

# Experiences in and Suggestions for Ecological Civilization Construction in Fujian Province

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**Abstract:** As the first national ecological civilization pilot zone in China, Fujian Province has made significant progress with a series of successful experiences in ecological civilization construction. This paper summarizes achievements in economic construction, environmental management, ecological protection, and human settlements construction since 2001 in Fujian Province. The authors found that the constraints on resources and the environment are still considerable regarding future development in Fujian Province, and that the adaptation of the institutional system to ecological civilization needs improvement. Furthermore, the authors found that the conflict between development and ecological protection is becoming increasingly prominent in the mountainous regions of Minxi and Minbei. This paper summarizes the experiences gained during the top-level design of, transformation from development mode, green governance, and system construction of ecological civilization in Fujian Province. The authors suggest that the national ecological civilization system reform pilot should be demonstrated intensively in Fujian Province, forming a strong institutional system that can lead the way in ecological civilization development and demonstrate its effects. The authors also suggest that Fujian Province focuses on promoting green economic transformation, innovating a supervisory system for the ecological environment, and optimizing the pattern of homeland security for the next stage of development.

**Keywords:** Fujian Province; ecological civilization; policy suggestion; national ecological civilization pilot zone; ecological civilization system reform

## 1 Introduction

Fujian Province is one of the earliest provinces to implement eco-provincial construction in China. Constructing an ecological province was proposed by Xi Jinping as the governor of Fujian Province in 2001 [1]. As an important carrier of ecological civilization (hereafter eco-civilization) and the concept of scientific development in Fujian, the Fujian provincial government has been interested in constructing an ecological province for more than a decade [2]. Pollutant emissions and resource consumption have dropped significantly during simultaneous rapid economic development. We discovered that the economic and ecological environments are growing together in Fujian Province, and the objectives of the overall eco-province construction plan were realized six years ahead of schedule. Fujian Province has accu-

mulated vast experience in eco-civilization construction in areas such as Changting County, a pilot area for soil erosion control; Ningde County, a pilot area for alleviating poverty; Quanzhou City, a pilot area for “Made in China 2025”; Nanping City, a pilot area of green development; and Yongan City, a pilot area for forestry reform. These experiences can be studied in other regions in China, enabling us to achieve development of a common social and ecological environment.

## 2 Effect of eco-civilization construction in Fujian Province

### 2.1 Strengthen the economy for a wealthy Fujian Province

Since 2000, people’s living standards have steadily improved

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in Fujian Province. The total GDP increased from 376.4 billion yuan to 26 000 billion yuan in 2015, and the per capita GDP totaled 67 966 yuan, far higher than in many other area of China. The per capita disposable income of urban and rural residents in Fujian Province steadily increased from 4190.8 to 25 404 yuan, 15.7% higher than the national level. Furthermore, the efficiency of land intensive use in Fujian Province improved significantly, as the gross national product of unit construction land increased from 10.65 billion yuan/hm<sup>2</sup> to 31.69 billion yuan/hm<sup>2</sup> [3].

## 2.2 Strengthen the environment for a fresh Fujian Province

Fujian Province has improved its environmental quality even with rapid economic development, and pollutant emissions continue to decline over time. The quality of water and air has been maintained at good levels for a long time. In 2015, the urban air quality in Fujian Province was 99.5%, and water quality of the 12 major water systems was excellent. Class I–III water quality accounted for 94.0%, much higher than the national level. Energy consumption per 10000 yuan GDP in Fujian Province decreased from 1.4 tons standard coal per million yuan to 0.531 tons standard coal per million yuan, and since 2000 the main pollutant emission indices such as SO<sub>2</sub> and chemical oxygen demand decreased by 78% and 72%, respectively [4]. Fujian Province has coordinated economic development and formed an eco-civilization. “Fresh Fujian” has become the gold standard for environmental competitiveness.

## 2.3 Strengthen the ecology for an ecological Fujian Province

About 80% of the Fujian Province area comprises mountains, 10% water, and 10% fields. The sea coastline ranks second in China. Fujian Province is rich in forest resources, and the province’s forest coverage rate increased from 60.5% in 2000 to the current 65.95%, which has ranked first in China for 38 years. The results of the Eighth National Forest Inventory show that forest volume in Fujian Province is  $6.08 \times 10^8$  m<sup>3</sup>, and that in 95% of the area, forest ecological functions are higher than medium level. The gross ecosystem product values and carbon sequestration functions in Fujian Province have steadily improved. Ecological resource assets have become the most advantageous resources in Fujian Province.

## 2.4 Strengthen the living environment for a livable Fujian Province

Fujian Province wants to meet and satisfy its people’s needs and is constantly optimizing the urban and rural living environment. In 2015, many human settlements in Fujian were considered among the best in China, including the urbanization rate, which now totals 62.6%. The urban built-up green area coverage rate totals 43.0%, and per capita green park area has reached

13.0 m<sup>2</sup> [3]. Most of the urban eco-environment in Fujian Province is in good condition. There are five national civilized cities, 15 national garden cities (counties), and five national ecological counties in Fujian Province. About 75% of the province’s townships and 84% of the villages have achieved the requirements for a national ecological demonstration area.

## 3 Main experiences of eco-civilization construction in Fujian Province

### 3.1 Top-level design to comprehensively promote eco-civilization

Top-level design to create an eco-civilization in Fujian Province has been advanced by planning, strengthening organization and leadership, and improving legal protection. First, Fujian Province formulated a long-term plan. In 2004, the Fujian Provincial Party Committee and provincial government jointly issued *An Overall Plan to Construct an Ecological Province in Fujian Province*, which presented the construction goals and tasks. The contents of the overall plan have been implemented in national economic and social development plans. Through the joint efforts of the relevant departments, planning has been implemented for all aspects of economic and social development. Second, Fujian Province set up a group led by the Provincial Party Secretary, which is directly dedicated to constructing an eco-civilization. The lead group considered construction effectiveness an important indicator of the cadre evaluation that would guide the local government to strengthen in constructing an eco-civilization. Third, Fujian Province has made efforts to improve the eco-civilization system. In 2010, the Fujian Provincial People’s Congress issued the *Decision on Promoting the Construction of Ecological Civilization*, and gradually introduced local regulations including *Regulations on Environmental Protection in Fujian Province* and *Regulations on Marine Environmental Protection in Fujian Province Xiamen Special Economic Zone Ecological Civilization Construction Regulations*. In this way, a multi-field, multi-level, an all-factor eco-civilization construction system was formed.

### 3.2 Green industry leading changes in the mode of economic and social development

Fujian Province has always pursued environmental protection over industrial development, and has expedited the adjustment of the economic structure to change the mode of development. First, Fujian Province firmly protects the environment by strictly controlling industrial development. Nanping City abandoned a project that was not compatible with the environment, and limited non-planned mineral development and extensive deforestation. The good environment has attracted other industries such as precision manufacturing, tourism, health, and breeding. The

excellent environment in Nanping has many advantages. Second, Fujian Province has made efforts to develop a modern service industry and other industries. As a result, many 100 million-yuan industrial clusters have developed, such as those related to the Internet, mobile, and solar PV LED products, as well as environmental protection industries. The environmental protection industry adds value to Fujian Province and has doubled in three years, accounting for about 10% of the province's value-added industries. Third, Fujian Province upgrades advantageous industries. Quanzhou leads the "CNC generation" by promoting "Quanzhou manufacturing" to the "Quanzhou smart made" transformation, which has become "Made in China 2025." Anxi County, once the largest state-level poverty-stricken county in Fujian Province, has fully repaid the stone plate of traditional industries. These strategic new industries provide a powerful engine for the development of traditional industries.

### 3.3 Strengthen investment in natural assets to improve environmental quality

A large amount of investment in natural assets will result in a significant return on the environment, as seen in Fujian Province. The good environment has become the Province's strongest competitive advantage. The proportion of fiscal expenditure on ecological construction and environmental protection continues to grow, with a total investment of more than 100 billion yuan. In 2015, the province's county sewage treatment rate was 89.5%, and the rate of harmless domestic waste disposal was 99.2% [5]. The urban and rural environmental infrastructure capacity has been comprehensively improved in Fujian Province. A relatively complete "village collection, town transit, county treatment" model of urban and rural waste treatment has been established. Comprehensive improvement of environmental quality is an important foundation to achieve the blue sky, green mountains, and clean rivers in Fujian Province.

### 3.4 Deepen structural reform to provide support for constructing an eco-civilization

Fujian Province integrates eco-civilization construction with the goals of economic and social development to build up an institutional system of eco-civilization construction. First, a "green oriented" cadre assessment mechanism was established in Fujian Province, and the effectiveness of forming an eco-civilization was included in the performance evaluation of local governments at all levels [6]. In 2014, the forest area and forest reserve volume doubled according to the annual growth assessment index and have been used as economic and assessment indicators in 34 counties of Fujian Province. A pilot project of a natural resources assets responsibility audit was initiated by local government departments in Fujian Province. Second, a financial transfer payment system for ecological protection was estab-

lished [2]. Regional ecological subsidy funds are divided into two parts—ecological protection funds and ecological incentive funds—which encourage the local government to take measures to improve the environment. Third, Fujian Province takes the lead in enacting measures for ecological compensation in key watersheds to establish a long-term compensation mechanism linked to local financial resources, protection responsibilities, and income levels. Fourth, tenure reform in collective forests continues to deepen in Fujian Province, in which compensation standards for public welfare forests have been raised and the forest ecological compensation mechanism gradually improved. As such, Fujian has become a banner of national forestry reform.

## 4 Main challenges faced during the formation of eco-civilization construction in Fujian Province

### 4.1 Vast resources and environmental constraints in the future

Resource and environmental constraints will continue to increase in the 13th Five-Year Plan period with consistent growth of the economy and urbanization in Fujian Province. First, the lack of land resources is a restriction. The per capita cultivated land in the province is 0.55 mu, only 36% of the national average. Less than 10% of the land is suitable for urban development, so the pressure on urban and industrial land resources will be enormous in the future. Second, regional water shortages in coastal towns of southeast Fujian are another important constraining factor. The potential danger of a water shortage in Xiamen and Putian is greater in dry years. Third, shortages of conventional energy resources such as oil, coal, and gas lead to high-energy dependence on foreign countries. At present, the coal-based energy structure greatly impacts atmospheric quality. Fourth, environmental risks caused by the heavy industrial structure continue to increase in Fujian Province. In recent years, the province has vigorously promoted the development of new industrialization, and the heavy industry trend has become clear. However, high pollution industries such as iron, steel, and petrochemicals are located in coastal areas, resulting in environmental problems including the loss of the natural coastline, which increases the risk to the environment.

### 4.2 The system adopted for an eco-civilization needs to be perfected

Institutional innovation is an important measure to promote the eco-civilization construction, which is the foundation of implementing ecological compensation, Off-Office auditing of cadres, and assessment of eco-civilization construction. However, the natural resources audit in Fujian Province is still in the pilot stage. The system for constructing the eco-civilization has not been perfected. First, the forms, approaches, and standards

of ecological compensation remain unknown. Existing ecological compensation measures are staged and temporary, and many problems exist such as how the policy is to continue in the future. Second, many departments implement ecological compensation measures, but lack unified management. It is difficult for local governments to coordinate the use of funds in accordance with conservation needs. Third, the ecological compensation standard and capital investments are low and insufficient to address ecological protection and pollution control issues in Fujian Province.

### **4.3 Increasing contradiction between development and ecological protection in western and northern mountains of Fujian Province**

Regional economic development is extremely unbalanced in Fujian Province, because of its geographic location, production factors, and industrial associations. The metropolitan areas of Xiamen, Zhangzhou, Quanzhou, and Fuzhou located in the coastal area of Fujian Province account for nearly 70% of the province's total economic output. However, the gap between northwest Fujian Province and southeast Fujian is obvious, and seriously affects the coordination of and potential for economic development in Fujian Province. The overall economic level of the northern and western regions is seriously behind that of the coastal areas. Fujian Province launched joint development of the mountains and sea under these conditions. It played an important role in narrowing the development gap and promoting the coordinated development of the regional economy. However, 735 000 people still live in poverty in remote mountainous areas. In the future, the strategic focus of poverty alleviation will be on how to explore the ecological advantages of these areas and promote the development of special industries.

## **5 Main experiences and suggestions for the construction of the eco-civilization**

### **5.1 Strengthen the concept of green development to guide eco-civilization construction**

We should continue to strengthen the concept of green development to guide the construction of an eco-civilization in the future. First, the concept of ecological advantage as core competitiveness needs to be established, and ecological product productivity should be regarded as an important indicator of regional development. Second, the concept of environmental quality anti-demotion should be established, the principle of protecting priority maintained, and environmental quality should not be sacrificed for economic development. Third, the concept of protecting the environment bottom line should be established, the ecological function should have a guaranteed baseline and environmental quality, and the safety baseline and use of natural

resources should be regarded as rigid constraints of development. Fourth, the concept of protect-repair-enhance ecological improvement should be established and traditional practices of first pollution control later changed.

### **5.2 Promoting green transformation of the economy to transform ecological advantages into developmental advantages**

High-end equipment manufacturing, energy conservation, environmental protection industries, agricultural and forestry industries with superior characteristics, and the green eco-tourism industry should be promoted to ensure green transformation of the economy. First, new economic growth as represented by the environmental protection industry should be explored and supported. The environmental protection industry, for example the Longjing Environmental Protection Co. Ltd., should be encouraged by examining the advantages of mountainous areas. Dominant industries such as tea, vegetables, fruit, livestock and poultry, aquatic products, forest, bamboo, flowers, and seedlings, of which the annual output value is more than 100 billion yuan, should be prioritized. Based on distinctive agricultural products such as fungal products in Ningde County and tea products in Anxi County, eco-product production and the tourism industry should be developed in poverty-stricken areas to establish tourism and special industries in Fujian Province. Second, the rural environment should be improved by promoting construction of the countryside. The county town planning system should be further improved to strengthen construction of beautiful rural demonstration villages. The "home cleaning" campaign should be extended in rural areas by improving the level of rural sewage treatment and public facilities to promote the utilization of domestic waste in rural areas. Ecological protection and restoration of the inland water basins and tourist attractions should be initiated to strengthen the treatment of rural water and soil erosion areas. Activities such as creating eco-villages and green villages by protecting old trees and forests should be initiated to achieve harmony between the village and the natural environment. Third, the energy structure must be further optimized to respond to climate change commitments in the Paris Agreement. It should also be ensured that the production mode and consumption patterns conform to the requirements of an eco-civilization by eliminating high-carbon and high-energy-consuming industries. The efficiency of the smart grid, fuel cell, energy-efficient cars, buildings and green logistics, and low-carbon energy consumption should be improved, and low-carbon industries vigorously developed.

### **5.3 Innovative environmental monitoring system to reform the eco-civilization system**

Eco-civilization innovation should be strengthened and the

relevant mechanism and system improved. First, a comprehensive measurement index of regional economic development must be constructed to reflect regional economic development and the status of ecological resources that can replace the pure GDP assessment index. Based on the balance sheet of ecological resources, Fujian should take the lead in realizing an ecological audit of leading cadres leaving their posts. Second, based on the bearing capacity of different types and regions, Fujian should initiate a pilot system to control pollutant capacity and add an emission permit system, study and publish local standards and environmental technology standards, and achieve ecological environment “anti-degradation” rigid constraints and “protection priority, protection-repair-function improvement” of the environmental regulatory system. Third, compensation for ecological conservation should be introduced. A unified centralized ecological compensation special fund should be developed to change the present management of the compensation fund. Innovative compensation methods such as purchasing ecological products and those with quality pricing by the government should be promoted through a demonstration. Fourth, a market regulation mechanism must be developed and improved for the rational allocation of resources. Based on the value of environmental assets, a market adjustment mechanism covering ecological environment assets transactions should be formed through economic leverage.

#### **5.4 Continue raising investment in natural resources to increase green savings in Fujian Province**

Investment in natural resources should be continuously increased to increase green savings in Fujian Province. First, the Province should prioritize ecological protection and continue to increase investment in natural resource assets. Key areas such as nature reserves, forests, and wetlands should be strengthened through ecological protection and restoration. Regional species diversity and local natural resources must be protected, and the structure and quality of existing natural ecosystems improved to enhance the supply of eco-products. Second, natural resource assets in different regions must be strengthened, and a balance sheet of natural resources prepared. Furthermore, the principles and methods of accounting for natural resources in Fujian

Province must be clarified, and natural resources and services accounted for in an orderly way to promote the conservation and protection of natural resources.

#### **5.5 Strengthen the protection of important ecological function areas to construct a land ecological security pattern**

Environmental protection should be strengthened in the regions of the Minjiang River Basin and Jiulongjiang River Basin, the source of the Tingjiang and Wuyi-Daimao mountains, and a land ecological security pattern should be established in Fujian Province. First, fiscal support must be strengthened. It has been suggested that the 22 counties involved in this region be protected as national key ecological function areas and be provided with state financial transfer efforts payment. Second, the Wuyihan region should be integrated with pilot program for establishing national parks, and effective ways to protect and manage the important areas of inter-provincial ecological functions should be explored in this region to solve the differences in management mechanisms, protective power, and development made in trans-provincial management.

#### **References**

- [1] The Reporter Group. From “ecological province” to “national ecological civilization pilot zone” [J]. *Money China*, 2015(3): 55–56. Chinese.
- [2] Promote the construction of ecological province, to create a national pilot ecological civilization construction zone [N]. *Fujian Daily*, 2014-10-16(3). Chinese.
- [3] Fujian Provincial Bureau of Statistics. *Fujian statistical yearbook 2016* [M]. Beijing: China Statistics Press, 2016. Chinese.
- [4] Fujian Provincial Department of Environment Protection. 2000—2015 Fujian marine environment quality bulletin [EB/OL]. (2004-06-04) [2016-06-02]. <http://www.fjepb.gov.cn/zwgk/kjc/hjzl/qshjzkgb/>. Chinese.
- [5] Sun C.L. Adhering to scientific development and building ecological civilization—Exploration and practice of ecological province construction in Fujian Province [J]. *Qiushi*, 2012(18):17–19. Chinese.
- [6] Xiao F. Fujian’s “ecological beauty” getting better [N]. *Chinese People’s Political Consultative Conference Newspaper*. 2013-09-17(2). Chinese.