The Research on the New Pattern and New Approach to Accurate Poverty Alleviation in Henan Based on Big Data Analysis

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Abstract—The property problem involves in livelihood issues of common people and also the social hotspot concerned by NPC and CPPCC. For poverty, the nation has already valued from the strategic height. The final target aims at establishing the comprehensive well-off society in an all-round way. For this reason, Henan Province keeps up with the step of the central, develops from finance and education and plays an obvious supporting role on overcoming poverty. However, standing on the whole province or even the whole country, the difficult task of poverty alleviation is still severe. Based on it, the author studied the new pattern and new approach to accurate poverty alleviation in Henan based on big data analysis.

Keywords: Big data; Accurate poverty alleviation; pattern; approach(Keywords)

1 INTRODACTION

Agricultural development is the need to establish a province with powerful economy and create beautiful Henan. It is necessary to transform the traditional agricultural development pattern for realize the agricultural development. In order to realize accurate poverty alleviation, it must identify accurately, namely it must find out the real impoverished people. However, for Henan with more than 100 million populations, it must live up to really accurate in every link and ensure high-efficient development of capital, manpower and material resources.

I. Conntations and Action Principles of Big Data

The concept of big data was proposed by the well-known consulting company McKinsey & Co, indicating that big data have already permeated into every industry and business field and have gradually become the important production factors. Big data will the cutting-edge field of improving innovation, competition and productivity. At present, this is no recognized definition on big data. Generally speaking, it is thought that big data mean that data scale involved can't be acquired, managed, disposed and settled into messages serving for business decisions through the current mainstream software tools. Big data generally have the following features: large quantization, diversification, high speed, reality and value. Big data are applied to relief poverty and have specific situations of populations in poverty-stricken areas, economic development status, resource development and utilization, constructive situation of basic facilities and traffic convenient degree, etc.

A. Industrialization and Synergetic Development of Accurate Poverty Alleviation

Accurate poverty alleviation is relative to the traditional extensive poverty alleviation. The obvious features include refinement, scientization, high efficiency and continuity.

1. Driven by the modern agricultural park; speed up the construction of the modern agricultural park; and increase incomes through "rent", "salary" and "money paid for shares", etc;

2. Concentrate on characteristic industrial development, apply the "six-in-one" pattern of the government+ leading enterprises+ financial organizations+ scientific research institutions +farmers' cooperatives+ peasant households"; There are so many characteristic agricultural products in Henan province, such as Chinese-date in XInzheng, apricots in Yongchi and tea in Xinyang, etc., and it is too numerous to mention one by one.

3. Driven by rural tourism: by virtue of the first tourism development meeting in Henan Province and based on resources and ecologic dominance in 68 scenic spots in the impoverished counties, it is necessary to explore the poverty alleviation through tourism and expand mechanism and pattern of poverty alleviation through tourism with "all-round tourism and scenic spots in villages". Based on the abundant characteristic resources in Henan, it must explore its connotations, develop the excellent routes as a whole, and forge characteristic brands, such as biological science tourism circle, water science landscape belt and agricultural science tourism circle, etc. It can forge two belts—tourism belt of the Yellow River and middle line tourism belt of the south-to-north water transfer project. The tourism belt of the Yellow River has the total length of 711 km. The Henan section is the most characteristic. Plateaus and river valleys in Sanmenxia City, mountains and gorges in Luoyang, broad flats in Zhengzhou with vast boundary, hanging rivers in Kaifeng and towering levees, as well as ecological wetlands, agricultural landscapes, world cultural heritages and Chinese ancient capital groups, etc., integrate into the middle line tourism belts of the south-to-north water transfer project. It must integrate with the natural human resources, local features and urban recreation and forge the tourism belt of ecological culture.

4. Driven by the leading enterprises: enlarge and strengthen 161 three-level leading enterprises of poverty alleviation in provincial, municipal and county levels(53 provincial enterprises in application, 52 municipal enterprises and 66 county-level enterprises in approval), expand the industrial chain and drive 25000 low income families.

B. Big data promote establishment of logistic e-commerce platform

Impoverished counties in Henan province have product categories with bright features. Limited by traffic or marketing, most of them are hard to be known and recognized by the outside market. Features of e-commerce

refer to break through the limitation of geographical location and realize construction of crossing connection, so as to promote conclusion of transaction. Based on it, "e-commerce+ poverty alleviation" naturally becomes the perfect combination to achieve the task of poverty alleviation. Rural e-commerce should apply the thought of "industrial chain+ industry chain", use the way of "technical driving+ user driving+ data driving" to connect with ecological chain of rural e-commerce and provide basis for e-commerce platform decisions based on the participation of big data.

C. To realize long-term and accurate poverty alleviation and avoid from relevant poverty

Poverty alleviation should consider sustainable development in the areas of overcoming poverty and promote the lasting vitality of relevant industry. It must consider a unbalanced problem in subsequent regional development in current help-the-poor measures and improve foresight of policies.

II. The Performance Analysis of Accurate Poverty Alleviation Pattern Based on Big Data

A, Index Confirmation

According to basis and principles of index selection and combined with the poverty features in Nanyang County and Lankao County, the AHP method is used to select the index system of evaluation preliminarily through field research and data analysis. Performance evaluation index is analyzed from relevance, efficiency, effects and sustainable development and confirms the index system structure.

Table 4-1 The Quantization Basis of Performance Evaluation for Poverty Alleviation Development in Resource Industry

B	C	Scoring basis
Policy relevance B1	Policy applicability C1	The coordination degree of relevancy of mutual poverty alleviation, new rural cooperative medical system and low guarantee accounts 50% of shares, respectively
	Planning and implementation of poverty alleviation C2	2 scores for having poverty alleviation planning, 2 scores for identical local poverty alleviation and provincial and municipal poverty alleviation planning, and 2 scores for consistent planning and actual progress
	Connection with other policies of poverty alleviation C3	Relevancy with industrial poverty alleviation, relevancy with scientific poverty alleviation, relevancy with industrialized poverty alleviation, relevancy with rainy planning, and relevancy with income increase account for 10% of shares, respectively
Poverty alleviation efficiency B2	Poverty alleviation rate C4	Poverty alleviation rate gives priority to poverty alleviation monitoring data, involving in whether exceeding poverty occurrence rate, poverty return rate and proportion of poverty populations and accounting for 4 scores
	Governmental tax rate C5	Growth situation of general budget incomes and expected targets confirmed by government work reports for 2

		scores
	Growth rate of poor farmers C6	Growth situation of farmers' incomes and expected targets confirmed by government work reports for 2 scores
Effects of poverty alleviation B3	Infrastructure construction C7	"Infrastructure construction" is used for grading standards according to individual field inspection. Constructive schedule and quality account for 50%, respectively
	Scientific poverty alleviation and labor transmission C8	Check training tasks in the whole county; 80% of skill training or above, and transfer more than 90% and obtain 50% of scores
	Demonstrative driving ability C9	Cooperative degree between villages and 50% of scores for two relevant enterprises or above
Sustainable development B4	Industrial concentration development C10	Establish the influential industrial concentration area, attract the same kind of industry, perfect industrial chain, and score 50% for more than 10% of local GDP
	Social development ability C11	Insect democratic management and coverage of various policies, score as regional schedule and quality, and account for 50%, respectively
	Sustainability of ecological environment C12	Evaluate value according to rural household survey in counties and areas and deduct for unsatisfied ones as certain proportion

B. Performance Analysis of Poverty Alleviation Development

On the basis of mastering poverty alleviation development of relevant resources comprehensively, experts assign values to various indexes according to data analysis and settlement on the spot. According to the method of AHP performance evaluation, two counties are driven by leading enterprises to realize industrial resource development and degree of realization, so as to provide reference for poverty alleviation of resource industry.

(1) Evaluation Index Weight and Score Confirmation

The judge matrix of the second layer relative to the first layer is shown as follows:

Table 4-2 Judge Matrix of C1

C1	D1	D2	D3	D4	D5	D6
D1	1	0.33	0.33	0.5	0.5	0.5
D2	3	1	0.33	0.33	0.5	0.5
D3	3	3	1	0.33	0.33	0.5
D4	2	3	3	1	0.33	0.33
D5	2	2	3	3	1	0.3385
D6	2	2	2	3	3	1
	13	11.33	9.66	8.16	5.66	3.16

Table 4-3 Judge Matrix of C7

C7	D14	D15	D16	D17	D18	D19
D14	1	0.5	0.5	0.5	0.33	0.33
D15	2	1	0.5	0.5	0.5	0.33

D16	2	2	1	0.5	0.5	0.5
D17	2	2	2	1	0.5	0.5
D8	3	2	2	2	1	0.5
D19	3	3	2	2	2	1
D20	2	3	3	2	2	2
D21	2	2	3	3	2	2
	17	15.5	14	11.5	8.83	7.16

Table 4-4 Judge Matrix of C8

C8	D22	D23	D24	D25
D22	1	0.33	0.33	0.5
D23	3	1	0.33	0.33
D24	3	3	1	0.33
D25	2	3	3	19
	9	7.33	4.66	2.16

According to the above-mentioned matrixes, matrix elements are conducted normalization processing, obtaining disposed matrix

After normalization processing, the corresponding W_i^1=(0.0747,0.1067,0.1427,0.1691,0.2149, 0.2919)^T of C1, the corresponding W_i^1 =(0.0578, 0.0678, 0.0782, 0.0963,0.1267, 0.1577, 0.1878, 0.2277)^T of C7, and corresponding W_i^1=(0.1146, 0.1733,0.2775, 0.4346)^T of C8 are shown as above, and so on, so as to obtain the corresponding W_i^1 of C2, C3, C4, C5, C6, C9, C10, C11 and C 12. Every data may stand for the corresponding index weight of every index.

The next is to test weight. First of all, SPSS16.0 is applied to calculate the largest eigenvalue λmax of judge matrixes.

$$\lambda\max = \frac{\sum(C_1 * W_i^1)}{6 * W_i^1} = 6.571 \quad (i=1, 2, 3, 4, 5, 6)$$

$$\lambda\max = \frac{\sum(C_7 * W_i^1)}{8 * W_i^1} = 8.362 \quad (i=14, 15, 16, 17, 18, 19, 20, 21)$$

$$\lambda\max = \frac{\sum(C_8 * W_i^1)}{4 * W_i^1} = 4.391 \quad (i=22, 23, 24, 25)$$

The Consistency index of judge matrixes is calculated.

$$C.I.(\text{Consistency Index}) = \frac{\lambda\max - n}{n-1} = \frac{6.571 - 6}{6 - 1} = 0.1142$$

Consistency ration of random matrixes is calculated.

$$C.R.(\text{Consistency Ratio}) = \frac{C.I.}{R.I.} = \frac{0.1142}{1.2494} = 0.0914 < 0.10$$

indicating that the weight calcuatled by AHP is available. Therefore, weight of D1, D2, D3, D4, D5, D6 is 0.0747, 0.1067, 0.1427, 0.1691, 0.2149 and 0.2919, respectively. With the expert scoring, the scores of 6 indexes are 3.00, 3.00, 2.00, 3.00, 3.00, 3.00 and 3.00, respectively. The score of secondary indexes is 2.8573, and so on. In the evaluation system of poverty alleviation driven by leading enterprises in Taiqian County and Fan County, weight and scores of 4 criterion layers, 12 secondary indexes and 33 specific

evaluation indexes can be calculated, as 3.00, 3.00, 2.00, 3.00, 3.00 and 3.00. The score of secondary indexes is

rank of matrix	1	2	3	4	5	6	7	8	9
RI	0	0	0.5149	0.8931	1.1185	1.2494	1.345	1.42	1.4616

2.8573. The weight of specific evaluation indexes is shown in the table.

Table 4-5 Average Random Consistency Index RI Standard Value

Table 4-6 Index Weight, Score and Comprehensive Index Calculated by AHP

Criterion layers B		Three-level indexes	Weight	Comprehensive index
B1	C1	D1 Relevancy with industrial poverty alleviation	0.0747	0.006225
		D2 Relevancy with scientific poverty alleviation	0.1067	0.008892
		D3 Relevancy with industrialization of poverty alleviation	0.1427	0.011892
		D4 Relevancy with rainy planning	0.1691	0.014092
		DS Relevancy with income increase	0.2149	0.017908
		D6 Relevancy with mutual poverty alleviation	0.2919	0.024325
	C2	D7 Consistency between local policies and central and provincial policies	1.000	0.083333
	C3	D8 Planning and implementation of poverty alleviation policy development	1.000	0.083333
B2	C4	D9 Poverty occurrence rate	0.5000	0.041667
		D10 Poverty return rate	0.5000	0.041667
	C5	D11 Proportion of poor farmers' income increase in total incomes	0.5000	0.041667
		D12 Proportion of financial income in total incomes	0.5000	0.041667
	C6	D13 Arrival rate of poverty alleviation capital	1.000	0.083333
B3	C7	D14 Backroad hardening	0.0578	0.004817

		D item	Weight	Scores
		construction		
		D15 Rainwater harvesting construction	0.0678	0.005650
		D16Drinking water construction	0.0782	0.006517
		D17 Small-scale water conservancy construction	0.0963	0.008025
		D18 Engel coefficient	0.1267	0.010558
		D19 Total power of agricultural machinery	0.1577	0.013142
		D20 Student number in common primary schools	0.1878	0.015650
		D21 Beds in hospitals and welfare houses	0.2277	0.018975
	C8	D22 Proportion of family operation incomes in pure incomes of farmers	0.1146	0.009550
		D23 Scientific training and promotion situation	0.1733	0.014442
		D24 The number of transfer labor force	0.2775	0.023125
		D25 "One college student in a village" and training of "two after-born students"	0.4346	0.036217
	C9	D26 The number of driving settlement of relevant enterprises	1.000	0.083333
B4	C10	D27 Facilities construction of footstone	0.5000	0.041667
		D28 Growth rate of production value in industrial cluster district	0.5000	0.041667
	C11	D29 Development ability of planting and breeding industry	0.5000	0.041667
		D30 Operation situation of industrialized projects	0.5000	0.041667
	C12	D31 Occurrence rate of natural disaster	0.31190	0.025992
		D32 Forest coverage rate	0.19762	0.016468
		D33Ecological environment satisfaction	0.49048	0.040873

Table 4-7 Index Weight and Scores Calculated by AHP

Criterion Layers	Weight	Scores	Second indexes	Weight	Scores
B1	0.16486	2.59424	Policy	0.50832	2.8573

			Third index	Weight	Scores
Policy applicability			applicability C1		
			Poverty alleviation planning and implement C2	0.15846	3.0000
			Connection with other poverty alleviation policies C3	0.33322	2.0000
B2 poverty alleviation efficiency	0.33535	2.60803	Poverty alleviation rate C4	0.35681	2.4701
			Financial growth rate C5	0.39474	2.4860
			Growth rate of poor farmers' incomes C6	0.24845	3.0000
B3 poverty alleviation effects	0.34442	2.52342	Infrastructure construction C7	0.49505	2.4601
			Scientific poverty alleviation and labor transmission C8	0.21228	2.8028
			Demonstrative driving ability C9	0.29267	2.4279
B4 Sustainable development ability	0..15537	2.57993	Industrial cluster development ability C10	0.42105	3.0000
			Social development ability C11	0.33552	2.2257
			Sustainability of ecological environment C12	0.24343	2.3416

3. Performance Evaluation Results of Poverty Alleviation Development

According to index score standards and performance assessment quantization score, qualitative and quantitative evaluations are implemented on four criterion layers, including policy relevancy driven by leading enterprises, poverty alleviation efficiency, poverty alleviation effects and sustainable development ability, etc. The development pattern driven by leading enterprises has the good effects, as shown in the Table 4-11.

Table 4-8 The Performance Evaluation Results of Poverty Alleviation Pattern Driven by Leading Enterprises

Evaluation Criterion	Weight	Performance Grade	Scoring Value	Weighted average
B1	0.16486	Relevancy	2.59424	0.427686
B2	0.33535	Higher poverty alleviation efficiency	2.60803	0.874603
B3	0.34442	Satisfy poor populations	2.52342	0.869116
B4	0.15537	Sustainability	2.57993	0.400844

Compreh ensive performa nce	100%	Good	/	2.57224 9

It can be observed from the table that the primary indexes of poverty alleviation driven by leading enterprises have the scores of 2.59, 2.6, 2.52 and 2.58, respectively. The total scores are 2.57. The total effects of driving poverty alleviation are good. Particularly, the poverty alleviation efficiency is high and driving force of poverty alleviation is strong. The weight index from AHP shows that actual situation in the poverty-stricken areas. This is basically consistent with experts' opinions.

III. Conclusions

Poverty alleviation should be accurate. It must be kept on every link, every duty and every policy in poverty alleviation accurately, so that capital of poverty alleviation can be used for the right place. It must control organizational management, establish the strict organizational system and assessment mechanism, including incentive mechanism, constraint mechanism, and evaluation mechanism, etc., and try to make progress orderly for every task. On the basis of realizing long-term poverty alleviation and harmonious regional development, big data also can develop corresponding predictive roles. With big data, it also can contact with national provinces, share experience in poverty alleviation, communicate with regional differences, so as to match with the task of poverty alleviation with entire situation, contribute to promote the task as a whole, and realize the political vision of the moderately prosperous society benefiting all people.

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