

A review of the balance of regional development in China from the perspective of development geography

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Abstract: Large regional differences and uneven regional development are fundamental challenges for China. Balanced regional development is an important issue in research on development geography. This study reviews the course of balanced regional development in China and summarizes its characteristics in each period. The results show that inter-regional development in China has undergone successive periods of balanced and unbalanced development. Each period has enhanced social development and contributed to a more balanced regional development. This paper discusses the scientific connotation of balanced regional development, and invokes sustainable development theory to argue that we should pay attention to the differences in resource endowments among regions, and solves the imbalance among the economy, humans, and nature to promote the spatial balance of regional development and green development for better coordination between economy and ecology. The balanced promotion of the well-being of people in each region is the ultimate goal of balanced regional development. We then use concepts from development geography to examine China's path of balanced regional development from the three perspectives of society, the economy, and ecology. Suggestions are also provided for the balanced development of China's regions and the improvement of public well-being.

Keywords: regional development; balanced development; high-quality development; development pathways; development geography

1 Introduction

Promoting balanced regional development and narrowing the gaps in development across

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areas is a global challenge. The World Bank has noted the uneven distribution of economic growth worldwide, and has claimed that the adjustment of macroscopic policies and the optimal combination of infrastructures can narrow the gap in people's living standards, and can help achieve the corresponding economic and social benefits (Aoyama and Horner, 2020). In several reports, the Organization for Economic Cooperation and Development has also pointed out the importance of policies for balanced regional development to tap into the regional growth potential (OECD, 2019). Both the EU 2020 Strategy proposed by the European Union and the 2050 Regional Development Strategy formulated by the United States aim to solve the problem of uneven development between regions through policies (Lin *et al.*, 2020). Since the 19th National Congress of the Communist Party of China (2017), China has promoted the strategy of regional coordinated development, paying equal attention to efficiency and fairness, in order to improve the quality of development and attain balanced development across regions. Discussion on the theories of balanced and unbalanced development of the regional economy has evolved in theoretical research (Chen *et al.*, 2000; Zhong *et al.*, 2009). The process and experience of China's balanced regional development have been summarized in the corresponding paradigms and theories (Sun *et al.*, 2014; Liu *et al.*, 2020). In empirical research, studies have been carried out on population flow and regional development (Zhang and Cai, 2013; Li and Miao, 2020), the convergence of regional development (Hong *et al.*, 2020), factors influencing it (Liu and Wang, 2009; Li *et al.*, 2014), and its evolution (Li *et al.*, 2010). These studies have analyzed the course of China's regional development from different perspectives. Early theoretical and empirical research has promoted awareness of balanced regional development but has mostly focused on economic factors, and ignored social and ecological factors. As the concepts of high-quality development and the development of an ecological civilization have gained popularity in recent years, scholars have examined the level of regional development by integrating social, ecological, and economic factors (Zhou *et al.*, 2014; Liu *et al.*, 2017). However, relevant studies lack a comprehensive analysis of the differences in regional functions and types of regional development.

Development is a multidimensional concept that needs to be studied using system science. Development geography integrates management, economics, and ecology to focus on economic, social, ecological, and cultural factors influencing differences in regional development. Reviewing and analyzing regional balanced development strategy of China can provide not only a deeper understanding of the exploration process of China's development theory of building socialism with Chinese characteristics, but also an effective reference for the design of future regional balanced development paths (Liu *et al.*, 2019; Deng *et al.*, 2021). This study analyzes the process of China's balanced regional development from the perspective of development geography, examines the scientific connotation of and factors influencing China's balanced regional development based on the relevant process, its key elements, and driving mechanism, and proposes possible paths for balanced regional development.

2 Process of balanced regional development in China

The evolution of regional development in different stages reflects the continual development of the human understanding of the concept of development. Reviewing and analyzing re-

gional balanced development strategy of China can not only provide a deeper understanding of the exploration process of China's development theory of building socialism with Chinese characteristics, but also provide an effective reference for the design of future regional balanced development paths.

2.1 Balanced regional development in the early days of the People's Republic of China

In the early days of the founding of the People's Republic of China in 1949, the Central Committee of the Communist Party of China (CPC) learned the basic connotations of socialist production distribution theory, which had originated from the Soviet Union, along with "balanced distribution theory" and the "determinism of production relations" as the core, in order to improve China's level of comprehensive development. According to the international and domestic state of economic and social development at that time, Mao Zedong proposed the future developmental direction for China in his "On the Ten Major Relations (1956)," and pointed out that it was necessary to promote the balanced development of the regional economy. Specifically, to balance the layout of industrial development, development in the interior should be promoted while encouraging industrial development in coastal areas. It is necessary to make rational use of the existing foundation of industrial development in coastal areas, that is, to promote the vigorous development of the inland industry through the coastal areas while not neglecting progress in the latter regions.

The period of balanced regional development after 1949 consisted of five five-year plans, from the First Five-Year Plan (1953–1957) to the Fifth Five-Year Plan (1976–1980). The former involved promoting industrial construction with the help of the Soviet Union. China also encouraged the handicraft industry as well as the establishment of agricultural production cooperatives to promote local agriculture. The Second Five-Year Plan (1958–1962) continued to focus on industrial development, with emphasis on the heavy industry. This was based on China's existing model of collective ownership, and was used to develop industry, agriculture, and handicrafts as well as transportation and commerce accordingly. During the Third Five-Year Plan (1966–1970), a nationwide three-line layout was adjusted, and eastern coastal areas with more advanced industrial technology as well as the Sino–Soviet border areas were classified as first-tier regions. Some central and western regions with relatively backward economic development were classified as third-tier regions. Such areas as Guizhou, Sichuan, Shaanxi, Gansu, western Shanxi, western Henan, and western Hunan, and the rest of the country were classified as second-tier regions. Agriculture was developed, primarily to solve the problem of food and clothing shortages, while strengthening national defense and other basic industries so that the national economic construction could be focused and proportionally concentrated in the third-tier regions. This helped promote their economic development and formed a spatial strategic transfer. With the gradual improvement in foreign relations in the 1970s, the intensity of investment in third-tier regions slowed down during the Fourth (1971–1975) and Fifth Five-Year Plans (1976–1980). While ensuring the construction of the strategic rear inland area, investment in coastal provinces was increased, and new projects were mainly distributed in the eastern and central regions. At this time, China's regional development strategy began to focus on coastal areas, the economic center of gravity began to shift, and the regional economy gradually became unbalanced.

The balanced regional development strategy after 1949 led to significant achievements given the national conditions at the time. It helped develop industry and agriculture, narrowed the economic gap between the eastern and western regions, and eased the imbalance among regional economies in the early days of the People's Republic of China. This helped provide a stable foundation for the development of the central and western regions. However, in this period, more attention was paid to the simultaneous and stable development of various regions, and the differences in their basic conditions and their local developmental advantages were not fully considered. Moreover, the internal economic relationship between these factors in light of the given region was ignored. Although this egalitarian development narrowed the gap in regional development on the surface, it has led to missed opportunities for the development of coastal areas.

2.2 Regional unbalanced development since the 1970s

At the end of the 1970s—in an international backdrop where China was saddled with geopolitical and military conflicts, the economic pattern of neighboring countries was evolving, and their speed of economic growth was significantly improving—China's comparative disadvantage in international market competition became increasingly prominent, and the need to adjust its industrial structure became increasingly clear. The regional economic development strategy was in urgent need of change. The second-generation leaders of the Party proposed the idea of unbalanced regional development. Deng Xiaoping proposed the “two overall situations,” and China began to implement the reform and opening-up policy, that is, to accelerate the pace of opening up in the eastern region, and prioritize its development in the hope of promoting the development of inland areas. Since then, China has followed this strategy of unbalanced regional development.

There were two periods of unbalanced regional development, represented by the Sixth (1981–1985) and the Seventh Five-Year Plans (1986–1990). During the period of the former, China made full use of the geographical advantages of its coastal areas to promote their rapid economic development through international trade. In this period, special economic zones played a positive role in the development of eastern China. It was far ahead in technology, management, knowledge, and foreign policy, and had a profound impact on the formulation of China's strategy for unbalanced regional development. Special economic zones rendered the regionally unbalanced strategy of development viable. In 1986, China formally implemented the Seventh Five-Year Plan (1986–1990). It focused on the economic development of the coastal areas, and, for the first time, divided China into eastern, central, and western regions based on their levels of development. It proposed reasonably dealing with the developmental relationship among the three economic zones. That is, the eastern region should give priority and focus on development, and the central region should rely on its resource-rich advantages to develop related industries, and strategically follow the development sequence of eastern, central, and western regions (Table 1).

The strategy of unbalanced regional development has led to remarkable achievements in China. By shifting the focus of development to the eastern region, China greatly accelerated its economic and industrial development. The rapid economic development in the eastern region promoted the establishment of the socialist market economic system. The achievement of economic in eastern region has created many jobs, indirectly solved the employment

Table 1 Proportions of investment in infrastructure construction in eastern, western, and central China from 1978 to 1995

Year	Eastern	Central	Western	East-center-west ratio
1978	40.1	30.6	20.4	1.97:1.50:1
1980	44.5	29.5	20.3	2.19:1.45:1
1985	48.4	28.2	16.8	2.88:1.68:1
1990	50.9	23.2	16.8	3.03:1.38:1
1995	54.9	22.7	15.2	3.61:1.49:1

Data source: China Fixed Assets Investment Statistical Yearbook 1950–1995. New China 60 Years' Statistical Data Compilation.

problem in the central and western regions, and effectively improved China's economic efficiency. In the eastern region, such measures as establishing special economic zones and coastal open cities have promoted economic development in the central and western regions. This significantly alleviated the imbalance in China's industrial structure, allowed the local economy to develop flexibly, promoted the diversified development of market subjects, and helped establish a characteristic market system. The strategy of unbalanced regional development emphasizes efficiency. For developing countries in the primary stage of economic development, it is appropriate to implement this strategy. Under these circumstances, China's economy has gradually developed to form a multilevel, regionally centralized, and all-round pattern of unbalanced development.

2.3 Initial stage of coordinated regional development in the 1990s

In the 1990s, China's regional development took on new features. The principle of efficiency was still the focus in all regions, and both efficiency and equity were emphasized in policy making. The Eighth Five-Year Plan (1991–1995) heralded a new period of regional development. With the guiding principles of "overall planning, rational division of labor, complementary advantages, balanced development, balanced interests, and common prosperity," China made strategic adjustments, and added the economic development of the central and western regions to its agenda, specifically by increasing construction of the basic industries and infrastructure. In the western region, China focused on implementing the strategy of "speeding up opening," developing foreign trade and economic cooperation with neighboring countries, and making full use of its own regional advantages to promote the economic development of the region with the aim of ensuring the balanced development.

Regional unbalanced development has driven China's economic development but its shortcomings have gradually emerged. The orientations of the goals of both efficiency and fairness have gradually been determined in the process of economic and social development. In 1999, China began to implement its western development strategy, and promoted the economic development of the central and western regions. The economic development of the western region has since significantly accelerated. In 2000, the ratio of the current value of fixed assets of the state-owned industries to GDP in the western region was higher than that in the eastern and central regions. Infrastructure construction has been carried out in the western region, and the economy and living standards of the people have greatly improved. While promoting economic development, environmental protection has not been neglected in the western region. China has intensified ecological restoration and environmental protec-

tion, and the government has issued corresponding policies to support this aim. For example, the project of returning the farmland to forests and grasslands in the western region has helped protect the ecological environment. Since the implementation of the Ninth Five-Year Plan (1996–2000), transportation arteries and central cities in all provinces and regions in China have helped balance and stabilize the development of regional economies, and seven trans-provincial economic regions have been formed. The 10th Five-Year Plan (2001–2005) emphasized the development of the eastern, central, and western regions. According to it, the eastern region should continue to open up to the world to promote its rapid economic development. Regions that are economically advanced should modernize. The central region should make full use of its regional advantages and rich natural resources, and the western region should proceed according to its own conditions (Guo *et al.*, 2020), formulate overall plans, develop in a scientific manner, improve its investment environment, and attract investors to participate in the development and construction of the region.

The implementation of a balanced regional economic development strategy has enhanced China's overall national and economic strength. The western development strategy has also accomplished significant achievements. While the economic and technological level of the western region of China has been greatly improved, the eastern region was still in a good state of economic development and maintained a positive momentum of economic development.

2.4 Balancing regional development in the early 21st century

As a trans-century project, the western development strategy has achieved remarkable results that have manifested in the rapid economic development and improvement of the ecological environment in the region. However, owing to the relatively poor natural conditions in western China, its low economic level, and weak infrastructure, the low conversion rate of funds invested in the region, and medium- and long-term projects struggle to yield benefits in the short term, all contradicted the relative scarcity of national funds. At the same time, the importance of the northeastern and central regions to the overall national pattern has declined, and the development strategy for the western region thus needs to be adjusted. The Third Plenary Session of the 16th Central Committee of the Communist Party of China (CPC) was held in 2003, and made proposals for China's future development as well as the "Five Overall Plans" for economic development: namely, urban and rural development, regional development, economic and social development, harmonious development between humans and nature, and domestic development and opening up (Gao *et al.*, 2008). This should be used to adjust the plan for regional economic development. The Party Central Committee pointed out that the overall development of the regional economy should be implemented under the guidance of scientific development. It also proposed that in the future, China should continue to implement its western development strategy, focusing on the economic development of and construction of infrastructure in the western region while promoting the overall revitalization and orderly development of the old industrial base in the northeast. Moreover, it should continue to promote the rise of the central region. We must also continue to promote the priority development of the eastern region and promote the overall development of the region. At the same time, it is necessary to establish a sound, regional, and balanced mechanism of interaction to promote balanced regional development

(Feng, 2020). Overall regional development involves deepening balanced regional development, and this includes its basic content and basic connotation.

The 11th Five-Year Plan (2006–2010) outlined a macro-strategic deployment for China’s future regional economic development, stating that it would continue to encourage the eastern region to take the lead in economic development. This region should enhance its scientific and technological innovation, improve market mechanisms, and contribute to economic development of the central and western regions while developing itself. The western region should speed-up the pace of reform and opening up to the outside world, pay more attention to infrastructure construction and natural environmental protection, and develop advantageous local industries to improve local economic development capacity. The northeast region should promote the transformation of state-owned enterprises, develop advantageous industries, and promote the adjustment and upgrade of its industrial structure. It should also focus on the development of modern agriculture, improve the economy, and revitalize the old industrial base. To improve its own economy, the central region should make full use of its energy and manufacturing advantages, further increasing the construction of local infrastructure, increase market development, and build a modern market system to play a role in connecting the east to the west. Since then, China has entered a period of coordinated and balanced development of the four major regions. Under the guidance of the regional overall development strategy, a balanced developmental pattern in the eastern, northeastern, central, and western regions has gradually formed, and China’s economy and society have developed in a steady and orderly fashion (Table 2).

Table 2 China’s regional economic development from 2000 to 2010

Year	National per capita GDP/yuan/person			Per capita GDP/yuan/person in western China		
	Highest	Lowest	Maximum difference	Highest	Lowest	Maximum difference
2000	34547	2662	12.98	7470	2662	2.81
2005	51474	5052	10.19	16331	5052	3.23
2010	73297	13221	5.54	47174	13221	3.57
Year	Per capita GDP/yuan/person in central China			Per capita GDP/yuan/person in northeast China		
	Highest	Lowest	Maximum difference	Highest	Lowest	Maximum difference
2000	7188	4851	1.48	11226	8562	1.31
2005	12495	8675	1.44	18983	13348	1.42
2010	27615	20611	1.34	41782	26715	1.56

Data source: China Statistical Yearbook

2.5 Comprehensive implementation of regionally coordinated development strategy since the 18th CPC National Congress

In the 18th National Congress of the CPC in 2012, the Party Central Committee has proposed a spatial layout strategy centering on the coordinated development of the regional economies. A coordinated regional economic development strategy, represented by the development of the Beijing–Tianjin–Hebei region, “the Silk Road Economic Belt and the 21st-Century Maritime Silk Road (B&R)” (the Belt and Road Initiative), and the Yangtze

River Economic Belt, has since been formed. In addition to the eastern, central, western, and northeastern regions of China, countries and regions along the Belt and Road are included in the scope of this coordinated development. Compared with the balanced development strategy, which emphasizes narrowing the gap between elements, coordinated development requires more competition and tacit cooperation among the relevant elements to achieve a win–win and mutual benefit (Wang, 2012). The Beijing–Tianjin–Hebei coordinated development and the Yangtze River Economic Belt construction strategies have been focused on changing the domestic situation of regional economic development, while the Belt and Road Initiative focusing on overall development, emphasizing the development of China beyond its borders, and achieving the goal of establishing a “community of destiny and community of interests,” which is a strategy for spatial development. This can promote the harmonious development of all countries in the world, the economic balance between developing and developed countries, and the two go hand in hand in the context of developing the economy (Gou and Yang, 2020) (Table 3).

In early 2018, the Chinese President Xi Jinping pointed out that it is necessary to implement regionally coordinated development, make full use of regional advantages, develop characteristic industries in each region, promote the coordinated and linked economic mode of development of each region, and establish a green and sustainable system of development for the coordinated development of various regions. Thus, while implementing the strategy of regionally coordinated development, a new pattern of this is formed and the spatial layout of modern economic system is promoted. The CPC Central Committee hopes to establish a modern regional development system that can coordinate all regions, so as to form a new pattern of regional development that is coordinated and linked between regions and promote the rapid economic development of various regions across the country.

Table 3 China’s regional economic development from 2011 to 2016

Year	National per capita GDP/yuan/person			Per capita GDP/yuan/person in western China		
	Highest	Lowest	Maximum difference	Highest	Lowest	Maximum difference
2011	86496	16117	5.37	56666	16117	3.52
2013	101669	22982	4.42	67604	22982	2.94
2016	115617	27513	4.20	74203	27513	2.70
Year	Per capita GDP/yuan/person in central China			Per capita GDP/yuan/person in northeast China		
	Highest	Lowest	Maximum difference	Highest	Lowest	Maximum difference
2011	50349	32637	1.54	34223	25395	1.35
2013	61695	38602	1.60	42686	31795	1.34
2016	54066	40365	1.34	55196	35284	1.56

Data source: China Statistical Yearbook

In the five stages constituting the course of China’s regional economic evolution—balanced regional development, unbalanced regional development, the start stage, regional harmonious development as a whole stage, and the regionally harmonious stage of development—can be summarized as “low level, unbalanced development, and the balanced development of high-level balanced development” (Ding and Chen, 2020). From the per-

spective of balanced regional economic development, from the thought of regional balanced development in early days of new China to the regional coordinated development in the new era, although the emphasis on regional development strategies is different in different periods, the ultimate development goal is common prosperity.

3 Scientific connotation of and factors influencing balanced regional development in the new era

The Report of the 19th National Congress of the Communist Party of China (2017) stated that the main contradictions in Chinese society, in the backdrop of the new era of socialism with Chinese characteristics, have transformed into contradictions between the people's growing needs for a better life, and unbalanced and insufficient development. Imbalances in regional, urban, and rural development, as a manifestation of inadequate balance in development, have not only existed in the past but may also exist for a long time in the future, and will cause many social contradictions and problems. In the new era, achieving a balanced regional development from the perspective of development geography, and constantly enriching theories and strategies of balanced regional development in China are important for achieving high-quality development and common prosperity.

3.1 Connotation for balanced regional development from development geography

At the Central Economic Work Conference held in December 2017, President Xi Jinping proposed a coordinated regional development strategy for the equalization of basic public services, with a relatively balanced degree of access to infrastructure and roughly the same standard of living. On the premise of emphasizing balanced economic development in the past, this strategy has incorporated the concept of social, cultural, and ecological balance to attempt to attain a balanced state in people's lives and well-being across regions.

The neoclassical theory for the balanced development of a regional economy claims that regional economic development eventually tends to equilibrium automatically through the process of capital accumulation within a region, and the flow of factors of production between regions under the action of the market mechanism. However, this theory ignores the cost of the spatial flow of economic factors. In a certain sense, the neoclassical theory of balanced regional economic development is actually a theory that does not consider the concept of space. Subsequent work in unbalanced development theory has pointed out the infeasibility of balanced development from the perspective of resource scarcity, and derived exemplars such as the growth pole theory (Perroux, 1950), and gradient transfer theory (Vernon, 1966). These theories have emphasized the development of key regions and departments to drive the entire region. Although the theory of unbalanced regional development adds the consideration of spatial factors to the equation, it ignores the potential benefits of balanced regional development and the influence of regional characteristics on it. With the intensification of globalization and continual regional integration, Western economists, as exemplified by Krugman, have turned to the perspective of the geospace to discuss reasons for differences in the development of different regions. This has led to the birth of new economic geography (Krugman, 1991). By taking multiple equilibrium as the basic idea, new economic geography integrates spatial heterogeneity into economics, and studies the

spatial agglomeration and diffusion of economic activities, which is essentially a theory of regional economic imbalance. The “spatial turn” of mainstream economics has improved the explanatory power of economic theory (Yang *et al.*, 2009). However, the description of the so-called “space” in the economic model has been generalized in the past, and the scale and characteristics of the region have been ignored so that it cannot guide policy for a specific region (Duan *et al.*, 2010).

The relationship between equity and efficiency in regional economic development has always been the focus of theoretical research on economic geography. Economic geography explores the role of industrial agglomeration and path innovation in promoting regional economic development in terms of regional economic development efficiency (He *et al.*, 2016; He *et al.*, 2018), and studies how to use spatial policies to redistribute production factors in terms of equity to promote the development of underdeveloped regions (Fan and Wang, 2019; Fan *et al.*, 2019). Economic geographers not only use space as a factor to explain economic development, but also use space as one of the tools of regulation and control to promote regional economic production and development. With the examination of economic geography in the context of regional development and regulation, the idea of “spatial governance” has gradually emerged and been applied. Its core view is “to realize the effective, fair, and sustainable utilization of land space and the relatively balanced development among regions through resource allocation” (Lin, 2014). Regional development (Fang, 2021), main functional zoning (Fan, 2015), national territorial spatial planning, and other important topics in geographical research on China are the concentrated embodiment of the idea of “spatial governance.” As Smith has stated, unbalanced geographical development is a systematic geographical expression of the inherent contradiction of capital accumulation, and “neoliberalism,” arguing that a complete free market mechanism cannot balance the economic development between regions (Smith *et al.*, 1990). Socialism with Chinese characteristics does not allow capital accumulation and appreciation to widen the developmental differences between regions. The government has the power to intervene in the spatial flow of factors of capital production to promote fairness and justice in social development. From this perspective, adjusting the spatial flow of production factors in the process of social reproduction through different spatial policies to achieve a balance in regional economic development is the connotation of economic geography in the context of balanced regional development.

From the perspective of development geography, balanced regional development refers not only to the spatial balance of the “results” of regional economic development but also to the spatial balance of regional developmental capabilities and opportunities. The spatial balance of development opportunities is the basic requirement for balanced regional development, and a concentrated expression of social fairness and justice. Each region has different resource endowments and developmental paths, but should enjoy equal development rights. In terms of national policy orientation and resource allocation, we should create more equal development opportunities for different regions so that the development potential of each can be fully realized (Sun and Hou, 2019). In terms of development capacity, China has clear physical and geographical differentiation, uneven distribution of regional resources, and significant differences in social and economic development, thus forming a complex and diverse path to regional development. The various paths to regional development determine

those different regions have different modes of development. The balance of developmental capacity is reflected in whether a region can give full play to regional characteristics and advantages according to local conditions and time to achieve high-quality development and benefit the local people. The balance of the results of development is the most stringent requirement, and the final effect should be reflected in the development of people's livelihood. With regional characteristics as the main body, multi-objective coordinated development meets the increasingly diversified, multi-level, and multi-faceted needs of people in the process of development. The people-oriented idea of the new concept of development runs through time. The result of balanced regional development should be a balance in people's well-being between regions, which is the meaning of "people's living standards being roughly the same." In general, balanced regional development in development geography involves examining the spatio-temporal pattern of development from the perspective of geography, and analyzing the relationship between development and such key factors as society, economy, and politics to identify developmental differences between and within developed countries/regions and underdeveloped countries/regions. This can provide decision support for the convergence of regional development and an improvement in people's well-being (Liu *et al.*, 2019; Deng *et al.*, 2021).

The current situation of regional development and differences in China is the result of many factors. Among the numerous factors, geography is the basic one guiding it. The geographical factor here refers to the "Earth" element in the Human–Earth relationship, and is the basis of the spatial structure formed by the interaction between "Humans" and "Earth" (Lu and Liu, 2000). In the new era, geography, as a practical subject, should be more actively engaged in balanced regional development. With its comprehensive, regional, open, and practical characteristics, it should make unique contributions to China's balanced regional development under the guidance of human–land relationship theory.

3.2 Quality-related connotation of balanced regional development

The quality of development is a core of the balanced regional development, and the transition from quantitative to qualitative development is the essential requirement of the concept of development in the new era. Scientifically defining and interpreting the connotation of the quality of balanced regional development is an important criterion and basis for exploring improvements in the latter (Deng *et al.*, 2020). Regional development requires overall development from the economic, social, and ecological perspectives. Therefore, the quality of balanced regional development is also determined by these aspects. The region can be divided into three subsystems: economy, society, and ecology. The quality of balanced regional development can be characterized by the comprehensive development of each subsystem in the process of regional development as well as the level of coordination in development among these subsystems.

High-quality development of the economic system is the goal of regional development, and national economic development embodies the connotation of the quality of regional development. China's economy has transitioned from the stage of high-speed growth to that of high-quality development. Innovation is the driving force of high-quality economic development. The measurement of innovation should include two levels. One is to measure the effectiveness of innovation itself as a result, that is, the driving capability of innovation; the

other is to regard innovation as an input factor and measure its impact on the use efficiency of other production factors, that is, the ability of innovation to promote efficiency (Xu *et al.*, 2013; Lin, 2017; Chen *et al.*, 2019). Innovation is an economic activity rather than an end in itself, and its main purpose is to improve economic efficiency (Huang *et al.*, 2014; Sun *et al.*, 2017). China is in a critical period of transforming its mode of development, optimizing its economic structure, and transforming its momentum for growth. The current factor-driven mode of growth is no longer sustainable, and must be transformed into an innovation-driven mode (Anadon *et al.*, 2000; Coccia *et al.*, 2009).

The level of development of the economic system is an important indicator used to measure the development of a region. However, excessive ecological and socio-economic development is undesirable. The essential connotation of high-quality development is highly efficient, fair, green, and sustainable development to meet the growing needs of people for a better life. Continually improving the level of regional social development is not only the internal requirement of high-quality regional development but also the prerequisite to meet the growing needs of people for a better life. In addition to material and cultural life, people have increasingly stringent requirements for democracy, the rule of law, fairness, justice, security, and the environment, and attend to health and education (Gao *et al.*, 2020). Development must be one in which people's quality of life continues to improve, and the achievements of development must be shared by all. If we blindly pursue economic growth and ignore social construction, this can lead to a serious widening of the income gap and the solidification of the social stratum. Economic growth will not be sustainable in this case. A harmonious society can provide a strong driving force for development, stimulate the enthusiasm and initiative of the people to participate in modernization, and promote the rapid accumulation of material wealth (Cai, 2020).

The ecological civilization is the product of industrial civilization in a certain stage, and is a new requirement for realizing the harmonious development between humans and nature. In the past, the mode of emphasizing development over protection accumulated a large number of ecological and environmental problems that directly restricted economic development. In the present stage, China's construction of an ecological civilization is in a critical period of superimposed pressure, and has a long way to go. The overall improvement in the quality of regional development should follow the basic principle of "ecological priority and green development." In the process of regional development, strengthening the attention paid to the subsystem of the ecological civilization reflects the value orientation of respecting nature and utilizing resources, developing the economy, and protecting the ecology (Hu *et al.*, 2000; Xiong *et al.*, 2009). The report to the 19th National Congress of the Communist Party of China (CPC) clearly states that "building an ecological civilization is a thousand-year plan for the sustainable development of the Chinese nation." This statement has raised the ecological civilization to an unprecedented height of importance, which also means that it runs through the entire process of high-quality economic development. In the future, China's regional development should optimize the orientation of its main regional functions and industrial layout, solve the contradiction between resource-based development and strengthening protection for the ecological environment, and promote the highly coordinated development of resources and the environment with economic development.

Regional development requires overall development from the economic, social, and eco-

logical perspectives, so that the quality of regional development is also determined by these dimensions. In short, balanced regional development in the new era has gone beyond the concept of balanced economic development. It considers the characteristics of regional development as the main body, and achieves the coordinated development of multiple objectives, such as the ecology, society, and economy, to finally achieve the goal of roughly equal living standards among regions.

3.3 Factors influencing balanced regional development

Regional development is a complex and multi-dimensional process (Martin *et al.*, 2006; Martin *et al.*, 2010; Liu *et al.*, 2019; Deng *et al.*, 2020). Most relevant studies have analyzed regional imbalance along the industrial (Chen, 2020) and spatial dimensions. Krugman (Khalil *et al.*, 1992) has claimed that spatial heterogeneity (differences in history and culture, factor endowment, and policy environment) is not only the basic element of the regional division of labor but is also the reason for industrial agglomeration. The emergence of industrial agglomeration leads to the spatial asymmetry of economic activities. In turn, the spatial asymmetry promotes industrial agglomeration, and finally forms a relatively developed “central region” and a relatively backward “peripheral region.” Regional development is a process determined by the industrial technological connection, and path dependence relies on natural resources, the sunk cost of local assets and infrastructure, local external economy, the regional technology lock, and an agglomerated economy (He and Zhu, 2020). At the same time, changes in the conditions for economic development and the resource structure lead to path innovation, which realizes the spiral and progressive innovation of regional development under the joint action of path dependence and path innovation (Meng *et al.*, 2011).

Economic geographers believe that the physical geographical environment, location and transportation, human capital, and research and development are the main factors determining regional development, where the physical geographical environment is the basic reason for differentiation in regional development (Wang, 2002). Such geographical factors as natural conditions, location, resource endowments, ecological environment, and infrastructure have relatively stable and long-term effects on regional development (Fan, 2004). In terms of the spatial division of regional development, China is usually divided into three (eastern, central, and western) or four major regions (eastern, central, western, and northeastern). However, studies have shown that major differences persist within these regions. China’s social economy is thus further subdivided into eight major regions: the northeast, the northern coastal region, the eastern coastal region, the southern coastal region, the middle reaches of the Yangtze River, the middle reaches of the Yellow River, the southwest, and the northwest. In each historical period, the levels and speeds of development of regions have differed as driven by regional development strategies, such as balanced development and gradient development. With the transformation of the mode of social and economic development as well as the implementation of poverty alleviation, regionally coordinated development, urban–rural integration, and other strategies, the factors affecting China’s regional development level have further expanded in form and content. In addition to traditional geographical factors, uncertain factors, such as scientific and technological development, element circulation, policy control, system arrangement, and natural disasters, have also gradu-

ally exhibited their influence on regional development.

As a multi-scale and multi-type spatial system, the region is a concrete carrier for the implementation of sustainable development. The factors affecting the sustainable development of different scales and types of regions are not completely consistent. They include economic development, social development, the resource environment, and sustainable development capabilities (Jia and Liu, 2003). After the evolution of disordered development, black development, and circular development, sustainable development has become the core of China's construction of an ecological civilization, and plays an important role in social development plans and regional policy-making.

4 Path of balanced regional development in China

As a manifestation of inadequate development, unbalanced development between regions, and between urban and rural areas may continue to persist for a long time to come (Liu *et al.*, 2019; Deng *et al.*, 2020). The goal of development determines the choice of developmental path, which in turn affects the basic principles of dealing with contradictions among factors during development. Under the guidance of sustainable development theory, the goal of development geography is to pay attention to the differences in resource endowments among regions, solve the contradictions among the economy, humans, and nature, and promote the spatial balance of regional development as well as the green development of the ecological economy. According to the process of nationally balanced regional development in combination with China's measures to implement the objectives of the sustainable development agenda, the paths to balanced regional development mainly include the harmonious symbiotic development of humans and nature, territorial spatial planning, and the transformation and development of agricultural and rural modernization.

4.1 Harmonious development among economy, society, and ecology

In the new era of the development of socialism with Chinese characteristics, the main contradictions in Chinese society have undergone a fundamental transformation. There is a contradiction between the people's growing pursuit of a better life in terms of a suitable environment, and the demand for and supply of high-quality ecological products. The Party Central Committee has decided that the construction of an ecological civilization is in the "superposition of three phases." With the Belt and Road Initiative, the coordinated development of Beijing, Tianjin, and Hebei, and the three major strategies for the development of the Yangtze River Economic Belt, regional ecological economic socially sustainable development have become the new trend of China's regional development strategy.

In 2015, the Central Urban Work Conference called for "coordinating the layout of production, living, and ecology to improve the livable nature of urban development." The transformation of production and lifestyle based on the ecological environment is a new requirement for balanced regional development in the new era. Specifically, the premise is to transform the regional economy and optimize the industrial structure. In this stage of high-quality development, the original mode of regional economic development can no longer meet developmental needs, and the mode of development needs to be extensively adjusted. We should make greater efforts to improve the current situation, in which the in-

dustrial structure is biased toward fossil energy and the industrial layout is dominated by many human factors. We need to accelerate the green transformation of the regional economy, drive the development of productive forces with technological innovation, promote the construction of new energy, reduce dependence on highly polluting traditional energy, strive to strike out a path to green production with low energy consumption and low pollution, and promote the harmonious symbiotic development of humans and nature.

To promote the balanced, healthy, and sustainable development of the global economy, ecology, and society, the Sustainable Development Global Action Goal Network united with the Bertelsmann Foundation of the United States to develop a set of “SDGs Index and Dashboards” in 2016. These are the 17 Global Sustainable Development Goals (SDGs); each target in the index establishes a set of corresponding specific methods of analysis and indicators. The purpose is to help countries around the world identify problems and challenges in the process of achieving the SDGs (Sach *et al.*, 2016) (Table 4). China is facing major challenges in terms of economic and social equity, pollution of agricultural water resources, and environmental and ecological protection. In 2016, Premier Li Keqiang announced the official release of China’s national plan for implementing the 2030 Agenda for Sustainable Development in Beijing. The plan summarizes the main achievements and valuable experience of China’s sustainable development in recent years, evaluates the opportunities and challenges facing China’s further realization of the SDGs, and points out the guiding ideology, coping strategies, and specific measures for policy implementation. In the future, we should promote the process of sustainable development by improving its working mechanism, paying attention to the construction of an ecological civilization, strengthening the coordinated development of ecology, the economy and society, and improving the public’s sense of responsibility.

Table 4 Results of evaluation of the SDG index in China in 2018

Goal	SDG1	SDG2	SDG3	SDG4	SDG5	SDG6	SDG7	SDG8	SDG9
Score	99.7	71.5	80	73.8	75.6	89.9	69.1	83.1	58.7
Rank	43	19	61	96	38	34	98	26	31
Goal	SDG10	SDG11	SDG12	SDG13	SDG14	SDG15	SDG16	SDG17	
Score	59.6	69.2	73.2	69.3	33.5	58.6	72.5	53.6	
Rank	64	95	80	139	106	90	37	112	

Data source: Global Report on SDG Indicators and Dashboards, 2018.

4.2 Territorial spatial planning

As an important regulatory means for balanced regional development, China’s spatial planning system has undergone an evolution, and its development in each stage reflects the phased needs of China’s regional development. Spatial planning is based on a full consideration of China’s national economy by taking into account its direction of social development as well as goals and requirements. It is established in accordance with the corresponding regulations that include the rational layout of land and space, and the overall development and utilization of the country’s strategies, plans, or policies. It is characterized by a reasonable and precise spatial scope. Usually, the content of spatial planning includes the comprehensive utilization of national resources, reasonable layout of productive forces, overall

management of the country, and comprehensive environmental protection (Yang *et al.*, 2014). Building a planning system for territorial space is an objective requirement for a country to promote the construction of an ecological civilization. We should not only fully consider the corresponding restrictions on and balance of self-interest and power among governments, but should also intervene in Chinese market economy, and give full consideration to social development and ecological protection. As the basis for the government's regulation of balanced high-quality development, territorial spatial planning is an objective requirement for China to promote ecological progress and the basis for coordinated and high-quality national development.

To promote balanced regional development, territorial spatial planning should aim at optimizing the pattern of territorial development and protection, focusing on the coordinated development of urban agglomerations and surrounding areas, promoting the flow of production factors to less developed areas, and protecting ecologically important areas. By means of policy and spatial governance, efforts should be made to improve the inclusiveness of cities, enhance their capacity to absorb migrant population, promote the simultaneous aggregation of the economy and population, realize the spatial balance between the population and the economy, and gradually realize the basic equality of provinces in terms of national population and economic aggregate (Fan, 2020). Spatial planning should strengthen infrastructure in underdeveloped areas, and break barriers to the circulation of production factors to achieve a relative balance of development opportunities among regions. It should innovate paths for regional development based on natural carrying capacity, geographical environment, and regional functional suitability. Regional advantages and characteristics should be considered fundamental for improving regional development capacity, and realizing the spatial balance between quantitative and qualitative regional development. At the same time, governments should, based on the "three lines delimitation," formulate a spatial planning system to reasonably maintain its main functional orientation. The government should consider such factors as an ecological civilization, industrial development, the layout of towns and villages, and infrastructure to reasonably delimit the "three health control line," realize the scientific goal of protecting national ecological security, production safety, and living safety, and formulate various types of spatial plans in China.

4.3 Reconstructing and upgrading the eco-agriculture in China

The development of agriculture and rural areas is a fundamental issue related to the national economy and people's livelihoods, and is the focus of research on development geography. Comprehensively promoting the modernization of agriculture and rural areas is a major task for building a modern socialist country in the new era. In 2017, President Xi Jinping put forward the strategy of rural revitalization in the report of the 19th National Congress of the Communist Party of China, emphasizing that solving agricultural and rural issues should always be the top priority of the Party's work.

Scholars have worked on the concept and scientific practice of eco-agriculture since the 1980s by integrating the advantages of traditional agriculture with modern science and technology. For China to realize the transformation of its agricultural ecology requires various favorable measures—for example, to strengthen the construction of pilot projects for eco-agriculture, encourage scientists to continue high-level scientific research, enhance their

innovation capabilities, increase research on the agricultural ecological environment, increase environmental protection measures, compare all aspects of methods of agricultural production, go to grassroots farmers, discover and summarize the practical experience of the people, use various means to widely publicize and carry out knowledge promotion as well as the promotion of an agricultural ecology (Luo, 2020). Eco-agriculture has been integrated into rural development in recent years. While increasing the income of rural residents, this has also improved the quality of the ecological environment.

In addition to increasing technological innovation and developing eco-agriculture, it is important to promote rural reform. President Xi Jinping has pointed out that reform is an important measurement for rural revitalization. To promote agricultural and rural modernization in the new era, we should get rid of various obstacles to agricultural and rural development, and awaken the “sleeping resources” in rural areas. We should grasp the characteristics of regional differentiation among villages, and formulate policies and measures in line with local development. Moreover, rural modernization should not be confined to rural areas. We must choose integrated development between urban and rural areas, strengthen the use of industry to supplement agriculture, encourage urban areas to lead rural areas, and promote the formation of a new urban-rural relationship of mutual promotion between industry and agriculture, urban-rural complementarity, coordinated development and common prosperity. The ultimate goal of development is to enhance people’s well-being, consolidate and improve rural infrastructure, protect farmers’ practical rights and interests, and provide a stable policy-related and developmental environment for them.

5 Conclusions and discussion

Development is an eternal theme. With continuous advancement in human understanding, the concept of development has also constantly evolved. Since 1949, China’s regional development has shown a succession of stages of unbalanced and balanced development, each evolution makes the quality of social development to a new level, and gradually makes China move towards a state of high-quality development and balanced regional development.

In the new era, the results of balanced regional development should be reflected in the development of people’s livelihood. In addition to the balanced development of the economy, that of society, culture, and ecology cannot be ignored. By using regional characteristics as the basis, the relevant problem that needs to be solved is to attain multi-objective coordinated development that meets the diversified, multi-level, and multi-faceted needs of the people. Development should take innovation as the driving force, promote the innovation of the factors of production and the economic structure, improve the quality of economic development, strengthen the construction of the social system, ensure people’s quality of life, and improve their enthusiasm for and initiative in modernization. We also need to attend to the coordinated development of the ecological civilization, optimize regional functions and the industrial layout, and promote the harmonious development of people and land.

Looking forward to the 14th Five-Year Plan (2021–2025) and the 2035 development goals, and relying on the “regionally coordinated development strategy” guided by national macroscopic planning, China will implement territorial spatial planning, modernize its agricultural and rural development, promote the transformation and development of economy and society, and work to construct an ecological civilization to promote balanced development among its regions.

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