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# *Research on the Evaluation of the Development Level of New Quality Productive Forces in China's Agriculture*

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**Abstract:** Cultivating new agricultural productive forces is an inherent requirement and a key focus for promoting high-quality agricultural development and building a strong agricultural country. Based on panel data from 30 provinces and cities in mainland China from 2012 to 2022, the entropy method, Dagum Gini coefficient, and Moran's I were used to study the development level of new agricultural productive forces. The results show that: first, the development level of China's new agricultural productive forces has steadily improved, and at the regional level, it shows a decreasing trend in the order of the eastern, central, western, and northeastern regions; second, the degree of inequality in the development of China's new agricultural productive forces has continued to expand, and the inter-regional gap is the main reason for the unbalanced development; third, the development of China's new agricultural productive forces has a positive spatial autocorrelation in space, with a concentrated distribution. Accordingly, policy recommendations are put forward from the perspective of the overall development level and regional difference characteristics of new agricultural productive forces.

**Keywords:** agricultural new quality productive forces; development level; entropy method; Dagum Gini coefficient; Moran’s index

## 1. Introduction

In recent years, with the proposal of new productive forces and their application in the agricultural sector, agricultural new productive forces have gradually become a research hotspot in academic circles. In February 2025, the Central No. 1 Document put forward the concept of "agricultural new productive forces" for the first time, clearly stating that "we should rely on scientific and technological innovation to lead the agglomeration of advanced production factors and develop agricultural new productive forces in accordance with local conditions". This marks that China's agricultural development has entered a new stage, which is not only a profound insight into the current situation of China's agricultural development, but also an accurate grasp of the future direction of agricultural development. Against this background, constructing a scientific, reasonable, comprehensive and systematic evaluation index system for agricultural new productive forces to study the development level and characteristics of agricultural new productive forces in various regions has important theoretical and practical significance. It not only provides a scientific basis for formulating development strategies in accordance with local conditions, but also helps guide the optimal allocation of agricultural resources, improve the level of agricultural modernization and sustainable development, and promote high-quality agricultural development.

Marxist political economy holds that productive forces, composed of three elements: laborers, means of labor and objects of labor, are the decisive force driving the development of human society[1]. Based on the Marxist theory of the three elements of productive forces, agricultural new productive forces realize the leap of productive forces through the optimal combination of new-quality laborers, new-quality means of labor and new-quality objects of labor, marking a new stage and new paradigm of productive forces development[2]. Academic circles have carried out extensive and in-depth discussions on the theoretical connotation, enabling effect and practical path of agricultural new productive forces. Some scholars have pointed out that the core essence of the agricultural new productive forces lies in taking agricultural digitalization and intellectualization as the main line, actively integrating scientific and technological innovation resources, accelerating the in-depth transformation and upgrading of agriculture, realizing the development of industrial productive forces from quantitative to qualitative changes, continuously improving the total factor productivity of agriculture such as labor, knowledge, technology, management, data and capital, and achieving high-quality agricultural development[3]. Some scholars have proved that it plays a significant role in accelerating the construction of digital villages, promoting green agricultural development and improving the resilience of the industrial chain[4]. These research results indicate that the agricultural new productive forces have become a new engine for promoting high-quality agricultural development.

Regarding the construction of the index system for agricultural new productive forces, most scholars have carried out the construction from the three elements of productive forces, namely labor, labor resources and labor objects[5]. Some scholars have based on the mechanism of agricultural new productive forces, constructed a comprehensive evaluation index system for agricultural new productive forces based on three dimensions: agricultural scientific and technological productive forces, agricultural green productive forces and agricultural digital productive forces[6]. These studies have added diverse perspectives to the quantitative evaluation of agricultural new productive forces, but at the same time, they have also exposed some problems: at present, the academic circle has a single method for constructing the index system of agricultural new productive forces, and the conceptual definition of index selection is vague, which still needs to be further expanded. Based on this, this study closely adheres to the theoretical connotation of agricultural new productive forces, innovatively integrates multiple methods, focuses on regional heterogeneity, and comprehensively uses the entropy method, Dagum Gini coefficient and Moran's I. It not only analyzes the overall development level of agricultural new productive forces, but also further explores their dynamic transition paths and spatial correlation characteristics, reveals the complex evolutionary characteristics of agricultural new productive forces, and provides empirical basis for formulating policies in accordance with local conditions.

# 2. Model Selection and Data Description

## 2.1. Model Selection

### 2.1.1. Entropy Method

To objectively reflect data characteristics, the entropy method is adopted to evaluate the comprehensive development level of agricultural new productive forces. As an objective weighting method based on data dispersion, the entropy method can effectively reduce the influence of human factors and subjective biases.

The specific steps are as follows:

1. Construct the original index data matrix.

$$X = (X_{ij})mn(1 \leq i \leq m), (1 \leq j \leq n) \tag{1}$$

Assuming there are m regions and n evaluation indicators, $X_{ij}$ represents the value of the *j*-th indicator in the *i*-th region.

2. Data standardization.

The original data are standardized to eliminate the influence of dimensions and orders of magnitude.

For positive indicators, the standardization formula is:

$$X'_{ij} = \frac{X_{ij} - \min X_{ij}}{\max X_{ij} - \min X_{ij}} + 0.0001 \tag{2}$$

For negative indicators, the standardization formula is:

$$X'_{ij} = \frac{\max X_{ij} - X_{ij}}{\max X_{ij} - \min X_{ij}} + 0.0001 \tag{3}$$

In formulas (2) and (3), $\max X_{ij}$ and $\min X_{ij}$ denote the maximum and minimum values of the *j*-th indicator, respectively; $X_{ij}$ is the original data sample value, and $X'_{ij}$ is the normalized data sample value. The specific direction of each indicator is marked in Table 1.

3. Calculate the weight of each indicator.

$$P_{ij} = \frac{X'_{ij}}{\sum_{i=1}^{m} X'_{ij}} \tag{4}$$

Using formula (4), the weight of the *i*-th region's indicator value under the *j*-th indicator is calculated, obtaining $P = (P_{ij})_{mn}$.

Calculate the entropy value of each indicator

$$e_j = -\frac{1}{\ln m}\sum_{i=1}^{m} P_{ij} \times \ln P_{ij} \tag{5}$$

4. Calculate the difference coefficient of each indicator.

$$g_j = 1 - e_j \tag{6}$$

$g_j$ is the difference coefficient. A larger difference coefficient indicates a higher relative importance of the indicator in the evaluation.

5. Determine the weight of each indicator.

$$W_j = \frac{g_j}{\sum_{j=1}^{n} g_j} \tag{7}$$

6. Calculate the comprehensive score of agricultural new productive forces.

$$Z = \sum_{j=1}^{n} P_{ij} \times W_j \tag{8}$$

## 2.1.2. Dagum Gini Coefficient

The Dagum Gini coefficient is used to decompose the overall disparity in the development of China's agricultural new productive forces into three components[7]: within-group disparity（$G_w$）, between-group disparity（$G_b$）, and hypervariable density（$G_t$）, which satisfy the relationship: $G=G_w+G_b+G_t$.The formula is as follows:

$$G = \frac{\sum_{j=1}^{q}\sum_{h=1}^{q}\sum_{i=1}^{nj}\sum_{r=1}^{nh}\left|y_{ji} - y_{hr}\right|}{2n^2\overline{y}} \tag{9}$$

In formula (9), G represents the overall Gini coefficient; a larger G indicates a greater gap in the development of agricultural new productive forces among China's provinces. n is the number of provinces, q is the number of divided regions, $n_j$ and $n_h$ are the numbers of provinces in regions j and h, respectively; i and r are the numbers of provinces within regions; $y_{ji}$ and $y_{hr}$ represent the development level indices of agricultural new productive forces in provinces within regions j and h, respectively.

## 2.1.3. Moran's Index.

Spatial exploratory analysis methods are mainly used to examine spatial correlations between different regions. The global Moran's index and local Moran's index are employed to evaluate the spatial distribution patterns and agglomeration characteristics of the development indices of agricultural new productive forces across China's regions. The formula is as follows:

$$I = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}\left(X_i - \bar{X}\right)\left(X_j - \bar{X}\right)}{S^2 \sum_{i=1}^{n}\sum_{j=1}^{n} W_{ij}} \qquad (10)$$

In this formula, n represents the total number of regions; $X_i$ and $X_j$ are the attribute values of regions $i$ and $j$, respectively; $S^2$ is the variance of the attribute values; $W_{ij}$ is the spatial adjacency weight matrix, with the following formula:

$$W_{ij}\begin{cases} 0, \text{When province } i \text{ and province } j \text{ are adjacent} \\ 1, \text{When province } i \text{ and province } j \text{ are not adjacent} \end{cases} (i \neq j) \qquad (11)$$

## 2.2. Data Description

The study period was from 2012 to 2022, and the study subjects were 30 provinces in China (excluding Tibet and Hong Kong, Macao, and Taiwan). The National Bureau of Statistics' division of geographical regions was used, which is divided into eastern, central, western, and northeastern regions. Specifically, the eastern region includes 10 provinces (cities): Beijing, Tianjin, Hebei, Shanghai, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan; the central region includes Shanxi, Anhui, Jiangxi, Henan, Hubei, and Hunan provinces; the western region includes Inner Mongolia, Guangxi, Chongqing, Sichuan, Guizhou, Yunnan, Tibet, Shaanxi, Gansu, Qinghai, Ningxia, and Xinjiang provinces (regions and municipalities); and the northeastern region includes Liaoning, Jilin, and Heilongjiang provinces.

The data for this study primarily comes from the National Bureau of Statistics website, provincial statistical yearbooks, the China Statistical Yearbook, the China Rural Statistical Yearbook, and the China Fiscal Yearbook. For individual missing values, the mean or linear interpolation method was used to fill in the gaps. To stabilize the variance, some indicators were log-transformed.

# 3. Construction of Agricultural New Productive Forces Index System and Level Measurement

## 3.1. Construction of a Comprehensive Evaluation Index System for Agricultural New Productive Forces

Based on the connotation of new agricultural productive forces, and considering existing research and data availability, a comprehensive evaluation index system for new agricultural productive forces is constructed with 15 indicators across three dimensions:

agricultural laborers, agricultural labor objects, and agricultural labor tools[8]. The specific indicators and their explanations are shown in Table 1.These indicators reflect that it drives agriculture towards a more efficient, eco-friendly, economical, and innovative direction through technological innovation, efficiency improvement, sustainable development, and industrial integration, forming a sharp contrast with traditional agriculture.

**Table 1.** Comprehensive Evaluation Index System of Agricultural New Productive Forces

| | Primary indicator | Secondary indicators | Tertiary indicators | New quality attribute annotation | Measurement method | Attributes |
|---|---|---|---|---|---|---|
| Agricultural New Productive Forces | Agricultural Laborers | Worker Skills | Level of Education | Enhancing productivity | Average years of education per rural labor force member | + |
| | | | Proportion of Rural Adult Technical Training | Assisting the labor force to adapt to technological upgrades | Number of graduates from rural adult cultural and technical training schools / rural population | + |
| | | Labor Productivity | Per Capita Output Value of the Primary Industry | Increasing agricultural production efficiency | Output value of the primary industry / number of people employed in the primary industry | + |
| | | | Per Capita Income of Rural Residents | Increasing farmers' income | Per capita disposable income of rural residents | + |
| | | Worker Employment Philosophy | Situation of Rural Labor Mobility | Optimizing resource allocation | Migrant workers / rural employed population | - |
| | Agricultural Labor Objects | Ecology Environment | Green and Environmental Protection | Protecting the ecological environment | Forest Coverage Rate | + |
| | | | | | Environmental Protection Fiscal Expenditure / Government Public Fiscal Expenditure | + |
| | | | Pollution Control | Achieving sustainable agricultural development | Agricultural COD Emission Proportion / Primary Industry Output Value Proportion | - |
| | | | | | Agricultural Ammonia-Nitrogen Emission Proportion / Primary Industry Output Value Proportion | - |
| | | New-quality Industry | Agricultural Industry | Enhancing agricultural economic vitality | Number of Farmers' Professional Cooperatives / Primary Industry Workers | + |
| | | | Situation of Agriculture, Forestry, Animal Husbandry, Fishery, and Service Industries | Perfecting the agricultural industry chain | Added Value of Agriculture, Forestry, Animal Husbandry, Fishery, and Service Industries | + |
| | Agricultural Labor Tools | Material Means of Production | Traditional Infrastructure | Ensuring stable agricultural development | Rural Road Mileage / Rural Population | + |
| | | | Digital Infrastructure | Promoting the modernization transformation of agriculture | Rural Broadband Access Users / Rural Households | + |
| | | | | | Length of Optical Cable Lines per Square Meter | + |
| | | | Energy Consumption | Reducing production costs | Energy Consumption of Agriculture, Forestry, Animal Husbandry, and Fishery / Total Output Value of Agriculture, Forestry, Animal Husbandry, and Fishery | - |
| | | | | | Per Capita Electricity Consumption in Rural Areas | + |
| | | Intangible Means of Production | Technological Innovation | Enhancing agricultural competitiveness | Number of Agricultural Science and Technology Workers | + |
| | | | | | Agricultural R&D Investment Stock | + |

| | | | |
|---|---|---|---|
| Level of Digitalization | Enhancing the level of agricultural innovation | Rural Digital Inclusive Finance Investment Index | + |
| | | Rural Digital Inclusive Finance Mobile Payment Index | + |

## 3.2. Analysis of the Development Index of Agricultural New Productive Forces in China and the Four Major Regions

Based on the calculation using provincial panel data from 2012 to 2022, as shown in Table 2, China's agricultural new productive forces development index presents a sustained growth trend. At the national level, the annual average growth rate of the agricultural new productive forces development index reaches 4.8%, with a cumulative increase of 0.074 index points. This indicates that the development level of China's agricultural new productive forces is improving at a slow pace, reflecting that under the innovation-driven development strategy, the system of agricultural new productive forces is in a transitional stage featuring both quantitative expansion and qualitative upgrading.

In the eastern region, the agricultural new productive forces development index rose from 0.158 in 2012 to 0.263 in 2022, with an annual average growth rate of 5.2%. In the central region, the index increased from 0.114 in 2012 to 0.192 in 2022, at an annual average growth rate of 5.3%. For the western region, the index grew from 0.102 in 2012 to 0.163 in 2022, with an annual average growth rate of 4.9%. In the northeastern region, the index went up from 0.105 in 2012 to 0.119 in 2022, at a relatively low annual average growth rate of 1.3%.

In summary, the development index of China's agricultural new productive forces shows the characteristic of "eastern region > central region > western region > northeastern region". This may be attributed to the accumulated advantages from the earlier development of the eastern region, which have facilitated the high agglomeration of innovative factors and the formation of synergistic effects. In contrast, the northeastern region, constrained by path dependence on traditional industries, has shown a sluggish performance in its agricultural economy during the new development stage.

In addition, in terms of the annual average growth rate, the order is "central region > eastern region > western region > northeastern region". The central region, with the fastest growth rate, is gradually narrowing the gap with the eastern region. This might be because the central region has gradually formed a momentum of catching up with the eastern region by undertaking industrial transfers from the east, increasing investment in innovation, and strengthening policy coordination. This implies that the central region is leveraging its own advantages and external opportunities to accelerate economic development and industrial upgrading, gradually narrowing the gap with the developed eastern region. The western region, relying on its unique resource endowments, is actively cultivating and enhancing agricultural new productive forces, injecting new impetus into regional agricultural modernization. The northeastern region, with a significantly low growth rate and insufficient development momentum, has seen its index linger at a low level for a long time.

**Table 2.** Development Index of China's Agricultural New Productive Forces

| Region | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | Annual average growth rate (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| eastern region | 0.158 | 0.162 | 0.176 | 0.202 | 0.201 | 0.218 | 0.255 | 0.274 | 0.320 | 0.284 | 0.263 | 5.2 |
| central region | 0.114 | 0.120 | 0.127 | 0.145 | 0.148 | 0.166 | 0.166 | 0.183 | 0.206 | 0.207 | 0.192 | 5.3 |
| western region | 0.102 | 0.103 | 0.118 | 0.132 | 0.130 | 0.164 | 0.151 | 0.175 | 0.188 | 0.191 | 0.163 | 4.9 |
| northeastern region | 0.105 | 0.111 | 0.119 | 0.126 | 0.095 | 0.103 | 0.123 | 0.125 | 0.135 | 0.143 | 0.119 | 1.3 |
| National average | 0.124 | 0.127 | 0.139 | 0.157 | 0.154 | 0.177 | 0.186 | 0.205 | 0.230 | 0.221 | 0.198 | 4.8 |

## 3.3. Temporal Changes in the Development Index of New-Quality Productivity in 4 Agriculture for the Whole Country and Four Major Regions

Figure 1 shows the dynamic changes in the development index of new-quality productivity in agriculture for the whole country and the four major regions from 2012 to 2022. Overall, although there were fluctuations in the development index of new-quality productivity in agriculture for the whole country and the four major regions during this period, the general development trend was positive, reflecting the continuous enhancement of China's new-quality productivity in agriculture. Specifically, the growth rate was relatively slow from 2012 to 2017, but it accelerated after 2018. In 2020, the index increased significantly due to intensified policy support and technology promotion. The development index of new-quality productivity in agriculture in the eastern region has been on the rise, with a marked increase in the growth rate from 2019 to 2020 and a stable growth rate after 2020. The development index of new-quality productivity in agriculture in both the central and western regions has also shown an upward trend. Although the central region's growth rate was slightly lower than that of the eastern region, it had a significant catch-up effect. The western region had a moderate growth rate but started from a lower level. The northeastern region had the slowest growth rate and lagged in development. By comparison, only the development index of new-quality productivity in agriculture in the eastern region was higher than the national average. The development indices of new-quality productivity in agriculture in the central, western, and northeastern regions were all lower than the national average, with the northeastern region at the bottom.

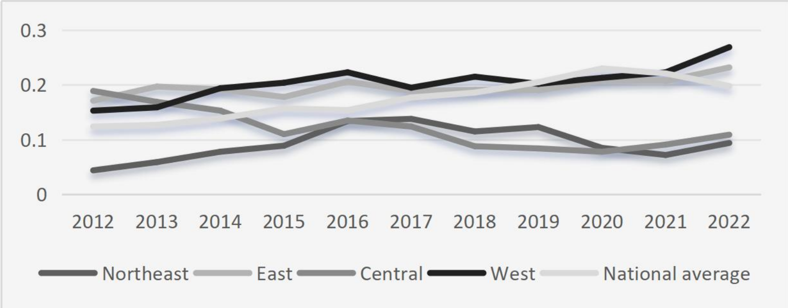


**Figure 1.** Temporal Evolution of the Development Index of New-Quality Productivity in Agriculture

# 4. Differences and Source Decomposition in the Development Level of New-Quality Productivity in Agriculture

## 4.1. Overall Differences and Contribution Rates

Figure 2 shows the overall differences in the development level of new-quality productivity in agriculture. From 2012 to 2022, the overall Gini coefficient for the country rose from 0.199 to 0.266, an increase of about 33.67%, with an average annual growth of around 3.4%. This indicates that the degree of inequality in the development of new-quality productivity in agriculture across the country has been continuously expanding. Although there were slight declines in some years, the overall trend was a steady upward increase.

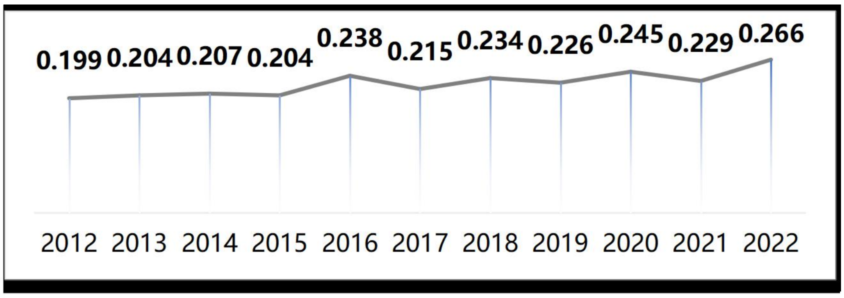


**Figure 2.** Overall Differences

Figure 3 shows the contribution rates of each part of the Gini coefficient for the development level of new-quality productivity in agriculture. The within-group contribution rate increased by 1.405% from 2012 to 2022, stabilizing between 24% and 26%. This reflects that the impact of differences within regions on overall inequality is relatively fixed and shows a gentle upward trend overall. The between-group contribution rate decreased from 52.011% to 51.047%, a reduction of 0.964 percentage points, with a slight overall decline but significant fluctuations in some years. The between-group contribution rate exceeded 50% in most years and always dominated, indicating that between-group inequality is the main contributing factor to the overall Gini coefficient. The contribution rate of the overlapping density showed a fluctuating change from 2012 to 2022, decreasing from 23.477% to 23.036%, a reduction of 0.441%. However, the fluctuation amplitude was large during this period, indicating that there were overlapping phenomena among different regions. The between-group difference is always the main factor leading to the overall difference, followed by the within-group difference, and the contribution of overlapping density is the smallest. This research conclusion is consistent with that of Judy et al.

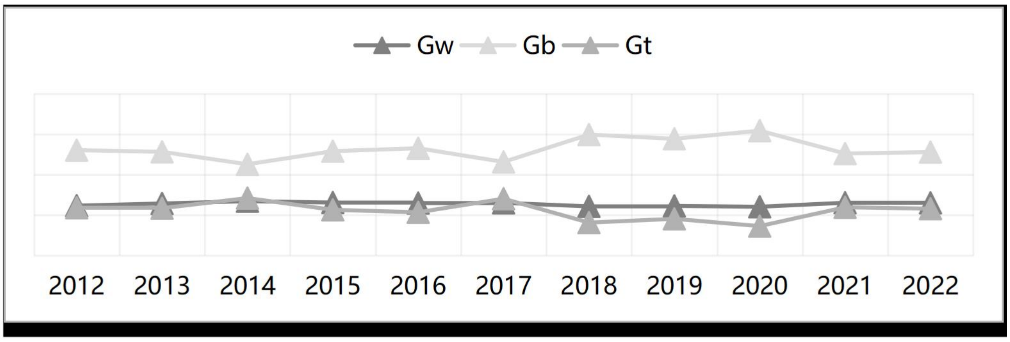


**Figure 3.** Contribution Rates

## 4.2. Intra-Regional Differences

Figure 4 shows the within-group trends of the development index of new-quality productivity in agriculture for the four major regions. In the Northeast region, the index increased from 0.044 in 2012 to 0.094 in 2022, showing a slow upward trend overall. In the eastern region, the index rose from 0.171 to 0.232, with internal differences continuing to widen. In the central region, the within-group Gini coefficient decreased from 0.189 to 0.109, the only area showing a downward trend. In the western region, the index increased from 0.153 to 0.269, the largest increase among the four regions, indicating that the degree of inequality in the development of new-quality productivity in agriculture in the western region is continuously expanding.

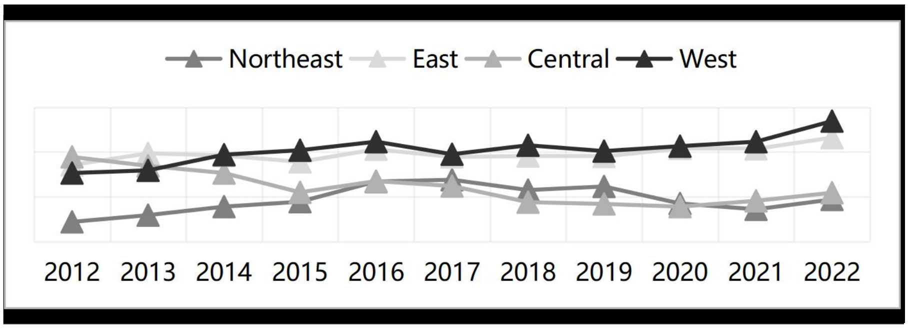


**Figure 4.** Within-Group Differences

## 4.3. Inter-Regional Differences

Figure 5 shows the between-group differences in the development index of new-quality productivity in agriculture among the four major regions. The between-group Gini coefficients for most regional combinations showed an increasing trend from 2012 to 2022, indicating that imbalances in the development of new-quality productivity in agriculture between regions are widespread and continuously expanding. The between-group

Gini coefficients reached higher points in multiple regional combinations in 2020 and 2022, suggesting that the differences in the development of new-quality productivity in agriculture between different regions were the greatest in these two years. There are significant differences in the between-group Gini coefficients among different regional combinations. The between-group Gini coefficient between the Northeast and other regions increased the most significantly, indicating that the development of new-quality productivity in agriculture in the Northeast region fluctuated the most compared to other regions.

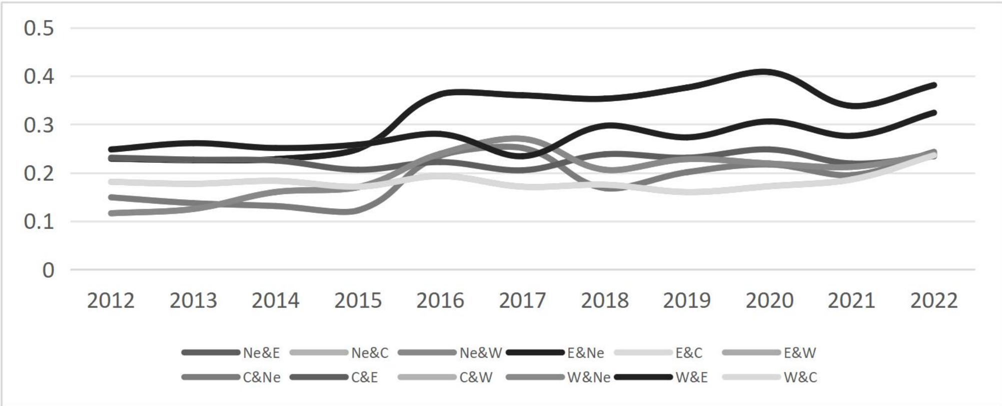


**Figure 5.** Between-Group Gaps

# 5. Spatial Distribution Characteristics of New-Quality Productivity in Agriculture

## 5.1. Global Moran's I

The results of the spatial clustering characteristics of the development index of new-quality productivity in agriculture are shown in Table 3. The Global Moran's I index for 2012–2022 is greater than zero, with an average Moran's I of 0.329. Except for 2012, it shows positive significance, indicating a moderate degree of positive spatial autocorrelation. This means that the index of new-quality productivity in agriculture shows similarity in space.

**Table 3.** Global Moran's I

| year | I | z value | p value |
|---|---|---|---|
| 2012 | 0.093 | 1.086 | 0.139 |
| 2013 | 0.168 | 1.734 | 0.041** |
| 2014 | 0.137 | 1.463 | 0.072* |
| 2015 | 0.324 | 3.061 | 0.001*** |
| 2016 | 0.270 | 2.602 | 0.005*** |
| 2017 | 0.188 | 1.900 | 0.029** |
| 2018 | 0.428 | 3.954 | 0.000*** |
| 2019 | 0.384 | 3.578 | 0.000*** |
| 2020 | 0.357 | 3.343 | 0.000*** |

| | | | |
|---|---|---|---|
| 2021 | 0.184 | 1.867 | 0.031** |
| 2022 | 0.203 | 2.030 | 0.021** |
| 平均 | 0.329 | 3.108 | 0.001*** |

Note: *** , ** , * indicate significance levels of 1%, 5%, and 10% respectively.

## 5.2. Local Moran's I

The average data of agricultural new-quality productivity index from 2013 to 2022 were selected to draw the Moran scatter plot. As shown in Figure 6, the horizontal axis represents the z - value, which reflects the deviation of the observed value from its expected value; the vertical axis represents the spatial lag value, which reflects the spatial propagation effect of this deviation. The data points in the first quadrant indicate high - value clustering (high - high clustering), and those in the third quadrant indicate low - value clustering (low - low clustering). Most provinces are distributed in the first and third quadrants, indicating that the development of agricultural new-quality productivity has positive spatial autocorrelation and is concentrated in space. In addition, the provinces in the first quadrant are mainly in the eastern region, indicating that the spatial positive correlation of agricultural new-quality productivity development in this region is stronger and the regional radiation and driving effect is better. Most provinces in the western region are distributed in the third quadrant, reflecting the relative lag in the development index of agricultural new-quality productivity in this region.

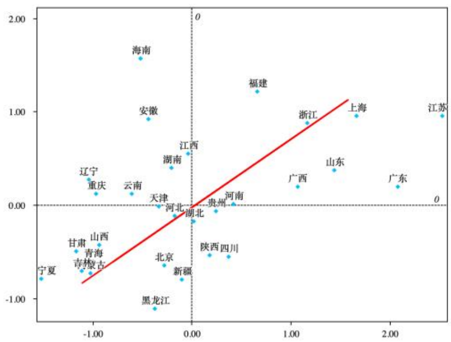


**Figure 6.** Average Local Moran's Scatter Plot for 2013–2022

# 6. Research Conclusions and Policy Recommendations

## 6.1. Research Conclusions

Based on the panel data of 30 provincial-level regions from 2012 to 2022, this study employs the entropy method, the Dagum Gini coefficient, and the Moran index to investigate the development level of China's new-quality productivity in agriculture. The following conclusions are drawn: First, at the national level, the annual average growth rate of China's new-quality productivity in agriculture reaches 4.8%, showing a steady increase. At the regional level, the development level of new-quality productivity in agriculture in China shows a pattern of eastern region > central region > western region > northeastern region, while the annual average growth rate shows a pattern of central region > eastern region > western region > northeastern region. Second, the degree of inequality in the development of new-quality productivity in agriculture in China continues to expand, with inter-regional differences being the main cause of the imbalance. The within-group Gini coefficient of the western region and the between-group coefficients with other regions are rapidly increasing, making the western region the "focus area" of national inequality in the development of new-quality productivity in agriculture. Third, the index of new-quality productivity in agriculture in China shows similarity in space, with positive spatial autocorrelation existing in the development of new-quality productivity in agriculture, indicating a concentrated distribution.

## 6.2. Policy Recommendations

Based on the research conclusions of this study, the following policy recommendations can be put forward:

### 6.2.1. Overall Development.

（1）Establish special support funds to support agricultural technological innovation, the cultivation of new types of business entities, and the construction of high - standard farmland. Encourage financial institutions to increase credit support for the field of new-quality productivity in agriculture, innovate financial products and service models, and provide diversified financing channels for agricultural business entities. Promote the horizontal and vertical extension of the agricultural social service system, strengthen support for small farmers, achieve greater integration of service resources, and make up for the shortcomings in farmers' production.

(2) Strengthen the training and introduction of agricultural talents, improve the agricultural professional education system, and cultivate high - quality talents that meet the needs of the development of new-quality productivity in agriculture. Enhance the training of new - type professional farmers, agricultural technical personnel, and agricultural management personnel to improve their professional skills and overall quality. At the same time, optimize the agricultural talent flow mechanism and guide "professional farmers" to flow to the western region and rural grassroots. Encourage enterprises and universities to jointly carry out agricultural technological innovation research, strengthen cooperation between industry, academia, and research, create pilot projects such as "science and technology cottages," promote the close integration of scientific and technological achievements with agricultural production practice, focus on breaking through key core technologies, and improve the efficiency of technological achievement transformation.

### 6.2.2. Regional Characteristics.

(1) Differential policy support. Utilize the advantages of transportation hubs and market hinterlands in the central and eastern regions to further promote the integration and innovation of new-quality productivity in agriculture with cutting-edge technologies such as

the digital economy, creating a "technology diffusion highland" for agricultural modernization. In combination with the rich natural resources and ecological environment advantages of the western region, support its development of characteristic and ecological agriculture while strengthening infrastructure construction and improving the agricultural production environment. For the northeastern region, focus on industrial structure adjustment and transformation and upgrading, make good use of land resource endowments, and continue to promote the action of increasing the yield of large - area crops.

(2) Reasonably optimize the layout of the agricultural industry and strengthen spatial planning. Establish a long - term mechanism for coordinated development of new-quality productivity in agriculture among regions, guide the concentration of agricultural resources in advantageous areas, form industrial clusters and regional characteristic brands, and promote the diffusion and sharing of new-quality productivity in agriculture in space. Encourage the establishment of long - term and stable cooperation mechanisms between the eastern and western regions, promote factor flow and resource sharing through horizontal compensation, technology sharing, and experience exchange.

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