UNEP

Measuring Progress towards an Inclusive
GREEN ECONOMY

2015-2017

Green Economy Progress Measurement in Jiangsu & Fujian Province, China

EMPA
Center for Environmental
Management and Policy Analysis

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Citation

PAGE (2020)，2015-2017 Green Economy Progress Measurement in Jiangsu and Fujian Province, China

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This document was produced with the financial assistance of the European Union, but the views expressed herein can in no way be taken to reflect the official opinion of the European Union.

The English version of the report is a synthesis version of the original report which was produced in Chinese.

Acknowledgements

This report was led by the Center for Environmental Management and Policy Analysis (EMPA), Nanjing University, cooperated with the research group in School of Economics, Fujian Normal University. Zhang Bing, Liu Beibei, Lin Shoufu, Huang Maoxing, Li Junjun and Ye Qi are the principle authors, data collecting and editing support from Liu Zifu.

From the PAGE partner agencies, the report was supervised by UN Environment's Economic and Fiscal Policy Unit led by Sheng Fulai.

This report has also benefited from invaluable comments and review from: Shi Minjun (Zhejiang University), Dong Zhanfeng (Chinese Academy for Environmental Planning), Zhang Lei (Academy of Environmental Protection of Jiangsu Province), Wang Yong (Environmental Policy Research Center of Ministry of Ecology and Environment), Liu Peng (Xijiao-Liverpool University).

PAGE gratefully acknowledges the support of all its funding partners: European Union, Germany, Finland, Norway, Republic of Korea, Sweden, Switzerland and the United Arab Emirates.

PAGE is grateful to the European Union for providing the funding support to this project.

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Executive Summary

The Partnership for Action on Green Economy (PAGE) is a United Nations (UN) initiative that seeks to put sustainability at the heart of economic policies and practices to advance the 2030 Agenda for Sustainable Development and supports nations and regions in reframing economic policies and practices around sustainability to foster economic growth, create income and jobs, reduce poverty and inequality, and strengthen the ecological foundations of their economies.

In September 2014, China's Ministry of Environmental Protection (now the Ministry of Ecology and Environment) expressed its interest through the United Nations Environment Programme to join PAGE to bolster green development in Jiangsu at provincial level.

In 2007, the UNEP global tool, Green Economy Progress (GEP) Measurement Framework, was localized and accredited in collaboration between the UNEP and Nanjing University to complement the existing system from the provincial government, and to identify policy gaps and opportunities for future resource allocation. This marks the first application of GEP at the sub-national level.

The GEP was later extended to the prefecture city level in Jiangsu Province and to both the provincial and city level of Fujian Province in collaboration with Fujian Normal University. At the same time, Nanjing University developed the Database of Jiangsu Green Economy for regular monitoring purposes.

The indicators show overall the progress of green development in Jiangsu Province. The measured progress of green development in the province surpasses the required national and provincial level. This indicates that the Jiangsu government has been making strong efforts towards green development, and is well on track. In Fujian Province, the progress also not only meets and exceeds the target, but shows upward momentum, indicating further strong progress. However, the progress of green development varies across dimensions and indicators in both provinces.

Research Background

2.1 China`s Path towards Green Development

In November 2012, "Ecological Civilization"[1] was underscored by the 18th CPC National Congress as a strong boost to high-quality and sustainable economic and social development. Henceforth, fostering green and resource-efficient development has become one of the most pressing tasks for the country. On March 24, 2015, "green development" was first proposed by the National Congress.

Two national documents—Opinions of the Central Committee and the State Council on Accelerating Ecological Progress and the General Plan for Reforming the System for Ecological Conservation—were issued on May 5 and September 22, 2015 respectively, indicating that "Ecological Civilization" has been translated from top-level design to specific policies. On October 29 of the same year, "Five Pathways for Development" was introduced at the national level, featuring innovation, coordination, greenness, openness, and sharing.

On December 22, 2016, the General Offices of the CPC Central Committee and the State Council jointly issued the Method for the Assessment of Ecological Progress. It requires governments at all provincial and prefecture levels to accelerate green development, work on ecological civilization and standardize evaluation processes. The indicator system for such evaluations was put in place in the third quarter of 2017. According to this document, a set of green development indicators will be used in the annual assessment to measure the trend and progress in key areas including resource use, environmental protection, ecological conservation, growth quality, green lifestyle and public satisfaction. A green development index will be calculated on that basis for each administrative district. The enforcement of the index system indicates that, apart from being a policy focus at macroeconomic level, "green development" has begun to feature prominently on the government's agenda. In the same year, the 19th CPC National Congress proposed the Beautiful China initiative, ensuring the harmony between human and nature. In addition, pollution control was regarded as one of the major focus areas. These measures have led to an accelerated and scaled-up transition

[1] "Ecological Civilization" is a Chinese concept for a sustainable development framework. It is defined as: "a resource efficient and environmental-friendly society, based on the carrying capacity of the environment, observing the law of nature and aimed at realizing sustainable development".

towards green development and ecological civilization in the country.

2.2 Introduction to the GEP Measurement Framework proposed by the United Nations

Figure 1 The Evolution of Green Development

Persistent poverty, overstepped planetary boundaries and inequitable sharing of growing prosperity are the three challenges that increasingly affect human well-being, according to the GEP Measurement Framework by UNEP. The idea of fostering an inclusive green economy, therefore, was proposed as a comprehensive response to those problems, and as a way to eradicate poverty, pursue growth without breaching ecological threshold and ensure health, happiness and development for mankind under the framework of the 2030 Agenda for Sustainable Development.

To track regional green economy progress, the GEP Measurement Framework is formulated by UNEP under the UN Sustainable Development Goals (SDGs). This framework consists of 19 indicators, of which 5 come from the economic dimension (green trade, environment patents, renewable energy, energy use, material footprint), 6 from the social dimension (Palma ratio, gender inequality, social security, education, life expectancy and access to basic services) and 8 from the environmental dimension (air pollution, protected areas, freshwater withdrawal, land use, ecological footprint, greenhouse gas emissions, nitrogen emissions and inclusive wealth index).

Furthermore, the GEP Measurement Framework (GEP+) divides its indicators into two

categories: one is the GEP Index, including green trade, green innovation and 11 other indicators, which are used to track progress relative to desired changes, impacting current well-being; the other is the Dashboard of Sustainability, designed to monitor the sustainability of well-being for future generations, and it is made up of 6 indicators (greenhouse gas emissions, inclusive wealth index, nitrogen emissions, land use, ecological footprint, and freshwater withdrawal). This measurement framework places more emphasis on the process rather than the performance.

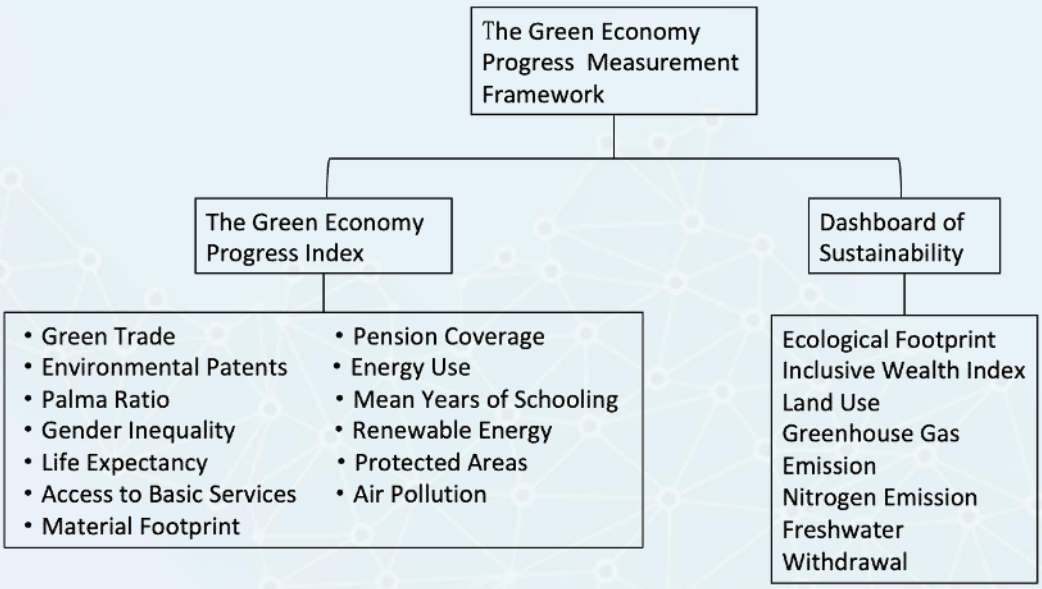

Figure 2 UNEP GEP Measurement Framework

In this report, the green development progress evaluation system was based on UNEP's GEP Measurement Framework and indicator selection principles, while using China's green development indicator system for reference. The selection of indicators took the local characteristics of Jiangsu Province and Fujian Province into account, and considered the availability of stable and open channels of data. Based on the data, this report applied the GEP Measurement Framework methodology to calculate the green development progress of Jiangsu Province and Fujian Province, as well as prefecture-level cities of the two provinces from 2015 to 2017.

Design of the Green Development Indicator System

3.1 Indicator Selection and Principles

3.1.1 Selection of the Framework for Green Development Indicators

Tables 1-3 show the indicators selected on the basis of the UNEP's GEP Measurement Framework in combination with China's green development indicator system to assess the provincial and city level of green development progress in Jiangsu Province and Fujian Province:

Table 1 Selected Green Development Indicators for Province

GEP Measurement Framework Indicators	Provincial Indicators of Green Development	Unit
Green Innovation	Companies' internal R&D expenditures	RMB 100 million
Renewable Energy	Percentage of renewable energy supply[2]	%
Energy Use	Energy consumption per unit of GDP	Tons/RMB 10,000
Income	Per capita disposable income of urban residents	RMB yuan
	Per capita disposable income of rural residents	RMB yuan
Palma Ratio	Annual disposable income of a rural resident to that of an urban resident[3]	/
Access to Basic Services	Environmentally sound treatment rate of household waste	%
	Buses per 10,000 people	/
	Centralized treatment rate of domestic sewage in urban areas	%
Education	Mean years of schooling[4]	Years

[2] Calculated based on the ratio of electricity generated by power plants using renewable energy (nuclear, hydro, wind, photovoltaic, etc.) in a region to total electricity generated.
[3] Measured by dividing per capita disposable income in rural areas by that in urban areas.
[4] Illiteracy or very little ability to read and write is counted as 0 years, enrollment of primary education as six years, enrollment of junior and senior high schools as nine and 12 years, respectively, and enrollment of universities and

Life Expectancy	Mortality	%
Social Security	Pension coverage[5]	%
	Medical insurance coverage[6]	%
	Unemployment insurance coverage[7]	%
Air Pollution	Annual average concentration of Fine Particulate Matter (PM2.5)	Micrograms per cubic meter
	Sulfur dioxide (SO_2) emissions	10,000 tons
Greenhouse Gas Emissions	Carbon dioxide (CO_2) emissions per unit of GDP	Kilograms/yuan
Nitrogen Emissions	Chemical Oxygen Demand (COD) emissions	10,000 tons
	Ammonia nitrogen emissions	10,000 tons
Freshwater Withdrawal	Freshwater consumption per unit of GDP	Cubic meters/RMB 10,000
	Per capita freshwater consumption	Cubic meters
Land Use	Percentage of sown area	%
Ecological Footprint	Per capita ecological footprint[8]	10,000 tons of carbon/10,000 people

Table 2 Selected Indicators for Green Development Evaluation of Cities in Jiangsu Province

GEP Measurement Framework Indicators	Indicator for Cities in Jiangsu Province	Unit
Green Innovation	R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more from their main business operations	RMB 10,000
Energy Use	Energy consumption per unit of GDP	Tons/RMB 10,000
Income	Per capita disposable income of urban residents	RMB yuan
	Per capita disposable income of rural residents	RMB yuan

higher-learning institutes as 16 years. Overall years of schooling are calculated with the number of people under statistics as the weight.

[5] Measured at the percentage of people covered by the pension insurance program in the total resident population.

[6] Measured at the percentage of people covered by the medical insurance program in the total resident population.

[7] Measured at the percentage of people covered by the unemployment insurance program in the total resident population.

[8] Statistics are made by type of land in use according to the Living Planet Report China. WWF. (2015)

Palma Ratio	Annual disposable income of a rural resident to that of an urban resident	/
Access to Basic Services	Environmentally sound treatment rate of household waste	%
	Buses per 10,000 people	/
	Centralized treatment rate of domestic sewage in urban areas	%
Education	Mean years of schooling	Years
Life Expectancy	Mortality	%
Social Security	Pension coverage	%
	Medical insurance coverage	%
	Unemployment insurance coverage	%
Air Pollution	Annual average concentration of Fine Particulate Matter (PM2.5)	Micrograms per cubic meter
	Sulfur dioxide (SO_2) emissions	10,000 tons
Greenhouse Gas Emissions	Carbon dioxide (CO_2) emissions per unit of GDP	Kilograms/yuan
Nitrogen Emissions	Chemical Oxygen Demand (COD) emissions	10,000 tons
	Ammonia nitrogen emissions	Tons
Freshwater Withdrawal	Freshwater consumption per unit of GDP	Cubic meters/RMB 10,000
	Per capita freshwater consumption	Cubic meters
Land Use	Percentage of sown area	%
Ecological Footprint	Per capita ecological footprint	10,000 tons of carbon/10,000 people

Table 3 Selected Indicators for Green Development Evaluation of Cities in Fujian Province

GEP Measurement Framework Indicators	Indicator for Cities in Fujian Province	Unit
Green Innovation	Companies' internal R&D expenditures	RMB 10,000
Energy Use	Energy consumption per unit of GDP	Tons/RMB 10,000

Income	Per capita disposable income of urban residents	RMB yuan
Income **Palma Ratio**	Per capita disposable income of rural residents	RMB yuan
	Annual disposable income of a rural resident to that of an urban resident	/
Access to Basic Services	Environmentally sound treatment rate of household waste	%
Access to Basic Services **Life Expectancy**	Buses per 10,000 people	/
	Centralized treatment rate of domestic sewage in urban areas	%
	Mortality	%
Social Security	Pension coverage	%
Life Expectancy	Medical insurance coverage	%
Social Security **Air Pollution**	Unemployment insurance coverage	%
	Annual average concentration of Fine Particulate Matter (PM2.5)	Micrograms per cubic meter
	Sulfur dioxide (SO_2) emissions	10,000 tons
Greenhouse Gas Emissions **Nitrogen Emissions**	Carbon dioxide (CO_2) emissions per unit of GDP	Kilograms/yuan
	Chemical Oxygen Demand (COD) emissions	10,000 tons
Greenhouse Gas Emissions	Ammonia nitrogen emissions	Tons
Freshwater Withdrawal	Freshwater consumption per unit of GDP	Cubic meters/RMB 10,000
	Per capita freshwater consumption	Cubic meters
Land Use	Percentage of cultivated area	%

The selection of indicators at the levels of province and city was based on UNEP's GEP Measurement Framework and also factored in the green development indicator system of China. However, some of the indicators for Jiangsu and Fujian Provinces, as well as the two provinces' cities, were adjusted or replaced to maintain the consistency of indicators used for the provincial level. On the city level, some indicators were substituted or dropped due to differences in statistical methods taken in statistical yearbooks of different cities and/or unavailability of data.

Data used in the assessment were mainly from statistical yearbooks. In view of the differences in some statistical indicators and methods in the statistical yearbooks of the two provinces, single indicators in the indicator framework were adjusted as follows:

(1) Due to the lack of data in Fujian, the provincial indicator "R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more from their main business operations" (denoting green innovation) was taken place by the indicator "companies' internal R&D expenditures", available in the statistical yearbooks of both Jiangsu and Fujian. The indicator for cities of Fujian Province was the same as that for the province, i.e. "companies' internal R&D expenditures", but the indicator for cities of Jiangsu Province remains "R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more from their main business operations".

(2) Due to the lack data in Jiangsu, the indicator for cities "percentage of crop acreage" (denoting land use) was replaced by the indicator "percentage of sown area", available in the statistical yearbooks of the two provinces.

(3) The indicators "ecological footprint" and "education" were deleted from the indicator framework for the cities in Fujian Province due to the inaccessibility of relevant data.

In addition, some indicators gauged by the decrease in or reduction of value show instability and cannot be compared with target values at the level of cities, leading to extreme values. Therefore, these indicators were replaced by their absolute values, including GDP per unit of energy use, sulfur dioxide (SO_2) emissions, Chemical Oxygen Demand (COD) emissions, ammonia nitrogen emissions, per capita freshwater consumption, freshwater consumption per unit of GDP, and Carbon dioxide (CO_2) emissions per unit of GDP.

3.1.2 Selection Principles

The design of the indicator system should follow four principles:

(1) Systematic: The indicator system should cover all the perspectives of the transition towards green development.

(2) Targeted: The indicators should be directly related to the assessment targets of the transition towards green development; the most relevant and representative indicators should be prioritised.

(3) Scientific: The indicator system should be built to reflect the state of development in a comprehensive and targeted manner, and to evaluate the progress and inform development policy. The assessment and measurement methodology should be scientific.

(4) Available: The indicators should be clear, specific and measurable and easily applied. Quantitative indicators should be accessible or calculable. For example, data should mainly be accessed from sources such as China Statistical Yearbooks and annual reports published by ministries and commissions, provincial/municipal governments and industry associations, or accurate data that can be continuously obtained from city/county government departments.

3.2 Green Development Index Measurement Methodology

3.2.1 Positive and Negative Indicators

Positive indicators: - an increase in the value of these indicators signals progress in green development. The bigger the indicator values are, the higher the evaluation scores.

Negative indicators: - a decrease in the value of these indicators signals progress in green development. The smaller the indicator values are, the higher the evaluation scores.

Table 4 below depicts the categorization of “Positive” and “Negative” indicators.

Table 4 Positive and Negative Indicators

Companies' R&D expenditures	Positive	Unemployment insurance coverage	Positive
R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more from their main business operations	Positive	Percentage of sown area	Positive
Percentage of renewable energy supply	Positive	Energy consumption per unit of GDP	Negative
Annual disposable income of a rural resident to that of an urban resident	Positive	Mortality	Negative
Per capita disposable income of urban residents	Positive	Annual average concentration of Fine Particulate Matter (PM2.5)	Negative
Per capita disposable income of rural residents	Positive	Sulfur dioxide (SO_2) emissions	Negative
Environmentally sound treatment rate of household waste	Positive	Carbon dioxide (CO_2) emissions per unit of GDP	Negative
Buses per 10,000 people	Positive	Chemical Oxygen Demand (COD) emissions	Negative
Centralized treatment rate of domestic sewage in urban areas	Positive	Ammonia nitrogen emissions	Negative
Mean years of schooling	Positive	Per capita freshwater consumption	Negative
Pension coverage	Positive	Freshwater consumption per unit of GDP	Negative
Medical insurance coverage	Positive	Per capita ecological footprint	Negative

3.2.2 Expected and Target Values

The provincial indicator system consists of two kinds of indicator values for assessing green development progress in a year—expected and target values. 'Expected value' for a year refers to the value predicted based on the average growth rate for the previous three years. If certain positive indicators first decrease then increase or first increase then decrease in the three previous years, linear regression will be applied. If the overall trend is increasing, the year's expected values are calculated via linear regression; if the overall trend is decreasing, the maximum values in the previous three years are taken as the expected values. The same method applies to negative indicators.

'Target value' refers to the development targets set by the central government or provincial governments in relevant policies or plans. Provincial targets take priority. If an indicator has no provincial target, the national target will be selected. However, if the target is inapplicable or unavailable at both the provincial and national levels, or the target value is lower than the expected value, the expected value will be selected.

In this report, the indicator system for cities consists of target values only. The maximum indicator values among the cities in one province serve as the target values of positive indicators, while the minimum values are chosen as the target values of negative indicators.

3.2.3 Progress in the Single Indicator Case

Among positive indicators,

Single indicator progress $p = \frac{y_1 - y_0}{y_* - y_0}$. Where, y1, y0 and y* stand for actual value, initial value and target value, respectively.

Among negative indicators,

Single indicator progress $p = \frac{y_0 - y_1}{y_0 - y_*}$. Where, y1, y0 and y* stand for actual value, initial value and target value, respectively.

Taking the year 2017 as an example:
Progress of single indicator (scores) = (indicator value in 2017 - indicator value in 2016) / (target value in 2017 - indicator value in 2016).

Under the unlikely scenario that the indicator value in 2017 equals that in 2016, the progress score will be 0, indicating it did not make any progress. But when the target value for 2017 equals the indicator value in 2016, it indicates that the target was reached ahead of schedule, and the progress will be 1.

3.2.4 Weight

'Weight' for a progress of single indicator is the ratio between the initial value of the

previous year and the target value of the year assessed. It represents the gap between the current actual value and target. The larger the gap, and the more difficult it is to achieve the target, the more weight it has.

Among positive indicators, weight $\pi = \frac{y*}{y_0}$. Where, y* is the target value, and y_0 is the initial value.

Among negative indicators, weight $\pi = \frac{y_0}{y*}$. Where, y* is the target value, and y_0 is the initial value.

Taking the year 2017 as an example:
Among positive indicators, weight = target value for 2017 / initial value in 2016;
Among negative indicators, weight = initial value in 2016 / target value for 2017.

3.2.5 GEP

GEP of a single indicator = single indicator progress * weight; Total GEP = weighted average of all the single indicators' GEP. This methodology also applies to the calculations of the Framework for Green Development Indicators, GEP Measurement Framework (GEP+), the GEP index and the Dashboard of Sustainability.

$$GEP = \frac{\sum \pi \cdot p}{\sum \pi}$$ Where, p stands for the progress of single indicator, and π is the weight.

2015-2017 Green Development Evaluation Results

The progress scores have two critical values, i.e. 0 and 1. A progress score above 1 indicates exceeding the target, a score equal to 1 means meeting the target, and a score ranging between 0 and 1 denotes missing the target, 0 represents remaining the same, and a score below 0 denotes a regress. The critical points apply to the analysis of both total GEP scores and a single indicator's GEP score.

4.1 Green Development Scores of Jiangsu Province in 2015-2017

Figure 3 illustrates the scores of Jiangsu Province in Green Economy, Sustainability and GEP+ during 2015-2017. It shows that the province's score in both Green Economy and GEP+ framework was higher than 1 in 2015 and 2017, exceeding the targets; but it did not fulfil the targets in Green Economy, Sustainability and GEP+ in 2016 in spite of progress. 2016 was the only year with a Sustainability score surpassing that in Green Economy and GEP+. Furthermore, in the evaluation period, the scores for the Sustainability in Jiangsu Province posted decrease after increase – the exact opposite to the trends for the Green Economy and GEP+ frameworks.

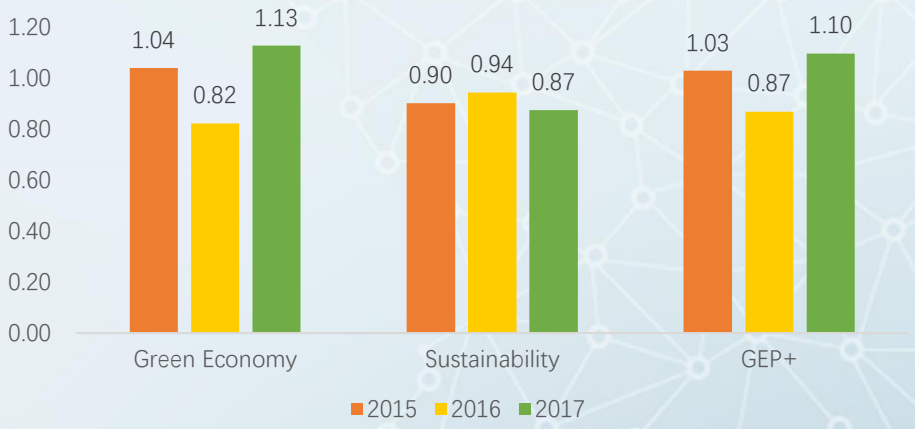

Figure 3 Scores of Jiangsu Province under the Indicator Framework in 2015-2017

Figure 4 shows single indicators scores of Jiangsu Province in 2017. All indicators except the "land use" indicator (a negative score pointing to regress) scored positively.

Moreover, the province scored higher than 1 in green innovation, renewable energy supply, energy use, income, social security, greenhouse gas emissions and freshwater withdrawal, reaching the targets early.

Figure 4 Single Indicator Scores of Jiangsu Province in 2017

Figure 5 below displays the contributions of Jiangsu Province's single indicator scores in 2017 for GEP+, in which the indicator "renewable energy supply" made the largest contribution (22%). According to Figure 6, below, the percentage of renewable energy supply in Jiangsu Province trended higher year after year. The growth in 2017 reached to 8.2%. Based on the target that "renewable energy supply will take up a share of 16% in China in 2020", proposed in the Medium-term Renewable Energy Development Plan of the National Development and Reform Commission, renewable energy supply in Jiangsu Province still boasts great potential.

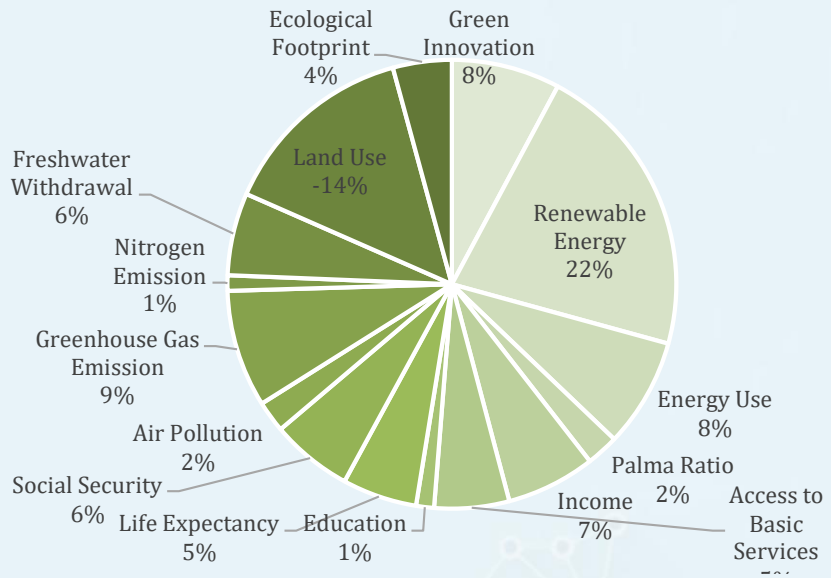

Figure 5 Contributions of Jiangsu Province's Single Indicator Scores in 2017 to GEP+

Figure 6 Percentages of Renewable Energy Supply in Jiangsu Province in 2011-2017

4.2 Green Development Scores of Fujian Province in 2015-2017

Figure 7 below shows green development evaluation results for Fujian Province in 2015-2017. The province featured a relatively high level of Green Economy progress

in the evaluation period, with the score in all the three years exceeding 1 point, outperforming the targets. The Sustainability progress improved quickly in 2016, with the score increasing from 0.43 in 2015 to 1.08 in 2016, marking a shift from improvement to exceeding the target. The province's GEP+ scores in 2015-2017 were all above 1 point, exceeding the target. In general, Fujian Province maintained strong momentum in pursuing green development in the three-year period.

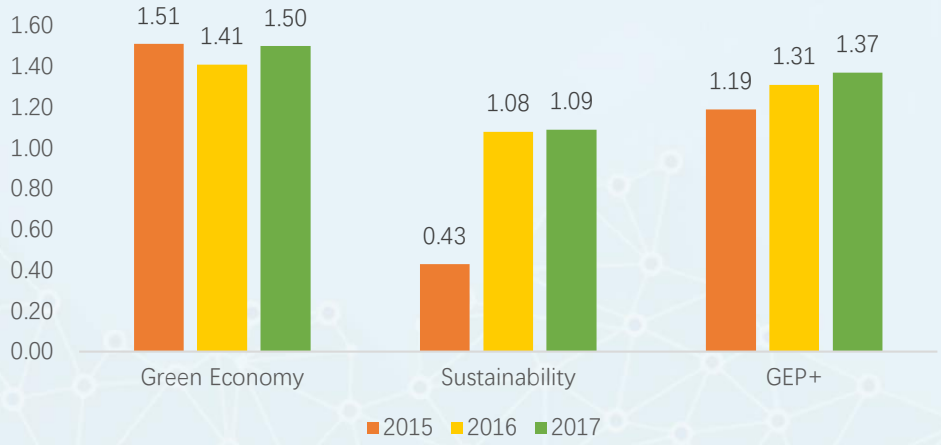

Figure 7 Scores of Fujian Province under the Indicator Framework in 2015-2017

Figure 8 below displays a horizontal comparison of the scores in 15 provincial single indicators. From 2015 to 2017, single indicators such as Green Innovation, Palma Ratio, Social Security, Freshwater Withdrawal and Land Use scored notably higher. Single indicators including Access to Basic Services and Ecological Footprint remained roughly the same, and those such as Renewable Energy, Energy Use, Air Pollution and Greenhouse Gas Emissions scored sharply lower. Single indicators which turned from negative to positive included Life Expectancy, Freshwater Withdrawal and Land Use.

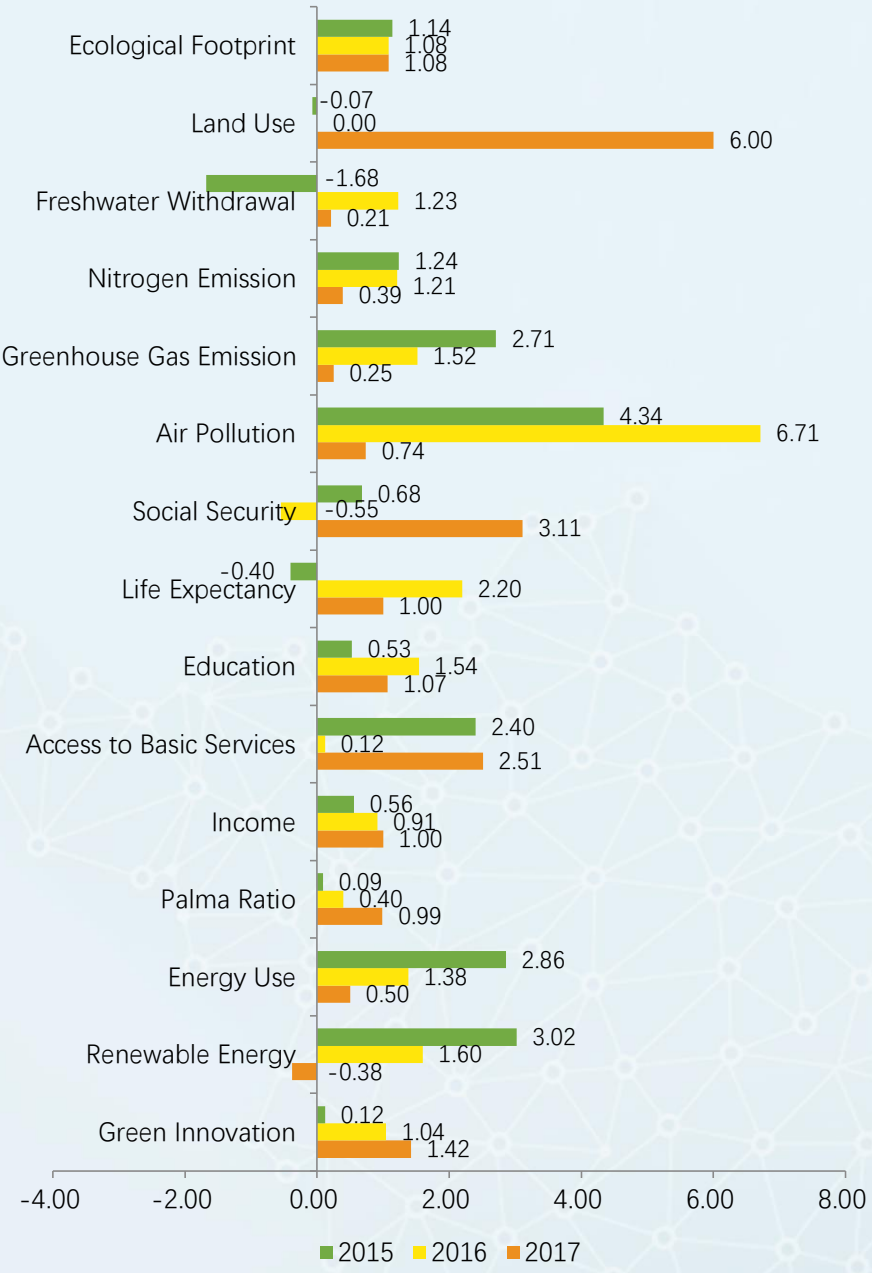

Figure 8 Single Indicator Scores of Fujian Province in 2015-2017

Fujian Province continued to see a rapid growth in R&D Expenditures of Industrial Enterprises with annual revenue of RMB 20 million or more from their main business operations. This nearly tripled from RMB 15.44 billion in 2010 to RMB 44.88 billion in 2017 (see Figure 9), mirroring the fact that local large enterprises placed a high premium on R&D inputs. Furthermore, the whole province's R&D expenditures took up an increasing share in GDP. But the share was still below the target of the 13th Five-year Plan and the country's average.

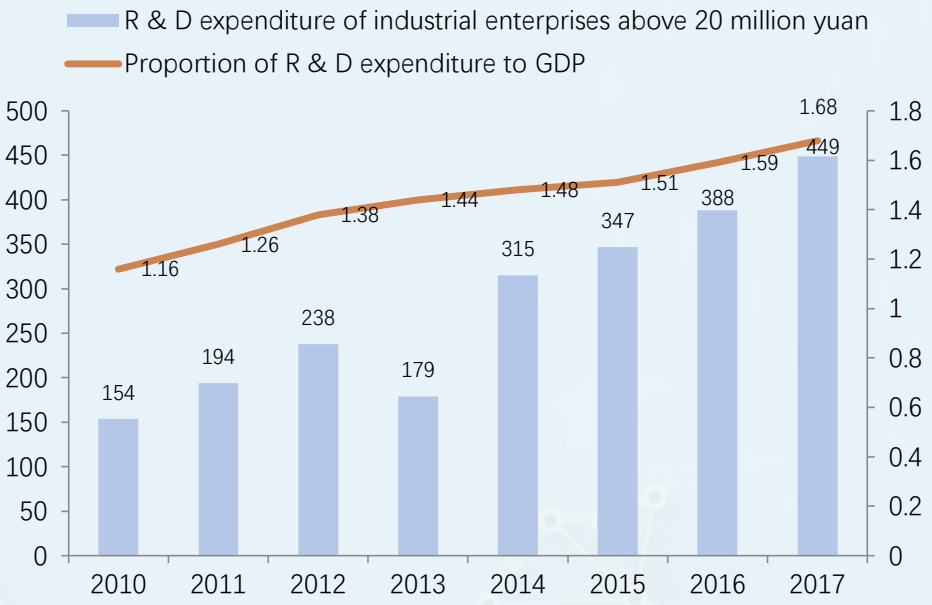

Figure 9 Changes of "Green Innovation" in Fujian Province during 2010-2017

Figure 10 shows a stably decreasing trend in the scores for Fujian Province in Greenhouse Gas Emissions and Ecological Footprint during the evaluation period. It also highlights the province's notable achievements in carbon emissions control. GDP per unit of carbon dioxide (CO_2) emissions reduced faster than the scheduled reduction of carbon emissions in the 13th Five-year Plan period. Per capita carbon dioxide (CO_2) emissions dropped by 5.3% from 55.47 tons per 10,000 people in 2010 to 52.51 tons per 10,000 people in 2017. The decline was less than that of carbon emissions intensity.

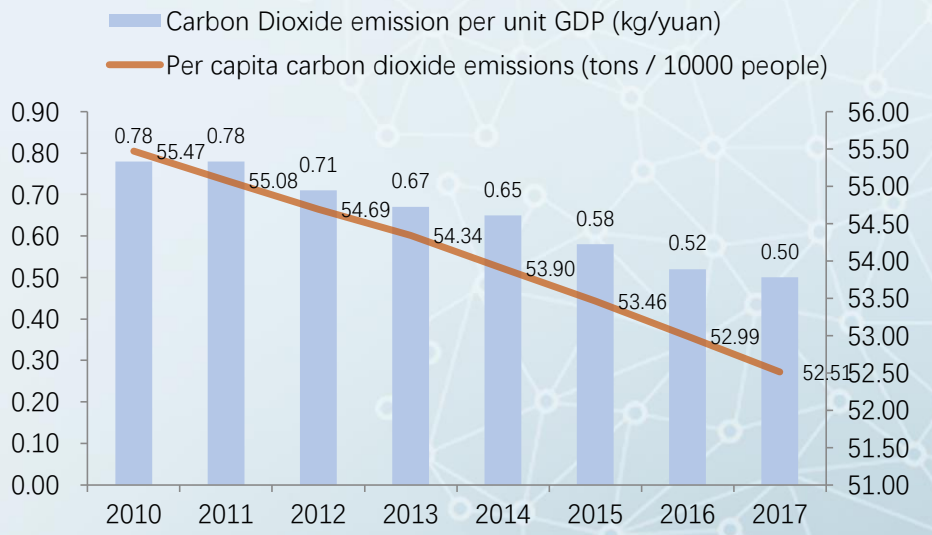

Figure 10 Changes of "Greenhouse Gas Emissions" in Fujian Province during 2010-2017

As shown in Figures 11 and 12, the contributions of different indicators to green development can be compared according to the weight of each indicator's score in GEP+. In 2015, Air Pollution contributed the most at 25%, followed by Access to Basic Services (21%). The two indicators contributed nearly half to green economy progress of Fujian Province. Three indicators - Renewable Energy Supply, Energy Use and Greenhouse Gas Emissions - also made an important contribution to boosting the province's green development. In 2017, social security became the largest contributor (27%) to green economy progress in Fujian Province, followed by Access to Basic Services (22%) and Land Use (17%).

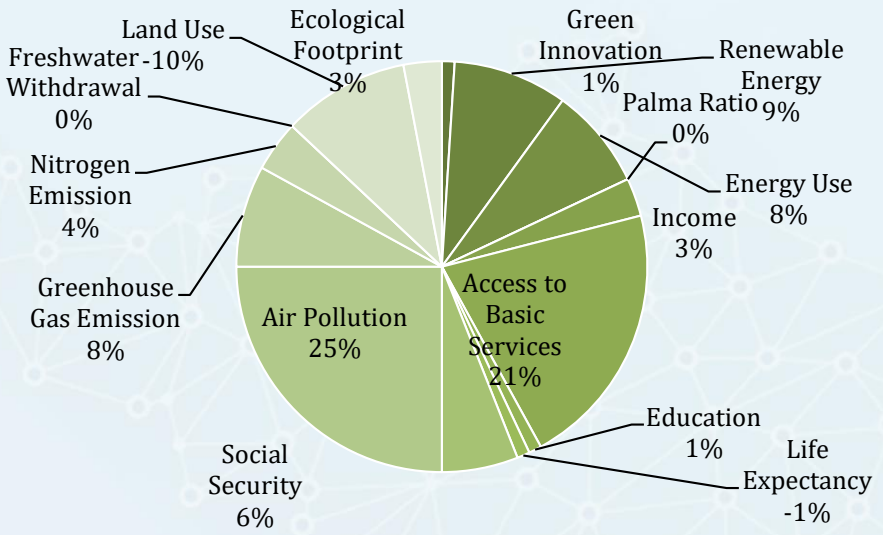

Figure 11 Contributions of Fujian Province's Single Indicator Scores in 2015 to GEP+

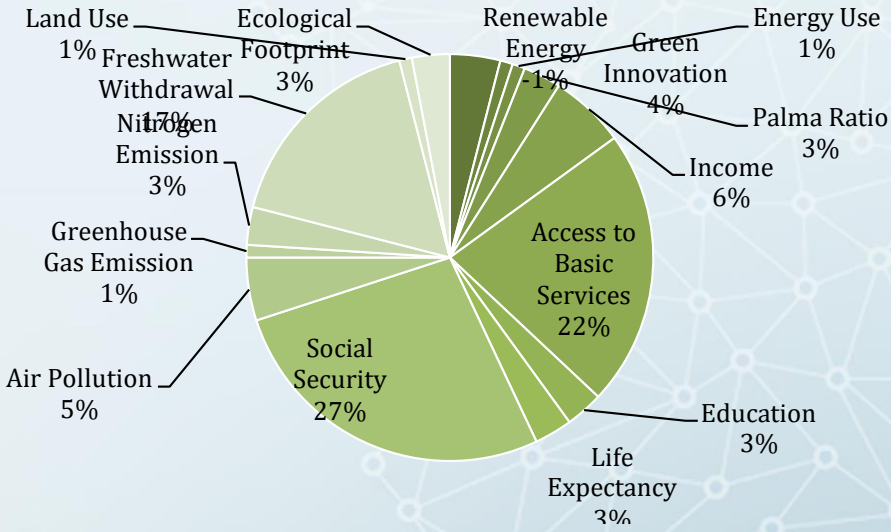

Figure 12 Contributions of Fujian Province's Single Indicator Scores in 2017 to GEP+

4.3 Green Development Scores of Cities in Jiangsu Province in 2015-2017

The scores of 13 cities in Jiangsu Province in 2015-2017 were all positive, which denotes progress in green economy. In particular, Suzhou City achieved a score above 1 point in 2016-2017 and topped the whole province with the highest green economy scores in the evaluation period. Nanjing, Wuxi, Xuzhou, Lianyungang and Zhenjiang continued to raise their Green Economy scores at an increasing rate for three years; Nantong, Huaian, Yancheng, Yangzhou and Taizhou all progressed relatively more in 2016.

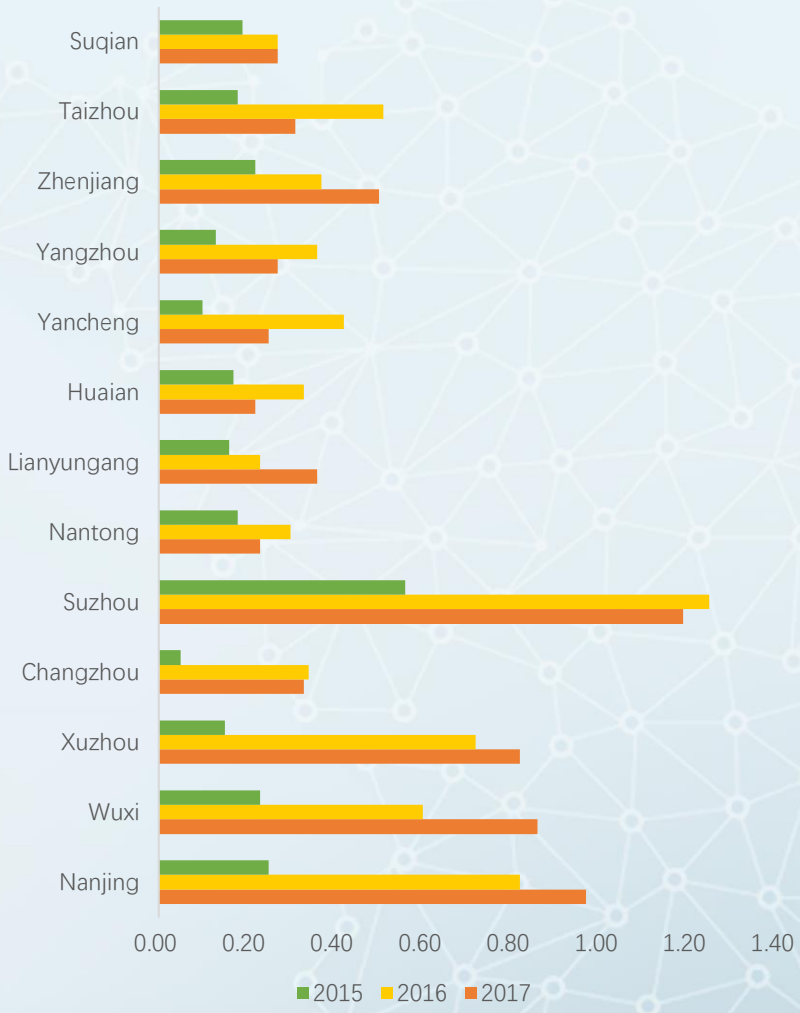

Figure 13 Green Economy Scores of 13 Prefecture-level Cities in Jiangsu Province under the Indicator Framework in 2015-2017

Figure 14 below shows the Sustainability scores of Jiangsu Province's 13 prefecture-level cities in 2015-2017. Nanjing, Wuxi, Xuzhou, Suzhou, Yancheng, Zhenjiang, Taizhou and Suqian scored positive in all three years, but their progress differed. Specifically, Huaian scored more than 1 point in 2015, Suzhou scored higher than 1 in 2016 and 2017, and Xuzhou and Lianyungang both scored over 1 point in 2017. Changzhou, Nantong, Lianyungang, Huaian and Yangzhou scored negatively in 2015, and Nantong posted the largest regress with a score of -0.23. The score for Huaian changed to -0.17 in 2017 after experiencing a large decline in 2015-2016. The scores for Xuzhou, Wuxi and Zhenjiang in 2015 and 2017 were higher than for those in 2016, and they made notably faster progress in 2017. Conversely, Nanjing, Suzhou, Yancheng, Yangzhou and Taizhou's Sustainability scores were highest in 2016.

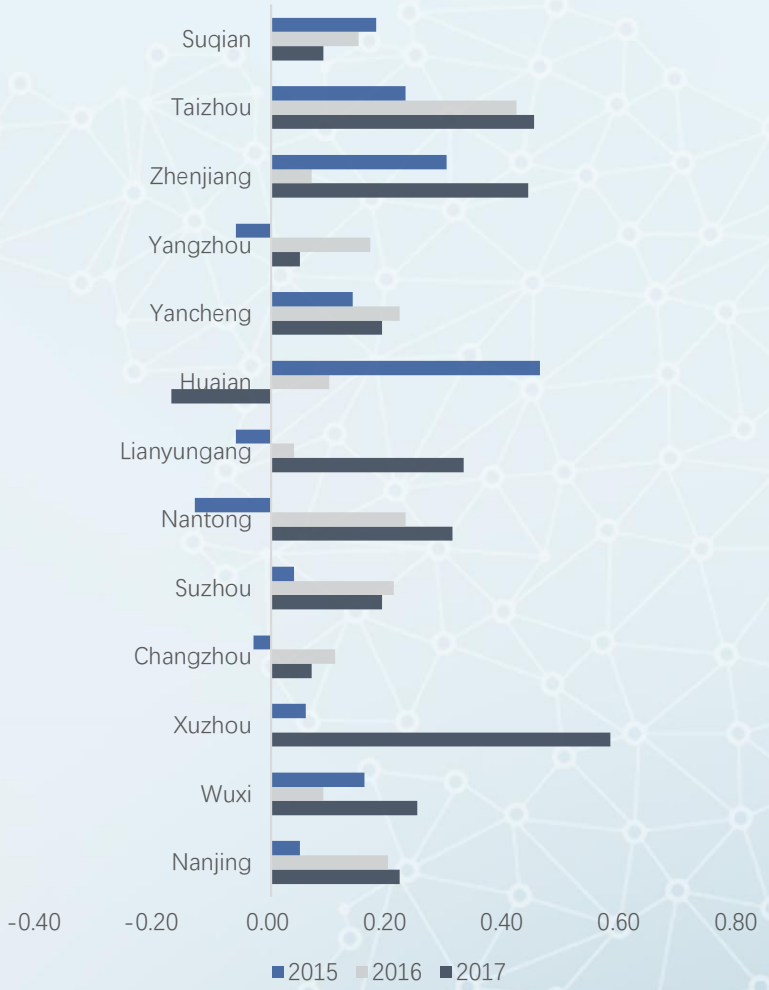

Figure 14 Sustainability Scores of 13 Prefecture-level Cities in Jiangsu Province under the Indicator Framework in 2015-2017

The GEP+ scores for the 13 prefecture-level cities in Jiangsu Province are depicted in

Figure 15, below. Except Changzhou, which regressed in 2015, all the other 12 cities achieved positive scores in the evaluation period, in spite of varied progresses. The overall trend of some cities' GEP+ scores is similar to that of the GEP Index. Wuxi, Xuzhou, Changzhou, Lianyungang and Zhenjiang scored increasingly higher in GEP+ for three years, and they also progressed increasingly rapidly; Nanjing, Suzhou, Nantong, Yancheng, Yangzhou, Taizhou and Suqian scored higher in 2016 than the other two years; Huaian's progress slowed from 2015 to 2017. Suzhou scored more than 1 point in 2016-2017, the highest in the province, and Xuzhou scored over 1 point in 2017.

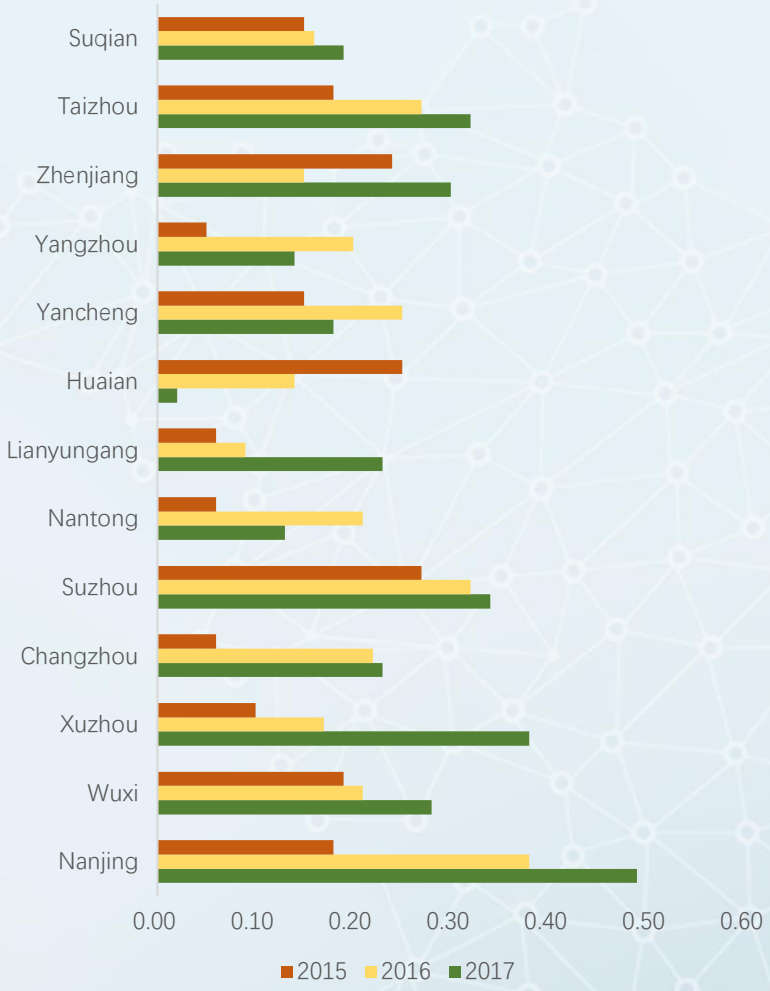

Figure 15 GEP+ Scores of 13 Prefecture-level Cities in Jiangsu Province under the Indicator Framework in 2015-2017

The evaluation results of prefecture-level cities in Jiangsu Province is covered by taking single indicator scores for Nanjing City for example. According to Figure 16, Nanjing made progress in most indicators by achieving positive scores during 2015 to 2017, but

the progresses displayed stark differences. Some cities scored over 1 point in single indicators. Among the indicators for which Nanjing recorded negative scores, the Percentage of sown area and Per capita freshwater consumption regressed in three years. The largest regress occurred in 2016. Pension coverage and R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more from their main business operations scored negatively in 2015, then positively in 2016. The indicator Buses per 10,000 people" turned from positive scores to a negative score in 2017, indicating a regress.

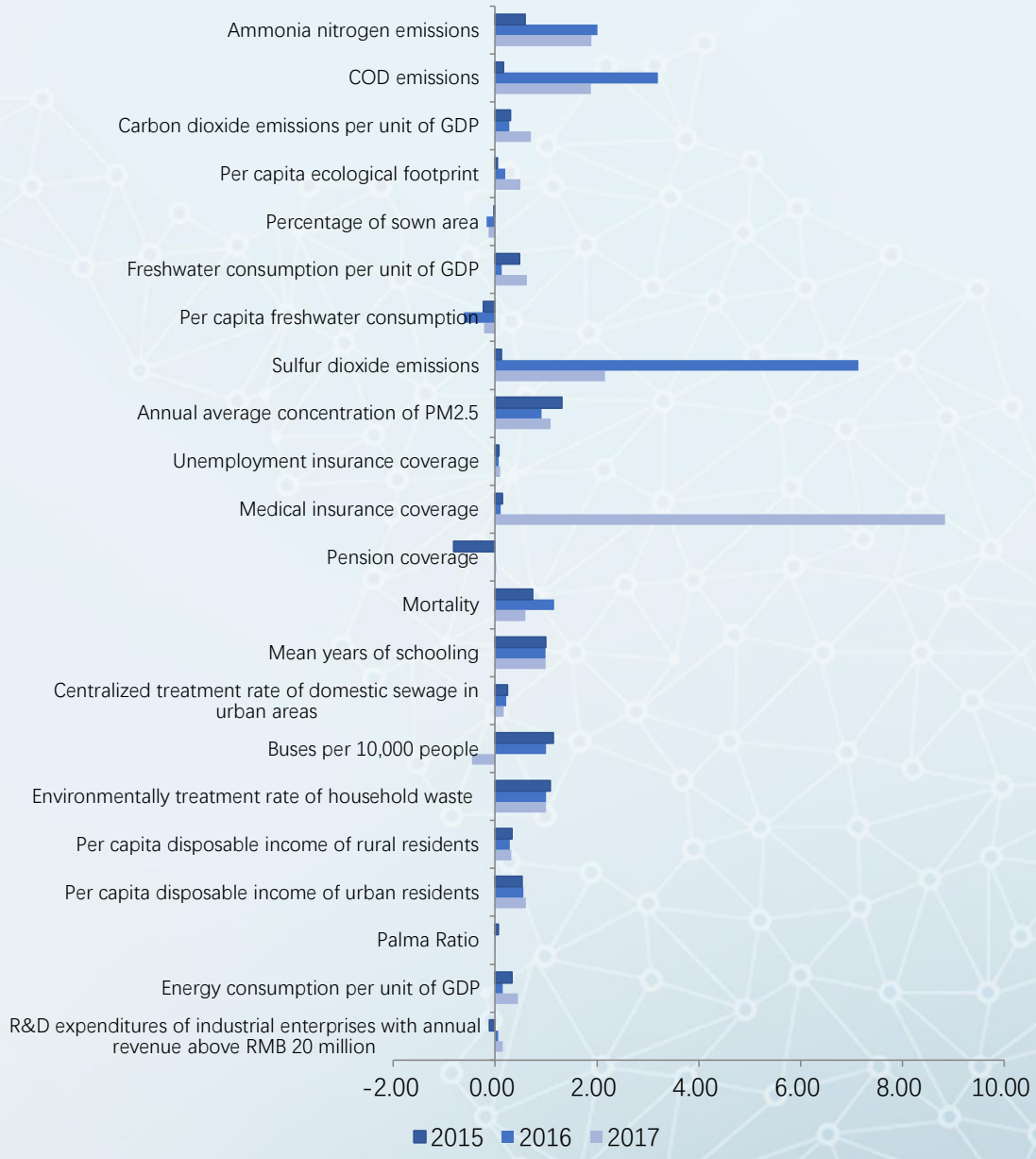

Figure 16 Scores of Nanjing City in Single Indicators during 2015-2017

It is noteworthy that the majority of cities in Jiangsu Province made strong progress in Sulfur dioxide (SO_2) emissions, Chemical Oxygen Demand (COD) emissions and Ammonia nitrogen emissions in 2016. For example, Nanjing scored much higher in Sulfur dioxide (SO_2) emissions, Chemical Oxygen Demand (COD) emissions and Ammonia nitrogen emissions in 2016 than in 2015, demonstrating it relatively fast progress. In addition, Nanjing's scores in both 2016 and 2017 were over 1 point, outstripping the targets. In particular, its score in Sulfur dioxide (SO_2) emissions in 2016 exceeded figures for the other two years.

Annual average concentration of Fine Particulate Matter (PM2.5) represents an indicator for the measure of Air Pollution in the GEP Index. Figure 17 shows that all the 13 prefecture-level cities in Jiangsu Province achieved over 1 point in this indicator in 2015, and all of them exceeded the targets. In 2016, only Yancheng, Nantong and Suzhou remained the same; Zhenjiang, Yancheng and Xuzhou recorded negative scores in 2017, registering a higher Annual average concentration of PM2.5 over the prior year, marking a regress.

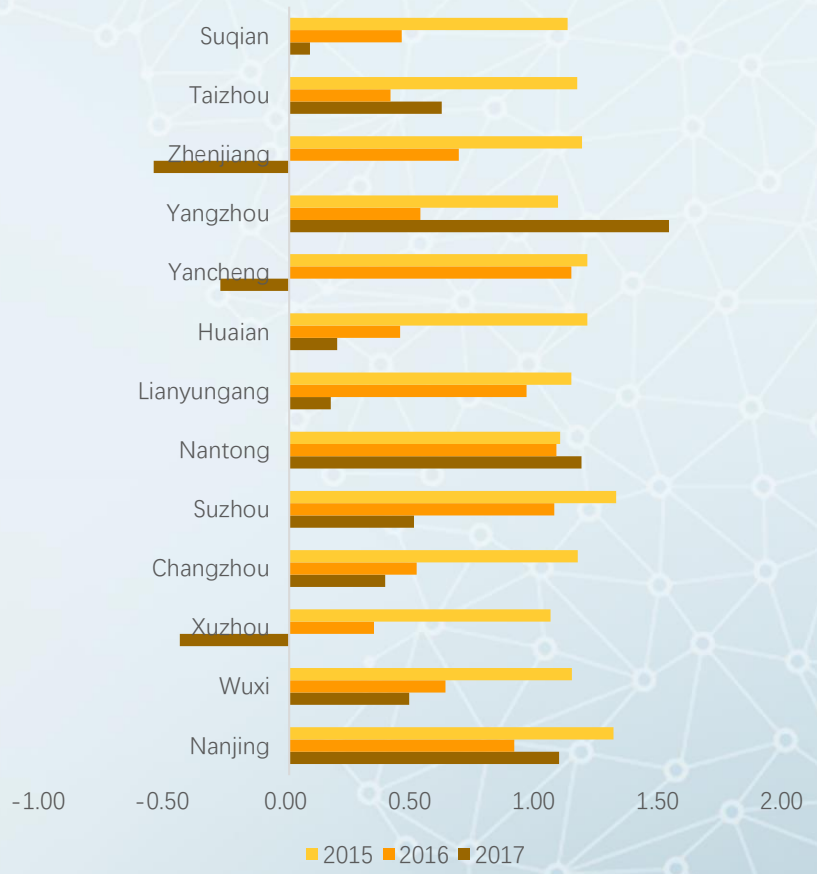

Figure 17 Scores of 13 Prefecture-level Cities in Jiangsu Province in Annual Average Concentrations of PM2.5 in 2015-2017

According to the GEP Measurement Framework of the UNEP, Ecological Footprint is one of the indicators that can manifest sustainability. As shown in Figure 18 below, Lianyungang and Taizhou recorded a negative score in Ecological Footprint in 2015, but this turned positive in 2016 and increased it further in 2017. The score of Suqian fell into negative territory in 2016. Wuxi was the only city with a score in Ecological Footprint surpassing 1 point, and it remained over 1 for three years, proving the city performed well and outstripped the targets throughout the evaluation period.

Figure 18 Scores of 13 Prefecture-level Cities in Jiangsu Province in Per Capita Ecological Footprint in 2015-2017

4.4 Green Development Scores of Cities in Fujian Province in 2015-2017

Figure 19 shows the GEP Index of nine prefecture-level cities in Fujian Province in 2015-2017. Nine cities presented an overall increasing trend for Green Economy scores in the three years, but all their scores were less than 1, i.e. failing to meet the target. Prefecture GEP Index scores varied greatly - Xiamen achieved the highest scores, and

was far ahead of other cities. In terms of progress, all the prefecture-level cities registered higher GEP in 2016 than in 2015.

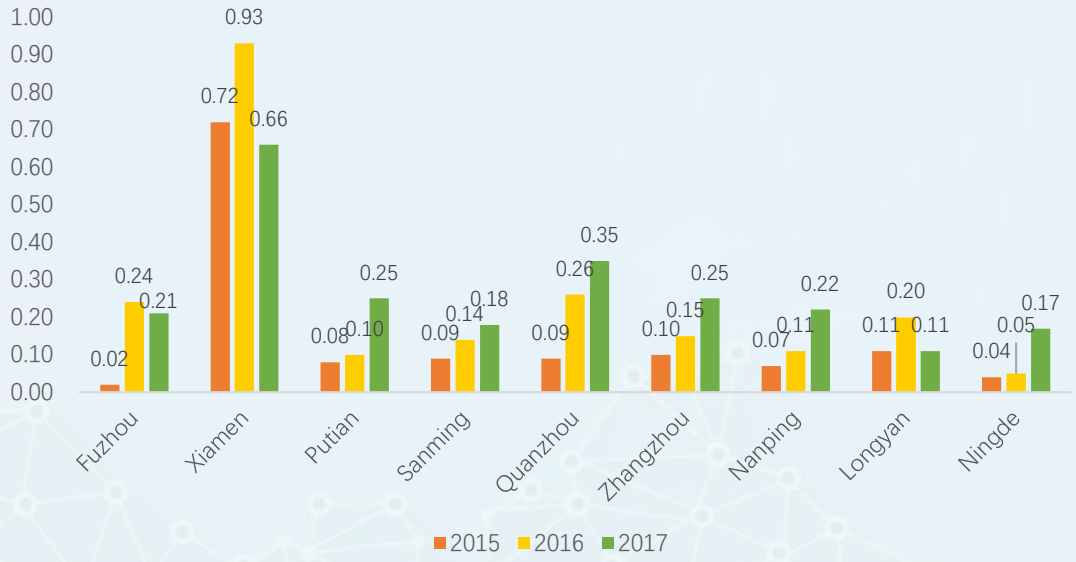

Figure 19 Green Economy Scores of 9 Prefecture-level Cities in Fujian Province in 2015-2017

Figure 20 shows the Sustainability scores for cities in Fujian between 2015 and 2017. An overall downward trend is shown for that period. However, there is variation among cities. Xiamen ranked first in both 2015 and 2016, while all cities, excluding Xiamen and Sanming, increased their scores in 2016. The increase in scores then slowed down across Fujian in 2017, and even became negative in some cities.

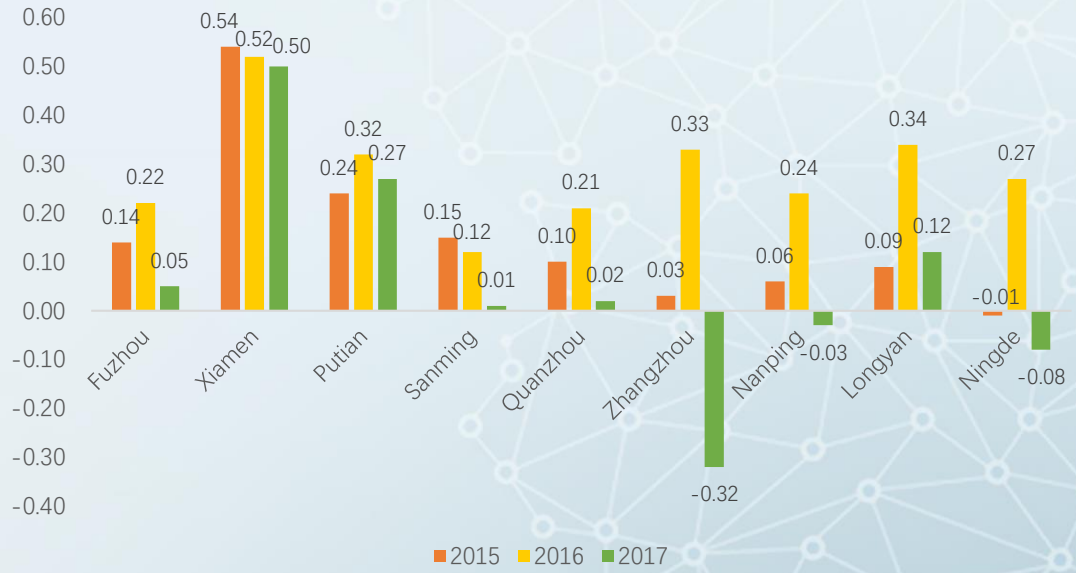

Figure 20 Sustainability Scores of 9 Prefecture-level Cities in Fujian Province in 2015-2017

Figure 21 below presents the GEP+ scores for 9 cities in Fujian between 2015 and 2017. There is a volatile rise in GEP+ scores across Fujian during the period, and no city scored over 1. Specifically, all cities excluding Xiamen scored less than 0.3. All cities have made progress, but there remains large room for improvement before meeting the target. Xiamen remains the highest performer in GEP+, following Green Economy and Sustainability evaluation.

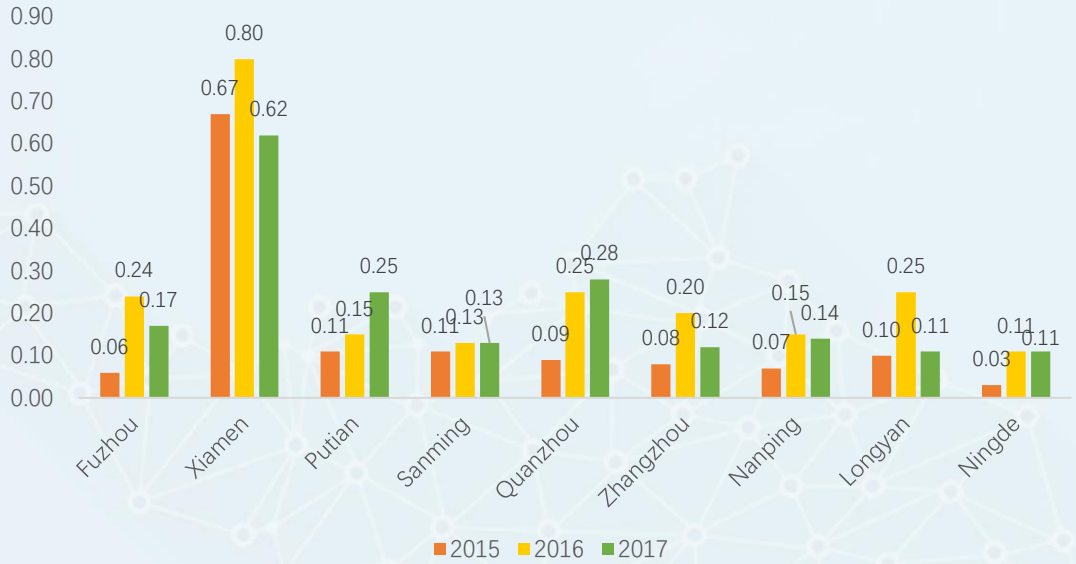

Figure 21 GEP+ Scores of 9 Prefecture-level Cities in Fujian Province in 2015-2017

4.5 Evaluation Method Illustrated by Jiangsu Ecological Footprint in 2017

The Ecological Footprint of Jiangsu Province is calculated with available open data collected from the statistical yearbooks of China and Jiangsu Province, by Per capita ecological footprint (10,000 tonnes of carbon/10,000 people). This is based on the Living Planet Report China 2015 published by the World Wide Fund for Nature (WWF) and the net primary production (NNP) factors calculated by the Institute of Geographic Sciences and Natural Resources Research at Chinese Academy of Science.

The calculation process and method are shown as below:

Table 5 Ecological Footprint Calculations in Jiangsu Province

Land Use Type	NPP (gC/M^2)	2013	2014	2015	2016	2017	Unit
Farmland	1.29	7683.64	7678.63	7745.04	7676.93	7601.25	10,000,000 m^2
Forestland	0.61	194.3	158	154	156	156	10,000,000 m^2
Fishing ground	1.86	765.28	761.04	753.44	753.16	735.15	10,000,000 m^2
Construction land	1.71	380.9	402	418.9	429.9	442.7	10,000,000 m^2
Ecological Footprint		**12.10518**	**12.10477**	**12.20276**	**12.13441**	**12.0252**	**10,000 tonnes of carbon**

The indicator scores in 2017 were calculated through linear regression of data from 2014-2016. With an indicator weight of 1.02, the progress score is 0.77 and the GEP score is 0.79.

Discussion and Suggestion

5.1 2015-2017 Policy Suggestions for Green Development in Jiangsu Province

(1) Jiangsu Province has progressed its green development during the evaluation period (2015-2017). In 2017, Jiangsu met or even exceeded national and provincial requirements on green development as measured by GEP+ (it exceeded the target with a score of over 1 point), GEP (over 1 point), and Sustainability (close to 1 point). All this demonstrates sustained efforts of the local government to push forward green development.

(2) Rapid progress is observed in most indicators during the evaluation period. The indicator Renewable resource supply is a top scorer, which is attributed to the attention and support given by local cities to renewable resources. In recent years, cities like Suzhou, Wuxi, Xuzhou, Changzhou, Yancheng, Zhenjiang, Yangzhou, Nantong, and Lianyungang have been transforming their energy mix, promoting energy efficient projects and alternative clean energy sources, and exploring new ways to comprehensively utilize new resources. All these measures aim to accelerate the application of clean energy. Some fast-improving indicators include Green Innovation", Energy Use, Income, Social Security, Greenhouse Gas Emissions, and Freshwater Withdrawal. These areas were mentioned in the *Notice of Jiangsu Province on the 13th Five-year Plan Outline* issued in 2016. They are expected to move upwards in the coming three years if the requirements are well implemented.

(3) The indicators Nitrogen Emissions and Air Pollution show progress but are still performing below expectations. Jiangsu Province has attached considerable importance to addressing air and water pollution, as outlined in policy documents such as the *Implementation Opinions on Deepening the Transformation of Chemical Industry in Jiangsu*, and the *Guidelines on Building Ecological Protection Pilot Area and Ecological Protection Special Area*, published by the provincial government in 2016 and 2017. The two indicators are expected to register greater progress during the next evaluation period, with a stricter grip on air and water pollution control, continuous and long-term policy support, and closer concerted efforts in environment stewardship - in particular, the prevention and treatment of air pollution.

(4) Jiangsu Province and most of its cities regressed and failed to reach the expected Land Use score. The indicator measures the area of farmland used for other purposes. With a high level of industrialization and urbanization, most cities in Jiangsu have been witnessing a shrinking farmland base over years. The *Notice of Jiangsu Provinces on the Planning of National Ecological Conservation Red Line* issued in 2018 specified requirements on land use. It is advised that Jiangsu Province and its cities meet requirements for implementing the ecological conservation red line[9], and strike a balance between the agricultural use and the commercial use of land as part of urbanization. At the same time, efforts should be intensified in improving supervision of the ecological environment and introducing more regulations to protect the ecological environment. This would help slow down the loss of farmland and improve the indicator scores in the next period.

(5) The Freshwater Withdrawal scores of some cities in Jiangsu dropped and fell short of expectations. The indicator evaluates the overall utilization of water resources in the region. Statistics show declining Freshwater Withdrawal scores for Nanjing, Wuxi, Changzhou, Suzhou, Nantong, and Lianyungang in both 2015 and 2016. The 2017 scores improved, but are still below the expected level. During the evaluation period water resource utilization efficiency received much attention. In 2015, Jiangsu Province formulated the *Regulations on Water Saving in Jiangsu Province*. In 2016, the Jiangsu Provincial Department of Ecology and Environment emphasized efficient water use in its response to the *proposal of Enhancing Water Environment Management and Building a Beautiful, Livable Jiangsu.* It is advised that all cities in Jiangsu Province carefully consider local water use efficiency and improve water-saving technology and standards. Water conservation should be promoted among industries, agriculture, and residents, so that the indicator score increases in future evaluation periods.

(6) All cities in Jiangsu Province have made progress in green development, with slight differences. Suzhou made the strongest progress. Suzhou scored the highest in the GEP Index for three consecutive years. With Sustainability and GEP+ scores over 1 point in 2016 and 2017, Suzhou has surpassed targets in green development. As the results show, an obvious increase is seen in green development growth in all cities in 2016 and 2017 when compared to 2015. Nanjing, Wuxi, Xuzhou, Suzhou, Nantong,

[9] The ecological conservation red line can be divided into ecological function baseline, environmental quality baseline and natural resource utilization upper limit. The areas included in the baseline of ecological function are prohibited use for industrial and urbanization; the baseline of environmental quality is to control and manage total pollutant discharge and environmental risk; the upper limit of natural resources use is to ensure that the application of energy, water and land resources does not exceed the maximum limit.

and Taizhou scored comparatively higher. In 2017, Wuxi, Xuzhou, Changzhou, Lianyungang, and Zhenjiang made great strides in green development as compared to 2016. Xuzhou scored over 1 point for GEP+ and surpassed its target. It is advised that green development synergy be built within the province to optimize ecological resource allocation and enhance ecological protection and pollution prevention. Greater focus should be attached to lower-than-expected indicator scores to boost green development progress at both provincial and city levels.

5.2 2015-2017 Policy Suggestions for Green Development in Fujian Province

(1) Fujian Province saw an upward trend in Green Economy performance during the evaluation period (2015-2017). The GEP+ score increased from 1.19 points in 2015 to 1.31 points in 2016, and to 1.37 points in 2017. The GEP index score increased to 1.5 points in 2017, following a decrease. The Sustainability score remained over 1 point throughout the evaluation period and improved to 1.09 points in 2017. This indicates that Fujian boasts a solid ecological foundation, favorable ecological conditions, and ongoing drive to advance green development.

(2) Indicator scores at the provincial level varied widely in the evaluation period. Among all the 15 provincial-level indicators, a significant rise between 2015 and 2017 was registered in Green Innovation, Palma Ratio, Social Security, Freshwater Withdrawal, and Land Use. Indicators such as Infrastructure Construction and Ecological Footprints remain roughly unchanged, and a clear decrease is seen in Renewable Energy, Energy Use, Air Pollution, and Greenhouse Gas Emissions. The highest score in 2017 was for Land Use, followed by Social Security and Infrastructure Construction. The lowest score was for Renewable energy supply - the only indicator with a negative score. The three biggest contributors to Fujian's green development in 2017 were Social Security, Infrastructure Construction, and Land Use, with a total contribution of nearly two thirds. For indicators with a lower score or decreasing score, Fujian should consider introducing well-targeted policies to boost the green development of emerging industries of strategic importance, such as IT, high-end equipment manufacturing, renewable energy vehicles, new materials, graphene, and biomedicine. Focus should be placed on the growing digital economy and artificial

intelligence, optimizing smart management of energy, resources, and the environment with less waste discharge. In addition, green infrastructure should be improved to support Fujian's ecosystems of green technology innovation, green finance, and green low-carbon and circular industries. These measures would help curb the declining indicator scores and see improved progress in the next evaluation period.

(3) All cities scored below 1 point for GEP and Sustainability with varied progress. Between 2015 and 2017, no cities across Fujian Province scored higher than 1 point for GEP and Sustainability. There was also considerable variation. Ranking first in both GEP and Sustainability, Xiamen scored 6 times that of Longyan and 0.82 points higher than Zhangzhou. In this light, cities in Fujian should consider taking into account their respective strengths and weaknesses and explore a distinctive path, while collaborating closer to explore further synergies and possibilities for green development. Policymakers could focus building the cross-strait industrial belt in coastal cities, while mountainous regions could explore a path of industrial development that features ecological products. In order to facilitate collaboration between the coastal and mountainous regions, a circular green industry should be fostered and expanded, and a long-acting mechanism of cooperation should be built for the two regions to work together. Regional cooperation can further optimize province-wide ecological resource allocation and close the green development gap to embrace a more coordinated path of green development with unique characteristics.

(4) A clear decrease in the Sustainability score at the city level is seen during the evaluation period. All cities increased their GEP scores in 2016 as compared to that of 2015. However, the scores of Fuzhou, Xiamen, and Longyan dropped in 2017. The Sustainability score for all cities fell significantly in 2017, and even became negative in Zhangzhou, Ningde, and Nanping. This reflects a weak foundation for green development and poor sustainability in Fujian. This indicates that Fujian must build sound systems for enhancing ecological surveillance, economic policy support, legislative guarantee, and protection capability, and for encouraging public participation. The reform in the forest property system should be further advanced. This would require greater efforts in protecting and managing Wuyishan Mountain National Park, for example, and restoring the ecological environment of the Minjiang River and Jiulong River basins. The ecological protection red lines require implementation, and enhancing the bearing capacity of green development would help support these efforts. In this way, green development in Fujian will become more sustainable if buttressed by a stronger foundation and greater support.

(5) The space for improvement should be explored for declining single indicators. In 2015, there are no single indicators exceeding the target, and those with significant increases include Energy consumption per unit of GDP, Annual average concentration of PM2.5, and Freshwater consumption per unit of GDP. In 2016, higher-than-expected indicators included SO_2 emission, COD emission, and Ammonia nitrogen emission. A striking upward trend is seen in the Environmentally sound treatment rate of household waste and Water consumption per unit of GDP. Percentage of sown area is the only score that decreased. In 2017, indicators outstripping the targets included Medical insurance coverage and SO_2 emission, and strong progress was made only in Water consumption per unit of GDP. Indicators with score decreases included Per capita freshwater consumption and Percentage of cultivated area. Fujian Province has paid much attention to declining indicators in the evaluation period, and has launched a comprehensive campaign to protect drinking water sources, and has identified and solved several environmental problems concerning large drinking water sources at the county level and above. In addition, food security is prioritized, and cultivated area is kept at a stable level. It is advised that all cities elevate water resource protection to the top of the agenda, by improving technical standards for water saving and increasing water efficiency. Farmland should be protected to guarantee a sufficient area for stable food output. With these efforts, the per capita freshwater consumption and percentage of cultivated area will likely make notable progress in the next evaluation.

5.3 Comparison with the National Green Development Indicator Systems

In December 2016, two indicator systems—the *Green Development Indicator System* and *Ecological Progress Target Assessment System*—were jointly issued by the National Development and Reform Commission (NDRC), the National Bureau of Statistics, the Ministry of Ecology and Environment, and the Organization Department of the Central Committee of China.

The *Green Development Indicator System* encompasses indicators including resource utilization, environmental stewardship, environmental quality, ecological preservation, growth quality, green living, and public satisfaction. These indicators are identified based on the obligatory targets and monitoring and evaluation indices proposed in

China's 13th Five-year Plan and the *Opinions on Accelerating the Ecological Civilization Construction*, together with data from National Health and Family Planning Commission, the Ministry of Housing and Urban-Rural Development, and the Ministry of Water Resources. Public satisfaction, a subjective survey index, is evaluated separately and not included in the calculation of composite indicator.

The GEP Measurement Framework in this report enjoys a more streamlined list of indicators as compared to the national system (as shown in Table 6).

Table 6 Comparisons between GEP Indicators and National Green Development Indicators

<table>
<tr><th colspan="2">GEP Indicators</th><th colspan="2">National Green Development Indicators</th></tr>
<tr><th>Unique Indicators</th><th colspan="2">Overlapped Indicators</th><th>Unique Indicators</th></tr>
<tr><td rowspan="8">Average years of education
Mortality rate
Pension coverage
Medical insurance coverage
Unemployment insurance coverage</td><td>R&D expenditures of industrial enterprises with annual revenue of RMB 20 million or more</td><td>Research and experimental development expenditures as a percentage of GDP</td><td rowspan="8">Total energy consumption
Reduction rate of freshwater consumption per unit of industrial added value
Effective use coefficient of farmland irrigation water
New construction land scale
Resource output rate
Comprehensive utilization rate of general industrial solid waste
Comprehensive utilization of crop straws
Total reduction in Chemical Oxygen Demand (COD) emissions
Reduced total nitrogen oxide emissions
Disposal and utilization rate of hazardous waste
Centralized sewage treatment rate
Environmental pollution treatment investment as a percentage of GDP
Ratio of days with good air quality of cities at the prefecture level and above
Proportion of surface water that meets or exceeds Class III water bodies
Proportion of surface water inferior to Category V water bodies</td></tr>
<tr><td>Percentage of renewable energy supply</td><td>Non-fossil energy as a share of primary energy consumption</td></tr>
<tr><td>Energy consumption per unit of GDP</td><td>Reduced energy consumption per unit of GDP</td></tr>
<tr><td>Annual disposable income of a rural resident to that of an urban resident</td><td>Per capita disposable income</td></tr>
<tr><td>Environmentally sound treatment rate of household waste</td><td>Environmentally sound treatment rate of household waste</td></tr>
<tr><td>Buses per 10,000 people</td><td>Green traveling (passenger traffic per 10,000 people in urban areas)</td></tr>
<tr><td>Annual average concentration of Fine Particulate Matter (PM2.5)</td><td>Reduced concentration of Fine Particulate Matters (PM2.5) in cities on the prefecture level and above that fall below PM2.5 requirements</td></tr>
<tr><td>Sulfur dioxide (SO2) emissions</td><td>Reduced sulfur dioxide (SO_2) emissions</td></tr>
</table>

	Chemical Oxygen Demand (COD) emissions	Reduced emissions of Chemical Oxygen Demand (COD)	Water quality compliance rate of the water function areas of major rivers and lakes Proportion of centralized drinking water sources in prefecture level cities with quality reaching or exceeding Class III Proportion of excellent water (Types I and II) in the coastal waters Safe utilization rate of contaminated farmland Chemical fertilizer user per unit of arable land Pesticide use per unit of arable land Forest stock volume Comprehensive vegetation coverage of grassland Natural coastline retention rate Wetland protection rate Marine conservation area Added area of soil erosion under control Treatment rate of controllable desertificated land Newly restored mines Per capita GDP growth Added value of the tertiary industry as a percentage of GDP Added value of strategic emerging industries as a percentage of GDP Decreasing rate of energy consumption per capita of public institutions Growth rate of new energy vehicle ownership Share of green buildings in newly built buildings of cities and towns Ratio of green space in urban built-up areas Penetration rate of rural tap water Penetration rate of rural sanitation toilets Public satisfaction with ecological environment quality
	Ammonia nitrogen emissions	Reduced ammonia nitrogen emissions	
	Carbon dioxide (CO2) emissions per unit of GDP	Reduced CO_2 emissions per unit of GDP	
	Per capita freshwater consumption	Freshwater consumption	
	Freshwater consumption per unit of GDP	Reduced freshwater consumption per unit of GDP	
	Percentage of sown area	Arable land ownership	
	Per capita ecological footprint	Reduction rate of construction land per unit of GDP	

While the national green development indicator system centers around energy conservation, emissions reduction, and resource efficiency, the GEP Measurement Framework expands beyond environmental protection to include some social indicators and composite indicators calculated with open data like the ecological footprint. The national green development system bases its calculation on statistics from government departments at all levels, while the GEP indicator system relies on public data.

The *Ecological Progress Target Assessment System* covers five dimensions: resource utilization, ecological environment protection, annual evaluation results, public satisfaction, and ecological environment incidents, involving the evaluation of green economy progress, in line with the core of the GEP Measurement Framework.

There is still potential for improvement on the Measurement Framework constructed in this report. Indicators under the framework are selected according to the GEP Measurement Framework issued by UNEP and its principle of indicator selection. China's green development indicator system is used for reference and the characteristics of Jiangsu and Fujian Province, and the availability of data, are taken into account. The integrity of the data has been limited to a certain extent by the lack of relevant data and poor continuity. To address the data gap, specific indicators were modified and replaced in the research, which impacted on results. At the same time, the indicator system in this research is based on the development history and current status of the region, and aimed at assessing the progress of green development in the region. In this regard, some indicators are suitable for this region, but may not be suitable elsewhere; some indicators are available in this region, but may not be available elsewhere. This limits the horizontal comparability of the indicator system.

5.4 Construction and Operation Plan of "Green Development Indicator" Database

5.4.1 Information Collection Channels

The information was sourced from official statistical yearbooks and other public data. The specific indicators collected in the annual database in the future can be adjusted in light of the data of that year and special circumstances.

5.4.2 Evaluation Result Release

Plans are in place to set up a network platform, and publish reports in soft and hard copies of the annual evaluation of green development in Jiangsu Province, including provincial and prefecture levels. These reports are to provide guidance and policy suggestions for green development in the future.

Regular expert meetings are planned to be held as an exchange platform for experts from research institutions, government departments and business circles to provide suggestions for revision of the report and as long-term bonds with stakeholders to promote this indicator system.

5.4.3 Construction and Operation of Database

The database platform is built and later operated by Nanjing University, the green development evaluation results of Jiangsu Province will be published on the platform regularly, and the public download channels of evaluation results and data will be provided.

The website address of the database is: http://gep.indus.vip/

5.5 Reference

This research refers to the following documents on environmental and ecological development and management in recent years:

■Medium and Long-term Program of Renewable Energy Development_F.G.N.Y. No. [2007]2174

■ The Notice of the 13th Five-year Plan for Energy Development_F.G.N.Y. No. [2016]2744

■ The 13th Five-year Plan for Water Conservancy Reform and Development_National Development and Reform Commission, the Ministry of Water Resources and the Ministry of Housing and Urban-Rural Development

■ Notice of the General Office of the Ministry of Human Resources and Social Security on Full Registration for Universal Participation in Social Insurance_ R.S.B.F.No.[2014]40

■ Notice of the Ministry of Land and Resources on Issuing the Outline of the Adjustment Scheme of the Overall Plan of National Land Use_G.T.Z.F.No.[2016]67

■ National Human Rights Action Plan of China (2012-2015)_The State Council

■ Notice of the State Council on Issuing the Outline of Chinese Women's Development and the Outline of Chinese Children's Development_G.F.No.[2011]24

■ Notice on Issuing the Outline of the 13th Five-year Plan for the Ecological Protection of China_H.S.T.No.[2016]151

■ Notice of the State Council on Issuing the 13th Five-year Plan for the Ecological Environment Protection_G.F.No.[2016]65

■ Notice of the State Council on Issuing the Air Pollution Prevention and Control Action Plan_G.F.No.[2013]37

■ Notice of the State Council on Issuing the Water Pollution Prevention and Control Action Plan_G.F.No.[2015]17

■ Notice of the State Council on Issuing the Soil Pollution Prevention and Control Action Plan_G.F.No.[2016]31

■ Opinions of the CPC Central Committee and the State Council on Accelerating the Ecological Civilization Construction_2015.04.25

■ Notice of the Jiangsu Provincial Government on Issuing the Air Pollution Prevention and Control Action Plan of Jiangsu Province_S.F.No.[2014]1

■ Notice of the Jiangsu Provincial Government on Issuing the Water Pollution Prevention and Control Action Plan of Jiangsu Province_S.F.No.[2015]175

■ Indicators of Demonstration Counties and Municipalities in the National Ecological Progress (Trial)_H.S.T.No.[2016]4