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Research on Sustainable High-Quality Forestry Development in China—From Measurements, Dynamic Evolution, and Regional Differences

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Abstract: Following the new development philosophy, this research elaborates the connotation of sustainable high-quality forestry development and constructs an evaluation index system based on the connotation. The entropy-based TOPSIS method was used to measure the forestry development level from 2005 to 2021 in China. On this basis, the kernel density estimation, spatial association analysis, Markov chain, and Gini index were used to analyze the evolution characteristics in time and space and regional differences in China's forestry development from multiple angles and levels. The results show that, first, although the overall sustainable high-quality development level of China's forestry tends to rise, and the level ranking of each province is relatively stable, the development level varies greatly from province to province; second, the development level in the central, eastern, and western regions shows an upward trend, and in the northeast region, it rose first and then fell, presenting a decreasing step distribution of from the eastern, central, northeast, to western regions; third, the regional differences are the main reasons for the development difference in China's forestry, with the largest difference in the east, followed by the west, central, and northeast regions; fourth, sustainable high-quality forestry development in various provinces has a great effect in terms of spatial agglomeration, and the spatial lag has a significant impact on the transfer of sustainable high-quality forestry development; however, there are still some difficulties in achieving progress in its development.

Keywords: sustainable high-quality forestry development; dynamic trend; space distribution; regional differences

Citation: Jiang, Y.; Zhang, S. Research on Sustainable High-Quality Forestry Development in China—From Measurements, Dynamic Evolution, and Regional Differences. *Sustainability* **2023**, *15*, 9821. https://doi.org/10.3390/su15129821

Academic Editor: Jim Lynch

Received: 10 May 2023
Revised: 13 June 2023
Accepted: 16 June 2023
Published: 20 June 2023

1. Introduction

Forestry is the foundation for ecological security and sustainable development [1]. The purpose of forestry development includes the rational use of forests to improve ecosystem services and shared human well-being, and to achieve sustainable development [2]. Since the founding of the People's Republic of China, forestry development has achieved fruitful results, and the forest area and stock have maintained double growth for 30 years [3]. China is known as the country with the greatest improvement in forest resources in the world. At the same time, the forestry industry has also been vigorously developed, with the total output value of forestry reaching more than 1 trillion dollars in 2021, and the total output of economic forest products reaching 200 million tons, gradually forming more than 30 pillar industries with an annual output value of more than hundreds of billions of dollars, such as wood processing, forest tourism, and economic forestry, making outstanding contributions to economic development and ecological civilization construction [4]. However, the high-speed development of China's forestry mainly benefits from the demographic dividend and natural resources, and this development model is easily shackled by rising labor costs, marginal decline in forestry returns on investment, and excessive exploitation of natural resources, which hinders the transmutation of forestry development from quantity to quality [5]. Therefore, promoting the sustainable high-quality development of forestry is the general trend in response to the new normal of China's economy and the construction of ecological civilization.

Sustainable high-quality forestry development derives from China's sustainable high-quality economic development in the new era. At present, the main views of scholars on this issue are as follows: Hiltunen et al. [6] studied the impact of forests on climate change and the economic profitability of forest production. Bojan et al. [7] examined the combination of decision-making trial and evaluation laboratory and analytic hierarchy process methods in assessing sustainable forestry targets. Xu [8] proposed that forest management is an important link in realizing the high-quality development of forestry, and it is beneficial to promote sustainable forest management. Zhang et al. [9] put forward that promoting the high-quality development of forestry is not only an important measure to promote China's ecological construction, but also an inevitable requirement for mobilizing social forces to actively participate in the ecological construction of forests and grasslands, and the high-quality development of forestry requires improving the quality and growth rate of forest resources through advanced science and technology. Ren et al. [10] proposed that, in order to achieve sustainable high-quality forestry development, the coordination indicators in the fields of industries and enterprises should be paid more attention, and the number of efficiency indicators and new momentum development indicators should be given importance. In the accounting of the development status of each entity, quality indicators need to be used. On this basis, it can provide the necessary conditions for sustainable high-quality forestry development. Chen et al. [11] used the entropy method, from the perspective of comprehensive evaluation, to evaluate and analyze the sustainable high-quality forestry development level of different provinces in China from 2012 to 2017. Based on the analysis, he concluded that promoting the optimization of forestry industry structure, cultivating forestry industry innovation ability, and improving the internal coordination of forestry industry can have a positive effect on sustainable high-quality forestry development. Yang et al. [12] analyzed, from the perspective of influencing factors, the background of sustainable high-quality forestry development in Guizhou Province from 2008 to 2016.

In summary, although there is a theoretical basis, the measurement of and research into the sustainable high-quality development of forestry is still in the initial phase, lacking in-depth analysis of its dynamic trend and spatial distribution. Therefore, this paper defines the connotation of sustainable high-quality forestry development from the theoretical aspect first and constructs an index system of China's sustainable high-quality forestry development with the guiding ideology of "innovation, coordination, green, openness, and sharing". Then, the entropy-based TOPSIS model [13] is adopted to measure the status of sustainable high-quality forestry development in China. At the same time, the kernel density estimation is used to investigate the developing trend of sustainable high-quality forestry development in China. Furthermore, spatial dependence analysis is adopted to analyze the characteristics of spatial distribution, the Markov chain is introduced to determine the specific transfer probability of each development status, and the Gini index method [14] is used to reveal its regional differences. This research aims to analyze the current situation of sustainable high-quality forestry development and provide a reference for related departments to formulate policies.

2. Materials and Methods

2.1. Illustration of the Connotation of Sustainable High-Quality Forestry Development

Since the concept of "sustainable high-quality development" was proposed, scholars have discussed the connotation of "sustainable high-quality forestry development" from different perspectives. Initially, the research regarding the connotation definition was closely related to the rationality of the evaluation index and the direction of future development. Based on the previous forestry theory [15–19], new development theory, developmental economics, and government policies [20,21], the connotation of "sustainable high-quality forestry development" is divided into five parts, which are innovation-driven, coordinated development, green ecology, open development, and benefit sharing [22–24]. The connotation is shown in Figure 1.

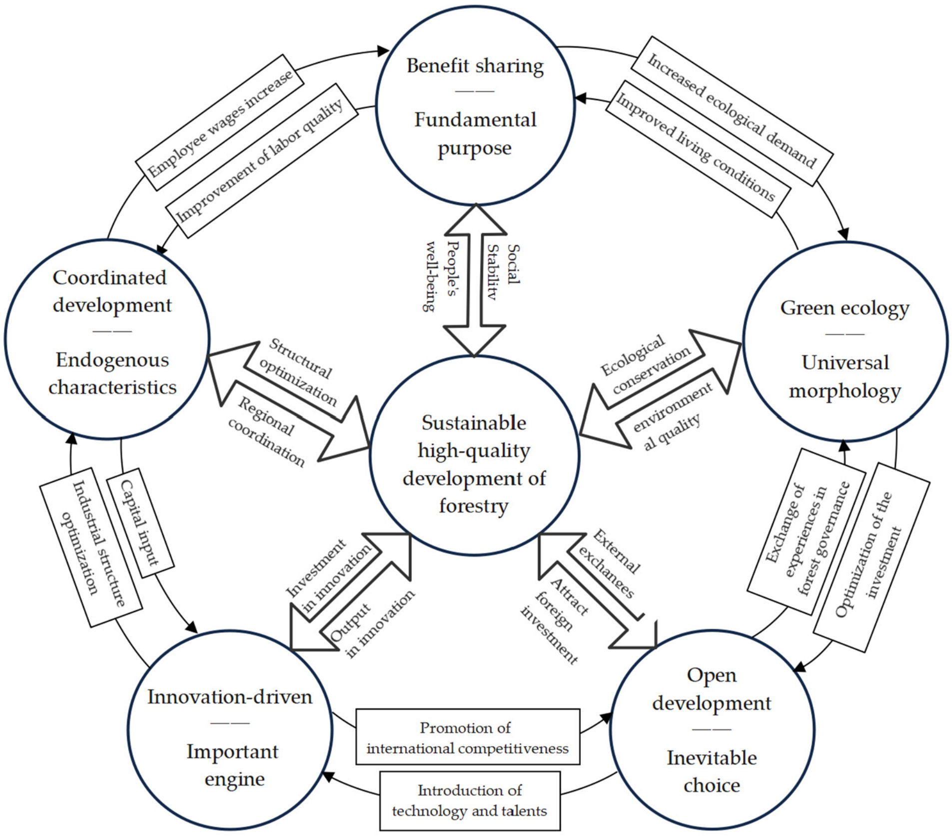


Figure 1. The connotation of sustainable high-quality forestry development.

It can be seen from Figure 1 that the five parts have a certain interaction logic with each other, and each part has a clear position. The details are as follows: innovation-driven is an important engine for sustainable high-quality forestry development, and can provide more powerful efficiency for it, resolving the problems of excessive speed, lags, and imbalance in the process of development [25]. The investment of innovative elements can effectively promote technological upgrading and improve international competitiveness; hence, it can provide power to sustainable high-quality development [26,27]. Coordinated development is the endogeneity characteristic of sustainable high-quality forestry development, so that forestry resources can be rationally and effectively allocated [28]. It can correct the irrational allocation of production factors, eliminate low production capacity, and induce more capital flow into innovative fields, thus it can promote the sustainable high-quality development of forestry. Green ecology is the universal morphology of sustainable high-quality forestry development [29]. Green development should not only focus on the improvement of environmental quality and ecological construction, but also include solving the problems of ecological destruction, playing the correct role in the cycle of the forestry comprehensive system, and showing sustainable high-quality governance capabilities and systems. Thus, it can provide better ecological resources for a better way of life [30–32]. Open development is an inevitable choice for high-quality forestry development, reflecting the influence and attractiveness to the international market. The exchanges and cooperation with nations in the field of forestry should be strengthened, and the revolution will be achieved by promoting the forestry industry in global economy development [33,34]. Benefit sharing is the fundamental purpose of sustainable high-quality forestry development, ensuring that the results of reform and development can be shared by the people. Benefit sharing aims at providing a better ecological environment for the people, reconciling the contradictions in income distribution in the forestry field, paying attention to the well-rounded development of people, and promoting the process of modernization [35–37]. The above five parts develop coordinately, and will jointly promote sustainable high-quality development in the field of forestry.

2.2. Construction of the Index System of Sustainable High-Quality Forestry Development

Based on the guidance of the new development concept, this research refers to the construction process of the index system of sustainable high-quality economic development and forestry sustainable development, combined with the elaboration of the connotation of sustainable high-quality forestry development and the relevant studies [38–41]. Subsequently, the three-level index system of sustainable high-quality forestry development was constructed, including five criterion layers (innovation-driven, coordinated development, green ecology, open development, benefit sharing), twelve system layers, and twenty-one indicator layers, adhering to the principles of systematic, objective, and available (Table 1).

Table 1. Index system of sustainable high-quality forestry development in China.

Criterion Layer	System Layer	Indicator Layer	Specific Measurement Methods	Direction
Innovation-driven	Innovation input	Forestry innovation support capacity	Investment in forestry science and technology, education, rule of law, publicity, and other investments (million yuan)	+
		Forestry innovation research and development capabilities	Number of professional and technical personnel in forestry workstations (people)	+
		Forestry innovation inheritance capacity	Total number of forestry workers with a college degree or above (person)	+
	Innovation output	Forestry labor productivity	Forestry industry value added/number of forestry employees (million yuan/person)	+
		Forestry land productivity	Gross forestry output value/forest land area (%)	+
		Forestry technology output	Forestry-related patent disclosures (pcs)	+
Coordinated development	Forestry industrial structure	Rationalization of industrial structure	Output value of forestry secondary and tertiary industries/output value of forestry primary industry (%)	+
		Advanced degree of industrial structure	Output value of forestry tourism, health care, leisure services/total output value of forestry (%)	+
	Forestry employment structure	Employment distribution structure	(Number of employees in the secondary industry of forestry + number of employees in the tertiary industry of forestry)/total number of employees in forestry (%)	+
	Forestry growth structure	Forestry economic growth rate	Growth rate of gross forestry production (%)	+
	Forestry resource structure	Structure of forest origin	Natural forest area/total forest area (%)	+
Green ecology	Richness of forest resources	Forest cover	Forest area/total land area × 100% (%)	+
		Growth rate of afforestation area of ecological engineering	(Afforestation area of ecological engineering in the current period–afforestation area of ecological engineering in the base period)/afforestation area of ecological engineering in the base period (%)	+
	Stability of forest resources	Forest governance capacity	Forest pest control rate (%)	+
		Forest security capabilities	Forest fire control rate (hectares/time)	-

Table 1. *Cont.*

Criterion Layer	System Layer	Indicator Layer	Specific Measurement Methods	Direction
Open development	Openness of forest resource	The level of openness of forestry construction	(Self-financing + other funds)/state budget investment (%)	+
		The level of openness of forestry services	Growth rate of overseas visitors to Forest Park (%)	+
Benefit sharing	Economic benefit sharing	Employee income sharing	Average wage growth rate of employees in forestry units (%)	+
	Eco-efficiency sharing	Ecological environment sharing	Green coverage rate of built-up area (%)	+
	Social benefit sharing	Social security sharing	Growth rate of forestry employees (%)	+
		People's livelihood security and sharing	Growth rate of investment funds in forestry and livelihood projects (%)	+

2.3. Data Source and Pretreatment

According to the consistency of data statistics and the persistence principle of data observation, the forestry development data of 31 provinces in China from 2005 to 2021 were selected as samples for this research. The data of afforested areas in built-up areas are from the China Statistical Yearbook (2005 to 2021). The number of forestry-related patents is from the Yearbook of China's Forestry and Grassland Intellectual Property (2005 to 2021). Other data are from the China Forestry Statistical Yearbook (2005 to 2017) and the China Forestry and Grassland Yearbook (2018 to 2021). The missing values of individual indicators were filled via the method of averaging or linear interpolation. In the process of calculation, the GDP deflator was based on 2005, and the relevant indicators, such as output value, were deflated to ensure the comparability of the data.

2.4. Entropy TOPSIS Method

In the research, the entropy-based TOPSIS method is adopted to calculate the sustainable high-quality forestry development index to measure the forestry development level in various provinces. The adoption of the entropy-based TOPSIS method makes the results more objective and reasonable when measuring the level of sustainable and high-quality development of forestry. The calculation steps are as follows:

First, the original data are standardized to eliminate the impact of differences in dimensions and orders of magnitude of indicators. The formula is as follows:

Positive indicators:

$$X_{ij} = \frac{x_{ij} - x_{min,ij}}{x_{max,ij} - x_{min,ij}} \tag{1}$$

Negative indicators:

$$X_{ij} = \frac{x_{max,ij} - x_{ij}}{x_{max,ij} - x_{min,ij}} \tag{2}$$

Second, the information entropy B_j of X_{ij} in the measurement system is:

$$B_j = -\frac{1}{\ln n}\sum_{i=1}^{n}[(X_{ij}/\sum_{i=1}^{n}X_{ij})\ln(X_{ij}/\sum_{i=1}^{n}X_{ij})] \tag{3}$$

Third, the term weight W_j of X_{ij} in the index system:

$$W_j = (1 - B_j)/\sum_{j=1}^{n}(1 - B_j) \tag{4}$$

Fourth, the weighting matrix R in the index system:

$$V_{ij} = (V_{ij}\prime) = (X_{ij} \times W_j)_{m \times n} \tag{5}$$

Fifth, the optimal scheme V^+ and the worst scheme V^- are calculated according to the weighting matrix R:

$$V^+ = \left(V_{ij}'\right)_{max};\ V^- = \left(V_{ij}'\right)_{min} \tag{6}$$

Sixth, the optimal scheme D_i^+ and the worst scheme D_i^- of Euclidean distance are determined:

$$D_i^+ = \sqrt{\sum_{j=1}^{n} \left(V_{ij} - V^+\right)^2};\ D_i^- = \sqrt{\sum_{j=1}^{n} \left(V_{ij} - V^-\right)^2} \tag{7}$$

Seventh, calculate the relative proximity U_i of each scheme and the ideal one:

$$U_i = \frac{D_i^-}{D_i^+ + D_i^-} \tag{8}$$

The greater U_i of Formula (8), the higher level of sustainable high-quality forestry development.

2.5. Kernel Density Method

The Kernel density function that is based on the kernel function determine the distribution characteristics of the probability density of random variables by using smooth estimation. Then, the kernel density function was adopted to study the regional dynamic evolution of sustainable high-quality forestry development, and attempt to summarize the distribution law of sustainable high-quality forestry development. The formula is as follows:

$$f(\delta) = \frac{1}{nh}\sum_{i=1}^{n} K\left(\frac{\delta - \delta_i}{ih}\right) \tag{9}$$

In Formula (9), K(*) is the kernel density function and h represents the bandwidth. The value determines the smoothness of the density function.

2.6. Moran's I Method

In order to explore the spatial association of sustainable high-quality forestry development, Moran's I is quoted. The global Moran's I formula is:

$$I = n\sum_{i=1}^{n}\sum_{j=1}^{n} \omega_{ij}(x_i - \overline{x})(x_j - \overline{x}) / \sum_{i=1}^{n}\sum_{j=1}^{n} \omega_{ij} \sum_{j=1}^{n} (x_i - \overline{x})^2 \tag{10}$$

The local Moran's I formula is:

$$I_i = n(x_i - \overline{x})\sum_{j=1}^{n} \omega_{ij}(x_j - \overline{x}) / \sum_{i=1}^{n} \left(x_i - \overline{x}\right)^2 \tag{11}$$

If I > 0, it represents a positive spatial association; if I < 0, it represents a negative spatial association; if I = 0, it represents no spatial association.

2.7. Markov Chain Method

In order to further analyze the probability of sustainable high-quality forestry development in different states, the traditional and spatial Markov chain was adopted to describe the evolution characteristics of spatial clusters of sustainable high-quality forestry development and analyze the spatial convergence effect of it. The formula is as follow:

$$P_{ij}^{t,t+d} = \frac{\sum_{t=T_0}^{T-d} n_{ij}^{t,t+d}}{\sum_{t=T_0}^{T-d} n_i^{t,t+d}} \tag{12}$$

$P_{ij}^{t,t+d}$ is the probability that calculated by the data of shifting from the type "i" in the year "t" to the type "j" in the year "t + d".

$n_{ij}^{t,t+d}$ represents the number of provinces of type "j" that changed from type "i" in the year "t" after "d" (years). $n_i^{t,t+d}$ is the number of provinces of type "i" in the year of "t". If the sustainable high-quality forestry development level in a certain area remains unchanged after t years, it indicates that the transfer is stable; if the type is promoted after "t" years, it means improvement, and vice versa.

2.8. Gini Coefficient Decomposition Method

In order to further explore spatial heterogeneity and seek ways to narrow regional differences in sustainable high-quality forestry development, the level of coordinated development should be improved [42]. The Gini coefficient decomposition method can be used to decompose the overall difference (G) into regional difference contribution (G_w), interregional difference contribution (G_{nb}), and contribution of intensity of transvariation (G_t). The contribution of transvariation is the influence of the existing intersection terms on the total difference. The formula is as follows:

$$G = G_w + G_{nb} + G_t \tag{13}$$

$$G = \frac{1}{2n^2\mu}\sum_{j=1}^{k}\sum_{h=1}^{k}\sum_{i=1}^{n_j}\sum_{r=1}^{n_h}\left|y_{jit} - y_{hrt}\right| \tag{14}$$

$y_{jit}(y_{hrt})$ is the sustainable high-quality forestry development index of province "i(r)" in region "j(h)" at the time of "t". "μ" represents the average of sustainable high-quality forestry development in each province. "n" represents the number of provinces. "k" represents the number of regional divisions, and "$n_j(n_h)$"is the number of provinces in region "j(h)".

$$G_{jj} = \frac{\frac{1}{2\mu_j}\sum_{i=1}^{n_j}\sum_{r=1}^{n_j}\left|y_{ji} - y_{jr}\right|}{n_j^2} \tag{15}$$

$$G_w = \sum_{j=1}^{k} G_{jj} p_j s_j \tag{16}$$

$$G_{jh} = \frac{\sum_{i=1}^{n_j}\sum_{r=1}^{n_h}\left|y_{ji} - y_{hr}\right|}{n_j n_h\left(\mu_j + \mu_h\right)} \tag{17}$$

$$G_{nb} = \sum_{j=2}^{k}\sum_{h=1}^{j-1} G_{jh}(p_j s_h + p_h s_j) D_{jh} \tag{18}$$

$$G_t = \sum_{j=2}^{k}\sum_{h=1}^{j-1} G_{jh}(p_j s_h + p_h s_j)(1 - D_{jh}) \tag{19}$$

$$D_{jh} = \frac{d_{jh} - p_{jh}}{d_{jh} + p_{jh}} \tag{20}$$

$$d_{jh} = \int_0^{\infty} dF_j(y)\int_0^{y}(y - x)dF_h(y) \tag{21}$$

$$p_{jh} = \int_0^{\infty} dF_h(y)\int_0^{y}(y - x)dF_j(y) \tag{22}$$

"G_t" is the contribution of transvariation. "$\left(1 - D_{jh}\right)$" is the intensity of transvariation. "$F_j(F_h)$" is the cumulative distribution function in region "j(h)".

3. Results

3.1. Analysis of the Results of Sustainable High-Quality Forestry Development Level of Provinces in China

Stata 17.0 software was used to measure the specific indicator weights and the level of quality development of sustainable forestry in each province through the entropy-based TOPSIS method, as shown in Table 2. It can be seen that, from the perspective of development trends, the sustainable high-quality forestry development level in more than 80 percent of provinces is steadily improving in Table 2. From the perspective of development trends, Shanghai, Guangdong, Guangxi, Chongqing, Hubei, Anhui, and other provinces have performed strongly, more than doubling in 17 years. Moreover, Sichuan, Jiangxi, Hainan, Hebei, and other provinces have shown a steady and increasing trend in overall development. The sustainable high-quality forestry development in Heilongjiang, Tianjin, and other provinces has declined. Generally, the ranking of sustainable high-quality forestry development levels in each province during the period 2005–2021 was not obvious. From the comprehensive average value (2005 to 2021), Jiangsu, Shanghai, Zhejiang, and other eastern regions are ahead of the rest of the provinces.

Table 2. The comprehensive level of sustainable high-quality forestry development in 31 provinces in China.

Region	Province	2005	2009	2013	2017	2021	Average 2005–2021	Ranking
eastern	Jiangsu	0.3006	0.2345	0.1859	0.1926	0.2787	0.2415	1
eastern	Shanghai	0.0821	0.0904	0.2841	0.2246	0.2133	0.2037	2
eastern	Zhejiang	0.0950	0.1037	0.1456	0.1779	0.2496	0.1520	3
eastern	Guangdong	0.0607	0.1168	0.1397	0.1795	0.2080	0.1411	4
eastern	Fujian	0.0929	0.0961	0.1183	0.1402	0.1601	0.1411	5
eastern	Shandong	0.1115	0.0851	0.1439	0.1693	0.1673	0.1338	6
western	Guangxi	0.0656	0.0824	0.1590	0.2547	0.1663	0.1312	7
central	Hunan	0.1068	0.0985	0.1085	0.1585	0.1368	0.1150	8
western	Guizhou	0.0609	0.0752	0.0998	0.1414	0.1560	0.1093	9
western	Yunnan	0.0870	0.1123	0.1123	0.1101	0.1194	0.1064	10
western	Sichuan	0.0859	0.0960	0.1048	0.1128	0.1213	0.1040	11
central	Jiangxi	0.0805	0.0862	0.1034	0.1138	0.1539	0.1017	12
northeast	Heilongjiang	0.1266	0.1344	0.0794	0.0860	0.0874	0.1000	13
central	Anhui	0.0516	0.0602	0.0845	0.1389	0.1522	0.0962	14
central	Hubei	0.0696	0.0747	0.0834	0.1116	0.1219	0.0917	15
western	Chongqing	0.0631	0.0633	0.0785	0.1052	0.1307	0.0885	16
eastern	Hainan	0.0613	0.0633	0.0695	0.0840	0.0866	0.0853	17
northeast	Jilin	0.0816	0.0925	0.0842	0.0854	0.0816	0.0851	18
eastern	Beijing	0.0453	0.0865	0.0632	0.0834	0.0926	0.0846	19
eastern	Hebei	0.0628	0.0654	0.0668	0.0728	0.0824	0.0803	20
western	Shaanxi	0.0689	0.0685	0.0813	0.0830	0.0954	0.0800	21
central	Henan	0.0541	0.0708	0.0703	0.0902	0.1007	0.0769	22
northeast	Liaoning	0.0550	0.0693	0.0755	0.0798	0.0797	0.0714	23
western	Tibet	0.0618	0.0564	0.0455	0.0649	0.0891	0.0653	24
western	Inner Mongolia	0.0602	0.0555	0.0562	0.0663	0.0808	0.0631	25
western	Xinjiang	0.0449	0.0444	0.0598	0.0778	0.0802	0.0611	26
central	Shanxi	0.0487	0.0464	0.0548	0.0622	0.1146	0.0580	27
western	Gansu	0.0443	0.0495	0.0533	0.0657	0.0749	0.0565	28
eastern	Tianjin	0.0629	0.0382	0.0408	0.0525	0.0454	0.0464	29
western	Ningxia	0.0215	0.0427	0.0332	0.0574	0.0762	0.0455	30
western	Qinghai	0.0188	0.0299	0.0284	0.0468	0.0696	0.0402	31

3.2. Spatial and Temporal Dynamic Evolution Analysis of Sustainable High-Quality Forestry Development Level

3.2.1. Kernel Density Estimation Analysis

Based on the Gaussian kernel function, the dynamic distribution of sustainable high-quality forestry development in China was analyzed, and the results are as follows:

Figure 2 reflects the dynamic evolution trend of sustainable high-quality forestry development in China. The following characteristics are shown as follows: first, in terms of distribution location, the center of the Kernel density of the national forestry sustainable high-quality development level has a trend of shifting to the right with time, reflecting the trend of continuous improvement of forestry development quality. Second, in terms of graphic changes, the density curve gradually changes from peak to broad peak. Moreover, its wave height showed a decreasing pattern, reflecting that the distribution of sustainable high-quality forestry development level in China was more even, and its absolute difference gradually expanded. Third, in terms of distribution ductility, the right trail feature of the density curve is gradually weakened, reflecting the gradual decline in the leading position of individual provinces in sustainable high-quality forestry development.

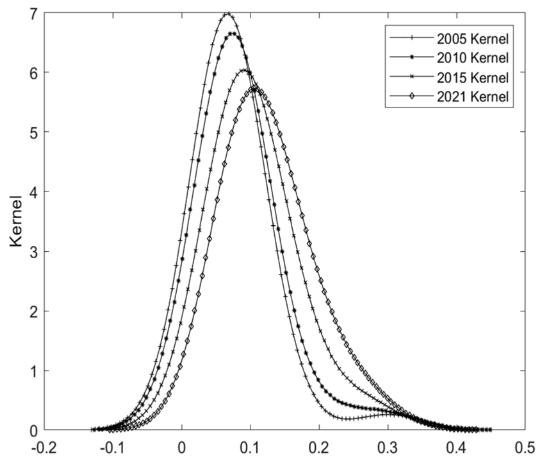


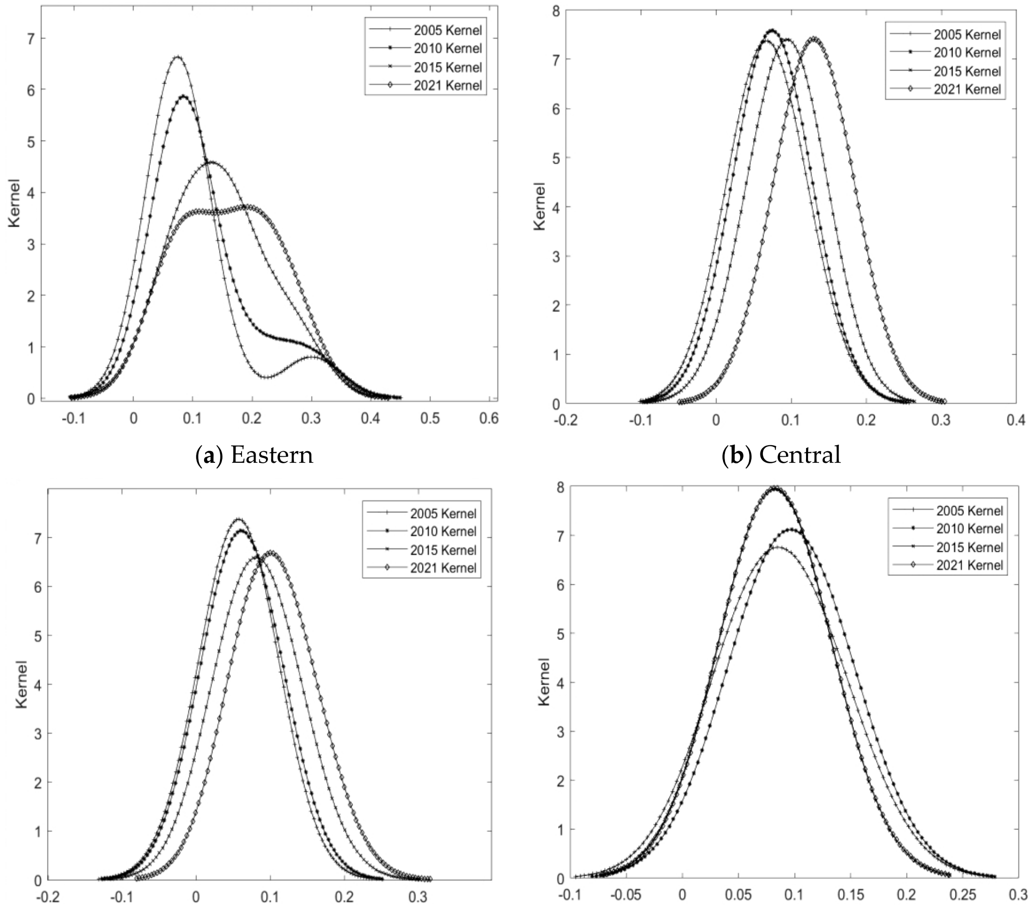
Figure 2. The distribution of sustainable high-quality forestry development in China.

Figure 3 reflects the dynamic evolution trend of sustainable high-quality forestry development in the four major regions of China. The characteristics are shown as follows: first, in terms of distribution location, the density curve in the eastern, central, and western regions has a trend of moving to the right with time, reflecting the continuous improvement of the sustainable high-quality forestry development level. There is a trend of moving right first and then moving left in the northeast region, which reflects that its quality changes rise first and then fall; second, in terms of the graph change, the distribution curve in the eastern region shows a trend of decreasing the peak height and increasing width, and its right trail gradually transforms into a bimodal pattern. It reflects that the difference expanded gradually in the eastern region, presenting a trend of polarization. The peak heights and widths of the distribution curves in the central and western regions do not change much, indicating that the absolute difference has no obvious change. The distribution curve in the northeast region shows a trend of peak height decreasing first and then rising, but the peak width first increasing and then decreasing. It is shown that its absolute difference first expands and then decreases.

3.2.2. Analysis of Moran's I

Based on the construction of geographical adjacency weights, this paper uses global and local Moran's I to calculate the spatial association and local agglomeration of sustainable high-quality forestry development levels in 31 provinces from 2005 to 2021. The results are shown in Table 3.

It can be seen from Table 3 that the global Moran's I is significantly positive in China except in 2006, which reflects that there is a spatial association of the sustainable high-quality forestry development level in various provinces in these years. Among them, the minimum value of the Moran's I from 2005 to 2021 is 0.027, and the maximum value is 0.670, and it presents an increasing trend year by year. It can be seen that the spatial association is gradually increasing. In order to study the spatial aggregation of the 31 provinces, 2005 (the beginning of the period), 2010, 2015, and 2021 (the end of the period) were selected as nodes to generate the Moran scatterplot. It can be observed that most provinces are clustered in the first or third quadrant, reflecting that high-level areas are adjacent to high-level areas, and low-level areas are adjacent to high-level areas.



(**a**) Eastern (**b**) Central

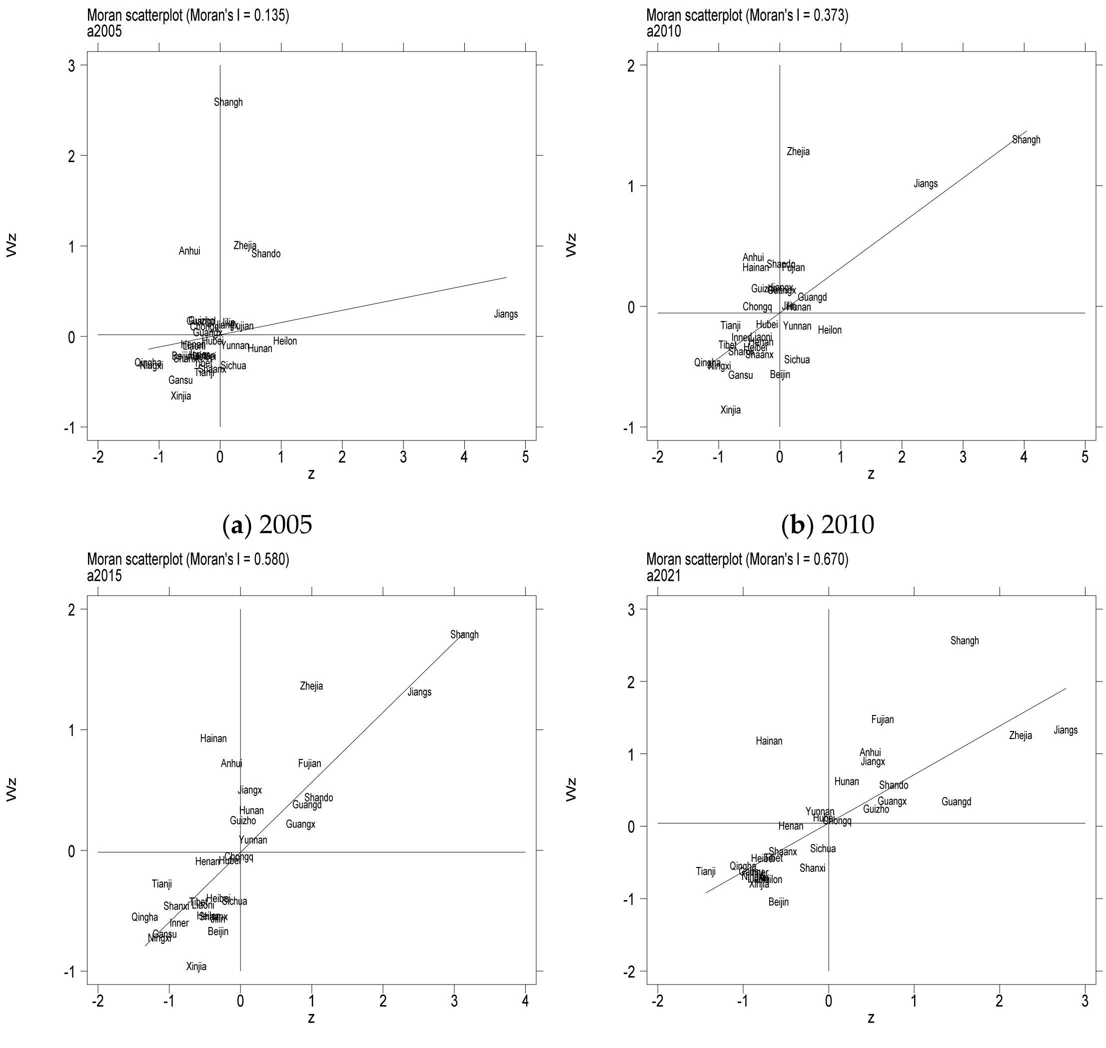
(**c**) Western (**d**) Northeast

Figure 3. The dynamic distribution of sustainable high-quality forestry in the four major regions.

Table 3. Global Moran's I of sustainable high-quality forestry development in China from 2005–2021.

Variables	I	*p*-Value
2005	0.135	0.017
2006	0.027	0.195
2007	0.140	0.019
2008	0.345	0.000
2009	0.165	0.022
2010	0.373	0.000
2011	0.169	0.024
2012	0.456	0.000
2013	0.493	0.000
2014	0.517	0.000
2015	0.580	0.000
2016	0.361	0.000
2017	0.549	0.000
2018	0.652	0.000
2019	0.589	0.000
2020	0.581	0.000
2021	0.670	0.000

Figure 4 shows the spatial distribution of the sustainable high-quality forestry development index in selected years in chronological order. Generally, during the sample period, the local Moran scatterplot shows that the characteristics of the distribution are the types H-H and L-L. It indicates that the sustainable high-quality forestry development has a feature of positive agglomeration in general; however, in some provinces, Moran's I presents the types L-H and H-L. This shows that there is spatial heterogeneity in the sustainable high-quality development level of forestry in China. In addition, Jiangsu, Zhejiang, Shanghai, and other provinces with leading levels of sustainable high-quality forestry development are the type H-H. Shanxi, Beijing, Heilongjiang, and most of the western provinces are the L-L type, as shown in the figure. The forestry development in these regions did not perform well, and the development in the surrounding areas is also at low levels. In terms of the time-varying trend of the Moran scatterplot, although the provinces gathered in the L-L area are still the majority, the number of provinces in the H-H agglomeration area is significantly increasing.



(**a**) 2005 (**b**) 2010

(**c**) 2015 (**d**) 2021

Figure 4. Spatial distribution type of sustainable high-quality forestry development of 31 provinces in selected years.

3.2.3. Analysis of Markov Chain

In this part of our study, we use a quartile to divide the states into four types. The quantiles of 25%, 50%, and 75% are 0.0649, 0.0847, and 0.1152, which correspond to sustainable high-quality development status of forestry in each region. It can be divided into low level (L, less than 0.0649), medium and low level (ML, 0.0649–0.0847), medium and high level (MH, 0.0847~0.1152), and high level (H, greater than 0.1152). After the state is determined, the transition probability matrix between the states over different periods of time is measured. The results are shown in Table 4.

Table 4. The calculation results of Markov chain in China's sustainable high-quality forestry development.

Local Level	L	ML	MH	H	Number of Samples
L (Low level)	0.832	0.122	0.031	0.015	131
ML (Medium and low level)	0.048	0.758	0.177	0.016	124
MH (Medium and high level)	0.000	0.105	0.742	0.153	124
H (High level)	0.000	0.026	0.060	0.915	117

According to Table 4, the dynamic evolution, in chronological order, of the sustainable high-quality forestry development in China can be obtained as follows: First, the larger values in the transfer matrix are all on the leading diagonal, indicating that the distribution status of sustainable high-quality forestry development in China is relatively stable in one year. Second, the probability of China's forestry sustainable high-quality development index shifting from one state type to another is low. In the one-year investigation, the state of the index exhibits state transition, which manifested as the transfer from a low-level state to a medium–high-level state, and the transfer from a medium–low-level state to a high-level state. The transfer probability is 3.1% and 1.6%, respectively, indicating that the sustainable high-quality forestry developed step by step, and it is difficult to achieve progress in a short time. Third, the probability of the provinces with higher forestry development indices remaining at the higher level is 91.5%. The probability of the provinces with lower levels remaining the same is 83.2%. It can be seen that there is a certain polarization in the development of the growth of the sustainable high-quality development index of forestry.

In order to know the internal transition pattern of sustainable high-quality forestry development according to the calculation result of Moran's I, the partial factors should be taken into consideration based on the Markov chain, and the transition probability matrix of the spatial Markov chain should be constructed. In this way, the influence of different neighborhood types on the probability of sustainable high-quality forestry development level transfer can be analyzed. The results are shown in Table 5.

It can be seen from Table 5 that the spatial lag type has an important impact on the evolution of the sustainable high-quality forestry development level, and the different spatial lag types have different effects on the probability of transfer of the development level under different distribution states. The specific manifestations are as follows: First, the provinces with low levels have 16.8% probability of moving upward when ignoring the influence of neighbors. The probabilities of upward transfer in low-level provinces are 7.7%, 20.9%, 23.1%, and 50% when taking the influence of neighbors into consideration. It can be seen that the latter three types of state neighbors have a positive impact on the upward transfer for low-level provinces, while low-level neighbors hinder the upward transfer of low-level provinces to a certain extent. Second, the provinces with medium and low levels have a 19.3% probability of moving upward when ignoring the influence of neighbors. These areas have a 21.1%, 14.8%, 21.9%, and 33.4% probability of moving upward when considering the influence and facing four types of neighbors from low to high level. It can be seen that the neighbors of the first, third, and fourth states all have a positive effect on the provinces with medium and low levels, while the neighbors in the medium- and low-level states have a negative impact. Third, the provinces with medium and high levels have a 15.3% probability of moving upward when ignoring the influence. The regions have probabilities of 12.5%, 0%, 15.4%, and 45.5% for moving upward when taking the influence into consideration. Thus, the provinces with medium and high levels have a greater probability of moving upward with the neighbors in medium- and high-level states, but the probability will be reduced if the neighbors are in low- or medium-level states. Fourth, the provinces with high level development have an 8.6% probability of moving downward when ignoring the influence. The regions have probabilities of 100%, 33.3%, 14.3%, and 3.5% for moving downward if considering the influence. Therefore, the probability can be reduced if the neighbors are in high-level states. If the neighbors' levels are lower than these provinces, the probability of moving downward will be increased.

Table 5. The calculation result of spatial Markov chain of sustainable high-quality forestry development in China.

Type of Spatial Lag	Local Level	L	ML	MH	H	Number of Samples
Neighboring provinces with low level	L	0.923	0.077	0.000	0.000	52
	ML	0.105	0.684	0.211	0.000	19
	MH	0.000	0.125	0.750	0.125	8
	H	0.000	0.000	1.000	0.000	1
Neighboring provinces with medium and low level	L	0.790	0.129	0.048	0.032	62
	ML	0.033	0.820	0.148	0.000	61
	MH	0.000	0.238	0.762	0.000	42
	H	0.000	0.333	0.000	0.667	9
Neighboring provinces with medium and level	L	0.769	0.154	0.077	0.000	13
	ML	0.031	0.750	0.219	0.000	32
	MH	0.000	0.019	0.827	0.154	52
	H	0.000	0.000	0.143	0.857	21
Neighboring provinces with high level	L	0.500	0.500	0.000	0.000	4
	ML	0.083	0.583	0.167	0.167	12
	MH	0.000	0.045	0.500	0.455	22
	H	0.000	0.000	0.035	0.965	86

3.3. Analysis of Spatial Differences of Sustainable High-Quality Forestry Development

3.3.1. Overall Difference and Its Evolution Trend

It can be seen from Figure 5 that the sustainable high-quality development level of forestry in China is generally in a non-balanced state, and the overall difference ranges between 0.20–0.32. The overall difference can be divided into four stages in terms of evolution trend. First, the overall difference shows an inverted U-shaped pattern, first rising and then falling, from year 2005 to 2007, reaching the lowest value of 0.207 in 2007. Second, the overall difference increased in volatility, and reached a peak of 0.313 from 2007 to 2012. Third, the difference showed a U-shaped pattern, first falling and then rising, from 2012 to 2016. Fourth, the overall difference showed a downward trend in fluctuations. Generally, the overall difference of sustainable high-quality development presented a downward trend in fluctuations.

3.3.2. Regional Differences

From Figure 6, it can be seen that the polarization of inter-regional differences of sustainable high-quality forestry development in the four regions is significant. The difference between the eastern and western regions is significantly higher than that in the central and northeastern regions. The reason for this is that the provinces in the eastern region are distributed vertically and span large distances. The difference in climate and soil are also more significant, which leads to a significant difference in forest endowment resources. Thus, large internal differences occur in terms of sustainable high-quality forestry development among regions. The small regional difference in Northeast China is mainly due to the implementation of the policy of revitalizing the old industrial base in Northeast China, the increase in forestry special funds, and the similar climate and soil conditions in Northeast China, which result in there being little difference in the high-quality development level of regional forestry. In terms of evolution trend, the regional differences in the eastern and western regions show a trend of first rising and then decreasing, with a slow decline in the central region, and no significant change in the northeast region from 2005 to 2007; from 2007 to 2012, the differences between the eastern and western regions show a fluctuating upward trend, the central region shows little change, and the northeast region shows a downward trend, achieving a significant decline in 2010–2011; from 2012 to 2016, the eastern region shows a trend of declining first and then rising, the western region slowly declined, and the central and northeastern regions changed steadily; the difference in the eastern region declined first and then rebounded steadily, the western region rose first and then fell, the central region had a small fluctuation, and the northeast region did not change substantially after 2016. In general, the regional differences between the eastern and western regions are large and fluctuate more frequently (fluctuating between 0.151–0.360). The overall trend in the central region is relatively stable (fluctuating between 0.084–0.159). The regional differences in the northeast region remain stable after the decline (fluctuating between 0.012–0.181).

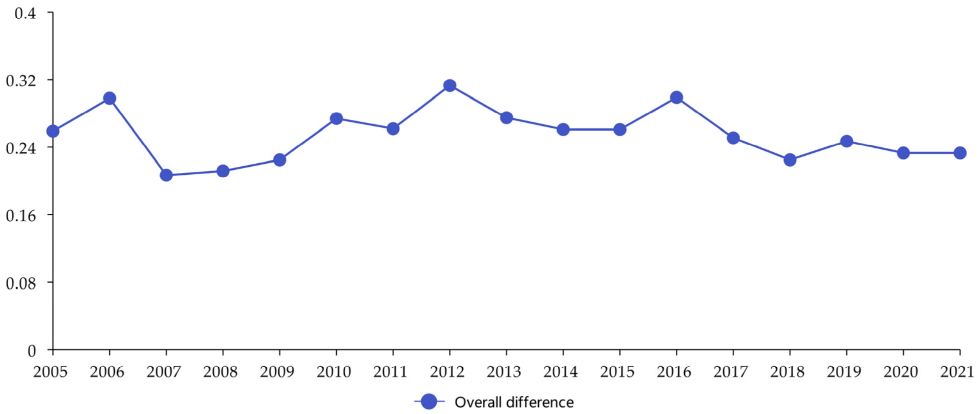


Figure 5. The evolution trend of overall difference of sustainable high-quality forestry development from 2005 to 2021.

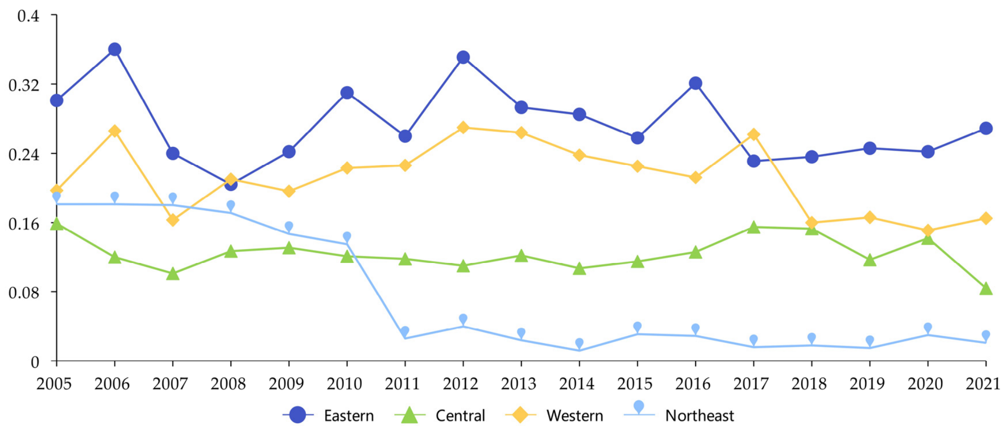


Figure 6. The evolution trend of regional difference of sustainable high-quality forestry development from 2005 to 2021.

3.3.3. Inter-Regional Difference

As can be seen from Figure 7, the level of sustainable high-quality forestry development varies between different regions. The difference between the western–eastern region is the most significant, with a mean value of 0.323, followed by the difference between the western–central and the central–eastern regions, with the mean values of 0.296 and 0.274. It can be seen that the difference between the western region and the eastern and central regions is large. The reason for this phenomenon is that the western region has a shortage of forest resources, economic foundation, and innovative resources. The differences between the northeast and western, eastern, and central regions are relatively small, with mean values of 0.1961, 0.1864, and 0.1622. The regional differences between the northeast and other regions are relatively small. The evolution trends of the western–eastern, western–central, and central–eastern regions are generally similar and fluctuate frequently. The overall regional difference between the northeast–western regions shows a downward trend, from 0.260 in 2005 to 0.147 in 2021, a decrease of 43.46%. The difference between the northeast–eastern region is relatively stable, fluctuating between 0.142 and 0.234. The difference between the northeast and central regions first declines and then rises.

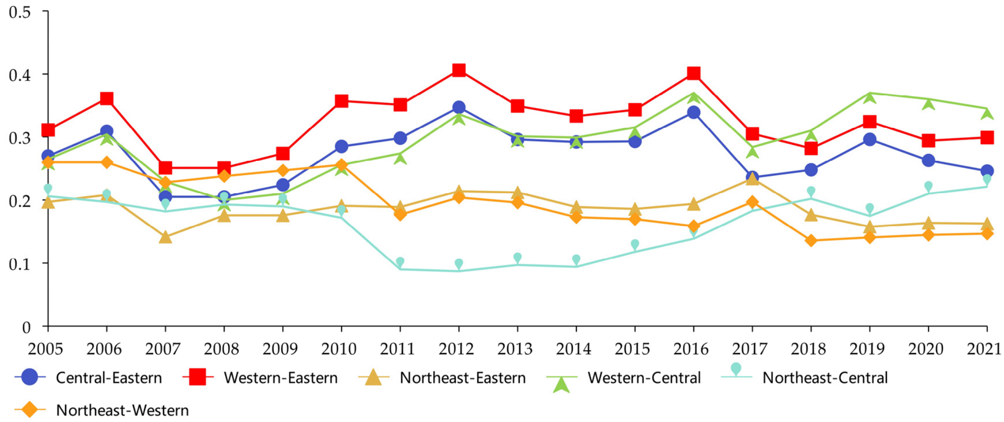


Figure 7. The evolution trend of inter-regional difference of sustainable high-quality forestry development from 2005 to 2021.

3.3.4. Reasons for Regional Differences and Their Contribution Rate

From Figure 8, it can be deduced that the proportion of between-group variation is the largest, and the average contribution rate during the observation period is 48.4%. The between-group variation fluctuated between 40% and 58% from 2005 to 2016. The variation showed a sharp downward trend, from 57.44% in 2016 to 36.27% in 2017, a decrease of about 21%. In order to achieve sustainable high-quality forestry development, it is necessary to further narrow regional differences and improve the level of inter-regional coordination. The within-group variation decreased slightly, from 27.15% in 2005 to 25.6% in 2019, and the overall change was negligible. The intensity of transvariation mainly reflects the impact of cross-overlap between regions, and its value increased from 23.71% in 2005 to 25.03% in 2021. The above analysis shows that regional differences have the greatest impact on the spatial heterogeneity of sustainable high-quality forestry development in China. It is necessary to further narrow regional differences. In addition, it is also necessary to pay attention to the impact of regional and inter-regional differences, balance development level within regions, promote cooperation between regions, and improve the quality of forestry development.

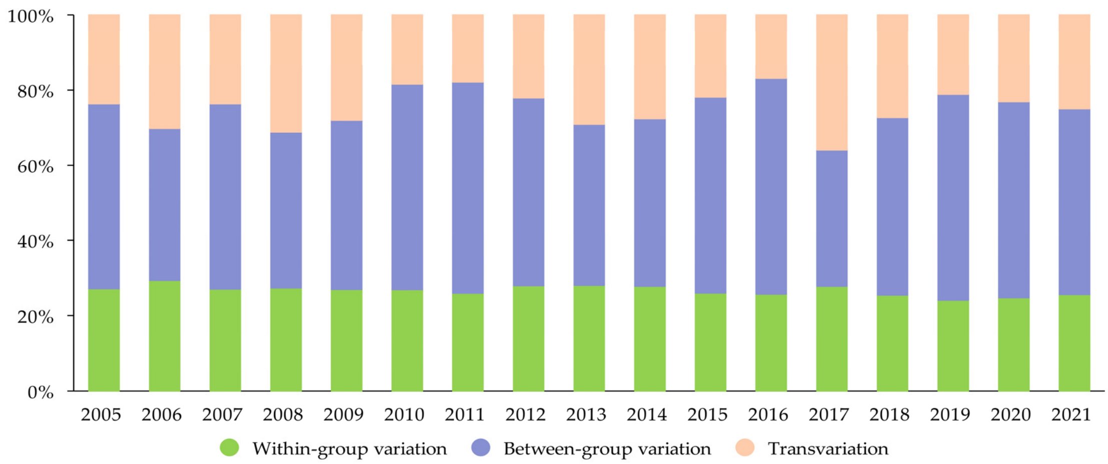


Figure 8. The contribution rate of regional difference of sustainable high-quality forestry development from 2005 to 2021.

4. Discussion

The results of the calculation of the sustainable high-quality development level of forestry show that the leading position of Zhejiang and Shanghai is consistent with previous research results [11]. Provinces with high levels have obvious economic development advantages, fast factor flow, and abundant innovation resources, which have provided impetus for the sustainable high-quality forestry development. They are followed by Yunnan, Guizhou, Sichuan, and other western provinces. Heilongjiang, Anhui, and Hubei are located in the middle, and Inner Mongolia, Jilin and Liaoning are located in the lower run. It is worth noting that these areas have abundant forestry resources, but they are limited by the relatively extensive forestry development mode, resulting in a low level of sustainable high-quality forestry development. Gansu, Ningxia, Qinghai, and other western provinces are at the lowest levels. The forest resources of these provinces are relatively scarce, and the economic support is inadequate for forestry development. However, most provinces have improved the level of sustainable high-quality forestry development and moved towards a higher stage through the continuous deepening of forestry reform. There are still great differences among provinces, and the distribution balance is poor. The forestry development in China presents a pattern of coexistence of high and low level in the eastern regions, scattered distribution in the central regions, weak development in the western regions, and stable development in the northeast regions. The differences in different provinces are reasonable. Although, to a certain extent, the economic development will affect the development of various industries in a region, it does not mean that the level of economic development is necessarily proportional to the industrial development level. It is also constrained by other factors that affect the development of industries. For example, the development of the forestry industry is not only affected by regional economy and infrastructure, but also depends on the reality of factor endowments in a region [43]. The eastern regions, such as Beijing and Tianjin, have strong economic strength but a poor forest resource base; thus, the sustainable high-quality forestry development level is relatively lower than for other regions. China's forest resources are concentrated in the eastern and certain central regions. With the continuous proposal of environment-friendly society, ecological civilization construction, new economic normal, and sustainable high-quality development, it is urgent to attach importance to the development and construction of forestry. Therefore, the forestry levels in Shandong, Fujian, Zhejiang, Guangdong, Guizhou, Hunan, and other provinces are relatively high, and are in accordance with the actual situation.

From the analysis of the temporal and spatial evolution and state transfer of the sustainable high-quality development level of forestry, it can be seen that the sustainable high-quality development of forestry in China has a significant spatial correlation, and has produced a strong spatial agglomeration effect. In general, the atmosphere, water, soil, and other ecological conditions are important factors affecting forest resources, and these factors often have the characteristics of crossing provincial administrative boundaries. Therefore, the spatial association among provinces for sustainable high-quality forestry development is strengthened, and this is obvious between neighboring provinces. These factors will not change significantly in a short period of time; thus, the spatial association of sustainable high-quality forestry development index in China will remain relatively stable. What is more, inter-regional differences are the main reasons for the differences. For the eastern regions with a high level of sustainable high-quality forestry development, it is necessary to tap its own advantages, promote the rational flow, and balance the allocation of production factors, such as advanced technology, professional skills, and sustainable high-quality endowments, so as to further improve the level of sustainable high-quality forestry development. For the central and northeastern regions and the western regions with relatively low levels of sustainable high-quality forestry development, it is necessary to fully implement revitalization strategies, such as the rise in the central region, the large-scale development of the western region, and the old industrial base in the northeast, and the provinces with rich forestry resources in the central and northeastern regions should improve their extensive production methods and give full play to their own forestry characteristics. We must strengthen exchanges and cooperation with the eastern region, take the initiative to learn advanced forestry technology and management models, pay attention to the cultivation and introduction of forestry skills, improve the utilization efficiency of forestry skills, and effectively prevent the loss of skills, so as to improve the level of sustainable high-quality forestry development and narrow the gap with regions with high levels of sustainable high-quality forestry development.

5. Conclusions and Suggestions

5.1. Conclusions

Based on the construction of a comprehensive evaluation index system for sustainable high-quality forestry development, including innovation-driven, coordinated development, green ecology, opening up, and benefit sharing, the comprehensive level of sustainable high-quality forestry development from 2005 to 2021 has been calculated in this research. The kernel density estimation, Moran's I, Markov chain, and Gini coefficient are used to analyze space–time dynamic evolution and regional differences of sustainable high-quality forestry development. The conclusions are as follows:

First, generally, the sustainable high-quality forestry development level of most provinces in China has steadily increased year by year. The level of most provinces in the east is relatively high, followed by the central and northeastern provinces. The development level in the west is relatively low. There is an uneven state of regional development.

Second, from the results of the kernel density estimation, the levels of sustainable high-quality forestry development in China and the eastern, central, and western regions have been improved. The level in the northeast region first rose and then decreased. In terms of absolute difference, it gradually widened in the eastern region and polarized. There is no obvious change in the differences between the central and western regions. The differences in the northeast region first expanded and then narrowed. Thus, the distribution is more even throughout the country, and the gap continues to expand.

Third, from the results of Moran's I, the sustainable high-quality development of forestry in China has a significant spatial correlation except for a few years, and has produced a strong spatial agglomeration effect. It consistently exhibits the distribution characteristics of positive agglomeration.

Fourth, from the calculation results of the Markov chain, the distribution status of sustainable high-quality forestry development is relatively stable, and there is a phenomenon of club convergence. At the same time, there is a certain polarization in the evolution of the growth of the sustainable high-quality forestry development index. The development level of adjacent regions has a significant impact on the regional development, but it is more likely to remain the same. Furthermore, it is difficult to improve the process of sustainable high-quality development of forestry in China, and it is hard to achieve a higher level. Our results show that development is gradual, and it is difficult to achieve progress in a short period of time.

Fifth, from the results of the Gini index, inter-regional differences are the main reasons for the differences. The regional differences between the western and other regions are the most significant, and the differences between the northeast and the western, eastern, and central regions are small. From the perspective of regional differences, the difference between the eastern and western regions is large, and it is small between the central and northeastern regions.

5.2. Suggestions

Based on the above research conclusions, the following suggestions are proposed:

First, take the new development concept as a guide and strive to achieve the common transformation of power, quality, and efficiency. The new development concept can help forestry development break through the bottleneck of the quantitative development model, make sustainable high-quality forestry development more efficient, systematic, fair, and lead to more sustainable development.

Second, continue to promote scientific and technological innovation, introduce better scientific and technological resources into the forestry field, and achieve technological breakthroughs. To make up for shortcomings, it is necessary to optimize the forestry public service system, enhance forest management capacity, and continuously improve people's sense of happiness.

Finally, it is necessary to eliminate regional boundaries and promote the coordinated development of sustainable high-quality forestry among regions.

At present, the overall difference in the high-quality development of forestry in China is still significant, and the difference between regions is the main reason for the overall difference. It is necessary to further promote inter-regional exchanges and cooperation under the guidance of helping the weak via the strong. Improve preferential policies for the flow of innovative resources and scientific and technological skills to the western and northeastern regions, and coordinate and promote the coordinated development of the regional forestry industry.

Author Contributions: Conceptualization, Y.J. and S.Z.; methodology, Y.J. and S.Z.; software, Y.J. and S.Z.; data curation, Y.J. and S.Z.; writing—original draft preparation, Y.J. and S.Z.; writing—review and editing, Y.J. and S.Z.; visualization, Y.J. and S.Z.; supervision, Y.J. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the general project of the National Social Science Fund of China, grant number 20BJY077.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Högbom, L.; Abbas, D.; Armolaitis, K.; Baders, E.; Futter, M.; Jansons, A.; Jõgiste, K.; Lazdins, A.; Lukminė, D.; Mustonen, M.; et al. Trilemma of Nordic–Baltic Forestry—How to Implement UN Sustainable Development Goals. *Sustainability* **2021**, *13*, 5643. [CrossRef]
2. Ke, S.F.; Qiao, D.; Zhang, X.X.; Feng, Q.Y. Changes of China's forestry and forest products industry over the past 40 years and challenges lying ahead. *J. For. Policy Econ.* **2021**, *123*, 102352. [CrossRef]
3. Ma, Z.Y.; Hu, C.; Huang, J.L.; Li, T.; Lei, J.P. Forests and Forestry in Support of Sustainable Development Goals (SDGs): A Bibliometric Analysis. *Forests* **2022**, *13*, 1960. [CrossRef]
4. Zhang, X.; Ke, S.; Xu, T.; Qiao, D. Review of China's Forestry Industry over the Past 70 Years and an Outlook for the Future. *J. Int. For. Rev.* **2020**, *22*, 269–282. [CrossRef]
5. Wang, S.Y.; Tian, X.J. Research on Sustainable Closed-Loop Supply Chain Synergy in Forest Industry Based on High-Quality Development: A Case Study in Northeast China. *Forests* **2022**, *13*, 1587. [CrossRef]
6. Hiltunen, M.; Strandman, H.; Kilpeläinen, A. Optimizing forest management for climate impact and economic profitability under alternative initial stand age structures. *J. Biomass Bioenergy* **2021**, *147*, 106027. [CrossRef]
7. Bojan, S.; Milena, L. Causality and Importance of Sustainable Forestry Goals: Strategic and Tactical Assessment by DEMATEL and AHP. *J. For.* **2022**, *14*, 77.
8. Xu, K.F. Study on forest cutting management under high-quality development of forestry. *J. Jiangsu Sci. Technol. Inf.* **2021**, *38*, 29–32.
9. Zhang, Q.; Wan, Z.F. Research on the System Dynamic Mechanism of high-quality Development of Forestry Industry. *J. Issues For. Econ.* **2021**, *41*, 607–613.
10. Ren, B.; Li, Y.M. On the Construction of Chinese high-quality Development Evaluation System and the Path of Its Transformation in the New Era. *J. Shaanxi Norm. Univ. (Philos. Soc. Sci. Ed.)* **2018**, *47*, 105–113.
11. Chen, X.Y.; Guan, Z.J. Measurement of China's Forestry High—Quality Development Level and Analysis of Regional Differences. *J. China For. Econ.* **2022**, *172*, 7–11.
12. Yang, X.; Deng, Y.J.; Qu, X. Evaluation of high-quality development level of forestry: A case study of Guizhou Province. *J. Wuhan Tech. Coll. Commun.* **2020**, *22*, 18–27.
13. Mai, Q.; Bai, M.; Li, L. Study on the Dynamic Evolution and Regional Differences of the Level of High-Quality Economic and Social Development in China. *J. Sustain.* **2022**, *15*, 382. [CrossRef]
14. Shen, W.K.; Xia, W.Q.; Li, S.F. Dynamic Coupling Trajectory and Spatial-Temporal Characteristics of High-Quality Economic Development and the Digital Economy. *Sustainability* **2022**, *14*, 4543. [CrossRef]

15. Yang, J.S.; Wang, F.Y. Developing a quantitative index system for assessing sustainable forestry management in Heilongjiang Province, China: A case study. *J. For. Res.* **2016**, *27*, 611–619. [CrossRef]
16. Rodriguez, A.M.; Osho, G.; Solomon, S.L. An Econometric Planning Model of Urban Forestry as a Measure of Sustainability: A Matrix of Action and Change. *J. Int. J. Sustain. Dev. World Policy* **2017**, *6*, 9–32. [CrossRef]
17. Lu, S.S.; Li, J.P.; Guan, X.L.; Gao, X.J.; Gu, Y.H.; Zhang, D.H.; Mi, F.; Li, D.D. The evaluation of forestry ecological security in China: Developing a decision support system. *J. Ecol. Indic.* **2018**, *91*, 664–678. [CrossRef]
18. Drasospolino; Zauhar, S.; Bambang, S.; Hermawan. The Forest Management Policy and its Influence in Forest area Utilization and Empowering Forest Communities in Yogyakarta. *J. Land Use Policy* **2023**, *127*, 106539. [CrossRef]
19. Meine, V.N. Agroforestry-Based Ecosystem Services: Reconciling Values of Humans and Nature in Sustainable Development. *J. Land* **2021**, *10*, 699.
20. Katila, P. Forestry development priorities in Finnish national forest programmes. *J. Int. For. Rev.* **2017**, *19*, 125–138. [CrossRef]
21. Faizul, H.; Collins, G.N. Environmental Policy, Sustainable Development, Governance Mechanisms and Environmental Performance. *J. Bus. Strategy Environ.* **2018**, *27*, 415–435.
22. Pan, W.; Wang, J.; Lu, Z.; Liu, Y.S.; Li, Y.R. High-quality development in China: Measurement system, spatial pattern, and improvement paths. *J. Habitat Int.* **2021**, *118*, 102458. [CrossRef]
23. Wang, B.; Zhao, J.; Dong, K.Y.; Jiang, Q.Z. High-quality energy development in China: Comprehensive assessment and its impact on CO_2 emissions. *J. Energy Econ.* **2022**, *110*, 106027. [CrossRef]
24. Hong, Y.; Liu, W.; Song, H. Spatial Econometric Analysis of Effect of New Economic Momentum on China's high-quality Development. *J. Res. Int. Bus. Financ.* **2022**, *61*, 101621. [CrossRef]
25. Zhou, C.L.; Li, X.Y.; Lin, X.Q.; Cheng, M. Influencing factors of the high-quality economic development in China based on LASSO model. *J. Energy Rep.* **2022**, *8*, 1055–1065. [CrossRef]
26. Wang, L.H.; Wang, Z.; Ma, Y.T. Does environmental regulation promote the high-quality development of manufacturing? A quasi-natural experiment based on China's carbon emission trading pilot scheme. *J. Socio-Econ. Plan. Sci.* **2022**, *81*, 101216. [CrossRef]
27. Ma, Z.; Liu, T.; Li, J.; Liu, Z.; Chen, W. Spatial Effect Analysis of Forestry Technology Innovation on Forestry Industry Economic Growth. *Forests* **2023**, *14*, 557. [CrossRef]
28. Tian, W.; Li, W.H.; Song, H.F.; Yue, H.D. Analysis on the difference of regional high-quality development in Beijing-Tianjin-Hebei city cluster. *J. Procedia Comput. Sci.* **2022**, *199*, 1184–1191. [CrossRef]
29. Feng, Y.J.; Dong, X.; Zhao, X.M.; Zhu, A.K. Evaluation of urban green development transformation process for Chinese cities during 2005–2016. *J. Clean. Prod.* **2020**, *266*, 121707. [CrossRef]
30. Karnatz, C.; Kadam, P.; Hamilton, H.; Smyth, R.; Bawa, R.; Dwivedi, P. Impacts of Sustainable Forestry Initiative fiber sourcing on the forestry best management practices and biodiversity conservation in the SE United States. *J. Trees For. People* **2023**, *11*, 100349. [CrossRef]
31. Zhang, X.; Guo, W.; Bashir, B.M. Inclusive green growth and development of the high-quality tourism industry in China: The dependence on imports. *J. Sustain. Prod. Consum.* **2022**, *29*, 57–78. [CrossRef]
32. Wang, F.Y.; Wang, R.; He, Z.L. The impact of environmental pollution and green finance on the high-quality development of energy based on spatial Dubin model. *J. Resour. Policy* **2021**, *74*, 102451. [CrossRef]
33. Zhang, F.T.; Tan, H.M.; Zhao, P.; Gao, L.; Ma, D.L.; Xiao, Y.D. What was the spatiotemporal evolution characteristics of high-quality development in China? A case study of the Yangtze River economic belt based on the ICGOS-SBM model. *J. Ecol. Indic.* **2022**, *145*, 109593. [CrossRef]
34. Chen, Y.; Tian, W.T.; Zhou, Q.; Shi, T. Spatiotemporal and driving forces of Ecological Carrying Capacity for high-quality development of 286 cities in China. *J. Clean. Prod.* **2021**, *293*, 126186. [CrossRef]
35. Widiyanto, A.; Fauziyah, E.; Suhartono. The evaluation of agroforestry development in marginal land area of Gunungkidul, Ina. *J. IOP Conf. Ser. Earth Environ. Sci.* **2022**, *1109*, 012090. [CrossRef]
36. Liu, H.; Liu, J.W.; Li, Q. Asymmetric Effects of Economic Development, Agroforestry Development, Energy Consumption, and Population Size on CO2 Emissions in China. *Sustainability* **2022**, *14*, 7144. [CrossRef]
37. Noémie, H.R.; Geneviève, L.; Ève, D.; David, R.; Alain, O.; Fabien, L.; Alain, C. Temperate Agroforestry Development: The Case of Québec and of France. *J. Sustain.* **2020**, *12*, 7227.
38. Huang, W.; Deng, X.Z.; Lin, Y.Z.; Jiang, Q.O. An Econometric Analysis of Causes of Forestry Area Changes in Northeast China. *J. Procedia Environ. Sci.* **2010**, *2*, 557–565. [CrossRef]
39. Chia, E.L.; Hubert, D.; Enongene, K.; Tegegne, Y.T. An AHP Assessment of Barriers in Adopting Sustainable Forest Management Practices in The Context Of Carbon Emission Reductions in Cameroon. *J. Sustain. For.* **2020**, *39*, 379–391. [CrossRef]
40. Chen, X.L.; Di, Q.B.; Jia, W.H.; Hou, Z.W. Spatial correlation network of pollution and carbon emission reductions coupled with high-quality economic development in three Chinese urban agglomerations. *J. Sustain. Cities Soc.* **2023**, *94*, 104552. [CrossRef]
41. Lu, H.; Zhang, M.; Nian, W. The Spatial Spillover Effects of Environmental Regulations on Forestry Ecological Security Efficiency in China. *Sustainability* **2023**, *15*, 1875. [CrossRef]

42. Qu, Y.B.; Wang, S.L.; Tian, Y.Y.; Jiang, G.H.; Zhou, T.; Meng, L. Territorial spatial planning for regional high-quality development—An analytical framework for the identification, mediation and transmission of potential land utilization conflicts in the Yellow River Delta. *J. Land Use Policy* **2023**, *125*, 106462.
43. Tan, J.; Su, X.; Wang, R. Exploring the Measurement of Regional Forestry Eco-Efficiency and Influencing Factors in China Based on the Super-Efficient DEA-Tobit Two Stage Model. *Forests* **2023**, *14*, 300. [CrossRef]