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Policies on Categorized Governance of China's Urban Agglomerations in 14th Five-Year Plan

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Policies on Categorized Governance of China's Urban Agglomerations in 14th Five-Year Plan

Abstract
From the 14th Five-Year Plan to 2035, urban agglomerations will remain the main form of China's urbanization. At present, the development of China's urban agglomerations has been diversified, the development pattern of their regions is increasingly differentiated, the strategic objectives of serving the protection of land and space development are diversified, and modern governance methods require precision. Therefore, it is necessary to classify and guide the development of urban agglomerations. Aiming at the problems that the comprehensive policy to classify urban agglomerations in China are not accurate and characteristic enough, this study proposes the "four specials + comprehensive" policy. Special policy guidelines are provided for the development of urban agglomerations based on the feature of scale, development mode, space organization, and resource and environmental carrying capacity, and comprehensive policy guidelines are provided for general questions. It is recommended that future urban agglomerations be a hierarchy in China's national spatial planning system, and each urban agglomeration should formulate a plan to determine its own policy package. In this study, three dimensions are proposed based on the national spatial development and protection strategic pattern, the national major regional strategic pattern, and the development law of the urban agglomeration. Three key points are put forward to promote the integration process of urban agglomerations and the expansion and improvement of urban agglomerations, and give play to the regional driving force of urban agglomerations. The policy framework of the four policy tools of "managing managers", "managing resources and environment", "managing production factors", and "managing business and living environment" is also proposed. From the special level, the types of urban agglomerations and precise policies are organized based on the scale, development model, spatial organization, and resource and environmental carrying capacity. At the comprehensive level, the main types and policy recommendations are proposed to guide the high-quality development of urban agglomerations in China.

Keywords
urban agglomeration; categorized policy; 14th Five-Year Plan; integrative development; spatial governance

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Abstract: From the 14th Five-Year Plan stage to 2035, urban agglomerations will remain the main form of China’s urbanization. At present, the development of China’s urban agglomerations has been diversified, the development pattern of their regions is increasingly differentiated, the strategic objectives of serving the protection of land and space development are diversified, and modern governance methods require precision. Therefore, it is necessary to classify and guide the development of urban agglomerations. Aiming at the problems that the classification of urban agglomerations by comprehensive policy in China is not accurate and characteristic enough, this study proposes the “four specials + comprehensive” policy. Special policy guidelines are provided for the development of urban agglomerations based on the feature of scale, development mode, spatial organization, and resource and environmental carrying capacity, and comprehensive policy guidelines are provided for general questions. It is recommended that future urban agglomerations be a hierarchy in China’s national spatial planning system, and each urban agglomeration should formulate a plan to determine its own policy package. In this study, three dimensions are proposed based on the national spatial development and protection strategic pattern, the national major regional strategic pattern, and the development law of the urban agglomeration. Three key points are put forward to promote the integration of urban agglomerations and their expansion and improvement, and give play to their regional driving force. The policy framework of the four policy tools of “managing managers,” “managing resources and environment,” “managing production factors,” and “managing business and living environment” is also proposed. At the special level, the types of urban agglomerations and precise policies are organized based on the scale, development model, spatial organization, and resource and environmental carrying capacity. At the comprehensive level, the main types and policy recommendations are proposed to guide the high-quality development of urban agglomerations in China. DOI: 10.16418/j.issn.1000-3045.20200408001-en

Keywords: urban agglomeration; categorized policy; 14th Five-Year Plan; integrative development; spatial governance

As an advanced spatial form and a vital part of global urbanization, urban agglomerations are a country’s major players in global competition and international division of labor [1]. It is no exception with China. Especially, in the wake of China’s social and economic development, urban agglomeration has become the key and optimized development area in China’s regionalization of main function [2]. From the 14th Five-Year Plan period to 2035 by which time China will have realized socialist modernization, urban agglomerations will bespeak China’s urbanization. They are the core growth poles with the strongest vitality and the greatest potential [3].

The development of China’s urban agglomerations has been diversified, the development pattern of their regions is increasingly differentiated, the strategic objectives of serving the protection of land and space development are diversified, and modern governance methods require precision. (1) Deepening industrialization and urbanization have given rise to urban agglomerations (or their prototypes), an advanced form of urbanization, in many regions in China. However, the degree of development varies greatly [4]. (2) Important changes have taken place in the pattern of coordinated regional development in China. Beijing-Tianjin-Hebei, Yangtze River Delta, Pearl River Delta, and Chengdu-Chongqing region have formed four core growth poles driving national economic growth. China’s regional difference in economic development is used to be seen between East China and West China. Now, the difference is also witnessed between South China and North China [5]. (3) According to China’s future land and space strategy, development, and protection pattern, different types of urban agglomerations are supposed to fulfill different missions [6]. Specifically, some participate in global competition on behalf of China, some promote the development of Central and West China to achieve the country’s goal of common prosperity, and still some are...
supposed to ensure national land and space security. (4) Different urban agglomerations have different development patterns, typified by coastal metropolises, mountainous urban agglomerations, and inland urban agglomerations. Modern governance mode calls for precise positioning so as to give full play to the comparative advantages and enhance China’s international competitiveness as a whole [7–14].

During the “14th Five-Year Plan” period, it is of great significance to classify and guide the development of urban agglomerations. How to accurately exercise policies, build and manage different types of urban agglomerations, and give full play to the important role of urban agglomerations with different natural and geographical conditions, stages of development, scales, and functions have become the key standard to measure the modernization of national governance capability.

1 Main forms of categorized governance

1.1 Governance of urban agglomeration based on “Four Specials + Comprehensive” policy during the 14th Five-Year Plan period

During the 14th Five-Year Plan period, China’s urban agglomeration, systematic and comprehensive as it is, values precise categorized policy, that is, “four specials + comprehensive” policy. “Four specials” policy means that different characteristics of urban agglomerations are identified from four dimensions, namely, scale, development mode, spatial organization, and resource and environmental carrying capacity. Corresponding classification and precise policy design are conducted. “Comprehensive” policy denotes that to comprehend some general and strategic policies, we should take the whole situation into account, indicating the top design of policies.

Resource and environmental carrying capacity, scale, spatial organization, and development mode are the four important factors affecting the classification of urban agglomerations for the time being and for a period of time to come. Regions with better resource and environmental carrying capacity tend to have greater population and economic scale [15]. From the trend of industrial mass production and global industrial development, city clusters with larger scale and higher energy level can facilitate the development of surrounding areas. However, a region’s carrying capacity is limited after all. The utilization of resources must be optimized, including its structure, so as to maximize their benefits. There are mainly two approaches for such optimization. (1) Within the urban agglomeration and in light of certain supply of resources, resources are allocated through reasonable spatial organization to cities with the most prominent benefits so as to maximize the overall benefits of the whole urban agglomeration. According to this logic, some cities should become large while some have to stay small. (2) In terms of development mode, not all cities should embrace energy-consuming and water-consuming industries. There must be rules governing the utilization of resources. Therefore, those regions highly globalized and undertaking science and technology revolution should take the lead in industrial upgrade and opt for industries consuming less resource. Some regions should take advantages of their land and water condition, resources, and environmental capacity to develop relevant industries. In this way, within the resource and environmental carrying capacity, urban agglomerations in a certain region can shape more reasonable scale, more orderly spatial organization, and more professional division of functions.

1.2 Urban agglomeration-specific precise and differentiated governance geared to the need of modernization

In the future, urban agglomerations should be regarded as a hierarchy in China’s national spatial planning system. Each urban agglomeration should formulate and plan its own policy package (Fig. 1). Although there are universal categorized policies, it is necessary for each urban agglomeration to formulate its own and tailored policy system based on national spatial planning. It can be predicted that, as far as precise governance is concerned, it will be difficult to divide China’s urban agglomerations into specific types. In other words, no policies of two urban agglomerations are the same. There may have some exceptions, such as an individual policy aiming at bringing the land use of megalopolis under strict control. But, it may only apply to one or two places. Hence, it is essential to improve policy precision through differentiated and urban agglomeration-specific policy design in accordance with the development intensity and strategic positioning of land and space.

2 Policies on categorized governance of China’s urban agglomerations

To policy makers and those implementing policies, it is important to understand or perceive the objective or outcome, the priority or starting point, and the measures or tools of policies and corresponding policy implementation. Policy objectives, priorities, and tools are the core content of the framework extending from design, formulation to implementation. The policy framework for categorized governance of urban agglomerations is also no exception, with emphasis placed on three dimensions, three key points, and four policy tools (Fig. 2).

2.1 Implementation objectives of categorized governance of urban agglomeration

(1) Given the second centennial goal and high-quality national spatial development and protection strategic pattern in
Fig. 1  Evolution of classification and guiding of urban agglomeration development

Fig. 2  Policy framework of categorized governance of China’s urban agglomerations

the new era, from a national perspective, it is essential to take into account population, resource, and environment constraints, national security, regional coordination, production and living style transformation in terms of urban agglomeration classification and guiding. The reasons are listed below. First, the proportions of population and economy of urban agglomerations will continue to expand in the future [16]. Second, urban agglomerations in different strategic locations should have different functions. Some, as participants of global competition, need to build a strong, high-quality dynamic system; some need to participate in the construction of new development axes promoting the improvement of Central China and West China and serve the two-way opening up of “the Belt and Road Initiative.”

(2) From a regional perspective, the classification and guiding policies of urban agglomerations should be tuned to major national regional strategies such as coordinated development of the Beijing-Tianjin-Hebei region, integrated development of the Yangtze River Delta, construction of the Guangdong-Hong Kong-Macao Greater Bay Area, and ecological protection and high-quality development of the Yellow River Basin. Policies should serve the development of urban agglomerations with different forms and scales in accordance with their administrative region, type, and policy as well as the geographic unit of delta, bay, and river basin.

(3) From the scale of urban agglomeration itself, the formulation of classification and guiding policies should also observe the development law of urban agglomeration. As stages of urban agglomeration development vary, the hierarchical status, spatial scale, functional combination, connection, and layout between cities should be redefined. The policies regarding spatial optimization and resource allocation should be formulated in line with their respective categories to promote the reasonable agglomeration and distribution of production factors and guide the planning and layout of the regional facility support system.

2.2 Priorities of categorized governance of urban agglomerations

(1) The implementation priorities of urban agglomeration policies should be conducive to promoting the integration process. First, complementary and coordinated development among cities should be highlighted. And optimization policies of scale, functions, and space of urban agglomerations should be established. In this way, central cities can better facilitate the development of surrounding areas, large, medium-size, and small cities can develop in a coordinated manner, and urban agglomerations can improve their overall sustainable development. Second, based on the concept that urban agglomeration integration is premised on infrastructure network development, the industrial systems of urban agglomerations should be coordinated in their development.

orientation, structural adjustment, and layout optimization. Third, attention should also be paid to the conflict between spatial development and ecological environment protection. To this end, restrictive requirements for environmental protection and management should be proposed. Therefore, urban agglomerations can grow into integrated spatial forms that have agglomeration development and are properly laid out.

(2) The priorities of urban agglomeration governance should be conducive to expansion and improvement. First, the upper limit of overall scale control, spatial pattern and scope of development policies are subject to resource and environmental carrying capacity, existing development density, and development potential within different regions of the same urban agglomeration. For resource and environment that are overloaded or on the point of being overloaded, relief policies and suggestions are put forward according to the causes of overloads. Second, the implementation priorities should give full play to the driving role of major projects in the expansion and improvement of urban agglomerations. The comprehensive carrying capacity of urban agglomerations should be improved through major infrastructure projects, major regional ecological construction projects, major regional environmental improvement projects, major industrial development projects, etc.

(3) The setting of priorities of urban agglomeration governance should be favorable to play the role of regional driving force. First, urban agglomerations should be a model in innovation through region-specific science and technology research and development and corresponding science commercialization chains, and opening up and sharing innovation resources, and developing innovation vehicles. Second, urban agglomerations should play well its dominant role in urban-rural planning by improving the integration system and mechanism, narrowing urban-rural gap, and balancing new type of urbanization and rural revitalization.

2.3 Categorized governance tools for urban agglomerations

China’s policy system for categorized governance of urban agglomerations is in transition from problemsolving-oriented policy to goal-oriented policy stressing high-quality development and living. Instead of direct regulation and control of resource allocation, the government turns to adopt the market mechanism. The policy system also extends from restrictive policies emphasizing overall control of land use and industrial negative list to dynamic incentive policies encouraging cross-regional application of innovative science and technology application and high-quality development.

In this aspect, there are four policy tools. First of all, “managing managers.” Regional leaders’ performance is evaluated in line with the regional functional positioning of urban agglomerations. Both restrictive and incentive policies are adopted to steer enterprises to frame their development strategies in accordance with major function-oriented zoning and high-quality development. Second, “managing resources and environment.” In line with the major function-oriented zoning mechanism, the government should exercise macro-control over regional resource supply of urban agglomerations, formulate and dynamically adjust the schemes for total environmental capacity, conduct monitoring and pre-warning of resource and environmental carrying capacity, and dynamically track regional sustainable development to adjust regional policies in a timely manner. Third, “managing production factors.” Population agglomeration, synchronized with economic agglomeration, propels the balanced development within urban agglomerations and realizes mutual flow between urban and rural areas. Based on function-oriented zoning, industrial positive and negative lists of urban agglomerations are established. Compensation for ecological damage and agricultural products are strengthened according to the requirement of major function-oriented zoning and equal access to basic public services. Fourth, “managing business and living environment.” Supported by effective market and effective government, we will deepen the reforms of streamlining administration, delegating powers, strengthening regulation, and improving service to optimize the business environment of urban agglomerations. Joint emergency rescue and infectious disease prevention of urban agglomerations should be improved to offer diversified channels to promote ecological progress and environmental control in a cooperative way. The transfer and coordination mechanism of public services across cities, towns, and regions should be improved to propel the equal access to basic public services.

3 Governance policies for urban agglomerations

3.1 Scale-based governance policies

According to population, gross domestic product (GDP), GDP per capita, GDP per land area, and number of megalopolis, urban agglomerations can be divided into three types in terms of scale (Table 1). An extra large-scale urban agglomeration is characterized by a total population of ≥ 50 million, GDP of ≥ CNY 5 trillion, GDP per capita of ≥ CNY 100,000, GDP per land area of ≥ CNY 100 million/square kilometer, and the number of megalopolis of ≥ 2. A large-scale urban agglomeration is characterized by a total population of ≥ 15 million, GDP of ≥ CNY 1 trillion, GDP per capita of ≥ CNY 6,000, GDP per land area of ≥ CNY 30 million/square kilometer, and the number of megalopolis of ≥ 1. A general scale urban agglomeration is characterized by a total population of ≥ 2 million, GDP of ≥ CNY 0.1 trillion, GDP per capita of ≥ CNY 50,000, GDP per land area of ≥ CNY 3 million/square kilometer, and no megalopolis.

(1) Extra large-scale urban agglomerations. Such urban
agglomerations should promote the balanced development of population rather than excessive population increase in the central urban areas of core cities; shape networking spatial pattern; endeavor to be the world center for science and technology innovation and the important cradle for emerging industries; make a city pleasant for living, working, and traveling; globalize and improve the allocation capability of global resources; make innovation in coordinated development, and be a model for cooperation between urban agglomerations.

(2) Large-scale urban agglomerations. Such urban agglomerations should bring into play the role of core cities in facilitating the development of surrounding areas, and foster regional central cities; enhance their comprehensive carrying capacity and service function, and make steady progress in promoting new type of urbanization in an orderly manner; create competitive industrial clusters and undertake industrial transfer at a high level; improve their supporting capability by expediting infrastructure connectivity; strengthen the comprehensive management of ecological environment and propel green development.

(3) General scale urban agglomerations. Such urban agglomerations should guide the stable growth and moderate agglomeration of population; enhance the connection between them; boost green industrial clusters by taking advantages of unique natural resources; build regional ecological security with ecological environment quality at the core; implement a proactive regional cooperation strategy by improving their level of opening up.

3.2 Governance policy based on development mode

Based on the industrial specialization index (location quotient), the development mode of urban agglomeration is divided into four types (Table 2).

(1) Producer-service-dominant urban agglomerations with advantages of emerging manufacturing industries. Such urban agglomerations should bring ecological environment pollution under strict control by analyzing overall carrying capacity, promoting the co-protection and co-governance of ecological environment, establishing an integrated environmental access and exit mechanism. They should optimize central cities’ comprehensive services function, guide population to cluster in key development areas, and prevent population growth from being excessive in other optimized development areas; nail down the orientation and direction of the development of cities to shape a highly efficient and graded industrial division system. Administrative barriers should be removed, service trade liberalization should be promoted, and a market system that is uniform but open should be established.

Table 1  Hierarchy of urban agglomerations in China

<table>
<thead>
<tr>
<th>Scale</th>
<th>Urban agglomerations</th>
<th>Population (10,000)</th>
<th>GDP (CNY trillion)</th>
<th>GDP per capita (CNY/10,000)</th>
<th>GDP per land area (CNY 10,000/ sq km)</th>
<th>Number of city</th>
<th>Number of megalopolis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra large</td>
<td>Yangtze River Delta</td>
<td>9 062</td>
<td>11.3</td>
<td>12.4</td>
<td>16 187</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Guangdong-Hong Kong-Macao</td>
<td>6 114</td>
<td>9.8</td>
<td>16.0</td>
<td>35 197</td>
<td>11</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Beijing-Tianjin-Hebei</td>
<td>5 447</td>
<td>5.8</td>
<td>10.7</td>
<td>12 671</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Large</td>
<td>Middle reaches of the Yangtze River</td>
<td>4 751</td>
<td>4.5</td>
<td>9.4</td>
<td>7 563</td>
<td>31</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Chengdu-Chongqing</td>
<td>5 736</td>
<td>3.9</td>
<td>6.8</td>
<td>5 269</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Western Taiwan Strait</td>
<td>3 386</td>
<td>2.5</td>
<td>7.4</td>
<td>5 834</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Shandong Peninsula</td>
<td>2 386</td>
<td>2.9</td>
<td>12.3</td>
<td>10 119</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Central Plain</td>
<td>2 151</td>
<td>1.3</td>
<td>6.2</td>
<td>9 350</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Harbin-Changchun</td>
<td>2 200</td>
<td>1.6</td>
<td>7.2</td>
<td>3 923</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Central and Southern Liaoning</td>
<td>1 987</td>
<td>1.5</td>
<td>7.8</td>
<td>7 987</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Central Shaanxi Plain</td>
<td>1 657</td>
<td>1.1</td>
<td>6.7</td>
<td>4 054</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>General</td>
<td>Hainan Gulf</td>
<td>1 732</td>
<td>1.1</td>
<td>6.6</td>
<td>3 028</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Hohhot-Haotou-Erzou-Yulin</td>
<td>508</td>
<td>0.6</td>
<td>12.0</td>
<td>4 155</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Cities of Ningxia along the Yellow River</td>
<td>273</td>
<td>0.2</td>
<td>6.7</td>
<td>1 467</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>North of Tianshan Mountains</td>
<td>675</td>
<td>0.5</td>
<td>7.5</td>
<td>366</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Central Shanxi</td>
<td>590</td>
<td>0.4</td>
<td>9.9</td>
<td>6 005</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Central Yunnan</td>
<td>739</td>
<td>0.6</td>
<td>8.1</td>
<td>3 821</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Central Guizhou</td>
<td>875</td>
<td>0.5</td>
<td>5.8</td>
<td>3 207</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Lanzhou-Xining</td>
<td>535</td>
<td>0.4</td>
<td>6.9</td>
<td>2 853</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>
(2) Urban agglomerations featuring traditional processing and manufacturing industries. Such urban agglomerations should establish and improve the systems of regional ecological protection and restoration and collective prevention and control of pollution, set up ecological barriers for green development, and strengthen regional water and atmospheric environment management. The advantages of core cities should be exerted, and the improvement of industrial competitiveness should be treated as the key to enhancing the core competitiveness of cities. A modern industrial system that underpins high-quality development should be built by the guidance of regional industrial cooperation, division of labor, and industrial concentration in line with industrial relative advantages. Transport infrastructure should be promoted to shape a modern comprehensive transportation system featuring sound network, reasonable layout, and efficient operation.

(3) Urban agglomerations with relatively advanced production and processing of energy and mineral resources. Joint efforts are made to protect ecological environment, the baseline of ensuring ecological function should be observed, and major ecological protection and restoration projects should be carried out. Central cities shall play a key role in promoting the development of small and medium-sized cities. Such urban agglomerations should support and encourage alternative industries, develop competitive industries, and strategic emerging industries, propel infrastructure integration and equal access to public service facilities, and narrow regional gap and urban-rural gap.

(4) Agricultural economy-dominant urban agglomerations with certain industrial basis. Such urban agglomerations shall upgrade traditional industries, develop industrial clusters with unique advantages, and create new industrial demonstration bases. They should enhance the position of central cities in the national development strategy and the ability to absorb population so as to facilitate the development of surrounding areas. They should speed up the construction of transportation networks inside and surrounding urban agglomerations and build a modern comprehensive transportation system.

Table 2  Classification of development modes of urban agglomerations in China

<table>
<thead>
<tr>
<th>Type of urban agglomeration</th>
<th>Name of urban agglomeration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer-service-dominant urban agglomerations with advantages of emerging manufacturing industries</td>
<td>Yangtze River Delta, Guangdong-Hong Kong-Macau, Beijing-Tianjin-Hebei, Chengdu-Chengdu</td>
</tr>
<tr>
<td>Urban-agglomerations featuring traditional processing and manufacturing industries</td>
<td>Western Taiwan Strait, Shandong Peninsula, Central Plain</td>
</tr>
<tr>
<td>Urban-agglomerations with relatively advanced production and processing of energy and mineral resources</td>
<td>Central and Southern Liaoning, Harbin-Changchun, Hohhot-Baotou-Ordos-Yulin, Central Shaanxi Plain, Central Shaanxi, City of Lanzhou along the Yellow River, Central Yunnan, Central Guizhou, Lhasa-Xining, North of Tianzhu Mountains</td>
</tr>
<tr>
<td>Agricultural economy-dominant urban agglomerations with certain industrial basis</td>
<td>Bohai Gulf, Middle reaches of the Yangtze River</td>
</tr>
</tbody>
</table>

3.3 Governance policy based on spatial organization

In general, urban agglomerations whose population primacy and economic primacy are greater than 1 and whose primate city’s population size and economic scale account for more than 50% of the total of the top four cities are called single-core urban agglomerations. Urban agglomerations whose population primacy and economic primacy are around 1 and whose primate city and second city’s population size and economic scale account for more than 80% of the total of the top four cities are called dual-core urban agglomerations. Urban agglomerations whose population primacy and economic primacy are generally below 1 and the economic development of the top three cities has a significant impact on the urban agglomeration are called multi-centered urban agglomerations (Table 3).

(1) Single-core urban agglomerations. Such urban agglomerations should enhance economic strength of central cities and surrounding areas, formulate specific policies to encourage industries to relocate to the central and western regions, and optimize the management mode of spatial development for urban construction, industrial development, and mineral development. They should promote core industries and services to spread to adjacent counties and cities, encourage mega-towns to build themselves into cities, establish regional industrial coordination at different levels, and improve industrial transfer and corresponding industrial connectivity. They should also build a composite fast channel between central cities and surrounding small and medium-sized cities to promote the networking and integrated development of urban agglomerations.

(2) Dual-core urban agglomerations. The performance assessment should include optimizing the spatial layout of urban agglomerations, strengthening the development of small and medium-sized cities, establishing and improving the system and mechanism of coordinated development, and promoting the development of regional integration. Such urban agglomerations should deepen the joint prevention and control of pollution, promote comprehensive environmental management, and construct the integration of regional environmental monitoring networks. They should relieve the non-core functions of megalopolis in an orderly manner, guide proper distribution of population, improve the development level of medium-sized cities, and develop a group of small cities with good foundation and strong carrying capacity. They should also build a rail-transit-driven multi-node, grid-based and full-coverge transportation network to improve the modernization of transportation organizations and services.

(3) Multi-centered urban agglomeration. For such urban agglomerations, performance evaluation should take into account the overall planning of the efficient use of land, water, and other resources, the promotion of organization, coordination, and cooperation among regional administrative
departments, and the advancement of innovative and integrated development. The utilization of resources should be maximized with land, water, and energy conservation at the core to promote ecological linkage inside and outside urban agglomerations, jointly building ecological corridors and ecological barriers. Multi-tier and multi-type development axes should be formed to shape networking spatial pattern. Supporting services for satellite cities in metropolis should be improved, and linked development of surrounding medium-sized and small cities should be strengthened to propel the development of characteristic industries of small and medium-sized cities and improve their ability to attract and agglomerate population. The industrial correlation among the members of urban agglomerations should be enhanced, and industrial systems that match the overall characteristics of urban agglomerations should be built. The inter-city and urban-rural development should be coordinated, household registration barriers between urban and rural areas should be gradually eliminated, and basic medical care and social security should be integrated in due course.

### 3.4 Governance policy based on types of resource and environmental carrying capacity

The carrying capacity of urban agglomerations should be evaluated by natural factors such as land resources, water resources, environment, ecology, and disasters. According to resources and environmental carrying capacity, three types of urban agglomerations are formed, that is, urban agglomerations with strong carrying capacity, those with general carrying capacity, and those with weak carrying capacity (Fig. 3).

1. Urban agglomerations with strong carrying capacity. Such urban agglomerations should upgrade development and stress both quantity and intensity. In addition, they should adopt forcible measures to limit and regulate those factors heavily loaded, accelerate industrial restructuring, reform traditional industries, value economic efficiency, and improve agglomeration degree and economics of scale. They should also strictly follow water, energy, and land conservation and raise the bar for the utilization of above resources, and gradually establish a long-term mechanism for sustainable development of resources and environment in which the government, the public, enterprises, and research institutions coordinate with each other.

2. Urban agglomerations with general carrying capacity. These urban agglomerations should uphold the principle that population agglomeration and the scale of cities are subject to resource and environmental carrying capacity. The development of a city should prioritize natural environment, and in this way, intensification of urban development can be realized. The total amount of construction land should be under control, that is, setting the upper limit of construction land. Threshold should be raised for industrial land use among development zones by setting the standard of investment intensity per mu (about 6 acre) and minimum standard of separate land supply. Total amount of land use should be well managed. Land use should be appropriately reduced and quota-based. The overall amount of sewage should be reduced step by step, and strict sewage charge system should be implemented, intensifying sewage levy. Officials’ performance assessment system should take into account resource consumption, environmental damage, and environmental benefits, emphasizing the evaluation of resource consumption, and environmental protection and management.

3. Urban agglomerations with weak carrying capacity. Such urban agglomerations should expedite the transformation of regional industries with high energy consumption and high pollution, to promote green development and development with regional characteristics, and appropriately improve urban development intensity and population density while bringing in new large-scale development under strict control. They should improve green coverage rate to ensure a certain proportion of public green space and ecological land, implement resources crisis management in water-deficient areas, and strictly limit the total amount of urban surface water and groundwater exploitation. In addition, these urban

<table>
<thead>
<tr>
<th>Types of urban agglomeration</th>
<th>Name of urban agglomeration</th>
<th>Core city</th>
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<tbody>
<tr>
<td>Single-core urban agglomerations</td>
<td>Central Plains</td>
<td>Zhengzhou</td>
</tr>
<tr>
<td></td>
<td>Control Guizhou</td>
<td>Guiyang</td>
</tr>
<tr>
<td></td>
<td>Cities of Ningxia along the Yellow River</td>
<td>Yinchuan</td>
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<td></td>
<td>North of Tianshan Mountains</td>
<td>Urumqi</td>
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<td></td>
<td>Central Shaanxi</td>
<td>Xi’an</td>
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<td></td>
<td>Central Yunnan</td>
<td>Kunming</td>
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<tr>
<td></td>
<td>Beijing/Tianjin-Hebei</td>
<td>Beijing, Tianjin</td>
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<tr>
<th>Double-core urban agglomerations</th>
<th>Name of urban agglomeration</th>
<th>Core city</th>
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<tbody>
<tr>
<td>Central and Southern Liaoning</td>
<td>Shenyang, Dalian</td>
<td></td>
</tr>
<tr>
<td>Northeastern Peninsula</td>
<td>Qingdao, Jinan</td>
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<thead>
<tr>
<th>Multi-centered urban agglomerations</th>
<th>Name of urban agglomeration</th>
<th>Core city</th>
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<tbody>
<tr>
<td>Yangtze River Delta</td>
<td>Shanghai, Nanjing, Hangzhou</td>
<td></td>
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<tr>
<td>Guangdong-Hong Kong-Macao</td>
<td>Guangzhou, Shenzhen, Hong Kong</td>
<td></td>
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<tr>
<td>Middle reaches of the Yangtze River</td>
<td>Wuhan, Changsha, Nanchang</td>
<td></td>
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<tr>
<td>Western Taiwan Strait</td>
<td>Xiamen, Fuzhou, Shantou</td>
<td></td>
</tr>
<tr>
<td>Bohai Gulf</td>
<td>Nanning, Manning, Haikou</td>
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agglomerations should prohibit and clear out mining and other development activities in various reserves, ban sewage discharge permits of enterprises seriously affecting environment in an orderly manner, and step up efforts to control various kinds of pollution arising from urban construction and residential living. They should also adopt “one ticket veto” in resource and environment protection. In other words, performance regarding resource and environment protection is directly linked to the promotion of officials, and improvement in resources and environment should be treated as the premise of winning financial support.

Fig. 3 Types of resource and environmental carrying capacity of 19 urban agglomerations in China

4 Comprehensive management policy for urban agglomerations

Urban agglomerations in China are divided into three types (See Fig. 4), and the classification is based on “four specials” policy, that is, scale, development mode, space organization, and resource and environmental carrying capacity. It takes into account the new requirement of national spatial development and protection strategic pattern and the new concept of national regional grand strategy, and the new trend of the development of urban agglomerations. Such classification is conducive to promoting the integration, the expansion, and improvement of urban agglomerations. It will give play to the driving force of urban agglomerations.

4.1 Give priority to the development of the Beijing-Tianjin-Hebei region, Guangdong-Hong Kong-Macao Greater Bay Area, Yangtze River Delta region, and Chengdu-Chongqing region

(1) In terms of promoting regional integration. ① We should take Guangdong-Hong Kong-Macao Greater Bay Area as the leverage to give full play to the role of Hong Kong and Macao as independent customs territories, free ports, and platforms for international exchanges with English-speaking and Portuguese-speaking countries, use the overall planning of “one country” to solve long-term prominent issues concerned by Hong Kong and Macao, and use the complementary system of “two systems” to promote the better development of Hong Kong, Macao, and Chinese mainland. ② We should promote integrated urbanization in places where urban infrastructure and public service facilities are covered. ③ We should establish an administrative system for the exclusive management of urban agglomerations, optimize the allocation capacity of administrative resources, and improve the efficiency and vitality of administrative management.

(2) In terms of expansion and improvement. ① We should accelerate the pace of central cities upgrading themselves into world-class cities and steer urban agglomerations to take the lead in realizing scientific and technological innovation-driven development. ② We should make the national central cities become strong and grow big, and optimize the allocation of the capital’s functions in the national central cities. ③ We should improve the quality of the cities and promote the simultaneous optimization of the living environment and investment environment.

(3) In terms of regional driving force. ① For global strategic competition, we should deploy strategic competition areas with the four major urban agglomerations as the pillars. ② For China’s medium and long-term strategic adjustment and balanced regional development, innovative regional economic complexes should be laid out in the Beijing-Tianjin-Hebei region, the Yangtze River Delta region, the Guangdong-Hong Kong-Macao Greater Bay Area.
4.2 Emphasize the development of seven regional urban agglomerations, namely, the middle reaches of the Yangtze River, central Plain, Shandong Peninsula, central and southern Liaoning, central Shaanxi Plain, western Taiwan Strait, and Beibu Gulf.

(1) In terms of promoting regional integration. ① We should continue to prioritize the both sides of the Taiwan Strait, and propel the regional integration, thus promoting the peaceful reunification of both sides of Taiwan Strait in the context that Chinese mainland’s overall development overtakes that of Chinese Taiwan in all aspects and the latter increasingly depends on the former in economic development. ② We should strengthen integrated development between cities by removing administrative barriers. ③ Urban-rural integration should be promoted. Within the scope of metropolitan areas, we should shape new regional integration with equivalent development between urban and rural areas by improving the system and mechanism of coordinated development between them.

(2) In terms of expansion and improvement. ① On the basis of the existing state-level central cities, we should narrow the jurisdiction of large provinces and develop emerging state-level central cities by setting new municipalities. ② We should vigorously support the construction of regional central cities, encourage the capital cities in the Yangtze River Economic Belt and the Yellow River Basin, and economically prosperous cities to re-set their subordinate counties as districts and expand their size, so as to improve their ability to absorb population and facilitate the development of surrounding areas. ③ We should steadily develop regional central cities, especially prefecture-level cities with an urban population of more than 500,000, by optimizing and reorganizing administrative regions. ④ Landscape cities should be developed to improve the urban character of traditional agricultural areas.

(3) In terms of promoting regional driving force. ① We should facilitate the development of the central areas of the central and western regions as well as Northeast China by building strategic security areas and innovative economic complexes there. ② We should give full play to the driving force of metropolitan areas and promote integrated development by enhancing the connection between cities within urban agglomeration. ③ We should stress the coordinated development and protection of the Yellow River Basin and the Yangtze River Basin, and set up a scheme of “two evaluations,” i.e., equally emphasizing land and space development and environmental carrying capacity to strictly regulate the purposes of land use and the intensity of land development.

4.3 Support eight sub-regional urban agglomerations of Harbin-Changchun, Lanzhou-Xi’ning, central Shanxi, Hohhot-Baotou-Erdos-Yulin, central Yunnan, and central Guizhou, cities of Ningxia along the Yellow River, and cities along the north of Tianshan Mountains.

(1) In terms of promoting regional integration. ① We should promote the integrated protection and development of the Yellow River Basin, make breakthrough on scientific and technological commercialization and resource transformation and distribution to ensure the high-quality and coordinated development among the upper, middle, and lower reaches of the Yellow River Basin. ② We should develop urban-rural integration by fostering equivalent and two-way urban-rural coordinated development around the 2-hour commuting range of central cities.

(2) In terms of expansion and improvement. ① For the sake of border security and ecological protection, Kashgar, Urumqi, Xi’ning, and other cities with prominent strategic positions are selected as potential state-level central cities for the future, which are to serve China’s foreign exchanges with countries along “The Belt and Road” and manage China’s national parks there. ② The construction of border central cities should be accelerated. By referring to the way of municipality establishment, we should select some important cities in China’s border areas as hub cities capable of consolidating and stabilizing borders, which enjoy the sub-provincial status within the scope of prescribed responsibilities and rights. ③ We should enhance the economic strength of central cities and their surrounding areas, energize market entities, and improve public service facilities and basic supporting infrastructure, thus raising the overall development quality of the urban agglomerations. ④ We should coordinate resource development and ecological environment protection, carry out mineral resources development in strict accordance with the “three areas, three lines,” speed up the green mining of mineral resources and the upgrading and transformation of processing technologies, and form a green basic industrial system.

(3) In terms of regional driving force. Open areas in the border areas of West China should be built, with Kunming, Nanning, and Urumqi as key candidates, and we should also speed up the distribution of productive forces such as international trade and characteristic light industry.

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