Study on the Layout of Forestry Industry in Yanbian

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Abstract Yanbian is a key state-owned forest area and timber production base in Jilin Province and Yanbian's five pillar industries rely heavily on the survival and development of forestry. Reasonable industrial layout can not only help to play the regional resource advantages, but also help to promote the sustainable economic development of Yanbian. Using location quotient method, this paper analyzes the layout of forestry industry in Yanbian, and brings forward the several recommendations for optimizing the layout of forestry industry in Yanbian.

Key words Forestry industry, Industrial layout, Yanbian

1 Introduction

Yanbian is a key state-owned forest area and timber production base in Jilin Province, and Yanbian has 67 townships (towns), 25 of which are in the mountains and 32 of which are in the hillsides. There are over 100 million people directly relying on forestry to survive. Yanbian's five pillar industries (food, energy and minerals, forestry, medicine, tourism) are largely dependent on the survival and development of forestry, and must also find the resource conditions in forestry. From the economic sense, the choice of industrial layout is an overall and long-term strategic plan for the construction of the national economy involving many levels and sectors, subject to a variety of factors[1].

2 Analysis method for industrial layout

The location quotient in this paper refers to the ratio of the share of output value in a specific sector of one region in the region's total output value to the share of output value in the sector in the national (or regional) output value[2]. By comparing the comparative advantages of agricultural industry in different regions, we can calculate the share of agricultural output value in the regional total output value as numerator, then calculate the share of agricultural output value in GNP as denominator, and calculate the region's location quotient of agriculture using numerator divided by denominator[3-4]. The location quotient of forestry industry is calculated as follows:

LQ_i = (*Total output value of forestry in region i* ÷ *GNP in region i*) ÷ (*Total regional output value of forestry* ÷ *Regional GNP*).

The location quotient of a sub-industry in forestry is calculated as follows:

LQ_{ij} = (*Total output value of industry j within forestry in region i* ÷ *Total output value of forestry in region i*) ÷ (*Total regional output value of industry j within forestry* ÷ *Total regional output value of forestry*).

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If the location quotient is greater than 1, the industry has a regional comparative advantage; if it is equal to 1, the industry has no advantage; if it is less than 1, the industry at a disadvantage.

3 Analysis of location quotient of Yanbian's forestry industry

3.1 Location quotient calculation results The forestry industry output value used in this paper is based on the total output value of forestry industry of Yanbian Forestry Group's 15 companies in *Yanbian Forestry Statistical Analysis Report*. The forestry output value in Yanji, Tumen and Longjing has a small share in Yanbian's forestry industry output value, so it is omitted in the calculation. The location quotient of output value of main sub-industries in the forestry industry of Yanbian Forestry Group's 15 companies is calculated (Table 1).

3.2 Analysis of results The regions with the location quotient of timber harvesting and transportation greater than 1 include Helong, Dunhua, Hunchun, Ansenju, Wangqing, Bajiazi and Dashitou, and the location quotient of other regions is less than 1 but close to 1, indicating that the timber harvesting and transportation industry is basically evenly distributed in Yanbian. The regions with location quotient of forest land economy greater than 1 include Ansenju, Dashitou, Hunchun, Dunhua, Bajiazi, Daxinggou, Helong, Tianqiaoling and Huangnihe, indicating that the forest land economy is also basically evenly distributed in Yanbian. The region with the location quotient of tourism industry greater than 1 is Baihe with obvious comparative advantages. The regions with the location quotient of forest product industry greater than 1 include Xinyuan, Helong Zhongxian, Hunchun Senlinshan, Wangqing Linyuan and Wangqing, and especially the first four areas have obvious comparative advantages, with location quotient close to 5. The regions with the location quotient of food processing industry greater than 1 include Tianqiaoling and Baihe, and only the two regions are engaged in the food processing industry. Facing the increasingly fierce market competition, Yanbian should adapt to the development of economic globalization and focus on structural adjustment to improve economic efficiency of regional industry and

industrial competitiveness from the macro-environment and regional location advantages. Based on the original industrial layout, Yanbian should achieve effective combination of natural resource and transportation, communication, innovative talent and market resources, and optimize the layout of forestry industry, to achieve rapid growth of forestry industry in Yanbian.

Table 1 Location quotient of main sub-industries in Yanbian's forestry industry

	Timber harvesting and transportation	Forest land economy	Tourism industry	Forest product industry	Food processing industry
Huangnihe	0.85	1.15	–	0.03	–
Dunhua	1.74	1.35	0.08	0.66	–
Dashitou	1.01	1.51	0.04	0.00	–
Bajiazi	1.14	1.33	–	0.00	–
Helong	1.92	1.29	0.50	0.72	–
Wangqing	1.35	0.92	–	1.20	–
Daxinggou	0.84	1.33	–	0.23	–
Tianqiaoling	0.72	1.28	–	0.24	3.51
Baihe	0.76	0.52	5.04	0.91	3.69
Hunchun	1.70	1.49	0.42	0.11	–
Ansenju	1.53	1.66	0.00	0.48	–
Xinyuan Muye	–	–	–	4.96	–
Helong Zhongxian	–	–	–	4.96	–
Hunchun Senlinshan	–	–	–	4.96	–
Wangqing Linyuan	–	–	–	4.96	–

4 Optimization of the layout of Yanbian's forestry industry

Based on the above analysis results and location characteristics of Yanbian, according to the present situation of forestry industry layout, the companies of Yanbian Forestry Group close to each other can be integrated together to form a new layout. The new layout of forestry industry will play a positive role in promoting the development of Yanbian's forestry industry. The optimized location quotient results are shown in Table 2. According to the calculation results in Table 2, it is found that the regions with location quotient of forest land economy greater than 1 include Helong, Wangqing, Dunhua; the regions with location quotient of timber harvesting and transportation greater than 1 include Wangqing, Helong, Dunhua; the region with location quotient of forest tourism greater than 1 is Antu; the regions with location quotient of food processing industry greater than 1 include Antu, Wangqing; the region with location quotient of fiberboard greater than 1 include Helong, Wangqing; the regions with location quotient of composite floor board greater than 1 include Hunchun, Dunhua; the regions with location quotient of solid wood flooring greater than 1 include Dunhua, Hunchun; the region with location quotient of furniture greater than 1 is Dunhua.

Table 2 Optimized location quotient of main sub-industries in Yanbian's forestry industry

	Forest land economy	Timber harvesting and transportation	Tourism industry	Food	Fiberboard	Composite floor board	Solid wood flooring	Furniture
Dunhua	1.07	1.01	0.01	0.00	0.00	1.03	2.02	2.88
Wangqing	1.14	1.26	0.00	1.25	1.93	0.14	0.00	0.00
Helong	1.23	1.19	0.27	0.00	3.93	0.18	0.00	0.00
Antu	0.69	0.73	4.01	3.21	0.00	0.26	0.87	0.27
Hunchun	0.83	0.72	0.14	0.00	0.00	6.12	1.58	0.00

5 Recommendations

Based on the comparative advantage of Yanbian's forestry industry and basic principles of industrial layout, the whole Yanbian forest region is divided into five industrial zones, and different industry clusters with characteristics are formed to play scale advantages and enhance competitiveness. For Yanbian's eastern regions, due to the location in the frontier of Northeast Asia Golden Triangle, it is necessary to give full play to Hunchun's unique border port and forestry processing park construction advantages, and form specialized production base of composite floor board and solid wood flooring on the basis of Senlinshan, Jinfa and Senlinwang brands. For Yanbian's western regions, Dunhua should establish floor and furniture industry clusters, form competitive brands, and develop into wood-based panel and solid wood furniture production base. Dunhua is along Changchun-Jilin-Tumen railway, and its forest product industry started early, forming solid material foundation. Through Dunhua's wood product processing center and Hunchun's floor processing park, it is necessary to establish wood product processing industry cluster, in order to improve the level of industrial organization and the overall competitiveness of industry, and form a production mode with full function and supporting system. For Yanbian's central regions, the available forest resources are on the verge of exhaustion for Yanji, Longjing and Tumen despite rich

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land ecological compensation can be divided into physical compensation, monetary compensation, intellectual compensation, technical compensation, and employment compensation. Now, it basically applies the simple monetary compensation, but the disadvantage is that it is easy to generate the thought of reliance, and when the grassland area is greater than 666.7 ha, it is difficult to control the huge amount of compensation and accordingly lead to social problems. Therefore, it is necessary to actively develop other compensation methods, such as the physical compensation of forage distribution, technical compensation of improving grassland productivity, intellectual compensation of providing education and training for herdsmen, and employment compensation of labor transfer. These can reduce grassland ecological pressure, really play the great role of restoring grassland vegetation and improving the grassland ecology.

According to the compensation condition, grassland ecological compensation can be divided into unconditional compensation and conditional compensation. Unconditional compensation is based on pastoral area of grassland property rights and the number of existing livestock of herdsmen. Compensation funds are directly allocated to compensation objects in accordance with the established compensation standards. Conditional compensation is to compensate the objects with some restrictive conditions. If the requirements are not satisfied, less or no compensation will be provided. Comparatively, the latter compensation is more effective in ecological restoration, but there is supervision or assessment cost. Therefore, it is proposed to gradually change the current unconditional and purely economic compensation to conditional and oriented compensation, to promote change in grassland use mode, to promote changes through compensation, and promote construction through compensation, and guide herdsmen to combine the developed production, well-off life and civilized ecological civilization[3]. In addition, it is feasible to carry out pilot unconditional compensation for the unconditional investment, change the compensation into investment. The investment can be launched in two aspects: one is grassland ecological construction investment, including fine grass seed investment and grassland irrigation investment, and the other is the transfer of employment investment, guiding herdsmen to develop other industries to realize the transfer employment.

7 Conclusions

The design of grassland ecological compensation is a complex theoretical problem, and also a complicated systematic project. All areas should design practical compensation mechanisms in accordance with respective actual situations. In the design of ecological compensation mechanism for the Tibetan grassland, any issue is a complicated and varied problem and has characteristics of historical stage and regional differences. We should not deal with these issues in a simple way and should not impose uniformity without examination. Besides, it is necessary for the governments at all levels, especially the government of Tibet Autonomous Region, to make a cautious analysis and scientific treatment.

References

[1] HOU XY, YANG L, HAN Y. The significance, tendency and suggestions to grassland eco-compensation in China[J]. Chinese Journal of Grassland, 2008(5):1-6. (in Chinese).

[2] CHEN ZZ, WANG SP. A discussion on the mechanism of reparation for balancing rangeland ecology[J]. Acta Agrestia Sinica, 2006(1):1-3, 8. (in Chinese).

[3] ZHANG ZM, YAN JP, ZHANG SM. The theory basis, the principle and the corresponding policy suggestion to the mechanism of reparation for rangeland ecology balance in China[J]. Journal of Arid Land Resources and Environment, 2007(8):142-146. (in Chinese).

[4] SONG LH, TANG XH. Analysis of China's grassland ecological compensation system[J]. Theory and Moderization, 2012(2):60-64. (in Chinese).

[5] GONG F, CHANG Q, WANG F, *et al.* Empiricall study on compensation standard for grassland ecology in Inner Mongolia[J]. Journal of Arid Land Resources and Environment, 2011(12):151-155. (in Chinese).

[6] HONG SQ, WU XQ, DUAN CQ, *et al.* The compensation channel and diversity provide base and garentee for eco-compensation[J]. Environmental Science and Technology, 2001(S2):40-42. (in Chinese).

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forest resources in Yanbian. These areas can take advantage of the preferential policies and barren hills to develop eco-tourism, and the future direction of development should focus on artificial raw material forest base construction. For Yanbian's southern regions, Helong and Antu have concentrated forest resources and two wood-based panel production lines. They should develop medium density fiberboard and chipboard industry clusters, and gradually extend the industrial chain to high value-added products, to finally form laminate flooring and plate furniture production base. It is necessary to give full play to the advantages of Changbai Mountain and border ports, to build Yanbian forest eco-tourism brand. For Yanbian's northern regions, due to decades of over-exploitation, low level of equipment and weak economic foundation in Wangqing, it is necessary to avoid re-investment in the project construction, use the original small scale enterprises to offer supporting processing for specialized products, and establish forest product raw material base with Wangqing as the core.

References

[1] WANG XY. Layout optimization and the improvement of concentration ratio as well as the increase of industrial competitiveness[J]. Dong Yue Tribune, 2009(1):92. (in Chinese).

[2] CHENG X. Study on the comparative advantage in parts of China[M]. Beijing: China Ji Hua Publishing House, 2001: 19-27. (in Chinese).

[3] GUO YJ, GAO SB, FANG F, *et al.* Assessment of the overall arrangement of urban modern agriculture industry in Beijing using location quotient technique[J]. Chinese Journal of Eco-Agriculture, 2008(7):976-980. (in Chinese).

[4] WANG H, XIA ZQ. Research on under-forest economy industrial distribution of Beijing City based on location quotient method[J]. Sichuan Forestry Exploration and Design, 2010(1):27-30. (in Chinese).