

Practical Research on the Fact that Clear Waters and Lush Mountains are Invaluable Assets in the Ecological Civilization Experimental area of Guizhou Province

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Abstract. Guizhou is one of the first national ecological civilization pilot zones selected, which needs to play a leading role in the road of ecological civilization construction. The good ecological environment status quo and the continuous high growth rate of economic development provide a research basis for the project. In-depth analysis of the relationship between ecological environment and economic development, to provide scientific suggestions for the solid progress. The main achievements of the research are as follows: (1) Construct the practice evaluation index system of "Two mountains" in ecological civilization pilot area in Guizhou Province, and the overall evaluation is "high"; (2) the evaluation result of "Two mountains" in Bijie pilot area shows that the evaluation result of "Two mountains" practice index in Bijie pilot area increased from 0.056 in 2015 to 0.107 in 2019, the comprehensive index of ecological civilization in Bijie pilot area increased steadily, and the total value of green water and green mountains in Bijie pilot area was 4201235.478 billion yuan in 2019; (3) The fitting curve of the relationship between environmental and economic benefits in Chishui River Basin in Guizhou Province shows that the ecological environment protection work in Guizhou Province effectively promotes the rapid improvement of environmental benefits and economic benefits; (4) the accounting of ecosystem service value in Chishui City shows that the total value of Chishui city in 2019 was 4,2170.788 billion yuan; (5) Summarize the "two mountains theory" in Guizhou innovation practice experience and model, put forward "speed up the construction of green ecological system, improve environmental carrying capacity" "speed up the construction of characteristic industry system, improve urban economic strength" "speed up the construction of modern urban system, improve the urban agglomeration ability" "vigorously develop circular economy, efforts to promote production mode change" "actively guide form green low carbon consumption pattern" and so on five countermeasures.

1 introduction

Due to the overexploitation of the natural world by human beings in the period of industrial civilization, which produced worldwide problems such as environmental pollution, ecological destruction, population explosion, and energy crisis, people began to gradually realize that they should respect nature, conform to nature, and protect nature. Foreign scholars paid early attention to ecological issues. Between 1962 and 1997, American scientist Rachel Carson touched the bud of ecological civilization in *Silent Spring* (Ruilan et al., 2008), *Limits of Growth* (Li Tao et al., 2013), and *The Reasons of Nature* (Zang Peihong, 2003)[1-2]. Research on the governance countermeasures of freshwater lakes (Yang Ya, 2008)[3]. Li Bo (2010) [4] put forward countermeasures such as formulating plans

to increase investment, building a characteristic economic and industrial system, and accelerating urbanization construction. From 1983 to 2009, the adoption of Our Common Future, Agenda 21, World Environment Day in 2007 with the theme of "melting glaciers and worrying consequences", and the Copenhagen Climate Change Conference in Denmark in 2009, indicating that the construction of ecological civilization has become an inevitable result of global human development. Foreign scholars analyze ecological problems from a relatively unique perspective, which provides useful viewpoints and methods for our research.

Domestic scholars on the green mountains and silver mountains began in the 20th century. In terms of practice, Guizhou Province construction of ecological civilization pilot demonstration area, Guiyang City issued the "construction of ecological civilization city index system and monitoring methods", "Guiyang City to promote

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ecological civilization Construction Regulations" and so on[5-8]. The index system of Guiyang city is more operable. Ability to conduct both horizontal and longitudinal comparisons. It shows that Guizhou Province's ecological civilization construction is now at the forefront of the country. In the new era, it is of great scientific significance and application prospect to deeply study the practice that clear waters and green mountains in Guizhou Ecological civilization experimental zone are gold and silver mountains.

2 Practice evaluation of "Two Mountains" in Guizhou Provincial Ecological Civilization Experimental Zone

Reference domestic related national ecological civilization experimental area ecological civilization construction practice, according to the ecological environment about "two mountains" index, national ecological civilization city and county evaluation requirements, around ecological civilization in Guizhou green water castle peak is the jinshan yinshan practice, build ecological civilization experimental area in Guizhou "two mountains" practice index system. Combined with Fujian province, Jiangxi province national ecological civilization experimental area construction results and Practice results of two mountains in Guizhou Province, build Guizhou ecological civilization test area in Guizhou "two mountains" practice index system, Take Bijie pilot area and Chishui City as an example for evaluation and analysis, and strive to open up the channel for the transformation of clear water and green mountains into gold and silver mountains. Which provided technical support for the construction of ecological civilization pilot zone in Guizhou Province.

2.1 Indicator system construction

According to the meaning of ecological civilization, the Ministry of Ecology and Environment's construction index system of demonstration cities and counties and the index evaluation system of "two mountains". According to the principles of integrity, operability, relative independence, guidance, forward-looking, practicality and importance of the index system construction. In combination with the requirements of ecological environment, development and reform, natural resources, forestry and other departments. According to the main goals of economic and social development of the province and all cities and states during the 14th Five-year Plan period. Depending on the accessibility of each index value, Select the allocation and efficient utilization of natural resources, green development mechanism, clean production process, terminal control, ecosystem protection and waste comprehensive utilization, green development performance assessment and other 8 tasks as the standard layer. The evaluation index system of per capita GDP,

urban sewage treatment rate and public satisfaction were selected as the index layer. Practice evaluation method of "Two Mountains" in the Ecological Civilization Pilot Zone of Guizhou Province: First, calculated according to the determined index to obtain the target value of each index, and then the corresponding target degree is weighted, and then calculate the criterion degree according to the weight of the three criterion layers, and calculate the comprehensive evaluation index of "Two Mountains" practice in Guizhou Ecological Civilization Pilot Zone according to the corresponding criterion degree.

Classify the factors involved in the comprehensive evaluation of "two mountains" in Guizhou Province, Constructs a hierarchical hierarchy of interconnected elements. Construct a judgment matrix to judge the relative importance of each indicator. Constructed the comprehensive evaluation index system of "two mountains" in Guizhou Province. The hierarchical analysis method is used to assign the weight of each index of "two mountains" evaluation in Guizhou Province. Obtain the original indicator data right, because each indicator data has different dimensions and magnitudes, direct use can not truly reflect the "two mountains" practice of the situation. Therefore, the data needs to be normalized before its practical application to eliminate the influence of the dimension and magnitude between the data.

The index value has a positive correlation with the comprehensive evaluation index of "two mountains" practice, and shows a single increase distribution, that is, the higher the index value, the higher the practice level of "two mountains". For example, the proportion of days with good ambient air quality and the standard quality rate of centralized drinking water sources, etc.

The index value has a negative correlation with the comprehensive evaluation index of "two mountains" practice, and shows a single reduction distribution, that is, the higher the index value, the lower the practice level of "two mountains", Such as water consumption per unit of GDP, sulfur dioxide emissions, the urban registered unemployment rate at the end of the year, etc.

The data preprocessing formula is as follows:
forward pointer:

$$x_{ij}^* = 1 - \frac{S_i - x_{ij}}{S_i - \min(x_{ij})} \quad (1)$$

$$x_{ij}^* = 1 - \frac{x_{ij} - S_i}{\max(x_{ij}) - S_i} \quad (2)$$

Negative indicators:

x_{ij}^* : The value after the preprocessing of the j th index in the i th index layer;

In the formula:

x_{ij} : The original value of the j th index of the i th index layer;

S_i : The target value of the i th index layer;

$\max(x_{ij})$: The maximum value of the j th index in all i th index layers is multiplied by 1.05;

$\min(x_{ij})$: The minimum of the j th indicator in all i indicator layers is divided by 1.05.

In the actual calculation process, the practice evaluation index and grade standard value of "Two Mountains" are jointly standardized by formula (1) and (2). The larger the index value of the conversion result, the higher the practice level of "Two Mountains".

2.2 Calculation model of the practice comprehensive evaluation index of "Two Mountains" in the Ecological Civilization Experimental Zone of Guizhou Province

The comprehensive evaluation index of "Two Mountains" practice in the Ecological Civilization Pilot Zone of Guizhou Province comprehensively reflects the ability of "two mountains" practice to promote society, economy, population and ecology and its coordination degree with environmental consequences. Therefore, the calculation model of the practice comprehensive evaluation index of "Two Mountains" in Guizhou Provincial Ecological Civilization Pilot Zone is as follows:

$$E = \sum_{i=1}^n \omega_i E_i \quad (3)$$

The criterion layer is calculated using the model of:

$$A_i = \sum_{j=1}^m \omega_{ij} B_{ij} \quad (4)$$

Formula E is the size of the comprehensive evaluation index of "Two mountains" in Guizhou Ecological civilization pilot area; A_i is i criterion index; B_{ij} is the value of i criterion j index, the weight of i criterion j index; n is the number of criterion indicators; m is the number of index layer indicators.

2.3 Determination of index weight and evaluation methods

According to some internationally recognized indicators and the Basic Standards for the National People's Well-off Life and the National Ecological City Construction Standards already issued by China. Referring to the social and economic development of Guizhou Province in recent years, it is determined that the highest score of the standardized index in the accounting table is 1 point, and the lowest theoretical score is 0 point. Each index between 0~1 is divided into the worst value, pass value and the optimal value. The optimal value can be considered as the best value for maintaining the good resilience of the ecosystem in Guizhou Province. The passing value can be considered as the internationally or domestically recognized risk-free safety value of an indicator, and the worst value is considered as the critical value that cannot maintain ecological elasticity. This is easy to analyze the dynamic change characteristics of urban ecological environment, and can meet the needs of comparative research to the greatest extent.

The weight of each index in the "two mountains" practice evaluation index system in the Ecological Civilization pilot Zone of Guizhou Province is

determined by hierarchical analysis method. Hierarchical analysis method is a combination of qualitative and quantitative. Hierarchical analysis method is a kind of qualitative and quantitative combination, systematic and hierarchical analysis method. The relationship between each indicator can be well described. First of all, the index system is hierarchical. According to the mutual relationship and subordination between the factors, the factors are combined according to different levels to form a multi-level analysis structure model. It finally boils down to the relative importance of the bottom level and the highest level. Ultimately, it comes down to the question of the weights of the lowest level relative to the relative importance of the top layer or the relative order of superiority and inferiority. Construct the judgment matrix of the criterion layer to the target layer, construct the judgment matrix of the indicator, standardize the matrix and solve the feature vectors, and determine the consistency of the matrix, so as to determine the weight value of each criterion layer. Guizhou Province is one of the regions in the world where the karst region is seriously affected by rocky desertification. The development and utilization of resources in the province is complex, and some indicators are far behind compared with international indicators. In order to reflect the actual situation within the region, on the basis of relevant domestic data and existing research results, the target value, status value and weight calculation of the "Two Mountains" practice evaluation index system.

Classification of the evaluation index:

At present, there is no clear unified standard for the practice evaluation of "two mountains". The traditional evaluation criteria generally include questionnaire survey method, standard method and reference frame method. According to the rating criteria of the above indicators, this study divides the influence of the above factors on the practice of "Two Mountains" in the Guizhou Ecological Civilization Pilot Zone into 5 grades.

2.4 Practice evaluation and analysis of "Two Mountains" in Guizhou Provincial Ecological Civilization Experimental Zone

According to Equations 1, 2, 3, and 4, Evaluation and analyze the practice of "two mountains" in ecological civilization pilot zone of Guizhou Province, As shown in Figures 1, 2, and 3.

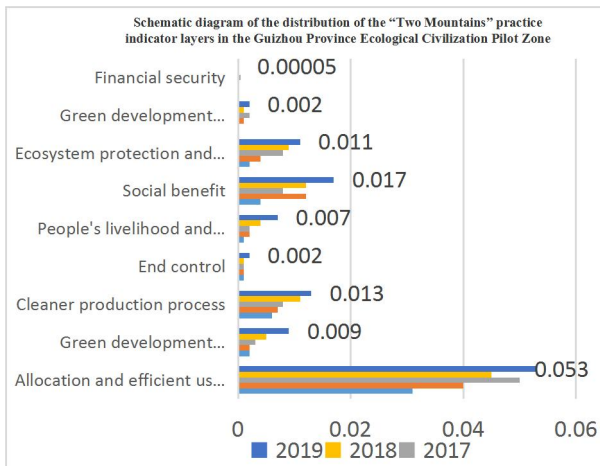


Figure 1 Schematic diagram of "Two Mountains" in the Ecological Civilization Experimental Zone of Guizhou Province

From Figure 1, Figure 2 and Figure 3, the comprehensive index of building green waters and green mountains, environmental protection, social progress norms and ecological civilization construction has shown a wave upward trend. It has grown rapidly since 2005. It shows that the economic, social and environmental conditions of Guizhou province have been greatly improved, which is inseparable from the ecological civilization construction in Guizhou Province. In terms of economy, the per capita GDP of Guizhou province in the past 10 years has increased from 4,957 yuan to 26,393, more than five times, with gratifying results. However, under the national economy facing the new normal, the economic development index of Guizhou Province in 2014 is still in the "medium" level; In terms of environmental protection, in the decade since 2005, Guizhou province has made chemical oxygen demand, ammonia nitrogen, soot, industrial dust and industrial solid waste emissions controlled within the national plan targets. Maintaining the overall water quality of the eight major river systems in the two major river basins of Quansheng is maintained well, controlling soil erosion, greening the city, etc., which has brought the province's environmental protection level to a new level. In many hardware and software facilities are not lagging behind other provinces, so its environmental protection level is "higher"; In terms of social and people's livelihood, Guizhou province has continuously increased its investment in science and technology, culture, education and health, the per capita disposable income of urban residents and the net income of farmers have been steadily increased, and the improvement degree of social and people's livelihood has reached a "higher" level. Since 2015, with the gradual implementation of the specific measures, the economic development index and environmental protection index have shown a steady upward trend, and the social livelihood index has shown a leaping upward trend since 2007. It shows that after 2007, Guizhou province has gradually increased the contribution of social society and people's livelihood by vigorously carrying out the construction of ecological civilization city. The comprehensive evaluation index of "Two Mountains"

practice in Guizhou Provincial Ecological Civilization Pilot Zone increased from 0.047 in 2015 to 0.114 in 2019. The overall evaluation was "high". It shows that Guizhou Province's national ecological civilization construction shows a steady rising trend.

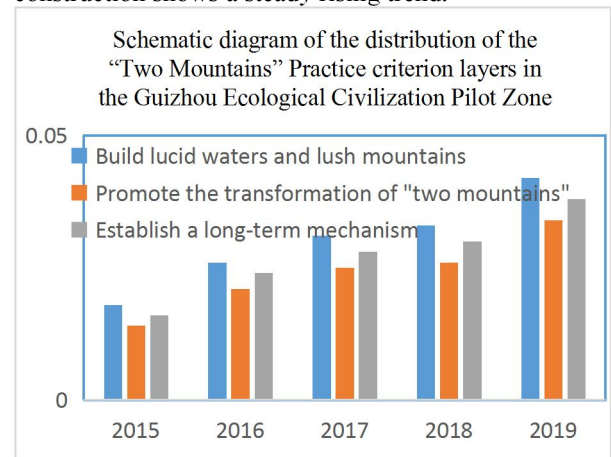


Figure 2 Schematic diagram of the layer distribution of the "Two Mountains" experimental criteria in the Ecological Civilization Experimental Zone of Guizhou Province

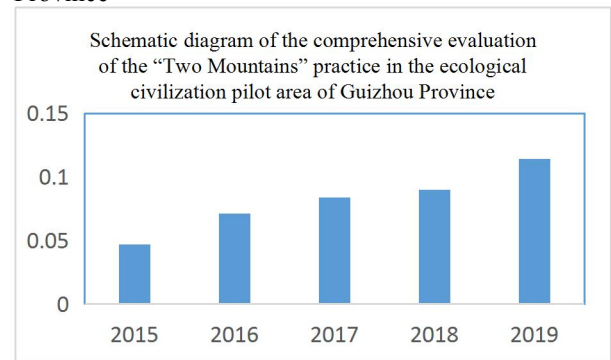


Figure 3 Schematic diagram of the comprehensive evaluation of the practice of "Two Mountains" in the Ecological Civilization Experimental Zone of Guizhou Province

3 Countermeasures and Suggestions for the Practice of "Two Mountains" in the Ecological Civilization Experimental Zone of Guizhou Province

(1) Accelerate the construction of a green ecological system and comprehensively improve the carrying capacity of the environment

Establish and improve the ecological space control mechanism. Strengthen ecological protection to ensure the safety of ecosystems. Strengthen environmental pollution control. Improving the systems and mechanisms for promoting ecological progress.

(2) Accelerate the construction of a characteristic industrial system, and comprehensively enhance the city's economic strength and development. Deepen a new type of industrialization.

Deepen a new type of industrialization. Accelerate the development of health care tourism. Accelerate the development of characteristic and efficient agriculture.

(3)Accelerate the construction of a modern urban system, and comprehensively enhance the capacity of urban agglomeration

Speed up the improvement of urban planning. Speed up the construction of municipal facilities. Innovate urban management services. Accelerate efforts to improve urban quality.

(4)Vigorously develop the circular economy and strive to promote the reform of the production mode

Under the guidance of Xi Jinping Thought on Socialism with Chinese Characteristics for a new era, we will firmly establish the five new development concepts, promoting rural economic construction, political construction, cultural construction, social construction, ecological civilization construction and the party's construction, comprehensively promote the new era "four beautiful rural countryside" construction. Which accelerating the modernization of rural governance system and management ability, and the modernization of agriculture and rural areas, accelerate the realization of "strong agriculture, rural beauty, farmers rich". We will scientifically formulate a strategic plan for rural revitalization, and optimize and integrate the spatial layout of villages in light of local conditions. Promote the development of the whole agricultural industrial chain, vigorously develop rural tourism, and vigorously implement the plan to improve the living environment, water, electricity, telecommunications, housing, roads, rural education, rural health, and basic rural security. The quality of rural living environment has been greatly improved, and the ecology is more livable. The whole industrial chain of "ten million" leading industries and the agricultural industry development pattern of "one township one special, one village one product" have basically taken shape. Domestic sewage and garbage treatment facilities in rural areas have basically covered all rural areas, and remarkable results have been made in the development of demonstration sites for integrated rural areas with distinctive features. The spiritual outlook of rural residents has been comprehensively improved, the civilized village style has become a trend, and the neighborhood relations are more harmonious. We will comprehensively eliminate absolute poverty in rural areas, increase the per capita disposable income of rural residents above 15,500 yuan, and enrich rural residents. A number of "Chishui experiences" that can be replicated and extended, and establish and improve long-term normal measures are further promoted.

We will fully implement the basic state policy of resource conservation and environmental protection, vigorously develop a circular economy, and build a circular industrial chain in response to local conditions, and reduce energy and resource consumption and waste production in all links of the production process at the source and actively promote cleaner production and promote the use of bulk industrial solid waste and agricultural and forestry waste resources. We will vigorously develop circular agriculture and promote highly efficient water-saving irrigation technologies. Give full play to the core supporting role of your various economic development zones, further integrate resources, promote the integrated development

of the service industry and other industries, promote clean services and reduce resource consumption, improve the comprehensive utilization rate of energy and energy, and encourage the recycling of water resources.

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