

Data Mining and Coupling Model of Coordinated Development Between Poverty Alleviation Effect and Residents' Participation in Minority Areas

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ABSTRACT

How to improve the effect of poverty alleviation through tourism is an important task faced by minority areas. There is a coupling phenomenon between residents' participation in tourism and the effect of tourism poverty alleviation. Data mining is a decision support process that reveals hidden, unknown and potentially valuable information from large amounts of data. In this study, data mining method and coupling theory are used to analyze the effect of tourism poverty alleviation and the relationship between residents' accidents and accidents in the Southwest Hunan minority areas, and to analyze the data from the behavior survey, to find out the coupling model of the impact of tourism poverty alleviation and residents' tourism behavior, and to conclude and reason. Finally, some Suggestions and measures are put forward to strengthen the coupling behavior between poverty alleviation of ethnic tourism and residents' participation.

Keywords: *Minority tourism poverty alleviation, Residents' participation, Coupling model, Data mining*

1. INTRODUCTION

Developing tourism is one of the important ways to get rid of poverty in minority areas. How to improve the effect of tourism poverty alleviation is an important issue in minority areas[1]. In minority areas, poverty alleviation effect of tourism and residents' participation act interact with each other, and there is a coupling phenomenon between them. Taking Suining and Chengbu Mao autonomous county in Southwest Hunan as examples, this paper use the data mining method to search for potentially valuable information hidden in a large amount of data, and then carries out the analysis based on the coupling model, and finally puts forward suggestions for promoting the effect of tourism poverty alleviation in minority areas.

2. CONSTRUCTION OF COUPLING COORDINATION MODEL

2.1. Data Mining

Data mining is a decision support process that reveals implicit, unknown and potentially valuable

information from a large amount of data [2]. In this study, this paper will use data mining method to analyze the survey data, find out the coupling model of tourism poverty alleviation effect and residents' tourism participation behavior, make inductive reasoning, and find the strategies of tourism poverty alleviation effect in minority areas from residents' participation behavior.

2.2. Indicators Selection

Coupling model refers to the model established by the dynamic relationship between two or more systems that depend on each other and interact with each other. There is a significant coupling between tourism poverty alleviation effect and residents' participation behavior, and they interact and influence each other.[3]. They restrict and develop mutually in the same time and space sequence. This paper combines various factors of poverty alleviation effect of Southwest Hunan minority tourism and various indexes that affect residents' participation behavior to make coupling analysis. Through a series of data analysis through coupling model, it shows the coupling relationship between poverty alleviation effect of Southwest Hunan minority tourism and residents' participation behavior. In this paper, starting from the five factors of economic income, democratic

rights, environment style, social culture and community management, the coupling model is carried out for analysis and research (see table 1).

Table 1 Evaluation index

Level-1 indicator	Level-2 indicator	Level-3 indicator(factor)
Participation action	Economic income Z1	Family tourism income (X1)、Community Economy (X2)、Tourism employment opportunities (X3)、Quality of life (X4)
	Democracy right Z2	Personal part right (X5)、Community part right (X6)、Tour education right (X7)、Right to know tourism policy (X8)、Fairness in system implementation (X9)
	Environment view Z3	Architectural features (X10)、Infrastructure (X11)、Natural environment (X12)、Landscaping (X13)、Environmental pollution (X14)
	Social Culture Z4	Cultural protection (X15)、Protection of ancient buildings (X16)
	Community management Z5	Social order (X17)、Cadre responsibility (X18)、Cadre management ability (X19)

2.3. Model Selection

SEM of structural equation model can analyze latent variables that are difficult to observe directly and can also include unavoidable errors into the model. Therefore, SEM is adopted to analyze factors that affect residents' tourism participation behavior. SEM is mainly used to explore the causal relationship between factors, and the relationship with the causal model and path graph form, said the model contains

the measurement model (a measure of the relationship latent variables and their observation variable) and the structure model, discuss the causal relationship between the latent variables), consists of three matrix equation. Measurement model below: $x = A_x \xi + \delta$; $y = A_y \eta + \epsilon$; $\eta = B \eta + T \xi + \xi$. Where, x is the vector composed of external indicators (such as indicators), Y is the vector composed of endogenous indicators (such as results), A_x and A_y is the factor load matrix, δ and ϵ is the error term, B is the relationship between endogenous latent variables, T is the influence of exogenous latent variables on endogenous latent variables, and ξ is the residual term of the structural equation [4].

AMOS19.0 (bootstrap method was used to estimate the standard error, confidence interval and significance test) was used to fit the factors of poverty alleviation effect of tourism with residents' participating behaviors. The end coupling model is more satisfactory outcomes after many correction, if correlation coefficient between 1 and 1, standardized coefficient of no more than 1, you can through the use of VB or C language to write the program to specify their own estimator), remove the unreasonable and standardized estimated values greater than 1 indicators, to test the coupling model. After repeated tests, the final coupling model was constructed.

3. CASE SDUDY

Based on the analysis of the above evaluation index system, this paper takes Suining and Chengbu Mao autonomous county of Southwest Hunan as the investigation objects and carries out the coupling evaluation of tourism behavior poverty alleviation and residents' participation behavior based on the coupling mechanism. A questionnaire containing 11 questions was designed, and respondents were asked to judge each index according to the actual situation. In Suining and Chengbu Mao autonomous county, 1,000 questionnaires were distributed in the poverty-stricken areas of the minority nationalities. After eliminating invalid questionnaires (excluding those with incomplete or obvious distortion), 988 valid questionnaires were obtained, with an effective recovery rate of 98.8%.

3.1. Quantitative Analysis of Results

In order to further evaluate the coupling between residents' participation and tourism behavior, this paper makes a quantitative analysis of the influencing factors of residents' participation in tourism behavior in Southwest Hunan minority areas, and adopts Likert scale scoring method.

Table 2 Survey results Likert scale

	index	The number of 5 point	average				
Economy Income (Z1)	X1	361	332	265	21	11	4.03
	X2	263	164	378	123	60	3.86
	X3	420	331	163	56	18	4.09
	X4	551	263	97	57	20	4.28
Democracy right (Z2)	X5	161	289	331	152	55	3.35
	X6	255	332	161	48	192	3.41
	X7	121	265	321	224	57	3.17
	X8	345	120	331	154	38	3.59
	X9	136	162	365	213	112	2.99
Environment-al features (Z3)	X10	126	137	528	134	63	3.13
	X11	137	162	551	68	70	3.23
	X12	133	224	369	223	39	3.19
	X13	110	356	289	204	29	3.32
	X14	273	159	263	274	19	3.40
Social Culture (Z4)	X15	116	235	276	248	113	2.79
	X16	269	194	387	138	30	3.63
Community management (Z5)	X17	356	137	164	235	87	3.42
	X18	79	287	354	267	11	3.46
	X19	467	287	175	59	14	4.13

From table 2, it can be concluded that there is a certain coupling between the effect of poverty alleviation of tourism and residents' participation in the minority areas in Southwest Hunan. Among them, economic income, democracy right and community management have the most significant influence on residents' tourism participation.

3.2. Model Analysis

By introducing the above path result coefficient into the AMOS19.0 system, it is analyzing that path confidence degree of the main factors which affect the poverty alleviation effect of tourism for ethnic minorities in Southwest Hunan. Finally, five major indicators of economic income, democratic rights, environment style, social culture and community management are calculated, and the following path result table can be obtained (see table 3).

Table 3 Path regression result

Path	Unstandardized factor load ξ (UNSTD)	standard error Δ (S. E.)	Standardized factor load η (STD)
Participation action← economic income	1.1	---	0.657
Participation action← social management	-1.23	0.109	-0.136
Participation action ← democracy right	3.65	0.228	0.839
Participation action← Environmental features	0.63	0.73	0.204
Participation action← Social Culture	0.51	0.86	0.318
Z1 ← economic income	1	---	0.303
Z2← democracy right	0.378	0.056	0.136
Z3← Environmental feature	5.062	0.699	0.611
Z4← Social Culture	3.62	0.138	0.561
Z5← Community management	0.553	0.07	0.103
Y1← Participation action	0.968	0.028	0.976
Y2← Participation action	0.941	0.042	0.983

Y3←Participation action	0.716	0.053	0.51
Y4←Participation action	1	---	0.293
Y5←Participation action	0.226	0.057	0.793

Note: ← means direction relation, --- default is relation
 Y represents the degree of participation of residents (The higher the η (STD) , the more significant the participation; The lower the unstandardized factor load(UNSTD, the more significant the participation)

The smaller the standard error Δ (S. E.), the more significant the participation.

According to the analysis of path results, the corresponding standard errors of indicator factors such as economic income, democratic rights environment style, social culture and community management are all within a reasonable range of 0-1.

The path result of analysis is brought into the correlation analysis of SPSS22.0, and the stability of its coupling is verified again. The Correlation analysis resulting model is shown in Table 4.

Table 4 Correlation analysis model diagram

	Average correlation coefficient	Z1	Z2	Z3	Z4	Z5
Y1	Pearson correlation	1	0.386	0.527	-1.000	0.665
	Conspicuousness(bilateral)		0.614	0.473	.	0.537
	Square and cross product sue for peace	.090	.035	.022	-.071	0.063
	covariance	.030	.012	.007	-.071	0.032
	N	4	4	4	2	3
Y2	Pearson correlation	0.386	1	-0.271	1.000	-0.957
	Conspicuousness(bilateral)	0.614		0.659	.	0.186
	Square and cross product sue for peace	0.035	0.212	-0.027	0.025	-0.095
	covariance	0.012	0.053	-0.007	.025	-0.048
	N	4	5	5	2	3
Y3	Pearson correlation	0.527	-0.271	1	1.000	0.164
	Conspicuousness(bilateral)	0.473	0.659		.	0.895
	Square and cross product sue for peace	0.022	-0.027	0.046	0.042	0.007
	covariance	0.007	-0.007	0.011	0.042	0.003
	N	4	5	5	2	3
Y4	Pearson correlation	-1.000	1.000	1.000	1	1.000
	Conspicuousness(bilateral)
	Square and cross product sue for peace	-0.071	0.025	0.042	0.353	0.017
	covariance	-0.071	0.025	0.042	0.353	0.017
	N	2	2	2	2	2
Y5	Pearson correlation	0.665	-0.957	0.164	1.000	1
	Conspicuousness(bilateral)	0.537	0.186	0.895	.	
	Square and cross product sue for peace	0.063	-0.095	0.007	0.017	0.318
	covariance	0.032	-0.048	0.003	0.017	0.159
	N	3	3	3	2	3

3.3. Conclusion

According to the normal fitting index and relative fitting index are both within the range, it is found that all the obtained data conform to the normal distribution. There is a relatively high coupling degree between the tourism poverty alleviation effect and residents' participation in the tourism poverty on the one hand, the positive effect of poverty alleviation of minority tourism has provided impetus and guarantee for residents' participation. On the other hand, the participation of residents will affect the poverty alleviation effect of the tourism of the minority nationalities in Southwest Hunan. Therefore, they both change and restrict each other and develop mutually.

The SEM optimization model shows that economic income, democratic rights and the management of this area have a great influence on the coupling model between them. Both intensity participation (Y1、Y2) and moderate participation(Y5) reflect residents' participation in tourism to a degree higher than 0.7, which indicates that local residents have a high participation in tourism, and tourism income accounts for the majority of residents' income sources. The standardized factor load value of economic income is the largest, which indicates that this factor has a great influence on residents' participation in a few tourism poverty alleviation projects.

The SEM optimization model shows that social culture and environmental(Y3、Y4) features have little influence on residents' tourism participation.

4. COUNTERMEASURES

Strengthen the management of poverty alleviation through tourism. In order to improve the tourism poverty alleviation effect of the minorities in Southwest Hunan, governments at all levels should apply scientific management system in Southwest Hunan. First, establish a reasonable poverty alleviation system for tourism. It is necessary to optimize the management of the tourism poverty alleviation projects and residents' participation, actively encourage residents to participate in the tourism poverty alleviation projects, protect the interests of the residents of minorities, and maintain the advantage effect of the tourism poverty alleviation projects of Southwest Hunan minorities. Secondly, training related staff, improve the sense of responsibility and management ability of grassroots cadres.

Ensuring the provision of tourism poverty alleviation funds. According to the questionnaire survey and the current situation of local development, in addition to some self-raised funds of the minorities in Southwest Hunan, the development of poverty alleviation through tourism also needs to broaden the financing channels, as well as some other channels. One is

government investment and subsidies. Since government investment has obvious transmission and demonstration benefits for tourism poverty alleviation, it is necessary to increase guiding investment in tourism poverty alleviation in a planned way, increase capital construction fund and increase subsidies for tourism and related industries. Second, it is necessary to attract funds from all aspects of society, strengthen exchanges with other regions, and take advantage of the opportunities offered by developed regions to obtain cooperation with local governments at all levels, Banks and tourism groups, so as to obtain more tourism construction funds. Third, strengthen bank loans, the state should focus on the development of tourism poor areas to provide preferential policies [5]. Adopt positive ways to improve residents' participation. In order to enhance the ability of the local residents to participate in the poverty alleviation of the minority tourism in Southwest Hunan, the local government needs to carry out reasonable encouragement and assistance. The government should provide some financial help to residents with very limited economic strength and solve the relevant knowledge of tourism poverty alleviation policies. Popularize some relevant legal knowledge, so that the minority residents have a more thorough understanding of the policy[6].

ACKNOWLEDGMENT

This research was supported by the college students' innovative entrepreneurial training plan of Shenyang Aerospace University under grant 201910143467. Professor Chen Danhong is the corresponding author and instructor of this paper.

REFERENCES

- [1] F.Simon.Consumer adoption of No Junk Mail sticker: An extended planned behavior model assessing the respective role of store flyer attachment and perceived intrusiveness. *Journal of Retailing and Consumer Services*, No.29, 12-21,2016.
- [2] L.M.Natalia.Gender differences, theory of planned behavior and willingness to pay . *Journal of Environmental Psychology*, No.21, 165-175,2016.
- [3] B.J.Wu.HDeng,Y.G.He. Research on poverty alleviation effect of animal husbandry tourism and residents' participation behavior in ethnic minority areas based on coupling model. *Heilongjiang animal husbandry and veterinary science*,No. 2, 264-268,2017.

[4] G.G.Bako,M.M.Jusan.Motivational factors influencing housing interior finish choice and preference.Procedia Soc Behav Sci,No.36,177-176,2012.

[5] Y.Gong, R.Y.Li. Research on poverty alleviation model of tourism led by limited government [J].

Journal of yunnan university for nationalities (philosophy and social sciences), No.6, 115-121,2016.

[6] S.G.Xie, M.S.Hu . Targeted poverty alleviation in minority areas. Academic BBS,No. 9 : 118-123,2016.