

## Research Article

### Study on Green Food Tourism Industry Integration Based on Analytic Hierarchy Process Evaluation Method

Lin Shaojiang, Chen Jiaying and Tao Changjiang  
Sichuan Agricultural University, Sichuan, China

**Abstract:** With continuous deepening of internalization, uncertain factors for development of world Green food tourism industry have been increasing gradually and Green food tourism industry in China confronts more and more pressure and challenges. This study provides empirical analysis to Green food tourism industry integration with the help of related concept definitions on Green food tourism industry integration and analytic hierarchy process evaluation method starting at the situation and developing tendency of world Green food tourism industry. The important direction to develop Green food tourism industry in China is industrial restructuring, transformation and upgrading. While, Green food tourism industry integration is a good condition to realize transformation.

**Keywords:** Empirical analysis, green food tourism industry, industry integration

#### INTRODUCTION

In face of contradictions among new diversified and explored demands to Green food tourism, limitation on Green food tourism resource review as well as Green food tourism enterprises at low informationalized level, there is an urgent issue to solve to explore the new model for developing Green food tourism industry. From the perspective of Green food tourism industry integration, it is feasible to solve the bottleneck problems of Green food tourism industry developing currently. Different from the traditional industry, the Green food tourism industry is demand-oriented instead of production-oriented, with extremely strong industry permeability and correlation and ease to develop integratedly with the other industries (Apostolakis, 2003).

This study builds a conceptual model of Green food tourism industry's convergence by combing and discriminating of convergence concepts of Green food tourism industry and proposes the active, interactive and passive convergence models of Green food tourism industry based on the conceptual model and analyses the formation mechanism of the three convergence models. This study selects the Green food tourism industry's convergence with agriculture, cultural industry and information industry as the research objects to argumentate the feasibility of the theory applied in practice (Yu and Law, 2000).

#### MATERIALS AND METHODS

This study takes SiChuan province to develop the green food tourism industry. Facing the contradiction of

the diversity and depth of the Green food tourism demands and the Green food tourism products' single function and less connotation of the Green food tourism supply, seeking a new model of development of Green food tourism industry has become an urgent issue to solve. Green food tourism industry's convergence with other industries can get rich in the number of Green food tourism products, improve the quality of Green food tourism products and develop the new Green food tourism industry, becoming an important way to solve the bottleneck in the development of the Green food tourism industry. As the theoretical researches of Green food tourism industry's convergence have started in recent years, there are a lot of controversies in the definition of the nature of Green food tourism industry's convergence. It did not form a unified theoretical research framework; current researches are insufficient to give right proposals to the development of practice, resulting in promoting the Green food tourism industry's convergence with all industries in the practice (Richards, 2011).

The research of the convergence of Green food tourism industry and agriculture mainly puts forward hypotheses based on the relation between the industry association convergences and then tests these hypotheses by measuring and analyzing of the input rate convergence degree (Gretzel *et al.*, 2000). On basis the paper makes further analyses on how Green food tourism industry changes agricultural industry chain. The research of the convergence of Green food tourism industry and cultural industry mainly puts forward hypotheses based on the relation between the industry coupling and convergence and tests the hypotheses by

Table 1: The number of people for international green food tourism and income increase of world green food tourism industry from 1950 to 2010

Year	The number of having international trip (10 thousand)	Growth rate (%)	International Green food tourism revenue (0.1 billion USD)	Growth rate (%)
1950	2531	-	22	-
1960	6920	174.92	7	227.56
1970	15968	131.41	178	160.41
1980	28383	79.27	1033	470.71
1990	45874	61.24	2657	160.98
2000	69898	52.6	4759	77.76
2010	94939	34.89	9189	94

cointegration analysis. On this basis the paper makes further analyses to interactive convergence state in the Green food tourism industry's convergence with cultural industry. The research of the convergence of Green food tourism industry and information industry mainly puts forward hypotheses based on the relation between the industry clusters and convergence by correlation analysis (Kim *et al.*, 2006). Finally, this study summarizes the features of the three convergence models and proposes the advice to develop the Green food tourism industry's convergence based on empirical research findings.

**The situation and developing tendency of world green food tourism industry:**

It is found by reviewing the development history world Green food tourism industry that, it is generally recognized internationally that, the establishment of Thomas Cook travel agency in 1845 marked the birth of world Green food tourism industry. However, Green food tourism industry began to develop on a large scale after the Second World War. Since world Green food tourism industry started to develop from the destroying Second World War in 1950 to over 60 years of development till now, world Green food tourism industry has experienced four different historical periods of starting up, developing, taking off and maturing. It has been developing at continuously stable speed from a past trivial industry to one of the biggest emerging industries in the world (Narayan, 2004). Currently, under the tendency of economic globalization and integration, Green food tourism industry has already been integrated into global industrial system, production mode and consumption model. It has gradually become one lifestyle modern people receive and like and the world is gradually entering "Green food tourism times". It is to show over 60 years of achievements of world Green food tourism industry in the following list Table 1.

**Related concept definition on green food tourism industry:**

The industrial system is not only with openness but also hierarchy in self-organizing. Its upgrading and development come from different sub-systems cooperating mutually and co-evolving. Green food tourism industry system is characteristic of openness, dynamic nature, multi-level and others. In its self-organizing evolving process and under the influence and interference of external factors, the Green

food tourism industry boundary, although being extensive and misty originally, presents to be changing dynamically more. For Green food tourism industry in China, it has also experienced considerable development since reform and opening up, with its industrial scale expanding continuously. Its industrial field expands gradually from the traditional tourist hotel, travel agency, tourist attraction, transport facilities of Green food tourism and others to every respects of our life, with its industrial chain extending from the downstream enterprises to upstream enterprises, which is more and more complete and perfect.

**Empirical analysis on degree of integration of green food tourism industry:**

In consideration that AHP and fuzzy comprehensive evaluation method are mature methods in the field of management science, the following is to analyze according to the calculation thoughts and steps of this method instead of introducing its principles.

**AHP evaluation on degree of integration of green food tourism industry:**

It is to evaluate degree of Green food tourism industry by utilizing AHP method to determine evaluation index system, weight of specific index and check their consistency to provide a basis for fuzzy comprehensive evaluation.

**Calculation of index weight of degree of integration of green food tourism industry:**

For weight calculation, it is mainly to invite experts to pairwise compare importance of various factors in each-level evaluation and the results are used to establish the judgment matrix of AHP weight distribution. By consulting experts, this study reaches A~An judgment matrix and An~B judgment matrix of degree of integration of Green food tourism industry in Hainan. Due to space limitations, this study only describes A~An judgment matrix. Shown in Table 2.

It is to calculate the feature vector of each judgment matrix as the weight of each criterion layer to goal level and to check consistency, the results are as follows: the weights of An criterion layer to goal layer A are (0.05, 0.29, 0.19, 0.31, 0.17); the weights of B1~B5 criterion layer to goal layer A2 are (0.36, 0.36, 0.16, 0.08, 0.04); the weights of B6~B9 criterion layer to goal layer A2 are (0.09, 0.09, 0.21, 0.61); the weights

Table 2: A~An judgment matrix

A	A <sub>1</sub>	A <sub>2</sub>	A <sub>3</sub>	A <sub>4</sub>	A <sub>5</sub>
A <sub>1</sub>	1.00	0.20	0.20	0.14	0.33
A <sub>2</sub>	5.00	1.00	3.00	1.00	1.00
A <sub>3</sub>	5.00	0.33	1.00	1.00	1.00
A <sub>4</sub>	7.00	1.00	1.00	1.00	3.00
A <sub>5</sub>	3.00	1.00	1.00	0.33	1.00

Table 3: Results of consistency check among indexes

Matrix	$\lambda_{max}$	C.I.	R.I.	C.R.	Whether it passed or not
A-A <sub>n</sub>	5.28	0.07	1.12	0.06<0.1	Yes
A <sub>1</sub> -B <sub>5</sub>	5.14	0.03	1.12	0.03<0.1	Yes
A <sub>2</sub> -B <sub>9</sub>	4.15	0.05	0.89	0.06<0.1	Yes
A <sub>3</sub> -B <sub>14</sub>	5.14	0.03	1.12	0.03<0.1	Yes
A <sub>4</sub> -B <sub>20</sub>	6.48	0.10	1.26	0.08<0.1	Yes
A <sub>5</sub> -B <sub>27</sub>	7.43	0.07	1.36	0.05<0.1	Yes

of B10~B14 criterion layer to goal layer A3 are (0.09, 0.05, 0.37, 0.07, 0.42); the weights of B15~B20 criterion layer to goal layer A4 are (0.21, 0.04, 0.44, 0.21, 0.04, 0.06); the weights of B21~B27 criterion layer to goal layer A5 are (0.03, 0.03, 0.31, 0.07, 0.07, 0.22, 0.27). Show in Table 3.

## RESULTS AND DISCUSSION

**To calculate compound weight vector and check consistency:** It is to calculate the compound weight vector of the lowest layer to goal layer and check consistency as per formula. If passing, it is to make decision as per the results from compound weight vector, or it is to reconsider the model or restructure those pairwise compared matrixes with great consistency rate. The maximum feature root and feature vector of judgment matrix obtained via square root method pass consistency check.

**Fuzzy comprehensive judgment of degree of integration of green food tourism industry:** It is to study evaluation of degree of integration of Green food tourism industry in Hainan and China in combination with fuzzy comprehensive evaluation method after determining the weight of criterion and sub-criterion layer via analytical hierarchy process. The empirical studies on evaluation of degree of integration of Green food tourism industry in Hainan and China can be compared to reflect the relation between economically developed area and those at average national level, which is visual to understand integration degree distribution of Green food tourism industry in China.

**To determine evaluation object:** Factor set is a set composed of various factors influencing the evaluation object represented by U:  $U = \{U_1, U_2, \dots, U_m\}$ . Wherein,  $U_i, i = (1, 2, \dots, m)$  which represents various factors influencing the object. In this study, U is composed of the above 27 indexes.

**Fuzzy multi-factor judgment:** Endowing different weights to different factors can properly reflect the comprehensive influence from all factors. The result of

fuzzy comprehensive judgment is that:  $C1 = B \cdot R1 = (0.23, 0.42, 0.25, 0.10, 0.02)$ . The results show that 23% experts think the degree of integration of Green food tourism industry in Hainan is very good, 42% experts think it is relatively good and 25% experts think ordinary, 10% experts think not so good and 2% experts think bad. According to maximum membership principle, the evaluation result is relatively good.

**Analysis on measure result of degree of integration of Green food tourism industry:** Green food tourism industry integration is at the stage of low integration. By analyzing the empirical study results of degree of integration of Green food tourism industry in Hainan and China and in combination with grading of integration degree threshold value of this industry when empirical study, it is to derive the following conclusions:

- The degree of integration of Green food tourism industry in China is at the stage of low integration. However, as for different administrative regions, they are under non-equilibrium status because of different degrees of integration under the influence of related factors of degree of integration of Green food tourism industry.
- The degree of integration of Green food tourism industry in Hainan is at a “relatively-good” status and that in China is at an “ordinary” status, with about 10 scores of difference. The degree of integration in Hainan is more advantageous, taking the lead among national average level. This shows that Hainan takes the lead among national average level in performance, industry dependence and relevance, new operational types of Green food tourism industry as well as scientific permeability and others.

## CONCLUSION

The essential reason of Green food tourism industry integration is the precondition and basis of Green food tourism industry integration and is significant attribute to reflect integration features of

Green food tourism industry. The integration results of Green food tourism industry are suggested to be the basic standard for integrating Green food tourism industry with the other industries, while the integration model of Green food tourism industry reflects the integration mode of Green food tourism industry with the other industries and the process of inter-industrial changing.

#### REFERENCES

- Apostolakis, A., 2003. The convergence process in heritage tourism. *Ann. Tourism Res.*, 30(4): 795-812.
- Gretzel, U., Y.L. Yuan and D.R. Fesenmaier, 2000. Preparing for the new economy: Advertising strategies and change in destination marketing organizations. *J. Travel Res.*, 39(2): 146-156.
- Kim, H.J., M.H. Chen and S.C.S. Jang, 2006. Tourism expansion and economic development: The case of Taiwan. *Tourism Manage.*, 27(5): 925-933.
- Narayan, P.K., 2004. Economic impact of tourism on Fiji's economy: Empirical evidence from the computable general equilibrium model. *Tourism Econ.*, 10(4): 419-433.
- Richards, G., 2011. Creativity and tourism: The state of the art. *Ann. Tourism Res.*, 38(4): 1225-1253.
- Yu, A.K.L. and R. Law, 2000. The application of e-commerce to enhance the competitive advantages of hotels in Hong Kong. In: Fesenmaier, D.R. *et al.* (Eds.), *Information and Communication Technologies in Tourism 2000*. Springer, Vienna, pp: 335-352.