

Objective and Framework for Territorial Development in China

LU Dadao

(*Institute of Geographic Sciences and Natural Resources Research, Chinese Academy of Sciences, Beijing 100101, China*)

Abstract: This paper analyzes the present situation of China's territorial development and holds that the spatial framework for socio-economic development can not be naturally extended under the present conditions. Hence it is necessary to strengthen rationally spatial agglomeration. The basic concept and framework for future territorial development are raised based on the elaboration of factors affecting the territorial development of China.

Keywords: territorial development; spatial agglomeration; functional zoning; economic metropolitan zone

1 Introduction

The territorial development in different countries and regions possesses different characteristics. In developed countries but with relative limited territory, the target of their territorial development and corresponding regional policy is mainly to solve the problems of unbalanced development and promote the development of relatively underdeveloped areas. According to the demand of such a kind of target, it is necessary to make corresponding territorial type division, establish corresponding indicator system and formulate relevant policies. However, in terms of China's development stage and practical problems in territorial development, the target of territorial development and the division of territorial types have different characteristics in China from those developed countries.

In order to build a macroscopic framework with efficient, economical and rational territorial development and allocation of economy, the future development of China needs to be prospected: up to the year 2020, China's Gross Domestic Product (GDP) will reach over 4×10^9 yuan (RMB) per year. Estimated according to the annual increase of urbanization rate at 0.6–0.7 percentage point, Chinese urban population then will reach around 600×10^6 . The scale of China's industrial development will be largened by a big margin comparatively over the present case. The occupation of resources and space for socio-economic development will be further expanded and the pressure further enhanced accordingly.

The concentration of various problems on the regional scale makes China's future territorial development and utilization as well as relevant development issues one of the keys to follow the view of science development and to solve a series of major problems.

To clarify the issues on how to realize rational utilization of China's resources and space and what kind of territorial framework should be built to maintain an increasingly huge economic and social aggregation, it is necessary to answer several strategic problems concerning national territorial exploitation, protection and development. The problems are as follows. What kind of functions should be performed at the national scale in different regions? What kind of spatial pattern will be constituted by these regions with different functions? What is the form of this pattern? Why?

2 Strategic Choice of China's Territorial Development and Socio-economic Allocation

Dramatic changes have taken place in natural and socio-economic structures in China as a result of long-term rapid economic growth and large-scaled urbanization. Such a kind of changes will continue to occur in the case of increasing pressure brought by socio-economic development on resources and environment. In recent years, most of the per capita GDP calculated in province, autonomous region and municipality exceeded 8000 yuan. Although it is considered that the mid- and long-term economic growth rate will be declined markedly

Received date: 2009-04-20; accepted date: 2009-05-20

Foundation item: Under the auspices of National Natural Science Foundation of China (No. 40871071)

Corresponding author: LU Dadao. E-mail: Ludd@igsnr.ac.cn

over the previous years, the present figure will be doubled every 10 years. Is it possible to make such economic indicator doubled at the same rate for each region considering the intensified difference of natural basis and industrial development level in various regions? What will be the result if such a double is planned to be achieved?

Natural conditions in various regions of China differ greatly. And the various kinds of ecological vulnerable areas exist extensively. Since reform and opening-up in the late 1980s, the rapid socio-economic development in various regions has induced drastic changes in natural structure. We can say that in the future development, the spatial framework of socio-economic development will be unable to extend in a balanced way following the present one. Importantly, the continuous economic growth in doubles is impossible at the same rate in all the regions of the country. China needs to build a relative concentrated socio-economic territorial space, meanwhile to practice the restricted development and strict protection to different degrees in regions with considerable vast territorial area.

In the "Eleventh Five-Year Plan" of China it has been proposed to define the direction and demand of the nation's territorial development according to functional zones. It is indeed a major measure to harmonize the man-land relationship and implement the "Five Overall Planning" and sustainable development, and also an important reform to make planning work in the new period adaptable to the national development demand (The 5th Plenary Session of the 16th Central Committee of the Communist Party of China, 2001)

The natural basis, development stage, population and economic characteristics of developed countries differ greatly from China. Their targets of spatial governance and planning are quite different from China's case. Over a long period of time, the target of China's territorial governance and planning is to design and build a rational territorial space and form a spatial structure adaptable to natural structure and environmental carrying capacity and tallying with other relevant elements well. This target is determined by China's special national conditions.

2.1 Problems on China's territorial development and protection

Under the background that spatial framework of socio-

economic development can no longer develop in a balanced way like the present one and construction distribution is out of control, at the same time, urban sprawl can not continue to extend, how can China's socio-economic development keep going and what kind of social and economic spatial structure should be built?

The rapid socio-economic development is the main cause to induce serious resources shortage and eco-environmental problems. In other words, China's development problem is closely related with land resources and eco-environmental problems. On the one hand, to solve China's resources and eco-environmental problems, it is important to understand and analyze the development scale, speed, structure and level of various regions, and analyze the causes of these development characteristics and their effects on eco-environment in China. On the other, it is necessary to consider how to make socio-economic development more adaptable to the ecological and environmental demands.

2.1.1 Strategic problems concerning China's territorial development, protection and regional development

(1) Overall strategy for China's future territorial development. This overall strategy considered the key problem: should China's socio-economic development in the future tend generally to be more scattered than present stage or to be more concentrated? That is, is the layout of social and economic elements in China's territory agglomeration or dispersion? Such a basic strategy is affected by both China's natural basic framework and economic globalization and informationization. As China has a vast territory, the direction and type of further concentrated development as well as the direction and regions of further dispersed development are also multiple, furthermore, the agglomeration and diffusion direction also varies for different social and economic elements. Therefore, the whole strategy for territorial development and outlines for policy implementation should be the overall strategies of China (Messerli et al., 2000).

(2) Rational framework for regional development. The rational framework for regional development means the division of the territories concerning layout of social and economic elements, and the macroscopic distribution of these regions, such as the allocation of social and economic elements in various regions, the "pole-axis system" framework formed by agglomeration in territorial space, distribution pattern of economic metropolitan zones, etc.

(3) Potential population, urban and industrial agglomerated areas. Since reform and opening-up massive population movement has constantly taken place in rural China. In the nationwide scope, population flows mainly from rural area to capital cities of provinces (autonomous regions). Meanwhile, agglomeration of industrial belts is also apparent. The spatial migration of population and industries will continue in the future, for example, population will continuously agglomerate towards economic metropolitan zones and industrial agglomerated belts possessing potential in development.

(4) Regions requiring measures dominated by protection and management. In order to guarantee nationwide sustainable development, protection and management measures should be primarily adopted in some eco-environmental sensitive areas of China, which are severely related to the security of economic metropolitan zones, population and industrial agglomerated belts. However, suitable choice and control are necessary in economic development.

2.1.2 Overall spatial arrangement

The answer of the above questions is actually to make an overall arrangement of society and economy and their respective elements in space. How can the overall arrangement be realized spatially?

(1) The basic guiding principle should be the realization of regional harmony in man-land relationship. The occurrence of the above-mentioned situation and problems in China indicates that the factor inducing environmental change is shifting from the natural one to the human one (Messerli et al., 2000). Presently, “it is man rather than land that determines whether man-land relationship is harmonious or contradictive” (Wu, 1991). Therefore, “man should positively get know of ‘land’ and consciously use and change it following the law of ‘land’, so as to realize its goal of serving the people better. This is the objective of man-land relationship.” (Wu, 1991).

(2) The basic strategic measure is to practice functional zoning by which territorial development orientation and development restriction can be realized.

(3) In order to implement the macroscopic regional development strategy and a series of policies and measures for the master functional zoning formulated by the central government, it is necessary to increase more and more participation of the public and social community (group) under the guidance of the government.

2.2 Oriented control of territory development—orientation and restriction

The state and governments control over the whole country and large regions are the core to formulate and implement overall strategies of territorial development. “Territory” or “territorial space” is an organic body. All the organic bodies have certain functions. In other words, with characteristic types and features, an individual region has its specific function. Such a kind of specific function aims at sustainable development in China and reflects the master function of development orientation and restriction. We can disintegrate these master function zone into 1) metropolitan group and economic metropolitan zone, 2) vulnerable eco-environmental protected area, 3) urban and industrial agglomerated belts undertaking large-scale urbanization and population/industrial agglomerations in the future, 4) economic metropolitan zones undertaking and participating in the global competition, key high-tech industrial development and offering higher-level service, 5) agricultural complex development areas, 6) ecological protected areas, 7) geopolitical security regions, and 8) nature reserves. The master functional zones are not completely the same as the agricultural areas, industrial districts, metropolitan groups, economic zones, flood traveling and retarding basins, soil and water conservation areas, infrastructure packages and the routes they passed. However, the above-mentioned master functions and master functional zones are also composed of those functional elements.

It is of extremely significance for the nation’s sustainable development to emphasize regional development orientation and restriction at nationwide scale according to regional function and master functions. It is also a general practice of the developed market economic countries.

The necessity for orientation and restriction lies in the inharmonious of various functions in a regional scale, that is, the conflicts among various functions and targets, for an instance of the conflicts between rapid economic growth and eco-service functions in vulnerable eco-environmental area.

To implement the view of science development, it is necessary to strengthen government management and control over territory. The main tasks include to re-mould territory to a certain degree, to work out planning and restrictions to the regional framework for territorial development and allocation of construction, to

coordinate man-land contradictions occurred in the transitional period of market economic system, to make overall arrangement of the major construction projects concerning the long-term development of the country, and to explore and utilize natural resources and ecological asset of China in a scientific way. Meanwhile, efforts should be made to avoid the presence of the grim situation endangering territorial security of the existence and development of China.

The oriented control of territorial development is specifically to determine the regional development direction, development principle and support system. The function orientation of territorial development is a reflection of the types and direction of territorial oriented control (governance) in the light of orientation and restriction of development.

The basis of territorial oriented control is to conduct various types of regionalization, including regionalization of physical geography, regionalization of ecological geography, economic regionalization, division of economic metropolitan zones, etc. On the basis of the above-mentioned regionalization, the functional zoning at national and regional scales is the basis of the realization of territorial oriented control.

The development orientation and restriction for different types of functional zones needs to raise development demands of a certain period based on the consideration of its special conditions and development target, such as the industrial policy and the direction of the industrial structure adjustment, utilization policy for energy and water/land resources, and investment policy serving for industrial structure adjustment.

2.3 Readjustment of territorial development with resources controlled by government

The developed countries attach great importance to the governance of territory, i.e. the intensity, process and spatial framework of territorial development in the oriented control region, so as to orient and restrict the general trend of socio-economic development and spatial allocation of various elements. In order to gain such a target, almost all the countries try to use the resources controlled by government to formulate and implement corresponding spatial policies and measures.

Here the "resources" include funds (means of revenue, e.g. financial shifting payment, bank lending controlled by government, loan interest), examination and approval

of major items and projects (including infrastructure projects) that are all important to the national economy and the people's livelihood, special freight rate policy, the provision (adjustment and allocation between territorial spaces) and price of state-controlled energy, land/water resources and other important resources, human training measures and implementation of specific prohibition, etc.

The key for controlling and using those "resources" to carry out territorial development is to conduct corresponding functional zoning, based upon which regional planning is conducted for the corresponding functional zones and corresponding regional policies and measures are formulated. However, in practice, to perform financial shifting payment and ecological compensation, particularly using means of revenue, needs to formulate specific indicator system to conduct detailed balance among regions and to realize the coordination between specific regions in functional zoning system. This issue extensively existed among regions in terms of very complicated ecological compensation. In developed countries, a variety of financial shifting means, policies and measures related to economy are extensively used in practicing regulation and control on development.

3 Major Factors Influencing Overall Strategies of Chinese Future Territorial Development

Mineral resources, water resources and transportation were once important factors in national industrialization and national development in most of the countries including China. Those factors affected even determined the basic framework of China's regional development and allocation of productivity. After reform and opening-up, especially structural adjustment in recent years, the role of those conventional factors is declining. Informationization and economic globalization have become the leading factors for the development of the regions with rapid economic growth. Over a long period, economic geography elaborated spatial layout and development characteristics of economic bodies and economic activities, studied how economy grew at the fastest rate or how to optimally utilize growth factors, based on the analysis on economic factors of transportation, resources and economic basis. Economic globalization will exert great impact on socio-economic development in various regions of China. Such an impact is an im-

portant strength for the formation of China's territorial development framework. Informationization leads to the spatial reformation of social and economic elements.

3.1 Natural structure and its characteristics

The essential foundation for the formation of socio-economic spatial structure of China is its special natural structure and its characteristics. This is mainly reflected in regional differentiation of physical geography of China, i.e., three natural zones and three great topographic steps. They determine the great regional disparities in economic development of China. In other words, the pattern of China's natural structure determines the basic framework of spatial pattern of China's future economic development to a great degree. China's natural condition varies tremendously, and the basic embodiment of such a kind of great disparities is that the principal share of both economic aggregate and economic growth concentrates inevitably in the coastal zones. Such a kind of pattern can not be changed fundamentally by human strength, and natural condition is an important foundation of the formation of functional zones. China's natural structure and its characteristics affect and even determine the basic setup of territorial development of China.

3.2 Economic globalization

Economic globalization will continue to remold territorial spatial development pattern of China. Generally speaking, economic globalization will make coastal zones and some metropolitan groups in central and western China vitalize their economic growth and urbanization. Particularly, it will not only intensify China's "T-shaped" spatial framework of territorial development (Lu, 2002), but also promote the formation of several economic metropolitan zones which are of international competitiveness in this framework.

3.3 Ecological and environmental status

Ecological and environmental status has exerted more and more important impacts on the socio-economic spatial pattern. The ecological vulnerable area in China will be the essential foundation of the future functional zone pattern. China will still maintain higher socio-economic development level in the next 15 to 20 years, so the natural structure and socio-economic structure of the country and its various regions will continue to evolve. The matching relationship between socio-economy and

natural condition will possibly tend to be worse, even induce more rigorous territorial security and resources security problems. It concerns the national territorial security and resources security in the long-term to protect those vulnerable ecological and environmental deteriorated areas from declining, and make those economic metropolitan zones, and population and industrial agglomerated belts be sustainable for development.

The vulnerable eco-geographic unit is the major target area in need of restricted and prohibited development. In the next 15 to 20 years China will face a multiple pressure of resources shortage, ecological damage and environmental pollution. This results from the resources shortage and environmental vulnerability on the one hand, while on the other it is caused by the impact of huge population and demands of rapid economic growth on resources, ecology and environment. Resources deficiency is of rigid restriction to the territorial development. Hence it is required to establish a national economic system featuring with resources-saving so as to form an intensive, high efficient and high dense territorial development pattern.

3.4 Spatial pattern of transportation, resources and energy supply system

Transportation, resources and energy supply system is currently and will be the basis for the formation and development of economic metropolitan zones and population and industrial agglomerated belts in the future, so it is the controlling factor to the basic arrangement of national functional zones. Especially it will exert a great influence on the location of economic metropolitan zones, population and industrial agglomerated belts. Concretely, the main line of communication and the major energy and resources supply direction determine the orientation and trend of some functional zones. That is the specific role.

4 Basic Trend and Overall Framework of China's Territorial Development

4.1 Spatial agglomeration—basic trend of territorial development and arrangement of economy and population in China

4.1.1 Reversed "U-shaped" correlation between economic growth and unbalanced regional development

Over a long period many countries took regional bal-

anced development as an important development target. However, it is proved that 1) balanced development is a long-term process; 2) balanced development is also relative because of different natural conditions, geographic positions, historical and economic development bases of various regions; 3) the bigger the difference of the stable factors among regions, the bigger the disparity of regional development. In the early and middle stages of industrialization development in a country, industrialization and urbanization are usually developed first in some regions so that advantages of those regions can be fully utilized. That is to say that the difference in the development among regions increases. Only in the later period of industrialization when massive over-expansion occurred in the early developed regions and resulted in a series of serious problems, may a gradual diffusion in economic development be formed, leading to a gradual shrinkage in the spatial difference of development. That is the law of reversed “U-shaped” correlation between economic growth and unbalanced regional development. It has been verified by the process of many developed countries. In China, such a law is also playing an evident role. It also inevitably dominates the government and academic community’s theoretic conception and practical selection of spatial pattern for regional development.

4.1.2 Different economic growth rates in regions

It is impossible for various regions to double the economic growth at the same rate. Since the 1990s, China has achieved sustainable economic growth at high and super high speed. An important feature is that all regions have achieved successive economic doubling. However, with the regulation and control of macroscopic structure of economic development and rigorous eco-environmental status in some regions of China, it is impossible for various regions to gain economic doubling at the same rate. During the periods of “Ninth Five-Year Plan” and “Tenth Five-Year Plan”, some regions achieved consecutively a two-digit GDP increase. But such a kind of high and super high speed growth has caused more and more difficulties in present and future sustainable development.

Evident changes are taking place in macroscopic strategies of Chinese development and the implementation of the view of science development will accelerate this process. The “extensive” rapid growth over years has paid a high price. The high consumption of energy

and resources, the consequent environmental pollution and ecological deterioration have become key problems restricting socio-economic harmonious development. The impetus for regional development has changed substantially, and traditional industries are becoming saturated. To effectively change the pattern from rapid growth to “better and faster” economic growth should be taken into account as one of the core issues concerning regional development strategy. Hence it is necessary to reexamine the strategic location and development trend of different regions so as to formulate and implement a sustainable integrated development strategy.

4.1.3 Sea attraction for human socio-economic activities

In the end of the 19th century, a geo-economist, Mahan A.T., called seas and oceans as “great road” in his book *The Influence of Sea Power upon History* (Mahan, 1890), and regarded them as the dominant component of history and the basic decisive factors for the prosperous of a country. Up to the 1920s–1930s, such a kind of geopolitical and geoeconomic thought still had a great influence. Nowadays, more than 60% of the world economic aggregate concentrate in a scope of around 100km along the coastal zone. Due to the first development and the corresponding opening-up policy, economic metropolitan zones and large population and industrial agglomerated belts will form in coastal zones in the positioning of functional zones. As a consequence, the coastal zones are bound to occupy increasingly great proportion in the aspects of national GDP increase rate, economic aggregate and industrial structural hierarchy, and economic internationalization degree (international competitiveness). Under the background of present economic globalization and informationization, such a kind of thought and concept has gradually been accepted.

4.2 Pole-axis system—most effective territorial development model in China

China has once formulated several important territorial development strategies at the first 30 years after the founding of the People’s Republic of China in 1949. The common point of these spatial strategies is macroscopic regional division including coastal zones and hinterland, or the three major parts of the eastern, central and western China. This key and non-key point’s model reflecting territorial development though it is simple and clear,

yet it is not a scientific policy regional division in national macroscopic hierarchy. The reason is that the spatial organization of socio-economic elements does not take such a kind of divided region as differentiated law. The most fundamental model or the most fundamental law of organization for the socio-economic elements in the space is controlled by the “pole-axis system” in China.

The “pole-axis system” theory is one of the theories concerning socio-economic spatial structure (organization), and a theoretic mode for allocation of productivity, territorial development and regional development. The socio-economic objects are always in an interactive state in the scope of region or space. This is also similar to the basic principle of spatial substance interaction, having two trends of spatial agglomeration and spatial diffusion. In the national and regional development process, most socio-economic elements agglomerate at “points” which are linked up by linear infrastructure to form an “axis”. The “pole” here refers to residential areas of various levels and central cities and the “axis” refers to the “infrastructure bunch” linking up by trunk lines of transportation and communication as well as energy and water source channels. With further regional socio-economic development, “pole-axis” inevitably develops into “pole-axis-agglomerated areas”. Here the “agglomerated areas” are also “points”, referring to metropolitan groups and economic metropolitan zones.

The “pole-axis system” theory was developed based on the “central place theory” raised by German geographer Walter Christaller. But “pole-axis system” theory is a theoretical system different from the “central place theory” in content and also in applied objectives. Briefly speaking, the “central place theory” is the doctrine on urban scale-hierarchical law and the theoretical model on urban planning and urban construction. The core of “pole-axis system” theory is the summary of theoretical mode relating to regional “optimum structure and optimum development”.

The “pole-axis system” reflects the objective law of socio-economic spatial organization and is the most effective spatial structure model for territorial exploitation and regional development.

The China’s “T-shaped” pattern of macroscopic strategy of territorial development and allocation of economy was put forward according to “pole-axis system” theory, and based on the analysis of China’s natural

conditions, particularly the characteristics of the country’s allocation of economy and integrated national strength. That is to say, taking coastal zones and areas along rivers as key strategic areas for China’s regional development and allocation of economy (“T-shaped” structure) is for the purpose of forming a macroscopic arrangement for territorial development in a long period of future.

Early in the mid 1980s, some scholars and leaders advocated to carry out “Grand Strategic Transfer” for China’s regional development, which is to allocate most population and economic resources in coastal area. Present facts proves that if China had carried out this policy, the opening up in coastal zones and the resulting superiorities in economic development would be suspended and there would be no large-scale development in western regions of China with the involvement of powerful strength from the state. The Yangtze (Changjiang) River connects the three parts of the eastern, central and western China, and the areas along the Yangtze River and the Yangtze River Basin have great potential for development. If the great potential had not been brought into play along the Yangtze River over the past 20 years, the enhancement of China’s integrated national strength would be affected substantially.

In rebuilding territorial development pattern of China, the economic globalization will continue to work. On the one hand, it will intensify the “T-shaped” spatial framework of territorial development, on the other hand, it will form several economic metropolitan zones with international competitiveness on the framework.

The western China has a vast territory with extensive area that is not feasible to be developed economically and inhabited by human beings. The spatial model for the western China development is a major issue concerning the implementation of the development strategies. The western China development should “line up poles to radiate area”, and establish model of economic zones (State Council of China, 2000). This is the specific application of the “pole-axis system” to the Chinese economic development.

4.3 Metropolitan zones, key cities and industrial agglomerated belts

Building economic metropolitan zones and industrial agglomerated belts is an essential component of national and regional development strategies. The theory of

metropolitan economic zone holds that economic globalization made the fastest economic developed areas concentrate in a few "economic metropolitan zones" in the nearly past 20 years (Lu et al., 2003). The core areas (cities) of the economic metropolitan zones are generally the financial center, hub of communications, talent aggregated area and most convenient channels for entering the international market of a country or a region, namely, the point of intersection of capital flow, information flow and technological flow, while manufacturing and storage enterprises with high demand for land disperse and aggregate around the core area, forming huge rural-urban interlocking zone. An extremely close linear relationship of industries exists between the core area and surrounding area. The role of core area is to present evidently production and service function (e.g. banking, media, security, product design and packaging, marketing, advertising, financial and accounting service, logistics allocation and delivery, technique service, information service, and personnel training) while the surrounding area presents the function of manufacturing base. The economic metropolitan zones that have such a kind of vertical division of labor and spatial structure are the core economic regions with the greatest competitiveness in the world.

The core cities under globalization are economically command and control centers (to take the role by such carriers as high-grade producers service and general headquarters of transnational corporations), key nodal points of global urban networks in spatial structure, local gateways diffused globally at regional scale, and they have a good cultural variety and tolerance. Building regional competitiveness with spatial form of "urban regions" to meet global competition is an important target of regional development and spatial planning. Spatially metropolitan area is the presentation of a huge multi-core and multi-layer metropolitan group connected by massive high-speed passageways. In such a space, because of agglomerated scale economy and regional economy, plus shortened distance between cities and economic activities by high-speed passageways, as well as substantial decrease of transaction cost, opera-

tion cost and management cost of production and service, the rate of return on investment and earning rate of elements increased apparently.

However, the development of metropolitan areas will also accelerate the regional disparity and be confronted with such problems as urban excessive investment and expansion, conflicts of resources supply and demand and aggravation of environmental pollution of the cities. In order to promote the formation of rational framework on territorial development, it is necessary to work out functional zoning scheme for development and management in the future 15 to 20 years according to the natural conditions, the present socio-economic development target and numerous regional problems induced by the long-term high speed growth and in light of the scientific principle and indicator, to determine the principal function and development principle of various major functional zones, and to propose the supporting conditions for promoting sustainable development of different functional zones.

References

- Lu Dadao et al., 2003. *The Theory and Practice on China's Regional Development*. Beijing: The Commercial Press, 456–520. (in Chinese)
- Lu Dadao, 2002. Formation and dynamics of the "pole-axis" spatial system. *Scientia Geographica Sinica*, 22(1): 1–6. (in Chinese)
- Mahan A T, 1890. *The Influence of Sea Power upon History, 1660–1783*. Boston: Little, Brown and Company.
- Messerli B, Martin Grosjean, Thomas Hofer et al., 2000. From nature-dominated to human-dominated environmental changes. *IGU Bulletin*, 50(1): 23–38.
- State Council of China, 2000. Notice on the implementation of several policies and measures for western development. *People's Daily*, December 28, 2000. (in Chinese)
- The 5th Plenary Session of the 16th Central Committee of the Communist Party of China, 2001. *The Outlines of 10th Five-Year Plan for National Economy and Social Development of People's Republic of China*. Beijing: People's Publishing House. (in Chinese)
- Wu Chuanjun, 1991. On the research core in geography. *Economic Geography*, 11(3): 1–5. (in Chinese)