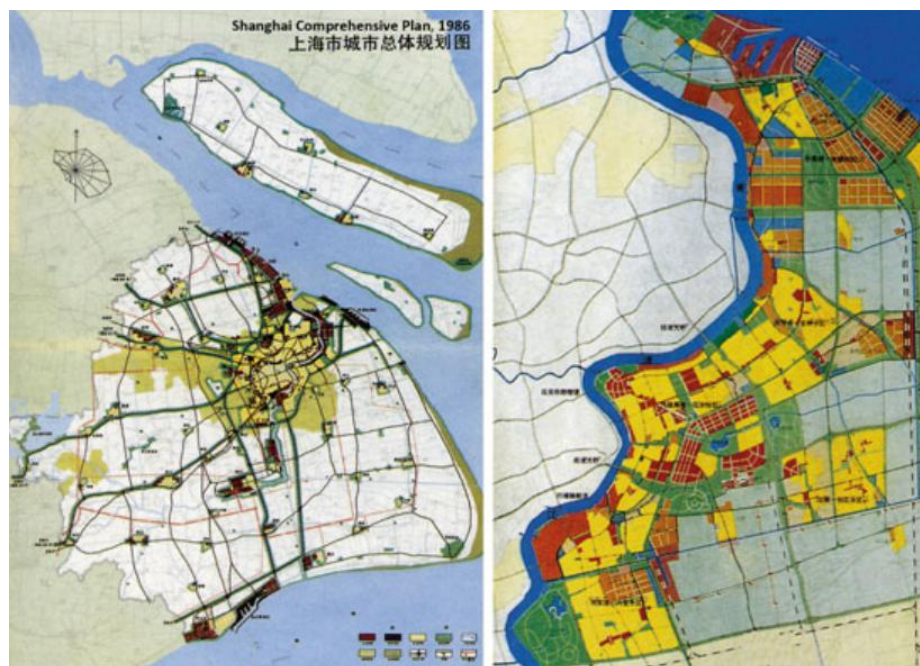
In order to enforce the competitiveness of Pudong, the sub-districts (especially the part of Shanghai's central districts) will undertake the key urban functions to form the centre, with an "open layout pattern" containing "seven relatively independent complex sub-areas".

Furthermore, the central urban area of Pudong new area, according to its residential distribution, is further divided into several large residential communities in the plan of 1992, after twenty years the urban form of these communities has melted together with perceptible limits.

A new Pudong showed itself as the most evident symbol of Shanghai's success before everyone at the last century, after 10 years of rapid development under the slogan 'A new look every year, an astonishing change every three years'.

The rapid development of Shanghai in the 1990s brought it back to the forefront of China's leading cities. Its urban patterns, urban planning and development practices, appropriate or otherwise, have inevitably become a role model for other cities throughout China. Pudong's Lujiazui CBD and Century Avenue, Nanjing Road Pedestrian Commercial Street, Shanghai Xintiandi urban redevelopment project, large green spaces and parks, metros, municipal libraries, grand theatres and other building initiatives in Shanghai have been emulated by other cities, but the consequences are undoubtedly an issue worth investigating into! (Fig.4.10).

Fig.4.9 Shanghai Comprehensive Plan (1986) and Pudong Comprehensive Plan(1991)

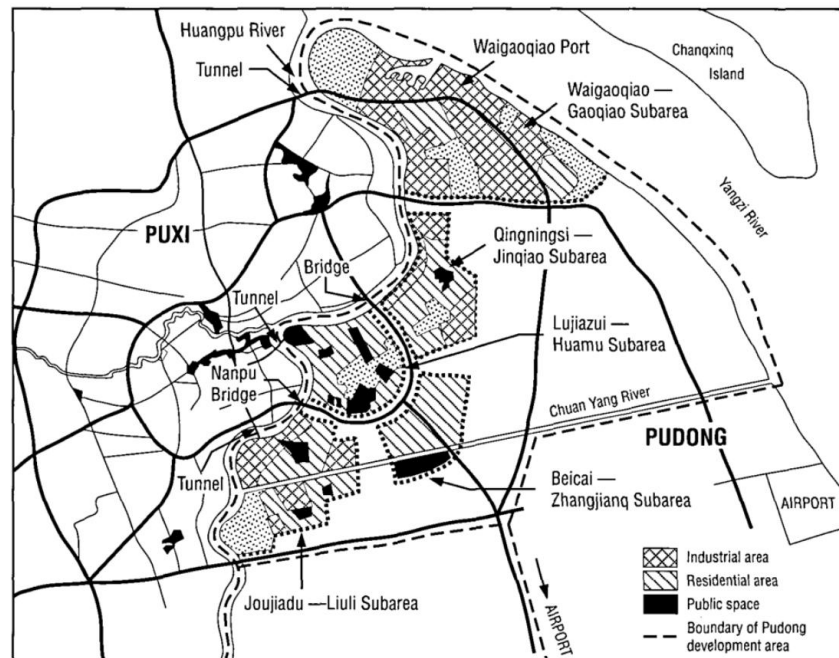


Source: Shanghai Planning and Land Resources Administration Bureau

Taking the objective of making an internationalized and modernized development in the future, in the words of its boosters, it will ensure a high quality standards that will be enhanced in the planing phases of 30 to 40 years or more, and will create a total area of 177 square k m² (out of the total of 350 square kilometers), which is equivalent to the size of Shanghai's existing urban center.

The Pudong part of Shanghai's central districts will form the centre, with an "open layout pattern", embracing "five relatively independent complex sub-areas" (Table.4.5): Jinqiao Export Processing Zone, Lujiazui Finance and Trade Zone, Liuli Modern Accommodation Zone, Sunqiao Modern Agriculture Development Zone, Wangqiao Industrial Zone, Waigaoqiao Free Trade Zone, Zhangjiang Hi-tech Zone.

Fig.4.10 The land-use of 7 major functional areas in Pudong



Source: Kerrie L. Macpherson. *The head of the dragon: the Pudong New Area and Shanghai's urban development. Planning Perspectives*, 1994(9): 61-85.

Table.4.5 Seven major urban functional units in Pudong

Urban functional unit	Area, km ²	Establishment, year	Investment, \$	Function description
Jinqiao Export Processing Zone	20	1990	3.26 billion	export processing, trade, commercial service and dwelling
Lujiazui Finance and Trade Zone	28	1990	1.05 billion	A financial and trade center of China, even of the world
Liuli Modern Accommodation Zone	3	1995	-	modern residential, commercial and trading service, cultural entertainment, travel and official business
Sunqiao Modern Agriculture Development Zone	9.5	1994	-	production, processing and distribution of a wide range of agricultural products
Wangqiao Industrial Zone	4.2	1992	-	free trade, export processing, logistic warehousing and bonded commodities' displaying
Waigaoqiao Free Trade Zone	10	1990	2.50 billion	international trade, processing for export, commodity flow and warehousing and exhibition and trade of duty-free commodities
Zhangjiang Hi-tech	17	1992	0.63 billion	Manufacturing, research and educational commercial

Zone				and residential facilities
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Source: The Comprehensive Plan of Pudong, 1991.

4.2.5 Key special policies and projects applicable in Pudong

As a symbol of deepening the reform of the national economic system and the mode of urban development, naturally, China central government has formulated a series preferential policies and large-scale infrastructure projects for Pudong to showcase the development of the first state-level new area.

During 1990-1995, the building activities in Pudong were focused on planning, analyzing and solving the expected traffic conditions, environmental analysis and existing investment environment. Hence, the scope of the project includes various forms of transportation assistance (e.g. the Yangpu bridge) to create proper conditions to attract foreign and native investment (Table.4.6). By 1995, all major projects have been completed at a cost of about \$ 3.1 billion. (Sohma, 1995).

Table.4.6 Major infrastructure projects

Major infrastructure projects	Completion date	Condition
Nanpu Bridge	1991	Six lanes
Pudong Gas Plant (second phase)	1991	2.0 million cubic meter gas
Yanggao Road	1992	running through four sub-zones
Yangpu Bridge	1993	Six lanes
The Inner Expressway	1993	eight kilometers long
Waigaoqiao Port	1993	Four berths
Lingqiao Water Plant	1993	0.2 tons water / day
Waigaoqiao Power Plant	1994	1.2 million kw
The Sewage Drainage	1995	34.3 kilometers long

Source: Hongyan Jia, Shanghai's Frontier: Pudong New Development Area. *Eastern Michigan University*: 11-21.

According to the Comprehensive Plan and its transportation plan, the Inner Ring Road links East Ring through the newly built Nanpu Bridge to the east coast of Huangpu, connecting Pudong and Puxi to form a new transportation pattern. And focus on the construction of basic functional facilities for the new "free trade zone" at Gaoqiao Port, which will stimulate the transfer of high-tech "pollution-free" industries such as trade and service industries with the support of scientific and educational industries.

Building a multi-level communities based on the sub-area layout involves residential, commercial, cultural, medical and recreational facilities, served by public utilities and ringed by a clear recognition of past failures in providing "perfect and fundamental city facilities". The expensive large-scale infrastructure investment will enter into the first phase of the project to be constructed, the planner who insists on "the regional coordinated development is quite crucial for the economy, society and ecology", the plan remains substantially silent on how "a sound natural ecological environment" will be attained.

Since the China's first free bonded zone (Waigaoqiao, Shanghai) was established in June, 1990 with

100.000 square kilometers planning area , the Chinese central government approved the ten preferential policies to serve the further development of Pudong on June 2, 1990, including the tax reduction, import duty exemption, land use rights and other policies. These new policies were designed to stimulate further foreign investment in Pudong,such as encouraging opening subsidiaries and bank branches. The main points of the 15 policies are summarized in Table 4.8.

After then,the China's State Council and its sub-ministries, and Shanghai government collected a plenty of polices jointly , such as the “Notice on the relevant policies for the development and opening of Pudong New Srea in Shanghai during the Ninth Five-year Plan.”Generally,these strategies can be summarized into two broad categories that have been used to finance the Pudong. One is to give convenient policies to attract foreign investment, and the other is to encourage home investment and raise money through the central government to raise building funds from grants, banks, and the sale of bonds.

From 1989 to 1994, these policies have produced a great impact in a total investment increase in Pudong. Much of the rapid increase is from foreign companies’investment (Table 4.7) , such as 3M Co, Porington Glass Co,Yaohan Co.And then,during 1995-2000, the economic growth of the PNDA kept steadily with an average annual growth rate of 22%. Its gross domestic product increased from 0.60 billion U.S. dollars in 1990 to 9.2 billion U.S. dollars in 2000 (Li,1995).

Table.4.7 Foreign Investment in Pudong:1992-1995

	Number of enterprises	Investment (\$)
1992	700	35.00 million
1994	2663	10.36 billion
1995	3083	12.51 billion

Source:Xiao, Xianping and He, Xingang,The Significant Changes in Five Years: Looking Back at the Achievement of Pudong Development in Five Years. Pudong Development , 1995,4: 10-13 (in Chinese).

Table.4.8 Special and protective policies in Pudong New Area

Tax reduction	Sino-foreign joint ventures and wholly-foreign owned enterprises shall be levied tax at the rate of 15%	Foreign companies' capital that flow into the construction of infrastructure will be exempted from income tax for the first five years and allowed a 50% reduction over the next five years	For China's investment, it will give a preferential treatment in terms of appropriate tax abatement
Import/export	Foreign trade and economic cooperative agencies will be allowed to engage in re-export trade, in port of raw material and spare parts for foreign-funded enterprises for production purposes as well as export of their products	Equipment, vehicles and imported building materials necessary for construction in the PNDA shall be exempt from custom duties and the consolidated industrial and commercial tax	The foreign trade production should be mainly based on export -oriented business
Subsidiaries and banks	In the import and export business companies with annual exports of more than 100 million US dollars; and exports of more than 20 million US dollars in manufacturing companies will be free to open a subsidiary in PNDA.	Foreign-funded financial institutions registered in the Lujiazui Finance and Trade Zone may set up branches in Waigaoqiao Free Trade Zone and establish foreign and sino-foreign insurance companies	Foreign investors will be allowed to allow foreign bank branches and building business in Chinese currency
Others	The land-use system was more simplified to adapt to the development of requirement of foreign companies.Pudong implemented a long-term land lease system,the term of land-use rights will be 50-70 years.Foreign investors may contract large tracts of land for development	The companies of Waigaoqiao free trade zone that approved to engaged in bonded business and to expand the foreign trade service without the retail business	Opening the tertiary industries to foreign companies.

Source: Modified from Wang, 1992; Anonymous, 1995b

4.2.6 Shaping Shanghai Pudong: Starting from Lujiazui

Lujiazui, which literally means "Lu's Mouth" that confined by Huangpu River, is located in the PND on the eastern bank of the Pudong's dream begins from Lujiazui, which is better known as Lujiazui Central Business District(or Lujiazui Financial and Trade Zone) that have been designed to serve tertiary industry such as finance, commerce,international communication,real estate and information,and to link the rest of world with some preferential policies.

After the great success of Shenzhen SEZ,the general plan and concept for the Lujiazui CBD began to take shape gradually. in 1990,with the programme that was decided by the Premier of State Council LiPeng to develop Pudong, Lujiazui Financial District, the Preparatory Committee of Pudong New Area organized an international urban design competition to determine some prioritized projects. such as urban spatial planning and industries.A number of renowned architectural companies were involved into this meaningful design games,for example the Richard Rogers (UK), Dominique Perrault (France), Toyo Ito (Japan) and Massimiliano Fuksas(Italy), which cooperated with with the Shanghai Urban Planning and Design Institute (SUPDI) jointly to formulate the general visions for the development of Pudong at the early exploratory stages.These ideas were deeply influenced by the current economic and political climate,and which together,drew a reasonable development environment in the future.Undoubtedly,this is a unique great innovation for Shanghai Municipal Government to apply the concept of CBD in Lujiazui.Its urban patterns,urban planning and development practices, appropriate or otherwise, have inevitably become a role model for other cities throughout China(CHARLIE Q. L,2011).

Finally,the urban design and planning of Lujiazui CBD district was constructed based on the scheme developed by SUPDI,and it can be described as a grid pattern + a core simply,within a group of homogeneous blocks that are dominated by a symbolic axis, and a new planned district is limited by some linkages or to geographic boundaries.Here, the development model of the superblock replaced the traditional residential blocks in many Chinese cities.Through the dense road network to subdivide the each block, there will be four or six plots of land, and all plots will have good planned public transportation routes.What's more, this kind of superblock design can not increase the amount of traffic allocated land area,while effectively reducing the government-funded infrastructure investment for Shanghai government.Because the Lujiazui CBD focuses on tertiary industry, such as finance, commerce,international exchanges,trade, real estate and information,the symbolic riverfront axis will also contain a plenty of iconic skyscrapers with diverse different architectural styles and large-scale public buildings ,such as theaters,films and TV centers, galleries,exhibitions and the Oriental Musical Hall.The four most famous landmarks of the Shanghai are located along Bingjiang Avenue beside the Huangpu River - the Oriental Pearl TV Tower(468m), Jin Mao Tower(420.5m), Shanghai World Financial Center(492), and Shanghai Tower(632m) are constructed next to each other (Li, Chak-man, 1995) .

Besides the tall and well-designed buildings,other supporting infrastructure has also been well planned,for example the Nanjing Road Pedestrian Commercial Street,Shanghai Xintiandi,Century Avenue urban redevelopment project, large open spaces and parks, metro system, Shanghai municipal libraries,Shanghai grand theaters,but the consequences are undoubtedly an issue worth investigating into!(Wu Qingdong,2012).

At present,Lujiazui has grown into a largest financial zone in mainland China,with over 500 banks、 financial institutions and insurance corporations from both home and abroad, including SCB, Citibank, and HSBC. Moreover, it is also home to the headquarters of more than 70

international giants and about 5,000 companies engaged in commercial trade, investment, and intermediary services. The sum of transactions in the Shanghai stock market ranks 2nd in the world only behind the New York Stock Exchange.

Fig.4.11 Skyscrapers in Pudong, Huangpu River



Source: People's Daily Online, April 03, 2017, China's three state-level new areas: Shenzhen, Pudong and Xiongan:
<http://en.people.cn/n3/2017/0403/c90000-9198362.html>

4.2.7 Conclusion

The Pudong new area has played a significant role in China's overall economic development and socialist economic market reform strategy during the past 30 years. The final success of Pudong's development relies on several factors, including the geographical location on the Huangpu River and Yangtze River as well as on the South China Sea coast, convenient cross-river traffic systems, and efficient infrastructure. The cooperation of Shanghai's people who will provide the labor force and well-intentioned governmental policies are also very important. When the preferential policies have combined with social reform and the development of a market economy, this will exceed the attractiveness of policies given to other economic zones in the country.

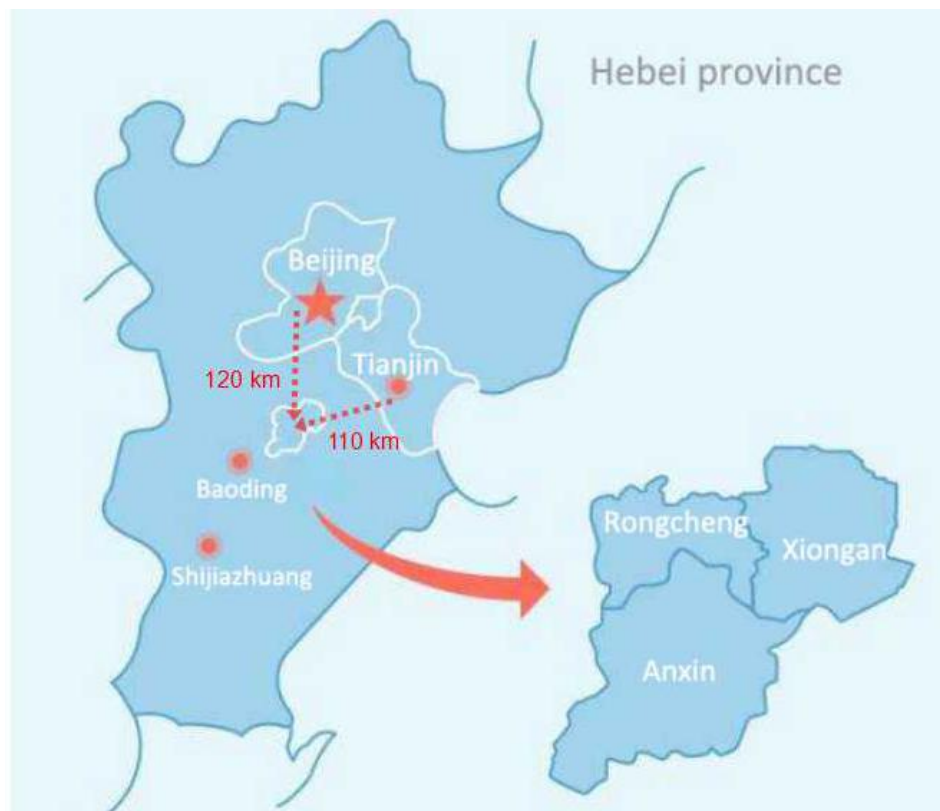
The Shanghai municipal government learned from previous experiences and concluded the importance of initially constructing the infrastructure of the PNDA. The keys to attracting people and the most visible improvements include more living space and convenient transportation. The completion of Nanpu and Yangpu Bridges, which created linkage between the PNDA and Shanghai's urban core, allowed badly needed interaction. When the improvement of other infrastructural needs in the PNDA reaches an acceptance threshold, people will live and work in this zone and growth is anticipated to be steady and possibly rapid. Concurrently, the development of the PNDA will lead to alleviation of some congestion in the older parts of Shanghai. If everything goes as planned, and there is cause for optimism, the PNDA will be not only the future economic center of Shanghai and an increasing focus of the Yangtze Valley, but it will become one of the most advanced economic zones in China.

5 Xiongan new area:a strategy crucial for a millennium to come

Xiongan New Area (XNA),is a latest state-level new area in the Baoding area of Hebei, China.On April 1,2017,,Communist Party of China (CPC) Central Committee and the State Council jointly announced a significant decision to establish a new urban area in Paoding, as part of advancing the coordinated development of the Beijing-Tianjin-Hebei region , which is a new area of national mission furthering similar efforts beyond the Shenzhen Special Economic Zone and the Shanghai Pudong New Area.In a word, Xiongan new area is "a strategy crucial for a millennium to come" for China (Xu K D,2017).

The current administrative area consists of Xiongan, Rongcheng and Anxin counties , located about 120 kilometers south of Beijing,and 110 kilometers west of Tianjin,forming a similar triangle structure in geographic geometry.Moreover,Baiyang Lake, northern China's largest freshwater wetland, is also included within the new area.The New Area will cover around 100 square km initially and will be expanded to 200 square km in the mid-term and about 2,000 square km in the long-term(Chinese People's Daily,2017).

Fig.5.1 Location of Xiongan New Area in Hebei



Source: drew by author.

5.1 Basic Information

Xiongan new area covers 3 counties (Xiongxian, Rongcheng, Anxin) and the surrounding 29 towns (land area:1560k m²) . Until 2016,there is a total of 112.7 million population in three counties, and the GDP was about 21.5 billion yuan (Baoding Economy Statistical Yearbook,2016).

Xiongan Area is monsoon influenced amid continent climate climate classification Dwa).The monthly daily average temperature is 11.9 °C.Precipitation averages around 522.9 mm annually, with close to three-fourths of that total falling from June to August.In terms f geography, the entire new area is located in the alluvial fan of the Daqing River, and the north 、 northwest part are slightly higher, and the south 、 southeastern are lower respectively , with an open terrain. Geographic elevation is about 7-19 meters, with one thousandth of the natural slope.In addition, its natural environment is a little vulnerable with low vegetation coverage,but harbors a number of ancient rivers forming a huge river network, such as Juma river, Yi river, Cao river etc. Moreover , these three counties have their own characteristics and strengths, in agriculture production, in industrial system, in commercial trade or in environmental management(table 5.1). After the reform and opening up, during the past 30 years,these areas have also made several achievements in economic field.

Table.5.1 Total area of administration area, population, economy and major features of Xiongan New Area in 2015

Xiongxian	
Area: 524 km ² Population (10000 people): 39.4 Urban resident: 13.29 Rural resident: 26.12 Economy (GDP/¥): 10.1 billion	1、 Private economy : as early as the 80's, Xiongxian has entered the rank of the top 30 counties in Hebei Province.At present, a variety of private economy organizations up to 13,000, forming four pillar industries:plastic packaging, latex products processing,rolling leather and electrical cable production. 2、 Natural resources : Xiongxian occupies 18.3 square kilometers water area in Baiyang lake, has the largest inland port in North China;the main oil producing area of North China;natural gas reserves of more than 1 billion cubic meters; geothermal area of 320 square kilometers;geothermal water reserves of 82.178 billion cubic meters, with excellent quality.
Rongchen	
Area: 314 km ² Population(10000 people):27.31 Urban resident: 13.58 Rural resident: 13.73 Economy (GDP/¥): 5.75 billion	1 、 Transportation : two high-speed railway lines (Baoding-Tianjin 、 Langfang-Baoding) and two national highways (Beijing-Hongkong-Marco 、 Rongcheng-Wuhai). 2、 Industry: the light industry has developed rapidly in past decades, which formed a couple of featured industries , such as the garment industry, food processing industry and auto-products industry
Anxin	
Area: 729 km ² Population(10000 people): 46.30 Urban resident: 13.95 Rural resident: 35.35 Economy (GDP/¥): 6.5 billion	1、 Beautiful natural scenery,with a great density of river network,which is a famous tourist destination in North China 2、 Rich natural resources, biodiversity, and human cultural heritage. 3、 Due to the fertile soil quality and long sunshine time,the agriculture economy has been fully developed. 4、 North China's largest non-ferrous metal distribution center

Source: 1、2015 “China County Statistical Yearbook (county volume)”, Xiongxian county annals, Rongcheng county annals and Anxin county annals.

5.2 Development background

As the China's urbanization process that continues to increase rapidly in the future, as well as the explosion of urban scale, the urban population has caused a series of social, for example, the high cost of getting medical treatment and quality education, and unbalanced regional development.

Hence, the China's central government has focused on the coordinated development of the urban and the rural area as a whole. It is a broad strategic structure to use the concept of big history and the superb political wisdom to address these challenges in non-Beijing capital area. The function is “bovine nose” promoting the major national strategy of coordinated development of Beijing, Tianjin, and Hebei.

Our president Xi Jinping said that we ought to consider constructing a new district of a scientific scale in a more suitable place in Hebei province, focusing on undertaking the Beijing's non-capital functions, adopting modern information and environmental protection technologies.

5.3 Development motivation and significance of the Xiongan

“From the international practical experience of view, most of the successful examples to solve “big city disease” problems that are willing to “jump out” the original old urban area and building a new town instead generally, based on the Chinese development track in the past decades, since the application of economic reform and opening up policy, through the construction of Shenzhen SEZ and Shanghai Pudong New Area, they strongly promote the economic growth and socio-economic development in these two areas.

Actually, over the past three decades, not only have these coastal cities been in the reform frontier, but also Beijing enjoyed the dividends of reform and opening up and its economy has expanded rapidly, which has grown into the second largest metropolis in China, meanwhile, Beijing has suffered from a series of “city diseases” as well: the water resource shortages, traffic congestion, air pollution, rocketing house prices and other problems caused by insufficient environment and society capacity. The “focuses” emerge in systems and organs of transport, environment (air, water) and housing, but the root cause seems to lie in fast growing “population”, behind which loom the calamities caused by unbalanced economic structure and productivity, over-centralized urban planning layout, etc.

By the end of 2015, the permanent resident population of Beijing was 21.71 million, among which 10.98 million live in the six urban districts. Actually, although the Beijing government has taken a plenty of measures to control the rate of population growth and the total of population, based on the previous urban master plan and multiple editions of BTH cooperative development programme, however, it seems that all of them are ineffective (M Zhong, 2007).

Moreover, the difference in natural resources, political conditions and state position, which worsen the regional unbalanced development level in these three areas; Beijing and Tianjin have continuously concentrated on the economic, educational, scientific and technological resources as a sponge, especially plundered them from the surrounding areas, and finally, created a special geographic economic product--a poverty belt around Beijing, which involves Langfang, Baoding,

Chengde and Zhangjiakou, surrounding the capital city (MA Yufang, 2016). As a result, the three counties of Xiongan that the new area covers reported a combined GDP of about 20 billion yuan (2.94 billion U.S. dollars) in 2016, less than 1 percent of Beijing's economic output.

Table 5.2 Foundation Status of Beijing, Tianjin and Hebei in 2016

Item	Beijing	Tianjin	Hebei
Permanent population (10,000 people)	2172.9	1562.1	7470.05
Urbanization %	86.5	82.93	53.32
GDP-Total (RMB/billion)	2489.9	1785.5	3182.8
GDP-Per-capita (RMB/10000)	11.46	11.42	4.26
Revenue (RMB/billion)	508.1	272.3	437.3
Primary, secondary, tertiary industry ratio	0.5:19.2:80.3	1.2:44.8:54.0	11.0:47.3:41.7
Vehicle ownership (10,000 units)	559.1	280.0	997.0
Per-capita vehicle ownership (unit/person)	0.25	0.18	0.13
Total highway mileage (10,000 km) (km/km ²)	2.2	1.6	17.9
Highway per unit area	1.3	1.3	0.9

Source: 1、Beijing municipal bureau of statistics, 2016 Beijing Municipal Economy and Social Development Bulletin

2、Tianjin municipal bureau of statistics, 2014 Tianjin Municipal Economy and Social Development Bulletin

3、Hebei Province bureau of statistics, 2014 Hebei Municipal Economy and Social Development Bulletin

4、Sources from Beijing、Tianjin、Hebei municipal bureau of statistics, 2014

It can be seen from Table.5.1 that the Hebei Province has the largest population, but with the lowest urbanization rate, even less than the national average rate. The national average urbanization rate is 57.35% in 2016. On the contrary, the rate of Beijing and Tianjin have been up to 86.5% and 82.93% respectively. In terms of per-capita GDP, Beijing and Tianjin are basically equal, while Hebei Province's level is only a bit more than 1/3 of that of Beijing. The per-capita vehicle ownership of Beijing doubles that of Hebei Province. The highway mileage per area unit in Beijing and Tianjin are 1.4 times that in Hebei Province respectively (X Li, 2017). As shown in Primary, secondary, tertiary industry ratio, Beijing is featured with the structure of tertiary-secondary-primary, the tertiary industry has reached a prominent position; Tianjin has a distinct advantage in manufacturing and processing, but moving towards an industrial adjustment for developing the high value-added and service-oriented structure; while Hebei has a structure of secondary-tertiary-primary industry, with the primary industry making up a relatively large proportion.

Therefore, it is not difficult to explain why the population of Beijing and Tianjin continues to increase, and a series of population control and function dispersal regulations have achieved a bit success. In terms of social development, the severe inequality of public resources distribution, social welfare system, per-capita income, and available opportunities are major contributing factors to attracting flow of people; On the other hand, the different administrative divisions and poor coordination in the construction of infrastructure are the main restricting factors of production in Beijing and Tianjin from spilling over into neighboring cities and converting into productivity, which have formed a vicious circle gradually (Yvonne Zhou, 2017).

Therefore, Xiongan new area was selected as an ideal breakthrough to assume the promotion of synergistic development for great BTH region that would, on one hand, invigorate the distinctive

economic region around China's capital, and on the other hand, provide paradigmatic reference for other emerging city clusters in China, which will operate as a new growth pole for the country's economy, and also aim to curb urban sprawl, bridge growth disparities and protect ecology. The area will be of the same national significance as the Shenzhen Special Economic Zone, and Shanghai Pudong New Area, established in 1980s and 1990.

Moreover, this decision will help phase out some non-capital functions from Beijing, explore a new model of optimized development in densely populated areas, restructure the urban layout in the BTH region and cultivate new innovation-driven engines, according to the circular. It will also operate as a new growth pole for the country's economy, and also aim to curb urban sprawl, bridge growth disparities and protect ecology. The area will be of the same national significance as the Shenzhen Special Economic Zone.

5.4 Development Positioning and construction objectives

Xiongan New Area, as the Beijing's ideal support site to bear non-capital urban functions, is necessary to build into a new important economic engine to reduce the regional imbalanced development in RTH region, a high-level socialist modern city to explore the innovative urban development and management model, an important pole of Jing-Jin-Jin world-class urban agglomeration to optimize the existing spatial structure, and a domestic model to promote the high-quality, high effective development. In a word, it can be summarized into several innovation and development zones:

1、a green ecological livable area

It adheres to the concept of ecol-priority and green healthy development, define the scope of ecological protection and permanent basic farmland, and the boundaries of urban development, delineate the ecological protection red line, permanent basic farmland, and urban development boundary. rationally determine the scale of construction of new districts, improve ecological functions, plan green corridors and landscape construction, and build an eco-city layout in which blue and green, fresh and bright, water cities are coexistent. cities are compactly developed, creating excellent living environment and realizing human and nature.

We will reasonably determine the scale of new district's construction activities, optimize the ecological functions, design green-corridors and eco-infrastructure system, and create a green ideal city where there is a living environment to realize harmonious coexistence between man and nature.

2、innovation drives the development of leading areas

Adhere to develop the high-end, high-tech, high-added industries, actively absorb and gather Beijing-Tianjin (or other domestic cities) and foreign innovation factor resources, encourage the close cooperation of companies, universities, and research institutes, establish innovative development leading areas and comprehensive reform pilot areas, and plan a number of national-level innovation platforms to form a new highland of institutional mechanisms and an important regional collaborative platform to nurture a modern economic system between Beijing-Tianjin and Hebei province.

3、a coordinated development demonstration area

Undertake the tedious urban functions, and ease the urban population and industries of Beijing effectively to solve the "big city disease", and utilize it to boost the radiation ability in Hebei Province and even BTH region to develop urban and rural areas, regions, and the industries.

4、a regional economic cooperation district of the national defence

It insists on the trend of economic globalization and the opening up policy, actively participates in the construction of the “Belt and Road” initiative, accelerates the transformation of government functions, promotes the facilitation of investment and trade; Cooperate with Beijing to build the International Exchange Center jointly, strengthen cooperation and exchanges with Beijing, Tianjin, and other Chinese important economies, such as Hong Kong, Taiwan and Macao regions, and open a new window for creating new highland and foreign cooperation to make great contributions to the improvement of BTH's economy.

According to the "Xiongan New District Planning Outline for Hebei province", by 2035, it will basically grow into a new high-level modern city with green, low-carbon, smart information, strong competitiveness and opportunities, and a livable harmony environment.

Urban functions tend to be perfect, the new area's transportation network will be convenient and efficient, the modern infrastructure system will be completed by the government, the economic development will be driven by the high-end and high-tech industries, the high-level public service system is basically created, and the Baiyang lake eco-environment has been proved fundamentally. Effectively undertaking Beijing-Tianjin's non-capital functions, the level of foreign exchange activities and international influence is continuously improving and urban capacity and social management have been achieved.

5.5 SWOT analysis : the basic features of Xiongan

5.5.1 Advantage

5.5.1.1 Convenient traffic system

Brilliant location and convenient transportation system. Xiongan is situated in the geometric heart of Beijing、Tianjin and Shijiazhuang (the capital of Hebei provincial), which constitutes a triangular economic circle (Jing-jin-ji). Besides that, the entire planned area has also been incorporated into the Beijing-Tianjin urban traffic network, according to the traffic network programme, to Beijing only 45 minutes by car, to Tianjin only 15 minutes, the unique location and traffic advantages are the biggest strength of the construction of Xiongan new area.

5.5.1.2 Abundant natural resource

Baiyang lake is located here, as the largest freshwater lake in north China; Under the influence of special geological structure, the underground of Xiongan is rich in geothermal resources. It was awarded the title of "China's hot spring town" by the Ministry of Land and Resources of PRC in 2010. Thus, these unique natural conditions will offer a better ecological environment and greater environmental capacity for the upcoming society.

5.5.1.3 Rich in cultural heritage and tourism resources

Xiongan is situated in the ancient land of Yang dynasty and Zhao Dynasty, as well as a harmonious area with cultural prosperity and full of public spirits for a long time. At present, the region has a total of 189 intangible cultural relics, including 3 national intangible cultural heritages and 2 national key cultural relics protection units, where these sites account for 80 percent of remains, the Great Wall of Song dynasty (Qiliang ruins), and the remaining buildings are mainly kind of residence in Ming and Qing dynasties.

In effect, as the unique wetland of the north China plain, Baiyangdian is an ecological heritage of harmonious co-existence between nature and man. The Baiyangdian lake is also one of the first class 5A scenic spots in China, which is a famous tourist attraction in the north of China. Among

them, the monuments of sino-japanese war, the Lushan scenic spot, and the Ranzhang ground war are known to the public.

5.5.1.4 Low development cost and wide development space.

Currently, Xiongan new area generally benefits from the lack of infrastructure investment, the low construction and development cost, and large potential spatial development area, which could meet terms of development requirements.

5.5.2 Disadvantage

5.5.2.1 Environmental pollution

1、Air pollution (smog and sandstorm)

In fact, Xiongan is an area surrounded by three-dimensional heavy pollution, which has been suffering from comprehensive environmental pollution--air pollution, water pollution, and soil pollution--for many years. Hebei is one of the most air-polluted provinces in China. Through the first quarter of 2017, six out of the ten cities with the worst air quality nationwide are in Hebei Province, according to the MEP. Table 5.3 reveals the air quality in Beijing, Tianjin and Hebei is relatively bad. However, compared with Beijing, the air quality in Tianjin and Hebei is even worse. Beijing is more effective in pollution control than in Hebei, which took regulatory measures to cut down on high-polluting and energy-intensive industries and transferred them to surrounding counties in Tianjin and Hebei since 2000s.

Table 5.3. Environmental status of Beijing, Tianjin and Hebei.

Item	Beijing (2014)	Tianjin (2013)	Hebei (2013)
PM10 annual average ($\mu\text{g}/\text{m}^3$)	116.0	150	190
NO2 annual average ($\mu\text{g}/\text{m}^3$)	56.7	54	51
SO2 annual average ($\mu\text{g}/\text{m}^3$)	21.8	59	74
Harmless treatment rate of domestic garbage (%)	99.6	95	92
Central urban area sewage treatment rate (%)	97.0	95	93.6
City-wide sewage treatment rate (%)	90.0	87.5	-

Source: 1、Beijing municipal bureau of environmental protection, 2014 Beijing Municipal Environment Bulletin

2、Tianjin municipal bureau of environmental protection, 2014 Tianjin Municipal Environment Bulletin

3、Hebei municipal bureau of environmental protection, 2014 Hebei Municipal Environment Bulletin

2、Water safety and pollution

Water shortage problem have become a most hot point problem in the Beijing-Tianjin-Hebei region. The per-capita water resource amount in the region is less than 300m³/year, representing only 1/7 of the country's average. Due to the drying up of rivers, the water system's capacity for regulating the ecosystem has weakened significantly, causing frequent occurrence of desertification phenomenon, urban heat island effect, and rain island effect. Meanwhile, with the gradual expansion of the urban land for construction, and due to the shortage of ecological and municipal infrastructure, megacities are facing the problem of serious water logging, and affected by the strange phenomenon that regional water shortage and flooding damage in urban area exist at the same time.

In addition, there is no doubt that water pollution is another critical ecological issues for Xiongan. For example, the eutrophication of water body, the reduced volume of water in storage, etc. Meanwhile, it is one of the districts with most severe rural surface source pollution and megacity environmental pollution as well.

5.5.2.2 The weakness of industrial base

As shown from the industrial structure, the entire planned new area present a typically “second-tertiary-first” industrial structure, and mainly rely on light industries such as textile industry and processing industry and tourism. However, due to the impact of the national policies and the market environment, the textile industry is facing the scale of reduction and the fate of production suspension. The tourism of Xiongan new area largely focuses on Baiyangdian lake, but caused by the low development degree and poor management, its utilization rate of natural resource is far lower than that of other tourist attractions at the same level.

The low level of industrial aggregation and technology are another two non-ignorable problems. It can be seen from the table 5.1, Xiongxian county mainly relies on the plastic packaging, electrical cables, latex production and rolling leather industry, enjoying the “China balloon town” and “China plastics packaging base”. However, as a whole, showing a “big cluster, small-scale”, with low tech-added and value-added characteristics in products. Besides, part of the enterprises exist “three highs (High energy consumption, high pollution and high emission industry)” phenomenon, affected by the relevant state environmental protection policies facing the fate of production cut or capacity transfer. Rongcheng county is famous with the pillar industry and garment industry that belong to the labor-intensive industry. However, because of the rising labor cost, the decline of workers and recruitment difficulties, the local garment factories is under the great pressure of industrial transformation and upgrading; An’xin county industry is composed of the largest footwear production base, the scrap metal collection and distribution center in north China. After decades of development, the traditional industrial development has also seriously damaged the local ecological environment, especially the water pollution in Baiyangdian lake.

5.5.2.3 Low development level of recreation.

In general, the issues of travel industry exist in three main aspects: 1、unified and low efficient management level; 2、Lack of related supporting service, which is difficult to meet the needs of tourists; 3、Low popularity and Low attraction. To be honest, the potential value of a huge ecological capacity is the significant driving force to sustain Xiongan’s growth in near future. Therefore, it is a wise choice to develop a tourism-based service sector.

5.5.2.4 The chaotic urban-rural layout, fragile native landscapes and inefficient land use

Compared the urban-rural spatial morphology with other developed areas in the Yangtze River Delta region and the Pearl River Delta region, the urban and rural development of Xiongan new area is disorderly, chaotic, lack of planning, lacking of aesthetics in spatial form, and even causes serious damage to the original ecological structure and natural texture (Table 5.3).

On the contrary, such as these cities in the Pearl River Delta and the Yangtze River Delta, which are also in the process of rapid urbanization, and facing the similar sharp contradictions between urban development and the natural environment. However, to some extent, those cities took actions to avoid the destruction of the rural landscape caused by the problems of urban sprawl and land

waste finally.

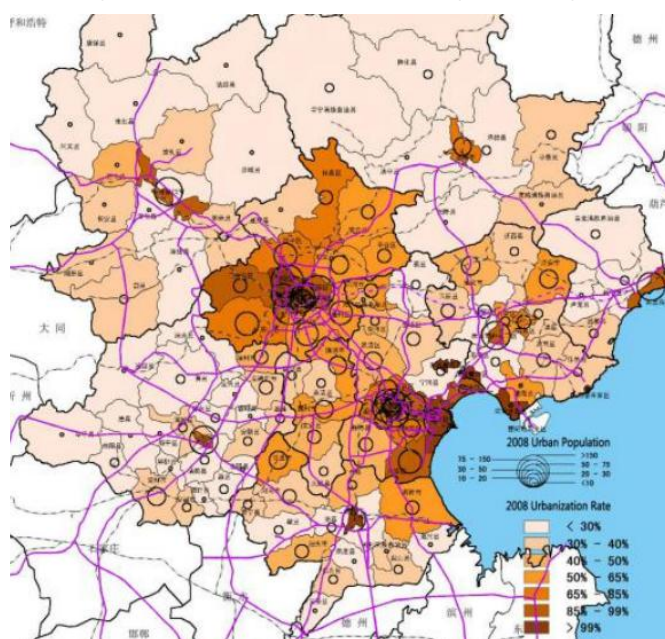
Rongcheng, and Anxin counties, which mainly include rural settlements, townships, farmland, water and wetland ecosystems. The construction of XNA should sustain the Beijing's non-capital urban functions, as well as moderately control population and industrial growth (Kuang Wenhui, 2017).

5.5.2.5 Imbalance Urbanization Development

Another significant feature of the whole area is the imbalance urbanization development. In 2016, the urbanization rate of XAN three counties are less than 50%, lagging behind the average urbanization rate of Hebei province 53.3% and national average rate of 57.4%. Regional differences of urbanization lie in different cities. Among the four cities, the urbanization rate of Xiongxian, Rongcheng, Anxin is 33.7%, 49.9%, 28.3% respectively.

However, the urbanization growth rate is comparatively amazing. The urban population of four cities distribute along the traditional transportation corridors. As shown in Fig 5.2, towns contribute most to attract urban population to cluster around the main urban area.

Fig.5.2 Urbanization Rate in Jing-Jin-Ji region



Source: The Program Outline for Coordinated Development of the BTH Region

5.5.3 Opportunity

5.5.3.1 Policy support and national guarantee

From the point of politics and policy background, The Third Plenary Session of the 18th CPC Central Committee defined the market as a crucial role in socioeconomic resource allocation, this is not only to reposition the role of the market, but also the major innovation for further deepening the achievement of reform and opening up. In comparison to the Shenzhen SEC and Pudong new area in last century, based on a set of practical experiences on the path of exploring Chinese-characteristic urban construction, Xiongan new area is bound to have more flexible policies and a more open market environment to attract domestic and external

investment,combined with the superior geographical location 、 convenient transportation network、 abundant natural and ecological resource and explicit , in under the leadership of the CPC central committee, with our country powerful economic basis for backing, drawing lessons from experience of the Shenzhen special zone and Pudong new area construction,which is to drive an economic turnaround, it will be the engine for economic development under the new norm in the kinetic energy.

5.5.3.2 Transfer of non-capital function

The idea and countermeasure of relocating non-core functions in Beijing are through moving non-core research institutions, design agencies and planning agencies that under the management of Central Government's ministries and commissions in Beijing,and further to boost the transformation and upgrading of the local pillar industries, and to promote the construction of the local infrastructure and the development of the regional cities,to drive the construction of the local infrastructure of Xiongan and the development of cities in the Jing-Jin-Ji region,to improve the quality and level of socio-economic development in these Lagging behind areas in Hebei province, and to help it to make up the short board of current regional development pattern.

5.5.4 Challenge

5.5.4.1 Long term and uncertain development requirement in future

Will Xiongan become China's third growth engine?At least,as a country's "big millennial plan"with such a historic strategic significance near the country's capital Beijing,appears to have more political significance than economy, it will be hard to assess success in the short term. From the regional development perspective, Xiongan new area is different from the YRD region and the PRD region. Driven by the pilot development in Shanghai and Shenzhen respectively, both of them enjoyed a number of unique and exclusive policies in that period to develop a new urban economic structure, while the rest of wide regions were still in socialism market economy, and eventually helping to kick-start China's market reform and further opening up. Instead, it is probable for Xiongan to prove to be a place where the state government can focus on its experiments with urbanization, supply-side reform and even state governing models.

5.5.4.2 Limited by the traditional pattern of new town land-use and real estate housing policy

Since the 1980s, Shenzhen SEZ has begun to charge land use fee instead of former free land use policy, China's land development has gradually entered into the payment of land owned phase in open sale, but based on this traditional land development policy, especially in the past 30 decades,causing a number of drawbacks during the China's rapid urbanization process.One is that Chinese Government unilaterally emphasis on fiscal revenue,and transferring the land-use rights excessively , ignoring the ecological security of land development.The second is the tax-oriented land-use development mechanism, leading to the government's administrative function being in a passive management status.

It is hard to achieve an effective control in concrete urban construction activities, the "enclosure movement" distorted the distribution of land differential premium rent income, boosted the land speculation behavior.Since the reform and opening up, China's real estate growth has been influenced by the "unification of land and housing" mode.Since China abolished the social housing distribution system, the real estate area has stepped on marketization gradually, resulting

in the separated operation between house and land in property development process being an inevitable trend.

Whether there will be a housing bubble in Xiongan? Will it cushion the growing momentum of Beijing's property prices? Probably, but it must depend on the degree to which Beijing's non-capital functions are delivered there.

Thus, how to break the existing irrational land supply system, explore initiative urban land development mechanisms and housing policy, are another tough questions for Chinese developers and policy-makers to answer (Table.5.3) .

5.5.4.3 Integration of existing industries

According to the recently signed documents, for instance, the “Agreement on strategic cooperation in planning and construction of Xiongan New Area” and the “Three-year action plan for the development of strategic emerging industries in Hebei province”, to promote the industrial development in Xiongan and other cities of Hebei,

Both Beijing and Hebei government will strengthen the coordination of industrial transfer and undertake, strictly control the planned new area to home the high pollution、high energy consumption and nature resource-dependent manufacturing industries, jointly promote the development of high-end products in Xiongan, and support the cooperation of Zhongguancun corporation and other municipal state-owned enterprises with Xiongan government in the field of scientific and technological innovation, so that the new area will be focused on the development of high-added and high-tech industries at the beginning stage.

As mentioned above, Xiongan has cultivated some characteristic industrial clusters, for example, for example, the plastic packaging industry in Xiongxian, the garment industry in Rongcheng. Hence, the industrial upgrading, industrial cooperation and industrial integration are the most important aspects of the future development of Xiongan. It is necessary to keep and encourage the development of the existing local enterprises, but also to make the enterprises transferred from Beijing take root in this hot area.

5.5.4.4 Allocation of existing rural population

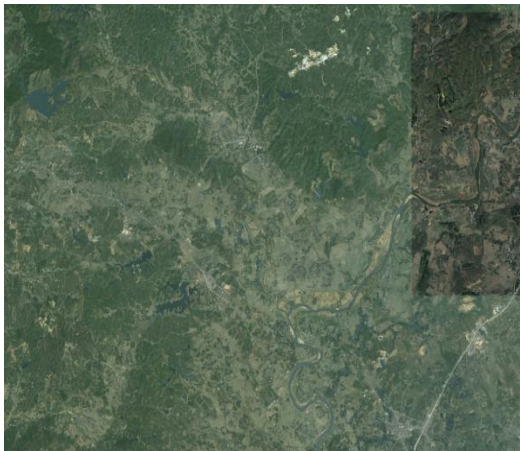
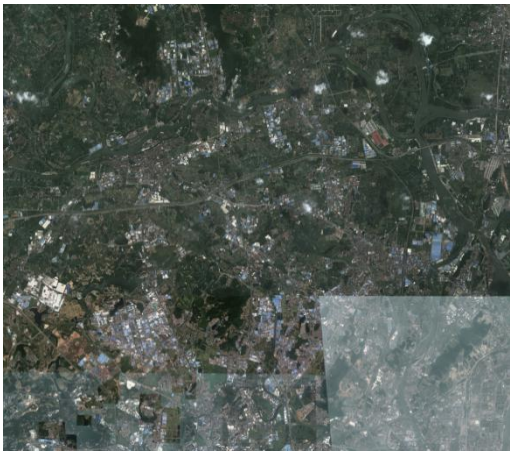
Once the initial 100 square km planned area will be practiced in Xiongan new area. There will be plenty of problems regarding in socioeconomic area for the original nearby 2 million residents that Chinese government need to deal with thoughtfully in the future, such as how to allocate the original three counties' nearby 2 million residents? which role they will be played in the upcoming broken society? What kinds of job they could do? Whether the traditional lifestyle and custom will be changed?

In addition, due to a special policy in household registration system (or Hukou system) has rooted into Chinese urban and rural areas, it classified people into “agricultural (rural) population” VS “non-agricultural (urban) population” according to the status or type of registration, and Hukou-based welfare provisions have led to a dual society in separated urban-rural development. Thus whether the farmer's social identification will be switched into urban Hukou and welfare system is another key point to consider.

Table.5.3 Comparison of different Town and District Patterns of China

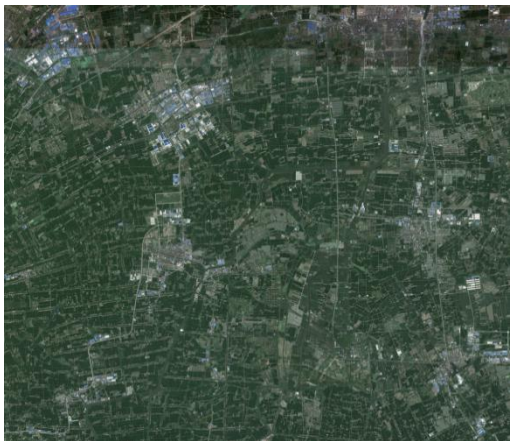
Pearl River Delta Region (Guangdong province)

- 1、Guangzhou -- the countryside around the Metropolis
- 2、Gaozhou -- urban development with ecological environment



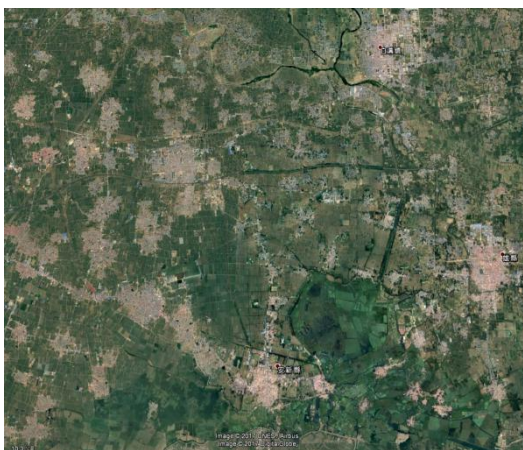
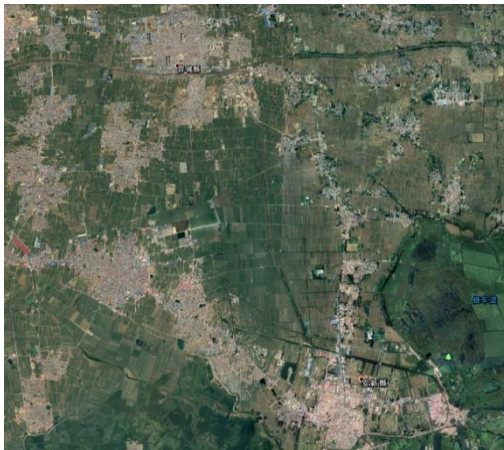
Yangze River Delta Region

- 3、Pinghu, Zhejiang province--a county with a rich river network
- 4、Danyang, Jiangsu province -- a small size county with rapid urbanization and industrialization



Jing-Jin-Ji metropolitan area

- 5、Rongcheng / Anxin, Hebei Province
- 6、Xiongxian, Hebei Province



5.6 Related references with plans, policies and guidelines

5.6.1 China's new-type urbanization plan 2014-2020 and China's

On 16 March 2014, the Chinese State Council released The National New Urbanization Plan. This strategic guideline report is the country's first official plan on urbanization, which admits mistakes in China's rapid urbanization progress since 1978, and summarized experiences from home and abroad to cope with issues of the next urban-rural development stage and external economic pressures (Xinhua News Agency, 2014). Generally, there are eight independent chapters involving over 30,000 words set out the objectives, the baseline, four strategic tasks, reforms in five related domains, the institutions in charge, and the path of future development (Zhou Zhihua, 2014).

Based on the the objectives of urbanization by 2020, the future evolution of Chinese characterized urbanization will be people-centered and quality-oriented in the form of integrated rural-urban development and well-cooperated city clusters. Briefly, it can be summarized in the following six aspects:

Number	Strategic task	Context
1	Human-Centered Approached	① To orderly transform China's rural population into urban citizens and to push forwards the social wealth Re-distribution ② To reform the household registration (Hukou) system, with respect to five domains in land, fiscal and taxation, housing (welfare) and ecological environment
2	Strategic Layout of Cities	① To optimize the urban agglomeration in the eastern region: the Beijing-Tianjin-Hebei Region, the Yangtze River Delta region and the Pearl River region ② To cultivate and develop the potential urban agglomeration in the central and western regions ③ To promote balanced development and create regional coordinated development mechanism, and to enhance the center cities' driving development capacity to radiate the surrounding areas. ④ To coordinate development of medium-sized and small cities based on major city clusters
3	Integrated Development:	① Industrialization --to facilitate the economic growth and to create more jobs for urban-residing workers. ② IT applications--to bring People together across distances and to making urban services accessible to rural areas. ③ Agricultural modernization--to safeguard food security and to protect arable land (12% of Land = 1.4 million km)
4	Ecological Conservation:	To promote the initiative, green, recycle and low-carbon development eventually fused with ecological sustainable idea in the process of building a beautiful China.
5	Cultural Continuity	① To respect the natural resource, cultural continuity and historical characteristics in different cities ② To encourage traditional historical-cultural values to shape cities cultural identities and special distinguished features.
6	Reform mechanism	Reform key areas of administration concerning people, land and funds, with

		coordinating efforts between central and local government.
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Source: Compiled from “National New-type Urbanization Plan (2014–2020)” (March 16 2014)

Even though there is no ready roadmap yet for some areas, particularly the financing and investment mechanisms for the four strategic tasks. the Plan thus emphasizes the importance of urban agglomeration and coordinated development in different layers of cities and regions, as well as various forms of reasonable targets and models for allowing urban initiative development. Obviously , the Jing-jin-Ji region will play an important role for exploring the new-type path of Chinese Urbanization, and undoubtedly, these is a rare opportunity for Xiongan new area to assume and practice such a mass of ambitious decisions in the near future (HE Zhiping, 2015) .

5.6.2 The Program Outline for Coordinated Development of the BTH Region

Beijing municipality, Tianjin municipality, and Hebei province consist of an significant economic region in the PRC. The BTH region is one of the three largest metropolitan regions (Yangtze River Delta and Pearl River Delta) in Eastern China , equipped with the Chinese third largest urban agglomeration of Beijing--21.72 million permanent inhabitants in 2016 (United Nations, 2016) . Obviously , over three decades of rapid economic growth in BTH region, which has been accompanied by excessive inequalities and inter-regional conflicts in terms of the diverse aspects of social welfare, personal income, infrastructure, public available resource (medical treatment、 education and among-st others)) , and ecological environment, as well as rooted into these three regions and their counties. But actually, since the 1980s, the Chinese government has noticed these quite critical problems , and focused on the topic of discussion in synergistic development of the BTH region, yet the progress of cooperation in regional development has been slow. From 2013, the government has picked up the pace with intensified efforts, and progress has been visible in the coordination of industries, transportation, and environmental protection and planning, among other things. And then , on 30 April 2015 , the state council approved the Program Outline for Coordinated Development of the BTH Region (the program outline), which is a major strategic decision promoted by Xi Jinping.

The “Outline of Planning” is a layout of the time - the recent goal is as of 2017, orderly ease Beijing non-capital function made significant progress, transportation, ecology, industry, the first breakthrough in three areas, and coordinated development achieved remarkable results , The medium-term goal is as of 2020, Beijing 'big city disease' and other issues have been alleviated, traffic, ecology, industry, three areas of linkage made significant progress, the initial formation of coordinated development, mutual benefit and win-win situation, long-term goal is as of 2030, The core function of the capital is more optimized, the level of public service tends to be balanced, and the regional integration pattern is basically formed.

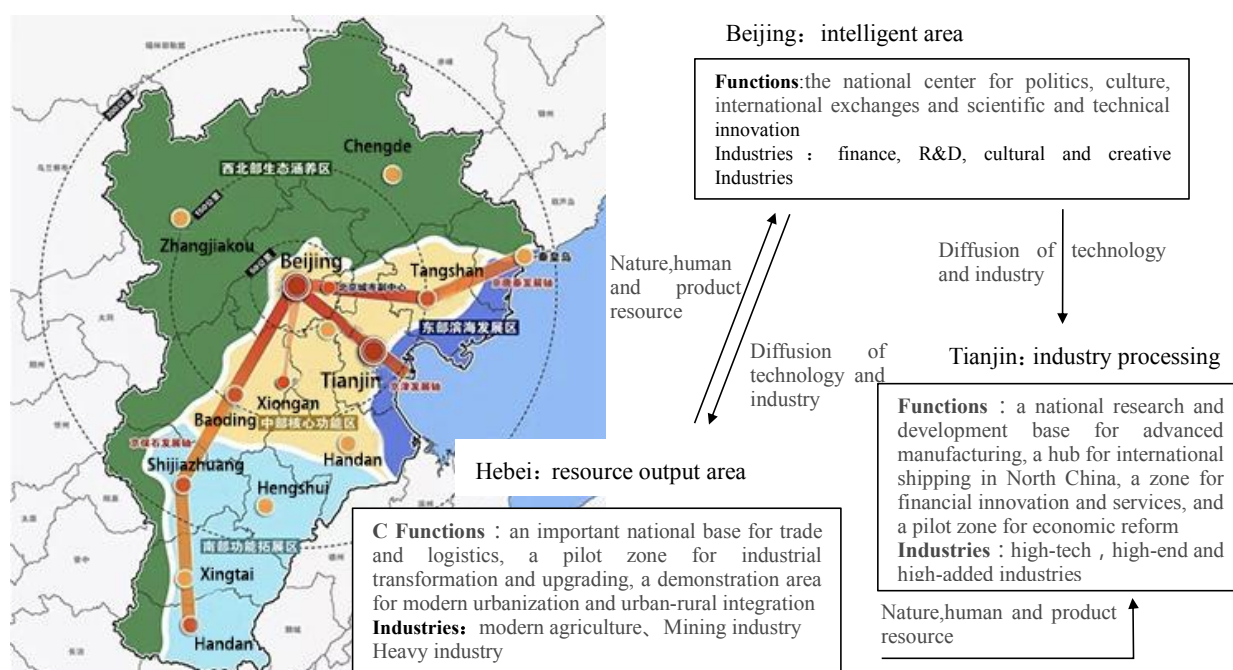
'By easing the Beijing non-capital function, adjust the economic structure and spatial structure, out of a new way of intensive development, to explore a population-intensive areas of optimal development model to promote regional coordinated development, New growth norm ', which is Xi Jinping in 2015 Central Financial Leading Group at the ninth meeting made clear instructions.

a) By 2017, breakthroughs in transport integration, environmental protection, and industrial upgrading in the BTH region will be achieved, with “remarkable progress” made in curing for Beijing’s megalopolis disease.

b) By 2020, the pressure of congestion and air pollution will be eased significantly, and the Beijing's population will be controlled into 23 million. Regional industry linkage will be created. A efficient and convenient transportation network will take shape, and the social imbalanced development between cities of the BTH region will be reduced with solid progress in public service equalization, such as education and medical care.

c) By 2030, a coordinated pattern of regional development will take shape, with a rationalized economic structure, improved environment, and generally equalized public service. Beijing, Tianjin and Hebei, each makes its plan according to its own current local conditions and advantages, which has led to the unevenness in the development in the region. The conflict and unevenness in the three regions have been formed on a long-term basis, and are closely related to the major functional orientation of the overall planning, as shown in Fig 5.4.

Fig.5.4 The geographic distribution pattern in BTH region



Source: 1、http://language.chinadaily.com.cn/2015-08/24/content_21686956.htm

2、<https://www.xuehua.us/2018/04/04/推动京津冀协同发展的供应链创新与应用/>

Under the strategy proposed above, the planning stipulates a spatial structure for the mega-region area, characterized as one-center, four-cores, six-axes, four-zones and multi-points (Figure 5.4). One core is Beijing-centered and four cores are Baoding, Langfang, Chengde and Zhangjiakou, four regional cores. Six axes are six developmental corridors. Four zones are four growth poles in peri-capital areas. multi-points include those industrial parks and towns. The spatial structure of the UBTHA identifies the main cores and nodes to serve for the whole regions.

5.6.3 The master plan of Beijing:2016-2030

Due to the transfer non-capital functions are one of an important components for Xiongan's historic mission. Whether Xiongan will become a third economic engine in a word just as Shenzhen and Pudong, in a word, depends on the degree, to which Beijing's non-capital functions

and resources are transferred to Xiongan in the near future , because Shenzhen's development mainly depends on Hong Kong's strong economic strength,and Pudong is supported by Shanghai's role as an international commercial、 financial and trade center.

Therefore , it is necessary to research into the latest urban master plan of Beijing and its other previous conditions to determine the exact development orientation for Xiongan new area,through summing up the historical trajectory of the development of Beijing city in the past decades , and solving the series of urban problems accumulated during this period.

In general , Beijing's urban master planning with socioeconomic development and political instability can be divided into three rounds since 1949, there are the earliest Beijing construction planning under Maoism in 1949-1970s, the urban development planning under Deng's ideas in 1980s-1990s,and the great Beijing urban plan under globalization after 2000 (Gu Chaolin, 2010). As shown from the table.6.4 , with the actual needs of Beijing's economic development and changes in political environment, the overall positioning of Beijing city from the beginning of the industrial center (industrial base), the economic center has gradually transformed into the cultural, international communication and technology center,which is also synchronized with the needs of Beijing's industrial upgrading and transformation.It seems like that the previous administrations have struggled with trying to balance Beijing's burden of doubling as an over-integrated metropolis.Besides , Beijing's population has been gradually rising , although each version of master plan set an expected goal to avoid being an over-crowded living environment , but a number of immigrants from all parts of China flowed into Beijing during the past decades.

Table.5.4 The historical evolution of Beijing's master plan

Time	Item	City positioning	Expected population	Actual population
1958	Initial Plan of the Beijing City Construction General Planning (Draft)	Beijing put forward the issues to establish satellite towns and planned to build 60 industrial projects at some places around the city	Up to 10 million residents in about 50 years	17.71 million residents by 2008
1973	Beijing City general construction planning	A clean socialist capital with modern industrial, modern agriculture, modern scientific culture and modern urban facilities	-	-
1983	Beijing City Construction General Planning	National political and cultural center	Up to 10 million residents by 2000	13.64 million residents by 2000
1993	Beijing City General Planning (1991-2010)	National political and cultural center , as well as the international brilliant ancient capital and modern city	Up to 13.6 million residents by 2000 , 15 million residents by 2015	21.71 million residents by 2015
2004	Beijing Urban Master Planning (2004-2020)	The great capital of PRC , the national political and cultural center, and the international brilliant ancient capital and modern city	Up 18 million residents by 2020	21.72 million residents in 2016
2016	Beijing Urban Master	The capital of PRC,the national	Less than 23 million	After a long

	Planning (2016-2035)	political center, cultural center, international communication center, science and technology innovation center	residents by 2020	period will be controlled in a stable range about 23 million residents
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Source:1、Beijing municipal commission of housing and urban-rural development , official online site :
<http://www.bjjs.gov.cn/>

2、The statistical yearbook 2010-2016 and The Beijing city's 60 years

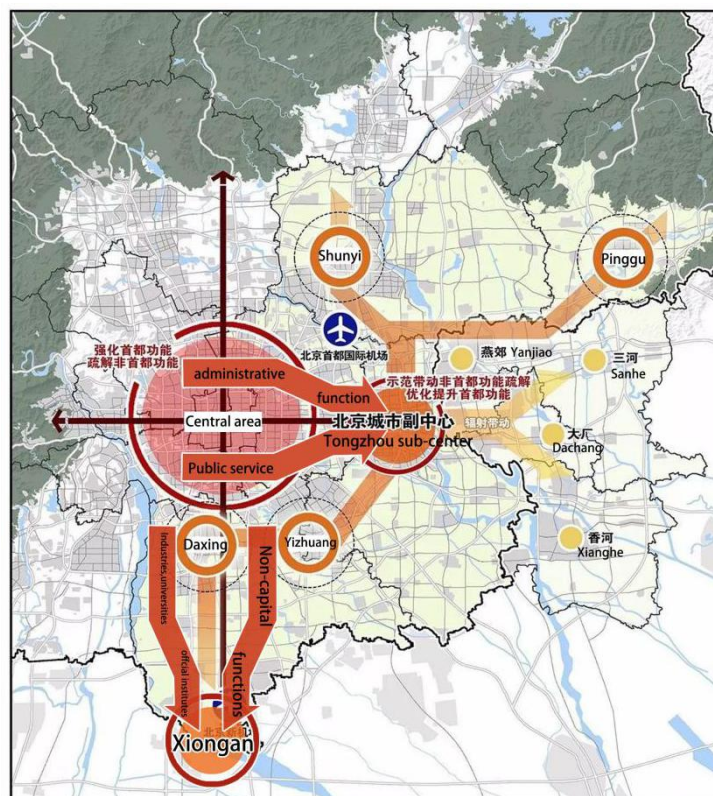
In September 2017, the state council approved the newest edition master plan of Beijing. Actually, this ambitious plan is made up of eight chapters, such as closely connected with the city's strategic positioning, closely involved in the relief of non-capital functions of the nose, trying to crack the 'big city disease', improve urban governance capacity and towards the international first-class harmonious and livable capital of the planning blueprint. As regards the spatial layout, the master plan proposing a 'one main one sub, two axis more area' urban spatial structure, Beijing will continue to improve its urban structure to change the old development model featuring a single center. And the city's functional restructuring and the reduction of non-capital functions should be pushed forward unswervingly.

Hence, the most important focus point in this plan, is the first time for Beijings' authorities to jump out the limited Beijing city cycle, allowing the regional coordinated development view to look at the city's environmental capacity、general positioning and growth pressure in the future, instead of only being limited, based on Beijing's practical conditions and residents' expectations. According to the report, the details are covered in the new-added VI chapter "To strengthen the urban-rural coordination, to achieve the integration of development", and the Chapter VII "To deepen the cooperation of Beijing-Tianjin-Hebei region, building the world-class metropolitan area based on the capital metropolis". (Fig.5.4) As to Beijing-Tianjin-Hebei coordinated development, Beijing will be the driving force in jointly forging a world-class city cluster with the capital as the core.

In Chapter VII, it involves a series of beneficial supporting programs and plans for assisting with the construction and development of Xiongan new area, for instance, establishing the convenient and efficient transport links (within 30 minutes) between Beijing and Xiongan; supporting the non-capital resources transfer from Beijing to Xiongan, and actively guiding the state-owned enterprises and Zhongguancun's companies to participate in the construction of Xiongan, encouraging them to set up new productive base and to form a new Zhongguancun Science and Technology Park with high-tech industries. In addition, boosting the full range of cooperation in public services and other well-being aspects to support Xiongan evolving into a integrated multi-functional district gradually, such as high quality schools, hospitals, universities and vocational colleges, and jointly promoting the construction of comprehensive public service facilities in health care, education, culture, sports, pension aspects.

Moreover, in terms of the issued document of State council, the paper points out 13 constructive suggestions, including the promotion of Jing-Jin-Ji cooperative development, the high-level construction of Beijing sub-center, and the improvement of urban main-functions and elements allocation etc.

Fig.5.5 Beijing Urban Master plan 2016-2030:
urban development structural conceptual planning



Source : 1 、 Beijing Municipal Commission of Urban Planning and Land Resources :
<http://www.bjgtw.gov.cn/web/index.html>.

2、Redesigned by author.

6 The outline of Xiongan new area' s planning

Recently, on April 21st, the CPC Central Committee and the State Council released the "Planning outline for Xiongan New District in Hebei", which is the first official document to guide Xiongan's planned economic construction. Combined with the various documents approved by the government, and the related domestic research reports and articles that focus on the application of innovative urban development theories and patterns, as well as the contexts of the rural policy of master plan that I took internship in the CAUPD, we try to make reasonable predictions and interpretations for the future development of XND.

In this chapter, I will mainly elaborate on the following aspects: forming a scientific and reasonable spatial layout; shaping a characteristic urban style; constructing a green, smart city and a beautiful natural ecological environment; developing high-end, high-added, high-tech industries; providing quality oriented public services and building a modern city security system; and constructing efficient and convenient modern transportation network.

6.1 Building a scientific and rational spatial layout

6.1.1 Urban and Rural Spatial Layout

Taking into account the orientation, development goals and current conditions of Xiongan new area comprehensively, the latest urban master plan adopts a "one main, two city axis, five auxiliary (wufu) and multiple functional nodes" urban and rural spatial layout.

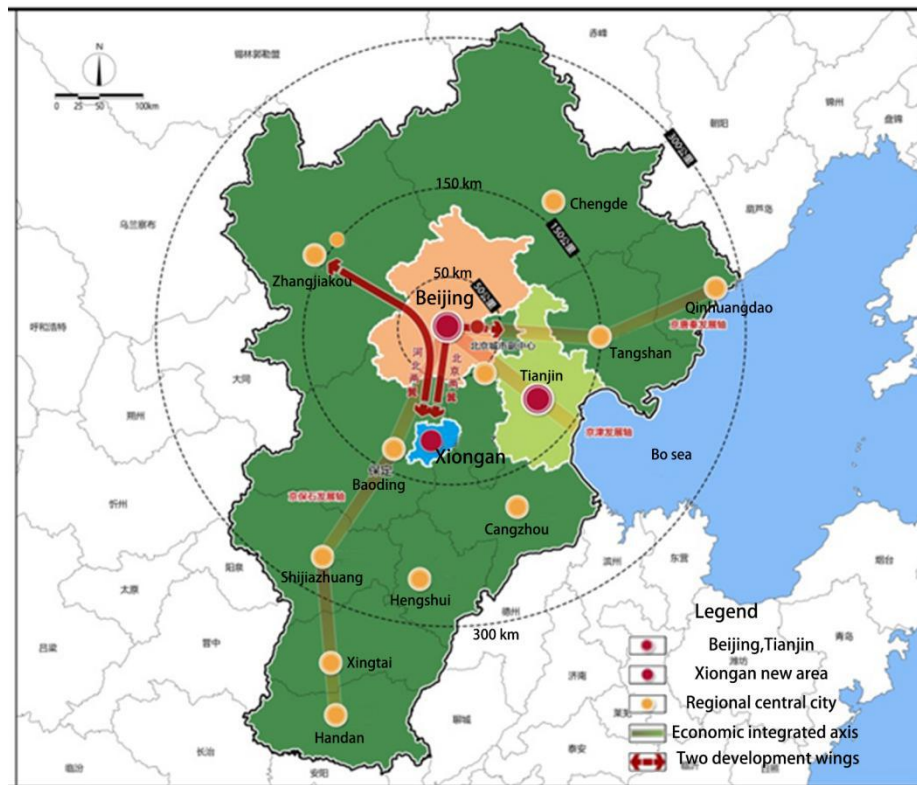
"One main" refers to the initial planning area, which is determined as the starting area between the Rongcheng and Anxin counties, and it is also the central urban area of the entire new town project.

"Two city axis" means the two most important urban development axis that connect the central area and other functional nodes. The North-South axis shows the characteristics of historical culture and ecology, highlighting the central axis symmetry, denseness, and delicate balance; The east-west axis uses traffic corridors to connect cities in clusters and gather innovative elements, institutions, headquarters companies, and financial institutions.

"five auxiliaries" is Xiong County, Rongcheng, Anxin County, and five peripheral groups of Zhaili and Qianggang, which could expand the urban area of two counties -Xiongxian and Rongcheng, optimize and adjust Anxin to establish an ecological isolation zone from the starting area.

"Multi-node" consists of several small towns and villages with sound industrial base, abundant natural resources and excellent development potential value, which is based on the strictly classified features, the demarcation of characteristic small town development boundaries, and the prohibition of large-scale development of real estate.

Fig.6.1 Schematic diagram of regional spatial structure of BTH region



Source:1、 Planning outline for Xiongan New District in Hebei

6.1.2 General planning of the initial area

Based on the constraints of factors such as industry base, topography, hydrographical condition, ecological environment and human cultural resources, this plan adopts a scientific multi-group layout model to form the overall spatial pattern of “North City, Middle Garden, and South Lake”.

"North City": Making full use of the higher topographical advantage of the northern region and scientifically plan five urban units with relatively complete functions. the clusters are isolated by green areas, a river networks, and wetlands;

"Middle Garden": Due to the low-lying of the central area, and combined with the construction of a sponge city to create a characteristic landscape where the new town will be harmonious co-existence between man and nature.

"South Lake": it means the Baiyangdian area in the south. through the upgrading and restoration of the surrounding villages and towns, as well as strictly controlling the construction activities in the lakeside area and utilizing the existing natural and human-made resources to create a series of characteristic cultural heritage and ecological landscape.

Fig.6.2 The master plan of starting area



Source: 1、Planning outline for Xiongan New District in Hebei, 2018

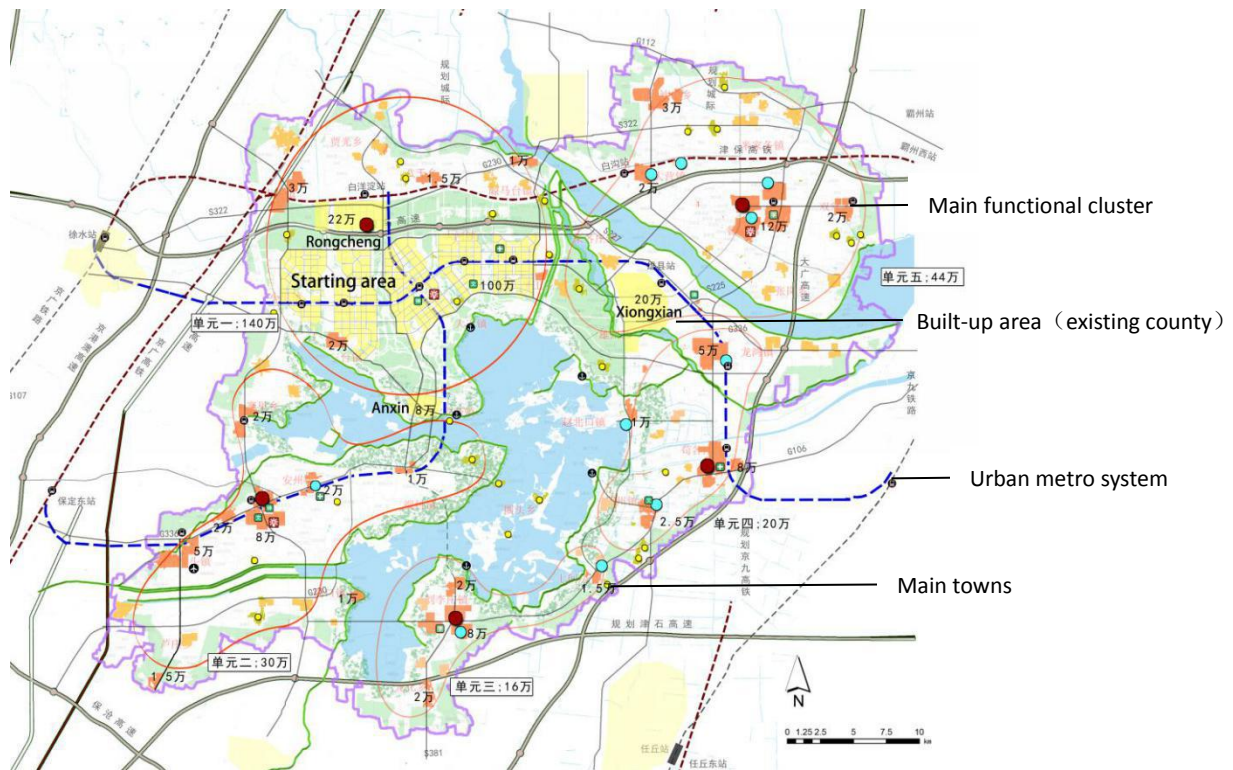
6.1.3 Land scale, spatial pattern and population size

1、Reasonable control of population density: Delineation of the starting area, peripheral groups, and the development boundary of characteristic small towns will be implemented. With reasonable control of population density, the new district planning and construction area is controlled by 10,000 people per square kilometer.

2、Adhere to ecological priorities and insist on the continuous optimization of the eco-system in Xiongan, and the proportion of natural ecological protection areas and public green areas is more than 70%. In addition, the new area's intensity will be contained strictly within 30% in the long-term perspective, and the total scale of built-up area is stable at 530 square km.

3、Strictly protect ecological red lines and permanent basic farmland. Cultivated land makes up about 18% of the total area of Xiongan, of which permanent basic farmland is not less than 10%. And rationally determine the three limited lines for ecological protection red line, permanent basic farmland and urban development borders, promote the cooperation and convergence of various types of spatial planning, for example, the special planning for land use, ecological protection, historical and cultural protection.

Fig.6.3 The distribution of urban-rural population in Xiongan(unit: 万/10000)



Source:1、Planned by author in CAUPD.

6.2 Shaping a modern city style with regional humanistic and natural characteristics

The urban design of Xiongan should adhere to the integration of Chinese and Western cultures, focus on China, blend ancient and modern, promote Chinese excellent traditional culture, preserve Chinese cultural genes, highlight regional cultural characteristics; strengthen urban design, shape urban features, protect history and culture, and embody historical inheritance, civilization and tolerance, and time innovation of Xiongan style.

6.2.1 Overall Urban Design

a) Initial area urban design: Chinese and Western combination

In order to achieve the perfect integration of the unique elements such as the lake, the new town, the forest area, the farmland, and deepening the spatial layout of “North City, middle park, and South Lake” we can draw an intentional scene of “One City, Two Axis, Five Clusters, Ten Parks, Hundred Flower Field, Millennium Forest, and Thousands of Waves” . . Inheriting the concept of the Chinese camp city, building a “Square Town” with a symmetric layout and a pleasant neighborhood measure; in accordance with the design philosophy of inheriting history and creating the future, we will shape the urban axis that embodies the Chinese civilization, the urban spirit and the function of the center; The concept of completeness and space density has the purpose of laying out a compact group of five scales with appropriate functions, mixed functions, and a balance between office and work life; using hydrographic features and historical culture to create an ecological garden centered on the Dagou ancient lake; and retaining farming memory, constructing an amazing landscape and livable environment with the flower and green

seas; large-scale tree planting and afforestation will be implemented by the Xiongan government, constructing a well-rounded ecological environment surrounded by forests in the periphery of the starting area; rejuvenating the ecological environment of Baiyang Lake; The ecological landscape of the waters realizes the coexistence and prosperity of the city.

b) Planning and designing city axis

The North-South axis shows the characteristics of historical and cultural ecology, highlighting the central axis symmetry, density, and delicate equilibrium; the east-west axis uses traffic corridors to connect cities in clusters, and gathers innovative elements, institutions, headquarters companies, and financial institutions.

c) Shaping the city skyline

Strictly control the height of the buildings, and based on the urban functional layout and industrial characteristics, planning and construction of high-rise buildings in a specific area of Xiongan to create contoured, undulating urban skylines and unique urban space patterns.

6.2.2 Special urban features of Xiongan

Based on local conditions, we design and plan a plenty of environmental landscapes, to integrate the different essences of Chinese and Western architecture, with a focus on architecture and the ancient and modern architecture; to form the unique urban style in China, lake scenery, and innovative fashion; to construct a attractive, nice, suitable and shared urban public space.

6.2.3 Protection of history and culture

Protect and develop historical cities and traditional villages and towns, of which the most important aspect is the the protection and rational use of cultural relics. The organic integration of the protection of iconic historical relics and the construction of urban public space organically protects traditional core areas where the historical spatial pattern is clear and the traditional style is more complete. It inherits and displays the production practices and folk cultural activities in the township.

6.3 Creating a Beautiful Natural Ecological Environment

Coordinating the management of urban forests, forestland, lakes, we will carry out large-scale afforestation campaigns, promote coordinated regional watershed management, carry out greening of national land, do a good job of Baiyangdian's ecological environmental protection, and restore the function of "the kidney of North China", comprehensively upgrade the quality of ecological environment, and build a model city of ecological civilization in a new era.

6.3.1 Implementation of Baiyang Lake ecological renovation

Restoring the total amount of water deposited, and implementing measures such as returning farmland to lakes, ensuring that the water area in the natural protected area gradually recovers up to around 360 square kilometers.

Achieving the high water quality standards, strengthening the management of water environment, insisting on the "control of source-sewage of pollution-river" system of basin management methods, implementing strict governance of river water quality goals, comprehensively controlling the industrial pollution sources, we should also optimize the collection and treatment of sewage in rural area such as towns and villages, effectively control the pollution of agricultural sources and

create a good ecological environment for rivers, and ensure that the water quality of the rivers in the Baiyang Lake meets the national standard, and gradually restore the water quality to III-IV. Moreover, we will carry out the ecological restoration work, making full use of the existing natural ecological resources base, and plan to build Baiyangdian National Park in the long-term program, which will promote the improvement of bio-resources protection measures, maintain the unique natural habitats and landscapes in the Baiyang Lake area, and eventually achieve the goal to support the integrity of wetland ecosystems in the Dian area.

6.3.2 Strengthening Ecological Environment Construction

We should carry out a large-scale afforestation movement and promote the construction of a stable ecological security pattern in Xiongan. Planning and constructing of "one lake, three belts, nine districts, and multiple corridors" will eventually form an ecological city with forest-city integration and forest-water dependence by creating a high-quality urban ecological environment with a pleasant and convenient public park system consisting of large-scale countryside ecological parks, large-scale integrated parks, and community parks, And by creating a suitable urban living environment, the green space system in Xiongan should construct an open space pattern that integrates large-scale rural ecological parks, large urban comprehensive parks and small community parks.

6.3.3 Launching a comprehensive environmental management campaign

In order to address the air pollution, soil pollution and other environmental problems in the new area, the government should adopt a regional environmental collaborative governance model to ban the construction of high-pollution, high-energy-consuming companies and factories by law, To improve the level of clean production, energy conservation, emission reduction, and comprehensive utilization of resources in traditional industries, we will also focus on the reasonable measures to clean, rectify and disperse polluting enterprises, rural domestic waste, and industrial solid waste so as to raise the overall level of the ecological environment in the new area.

Fig.6.4 Eco-environmental governance and protection planning of Baiyang Lake



Source: 1、Planning outline for Xiongan New District in Hebei, 2018

6.4 Development of High-end and High-tech industries

Combined with the development orientation of the China's major strategic position, accurately docking the non-capital function of Beijing, through actively absorbing and gathering innovative factor resources, laying out high-end high-tech industries from a high starting point, accelerating the transformation of traditional industries, and building a modern industrial system featuring scientific and technological innovation, modern finance, and human resources.

6.4.1 The transfer of non-capital function from Beijing

As well all know, Beijing will play a crucial role in the development process of Xiongan new area, according to the existing official documents and planning scheme, as well as the overall strategic positioning of Xiongan new area, we can summarize several key industries and development direction.

In the area of educational problems, we will focus on the establishment of a branch campus, innovation platforms or innovation centers in Xiongan, especially for some top colleges, universities and research institutes. In terms of medical and health areas, it is necessary to undertake high-end medical institutions to establish branches and research centers in Xiongan. In terms of financial institutions, and in the area of high-end service industry and high-tech industries, we will accommodate certain advantageous companies in the fields of software and information services, designing, creativity, consulting, information technology, bio-medicine, energy conservation and environmental protection, and high-end new materials, as well as corporate headquarters and branches of banks, insurance, securities, Chinese and foreign large companies.

6.4.2 Identifying the key development industries

As we just mentioned above, Xiongan should focus on the development of high-tech, high-end and high-added industries, and set up a typical model for the upgrading and transformation of industrial structure in other Chinese cities.

Table.6.1 The main industries of Xiongan for future development

Item	Development area
information technology	big data, cloud computing, artificial intelligence, industrial Internet, and network security
science and biotechnology industry	brain science, cell therapy, genetic engineering, molecular breeding, tissue engineering
new material industry	new materials, such as artificial intelligence, broadband communications, new displays, high-end medical care, and high-efficiency energy storage
high-end modern service industry	science and innovation services, business services, smart logistics, modern supply chain, digital planning, digital creativity, wisdom education, smart medical services
green ecological agriculture	nursery stock and flowers, and build a modern agricultural facility park

Source: 1、Planning outline for Xiongan New District in Hebei, 2018

6.4.3 Optimizing the industrial spatial layout

In chapter III and IV , I have briefly outlined the development history and types of China's new town. Due to the lack of scientific planning and development methods, China's new town movement has continued to a unreasonable development model-the separation of industries , which has caused great trouble for people's life and work.Hence, we must adhere to the principle of integration of production and cities, balance of work and residence, and production with water, and the principle of production and prosperity for Xiongan new area. We should adopt a more scientific functional structure with a combination of concentration and decentralization to promote the formation of a coordinated development of the starting zone, peripheral groups, and characteristic small towns (Table.6.2).

Fig.6.5 Schematic diagram of urban-rural spatial layout

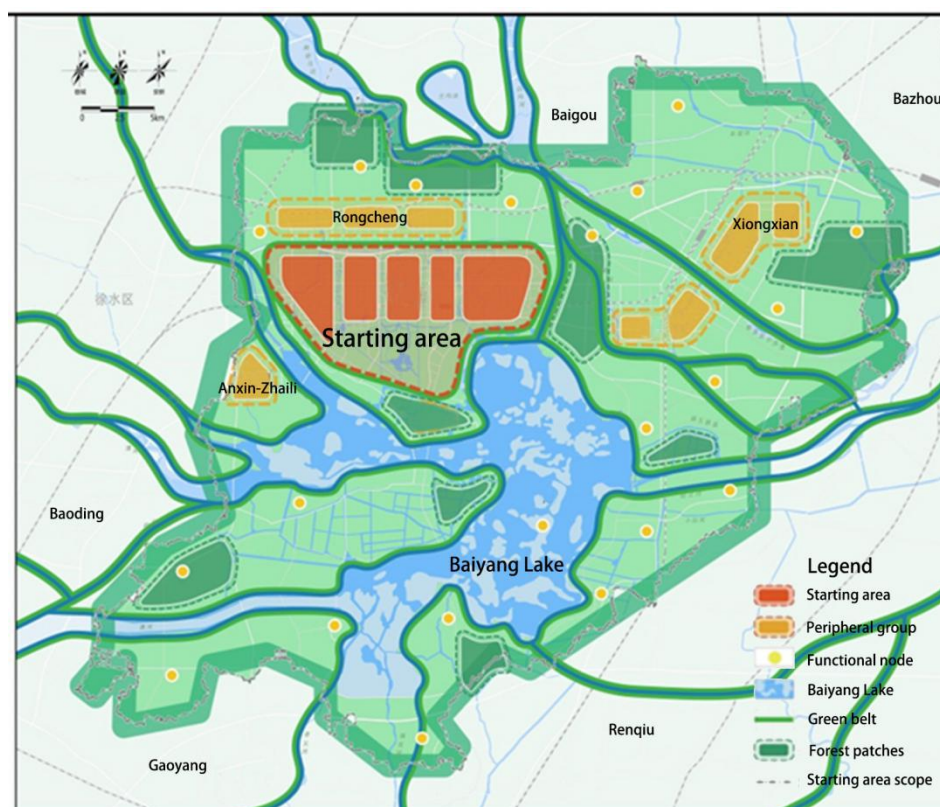


Table.6.2 The industrial spatial layout of Xiongan

Item	Content
Starting area	Undertaking functions such as Beijing-dissolved institutions, headquarters companies, financial institutions, colleges and universities, and research institutes, focusing on the development of artificial intelligence, information security, quantum technology, supercomputing
Five peripheral groups	High-end high-tech industries, such as electronic information, life science and technology, cultural creativity, military-civilian integration, and technology research and development
surrounding characteristics of small towns	1、North small towns: high-end services, network intelligence, and civil-military integration 2、South small towns: modern agriculture, ecological environmental protection, biotechnology, science and technology finance, and cultural and creative industries

Source:1、Planning outline for Xiongan New District in Hebei, 2018.

6.5 Forming a convenient and fast transportation network

For the comprehensive transportation planning of Xiongan new area is undoubtedly a decisive factor whether Xiongan will be successful in the future, especially for the transfer of factors from Beijing at the starting period such as the industries, capital and population.

Therefore, Xiongan should insist on the public transport priority, and speed up the cultivation of a comprehensive transportation network, including the rail transit system, the highway network and the urban transport facilities, connecting Xiongan with other cities of BTH region and Beijing Second International Airport in light with the demands of a networked layout, smart management, and integrated services.

6.5.1 Upgrading the existing regional transportation system

According to the already published documents and plans, it is not difficult to find that the Chinese government has started to improve the existing regional high-speed railway network to build a “four vertical and two horizontal” modern railway system, and to strengthen the connection between Xiongan and other cities of BTH region such as Beijing, Tianjin, Baoding. Finally, Xiongan will achieve the efficient integration with outside world and the BTH economic area, 20 minutes to the Beijing Second international Airport, 30 minutes to Beijing, Tianjin and Baoding. Another important part is improving the highway network and promoting the aviation service standards, which will be good for the logistic system of Xiongan and the transportation network links with Tianjin Port, Huanghua Port, Beijing airport and Tianjin airport, and open the new area to the world. What’s more, based on the planned high-speed railways, intercity stations and surrounding airport, we will optimize the connectivity of road networks and diverse modes of transportation to form a comprehensive transportation hub in Xiongan new area.

6.5.2 Building a high-standard urban transportation system

It depends on the development requirements and expect population scale of the new area and the needs of traffic travel, adhering to people-oriented, green, networking, multi-mode, and intensive type planning principles, Xiongan will construct an efficient urban rail transit, a fully functional new district backbone road network with scientifically planned road network density, a dedicated bus transit corridor, a greenway network that connects inside and outside, and an intelligent, shared sharing logistics system.

6.5.3 Creating a green and integrated smart transportation system

Xiongan should promote a healthy living style, building a “bus + cycling + walking” mode of travel and a perfect bicycle and pedestrian road network to increase the proportion of green traffic and public transport. The proportion of green traffic in the initial area will reach 90%.

In addition, considering the rapid development of high technology such as internet and big data in China, an high efficient logistic system, a digital smart transportation infrastructure and a global dynamic traffic control system are also worthy to apply in the starting area.

Fig.6.6 Regional high-speed railway network of Xiongan

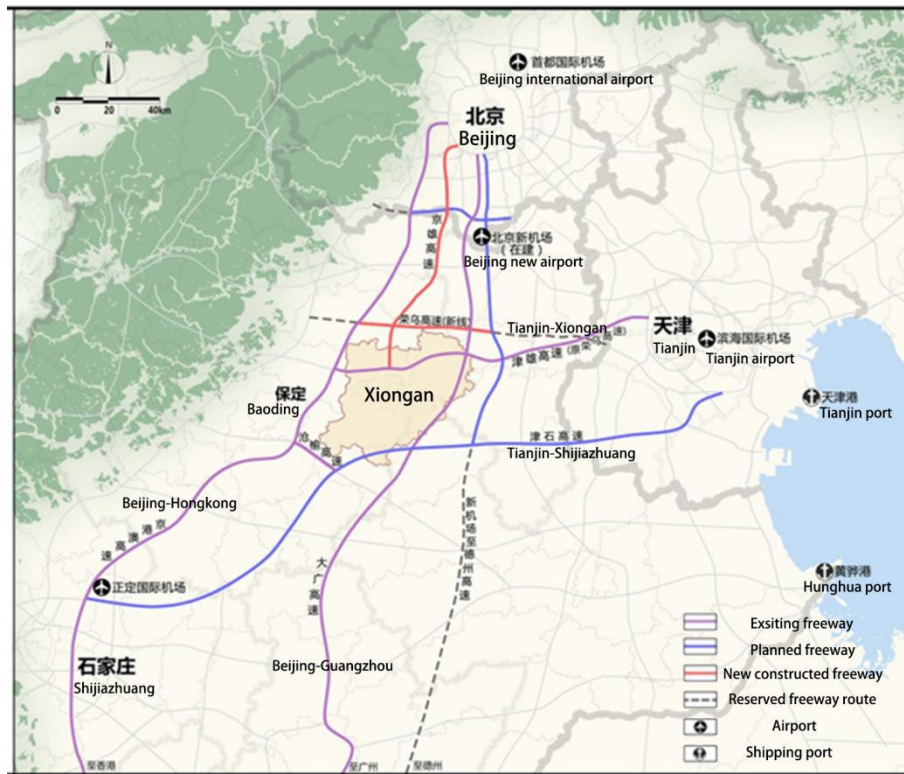


Fig.6.7 Regional freeway network of Xiongan



Source:1、Planning outline for Xiongan New District in Hebei, 2018.

6.6 Providing high-quality public services

Different from the disorder city-building movement in the previous stage, the development and construction of Xiongan New District should adhere to the people-oriented principle to create a modern new city that is suitable for living and sustainable development; focusing on safeguard and improve people's livelihood, and making full use of the transfer high-quality resources from Beijing and Tianjin, such as quality education, medical and health care, cultural and sports activities; building a quality shared public service system, improving the level of public services; building a diversified housing security system, to enhance the sustaining capacity, clustering power, and attractiveness of the new area.

6.6.1 Layout of quality public service facilities

Build a network of urban basic public service facilities. build a three-level public service facility system of “city-cluster-community” to form a multi-level, full-coverage, humane basic public service network.

Build group, community, and neighborhood living circles. In accordance with the service levels, service targets, and service scopes, the group center, community center and neighborhood center will plan and build basic living facilities including hospitals, elementary schools, secondary schools, shopping malls, cultural and arts centers, sports fields, community service centers, and 24 convenience stores, and forming 15, 10, and 5 minutes of living cycle respectively.

Build public service facilities for the urban-rural integration. Suburban rural areas share urban educational, medical, and cultural service facilities. Characteristics of small towns and Chinese beautiful countrysides are equipped with basic public service facilities, basic production service facilities, and village-based basic living areas, such as schools, health centers, nursing homes, cultural stations, sports and fitness venues, and other public service facilities.

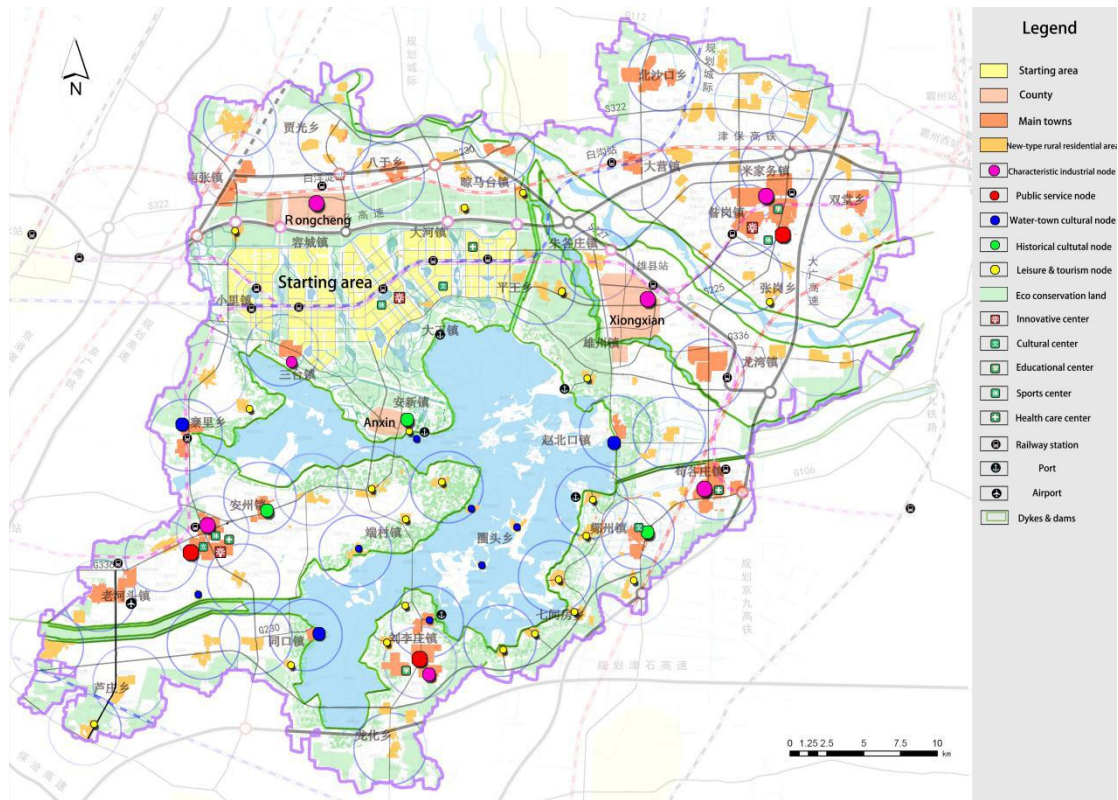
6.6.2 Establishing a new-type public housing security system

In view of the current abnormally developed Chinese real estate market, Xiongan shoulders the problem of exploring the initiative public housing system and the supply of developing construction land under the market economy system. Therefore, we will establish a housing system that provides multi-subject supply, multi-channel guarantees, and rent-purchase measures. We will improve multi-level housing supply policies and market regulation systems, and strictly control real estate development. Establish a long-term mechanism for speculation. Explore real estate financial product innovation.

6.6.3 Constructing a smart digital city

Building a digital citywide digital signage system and build a unified open platform for the city's Internet of Things, enabling unified access, centralized management, remote control, and data sharing and distribution of awareness devices. Building a ubiquitous wireless network with all ground-to-ground underground access and multi-network cooperation, and build a complete metropolitan backbone network and a unified smart city private network. Setting up multi-level inclusive computing facilities such as cloud computing and edge computing to achieve millisecond-level response of city data exchange and early warning deduction.

Fig.6.8 The layout of high-quality public services in Xiongan



Source:1、Planned by author in CAUPD.

7 Conclusion

From the early 20th century in the United Kingdom to the 21st century, in the rapid development of China, the New Town Movement has undergone a series of tremendous changes in the terms of time, space and form.

However, China's new town construction activities is different from the same process in Western countries, and has developed mainly under the demand of promoting economic growth and urbanization. Its construction originates from the establishment of various development zones after the reform and opening up policy (1978), which are dominated by the expansion of industrial districts. Then it entered the construction process of expanding urban development space that oriented by the multi-functional districts and the comprehensive urban towns. Today, under the background of market socialist economic transformation and the unbalanced regional development, it is necessary to establish a new model of urban area to narrow the regional development gap and to showcase the development achievements and the national self-confidence of China in the past 30 years.

Therefore, the establishment of Xiongan new area is properly a concentrated manifestation of China's exploration for the new generation of urban development, which based on the unique advantage of superior location, great resource conditions, and broad potential development space for not only becoming the optimum centralized bearing land to address the big city disease of Beijing, but also have also served to ease the non-capital functions from BTH region. More importantly, It will become a new benchmark for China's urban construction in the new era and a world model of a new town that embodies China's coordinated regional development.

In other words, the establishment of the Xiongan New District has been highly anticipated and demanded by the Chinese government and people. However, in light of the actual China's economic and social conditions and the existing controversial issues during the development process of new town and area, there are still many challenges to be worthy of well thinking and studying.

1、Material construction and social development of New town

As we all know, the new town can provide people with a good living environment and modern life service facilities. The development and construction of the new town also attracts diverse resources such as capital, technologies, and population to the city, compared to the old city, the new cities around the world generally have higher efficiency and vitality.

As most of the new towns are quickly built up from the almost empty non-construction sites in accordance with man-made planning, unlike cities that have developed naturally following the traditional methods, which were strongly influenced by the subjective factors of planners and builders during its growing process.

Due to the lack of comprehensive, systematic, and scientific design and planning, such emerging cities generally have many social problems. Hence, the rulers are required to consider potential problems as early as possible in the initial stages of construction, especially the social, environmental, and cultural issues of immaterial space that were difficult to detect at the beginning. For example, the employment, transportation, male-female ratio, age structure, the balance and integration of various social strata, and the special preferences of specific social groups that all

need to be fully considered and rationally arranged in the beginning.

At present, China is in the period of rapid urbanization, because of the political particularity of the one-party ruling, the government gives priority to invest a large amount of manpower and resources into material construction, and it is easy to overlook the consideration of social issues. In the long run, these problems are likely to damage the sustainability of the new town's growth in the future.

2、Rationality and resilience of new town planning

Due to the periodicity and diversity of social development, China's urban planning has drawn more lessons in view of conceptual theories and practical cases from the Western developed countries. However, considering the wide differences in historical culture, living habits, and economic development, these theories cannot fully meet the actual needs of the Chinese people that must be creatively transformed by the planners.

But the reality is that, under the slogan of blindly pursuing modernization and urbanization, "borrowlism" is the most convenient and reliable method; meanwhile, the hired international experts and designers often lack an in-depth understanding of China's national conditions, histories and cultures, which can easily make the planning program based on the empiricism, resulting in the lack of public space for residents' social activities in new town, and without a traditional culture and living atmosphere.

Just as mentioned above, most of the new town planning are "like a blank sheet, which can be used to depict the most amazing pictures according to human intentions". In fact, based on the pure rationality of modernism represented by Chandigarh and Brasilia, we neglected the human-centered design ideology and ignored the various needs of the city as a huge and diverse urban complex. It is far from satisfactory in terms of shaping urban space with human dimensions, creating a colourful and dynamic urban atmosphere, and providing convenience for urban residents. Unfortunately, it is true that most of China's new towns still inevitably embarked on the same erroneous roads, including Shanghai Pudong New Area, which has partly pursued the vanity projects and ignored the diversified needs of people.

The growth of natural cities requires a long time to catalyze. In such a long-term process, the various components of the city are constantly running in, constantly finding problems and solving problems. A city's growth is a huge systematic project, which requires urban planners and designers, and of course, including the government decision-making departments as well that must be abandon the bureaucratism during the entire planning process, to reserve space for the development of new towns, and to provide the possibility for every resident who in the new town with a free, personalized and vibrant life.

3、The theory and practice of new town planning with Chinese characteristics

As stated above, in the length and breadth of land of China, there is a vigorous urban construction campaign in the history of human development. According to the China's special domestic conditions, the rapid expansion of cities has made China's urban planning directly facing a large number of practical problems without systematic theories. Foreign experiences and practices were introduced into China but they could not provide direct basis for the development of each city. Experience is irreproducible, and each city is forced to seek a model of urban construction that reached its own development in practice.

Xiongan new area is at the turning point of China's economic and social comprehensive transformation and the construction of a modern, powerful and characteristic socialist country, to summarize and reflect the urbanization process in the past on time, and to explore and study the future path of urban development rationally, which is a epoch-making trans-era meaning event with a far-reaching influence.

Whereas, this is also the my main purpose to complete the dissertation: through the summary of history and typical cases, the study of the origins, the characteristics and the development process of the new town construction will be studied, trying to solve the problems of "Why", "What " and "How" in China, and I look forward to contribute a bit of work for the new town's theoretical study of China and the planning and construction of the Xiongan new area in the new future.

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