



# Analysis of Countermeasures to Promote the System of Accounting Methods for Gross Ecosystem Product in Yunnan Province

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**Abstract.** Gross Ecosystem Product (GEP), which corresponds to Gross Domestic Product (GDP), is a well-established system of statistics and accounting that can measure ecology effectively and covers the total economic value of products and services provided by ecosystems for human well-being, including the value of product provision, regulatory services, cultural services etc. Based on the basic development of Yunnan Province, this paper elaborates the necessity and feasibility of promoting the GEP accounting method system in Yunnan Province, and further proposes the application countermeasures and safeguard measures of the system, aiming to provide effective suggestions and ideas for vigorously promoting the GEP accounting method system in Yunnan Province.

**Keywords:** Yunnan Province · Application Countermeasures · Safeguard · Measures · GEP Accounting Method System

## 1 Introduction

GEP accounting, as a good statistics and accounting system that can measure ecology, tells people the value of clear water and green mountains by using a clear figure. Based on the basic situation of Yunnan Province, this paper elaborates the feasibility and necessity of GEP accounting implementation, explores the reasonable application countermeasures of GEP accounting results. It aims to promote the GEP accounting system and at the same time effectively promote the green transformation of Yunnan Province's development mode, better transform ecological advantages into economic advantages, and create a new model of ecological civilization construction with Yunnan characteristics.

## 2 The Concept and Main Content of the GEP Accounting Method

### 2.1 The Concept of the GEP Accounting Method

GEP accounting is an essential method to measure the ecological value of clear water and green mountains. Figuratively speaking, it tells people the value of the beautiful

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ecological environment with a clear figure. By accounting for important indicators that have a significant impact on the effectiveness of ecological civilization construction, we can analyze and assess the effectiveness of regional ecological civilization construction and enable people to scientifically understand the potential value of ecosystem services. The original goal of GEP accounting is to better protect natural capital, not to transform the value of ecological products. At present, GEP accounting has become an important way to implement the “Two Mountains” theory.

## 2.2 The Main Content of the GEP Accounting Method

The content of the GEP accounting method system mainly includes the value of the products provided by the ecosystem, the value of the regulating service and the value of the cultural service. Ecosystem products are those that can be bought and sold in the market, mainly including products and ecological energy from agriculture, forestry, animal husbandry and fisheries; regulating services mainly include water conservation, carbon sequestration and oxygen release, biodiversity protection, air purification, forest protection and climate regulation; cultural services mainly include leisure tourism, scientific research and popular science education.

**Table 1.** Comparison between GEP accounting and GDP accounting [Self drawn]

Accounting method	Basic concept	Accounting content	Relationship between the two
GEP Accounting	Adopting quantitative methods to measure and assess the changes in ecological environment quality	The value provided by ecological products, ecological regulation services and cultural services	GDP reflects the sum of value added created by human productive activities, while GEP accounting strengthens the assessment of ecological environment on this basis. The synergistic development of the two is conducive to promoting the harmonious coexistence of human and nature and the coordinated development of economic construction and ecological protection.
GDP Accounting	Reflecting the sum of value added created by human productive activities, and measure the economic situation and development level of a country	The market value of all final goods and services produced by the economic society in a certain period of time	

### **2.3 The Relationship Between GEP and GDP Accounting**

GDP accounting reflects the sum of the value added created by human productive activities. To some extent, it ignores the environmental pollution and resource damage caused by excessive pursuit of economic benefits, while GEP accounting can truly quantify the service function of ecosystems and incorporate the value created by ecosystems into the evaluation and consideration of social development [1]. The incorporation of GEP accounting helps to break the original “one-dimensional evaluation standard” of GDP, and the synergy of GDP and GEP in evaluating the development status of a country or region can provide support for the accurate quantification of “clear water and green mountains” and lay the foundation for high-quality economic development in China (Table 1).

## **3 The Necessity of Vigorously Promoting the GEP Accounting Method System in Yunnan Province**

### **3.1 GEP Accounting Contributes to the Green Transformation of the Development Approach of Yunnan Province**

Through GEP accounting, it can guide the province to accelerate the development of green industries such as ecological tourism, rural lodging, forest health care, and realize the transformation of “beautiful scenery” into “beautiful economy”. It can also further promote the province to increase the integrated protection and systematic management of mountains, water, forests, fields, lakes and grasses, and strengthen the determination to ban fishing for ten years in Tien Lake. Meanwhile, it can help the province to accelerate the planning and construction of new energy system, widely form a green and low-carbon production approach and lifestyle, and provide strong support for the green transformation of the province’s development mode [2].

### **3.2 GEP Accounting Helps the Province Transform Its Ecological Advantages into Economic Advantages**

Yunnan is a country with exotic mountains, water, forests and lakes, ecology is the charm of Yunnan Province. The realization of ecological product values is an essential part of the transformation of “green mountains and clear water” into “mountains of gold and silver”, and GEP accounting is the basis for the realization of the value of ecological products. GEP accounting results can provide basic support for the management and development of ecological products, and new economic growth points will come gradually [3]. In addition, the increment of GEP can continuously broaden farmers’ income avenues and enhance their welfare.

### **3.3 GEP Accounting Helps to Form a New Model of Ecological Civilization Construction with Yunnan Province’s Characteristics**

The GEP accounting system will provide a measurement mode for the excellent ecological environment in Yunnan Province and guide the construction of ecological civilization more precisely. Yunnan Province will continue to lead industrial restructuring

and upgrading with the concept of ecological civilization, which will constantly bring ecological premium and form a virtuous cycle of ecological civilization construction. With the GEP accounting evaluation system, both economic activities and the ecological environment can be measured quantitatively, and they will become important means to promote high-quality development of Yunnan Province [4]. GEP accounting will help Yunnan Province to achieve completely new achievements in ecological civilization construction on a larger and deeper scale.

## **4 Application Countermeasures of GEP Accounting Results**

The vitality of the GEP accounting system lies in its implementation and application. The application of GEP accounting results can be carried out by trying the following aspects:

### **4.1 Explore Ways to Establish a Market Trading System for Ecological Products**

GEP accounting has attached a value label to ecological products and provided a prerequisite for establishing a market trading mechanism for ecological products based on GEP accounting results. The next step is to establish a more complete trading system, focusing on the following links:

First, clarify the supply subject of ecological products in the market. Natural resources are mainly concentrated in the vast rural areas, and ecological products have public attributes. According to the practical experience around the world, state-owned ecological management companies should be established with governments at all levels as the main body. These companies are the guarantors of ecological products and the main market suppliers, they are responsible for ecological protection, construction, restoration and natural resource management and development.

Second, clarify purchase subject of ecological products in the market. The main consumer group of ecological products (mainly including agricultural and livestock products) and ecological cultural service products (mainly including tourism services) is the public. However, the purchasers of ecological regulation service products such as water connotation, climate regulation, carbon sequestration and oxygen release are mainly the government and enterprises, who are not only ecological beneficiaries, but also ecological development and utilization subjects [5]. They can purchase ecological products in many ways, such as purchasing from state-owned ecological operation companies or signing agreements.

Third, build a market trading platform for ecological products. Build an ecological product trading platform based on the existing investment project trading center or rural collective property rights trading platform. The platform should be responsible for sorting out fragmented natural resources into the province or city and coordinate the supply and demand sides of ecological products to sign purchase and sale agreements.

Forth, explore ways to launch financing credit products for ecological products value. Based on the promotion of forest rights and other natural resources for asset-based mortgage loans, financial institutions can be guided to explore the launching of “ecological loan” credit products linked to the value of ecological products, and take the value

of ecological products as a reference indicator for loan admission, loan amount, loan interest rate and loan convenience. In this way, while promoting financial reform and innovation, more funds will flow into the field of ecological and environmental protection construction.

#### **4.2 Explore Ways to Carry Out Inter-regional Ecological Compensation**

According to the results of ecological space accounting and the evaluation results of mutual ecological impact, horizontal ecological compensation will be carried out between ecological protection and construction areas and ecological beneficiary areas under the consultation and coordination of state-owned ecological management companies among different regions, in order to achieve fair and coordinated development between regions [6].

First, allocate a certain amount of funds every year to support and guide the states and cities in the basin to explore and establish a horizontal ecological compensation mechanism, and give financial incentives to the states and cities that have outstanding performance in water quality improvement, ecological products contribution, fund use efficiency and compensation mechanism construction.

Second, implement the overall management of the whole watershed. The provincial departments of finance, ecological environment, water conservancy, forestry and grass shall cooperate to establish a management platform for the basin ecological compensation mechanism, integrate relevant data and fully connect them with other information systems of relevant departments and localities, summarize information on forests, grasslands, wetlands, lakes, soil erosion management, ecological environment quality, economic and social development of the integrated watershed, and carry out GEP accounting in relevant states and cities, so as to provide a basis for them to carry out horizontal ecological compensation [7].

#### **4.3 Promote the Application of GEP Accounting in Decision-Making**

In accordance with the principle of feasibility and advancement, it is recommended to refer to GEP accounting results in the following aspects to make scientific decisions:

First, the allocation of funds for ecological construction depends not only on the total amount of GEP, but also on the growth of GEP. Appropriate financial support and rewards should be given to regions with rapid GEP growth and obvious achievements in ecological protection and construction projects.

Second, the GEP growth objectives should be clearly proposed in the regional development plan, and the layout of ecological projects and the amount of financial funds should be determined according to the target requirements and completion.

Third, determine the development direction and priorities of different regions according to the GEP accounting results. For regions with substantial ecological assets, GEP growth should be taken as a strategic task [8]. These regions should change their development mindset and development patterns, establish and enhance the mechanism for realizing the value of ecological products, focus on developing ecological agriculture and ecological tourism, and gradually realize ecological industrialization and industrial ecology.

#### **4.4 Pilot the Dual Assessment Mechanism of GDP and GEP**

The province can select representative cities to carry out pilot projects, incorporate GEP into the national economic accounting system as GDP, and use GEP as a local performance evaluation indicator, so that it can play the role of “baton”.

First, subdivide the assessment object. Divide the pilot areas into different types such as urban, rural, and special category (such as ethnic minority areas category) according to the resource endowment and development foundation, so that the actual performance appraisal can be both differentiated and uniformly fair.

Second, adjust the assessment index system. The GEP growth rate, GEP conversion rate and other important assessment indicators can be set according to different types of regions, and different assessment indicators and weights can be assigned [9]. In the assessment items, we can also add the principle of “one vote veto for GEP reduction” and other contents to highlight the constraints and applicability of the policy mechanism.

Third, strengthen the application of assessment results. For regions where GDP and GEP maintain dual growth and where GDP and GEP achieve dual transformation, the number of merit appraisal quotas for members of the party and government leadership should be appropriately increased and proper rewards should be given. Meanwhile, the results of GEP accounting will be used as an essential reference for in-service and out-service audits of natural resource assets of leading cadres, in order to strengthen the responsibilities of governments, departments and leading cadres in the construction of ecological civilization.

### **5 Vigorously Promote the Safeguard Measures of the GEP Accounting Method System**

GEP and eco-asset accounting is still a new concept and accounting method. In order to make it an effective policy tool, the following work need to be carried out:

First, strengthen the publicity and training of GEP accounting and application. The province should actively issue the application guide of GEP accounting, which should include the content of achievements, application publishing and accounting information construction, and incorporate it into the main content of cadres’ education and training as a compulsory course, guide party cadres to enhance their awareness of responsibility for green development and better guide and standardize the accounting and application of GEP in each region.

Second, improve the ecological monitoring system as soon as possible. Taking advantage of the opportunity of establishing regional and national ecological monitoring systems to incorporate the indicators and parameters required for GEP and ecological asset accounting into the ecological monitoring system. It provides a unified, reliable and stable data base for governments at all levels to account for GEP and ecological assets, and provides a basis for integrating GEP and ecological assets accounting into the socio-economic assessment and evaluation system.

Third, improve the green policy system. Focus on incorporating GEP accounting results into the policy system of ecological priority and green development, promoting the quantification of GEP accounting results in the application of financial rewards and subsidies for green development, territorial spatial management, environmental governance

assessment, resource allocation, etc., and improving the effectiveness of government decision-making [10].

Fourth, establish an evaluation mechanism for ecological protection and restoration effects based on GEP accounting. Promote relevant departments to regularly release GEP accounting reports of provinces, cities and counties, and further analyze and announce the contents of the reports, mainly including the effectiveness and shortcomings of this stage. Then, the province should set up development goals for the new stage based on the contents of the reports and promote the ecological protection and restoration work in our province to focus more on the goal of “providing more quality ecological products to meet people’s growing needs for a beautiful ecological environment”.

## 6 Conclusions

It is of practical significance and necessity to popularize GEP accounting method system in Yunnan Province. By exploring and implementing the application countermeasures of GEP accounting results and taking effective safeguard measures, GEP accounting system can be revitalized in Yunnan Province. The implementation of GEP accounting method system is conducive to promoting the green transformation of Yunnan Province, giving better play to its ecological advantages, and forming a new mode of ecological civilization construction with “Yunnan characteristics”.

This article studies and illustrates several projects, including the major special project on the spirit of the important speech of General Secretary Xi Jinping’s visit to Guizhou (Project No. 21GZZB08), the “Top Youth” project of Yunnan Province’s Revitalization Plan, and the phased research result of Yunnan Province’s postgraduate supervisory team construction project.

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