Research on the Definition and Development Evaluation of the Connotation and Extension of Resource-Based Areas

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Abstract：   The definition of the connotation and extension of resource-based cities (regions) in China has encountered some problems, resulting in the emergence of different opinions that there are 80 to 426 resource-based cities in New China. This paper proposes that the connotation and extension of resource-based cities (regions) may have some adjustments in different time and space, but its essential content should be fixed, constant and universally applicable in the world; relative indicators should be employed as far as possible since the establishment of absolute indicators for the evaluation index system of transformation performance and development potential of resource-based regions often lacks comparability. In this paper, we have made great efforts in these aspects.

1.   Research status of connotation and extension of resource-based areas

China's research on the connotation and extension of resource-based regions has encountered some problems, which leads to different statements about the number of resource-based cities in New China, for example, 80, more than 170, about 300, 426 and 262.[1] In 2003, "118 resource-based cities" were officially authorized in China[2]. Ten years later, in 2013, the number of authorized resource-based cities(regions) was expanded to 262, of which 128 were prefecture level cities (3.8 times that of 2003) and 62 county level cities (2.4 times that of 2003).[3] In addition, it was authoritatively defined that "resource-based cities were cities that had risen or developed due to the exploitation of natural resources, and resource-based industries occupied a large share of industry." [4] This definition, on the one hand, did not indicate whether it was a local resource or not; Besides, the "large share" was too flexible and general to be held.

The authoritative definition in 2013 was that "Resource-based cities are the types that take the exploitation and processing of natural resources such as minerals and forests in this area as the leading industry." There were 3 specific indicators: mining function intensity, output scale coefficient and the degree of resource contribution. Cities that met one of the three indicators could be recognized as resource-based cities. What remains to be discussed in this definition and the three indicators are: First, leading industries usually refer to those industries or industrial sectors that are in the leading position of technology in the industrial system, and represent the direction or trend of industrial structure evolution. The resource-based industries of declining resource cities cannot play a role of "driving and promoting". Second, the points remain to be discussed in the indicators of the mining function intensity and the output scale coefficient are as described above.

In addition to the above two authoritative definitions, many others have also defined

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[1]   Luhong Liu, Historical investigation and significance of the concept of resource-based city. Journal of Sichuan normal university (social science edition), September 2005

[2]   Research group of macroeconomic research institute, state planning commission. Macroeconomic research, no.11, 2002

[3]   Jianhui Yu, Jiaming li, Wenzhong Zhang. Identification and comprehensive classification of resource-based cities in China [J]. Acta Geographica Sinica, 2018, 73(4): 677-687

[4]   Research group of macroeconomic research institute, state planning commission. Macroeconomic research, no.11, 2002

resource-based cities, such as Hu Kui, Zhang Shaojun... Zhou Liang (2017) proposed the definition of post resource-based cities, which is, the cities which have undergone a period of transformation, focused on the cultivation of new alternative industries and began to take shape instead of relying on resource consumption.

Resource-based Town (City), Mining Town (City), Company Town (City), etc. are used to describe resource-based cities in other countries, which mean resource-based, industry and mining industry, and energy resource. City and town represent the geographical scope[5].

2.   Research status of development stage in resource-based areas

Lucas first put forward the "four-stage development theory" of resource-based cities in 1971, including construction stage, development stage, transformation stage and maturation period, on the basis of which the "decline stage, closing stage" was added by Bradbury in 1979.

Han Fengqin et al. (2014) divided resource-based cities into initial resource-based cities, mature resource-based cities and exhausted resource-based cities, while Zhao Kangjie and Zhao Yujuan (2011) classified them into lightly dependent, moderately dependent and heavily dependent resource cities. Yu Jianhui, Li Jiaming (2018) pointed out the traditional classification method based on the division of dominant resource types and the division of urban development cycle.

3.   Research status of transformation performance and development potential in Resource-based Regions

The evaluation index system in Annual performance assessment and evaluation methods for the transformation of resource-exhausted cities (trial) remains to be discussed in the following aspects: First, there is no GDP index. Second, there is no horizontal comparison index with the average level of the provinces and cities. Third, the index of "urban employment" should be changed to the urban registered unemployment rate, because the increase or decrease in employment sometimes cannot fully reflect the employment situation.

Niu Fei and Fu Yun (2007) analyzed the advantages and disadvantages of major evaluation methods for the transformation and development of resource-based cities, such as Delphi method, analytic hierarchy process, ecological footprint analysis approach, fuzzy comprehensive evaluation method, SVM method and entropy method. Ma Li et al. (2014) established an evaluation index system for the transformation of forestry resource-based cities from the four levels of economic system, social system, ecological system and resource system, including the target layer, system layer, element layer and index layer. Xu Jun (2011) constructed an evaluation index system for industrial transformation of resource-based cities from seven aspects: industrial growth potential，correlation，economic benefits, and comparative advantages, industrial scientific and technological progress, industrial human resource quality, and social benefits.

4. The author's definition of the connotation and extension of resource-based regions

4.1 Connotation

As a scientific concept, the connotation and extension of resource-based regions essential content should be fixed, constant and universally applicable. Therefore, our research group defines the connotation of resource-based regions as follows: Resource-based regions refer to the regions where the mining and processing of local mineral resources or forest resources is the leading or pillar industries. It contains the following four levels of meanings: First, resources include mineral resources and forest resources; second, the mining and processing of local resources; third, the mining and processing industries should be leading industries or pillar industries; fourth, regions formed by certain population, land and economic activities.

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[5] Luhong Liu, Historical investigation and significance of the concept of resource-based city. Journal of Sichuan normal university (social science edition), September 2005

4.2 Extension

The extension of resource-based regions is defined as follows from the perspective of population and land scale: industrial and mining areas, towns, county-level cities, and prefecture-level cities. Our research group defines the extension of resource-based regions as follows from the perspective of life cycle: pre-resource-based regions, growing resource-based regions, mature resource-based regions, exhausted resource-based regions, post-resource-based regions, as shown in Figure 1.
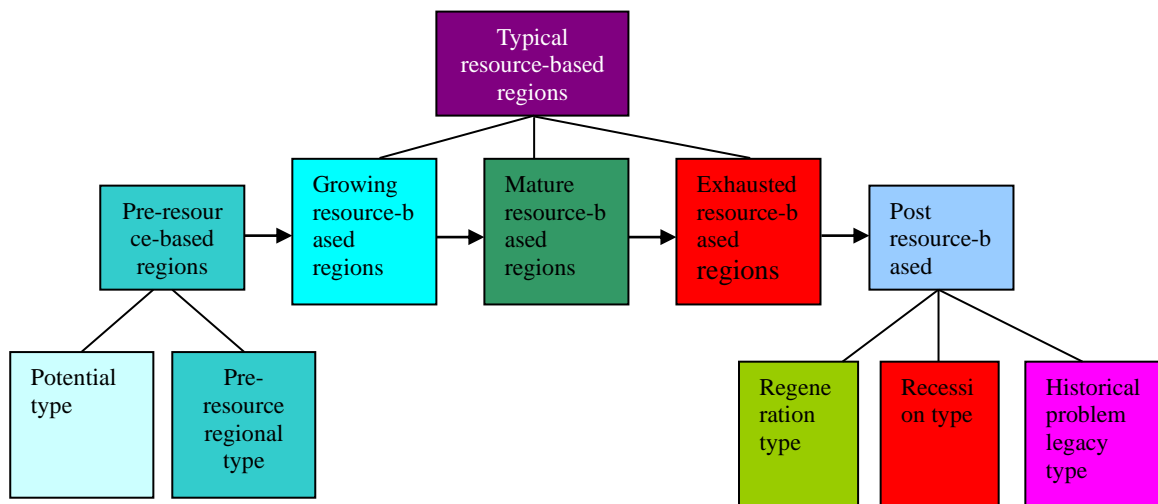

Fig 1. definition of Resource-based Region Extension from the perspective of life cycle

As shown in Figure 1, pre-resource-based regions refer to regions where the mineral or forest resources have exploitable reserves but have not been mined or have been mined and processed, but the resource industries have not become the dominant or pillar industries, including potential resource-based regions and quasi-resource-based regions.

Post-resource-based regions are regions that after experiencing the development stage of the typical resource-based regions, although the mining and processing of mineral resources or forest resources are still or will not be carried out in this region, the resource industry is no longer the leading industry or pillar industry. Among them, the regeneration type means that new alternative industries become the leading or pillar industries in the regions instead of the resource-based industries, and the transformation has been successful.

4.3 The author's construction of the evaluation index system for the transformation performance and development potential of resource-based regions

Principles for selecting indicators: First, Comparability. Considering that the scale of 262 resource-based regions in China has considerably different conditions. Based on the above difference, it is inappropriate to compare absolute indexes when we make comparisons of their development potential. Thus, relative indexes are adopted as far as possible. Second, Particularity. The selection of indicators should be as consistent as possible with ordinary areas. There are five first-level indicators in the evaluation index system designed by the research group, among which "resource development" reflects the characteristics of resource-based regions. There are 26 secondary indicators, six of which reflect the characteristics of resource-based regions. If the indicators that reflect the characteristics of resource-based areas are discarded, then the development potential can be compared with that of ordinary areas. If a region or a type of region or a national resource-based region is compared with itself at a certain point in the past, it can be concluded whether it has development potential and its size. Third, Accessibility. In addition to six indicators reflecting the characteristics of resource-based areas, other indicators can be found in the statistical yearbook, as shown in table 1.

Table 1 development potential evaluation index system of resource-based regions

Level indicator		Secondary indicator			evaluation criteria			
name	weight	Seral number	name	weight	Level 1	Level 2	Level 3	score
Resource development	0.2	1	Development stage (based on the type identified by the state in 2013)		recession	Growth mature	regeneration	
Economic development	0.3	2	Per capita GDP (yuan)	0.2	Lower than	Equal to	Higher than	
		3	The proportion of the total output value of the leading resource mining (logging) industry in the total industrial output value (%)	0.2	Higher than	Equal to	Lower than	
		4	The proportion of the total output value (%)	0.2	Lower than	Equal to	Higher than	
		5	Total fixed asset investment per capita(yuan)	0.1	Lower than	Equal to	Higher than	
		6	The per capita budget revenue of the public finance(yuan)	0.1	Lower than	Equal to	Higher than	
		7	The proportion of R & D investment in GDP(%)	0.1	Lower than	Equal to	Higher than	
		8	Energy consumption per unit of GDP	0.1	Higher than	Equal to	Lower than	
People's livelihood improvement	0.2	9	The average salary of on-the-job workers(yuan)	0.2	Lower than	Equal to	Higher than	
		10	The per capita disposable income of permanent urban residents(yuan)	0.1	Lower than	Equal to	Higher than	
		11	The per capita disposable income of permanent rural residents(yuan)	0.1	Lower than	Equal to	Higher than	
		12	The registered urban unemployment rate (%)	0.2	Higher than	Equal to	Lower than	
		13	The consumption level of all residents(yuan/person)	0.1	Lower than	Equal to	Higher than	
		14	Saving deposit balance(yuan/person)	0.1	Lower than	Equal to	Higher than	
		15	The average residential floor area (square meters)	0.1	Lower than	Equal to	Higher than	
		16	The completion rate of Shantytown reconstruction task （%）	0.1	Lower than	Equal to	Higher than	
Environmental remediation	0.2	17	General industrial solid waste production(tons)	0.2	Higher than	Equal to	Lower than	
		18	The comprehensive utilization rate of industrial solid waste (%)	0.2	Lower than	Equal to	Higher than	
		19	The recovery and treatment rate of geological environment in mines left over from history (%)	0.2	Lower than	Equal to	Higher than	
		20	The reclamation rate of damaged land left over from history (%)	0.2	Lower than	Equal to	Higher than	
		21	Land reclamation rate of historical goaf (%)	0.2	Lower than	Equal to	Higher than	
infrastructure	0.1	22	Per capita land area (square kilometers)	0.2	Lower than	Equal to	Higher than	
		23	Highway mileage per capita(kilometers)	0.2	Lower than	Equal to	Higher than	
		24	per capita beds in health institutions （number）	0.2	Lower than	Equal to	Higher than	
		25	the proportion of technical personnel in employees (%)	0.2	Lower than	Equal to	Higher than	

		26	The number of students above technical secondary school(ten thousand people)	0.2	Lower than	Equal to	Higher than	
			score					

Note: "lower than, equal to, higher than" in the evaluation criteria refers to the comparison with the average level of the local provinces and cities.

Relying on the index system, we can better understand the exploitation potential of different types of resources, the development potential of regions with different types of resourcesas well asnational resource-based regions, and provide decision-making basis for the overall framework and implementation path of the transformation and development of resource-based regions in the new era.

Reference

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