

Research on Spatial Pattern of Urban Social Development and Influencing Factors at Southwest Border Ports

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Abstract: With its unique geographic advantages and the special policies entrusted by the state to border port cities, China's border port cities have developed rapidly in foreign trade. This not only promotes the comprehensive and rapid economic and social development of border port cities and border areas, but also promotes the considerable development of the surrounding areas and China's foreign trade. Under the new historical conditions and domestic and international background, the development of China's border port cities will face more opportunities and challenges. This paper studies the spatial pattern of urban social development and its influencing factors at the southwest border port, establishes the grey relational degree model of urban social development at the southwest border port, and analyses the problems of urban development model at the southwest border port in China.

1. Introduction

With the deepening of economic globalization and regional economic integration, in order to share the benefits of globalization, countries around the world have turned their attention to the construction of regional economic integration. China has also actively participated in it and taken a series of measures. As of April 2013, China has established free trade zones with more than 30 countries and regions around the world. In 2013, the Third Plenary Session of the Eighteenth Central Committee of the Communist Party of China highlighted “deepening reform in an all-round way, expanding the opening up along the Inland border”; proposed strengthening the construction of the “New Silk Road” economic belt, which implies that further strengthening cooperation with neighboring countries will be the top priority of China's future development. In this context, as the strategic fulcrum of China's Opening-up along the border, border port towns play an increasingly prominent role in the regional division of labor. At present, there is a certain gap between the development level of cities and towns at border ports in China and that of coastal and inland developed cities. It is no delay to strengthen the construction of towns at border ports and promote the economic development of port cities and towns.

2. Human Geographical Environment in Southwest Frontier Area

The southwest border area is a long and narrow region bordering Southeast Asia, Myanmar, Laos and Vietnam. It starts from Dongxing City in Guangxi Zhuang Autonomous Region in the East and reaches Gongshan County in Nujiang Lisu Autonomous Prefecture in Yunnan Province in the west. The boundary line is 4054 kilometers long. Before the founding of the People's Republic of China, the southwest border area had always been regarded as a marginal area far away from the political, economic and cultural center of the country. It was a barbarian area inhabited by various minority nationalities. Its economic and social development was backward, its natural environment was bad, its people lacked education, and it was not ignored by the ruling class. Therefore, the location advantages of the southwest border area had been ignored for a long time. Since the founding of the People's Republic of China, due to the strategic needs of national defense, the southwestern border areas have begun to attract attention. Especially the self-defense counterattack against Vietnam in the late 1970s and early 1980s made Yunnan and Guangxi known to the whole China and even the whole world. Since the beginning of the 1990s, with the increasing opening up of our country and

the deepening of political and economic cooperation with neighboring countries, the geographical advantages of the southwest border have begun to emerge.

The southwest border area has a complex geographical environment and many ethnic minorities. Yunnan and Guangxi were affected by the Sino-Vietnamese border conflict from the end of 1970s to the beginning of 1980s. For a long time, they have been the marginal areas of China's economic development. Their economic development is lagging behind. They are typical “old, young, border and poor” areas. Since the 1990s, the opening up of the southwestern border areas has been steadily increased, and the scope of foreign trade has been expanded through border ports. The foreign trade targets are not only neighboring countries, but also ASEAN countries, even Europe and the United States. At the same time, the regional economic cooperation in the southwestern border areas has been further strengthened. Various border economic cooperation zones and sub-regional cooperation zones have brought unprecedented development opportunities to the border areas and greatly promoted the economic development of the border areas. At present, the economic development of 33 counties (cities) along the southwest border shows the following characteristics: regional gross product, per capita gross product and output value of three industries, as shown in Table 1.

Table 1. Statistical Table of basic economic situation of counties (cities) in southwest frontier area in 2017

| County (city) | GDP | One production | Second generation | Three production |
|------------------|--------|----------------|-------------------|------------------|
| Gong Shan County | 7.33 | 2.55 | 3.41 | 3.59 |
| Fu Gong county | 8.92 | 2.87 | 3.77 | 4.49 |
| Lushui County | 32.58 | 5.65 | 22.94 | 25.11 |
| Tengchong County | 133.39 | 38.19 | 55.16 | 62.26 |
| Long Ling County | 50.65 | 27.97 | 20.91 | 23.99 |
| Longchuan County | 41.79 | 23.89 | 10.28 | 9.84 |
| Yingjiang County | 77.32 | 31.17 | 41.54 | 26.83 |
| Ruili | 58.23 | 9.63 | 10.85 | 39.97 |
| Mango | 83.55 | 29.98 | 33.33 | 42.36 |
| Zhenkang County | 44.65 | 8.54 | 28.31 | 9.92 |
| Gengma | 73.85 | 34.97 | 31.65 | 29.35 |

In 2013, the total population of 33 counties (cities) in southwest border area was 94.191 million, of which the population of 25 border counties (cities) in Yunnan was 67.948 million, accounting for 72.1% of the total population, and that of 8 border counties (cities) in Guangxi Zhuang Autonomous Region was 26.251 million, accounting for 27.9% of the total population. From the general situation of the population in the southwestern border area (see Table 2), there are two main characteristics. First, the urbanization rate of the population in the southwestern border areas is generally low. Secondly, the sex ratio of population is high. In terms of the total number of men and women in the southwestern border area, the male population is 4312,000 more than the female population.

Located in the junction of the East Asian continent and the Central-South Peninsula, the Southwest Frontier Area is an important region for China to connect Southeast Asia and South Asia. It is connected with the mountains and rivers of Myanmar, Laos and Vietnam, and faces Thailand, Cambodia, Bangladesh, Singapore, Malaysia, Indonesia and the Philippines. It is the gateway for the opening up of Southwest China. At the same time, it is also an important passageway for China from land to Southeast Asia, South Asia to West Asia and the Middle East, and its location advantage is very superior.

Table 2. Basic population situation Tables of counties (cities) in southwest frontier region in 2017

| County (city) | Total population | Non-agricultural population | Male population | Female population |
|------------------|------------------|-----------------------------|-----------------|-------------------|
| Gong Shan County | 5.82 | 1.58 | 3.03 | 2.79 |
| Fu Gong county | 11.95 | 1.87 | 6.1 | 5.85 |
| Lushui County | 20.64 | 4.53 | 10.98 | 9.66 |
| Tengchong County | 67.65 | 6.17 | 35.24 | 32.52 |
| Long Ling County | 30.31 | 3.29 | 15.96 | 14.35 |
| Longchuan County | 20.62 | 4.27 | 10.46 | 10.16 |
| Yingjiang County | 33.11 | 4.66 | 17.18 | 15.93 |
| Ruili | 21.1 | 7.97 | 10.88 | 10.22 |
| Mango | 42 | 9.38 | 21.49 | 20.51 |
| Zhenkang County | 20.03 | 2.41 | 10.7 | 9.33 |
| Gengma | 32.28 | 5.45 | 16.59 | 15.69 |

3. Grey Relevance Degree Analysis of Urban Social Development at Southwest Frontier Port

The grey relational analysis method is used to analyze the development of port-vicinity industry in border port cities. Dandong port-vicinity industry is regarded as a reference sequence $X_0(t)$ which can reflect the characteristics and behavior of the system. The other 21 sub-indexes are regarded as the comparison sequence of grey relational degree analysis: $X_1(t), X_2(t), \dots, X_{22}(t)$, $t=1,2,\dots,7$. For the convenience of analysis, this paper chooses port throughput as the reference sequence $X_0(t)$, which represents the development status of port-vicinity industry.

(1) Find the initial values of each sequence.

The initial values of each sequence should be calculated according to the original data of each sequence, because the units of many indicators selected in the analysis are different. In order to make the horizontal comparison and analysis convenient, the initial value method is used to process the original data of each sequence. The purpose is to enhance the comparability of each factor and to achieve the reliability of the analysis results.

$$X_i(t) = X_i(t) / x_i(1) = [x_i(1), x_i(2), \dots, x_i(22)], i = 0, 1, 2, \dots, 21 \quad (1)$$

(2) Range of sequence.

$$\Delta_i(k) = |x_0(k) - x_i(k)|, i = 1, 2, \dots, 21 \quad (2)$$

(3) Maximum and Minimum Differences between Poles

$$M = \max_i \max_k \Delta_i(k) = 37.3855, m = \min_i \min_k \Delta_i(k) = 0 \quad (3)$$

(4) Correlation coefficient.

The grey correlation analysis method is used to calculate the correlation coefficients of other related industries affecting the southwestern border industries.

$$\gamma_{0i}(k) = \frac{m + \xi M}{\Delta_i(k) + \xi M}, k = 1, 2, \dots, 21; i = 1, 2, \dots, 7 \quad (4)$$

(5) Computation of correlation degree.

According to the calculated correlation coefficient, the grey correlation degree of 21 indicators to the southwest border industry can be further calculated, as shown in Figure 1.

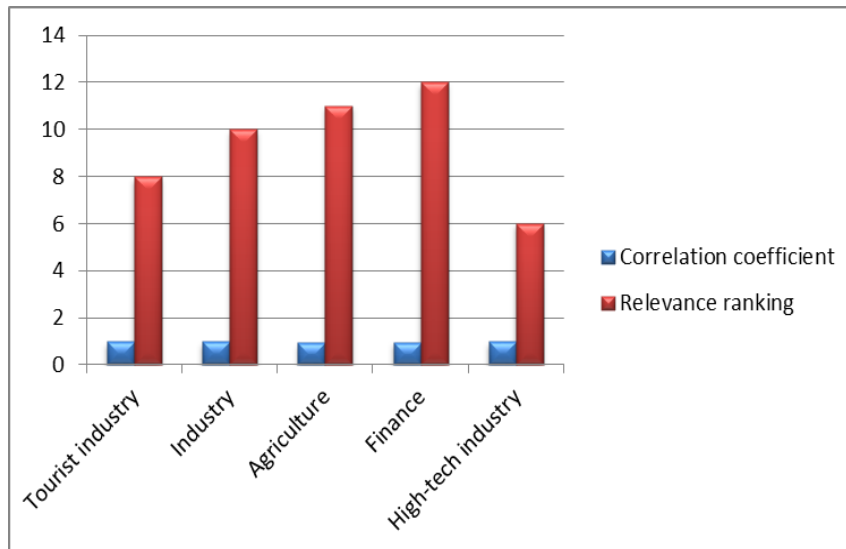


Figure 1. Grey relevance degree and ranking of town-related industries at southwest frontier ports

According to Figure 1, the order of grey correlation degree between port industry and related industries in Dandong, a border port city, can be arranged as follows. From the perspective of the first-level indicators, tourism > High-tech Industry > Industry > transportation industry > financial industry > Agriculture > Education industry. From the perspective of 21 secondary indicators, gross industrial output value > output value of high-tech products completed > number of inbound tourists received > total tourism income > number of domestic tourists received > balance of loans from financial institutions > expenditure on science and Technology > number of on-the-job workers in scientific research, technical services and geological exploration industry > gross agricultural, forestry, animal husbandry and fishery output value > average wages of on-the-the-job workers in financial industry > total passenger transport. Quantity > accommodation, catering industry practitioners > college students > number of Industrial Enterprises above scale > number of practitioners in units at the end of the second industry year > education practitioners > number of on-the-job workers in agriculture, forestry, animal husbandry and fishery > grain output > transportation, warehousing and postal industry practitioners > number of on-the-job workers in financial industry > educational expenditure.

According to the calculated data, the grey correlation degree of 21 selected indicators is larger than 0.5, and generally more than 0.9. The closer the value of grey correlation degree is to 1, the stronger the correlation between comparison sequence and reference sequence. The 21 indicators selected in this paper are highly correlated with the urban industry at the southwest border port, which has a significant impact on the urban industry at the southwest border port. Especially the gross industrial output value, the output value of high-tech products and the number of inbound tourists have the greatest impact on the development of the urban industry at the southwest border port, and tourism, high-tech industry and industry have the greatest correlation with the urban industry at the southwest border port.

4. Development Model Selection of Border Port Cities in China

As an important channel for the flow and value-added reorganization of complementary resources or factors of production between border port cities and neighbouring or third countries, it is an important bridge to strengthen international economic and trade links and cooperation. The construction of logistics system in border port cities is of great significance and role in promoting economic and social development and regional economic cooperation in border areas. Border port cities bear the vast majority of economic and trade passenger and cargo exchanges between China and its neighboring countries, and become important channels and important bridges for bilateral and multilateral economic and trade exchanges.

The tourism resources in China's border areas are rich and colorful, with prominent characteristics. Due to the complexity and particularity of the natural environment, geographical location and social history of the border areas, the individuality and monopoly of the tourism resources can not be compared with those in other areas. With the external development and economic development of the neighboring countries, China has provided an important tourist source for the tourism of the border port cities in China. Similarly, with the further implementation of China's border opening policy and the continuous improvement of the living standards of Chinese residents, China will also become an important market for the border tourism of the neighboring countries. Together with its neighboring countries, China constitutes a tourist destination with great attraction that can attract tourists from Europe, America and other countries.

The establishment of cross-border economic cooperation zones has become the trend of the development of border port cities. The establishment of cross-border economic cooperation zones will make border port cities the core of regional international competitiveness, bring about “nuclear effect” in the overall economic and social development of border areas, gather international flows of people, logistics, capital, technology and information, and promote the development of border areas and China's economic society. The definition of cross-border economic cooperation zone is preliminarily defined in the report of “Feasibility Study of China Pingxiang-Vietnam Tongdeng Cross-border Economic Cooperation Zone”. That is, to delimit a special region in the border areas adjacent to the two countries, and to give the region special preferential policies in finance, taxation, investment, trade and other supporting industries. Customs special supervision should be carried out to attract domestic people flow, logistics, capital flow and technology flow to gather and interact in the region, make full use of the two markets of resources to realize the development and prosperity of the region, and then drive the economic development of the surrounding areas through the radiation effect of industry.

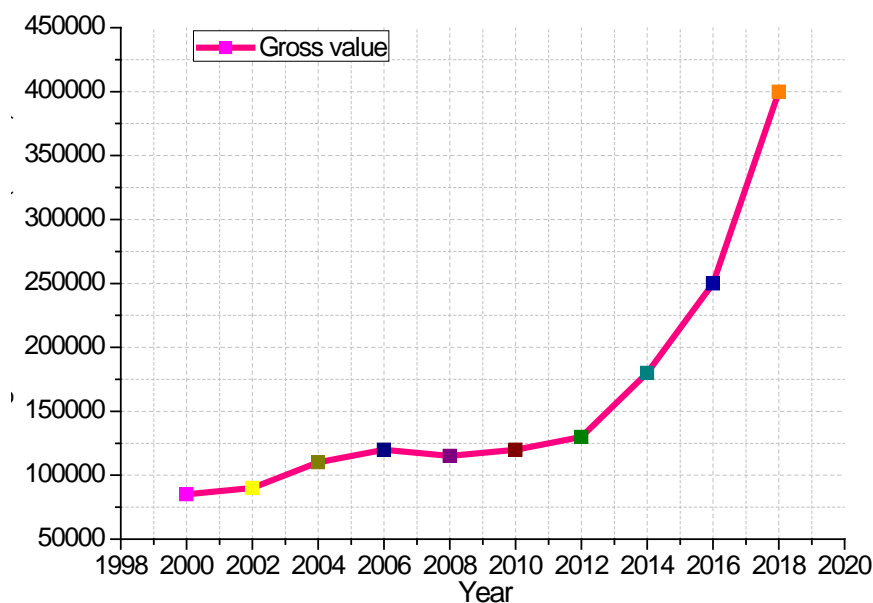


Figure 2. Change of gross import and export value

In terms of foreign trade, the improvement of customs environment and the improvement of Customs capacity at Manzhouli Port have promoted the rapid development of the port's foreign trade economy. By observing Figure 2, we can find that since the implementation of the policy of opening up along the border, especially since 2000, the number of import and export countries and regions in Manzhouli has been increasing, the trade market has been expanding year by year, and trade relations have been established with 17 countries and special administrative regions, such as Russia, the United States, Korea, Japan, Switzerland, the Philippines and Hong Kong.

5. Conclusion

In order to promote sound and rapid economic and social development under the new situation, and to build a border port city with sustainable development and pleasure in living and working, the southwest border port cities and towns should accelerate the strategic upgrading of opening up along the border. Construct a characteristic multi-industry system, implement project investment promotion measures, build a resource-saving and environment-friendly society, at the same time, improve living environment, create a business atmosphere, and coordinate the development of all social undertakings. We believe that with the acceleration of the development of the western part of the country and Guangxi's emphasis on economic development along the coast and border areas, the urbanization of ports in border ethnic areas will also develop better and faster.

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