

Analysis of Factors Influencing the Satisfaction Degree of Leisure Agricultural Parks Management Based on Binary Logistic Model

¹Yichuan Zhang and ²Jie Zhao

¹School of Horticulture and Landscape Architecture, Henan Institute of Science and Technology, Xinxiang 453003, China

²Department of Architecture, Henan Technical College of Construction, Zhengzhou 450002, China

Abstract: Degree of satisfaction, which plays an important role in management optimization of agricultural parks, is a major index that reflects the management level of a leisure agricultural park. Fenglekui Park, which is located in Zhengzhou city, Henan province, China, was the research object of this study. The study collected the data concerning the satisfaction degree of 978 tourists through a survey and set up the binary logistic regression model of management satisfaction and influential factors. These influential factors mainly covered four aspects: characteristics of tourists, external conditions, landscape quality and service quality. The results showed that the target tourist groups of the agricultural park should be selective and it is very important to strengthen the propaganda targeted at urban tourist groups and highly educated visitors, because this will help modify the structure of tourists and increase the revenue. The factors influencing the degree of satisfaction with park management which are arranged in a decreasing order of significance are: price level, agricultural landscape, agricultural culture, external ecological environment, service concept, infrastructures, amenities and products offered. The degree of satisfaction with park management can be enhanced effectively by improving the factors. In this study, the relationship between the satisfaction with leisure agricultural park management and influential factors was analyzed by setting up the Binary logistic regression model, which can provide a basis for management optimization of leisure agricultural parks.

Keywords: Binary logistic regression, leisure agricultural park, management, satisfaction degree

INTRODUCTION

China is a large agricultural country. China's agricultural development mainly depends on its grain production which is low economic added value. In order to promote the development of rural economy and farmers' incomes, Chinese government has vigorously implemented agricultural industrial structure adjustment and achieved remarkable benefits in recent years. Due to the integration of urban and rural areas and agricultural industrial structure adjustment, the leisure agricultural industry in the suburb is developing rapidly. At present, the leisure agricultural parks have been constructed in the periphery of China's large cities, especially developed cities, such as Beijing, Shanghai, Shenzhen, Hangzhou and Zhengzhou. These leisure agricultural parks usually perform multiple functions simultaneously, including agricultural production, scientific demonstration, leisure and sightseeing, science popularization education. The agricultural park now is an important component of suburban leisure and recreational complex which offers high-quality leisure and recreation destination for urban

residents. Since leisure agriculture industry is an emerging form of tourism in China and many parks are still at immature development stage, manifested as: unclear market positioning, repeated development patterns, lack of innovation in the development of leisure products, single management mode. The degree of satisfaction with park management is apparently an important evaluation standard for a successful development of leisure agricultural park, as may be found through tourist survey (Ignacio and Héctor, 2008; Rioux and Werner, 2011; Joaquín and Jaume, 2010). Therefore the study on satisfaction with the management leisure agricultural parks can provide a basis for management optimization. The survey on tourist's attitude can be highly complex. A large number of research results in the world have dealt with the attitudes of tourists from different perspectives (Ioja *et al.*, 2011; Carmen and Carmen, 2008). However, no research results concerning the tourist's satisfaction with leisure agricultural parks are known. Currently the focus of research is to conduct satisfaction analysis by quantitative approach (Hikaru, 2010; Yoo-Shik *et al.*, 2010; Vesna *et al.*, 2010) and logistic model is widely

used in diagnosis of influential factors of diseases, analysis of driving factors of land use changes, tourist's attitude analysis, etc. Therefore, the purpose of the study was to establish a binary logistic regression model and discuss and reveal the influential factors of satisfaction degree with the management of leisure agricultural parks and hence to promote management optimization of leisure agricultural parks.

RESEARCH OBJECT AND METHODS

The Fenglekuiyuan leisure agricultural park is located in the suburb of Zhengzhou of China's Henan province. It is an urban park that integrates agricultural production, leisure, recreation with tourism. As Henan is one of China's major grain producing areas, agriculture contributes a large share to the national economy of Henan province. With its large population and developed economy, Zhengzhou is a core city in the central China economic zone (consisting of 14 cities in Henan province). In recent years, the growing number of leisure agricultural parks in the suburb of Zhengzhou has witnessed vigorous development and the agricultural parks have become an important node of suburban leisure and recreational complex.

The binary logistic model was used for the current research (Adnan, 2011; Peeters *et al.*, 2012; Guo *et al.*, 2012). As a commonly used model for the analysis of individual decision-making behaviors, this model is applicable to the analysis in which the dependent variables are dichotomous variables. The values of dichotomous dependent variables may be either 1 or 0, which represents two possibilities of one decision-making. In the process of statistical analysis, the probability of satisfaction result is denoted as $P(Y = 1)$, while that of the un-satisfaction probability is $1 - P(Y = 0)$. Suppose that X_1, X_2, \dots, X_m are m influential factors of result Y and the logistic regression formula is used to represent the ratio of satisfaction and un-satisfaction probabilities, its natural logarithm being $LogitP = \alpha + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_m X_m$ (m is the number of independent variables).

The selection of influential factors and data acquisition: The tourist's satisfaction with leisure

agricultural park is mainly affected by factors of four aspects: characteristics of tourists, external conditions, landscape quality and service quality. The influence of characteristics of tourists is mainly manifested in that the difference in characteristics of tourists will lead to a variety of recreational expectations, needs and feelings; the influence of external conditions is manifested in that sound infrastructures, advanced public transportation and high quality external ecological environment can contribute to the development of the park; the influence of landscape quality is manifested that distinctive agricultural landscape characteristics, profound features of agricultural culture and convenient and sound amenities can provide internal conditions for the development of the park; the influence of service quality is manifested in that whether the service concept of the park, the products offered and the price level suit the needs of tourists is crucial for the development of the park. The satisfaction with management is taken as dependent variable and $X_1 - X_{10}$ as independent variable (Table 1).

Variable selection:

Selection of dependent variable: The dependent variable involved in this study was tourists' satisfaction with park management, which is a qualitative dichotomous variable. If satisfied, the dependent variable is $Y = 1$; otherwise, the dependent variable is $Y = 0$.

Selection of independent variable: The selection of independent variable can be seen in Table 1, Where X_1 and X_2 are trichotomous variables. Characteristics of tourists were classified according to the classification method in sociology. $X_3, X_4, X_5, X_6, X_7, X_8, X_9$ and X_{10} are dichotomous variables, which were classified according to the semantic differential method. This method is introduced by American psychologist Osgood to study common conception of things and the preference of the subjects. In semantic differential method, the subjects often tend to exaggerate their feelings and choose the neutral answer, resulting in error. Therefore, these influential factors were classified as dichotomous to clearly indicate the attitudes of tourists.

Table 1: Value assignment and types of independent variables

Factors	Independent variables	Code	Value assignment	Variable type
Characteristics of tourists	Age	X_1	18-30 (1), 30-50 (2), over 50 (3)	Trichotomous
	Income	X_2	Primary and secondary school (1); technical secondary school (2); college or above (3)	Trichotomous
External conditions	Infrastructures	X_3	Complete (1); incomplete (0)	Dichotomous
	Ecological environment	X_4	Good quality (1); poor quality (0)	Dichotomous
Landscape quality	Agricultural landscape	X_5	Good quality (1); poor quality (0)	Dichotomous
	Agricultural culture	X_6	Distinctive (1); un-distinctive (0)	Dichotomous
	Amenities	X_7	Complete (1); incomplete (0)	Dichotomous
Service quality	Service concept	X_8	Advanced (1); backward (0)	Dichotomous
	Products offered	X_9	Diverse (1); limited (0)	Dichotomous
	Price level	X_{10}	High (1); low (0)	Dichotomous

Data acquisition and processing: The survey was carried out by students majoring in landscape design in Henan Institute of Science and Technology. Two students worked in a group to conduct questionnaire survey combined with face-to-face interview and each group completed 50 questionnaires. A total of 1000 questionnaires were distributed and 978 valid questionnaires were recovered. The valid rate of questionnaires reached 97.8%. All the data were input into the computer after checking. SPSS 11 was used for analysis. Since the selected independent variables were not all dichotomous variables, the model thus established was a non-conditional regression model. When the independent variables was polychotomous variable, it could not be simply marked but transformed into dummy variable. The variables were introduced into the equation in one time. Because the relevance between independent variables was small, all the independent variables could be incorporated into the logistic regression model.

RESULTS AND DISCUSSION

Table 2 shows the output results after Logistic regression, including regression coefficient B , standard deviation S.E. estimated by regression coefficient, Wald statistics estimated by regression coefficient, significance level Sig. estimated by regression coefficient and odds ratio Exp (B). Where, $\beta_1, \beta_2, \dots, \beta_m$ are the partial regression coefficients of logistic regression, representing the influence of independent variable X_m on Y . When its value was positive with statistical significance, it was indicated that the value of Y would as the explanatory variable increased. On the contrary, when the regression coefficient was negative, it was indicated that the value of Y would decrease with the increase of X_i ; Wald statistics was used for null hypothesis significance test on zero coefficient in the Logistic regression equation and to judge whether a variable should be included in the model. In this research, the significance level was set at 0.05. When the probability value P corresponding to the explanatory variable Wald was less than the given significance level, then the regression coefficient of explanatory variable had significant difference with zero and should be retained in the equation. Otherwise, it failed to pass the significance test and be removed. As to odds ratio Exp (B), if X_i was dichotomous independent variable, then Exp (B) represented the odds ratio of $X_i = 1$ versus $X_i = 0$ when other conditions were constant; if X_i was polytomous independent variable, then Exp (B) represented the odds ratio of this variable versus reference variable when other conditions were constant. The odds ratio greater than 1 indicated that the independent variable had positive effect on event probability; the odds ratio less than 1 indicated that the independent variable had negative effect on event

Table 2: Variables in the equation

	B	S.E.	Wald	Sig.	Exp (B)
X_1			8.356	0.015	
$X_1(1)$	-0.105	0.257	0.165	0.684	0.901
$X_1(2)$	-0.845	0.295	8.200	0.004	0.429
X_2			21.308	0.000	
$X_2(1)$	1.490	0.393	14.351	0.000	4.436
$X_2(2)$	0.839	0.228	13.581	0.000	2.314
X_3	0.366	0.227	2.601	0.107	1.442
X_4	0.761	0.244	9.715	0.002	2.140
X_5	1.441	0.239	36.403	0.000	4.224
X_6	1.188	0.223	28.433	0.000	3.281
X_7	0.223	0.267	0.698	0.403	1.250
X_8	0.564	0.293	3.709	0.054	1.758
X_9	0.193	0.178	1.175	0.278	1.213
X_{10}	-3.618	0.501	52.113	0.000	0.027
Constant	1.892	0.542	12.164	0.000	6.632

probability; and the odds ratio equaling 1 indicated that the independent variable had no effect on event probability.

The influence of characteristics of tourists on management satisfaction: According to the regression coefficients of three dummy variables corresponding to age in Table 2, it can be known that if other conditions remained unchanged, the older the age, the lower the satisfaction would be. The reason was that most of the older subjects came from rural areas or had the experience of rural life and hence were very familiar with agriculture. The agricultural park is much less attractive to them. Generally, the population with higher education level has a higher satisfaction degree, for they have fewer opportunities to learn agriculture. But the satisfaction degree dropped again among the subjects who received higher education, because possessing higher education level, the tourists had more rigorous requirements on tourism destination.

The influence of external conditions on management satisfaction: According to Table 2, the satisfaction probability of the tourists who were satisfied with infrastructures and ecological environment was 1.44 and 2.14 times that of those who were unsatisfied, showing that external conditions had positive effect on satisfaction probability. Therefore, improving ecological environment and infrastructure construction is helpful to promote the park development.

The influence of landscape quality on management satisfaction: According to Table 2, agricultural landscape quality plays an important role in improving management satisfaction. The construction of agricultural landscape should be differentiated from that of urban green landscape, in terms of landscape layout, space organization and landscape details. The agricultural parks shall present tourists a leisure place with rural scenery through landscape construction by comprehensively integrating landscape elements of agriculture, forestry, animal husbandry, sideline

production and fishery. Agricultural landscape is the most attractive of agricultural parks and also key to tourist attraction. Agricultural culture is greatly attractive especially to urban residents. Agricultural production mode, agricultural machinery, rural village landscape, folk customs, rural life scenes and so on all can become the objects of cultural demonstration of agricultural parks. Therefore to strengthen the construction of agricultural culture is very important to improving the appeal of the parks.

The influence of service quality on management satisfaction: According to Table 2, price level has great influence on the satisfaction with agricultural parks and its ratio reached nearly about 37 times. Thus, the reasonable price positioning is the top priority in the management of agricultural parks. The park should provide differentiated products services to tourists of different needs.

CONCLUSION

- Through logistic regression, the relationship of characteristics of tourists, external conditions, landscape quality and service quality to the degree of satisfaction with the management of leisure agricultural park was found in this study. The research on the influential factors of management satisfaction is of guiding significance to the renovation of the agricultural parks.
- It is very important to strengthen the publicity among tourists from urban areas and among highly educated visitors, since this will optimize the tourist structure and increase the revenues of the parks. Improving agricultural landscape and agricultural culture can significantly improve the management satisfaction, which will in turn effectively increase the probability of management satisfaction.
- Due to the limitation of data acquisition, the influential factor system established in this study remains to be further improved. As the factors influencing park management satisfaction are large in quantity, only several factors which can be assessed and quantify were discussed. However, it is very difficult to quantify many important soft environment factors, such as agricultural policy, economic factor and consumption concept. The direction of further research is to screen more indices and to thoroughly analyze the influencing mechanism of satisfaction with park management.

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