Local Practice of Integral Management System under the Background of Rural Revitalization Policy

-- Evidence from Hefei City, Anhui Province

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Abstract

The year 2020 is a key year for poverty alleviation, with remarkable poverty alleviation performance in all provinces and regions, but this does not mean that the poverty problem has been completely solved. The issue of rural revitalization, as an important criterion to measure the long-term nature of poverty alleviation, has become a serious obstacle to poverty alleviation. Taking Hefei City as an example, this paper uses quantitative and qualitative methods to build a risk prediction system for rural revitalization according to the causes of rural revitalization through field visits and questionnaires, and then uses BP neural network to establish a risk quantification model, and accordingly puts forward corresponding early warning and prevention measures and suggestions. In view of the integral governance system and the forecast results, it will help to establish a monitoring and assistance mechanism to prevent rural revitalization, so as to consolidate the achievements of poverty alleviation.

Keywords

Rural Vitalization; Risk Assessment; Integral Governance.

1. Introduction

The year 2020 is a decisive year for poverty alleviation. The poverty alleviation performance of all provinces and regions is remarkable. For example, at the end of April this year, the Poverty Alleviation Office of Anhui Province issued an important public notice. Nine counties (districts) including Xiao County and Huoqiu County applied last year to withdraw from the poverty-stricken county range, which was officially approved this year. So far, all 31 poverty-stricken counties in Anhui Province have "lifted their hats". But this does not mean that the problem of poverty has been completely solved. Rural Revitalization and poverty alleviation occupy the same important position in the overall poverty alleviation. In recent years, the poverty alleviation situation in rural areas in China has taken a major turn and achieved remarkable results. However, according to effective surveys and statistics, while the poverty alleviation work continues to unfold, frequent and repeated Rural Revitalization has become an important problem to consolidate the achievements of poverty alleviation. The No. 1 central document proposes to further deepen the Rural Revitalization Strategy and promote the local practice of the integral governance system. This paper starts from the risk assessment of the integral governance system, analyzes the risks in the implementation process of the integral governance system, the feasibility of promoting the integral governance system, and makes a case analysis of the integral governance system, so as to provide suggestions for the development of China's Rural Revitalization Strategy.

2. Construction of Risk Assessment Model

2.1. Influencing Factors

According to the actual research and literature research, the incentives for rural revitalization are mainly divided into three aspects: subject, object and carrier. The subject mainly starts from the poor households themselves, specifically including household income and household expenditure; The object refers to social, political, economic and cultural policies, guided by government policies; The carrier refers to the natural environment carrying capacity, natural disasters and other resources and environmental factors. Based on the actual situation of Hefei, Anhui Province, the risk prediction model of rural revitalization is constructed by integrating the three categories of inducing factors.

2.2. BP Neural Network Approximation

The key to test and model the nonlinear cointegration system is to estimate the nonlinear cointegration function. If the component sequence of the vector time series is regarded as the input variable and the nonlinear cointegration function f is regarded as a nonlinear transformation, the output variable is a SMM sequence; The estimation of nonlinear cointegration function is equivalent to obtaining the relationship between component sequences from the input vector time series and the output SMM series.

The basic BP neural network algorithm has two aspects: the forward propagation of signal and the back propagation of error, that is, when calculating the actual output, the direction of input to output is followed, and the correction of weights and thresholds is carried out from the direction of output to input. The forward propagation process of signal can be summarized as follows:

$$O_k = \Psi(net_k) = \Psi\left(\sum_{t=1}^{J} w_{kt} y_t + \alpha_k\right) = \Psi\left(\sum_{t=1}^{J} w_{kt}\Phi\left(\sum_{J=1}^{J} w_{ij} x_t + \theta_i\right) + \alpha_k\right) \tag{1}$$

Using the total error of training samples, the output error of neurons in each layer is calculated layer by layer from the output layer, and then the weight and threshold of each layer are adjusted according to the error gradient descent method to make the modified final output closer to the expected value. This feedback process can be summarized as the calculation of the adjustment amount of each parameter in the network.

$$\Delta w_{ki} = \eta \sum_{p=1}^{p} \sum_{k=1}^{L} \left(T_k^p - O_k^p\right) \cdot \Psi'(net_k) \cdot y_i$$

$$\Delta \alpha_k = \eta \sum_{p=1}^{p} \sum_{k=1}^{L} \left(T_k^p - O_k^p\right) \cdot \Psi'(net_k)$$

$$\Delta w_{ij} = \eta \sum_{p=1}^{p} \sum_{k=1}^{L} \left(T_k^p - O_k^p\right) \cdot \Psi'(net_k) \cdot w_{ki} \cdot \Phi'(net_t) \cdot x_j \tag{2}$$

$$\Delta \theta_t = \eta \sum_{p=1}^{p} \sum_{k=1}^{L} \left(T_k^p - O_k^p\right) \cdot \Psi'(net_k) \cdot w_{ki} \cdot \Phi'(net_t)$$

among η Indicates the gradient descent step size.

2.3. Prediction of Neural Network

This paper takes Hefei City, Anhui Province as an example. On the basis of field surveys and visits, a large number of data and literature are collected, mainly from the subject, object and carrier aspects, to collect data on the main factors that trigger rural revitalization. In view of the non-uniformity of variable units and the avoidance of data deviation, we preprocessed the data to make it more operational. The processing formula is as follows:
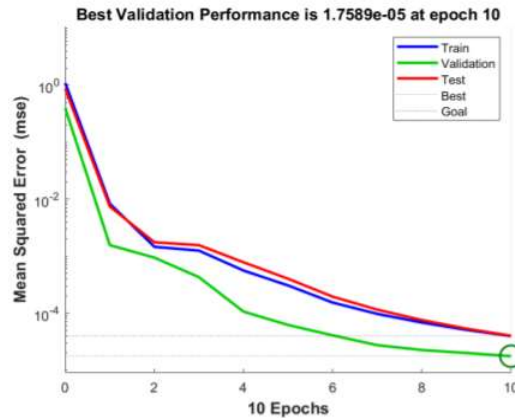
$$X_i^* = (X - U_i)/\sqrt{\sigma_{ij}} \tag{3}$$

Fig 1. Mean square error diagram

Process the collected data to determine 4 input layers, 2 output layers and 3 hidden layers. After the model is built, the collected data will be input for training operation, and the results are shown in the figure below. According to the results shown in the figure, the mean square error of the training data (Train), validation data and test data (Test) decreases rapidly in the horizontal axis direction, and reaches the minimum value in epochs10, that is, the training results are most effective at this time.

The following figure shows the data fitting effect of the trained BP neural network. The R2 values of training data, validation data, test data and overall data are 0.9995, 0.9995, 0.9994 and 0.9995 respectively, which are greater than 0.99. The training model has good results in data fitting, which can be used to predict the quantitative results of rural revitalization risk in Hefei City, Anhui Province in the next six months.
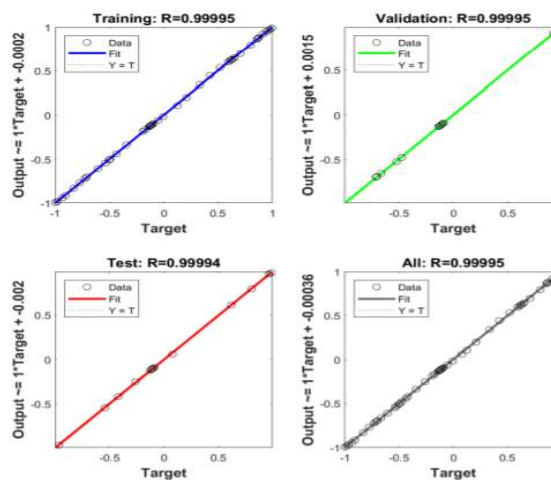

Fig 2. Fitting Effect

Through the above analysis, we can draw the following conclusions:

The household income and expenditure, government policies and resource environment of the poverty free households are very representative incentives for rural revitalization. Under this indicator system, the risk prediction results of rural revitalization calculated based on BP neural network have great credibility. It can be seen from the fitting results that in the next six months, the risk coefficient of rural revitalization in Hefei City, Anhui Province is low. Most of

the poverty free households have strong endogenous power, and the overall income is greater than the expenditure, showing a stable trend; The Hefei Municipal Government has also given maximum support in terms of policies, actively accelerated the development of "two industries", improved the construction of "double bases", and steadily increased the rural collective economy; At the same time, under the background of the growing international scientific and technological strength and the inherent natural conditions of Hefei, the local resource environment is relatively stable, with rich material resources and controllable natural disasters. According to the above analysis, the risk of rural revitalization in Hefei City, Anhui Province is low and the quality of poverty alleviation is high.

3. Establishment of Early Warning Mechanism

On the basis of quantifying the risk of rural revitalization of poverty stricken households by using the rural revitalization prediction model, the corresponding early warning mechanism should be established at the same time to control the risk and effectively consolidate the achievements of poverty alleviation. The incentives for rural revitalization include family income, natural resources, etc. Therefore, the establishment of early warning mechanism is also suggested from the perspective of subject, object and carrier.

3.1. Constructing a Scientific Rural Revitalization Supervision and Integral Governance System

The prediction of rural revitalization risk and the improvement of the supervision system are inseparable from scientific and accurate data analysis and judgment. The front of the early warning mechanism is the establishment of a scientific and systematic risk system for rural revitalization. Through the data collection of the main incentives for rural revitalization, the big data platform is used for multi-dimensional analysis and processing, and finally the risk quantification results with high accuracy and reliability are calculated with the aid of risk prediction models for rural revitalization, such as BP neural network and other tools. This is equivalent to an ex ante measure. Intervention and prevention at the source can save the risk and cost of supervision and early warning to a certain extent, which is highly efficient. At the same time, the risk coefficient of rural revitalization can be directly and concisely calculated to judge the size of rural revitalization risk and the distribution proportion of specific incentives, and then take corresponding remedial and consolidation measures.

3.2. Hematopoietic Mechanisms to Maintain Sustainability

Whether it is poverty alleviation or rural revitalization, we need to start from its main body, deeply study the characteristics of the main body, and solve the problem from the root. The main inducement of the rural revitalization problem lies in the fragility of the poverty relief achievements, that is, the endogenous power of the poverty relief subjects is not strong, and they cannot form a virtuous internal cycle of balanced self supply and self demand under the support of government policies. Therefore, it is particularly important to maintain the sustainability of poverty relief work and build a spontaneous hematopoietic mechanism for the poverty relief subjects. It is necessary to start from the main body of rural revitalization - the poverty free households, and provide them with corresponding education and training, professional guidance and technical support, so that they can master certain technical capabilities to increase the stability and long-term nature of the source of economic income. On the basis of maintaining basic living needs, we will gradually improve the quality of life and enhance our ability to resist risks.

3.3. Implement Proactive Incentive and Support Policies

Starting from the object of rural revitalization, the government also plays an important role in the whole process. The anti-poverty work is inseparable from the advocacy and support of the government. Similarly, the establishment of the early warning mechanism for rural revitalization also requires the participation of the government. To enhance the ability to resist the risk of rural revitalization, the government needs to implement corresponding support policies, such as the incentive mechanism, which can provide a certain amount of financial incentives according to the annual income of the poor families, or build a long-term and stable interest security mechanism to gradually improve the level of social security. The government's support is tantamount to adding a powerful barrier to the early warning mechanism for rural revitalization.

3.4. Encourage the Combination of Poverty Alleviation and Rural Revitalization

As the carrier of rural revitalization, in terms of resources and environment, we should adjust measures to local conditions, make full use of all available resources to develop strengths and avoid weaknesses, and inject vitality into the rural economy. For example, scenic areas can develop leisure tourism, and resource rich areas can extend the industrial chain. The main purpose of poverty alleviation is to increase farmers' income, narrow the gap between urban and rural areas, improve the growth rate of rural economic development through rural revitalization, consolidate the achievements of poverty alleviation, weaken the gap between urban and rural areas, and improve the quality of poverty alleviation.

Acknowledgments

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