Dynamic Evaluation of Eco-Economic Development in Prefecture-Level Cities in Yunnan Province

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Abstract: Based on the theory of ecological economics, ecological economy studies the sustainable development of natural socio-economic system. This paper constructs a dynamic evaluation system of ecological economy development, sets 18 secondary indicators from three perspectives of economic subsystem, social subsystem and ecological subsystem, and improves the entropy weight method by assigning weights to the indicators to calculate the evaluation scores of ecological economy development of eight prefecture-level cities in Yunnan Province. Through the analysis of panel evaluation data from 2010 to 2020, the following conclusions are drawn: (1) The overall development of the ecological economy of prefecture-level cities in Yunnan Province is good, with a large increase; (2) The prefecture-level cities in Yunnan Province as a whole have unbalanced development in the three subsystems of economy, society and ecology; (3) The development of all localities and cities in Yunnan Province is uneven, Kunming has a large development advantage, and Lijiang's ecological economic level is weak as a whole. In view of the above conclusions, this paper gives corresponding suggestions to help Yunnan Province's ecological economy to achieve further sustainable development.

Keywords: Ecological Economy, Development Evaluation, Entropy Weight Method, Panel Data, Sustainable Development.

1 INTRODUCTION

Under the background of China's socio-economic development increasingly pursuing quality and coordination, the sustainable development of ecological economy has attracted widespread attention [12]. In October 2022, General Secretary Xi Jinping pointed out in the report of the 20th National Congress of the Communist Party of China that the overall goal of China's development by 2035 includes: Build a modern economic system, form a new development pattern, basically realize the modernization of new agriculture, and widely form a green production and lifestyle, carbon emissions peak and decline steadily, and the ecological environment fundamentally improves.

Eco-economic evaluation analyzes the degree of coordination between the socio-economic and ecological ecosystems of different regions by incorporating the research elements of ecological economics [6]. The American economist Boulding (1966)[1] first proposed the concept of “ecological economics”, which is different from the previous development method of blindly

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developing the economy and ignoring the environment, he linked ecological factors with economic development. Subsequent researchers pointed out that research based on resource distribution is carried out from different perspectives, involving the fields of ecology, geography, management and economics. China's research on ecological economy is late, and Zhu Dajian (2009) proposed the difference between ecological economics and mainstream economics, including ecological natural resources into the utility function formula, emphasizing its significance to China's scientific development. Diao Shangdong et al. (2013) integrated the government's institutional construction into the evaluation index system of ecological civilization construction, reflecting the correlation between socio-economic development and government policies. Sun Buzhong et al. (2017) introduced time factors for dynamic evaluation and analysis, and established a composite system related to the length of observation. Ecological economy research mainly deals with the sustainable development of natural socio-economic systems, which can be summarized into two categories: (1) Quantitative measurement of sustainable ecological economic development [2, 6-7]; (2) Research on the integration model of ecological economic system [10, 12]. However, most of the domestic research on ecological economy focuses on the Yangtze River Economic Belt, and relatively few research on the ecological economy in southwest China. Yunnan Province has the positioning of "the vanguard of ecological civilization construction" and the needs of economic transformation [11], so studying the ecological economy of Yunnan Province is of great significance to the development of sustainable ecological economy in China.

Based on the existing research, this paper constructs an ecological economic development evaluation index system with economic subsystem, social subsystem and ecological subsystem as the primary indicators, and 18 indicators such as local general public budget revenue and expenditure, natural growth rate, and total carbon emissions as secondary indicators. At the same time, eight prefecture-level cities in Yunnan Province were selected as the research objects, and the sample data from 2010 to 2020 were selected to evaluate the dynamic development of ecological economy through the panel entropy weight method, and the data analysis results were analyzed and suggestions were made.

2 RESEARCH METHODS

2.1 Entropy weight method based on panel data improvement

The entropy weight method is a measurement method for assigning index values according to the amount of information provided by the observation values of each selected index, and as an objective weighting method, it has been applied to the study of ecological economy many times, and it has strong adaptability and can objectively evaluate the system.

This paper improves the panel data of three dimensions of city, time and indicators, and improves on the basis of the core idea of entropy weight method, and sets C city objects, i indicators and t time dimensions (time), through the standardization of data preprocessing, from the original two-dimensional data to form panel data indicators, and then carry out subsequent feature weight, entropy, weight, score calculation and analysis. The specific process of model building is as follows:

2.1.1 Standardization of panel indicators

For the standardization of indicators, it is necessary to achieve the three goals of positive indicators, dimensionless and normalization, so there are different operations for the processing of positive indicators and negative indicators.

Positive indicator standardization:

$$y_{ij} = \frac{x_{ij} - x_{i\min}}{x_{i\max} - x_{i\min}} \tag{1}$$

Normalization of negative indicators:

$$y_{ij} = \frac{x_{i\max} - x_{ij}}{x_{i\max} - x_{i\min}} \tag{2}$$

where represents the value of column y_{ij} jth of row i in the normalized matrix. After standardizing the positive and negative indicators, the index data are displayed in the range of (0,1).

Since the panel data involves three perspectives: city objects, indicators and time dimensions, it can be divided into double and two-dimensional data, and its indicators are standardized first, and the standardized matrix obtained, namely city-indicator matrix and Z_{ci} time-indicator matrix Z_{ti}. At the same time, in the construction of panel indicators, the formula of formula (3) is improved, and the improved panel indicator standardization matrix is obtained Z_{cti}.

$$Z_{cti} = \sqrt{Z_{ci} \cdot Z_{ti}} \tag{3}$$

2.1.2 Feature weight

Calculate the proportion of each indicator in the panel indicator to all indicators, that is, the feature weight expressed as the indicator Y_{cti}.

$$Y_{cti} = \frac{Z_{cti}}{\sum_{c=1}^{C}\sum_{t=1}^{T} Z_{cti}} \tag{4}$$

2.1.3 Calculate the entropy value

Information entropy is a measure of the degree of information order, and the entropy value is calculated based on the above step feature weight e_i.

$$e_i = -\frac{1}{\ln(CT)}\sum_{c=1}^{C}\sum_{t=1}^{T} Y_{cti} \cdot \ln(Y_{cti}) \tag{5}$$

2.1.4 Calculate the weight

Each indicator is objectively weighted after measuring the orderliness of data information.

$$d_i = 1 - e_i \tag{6}$$

$$w_i = \frac{d_i}{\sum_{i=1}^{I} d_i} \tag{7}$$

where d_i represents the information utility value and w_i represents the weight. The higher the degree of information order, the greater the information entropy, the less useful information provided, the smaller the information utility value, the smaller its weight, and vice versa.

2.1.5 Comprehensive scoring

According to the corresponding weight, the sample data of each indicator is weighted and summed, and the score and comprehensive score of each subsystem are calculated.

$$S = \sum_{c=1}^{C} \sum_{i=1}^{I} w_i \cdot Z_{cti} \tag{8}$$

2.2 Data Sources

The data used in this paper are mainly from China Urban Statistical Yearbook, Yunnan Statistical Yearbook, Scientific Data, and municipal statistical bureaus, and some missing data are supplemented by interpolation. Taking the prefecture-level cities in Yunnan Province as the research object, the statistical data of the eight prefecture-level cities involved were selected as data samples to ensure the validity of the data.

3 EMPIRICAL ANALYSIS

3.1 Overview of the study area

Yunnan Province is located in the Yunnan-Guizhou Plateau region of southwest China, shouldering the important responsibility of maintaining the ecology of southwest China, which is located in the transition zone of the ecosystem, with strong ecological environment heterogeneity and relatively fragile ecological system. Due to its geographical location, administrative background, resource conditions, and historical technology, the regional economic structure of Yunnan Province varies widely [11].

Considering the feasibility of data collection, this paper selects eight representative prefecture-level cities (Kunming, Qujing, Yuxi, Baoshan, Zhaotong, Lijiang City, Pu'er City, Lincang City) for discussion.

- ◆ Located in the north-central part of Yunnan Province, Kunming's economic development is relatively leading in the whole of Yunnan Province, providing perfect infrastructure and jobs, while continuously strengthening ecological governance.

- ◆ Qujing City is located in the eastern part of Yunnan Province. It actively develops the economy, introduces leading enterprises in the industry, and coordinates the development of high-level ecological environmental protection and high-quality economy.

- ◆ Yuxi City is located in the central part of Yunnan Province, with rich terrain and three-dimensional climate. The total economic volume has been continuously improved, the comprehensive strength has been steadily enhanced, and the implementation of ecological and environmental protection rectification and reform has been promoted.

- ◆ Baoshan City is located in the southwest of Yunnan Province, rich in lignite reserves and geothermal resources. It has taken multiple measures at the same time, increased ecological protection, and built a solid ecological security barrier in the southwest.

- ◆ Zhaotong City is located in the northeast of Yunnan Province, located in the transition zone from the Sichuan Basin to the Yunnan-Guizhou Plateau. Its gross economic output value has increased significantly, the comprehensive agricultural output value has developed rapidly, the ecological environment has achieved a good start, and the battle against pollution has achieved remarkable results.

- ◆ Lijiang City is located in the northwest of Yunnan Province, at the intersection of Yunnan, Sichuan and Tibet provinces, with outstanding advantages in biological resources, water energy resources and tourism resources, and a wide variety of animals and plants, which is a key forest area in Yunnan Province Biodiversity areas and treasure trove of biological resources.

- ◆ Pu'er City is located in the southwest of Yunnan Province, and its construction of the National Green Economy Experimental Demonstration Zone has a forest coverage rate of 74.59%.

- ◆ Lincang City is located in the southwest of Yunnan, rich in water resources, and is an important national hydropower energy base.

3.2 Construction of indicator system and data sources

3.2.1 Framework of evaluation index system

In order to accurately evaluate the regional ecological and economic level of prefecture-level cities in Yunnan Province, this paper mainly selects indicators based on the principle of systematicism, the principle of combining theory and practice, the principle of operability of indicators, and the principle of data availability. At the same time, combined with the existing research on ecological economy and the specific situation of various cities in Yunnan Province, this paper draws on He Weijun et al. (2016), Jia Haifa et al. (2020), Sun Buzhong et al. (2017), etc. According to the structural hierarchy analysis theory, the ecological economy evaluation index system of prefecture-level cities in Yunnan Province was constructed (Table 1), which took the economic subsystem, social subsystem and ecological subsystem as the first-level indicators. The Eighteen secondary indicators are selected based on the following:

(1) In the economic subsystem, the local general public budget revenue and expenditure, per capita regional GDP, and average wages of on-the-job employees reflect the degree of economic development, and the development of ecological economy is analyzed from the perspective of industrial structure of several industrial enterprises above designated size, the proportion of tertiary industry in GDP, and the total retail sales of social consumer goods.

(2) In the social subsystem, the total population and natural growth rate represent the number of people and the level of human capital, the number of registered unemployed in cities and towns, the number of employees in health and social security and social welfare industries reflect the level of social security, and the expenditure on education and science and technology represents the level of social education and quality.

(3) In the ecological subsystem, the centralized treatment rate of sewage treatment plants, industrial nitrogen oxide emissions, and total carbon emissions are used as indicators of waste emissions, while the proportion of urban construction land area, built-up area green coverage rate, and park green area are environmental protection construction indicators.

The above indicators can better reflect the actual situation of the ecological economy of prefecture-level cities in Yunnan Province, and provide real and reliable data for ecological economic evaluation and analysis, and the specific ecological economic development evaluation index system is shown in Table 1 below. The weights obtained by entropy weighting method as shown in the table show that the economic subsystem (0.3355), social subsystem (0.3303), and ecological subsystem (0.3342) have equal status in ecological economic. The economic subsystem has a slightly higher weight, followed by the ecological subsystem, followed by the social subsystem.

3.3 Evaluation and analysis

According to the established dynamic evaluation index system of ecological economic development, the data information was analyzed by programming using the panel entropy weighting method with STATA software to obtain the individual secondary index scores, primary index (subsystem) scores and comprehensive scores of each region for each year. At the same time, the overall eco-economic development of Yunnan Province, the comprehensive score ranking of 8 prefecture-level cities and the dynamic situation of each region from 2010 to 2020 are discussed and analyzed.

Table 1: Evaluation index system of ecological economic development

Evaluation indicators of eco	Level 1 indicators	Weight	Secondary indicators	Unit	Entropy	weight
	Economic subsystem	0.3355	Local general public budget revenue and expenditure status of the whole city	million	0.0625	0.0570
			Average wages of on-the-job employees	Yuan	0.0931	0.0551
			Number of industrial enterprises above designated size	piece	0.0895	0.0553
			Total retail sales of consumer goods	million	0.0559	0.0574

			GDP per capita	Yuan	0.0818	0.05 58
			The tertiary sector as a percentage of GDP	percentage	0.0956	0.05 50
	Social subsystems	0.3303	Year-end registered population	10,000 people	0.1031	0.05 45
			Natural growth rate	percentage	0.1149	0.05 38
			Number of registered unemployed persons in cities and towns	person	0.1382	0.05 24
			Number of employees in health, social security and social welfare	10,000 people	0.0813	0.05 58
			Expenditure on educational undertakings	million	0.0437	0.05 81
			Spending on science and technology	million	0.0834	0.05 57
	Ecological subsystems	0.3342	Centralized treatment rate of sewage treatment plants	percentage	0.1372	0.05 24
			Industrial NOx emissions	ton	0.0692	0.05 66
			The proportion of urban construction land in the area of municipal districts	percentage	0.0640	0.05 69
			Green coverage in built-up areas	percentage	0.1114	0.05 40
			The area of green space in the park	hectare	0.0403	0.05 83
			Total carbon emissions	Tons of tons	0.0780	0.05 60

3.3.1 Dynamic evaluation and analysis of the overall ecological economic development of prefecture-level cities in Yunnan Province

From the overall analysis, the comprehensive score of ecological economic development of prefecture-level cities in Yunnan Province showed an upward trend from 2 010 to 2020, from 0.0037 to 0.0058. The increase was close to 57 percent, but in recent years the rate of growth has slowed and has shown a downward trend.

Table 2: Dynamic evaluation of ecological economic development of prefecture-level cities in Yunnan Province

Year	Economic subsystem	Social subsystems	Ecological subsystems	Overall rating
2010	0.000606	0.001640	0.001445	0.003692
2011	0.000707	0.001708	0.001288	0.003704
2012	0.000941	0.001579	0.001407	0.003927
2013	0.001160	0.001962	0.001556	0.004678
2014	0.001217	0.001888	0.001663	0.004769
2015	0.001589	0.002098	0.001614	0.005301
2016	0.001890	0.002059	0.001901	0.005850
2017	0.001952	0.001984	0.001879	0.005815

2018	0.002047	0.001651	0.001668	0.005366
2019	0.002362	0.001931	0.001781	0.006074
2020	0.002481	0.001653	0.001661	0.005795

From the analysis of various subsystems, there is a significant increase in economy, society and ecology, of which the economic subsystem has the most obvious increase, close to 76%, the above data indicate In recent years, Yunnan Province has developed rapidly and played an important role in the development of ecological economy. The score of social subsystem has increased in previous years, and the score has decreased in recent years. The ecological subsystem as a whole is on an upward trend, but the increase rate is not very obvious, and there has been a downward trend in recent years. The index weights of the three subsystems of economy, society and ecology are almost the same, but there are obvious differences in the scores of the three subsystems in Yunnan Province, indicating that its ecological economic development has not maintained a balance in the three dimensions of economy, society and ecology, and has not achieved sustainable development in the field of ecological economy.

3.3.2 Dynamic Scoring Analysis of Ecological Economy in Cities at All Levels in Yunnan Province

From the perspective of prefecture-level cities, the comprehensive score ranking of 8 prefecture-level cities in Yunnan Province changes slightly every year, and there is an uneven development phenomenon in prefecture-level cities. The results of the dynamic eco-economic scoring of cities at all levels in Yunnan Province are detailed in the Table 3.

Table 3: Ecological economy score and ranking of cities at the local level

Cities	2010		2011		2012		2013		2014		2015	
	score	ranking	score	ranking	score	ranking	score	ranking	score	ranking	score	ranking
Kunming city	0.000614	1	0.000896	1	0.001151	1	0.001127	1	0.001062	1	0.001121	1
Qujing City	0.000496	4	0.000537	2	0.000656	2	0.000792	2	0.000857	2	0.00096	2
Yuxi City	0.000533	3	0.000521	3	0.000423	3	0.000616	3	0.000696	3	0.000764	3
Baoshan City	0.000333	8	0.000393	4	0.000294	8	0.000471	5	0.000459	6	0.000550	4
Zhaotong City	0.000338	7	0.000349	6	0.000355	6	0.000467	6	0.000456	7	0.000487	7
Lijiang City	0.000407	5	0.000303	8	0.000369	5	0.000353	8	0.000266	8	0.000382	8
Pu'er City	0.000563	2	0.000336	7	0.000297	7	0.000361	7	0.000474	5	0.000511	6
Lincang City	0.000407	6	0.000369	5	0.000381	4	0.000491	4	0.000498	4	0.000526	5
Cities	2016		2017		2018		2019		2020		synthesis	

	score	ranking	score	ranking	score	ranking	score	ranking	score	ranking	score	ranking
Kunming city	0.001263	1	0.001298	1	0.001065	1	0.001224	1	0.001283	1	0.001100	1
Qujing City	0.000940	2	0.000858	2	0.000851	2	0.001014	2	0.000864	2	0.000802	2
Yuxi City	0.000821	3	0.000727	3	0.000691	3	0.000827	3	0.000806	3	0.000675	3
Baoshan City	0.000581	6	0.000674	4	0.000522	8	0.000591	7	0.000597	5	0.000497	6
Zhaotong City	0.000531	7	0.000597	6	0.000532	7	0.000647	4	0.000553	7	0.000483	7
Lijiang City	0.000439	8	0.000465	8	0.00057	4	0.000529	8	0.000500	8	0.000417	8
Pu'er City	0.000620	5	0.000633	5	0.000569	5	0.000603	6	0.000554	6	0.000502	5
Lincang City	0.000655	4	0.000563	7	0.000567	6	0.000638	5	0.000638	4	0.000521	4

Due to differences in geographical location, location advantages, political status, resource base, etc., there are differences in the ecological and economic level of various cities in Yunnan Province. Among them, Kunming City remained in the first place and had a significant gap between the score and other prefecture-level cities, Kunming, Qujing City and Yuxi City basically remained in the top three places, while Baoshan City, Zhaotong City, Lijiang City, Pu'er City and Lincang City scored lower in comparison. Through the comprehensive score data of 2010-2020, it can be seen that Kunming ranks first among all local-level cities, while Lijiang ranks last in the comprehensive ranking, although Kunming and Lijiang are in an increasing trend as a whole. However, the ecological and economic development of Kunming and Lijiang is quite different.

Therefore, this paper further analyzes the ecological economic development of prefecture-level cities by taking Kunming and Lijiang as examples.

(1) Dynamic scoring analysis of ecological economic development in Kunming

As the capital city of Yunnan Province, Kunming is located in the center of the economic circle of Southwest China-Southeast Asia hinterland, and has advantages and policies in economic, social and ecological development compared with other prefecture-level cities, so Kunming scored first in the evaluation of the ecological economic development of prefecture-level cities.

Table 4: Dynamic score of ecological economic development in Kunming

year	Economic subsystem	Social subsystems	Ecological subsystems	Comprehensive score
2010	0.000127	0.000206	0.000280	0.000614
2011	0.000188	0.000258	0.000450	0.000896
2012	0.000305	0.000323	0.000523	0.001151
2013	0.00041	0.000249	0.000468	0.001127

2014	0.000313	0.000297	0.000452	0.001062
2015	0.000439	0.000165	0.000517	0.001121
2016	0.000486	0.000321	0.000457	0.001263
2017	0.000500	0.000382	0.000416	0.001298
2018	0.000526	0.00024	0.000299	0.001065
2019	0.000611	0.000291	0.000322	0.001224
2020	0.000603	0.000373	0.000306	0.001283

It can be seen from Table 4 that the score of Kunming's economic subsystem has increased by nearly 4.75 times in the past ten years, and its economic development level has developed rapidly The scores of social subsystem and ecological subsystem were relatively stable. Combined with the analysis of the actual situation, in recent years, Kunming's annual GDP has exceeded 600 billion yuan, with an average annual growth rate of 3.0%. The governance of the ecological environment has also been continuously strengthened, the feedback problems of environmental protection inspectors have been dealt with, illegal construction along Dianchi Lake has been rectified, the battle against pollution has achieved a phased victory, the city's ambient air quality has reached the national second-class standard, and the excellent air quality rate has reached 98.65%. While paying attention to the rapid economic and social development of the city, Kunming protects and restores the ecological environment, completing the ecological construction of 55.09 mu of forest and grass, adding 208 hectares of urban green space, and the forest coverage rate reached 52.62%. The above achievements also coincide with the overall growth trend shown by the statistics of each subsystem, but the fluctuation of the score is more obvious and basically in a good state.

(2) Dynamic scoring analysis of ecological economic development in Lijiang City

Lijiang City, as a prefecture-level city integrating the three world heritage sites, world natural heritage and memory of the world heritage, has achieved a huge leap from poverty and backwardness to development and prosperity with the help of unique tourism resource advantages in the past ten years, maintaining rapid and healthy economic and social development in the city, and realizing a historic transformation from agriculture to industry and service industry, and people's quality of life has been continuous Improved, the social security system has been continuously improved.

According to the data characteristics of each subsystem in Table 5, the score of Lijiang City in the economic subsystem showed an upward trend, while the score of the social subsystem showed a downward trend, and the score of the ecological subsystem fluctuated significantly, and the growth was not obvious. This coincides with the economic phenomenon that Lijiang City has made full use of natural resources to vigorously develop tourism, doubling its total GDP and exceeding the 50 billion mark, while under the impact of tourism, the ecological environment has suffered certain damage, and the local government has effectively shouldered the responsibility of forest resources protection and development with the "Four Ones". Co-building an ecologically livable environment, which can also explain fluctuations in ecological indicators. However, according to the comparative analysis of the comprehensive score data of Lijiang City and various cities in Yunnan Province, it can be seen that although Lijiang City has improved its economic, social and ecological development, there is still a big gap with the overall level.

Table 5: Dynamic score of ecological economic development in Lijiang City

year	Economic subsystem	Social subsystems	Ecological subsystems	Comprehensive evaluation
2010	6.35E-05	0.000204	0.000140	0.000407
2011	7.47E-05	0.000163	6.57E-05	0.000303
2012	6.68E-05	0.000204	9.87E-05	0.000369
2013	7.29E-05	0.000137	0.000144	0.000353
2014	8.47E-05	8.74E-05	9.34E-05	0.000266
2015	0.000158	0.000139	8.55E-05	0.000382
2016	0.000198	0.000109	0.000132	0.000439
2017	0.000180	0.000106	0.000178	0.000465
2018	0.000194	0.000104	0.000272	0.000570
2019	0.000252	9.73E-05	0.000180	0.000529
2020	0.000258	6.56E-05	0.000176	0.000500

(3) Comparative scoring analysis of ecological economic development in Kunming City and Lijiang City

Based on the data of 2010-2020, it can be seen that the overall development of ecological economy in Kunming occupies a good dominant position among all cities in Yunnan Province, while the overall development of ecological economy in Lijiang City is more worrying, at the end of the score of prefecture-level cities in Yunnan Province, in order to better compare and analyze the ecological economic development level of Kunming City and Lijiang City, this paper draws a comprehensive dynamic score comparison map of Kunming City and Lijiang City.

It can be seen from Figure 1 that the slope of the linear trend of Kunming's comprehensive score is greater than that of Lijiang's comprehensive score, indicating that the growth rate of Kunming's ecological economic development is greater than that of Lijiang's ecological economic development, and through the 2020 data, Kunming's comprehensive score is Lijiang City's comprehensive score is 2.566 times, and the development gap between Kunming City and Lijiang City is large, which shows that the imbalance in the development of various prefecture-level cities in the field of ecological economy in Yunnan Province is more serious.

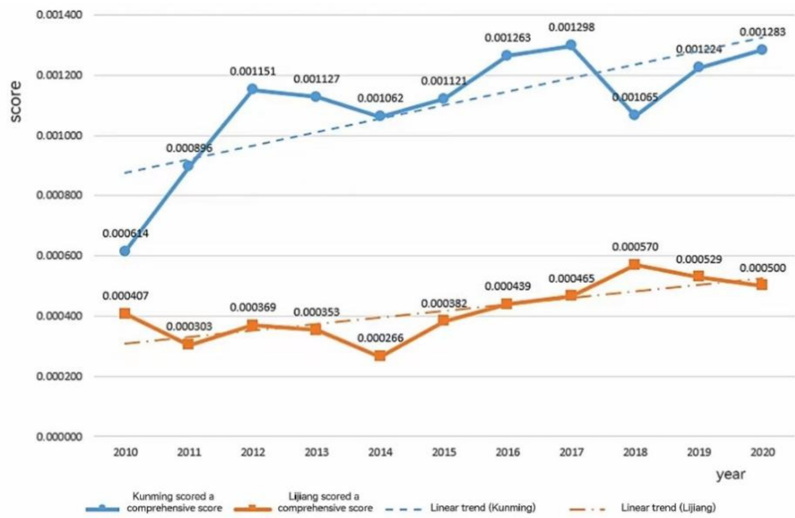

Figure 1: Comparative evaluation of ecological economy dynamics in Kunming and Lijiang

In view of the reasons for the relatively backward development of Lijiang's ecological economy, this paper summarizes the following three reasons based on the actual situation of the region:

(1) From an economic point of view, for the ecological economy industry The investment of funds is insufficient and the scale of development is limited. The development of ecological economy requires a lot of investment in ecological and environmental protection infrastructure, the promotion of new technologies, and the restoration of the ecological environment, all of which involve a lot of funds, but due to the shortage of funds, the scale of ecological economic development is limited.

(2) From a social point of view, the foundation of ecological economic development is weak and social participation is not high. The public's awareness of building a resource-saving and environment-friendly society is generally not high, and the sense of participation is not strong, believing that the development of ecological economy takes a long time and high cost compared with traditional development methods, and has no economic benefits and enthusiasm in the short term.

(3) From an ecological point of view, Lijiang's ecological environment is fragile. In recent years, Lijiang's economy has developed rapidly, but in the process of development, it also once relied on energy consumption to develop the economy, and the rough development of high energy consumption and high pollution has had a great impact on the ancient city of Lijiang and its surrounding environment. A series of problems such as the disappearance of animal and plant species. In addition, due to Lijiang's over-reliance on tourism, the eco-tourism environment is deteriorating, artificially putting great pressure on Lijiang's ecological environment. Due to the above reasons, Lijiang's ecological environment has deteriorated, and the economic benefits brought by the ecological environment are low.

4 CONCLUSION

According to the above evaluation and analysis results of the dynamic evaluation and analysis of the ecological economic development of prefecture-level cities in Yunnan Province, the following conclusions can be drawn: (1) The ecological economic development of prefecture-level cities in Yunnan Province has a good trend and a large growth rate. This is inseparable from the economic and ecological policies adopted by Yunnan Province in recent years. (2) The ecological economy of prefecture-level cities in Yunnan Province has uneven development in three dimensions: economic subsystem, social subsystem and ecological subsystem. Among them, it has relatively obvious development advantages in the economy, while the advantages of social development and ecological development are not obvious, and there is a downward trend. (3) The development of prefecture-level cities is uneven, and the scores of prefecture-level cities are quite different. Kunming, Qujing and Yuxi basically maintained their scores in the top three, while Lijiang and Zhaotong lagged behind.

Based on the conclusions reached, this paper makes the following five recommendations:

(1) From the overall results, it can be seen that Yunnan Province needs to closely integrate social and ecological development with high economic growth. On the basis of maintaining absolute high economic growth, Yunnan Province needs to increase the education popularization rate, increase the employment rate around ecological industries, encourage and promote sustainable structural reform of agriculture, industry, service industries and other industries, optimize the energy structure, change the mode of production and consumption, tap the potential of resources, innovatively develop economically developed and ecologically efficient industries, build a culture with reasonable system and social harmony, as well as an environment with a healthy ecology and suitable landscape, and improve the happiness of people's lives.

(2) Yunnan Province can include the ecological economy index in the scope of government assessment, increase the internal transformation momentum, and improve the conversion rate of ecological resources. With the Yunnan provincial government as the main body, encourage the change of the traditional resource-based economic development model, establish a sustainable development technology support system, and form an effective and mature sustainable ecological technology. At the same time, it pays attention to the current situation of unbalanced development of cities at the local level, implements preferential policies and local support for regions, narrows regional gaps, and supports areas with weak ecological economy.

(3) In the process of developing ecological economy, cities at the local level should give full play to their local advantages. Based on the above data, local municipal government organs can make horizontal comparisons, and then go deeper into vertical factors, combine local advantages and characteristics to develop a green ecological economy, and improve the utilization rate of local ecological economy according to local resources.

(4) Improve the plurality of subjects involved in the ecological economy and fully mobilize social resources. Yunnan Province needs to build a diversified investment system and fully mobilize social resources in southwest China. Through administrative and legal means, establish relevant research and development institutions, build a good ecological economic circle, and guide social forces to invest in ecological economic industries. Such as: subsidies for green environmental protection enterprises; Encourage the introduction of professional talents;

Improve supporting facilities; Highlight brand advantages, etc.

(5) Grasp the international situation, respond to the call of the country, and actively develop the ecological economy in the context of carbon neutrality. The state and individuals should maintain a united front and enhance the sense of identity and participation of social groups in building a resource-saving and environment-friendly society.

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