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Enhancing Research on Agricultural Economic Resilience Through Big Data Analysis and Collaborative CAD-Based Information Network Technology Diffusion

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Abstract. This paper combines big data technology to improve the agricultural economic data mining algorithm, exploring the resilience of the agricultural economy under information network technology diffusion. Moreover, it comprehensively considers the influence of the neighboring points of the current space-time position on it. It obtains the spatiotemporal autocorrelation and partial autocorrelation functions of the spatiotemporal sequence through the correlation analysis of the time and space delays. In addition, this paper constructs a research model of agricultural economic resilience based on big data technology.
Furthermore, this paper summarizes the components, different types, operating mechanisms, and strengthening paths of rural economic resilience in response to external shocks. It systematically constructs the theoretical framework of rural economic resilience. Finally, this paper combines experiments to verify the performance of this system. From the research results, it can be seen that the algorithm model constructed in this paper meets the actual needs.

Keywords: Collaborative CAD; Big data; information network; technology diffusion; agricultural economy; resilience
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1 INTRODUCTION

Agricultural development resilience can be understood as the ability of the agricultural system to digest and absorb external disturbances and maintain the original main features and essential functions. Compared with similar concepts such as agricultural fragility and adaptability, the connotation of agricultural development resilience is more complicated, and it has the meaning of flexibility and resilience, so it is an essential manifestation of the level of agricultural modernization [9].In the research on resilience, scholars have conducted a lot of explorations on regions, cities, and communities. These studies generally show that as regions and industries of complex systems, their resilience is a high-level construct with multiple connotations. Drawing lessons from scholars' related research on urban and community resilience, the resilience of agricultural development from the perspective of nature-society-ecosystem includes different dimensions such as production resilience, ecological resilience, and economic resilience. Moreover, agricultural production resilience reflects the resilience of agricultural production from destructive events and disasters, which is closely related to the construction of modern agricultural infrastructure and technological investment. In addition, infrastructure investment can help resist environmental uncertainties' impact on agricultural production and overcome the negative transmission of extreme events within the agricultural system [17]. At the same time, from the perspective of strengthening agricultural anti-risk capabilities, agricultural infrastructure construction needs to have a certain degree of redundancy. Although redundancy reduces the technical output efficiency of agricultural production to a certain extent, it enhances the necessary input for development resilience [14].

On the one hand, agricultural technology investment can reduce the labor intensity of farmers and improve agricultural production efficiency. In the context of weakening traditional factors, it is more necessary to rely on technological progress to increase production and income. On the other hand, technical investment is also conducive to improving the flexibility of agricultural disaster prevention and mitigation. Assist farmers in adequately dealing with the challenges faced in the production process and reducing losses caused by destructive events. Agricultural ecological resilience focuses on describing the coordinated development of agricultural production and environmental systems, which refers to the degree to which agricultural production systems can resolve and respond to changes in the natural environment. Agricultural ecological resilience has a profound impact on increasing agricultural internal circulation and agricultural environmental self-organization. My country's agricultural production has been extensively managed for a long time, and the production process has over-relied on chemical investors such as pesticides, fertilizers, and plastic films. This has improved agricultural production conditions and output efficiency and aggravated agricultural non-point source pollution. Leading to the quality and safety of agricultural products, seeking low-carbon agriculture, and reducing the dependence of agricultural production on chemical investors have also become an essential content of modern agricultural policies.

Research on agricultural economic resilience through big data analysis and collaborative CAD-based information network technology diffusion can make positive contributions towards achieving sustainable development goals by improving agricultural productivity and efficiency, enhancing risk management capabilities, promoting sustainable agricultural practices, improving farmer livelihoods and food security, driving the adoption of innovative technologies, and providing important policy insights. This research holds the promise of injecting new vitality into the agricultural sector, enhancing its overall risk-resistance and adaptability, and infusing new momentum into the global sustainable development endeavor." Agricultural economic resilience refers to the ability of multi-level entities such as farmers and rural areas to appropriately and flexibly respond to the risk of loss caused by monetary shocks, which is closely related to the agricultural economic foundation and production efficiency. Ample agricultural economic foundation can expand farmers' choice space when facing uncertain economic events, and higher production efficiency also helps to form farmers' flexibility to deal with risks. Foreign scholars have gradually incorporated system theory and ecological research methods in research on resilience in specific regions and industries. In contrast, domestic scholars have explored resilience measurement and problem diagnosis and included agricultural development resilience in their modernization studies. Dimensional analysis, but the existing research still lacks particular research on the systematic evaluation, temporal and spatial patterns, and influencing factors of my country's agricultural development resilience. Clarifying these issues will help ensure the sustainable and stable growth of agriculture, optimize the endogenous development capacity of agriculture, and improve the regional overall development pattern, but it is also of great significance.

2 RELATED WORK

The current concept of regional economic resilience is still in its infancy; the construction of the theoretical system is not yet mature, and the traces of direct borrowing from other disciplines are relatively strict. At first, there are two cognitive perspectives on regional economic resilience: equilibrium theory and evolution theory. From the perspective of equilibrium theory, regional economic resilience is the ability of the regional economy to recover to the initial economic development speed or maintain the stability of its system after a crisis. This perspective believes that each region has a reasonable equilibrium state. Literature [4] believes that the regional economy can recover in the face of crisis to restore the economy to a balanced state and become a speed issue. Relatively speaking, areas with strong resilience have relatively quick anti-interference ability and recovery ability. The literature [1] believed that a short-term external economic crisis in a region would stimulate the region's inherent self-repair function and eventually return to the original equilibrium state. The interpretation of the literature [19] for regional economic resilience focuses on short-term crises and cross-sectional studies to discuss the impact on regional economic growth. The literature [3] directly equated regional economic resilience with elasticity in physics, which is regarded as the ability of the economy to rebound to its original state.

The literature [7] believed that the study of regional economic resilience needs to pay attention to the long-term development trend of the region after being impacted or disturbed. At the same time, it is believed that accidental or unexpected events in the development process of the regional economy lead to the emergence of innovation, which will have a significant impact on the region and make it difficult for the area to return to the previous equilibrium state.

The literature [16] emphasized that regional economic resilience is a process that includes vulnerability, resistance, robustness, and recoverability. In this process, shock and recovery is a cyclical accumulation process, which itself triggers changes in the function and structure of the regional economic system, and at the same time, under the interaction, further affects the resistance and recovery of the regional economic system to subsequent shocks.

The literature [6] regarded the region as a complex adaptive system that continuously obtains new information and knowledge from the outside world and constantly develops and evolves. Resilience is also considered a dynamic and continuous change process, not a final equilibrium state. The literature [5] believed that when a region is disturbed by the outside world, it will return to the original development path or change the development mode to embark on a new development path, but the structure and function of the system will not change. The literature [11] believed that the geographical characteristics of the region itself will have different situations when faced with varying types of economic disturbances. Among them, regions with high resilience have returned to the path of economic growth by adjusting their structure and re-optimizing the allocation of resources. However, regions with low resilience have difficulty coping with changes in the external environment, leading to a continued economic downturn. At the same time, the economic crisis provides opportunities for regions to break regional locks and embark on a new path of economic development. The literature [18] proposed an analysis framework of evolutionary economic resilience, which divided the regional economic evolution process into four stages: reorganization, exploitation, conservation, and release. There are two cycles in this circulation. The first cycle relates to the emergence, development, and maintenance of a specific economic structure and growth path. The second cycle is the economic downturn process and exploration of new economic growth paths, namely release and reorganization. The literature [10] emphasized the application analysis of evolutionary methods in regional economic resilience and explained regional economic resilience from two dimensions: endogenous and exogenous. Endogenous economic resilience is the internal economic development process of the regional economic system.

In contrast, exogenous economic resilience maintains the current development path in the face of external shocks. The literature [13] explored the source of the creation of new growth paths for regional economies after being impacted. Moreover, it examined the influence of the relationship between maintaining the original economic system development model and breaking the original path to create a new growth path on the evolution of the regional economy. The literature [8] believed that after the resilience of a regional economy is refined, the difference in resilience is the result of a combination of multiple factors. These factors are universal and particular, so it is necessary to consider the critical factors specific to the region. In addition, affected by the perspective of evolution, regional economic resilience is a concept that considers multiple dimensions of time and space.

3 STARMA MODEL

The STARMA model is the product of combining the ARMA model and spatial attributes. In the modeling process, the influence of the neighboring points of the current space-time position on it is comprehensively considered. The spatiotemporal autocorrelation function and partial autocorrelation function of the time delay and space delay are obtained through the correlation analysis of the spatiotemporal sequence.

1. Spatio-temporal autocorrelation function

The expression of the spatiotemporal autocorrelation function is[17]:

$$\rho_{h0}(k) = \frac{r_{h0}}{\sqrt{\sigma_k(0)\sigma_0(0)}} = \frac{cov([W^h Z(t)]),([W^0 Z(t+k)])}{\sqrt{var\left(W^h Z(t)\right)\cdot(W^0 Z(t))}} \tag{1}$$

In the formula, $\rho_{h0}(k)$ is the spatiotemporal autocorrelation coefficient; k is the time delay, h is the spatial delay, $W^{(h)}$ is the spatial weight matrix with the spatiotemporal and W^0 is the spatial weight matrix with a spatial delay of 0, which is an identity matrix. This is because each point is its 0th-order domain. Among them, the spatiotemporal covariance expression of the sample is:

$$\hat{y}_{h0}(k) = \frac{\sum_{i=1}^{N}\sum_{t=1}^{T-k}[W^{(h)}Z_i(t)][W^{(0)}Z_i(t)]}{N(T-k)} \tag{2}$$

In the formula, N is the number of spatial units. When formula (2) is substituted into formula (1), the sample spatiotemporal autocorrelation coefficient $\hat{y}_{h0}(k)$ is obtained as:

$$\hat{\rho}_h(k) = \frac{T}{T-k}\cdot\frac{\sum_{i=1}^{N}\sum_{t=1}^{T-k}[W^{(h)}Z_i(t)][W^{(0)}Z_i(t+k)]}{\sqrt{\sum_{i=1}^{N}\sum_{t=1}^{T-k}[W^{(h)}Z_i(t)]^2[W^{(0)}Z_i(t)]^2}} \tag{3}$$

Formula (3) shows that the sample spatiotemporal autocorrelation coefficient is a measure of the correlation between the sample at the current time and the current region and the region formed by the sample when the time delay is k and the spatial delay is h, and the value range is [-1, 1]. The closer the calculation result is to 1, the higher the degree of autocorrelation of the spatiotemporal series.

2. Spatio-temporal partial correlation function

The Yule-Walker equations of space-time can be derived from the Yule-Walker equations of the time partial correlation function. The specific form is as follows[20]:

$$\hat{\rho}_h(k) = \sum_{k=1}^{\rho}\sum_{h=1}^{m_h}\phi_{kh}\rho_{h-1}(k) \tag{4}$$

Among them, $z_{l+h}(t)$ is the spatiotemporal autocorrelation coefficient, k is the time delay, h is the spatial delay, ρ is the maximum time delay, mk is the maximum spatial delay at the time delay k, and ϕ_{ih} is the spatiotemporal partial correlation coefficient.The spatiotemporal partial correlation coefficient can truly reflect the correlation between the two variables $z_{l+h}(t)$ and $z_l(t-k)$. Therefore, it can be used to determine the time delay k and the space delay h of the spatiotemporal autocorrelation process.

Although the STARMA model has been studied in depth and successfully applied in many fields, this model assumes that the time-space sequence involved in the calculation is stationary and cannot directly analyze real-world non-stationary time-space data.

The calculation of the global STI model is as follows:

$$STI_k = \frac{\sum_{i=1}^{n}\sum_{j=1}^{n}\omega_{t-k}\omega_{ij}(x_{i,t-k}-\overline{x_{t-k}})(x_{j,t}-\overline{x_t})}{\sqrt{\sum_{i=1}^{n}(x_{i,t-k}-\overline{x_{t-k}})^2}\sqrt{\sum_{i=1}^{n}(x_{i,t}-\overline{x_i})^2}} \quad (5)$$

Among them, n is the number of regions, $x_{i,t-k}$ is the observed value of region i at time t-k, $\overline{x_{t-k}}$ is the average of the observed values of all regions at time t-k, and $Z = \frac{STI_k - E(STI_k)}{\sqrt{VAR(STI_k)}}$ is the observed value of region j at time t. $\omega_{t-k,t}$is the time weight from time t-k to time i, and $\omega_{i,j}$ is an element of the spatial weight matrix w. W is a row-normalized spatial weight matrix that quantifies the proximity between surrounding areas. When the time lag k equals O, the global STI model becomes a global univariate Moran's I model.

The value range of STIk is [-1,1]. STIk>0 means positive correlation, STIk<0 means negative correlation, and STIk=0 means irrelevant. The larger the value of STIk, the stronger the spatio-temporal correlation; on the contrary, the smaller the value, the weaker the spatio-temporal correlation in the region. The significance level of the spatiotemporal autocorrelation of the regional unit can be tested with the standardized statistic Z value[15]:

$$Z = \frac{STI_k - E(STI_k)}{\sqrt{VAR(STI_k)}} \quad (6)$$

The significance level can be determined by the p-value (p-value>. At the significance level of p=0.05, Z>1.96 indicates a positive spatiotemporal autocorrelation. The spatiotemporal distribution is in an aggregated state. Z<-1.96 indicates that it is negative spatio-temporal autocorrelation. The spatiotemporal distribution presents a discrete state.-1.96<Z<1.96, indicating that the spatiotemporal autocorrelation is insignificant, and the spatiotemporal distribution presents a random state.

The global STI is a comprehensive measure of the spatiotemporal autocorrelation of all spatiotemporal objects and is used to detect the overall spatiotemporal correlation characteristics in the area. However, it ignores the potential instability of the spatiotemporal process and cannot explain the differences between different spatiotemporal objects in the region (local spatiotemporal heterogeneity). For this reason, it is necessary to use local indicators to reflect the heterogeneous characteristics of this difference further to reveal the local spatio-temporal correlation structure pattern. Therefore, Wartenberg proposed a local STI model[12]:

$$PSTI_k = \frac{n\omega_{t-k}(x_{i,t-k}-\overline{x_{t-k}})\sum_{j=1}^{n}(x_{j,t}-\overline{x_t})}{\sqrt{\sum_{i=1}^{n}(x_{i,t-k}-\overline{x_{t-k}})^2}\sqrt{\sum_{i=1}^{n}(x_{i,t}-\overline{x_i})^2}} \quad (7)$$

Among them, the time weight $\omega_{t-k,t}$, and the space weight $\omega_{i,j}$ are respectively the same as $\omega_{t-k,t}$, and $\omega_{i,j}$ in the global space-time Moran'sI. The local STI model represents the degree of similarity between the observed value of the local area at time t-k and the surrounding area at time t. The inspection method of the local STI model is consistent with the inspection method of the global STI model.

In addition, using the Moran scatter plot of the spatiotemporal process can divide the autocorrelation area into 4 aggregation modes: high aggregation (HH) means that the observation value of a certain area at time tk and the surrounding area at time t are both high; low, low Poly (LL) means that the observation value of a certain area at time tk and the surrounding area at time t is low; high-low poly (HL) means that the observation value of a certain area at time tk is higher, and the observation value of the surrounding area at time t The value is low; low high poly (LH) means that the observed value of a certain area at time tk is low, while the observed value of surrounding areas at time t is higher.

The shortcoming of the STI model defined by Wartenberg is that the space-time Moran'sI defined by it only introduces the concept of time in the space Moran'sI and does not consider the time-space sequence, which has complex time series characteristics in the time dimension—non-stationary characteristics.

Based on the theory of spatial autocorrelation, it is proposed that spatial objects be replaced with spatio-temporal objects as the primary research unit. The time dimension is introduced into the traditional spatial Moran's I model, and the Moran's I model is improved.

The construction idea of this improved model is spatial autocorrelation, which is the characteristic that a particular attribute value of a spatial unit is related to the same attribute value of neighboring spatial units. The time dimension is introduced into the traditional spatial Moran's I model, which defines the state of a spatial object at a particular moment as a spatiotemporal object. We denote the spatiotemporal object whose space number is p and time sequence number i is ST(p, i). If two spatiotemporal objects have an adjacent relationship in space and are located in adjacent periods in time, the two spatiotemporal objects are considered to be adjacent. A spatio-temporal adjacency matrix can represent this adjacency relationship. That is, when two spatiotemporal objects ST(p, i) and ST(q, i) are adjacent, W(p, i)(q,j)=1 in the spatiotemporal adjacency matrix, otherwise W(p, i)(q, i)=0. We use spatiotemporal objects instead of spatial objects as the research unit to construct global spatiotemporal Moran's I and local spatiotemporal Moran's I model and give Moran scatter diagrams[21].

If y(p, i) is defined as a specific attribute value of the spatiotemporal object ST(p, i), then the global spatiotemporal Moran's I model is as follows:

$$I = \frac{NT\sum_{p=0}^{N}\sum_{i=0}^{T}\sum_{q=0}^{N}\sum_{j=0}^{T}W(p,i)(q,j)(y(p,i)-\overline{y})\left(y(q,j-\overline{u})\right)}{\sum_{p=0}^{N}\sum_{i=0}^{T}(y(p,t)-\overline{y})^2\times\sum_{p=0}^{N}\sum_{i=0}^{T}\sum_{q=0}^{N}\sum_{j=0}^{T}W(p,i)(q,j)} \tag{8}$$

Among them, N and T are the number of space series and time series, respectively, y represents the average value of y attribute values of all spatiotemporal objects, and W(p, i)(q,j) represents the adjacency relationship between spatiotemporal objects ST(p, i) and ST(q,j).

Global spatiotemporal Moran' sI is a global spatiotemporal autocorrelation index that measures the overall characteristics of all spatiotemporal objects. Its value range is [-1,1]. All spatiotemporal objects are positively correlated when the index is greater than 0. The closer to 1, the more significant the positive correlation. When it is less than 0, it means a negative correlation. Moreover, the closer to -1, the more significant the negative correlation. When it is equal to 0, it means irrelevant.

Spatio-temporal autocorrelation will be different due to different spatiotemporal objects, and this difference is reflected by local spatiotemporal autocorrelation indicators, including local spatiotemporal Moran's I and Moran scatter plots. The local spatiotemporal Moran's I model is defined as follows:

$$I(p,i) = Z(p,t)WZ(p,i) \tag{9}$$

The square root of, sum from q equals 0 to cap N of the Among them, $WZ(p,i) = \sum_{q=0}^{N}\sum_{j=0}^{T} w(p,i)(q,j)Z(q,j) / \sum_{q=0}^{N}\sum_{j=0}^{T} w(p,i)(q,j)$, $Z(p,i) = (y(p,i) - \overline{y})/\sigma$, $\sigma = \sqrt{\sum_{q=0}^{N}\sum_{j=0}^{T}(y(p,i) - \overline{y})^2 /(NT-1)}$, and the symbol meaning in the formula is the same as before.

The physical meaning of local spatiotemporal Moran's I is similar to global spatiotemporal Moran's I. When I(p, i) takes a positive value, the property value of the spatiotemporal object ST(p, i) and its neighboring spatiotemporal objects are positively correlated locally. The greater the absolute value, the local The more significant the positive correlation; when I(p, i) takes a negative value, it means that the attribute value of its neighboring spatiotemporal objects is locally negatively correlated, and the more significant the absolute value, the greater the local negative correlation: when I(p, i) is 0, it means The neighboring objects are not related in time and space.

Moran scatter chart. Taking the standardized attribute value Z(p, i) of the spatiotemporal object ST(p, i) as the abscissa, the weighted value WZ(p, i) of the standardized attribute value of all spatiotemporal objects in the domain of the spatiotemporal object ST(p, i) is Y-axis. In the Moran scatter plot, the point in the first quadrant indicates that both Z(p, i) and WZ(p, i) are positive. The attributes of the space-time object ST(p, i) and its neighboring space-time objects tend to be high values manifested as a cluster of high and high values. On the contrary, the point in the third quadrant indicates that both Z(p, i) and WZ(p, i) are negative values, manifesting as a cluster of low and low values. Therefore, the state of the time-space objects in the first and third quadrants shows a clustering characteristic; similarly, it can be inferred that the states of the time-space objects in the second and fourth quadrants show heterogeneous characteristics.

The defect of the improved spatiotemporal Moran's I model is that the value of local spatiotemporal Moran's I am not limited to [-1,1], which does not conform to the first law of geography: it ignores that spatiotemporal data is non-stationary in the time dimension. Characteristics: The accurate complex geographic spatiotemporal data mined contains false elements.

4 RESEARCH ON AGRICULTURAL ECONOMIC RESILIENCE BASED ON BIG DATA ANALYSIS AND INFORMATION NETWORK TECHNOLOGY DIFFUSION

The agricultural economic resilience system comprises five subsystems: economic diversity, revenue and expenditure capacity, innovation environment, development trend, and openness. Among them, the resilience of the diversity system is composed of indicators of industrial diversity and industrial transformation and upgrading capabilities. The revenue and expenditure capacity system consists of personal and expenditure capacity and government revenue and expenditure capacity indicators. The innovation environment system comprises a scientific and technological innovation environment, an ecological development environment, and fundamental social environmental indicators. The development trend system is composed of economic development trends and social development trend indicators. The open system is composed of indicators for foreign trade openness and domestic trade openness. The combined effect of the five subsystems forms the comprehensive agricultural economic resilience (Figure 1), which affects the strength of the agricultural economy.

This paper empirically analyzes the factors influencing economic resilience and spatial spillover effects from three perspectives. Social and economic factors trigger the spatial agglomeration and flow of population and capital in the region, thereby affecting the path of regional economic development, but excessive resource concentration may destroy the original ecological environment and negatively impact the economic system.

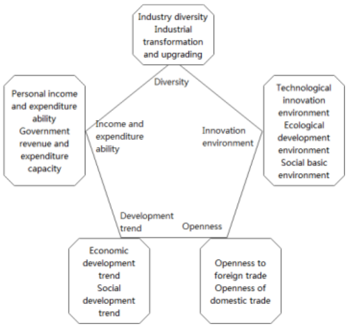

Figure 1: The framework for measuring the resilience of the agricultural economy.

This article explicitly selects urbanization rate and transportation infrastructure as social factors. In terms of economic factors, this paper selects industrial agglomeration, global participation, and fixed asset investment to refer to them, as shown in Figure 2.

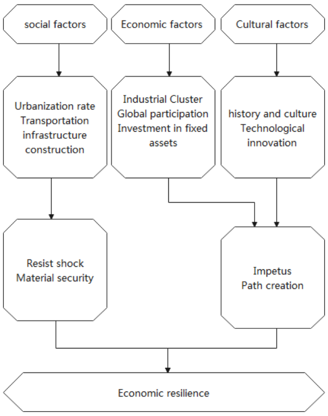

Figure 2: The path of influencing factors on economic resilience.

Agricultural economic resilience has four dimensions. The first is the region's sensitivity to recession or crisis. The second is the speed and extent of the regional economy's recovery from the recession. The third is the regional economy's reorganization and adaptability in response to recessions or crises, such as changes in technical structure, industrial structure, labor structure, and business operation mode. The last is the regional economy's ability to update the original growth path, as shown in Figure 3.

As shown in Figure 4, the region uses its comparative advantages and the localization of various external economies in the development stage. At this time, capital accumulation and agricultural economic resilience are both in an upward phase. As this growth model continues, the connectivity between the various components of the regional economy has increased, the development model has become rigid, and its ability to adapt to potential shocks has declined. If there is a shock, there may be a structural recession and a loss of growth momentum, companies will close or move out of the region, industry relevance will decline, and the regional economy will lose its agglomeration effect. In addition, the disintegration of the old economic operation model also brought the possibility of reorganization, and a new economic operation model characterized by innovation began to appear.

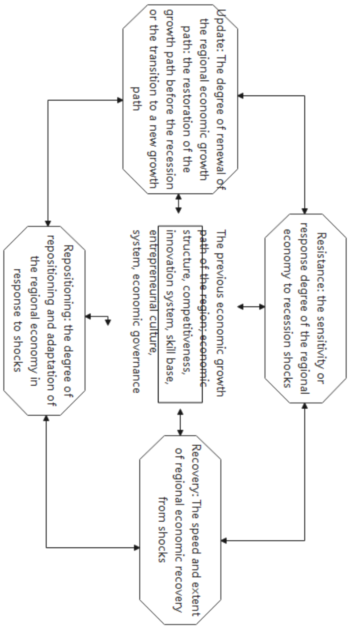

Figure 3: The four dimensions of agricultural economic resilience in response to shocks.

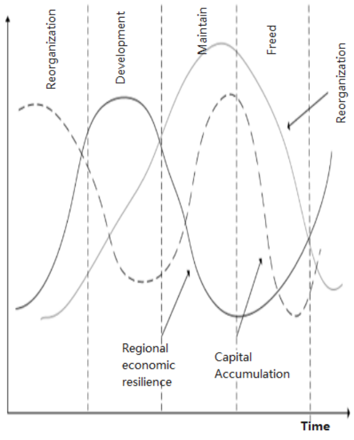

Figure 4: Changes in agricultural economic resilience based on adaptive cycles.

The primary mechanism of agricultural economic resilience is shown in Figure 5. The possible reasons for the spatial spillover effect of industrial specialization on agricultural economic resilience are shown in Figure 6.

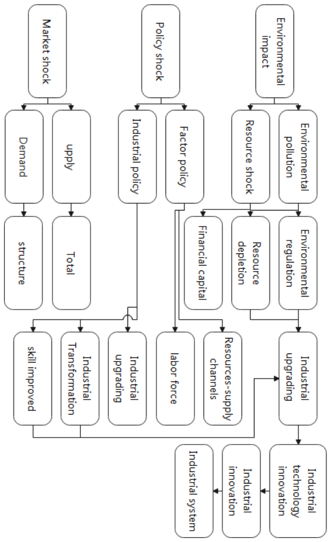

Figure 5: Basic mechanism of agricultural economic resilience.

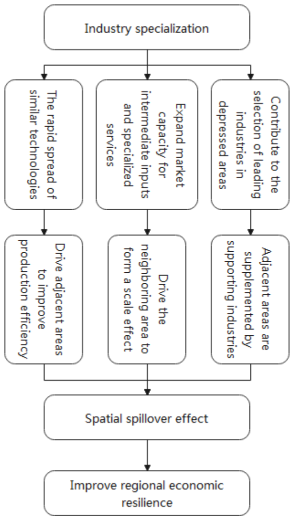

Figure 6: Schematic diagram of the spatial spillover effect of industrial specialization on agricultural economic resilience.

5 RESEARCH ON THE RESILIENCE OF THE AGRICULTURAL ECONOMY BASED ON THE SPREAD OF INFORMATION NETWORK TECHNOLOGY BASED ON BIG DATA ANALYSIS

This paper constructs an economic resilience research system based on big data analysis and information network technology diffusion and then evaluates the system's performance. The research methodology combines collaborative CAD technologies, big data analysis, and the diffusion of information network technology. Analyzing visual data from various sources helps identify patterns affecting agricultural resilience. The development of risk simulation models and decision support systems assists stakeholders. The study also emphasizes precision agriculture, capacity-building initiatives, and policy recommendations, contributing to promoting sustainable and resilient agricultural practices. This article uses crawler technology to obtain a large amount of agricultural economic data from the Internet, uses the data mining algorithm of this paper to conduct economic data mining, and calculates the results of agricultural economic data mining. The results are shown in Table 1 and Figure 7.

NO	*Agricultural Economic Data Mining*	*NO*	*Agricultural Economic Data Mining*	*NO*	*Agricultural Economic Data Mining*
1	*90.7*	*25*	*92.5*	*49*	*89.3*
2	*89.2*	*26*	*87.4*	*50*	*86.9*
3	*87.6*	*27*	*93.0*	*51*	*92.7*
4	*89.2*	*28*	*89.5*	*52*	*92.6*
5	*93.4*	*29*	*88.5*	*53*	*87.4*
6	*87.9*	*30*	*89.5*	*54*	*86.0*
7	*93.1*	*31*	*93.6*	*55*	*90.8*
8	*86.8*	*32*	*86.5*	*56*	*86.8*
9	*91.4*	*33*	*91.8*	*57*	*93.0*
10	*93.0*	*34*	*86.4*	*58*	*85.7*
11	*91.6*	*35*	*93.0*	*59*	*85.7*
12	*90.9*	*36*	*85.2*	*60*	*88.6*
13	*93.3*	*37*	*86.3*	*61*	*93.0*
14	*92.6*	*38*	*87.7*	*62*	*90.3*
15	*88.5*	*39*	*93.4*	*63*	*90.4*
16	*90.2*	*40*	*91.6*	*64*	*89.5*
17	*91.6*	*41*	*93.1*	*65*	*90.4*
18	*86.2*	*42*	*93.5*	*66*	*85.1*
19	*89.6*	*43*	*85.7*	*67*	*89.4*
20	*87.8*	*44*	*85.9*	*68*	*89.7*
21	*93.1*	*45*	*87.0*	*69*	*89.1*
22	*87.1*	*46*	*87.6*	*70*	*86.3*
23	*91.6*	*47*	*91.9*	*71*	*88.3*
24	*92.3*	*48*	*89.2*	*72*	*85.2*

Table 1: Statistical table of the data mining effect of the system on agricultural economic data.

The above research verifies the role of the data mining algorithm in this paper's analysis of agricultural economic data. This paper researches agricultural economic resilience and counts the system's effect in analyzing industrial economic resilience. The results obtained are shown in Table 2 and Figure 8.

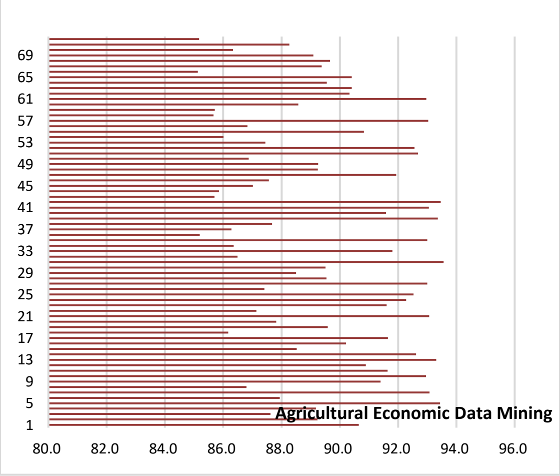

Figure 7: Statistical diagram of the data mining effect of the system on agricultural economic data.

NO	*Analysis of Agricultural Economic Resilience*	*NO*	*Analysis of Agricultural Economic Resilience*	*NO*	*Analysis of Agricultural Economic Resilience*
1	*88.5*	*25*	*72.6*	*49*	*81.9*
2	*89.4*	*26*	*77.8*	*50*	*88.9*
3	*76.8*	*27*	*82.2*	*51*	*72.5*
4	*87.9*	*28*	*88.0*	*52*	*81.9*
5	*73.6*	*29*	*89.1*	*53*	*75.3*
6	*84.9*	*30*	*80.9*	*54*	*77.2*
7	*89.3*	*31*	*74.6*	*55*	*72.9*
8	*86.3*	*32*	*83.4*	*56*	*80.5*
9	*73.8*	*33*	*78.3*	*57*	*81.2*
10	*84.5*	*34*	*76.0*	*58*	*75.2*
11	*77.9*	*35*	*78.4*	*59*	*90.2*
12	*81.3*	*36*	*76.6*	*60*	*88.6*
13	*88.0*	*37*	*84.6*	*61*	*85.7*
14	*77.0*	*38*	*81.4*	*62*	*73.7*
15	*81.6*	*39*	*84.2*	*63*	*75.4*
16	*80.0*	*40*	*79.1*	*64*	*87.0*
17	*82.0*	*41*	*82.3*	*65*	*78.7*
18	*90.1*	*42*	*89.9*	*66*	*76.6*
19	*84.2*	*43*	*82.8*	*67*	*77.4*
20	*83.6*	*44*	*86.2*	*68*	*83.5*
21	*85.5*	*45*	*78.8*	*69*	*72.1*

22	*86.1*	*46*	*73.5*	*70*	*74.4*
23	*80.7*	*47*	*80.4*	*71*	*72.1*
24	*89.9*	*48*	*77.9*	*72*	*72.9*

Table 2: Statistical table of the effect of agricultural economic resilience analysis.

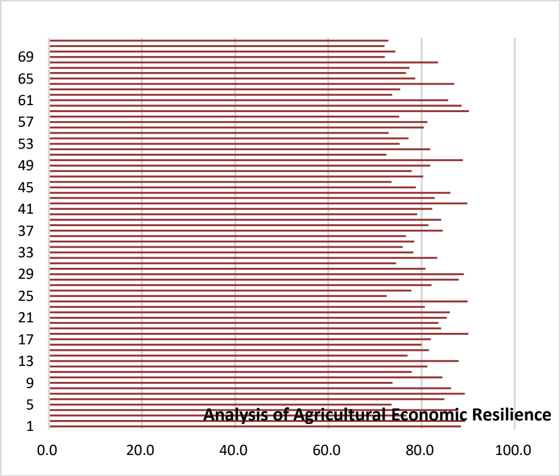

Figure 8: Statistical diagram of the effect of agricultural economic resilience analysis.

The above research shows that the system constructed in this paper can effectively analyze the resilience of the agricultural economy and improve the effect of subsequent agricultural economic decision-making development path optimization.

6 CONCLUSIONS

Domestic and foreign research on rural economic resilience is still an emerging concept, and the primary research involves definitions, index measurements, influencing factors, and recovery in economically depressed regions. However, current research has only made progress on the definition of rural economic resilience, but it is also inconclusive. Among them, some focus on the stability of economic growth, while others emphasize the transformation of economic growth. Moreover, the exchanges among economists on the resilience of the rural economy are not based on the same concept and indicators, leading to confusion in related research.

Based on a systematic review of relevant theories and research, this paper defines the concept of rural economic resilience as the ability of the agricultural economic system to respond to external shocks to maintain or improve the original economic operation mode. Moreover, this paper summarizes the components of rural economic resilience, different types, operating mechanisms, and strengthening paths in response to external shocks. In addition, this paper systematically constructs a theoretical framework of rural economic resilience and combines experiments to verify the performance of this system. From the research results, it can be seen that the algorithm model constructed in this paper meets the actual needs.

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