

Random Forest Evaluation and Collaborative Analysis of New Urbanization and Agricultural Modernization: Data from Anhui Province of China

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Abstract:

The In the context of China's rural revitalization, this paper uses the random forest intelligent evaluation method to evaluate the development level of new urbanization and agricultural modernization in Anhui Province, and uses the synergistic evaluation method to evaluate the coordinated development of new urbanization and agricultural modernization. Based on the establishment of new urbanization evaluation index and agricultural modernization evaluation index system, this paper builds an evaluation model based on random forest intelligent algorithm on the open source software R language platform. Selecting the corresponding index data of each city in Anhui Province from 2011 to 2016, and classify the new urbanization evaluation index and agricultural modernization evaluation index into high, high, medium and low. The results show that the cities with a higher level of new urbanization are Hefei, Wuhu, Tongling and Huangshan. The lower cities are Bozhou, Suzhou, Fuyang, Huainan, and Lu'an. The evaluation results of the new urbanization level of cities in Anhui Province from 2011 to 2016 showed an overall upward trend over time; In 2016, Huainan City made significant progress in the development of agricultural modernization, jumping to the first place in the province. From 2011 to 2016, the city with the largest increase in the evaluation value of the development level of agricultural modernization in Anhui Province is Huainan City, with an increase of 0.946, the city with the highest growth rate is Anqing City, with a growth rate of 45.76%; The city with the smallest increase in the evaluation value of the development level of agricultural modernization is Ma'anshan City, whose value is 0.133, with an increase of 45.76%, And the city with the lowest growth rate is Ma'anshan City, with a growth rate of 5.67%. The results of the "two modernizations" collaborative evaluation show that the areas with high levels of coordinated development of new urbanization and agricultural modernization in Anhui Province are concentrated in the central and eastern parts of Anhui Province, mainly including Hefei, Wuhu, Chuzhou, Ma'anshan and Bengbu. The areas with low levels of coordinated development of new urbanization and agricultural modernization in Anhui Province are concentrated in the southwest, mainly including Tongling, Anqing, Chizhou, and Huangshan. The remaining municipalities in Anhui Province are areas with the middle level of coordinated development of new urbanization and agricultural modernization, mainly including Huainan City, Huaibei City, Fuyang City, Xuancheng City, Suzhou

City, Bozhou City and Lu'an City.

Keywords: *Random forest, New urbanization, Agricultural modernization, Synergy.*

I. INTRODUCTION

In 2019, the first document of the Central Committee made a systematic and comprehensive deployment, which hardened and consolidated the policy arrangements for adhering to the priority development of agriculture and rural areas[1]. During the two sessions, General Secretary pointed out that the overall goal of implementing the rural revitalization strategy is agricultural and rural modernization[2].

China's urbanization will become a major engine of China's economic development in the 21st century. Urbanization is an important means to cultivate entrepreneurs and new-type farmers. It is also an important condition to drive agriculture to scale development and realize agricultural modernization. New-type urbanization and agricultural modernization—"two modernizations" promote each other, urban productivity can drive the development of agricultural productivity, drive the development of agricultural modernization and cultivate non-agricultural workers to meet the needs of new-type urbanization[3]. Only the coordinated development of new-type urbanization and agricultural modernization can the construction of agricultural modernization be benign and sustainable. Coordinated development of the "two modernizations" is a major strategic policy of the country, and the government should play a better role in promoting the simultaneous development of urbanization and agricultural modernization.

In this paper, the new urbanization and agricultural modernization Anhui Province of China in 2016 are evaluated by using the random forest theory and the coordinated development level of new urbanization and agricultural modernization in Anhui Province in 2016 was quantitatively studied by using the synergetic model.

II. MATERIALS AND METHODS

With the development of artificial intelligence, the machine learning method is bound to cause the impact of the "two modernizations" evaluation method. In this paper, the stochastic forest machine learning method is applied to the evaluation of new urbanization and agricultural modernization.

2.1 Materials and Methodology

2.1.1 Materials

Construction of evaluation index system of new urbanization and agricultural modernization in Anhui Province.

Based on the principles of science, systematicness, comparability and equilibrium, this paper selects 20 specific indexes from 3 levels as the indexes to measure the level of new urbanization in Anhui Province[4]. The main selected indicators of population and economy are: A_1 The urbanization rate of the permanent

population (%), A₂ The illiteracy rate of the total population (%), A₃ The average number of years of schooling per person (years), A₄ The registered unemployment rate in cities and towns (%), A₅ The average GDP per person (yuan), A₆ The ratio of the output value of tertiary sector of the economy to the total output value (%), A₇ Fixed asset investment per 10,000 population (Ten thousand yuans); In the aspect of infrastructure, the selected indicators are as follows: A₈ The area ratio of a 8 built-up area to all administrative areas (%), A₉ Area of utility land per 10,000 population(ha), A₁₀ Construction Land area per 10,000 population (ha) , A₁₁ Per capita urban road area (square meters), A₁₂ Per capita area of parks and green spaces(square meters), A₁₃ Number of fixed broadband subscribers per three persons (door); The indicators selected for the quality of human settlements are: A₁₄ Car ownership per 10,000 population (vehicles), A₁₅ Per capita expenditure on domestic tourism (yuan), A₁₆ Number of beds per 10,000 people in health facilities (sheets), A₁₇ Number of criminal cases filed and investigated by public security organs per 10,000 persons (cases), A₁₈ Floor space per 10000 people (square meters), A₁₉ Per capita expenditure on general public services (yuan), A₂₀ Urban public library collections (thousand copies). This paper presents the new urbanization index data of some cities in Anhui Province in 2016 as shown in TABLE I.

TABLE I. 2016 new urbanization index data of some cities in Anhui Province

	Hei fei	Huai bei	Bo zhou	Su zhou	Beng bu	Fu yang	Huai nan	Chu zhou	Lu an	Ma an shan
A1	72.1	62.1	38.3	40	53.7	40.2	62.1	50.4	44	66.5
A2	4.8	4.8	7.1	6.8	5.6	6.7	5.5	5.3	5.6	4.7
A3	10.9	9.5	8.3	8.7	9.6	8.4	9.4	9	8.8	9
A4	3	4.2	2.8	2.4	2.9	2.7	4	3.2	4	2.9
A5	80138	36427	20611	24270	41855	17642	27990	35302	23298	65833
A6	45	36	41.6	42.8	41.6	38.6	40.5	34.4	38.6	39
A7	82617	43427.6	17141.3	22682.2	50027.9	16176	27631.7	42018.1	22527.3	90712.5
A8	0.4	0.1	0	0	0.2	0.1	0.1	0.1	0	0.1
A9	0.8	0.7	0.3	0.3	3.3	0.3	0.4	0.8	0.5	0.5
A10	55.4	41.4	13.5	13.9	42.8	14.9	31.8	21.1	16	39.8
A11	17	16.9	45.5	27.9	20.1	26.2	15.4	43.9	24.2	19.1
A12	13.5	16.7	13.4	13.4	13	14	12.6	14.5	14.8	15
A13	0.8	0.6	0.3	0.4	0.5	0.4	0.5	0.5	0.4	0.7
A14	1817.1	935.7	839.3	655.1	835.1	786.2	754.9	729.9	859.4	936.3
A15	1251.9	635.9	734.1	634.6	618.2	683.8	635.4	817.1	734.6	727.9
A16	57.6	55.2	34.7	36.9	54.9	44.5	47.9	42.8	38.3	37.6
A17	77.7	33.6	21.6	33.2	43.3	25	30.2	42.7	22.6	41.3
A18	26665	5392	8080.5	10077.5	20301.3	8292.3	6896.3	16371.5	13908.3	17222.8
A19	688.9	574.9	367.6	401.1	522.9	377.3	471.2	495.8	728	736.8
A20	4437	839	705	619	958	110	335	253	195	1232

Based on the connotation of agricultural modernization and the construction principle of the index system, this paper selects 10 indicators to construct the evaluation index system of agricultural modernization level in Anhui Province, in order to reflect the development level of agricultural modernization in Anhui Province as objectively and truly as possible[5].

Investment in fixed assets of agriculture, forestry, animal husbandry and fishery (10,000 yuan)B1, electricity consumption in the primary industry (100 million kilowatt-hours)B2, total power of agricultural machinery (10,000 kilowatts)B3, and water-saving irrigation area (1,000 hectares)B4 , per capita crop sown area of employees in the primary industry (hectares)B5.

Total biogas production (10,000 cubic meters)B6, gross output value of agriculture, forestry, animal husbandry and fishery per person employed in the primary industry (10,000 yuan)B7, cereal yield per unit area (kg/ha)B8, vegetable yield per unit area (kg/ha)B9, and total meat production per capita of employees in the primary industry (tons)B10.

This paper presents the Agricultural Modernization Index data of some cities in Anhui Province in 2016 as shown in TABLE II.

TABLE II.2016 evaluation index system of agricultural modernization level in Anhui Province

	He fei	Huai bei	Su zhou	Beng bu Fuyang	Fu yang	Huai nan	Chu zhou	Lu an	Ma an shan	Wu hu	Xuan cheng	Tong ling	Chi zhou	An qing Hung shan	Huang shan
B1	13236.7	5716.5	1946.2	3885.7	1904.5	11157.3	5251.7	2648.6	10411.1	25025	6359.9	9124.1	3686.4	7425.7	8943.1
B2	2.6	0.6	1.3	1.7	1.1	1.3	2.4	1.1	1.8	2.2	1.7	0.7	0.8	1.5	0.5
B3	453.8	985.5	874.6	548.1	763.5	444	705.7	558.9	151.6	216.6	251.5	90.2	129.6	314.6	83.4
B4	4	430	282.4	25.2	288.3	57.9	47.9	62.1	1.4	0.3	16.8	0.6	4.1	5.6	2.3
B5	9226.2	6883.5	6992	6370.5	5578.8	7744.5	8145.3	4506.3	5250.2	7403.5	4846.4	5258.5	4312.1	5765.4	3743.6
B6	2199.4	456	1228.3	850.5	2324	1528.4	1519	2205.6	434.2	314.8	1882.6	483.3	1837.5	3941.5	843.5
B7	58621.2	28431.7	33742.6	33291.8	26768.5	31513.2	35734.3	23725	34415.2	54041.9	32732.4	24138.5	28361	32585.4	28818.9
B8	6291	5890	5440	6067	6095	6692	5898	6105	6743	6607	5776	5056	5780	5855	6137
B9	23779	37449	38248	41031	37999	31316	31046	20429	28325	24624	20529	22927	25388	22002	17410
B10	5814.3	2562.7	3396.2	3632.1	2970.4	3782.5	3655.5	2743.9	1871.8	3329.2	3322.1	1859.8	1986.7	2725.6	2659.2

2.1.2 Methodology

2.1.2.1 Principles of random forests

(1)The meaning of random forest

As a newly developed artificial intelligence modeling tool, random forest can be applied to identify ecological security conditions. The random forest algorithm has several advantages. First of all, it is not dimensionally limited, i.e. there is no need to normalize the data. Secondly, the model has high classification accuracy. On the basis of limited training samples, the error can be minimized by optimizing and adjusting the parameters, which can achieve high classification accuracy. In addition, the model also has a weight learning mechanism, which avoids the overfitting problem in the attribute evaluation of large and complex nonlinear systems[6].

(2) Random forest classification algorithm

Random forest regression algorithm is a new combined classifier algorithm proposed by Breiman. Random forest regression can be regarded as a strong predictor integrated by many weak predictors. The basic tree idea is to use the classification regression tree (CART) as the meta-classifier. Given the original sample set and the input vector X, multiple sample trees are extracted from the original sample trees, and the capacity of each sample is consistent with the original training set. In the construction of a single tree, features are randomly selected for attribute splitting of internal nodes; and establish K decision tree models for K samples, each decision tree classifier determines the optimal classification result by voting on different classification results. Each basic decision tree model uses random m variable attributes to obtain a combined classifier[7].

A complete algorithm for random forests: First, the autonomous sampling method (Bootstrap) was used to repeatedly extract n samples, which were used as a training set; Second, CART decision tree is established. In random forest, N decision trees need to be established, in this paper, we use Gini Index to evaluate the node split, and then form a complete tree without pruning; Thirdly, the test results of the test set are adopted the simple voting method of majority voting, and the category with the most votes is the classification result of the test set in the random sample.

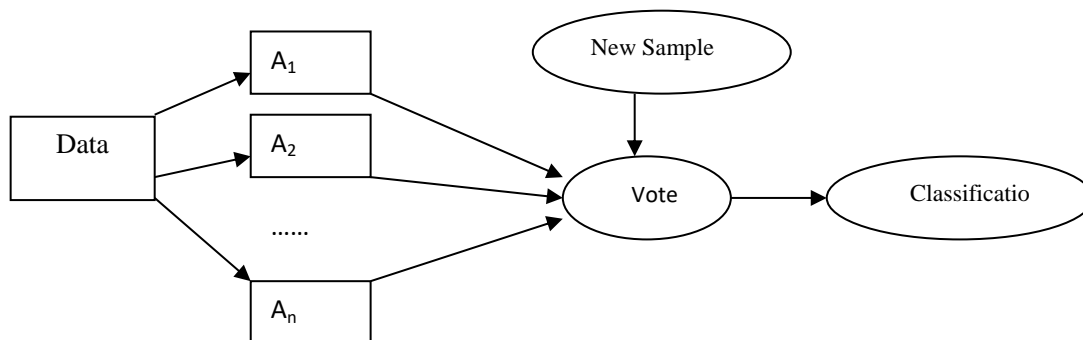


Fig 1: random forest classification algorithm

2.1.1.2 Coordination degree evaluation model

In order to reflect the coordinated development degree of new urbanization and agricultural modernization in Anhui Province more objectively, the concept of coupling coordination degree was introduced to evaluate the coordination degree on the basis of coupling degree. The specific formula of coupling coordination degree of coordinated development between new urbanization and agricultural modernization in Anhui Province constructed is as follows:

$$C = \left[\frac{U * A}{\left(\frac{U + A}{2} \right)^2} \right]^k, \quad k \geq 2 \tag{1}$$

Where, C is the coupling degree and k is the regulation coefficient, where k is 2. We know from the

formula that $0 \leq C \leq 1$. The higher the value of C is, the higher the coupling degree between the two systems is. When C is 0, it indicates the degree of self-coordination between the two systems; when C=1, it indicates that the two systems are in the optimal coupling state.

In order to further objectively express the coordinated development level of new-type urbanization and agricultural modernization in Anhui Province, the influence of their respective evaluation values on the coordination degree was added, rather than the relative coordination between the two, and the concept of coupling coordination degree was introduced to evaluate the coordinated development level of the two.

$$D=(C \times T) / 2$$

$$T=\alpha U+\beta A \quad (2)$$

Where, D is the coupling coordination degree and C is the coupling degree. T is the comprehensive development level index of new-type urbanization and agricultural modernization, α and β are undetermined coefficients, which respectively mark the weights of new-type urbanization and agricultural modernization in the comprehensive development level. In this paper, it is considered that new-type urbanization and agricultural modernization are equally important, so α and β values are both 0.5. Combined with the mathematical formula of D, it can be found that D is the evaluation value obtained by multiplying the comprehensive index representing the level of the new urbanization and agricultural modernization with the minimum difference between the two levels[8].

2.1.1.3 Random forest assessment "two modernizations" in Anhui Province

If qualitative analysis is used in the "two modernizations" assessment of new urbanization and agricultural modernization, it will be too subjective and inaccurate to meet the requirements of the "two modernizations" assessment. Subsequently, quantitative analysis is introduced into the "two modernizations" assessment. However, in recent years, we often use analytic hierarchy process, fuzzy and comprehensive evaluation, and gray system evaluation method, which lack information technology features.

(1)Evaluation of development level of new urbanization in Anhui Province based on random forest algorithm

On the basis of R language platform, this paper constructs a new urbanization level evaluation model of Anhui Province based on Random Forest (RF) intelligent algorithm:

First, data Import: `x=read. table("clipboard", header=T);`

Second, call the RF function: `library("random Forest");`

Third, constructing the forest model for evaluating the development level of new-type urbanization in Anhui Province.

Fourth, the importance or weight of the output variable: `importance(rf)`, As shown in fig 2.

are input to evaluate, and the result is as shown in figure 5.

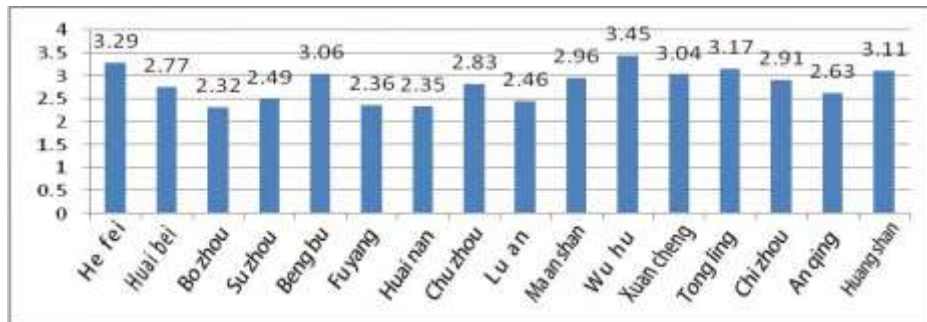


Fig 5: Output Value of New Urbanization Development Level of Various Cities in Anhui Province in 2016

(2) Random forest assessment of agricultural modernization development level in Anhui Province

Like new RF evaluation of urbanization in Anhui province, based on the comprehensive evaluation of level of agricultural modernization in Anhui province in 2016 random forest model establishment process analysis, through the Anhui province agricultural modernization index importance parameter importance (rfagr) analysis, water-saving irrigation area (thousand hectares) , per capita sown area of crops for employees in the primary industry(ha), biogas output volume (cubic meters) is the largest three indicators to assess the effect of the level of agricultural modernization in Anhui province. The established RF evaluation model of the level of agricultural modernization in Anhui Province is applied, and the evaluation results of the development level of agricultural modernization are shown in Fig. 6 after input the municipal standards of Anhui Province for each year[10].

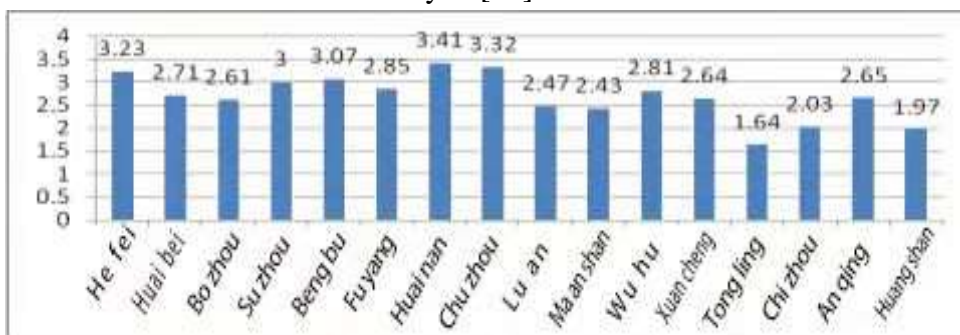


Fig 6: Output value of agricultural modernization development level of each city in Anhui Province in 2016

(3) Collaborative analysis of "two modernizations" in Anhui Province

According to the random forest model, we measured the evaluation value of the new-type urbanization level and the agricultural modernization level of each city in Anhui Province in 2016, and substituted the constructed coupling coordination degree model for calculation. The results of the coordinated development level of new-type urbanization and agricultural modernization in each city in Anhui Province were obtained in Figure 7:

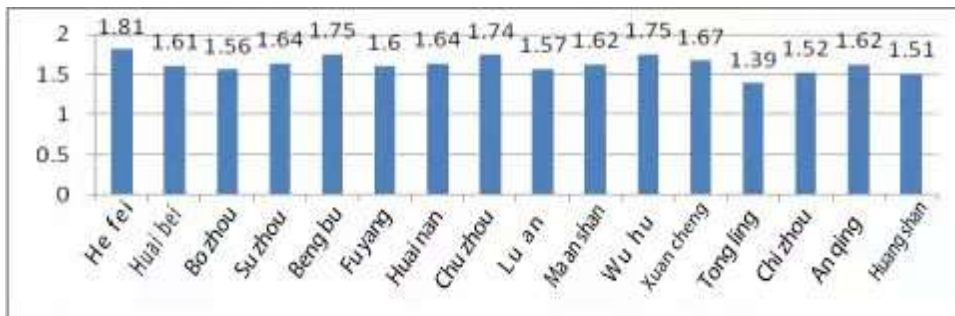


Fig 7: Coupling coordination degree of coordinated development level of "Two" in Anhui Province in 2016

III. CONCLUSION

3.1 Analysis of evaluation results of new-type urbanization

As can be seen from Figure 5, the evaluation of new urbanization level in Anhui Province in 2016 found that Wuhu City ranked first, Hefei City ranked second, and Tongling City ranked third respectively. These three cities are among the top three in the province's new-type urbanization rankings.

In 2016, Wuhu issued the New Urbanization Plan of the 13th Five-Year Plan, which proposed that the urbanization rate of registered population in Wuhu would reach about 62% by 2020, and that measures should be taken to reduce the gap gradually between the urbanization rate of permanent resident population and registered population by 10.5 percentage points. Seizing the pace of new-type urbanization development, Wuhu has optimized its urbanization system continuously and improved its urban construction level steadily. It has been awarded the National Advanced City in Scientific and Technological Progress for six consecutive times. In recent years, Wuhu has achieved remarkable results in the construction of ecological civilization while improving infrastructure. Wuhu has made outstanding achievements in energy conservation, emission reduction and environmental construction, which has built up to 27 national and provincial ecological towns.

Hefei, as the political center of the province, has far more resources than Wuhu. Therefore, in recent years, Hefei has opened a gap with Wuhu. In 2017, its annual GDP exceeded 700 billion, which was just 400 billion more than Wuhu. However, Wuhu is geographically superior to Hefei, which lies to the south of the Yangtze River. Hefei, the capital city of Anhui Province, is located north of the Yangtze River and south of the Huaihe River. Compared with Hefei, Wuhu is close to Jiangsu Province and is more influenced by the economic radiation from the developed areas of the Yangtze River Delta. In the urban planning of Nanjing, Wuhu is also located in the metropolitan circle of the city. Wuhu is a city of Anhui Province nominally, but its influence from Nanjing may not be less than that from Hefei.

Although Tongling is only a prefecture-level city in Anhui Province, its geographical location is also very superior, which located in the lower reaches of the Yangtze River. Tongling has caught the pace of new-type urbanization development and achieved good results relatively.

From the analysis of the evaluation results of new urbanization in Anhui Province in 2016, Fuyang City ranked the 14th, Huainan City ranked the 15th, and Bozhou City ranked the 16th. The new urbanization level of these three cities ranked the last three in Anhui Province.

3.2 Evaluation results of agricultural modernization

Figure 6 shows that Huainan has made great progress in the development of agricultural modernization in 2016, ranking first in the province. In terms of rural economy, the gross agricultural product of Huainan reached 20.9 billion yuan in 2017, 171.4 times that of 1978, and the level of agricultural modernization has been continuously improved in the past 40 years. In terms of urban and rural construction, the cumulative investment in urban and rural construction in Huainan has exceeded 100 billion yuan in the past 40 years. Among them, the built-up area of Huainan covers 130 square kilometers, and 63 percent of the population has been permanent urban residents. Its development of secondary and tertiary industries is fast. And it pay attention to the development of tertiary industry, especially commerce and trade. In 2017 alone, the total retail sales of social consumer goods increased by 230.8 times compared with 1978.

Agricultural modernization level of Chuzhou ranks second in Anhui Province, respectively, in recent years, Chuzhou on the reform of "separation of the three rights" as an opportunity, in the aspect of promoting agricultural modernization progress is apparent. Particularly, the Fengyang xiaogang village belongs to Chuzhou , which has accelerated the transformation of traditional agriculture to modern agriculture, actively promoted the combination of small farmers with modern agriculture, and increased the ownership, management of the contract right, "separation of the three rights" parallel advance, xiaogang has become more prominent achievements agricultural modernization.

Agricultural modernization of Hefei ranked third; Tongling has the lowest level of agricultural modernization in each year. This is because Tongling mainly relies on local mineral resources to develop its economy over the years, and the development of local mineral resources will inevitably have a negative impact on agricultural production, resulting in poor agricultural development conditions and weak agricultural foundation.

3.3 Analysis of coordinated results of new urbanization and agricultural modernization in Anhui Province

In general, the regions with high level of coordinated development of new-type urbanization and agricultural modernization in Anhui Province are concentrated in the central and eastern part of Anhui Province, mainly including Hefei, Wuhu, Chuzhou and Bengbu. These prefecture-level cities in Anhui Province have a relatively high level of economic development and flat terrain, and the level of new-type urbanization and agricultural modernization is relatively high.

The regions with low level of coordinated development of new-type urbanization and agricultural modernization in Anhui Province are concentrated in the southwest of Anhui Province, mainly including

Tongling City, Anqing City, Chizhou City and Huangshan City. Among the prefecture-level cities, the developed mining industry in Tongling has exerted a considerable influence on the development of its agricultural modernization level, resulting in a disharmony in each year. Anqing City is located in the hilly and mountainous area of western Anhui, and the main part of Dabie Mountain is located in the city, so it is difficult to develop modern agriculture for it, which restricts the process of agricultural modernization. Chizhou and Huangshan are located in the hilly and mountainous region of southern Anhui. There are Tianmu-Baiji Mountains, Huangshan Mountains and Jiuhua Mountains in these cities. Xin 'an River, Shuiyang River and Qingyi River valleys are among the three mountains, so it is difficult to develop modern agriculture in a large area for them.

The other cities in Anhui Province are at the middle level of new-type urbanization and agricultural modernization, mainly including Ma'anshan, Huainan, Huaibei, Fuyang, Xuancheng, Suzhou, Bozhou and Lu 'an.

3.4 Countermeasures and Suggestions

3.4.1 Optimize the industrial structure, boost rural revitalization, and promote the coordinated development of urbanization and agricultural modernization

The synchronization of new-type urbanization and agricultural modernization is inseparable from the optimization of industrial structure. We should strengthen the "production, processing and marketing" chain, extend the industrial chain of agricultural products processing, increase the added value of agricultural products, enhance the competitiveness of products, rely on the optimization of industrial structure, promote the rural revitalization strategy. Anhui Province has entered a new stage of relying on producer services to promote the new industrialization, accelerate the adjustment and optimization of the industrial layout and structure of Anhui Province, and construct the industrial development pattern of cities and towns in Anhui with distinctive characteristics and complementary advantages. At the same time, the "agriculture, rural areas and farmers" work in the new era has the characteristics of a new period, a new starting point and new requirements. We should seize the opportunities of rural revitalization and development, and promote the synchronization of urbanization and agricultural modernization with the help of industrial optimization.

We should actively foster a new type of urbanization economy on the supply side, aim at changes in industrial demand, promote the transformation of industrial structure to high-end, efficient and high added value, strengthen high-tech industries and modern service industries, and form an industrial structure based on service economy as soon as possible. We will accelerate the development of modern service industries. The sustainable development of new-type urbanization needs to accelerate the development speed of the tertiary industry and improve the development level of modern service industry. We will work hard to establish a new system for the development of modern industries and effectively promote the flow of talent, technology and capital to cities and towns. In the cultivation mechanism of leading industry, we should not only give full play to the basic role of market mechanism, but also give full play to the leading role of government. We should closely follow the trend of industrial upgrading, build the highland of industrial

innovation, improve the core competitiveness of the industry, and provide sustained impetus for the construction of new urbanization with Anhui characteristics.

We will strive to build a modern industrial system that integrates agriculture with secondary and tertiary industries, promote the agricultural supply-side structural reform in Anhui Province, and develop characteristic agriculture, modern agricultural product processing industry, "Internet +" and other new industries and new forms of business according to local conditions. We will explore ways to build pastoral complexes and promote coordinated development of rural modernization and new urbanization.

3.4.2 The rural revitalization strategy promotes the return of industry to feed agriculture and improves the level of agricultural modernization

Rural revitalization strategy to promote industry to feed agriculture, rural leaders at all levels need to respect the objective laws, and give full play to the subjective initiative. With the rural revitalization strategy as the starting point, the short-term and long-term goals of rural development should be closely linked, the supply-side structural reform of agriculture should be the main line, the weak links in agricultural and rural development should be strengthened, and the cities should drive the countryside.

In the new era, the Anhui province agricultural development faces problems with previous has essential difference, the development of agriculture, countryside and farmers' goal of adequate food and clothing mainly to new demand of a well-off society in an all-round way, the amount of principal contradiction by supply and demand of agricultural products to structure and quality of contradictions, the core of the agricultural development of leading the pursuit of production change to adapt to the market demand structure change, the connotation, the goal of agricultural modernization, path and so on have changed dramatically, they should be based on new requirements of the new situation, the increase in feed agriculture efficiency, and speed up agricultural modernization.

Keep up with the change of demand structure to accelerate structural adjustment and product upgrading, and form a modern industrial system integrating "plant-processing-sales". We will support modern industry in extending the management chain to agriculture. Around the middle and lower reaches of the integration of industrial chain, supporting the modern industrial enterprises in science, technology, equipment, personnel, services, and standardization of modern agriculture of injection. The standardized, high quality, high content of knowledge management in the agricultural industry, input of agriculture, farmers and other elements into the management of the modern industrial chain, to improve the level of industrialization, scale. Actively promote the cross-regional cooperation and cooperation of leading agricultural enterprises, and support enterprises to accelerate the interactive development between leading agricultural enterprises in rich and underdeveloped regions by means of equity participation, controlling shares, merger and acquisition. Leading enterprises in developed areas should be guided to directly invest and set up factories in less developed areas, combining the advantages of technology, capital and processing of leading enterprises in developed areas with the advantages of agricultural products resources and cheap labor in less developed areas, and providing assistance from the aspects of capital, technology and management to achieve joint development and balanced development.

3.4.3 Deepen the reform of "separation of agricultural land rights, three rights", lay a "cornerstone" for stabilizing rural revitalization, and steadily promote agricultural modernization

Powered by innovation, to speed up the pace of agricultural management system and mechanism innovation, as a whole to promote the rural land, rural collective property rights and the reform of the system for the protection of agricultural support, crack institutional obstacle of agricultural modernization, to improve agricultural science and technology independent innovation ability, and promote agricultural development shift from focusing on material inputs to innovation.

Perfecting the legal system of land transfer is the specific requirement of the development of new socialist countryside in the new era. Constructing a sound legal system of land transfer can fundamentally reverse the situation of improper interests of farmers, formulate clear legal provisions, and more specifically protect the vital interests of villagers in the transfer of management rights. To break the difficulty of farmers' income growth as a breakthrough, a variety of measures should be taken to jointly promote land circulation, accelerate the reform of "separation of the three rights", and realize the common dividend of farmers, village collectives and enterprises. In terms of system construction, the "separation of the three rights and extension of the land contract right for another 30 years" has laid the institutional foundation for optimizing and rational use of land resources, which is conducive to the development of agricultural modernization, and has also laid the "cornerstone" for rural revitalization.

In the reform of "separation of the three rights" of agricultural land, we should strengthen the management of new management entities. Because after the implementation of the reform of "separation of the three rights", there will be changes in the transfer of rural land management rights, and various operating subjects will enter the countryside to seek interests. If the government for lax management main body qualifications, not perfecting rural land management guidelines, it may appear rural land circulation in a disordered state. Once the operators to default, land circulation will be affected seriously, which affects the stability of the countryside, influences the country revitalization, also hinders the rural modernization, new urbanization coordinated development of "two modernizations". At the same time, the local government should also do a good job of publicity and service, unimpeded land circulation information, and reasonably guide the rural land circulation.

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