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The effects of service quality, tourism impact, and tourist satisfaction on tourist choice of leisure farming types

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In the highly-competitive leisure service industry, improving service quality to gain competitive advantages is the only key to sustainable management of leisure agriculture. However, developing leisure farming may cause positive and negative impact on local economy, social culture, and environment. Therefore, how to identify the factors affecting tourist choice of leisure farming types is an important issue which is worth studying. Leisure farming tourists living in Taiwan were selected as research subjects. The sampling survey is executed by questionnaires. The collected data are also analyzed by using statistical methods. The research results show: (1) there are positive relationships among service quality, positive tourism impact, and total tourist satisfaction; (2) some demographic variables may lead to significant difference in perception of service quality, tourism impact, and total tourist satisfaction; (3) tangibles and assurance of service quality, positive economy and positive social culture of tourism impact significantly influence tourist choice of leisure farming types; (4) there are significantly positive and direct effects between service quality and positive tourism impact, and positive tourism impact and total tourist satisfaction, but significantly negative and direct effects between service quality and negative tourism impact, and negative tourism impact and total tourist satisfaction through Amos analysis.

Key words: Leisure farming, service quality, positive/negative tourism impact, total tourist satisfaction.

INTRODUCTION

In recent years, with the economic development, the promotion of living standards, and the increase of leisure opportunities in Taiwan, the demand of leisure life has gradually increased for people in Taiwan. Therefore, leisure tourism has become the important part of the modern life. Leisure farming has been developed in Taiwan for many years, but developing leisure farming has not been listed as an agricultural policy by the authority concerned (Council for Agriculture, Executive Yuan; the organization of Taiwan government) until 1990. In the promotion of leisure farming, in addition to leisure farming areas, the government should also provide guidance to

tourism-oriented farms (fruit farms and tea farms), urban allotments which allows citizens to experience farming in urban areas, leisure farms surrounded by natural resources, educational farms, and bed-and-breakfasts (B&B) (Fang, 1997; Chang and Lin, 2006; Lin, 2006). The management of these agricultural establishments involves production, lifestyle, and ecology and covers a broad scope of contents.

Since implementing the new holiday policy in 2001 in Taiwan, leisure tourism and facilities requirements have gradually increased due to the growth of the population who like to visit leisure tourism locations. Especially, more and more people actively participate in tour actions of leisure farming because they want to reduce and relax the living pressure by experiencing the farm lifestyle to close to the natural environments. Moreover, the trend of growth of leisure farming industry in the rural area is able to be more

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and more obvious because of the lack of leisure and recreation spaces (green grounds) in the urban area. Leisure farming features diversified services, numerous service locations, and high substitutability. Therefore, how to provide high service quality to enhance tourist satisfaction and sustainability of leisure farms has become an important issue for leisure farm operators. Developing tourism or the leisure industry is not an elixir for promotion of local prosperity. It may also cause negative impact on local economy, social culture, and the environment (Brougham and Butler, 1981; Archer and Cooper, 1998; Baker and Crompton, 2000; Bigne, et al., 2001; Tosun, 2002; Lin, 2006). Hawkins (1982) pointed out that tourism and leisure not only increase economic revenue but also result in environmental pollution. Therefore, the government needs to adjust agricultural policies according to practical situations and set up auxiliary measures to maximize the economic efficiency of leisure farming resources to enhance their productivity, reduce cost, and improve the living standard of farmers. In the management of leisure farms, the impact of tourist activities and behaviors on the environment should also be minimized to maintain a balance between tourist activities and protection of the ecology. Thus, this study is aimed to explore the effects of service quality, positive/ negative impact of tourism, and total tourist satisfaction on tourists' choice of leisure farming types. The objectives of this study are: (1) to investigate the relationships and effects of service quality, tourism impact, and total tourist satisfaction on tourists' choice of leisure farming type; (2) to analyze the difference among tourists of different demographic variables in their perceptions of service quality, tourism impact, total tourist satisfaction, and choice of leisure farming types; (3) based on the research findings, to provide an important reference for leisure farm operators.

LITERATURE REVIEW

Leisure farming

The term "leisure farming" in Taiwan was first proposed in a "Conference on Developing Leisure Farming" held by Department of Agriculture Promotion, National Taiwan University in 1989. It was defined as "A practice of utilizing agricultural facilities, space, production area, products, activities, ecology, natural environment, and resources to exploit, through proper designs, the functions of agriculture and leisure tourism in agricultural areas for the purpose of improving general citizens' experience of farming and farms, quality of leisure activities, benefits of farmers, and development of farming areas" (Chiang, 1989).

Based on the definitions of leisure farming proposed by various scholars, it is defined in this study that leisure farming is a practice of integrating tangible and intangible agricultural resources and providing leisure - based

experiential services and education about the natural environment that can enhance the environment of agricultural development and increase the value added to agricultural activities (Fang, 1997; Chang and Lin, 2006).

According to Chen (2003) who explored the feasibility of developing healthy farms for agricultural tourism from the perspective of leisure needs using citizens of Taichung as an example, the better developed agricultural tourism types include (1) tourist farm, (2) urban allotment, and (3) leisure farm. In the study of Taiwan's current agricultural development and its future orientation, Chen (2005) classified leisure farming into 12 types, including (1) leisure farm, (2) leisure forest farm, (3) leisure fishery, (4) leisure ranch, (5) cultural activities in agricultural village, (6) leisure fruit farm, (7) tourist tea farm, (8) tourist garden (9), tourist vegetable farm, (10) urban allotment, (11) educational farm, and (12) holiday farm (B&B). In a study on the development of leisure farming and ecotourism in Taiwan, Lin (2006) classified leisure farming into (1) tourist farm, (2) leisure farm, (3) home stay accommodated by farming people, (4) urban allotment, (5) leisure fishery, (6) educational farm, and (7) cultural and ecotourism in aboriginal areas.

In this study, Chen's classification (2003) is employed. In the questionnaire, leisure farming is classified into tourist farm, urban allotment, and leisure farm.

Tourism impact

Tourism is an essential element of economic activities around the world. It can promote the development of new emerging countries and help reduce the gap between rich and poor nations. In addition, it is also an important policy adopted in many developing nations to revive economic growth. However, development of tourism may avoidably cause some impact. Tourism impact refers to either positive or negative changes, benefits or new situations caused by a series of activities associated with development of tourism (Chen, 2006).

Among the previous studies on tourism impact, the focus is usually placed on three aspects, including economic impact, socio-cultural impact, and environmental impact (Yen, 1994; Chen and Guo, 1995; Ap and Crompton, 1998; Ko and Stewart, 2002). From a review of related literatures on the above-mentioned impacts, Tosun (2002) concluded that the economic impact of tourism is generally positive, while the socio-cultural impact and environmental impact of tourism can be either negative or unclear.

In this study, it is defined that tourism impact refers to changes, benefits or new situations caused by a series of activities associated with development of tourism which may result in positive benefits or negative effects. Besides, the economic, socio-cultural, and environmental impacts of tourism proposed by Ap and Crompton (1998) and Ko and Stewart (2002) are employed as the dimensions of tourism impact of the questionnaire.

Service quality

Parasuraman et al. (1985) proposed from the perspective of consumers that it is harder to assess service quality than product quality. They argue that perception of service quality is the gap between expectation and perception, and it is the evaluation of not only the service outcome but also the service delivery process. Schiffman and Kanuk (2000) also mentioned that it is harder for consumers to measure service quality than product quality. Therefore, with the characteristics of intangibility, heterogeneity, perishability, and simultaneity (production and consumption), service quality should be measured through other external factors.

According to previous researchers, it can be defined that service quality is consumers' subjective judgment of a service provided by the service provider (producer), according to the gap between their expectation and realistic perception of the service.

Parasuraman et al. (1985) proposed ten dimensions of service quality, including tangibility, reliability, responsiveness, competence, access, courtesy, communication, credibility, security and understanding and use these dimensions to a questionnaire consisting of 97 item of the questionnaire. Through repetitive surveys and analyses, Parasuraman et al. (1988) integrated these dimensions into five, including (1) tangibles, (2) reliability, (3) responsiveness, (4) assurance, and (5) empathy. Ting (2003) utilized PZB to provide hotel owners the useful information for improvements to understand that there are gaps between expected service quality for the employee and the customer and perceived service quality. Yuksel et al.(2003) discussed the lodging service quality on the island of Crete by making use of the modified SERVQUAL to provide to British authorities that the intangible service qualities are more important than the tangible from viewpoints of the customers. Yeh et al. (2007) explored that the Taiwanese semiconductor industry implements effectively enterprise resource planning (ERP) to improve service quality by evaluating expected and perceived service quality for both upstream manufacturers and downstream customers through questionnaire survey. Hsieh et al. (2008) applied analysis network process (ANP) to study expected service quality for customers in hot spring hotels in Taiwan. Nakhai and Neves (2009) found that: service quality is more difficult for the customer to assess than product quality; the measure of service quality perceptions is to compare customer expectations to real service performance; and the assessment of service quality are not only founded on the results of a service but also include the delivery process assessment of the service from three decades of service quality research. Chuang (2010) thought that perceptions of service quality can be assessed and regarded as the measurement of differences between perceptions and expectations of the customers related to the specific service that the service enterprise offers.

In this study, the service quality scale (SERVQUAL) consisting of 25 items of the questionnaire developed by Parasuraman et al. (1988) is used to measure service quality.

Customer satisfaction

Czepiel and Rosenberg (1976) described customer satisfaction as an overall assessment of customers on various attributes of a product. Therefore, they use a single-item "overall product satisfaction" to measure satisfaction. Woodside et al. (1989) proposed that customers' overall attitude to a product purchase can reflect their preference of the product. According to Fornell (1992), satisfaction is an overall perception that can be directly measured, and consumers will compare the result with ideal criteria. Ostrom and Iacobucchi (1995) argued that satisfaction is an overall judgment of a product made through an evaluation of quality and benefit as well as cost and effort. Homburg et al. (2006) mentioned that ''customer satisfaction'' has been an important term in the marketing literature over the decades because satisfied customers are able to acquire long-term benefits such as customer loyalty and continuous profitability for enterprises. Customer satisfaction is regarded as customers can get more benefits than their cost (e.g. money, time and effort). For measuring customer satisfaction, perceived value is a suitable factor (Oliver and Swan, 1989; Yuan and Jang, 2008).

In this study, based on the arguments of Czepiel and Rosenberg (1976) and Woodside et al. (1989), satisfaction is viewed as a total evaluation to measure customer satisfaction.

RESEARCH FRAMEWORK AND METHODS

Research framework

The research framework is constructed on the basis of the theories and objectives discussed above. In the aspect of service quality, SERVQUAL developed by Parasuraman et al. (1988) is adopted. In tourism impact, the dimensions of tourism impact introduced by Ap and Crompton (1998) and Ko and Stewart (2002) are employed. In total tourist satisfaction, the concept mentioned by Czepiel and Rosenberg (1976) and Woodside et al. (1989) is adopted. Finally, as to the types of leisure farming, the three mature types of leisure farming proposed by Chen (2003) are used. The constructed framework is presented in Figure 1. This framework demonstrates the relationships and effects among "service quality", "positive tourism impact", "negative tourism impact", "total tourist satisfaction", and "choice of leisure farming type" and is also intended to measure the effect of "demographic variables" on consumers' perceptions of service quality, negative/positive tourism impact, total tourist satisfaction, and choice of leisure farming type.

Hypotheses

Based on the above research framework, the following hypotheses are developed:
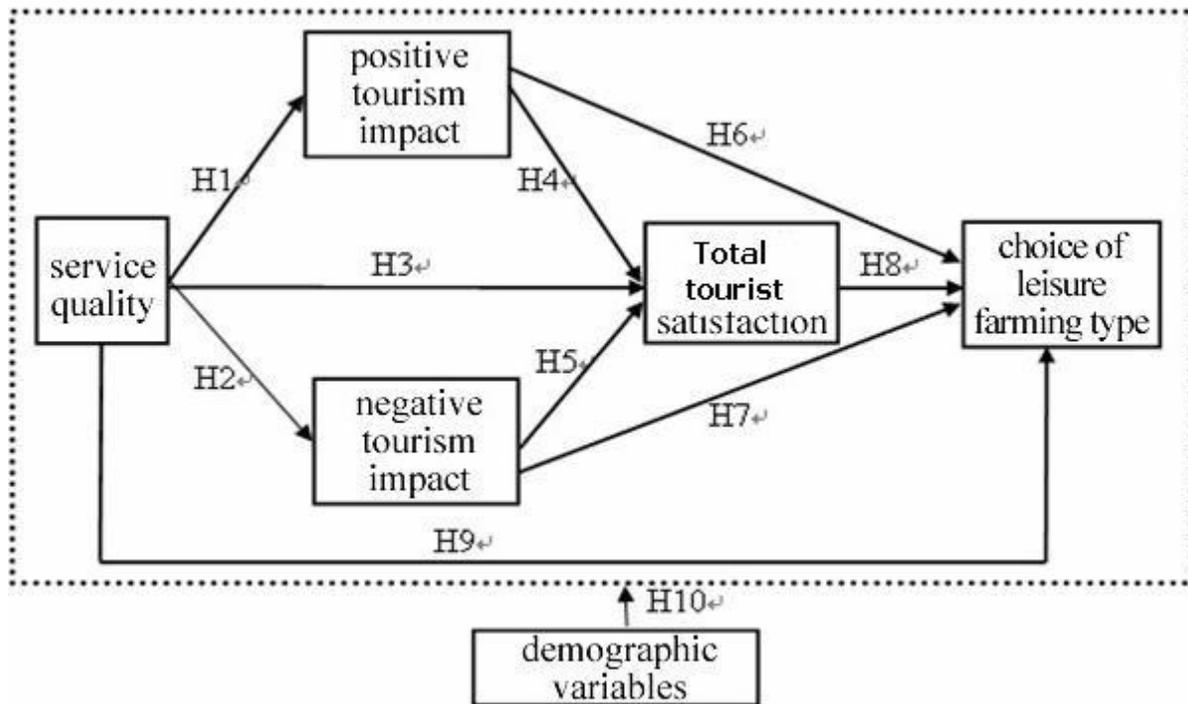
Figure 1. Research framework.

H1: Service quality has significant relationship and effect on positive tourism impact.

H2: Service quality has significant relationship and effect on negative tourism impact.

H3: Service quality has significant relationship and effect on total tourist satisfaction.

H4: Positive tourism impact has significant relationship and effect on total tourist satisfaction.

H5: Negative tourism impact has significant relationship and effect on total tourist satisfaction.

H6: Positive tourism impact has significant relationship and effect on choice of leisure farming type.

H7: Negative tourism impact has significant relationship and effect on choice of leisure farming type.

H8: Total tourist satisfaction has significant relationship and effect on choice of leisure farming type.

H9: Service quality has significant relationship and effect on choice of leisure farming type.

H10: Demographic variables have significant differences in tourists' perceptions of service quality, positive/negative tourism impact, total tourist satisfaction, and choice of leisure farming type.

Questionnaire design

According to the research framework, the items of the questionnaire are designed for the four dimensions, including leisure farming type, service quality, tourism impact, and total tourist satisfaction, respectively. These items are expected to be measured on Likert's five-point scale, ranging from 1 point to 5 points, respectively denoting "very disagree", "disagree", "neutral", "agree", and "very agree".

Data collection

The questionnaires were administered to residents living in Taiwan, according to the populations released by Directorate-General of Budget, Accounting, and Statistics, Executive Yuan (the organization of the government). During this period, there were 9,607,000 persons residing in northern Taiwan (Taipei, Keelung, Taoyuan, and Hsinchu), 5,731,000 persons in central Taiwan (Miaoli, Taichung, Nantou, Changhua, and Yunlin), 6,344,000 persons in southern Taiwan (Chiayi, Tainan, Kaohsiung, Pingtung), and 1,039 persons in eastern Taiwan (Yilan, Hualien, and Taitung). According to the pro- portion of populations in each area, questionnaires were distributed using stratified random sampling. 254 responses were administered to residents in the northern area, 151 in the central area, 168 in the southern area and 29 in the eastern area. The questionnaires were distributed at various leisure farming sites. A total of 602 responses were distributed, and 552 usable responses were collected. An acceptable response rate was 91.69%.

Data analysis methods

The data analyses were performed on SPSS 12.0 and AMOS 5.0. The methods adopted included descriptive statistics analysis, reliability/validity analysis, one-sample t-test analysis, correlation analysis, factor analysis, one-way ANOVA, chi-square test analysis, and structural equation modeling analysis.

DATA ANALYSIS AND RESULTS

Descriptive statistics analysis

Through descriptive statistics analysis, we could under-stand the distribution of basic attributes of the participants.
(1) Gender: 45.5% of the subjects were male, and the rest 54.5% were female. (2) Marital status: 52% were unmarried, and 27% were married (including having kids). (3) Age group: the main group was 21 - 30 years old, taking up 47.5%, followed by the group of 31 - 40 years old, and taking up 27.7%. (4) Occupation: the largest group was formed by those working in the service industry, taking up 38.2%, followed by that formed by those working in the manufacturing industry, taking up 15.9%. (5) Education: university/college education was the main group, taking up 52.7%, followed by high (vocational) school education, taking up 25.0%. (6) Monthly income: most of the subjects (28.1%) earned $20,000 ~ 30,000 a month, and 23.4% of the subjects earned $30,000 ~ 40,000 a month. (7) Residential area: northern Taiwan was the major residential area of the subjects (42.2%), followed by southern Taiwan (27.9%).

Reliability and validity analysis

As presented on SPSS 12.0, the overall reliability coefficient (Cronbach's) of the questionnaire was 0.915 and all the dimensions had a Cronbach's greater than 0.8, which complied with the criterion proposed by Hair et al. (2006). Hence, the reliability coefficient (Cronbach's) of the questionnaire was within the acceptable level. Besides, the questionnaire was consistent and stable, so findings from subsequent analyses were expected to very meaningful. The questionnaire was designed on several foundations, including SERVQUAL developed by Parasuraman et al. (1988), tourism impacts proposed by Ap and Crompton (1998) and Ko and Stewart (2002), total tourist satisfaction proposed by Czepiel and Rosenberg (1976) and Woodside et al. (1989), and the three mature leisure farming types induced by Chen (2003). Thus, the questionnaire items featured good construct validity. The results of reliability analysis are shown in Table 1.

One-sample t-test analysis

Through one-sample t-test analysis, it was discovered that all items of the questionnaire had a p- value (0.000) less than 0.05, indicating that the tourists showed a higher satisfaction with service quality, positive/negative tourism impact, and total tourist satisfaction. The results of one-sample t-test analysis on service quality, positive/ negative tourism impact, and total tourist satisfaction are shown in Tables 2, 3, 4 and 5.

Table 1. Reliability analysis of this research.

Dimensions (Factors)	Cronbach's
Service quality	0.935
Positive tourism impact	0.882
Negative tourism impact	0.929
Total Cronbach's	0.915

Correlation analysis

In this section, the relationships among service quality, positive/negative tourism impact, total tourist satisfaction, and choice of leisure farming type are analyzed using Pearson's correlation analysis method.

Test of relationships among service quality, positive/ negative tourism impact, total tourist satisfaction, and choice of leisure farming type

The correlation coefficient between service quality and positive tourism impact was 0.443 (p-value = 0.000 < = 0.05). Therefore, it can be concluded that there is a significant and positive relationship between service quality and positive tourism impact. The correlation coefficient between service quality and negative tourism impact was -0.103 (p- value = 0.015 < = 0.05). Therefore, there is a significant and negative relationship between service quality and negative tourism impact. The correlation coefficient between service quality and total tourist satis- faction was 0.246 (p- value = 0.000 < = 0.05). Hence, there is a significant and positive relationship between service quality and total tourist satisfaction. This implied that higher perceived service quality, and higher total tourist satisfaction. The correlation coefficient between service quality and choice of leisure farming type was 0.062 (p-value = 0.149 > = 0.05). Therefore, there is no significant relationship between service quality and choice of leisure farming type.

Test of relationship among positive tourism impact, total tourist satisfaction, and choice of leisure farming type

The correlation coefficient between positive tourism impact and total tourist satisfaction was 0.213 (p-value = 0.000 < = 0.05). Thus, there is a significant and positive relationship between positive tourism impact and total tourist satisfaction. This implied that higher positive tourism impact, and higher total tourist satisfaction. The correlation coefficient between positive tourism impact and choice of leisure farming type was 0.021 (p-value = 0.615 > = 0.05). Therefore, there is no significant relationship between positive tourism impact and choice of leisure farming type.

Table 2. One-sample t-test of service quality.

Items of the questionnaire	test value = 3	
	t-value	p-value(significance, upper tail)
b1. The leisure farming type features modern and new facilities.	12.967	0.000
b2. The leisure farming type features an attractive appearance and facilities.	20.370	0.000
b3. Servicepersons of this leisure farming type all wear uniformed and clean clothes.	21.087	0.000
b4. The promotional activities of this leisure farming type are attractive.	22.943	0.000
b5. Clear guidance on directions is provided in the establishments of this leisure farming type.	23.149	0.000
b6. All the commitments will be fulfilled.	19.412	0.000
b7. Servicepersons will help solve any problem that occurs to visitors.	27.560	0.000
b8. This leisure farming type is reliable.	24.299	0.000
b9. This leisure farming type offers services necessary to customers.	23.580	0.000
b10. The quality of the products sold is assured.	25.975	0.000
b11. The operator will actively notify customers the opening time of the farm.	19.434	0.000
b12. The experienced service quality is close to the expected.	21.685	0.000
b13. Servicepersons can offer services in a quick manner.	19.834	0.000
b14. Servicepersons are glad to offer assistance to customers.	26.043	0.000
b15. An information service channel is provided.	23.745	0.000
b16. Servicepersons are polite and friendly.	21.000	0.000
b17. Servicepersons will not neglect customer services when they are busy.	15.562	0.000
b18. Servicepersons have professional knowledge and skills.	20.591	0.000
b19. Servicepersons will help one another to offer the best service to customers.	23.976	0.000
b20. Customers can feel assured when making deals with servicepersons.	24.176	0.000
b21. Customized services are provided.	16.416	0.000
b22. Extra attention will be given to customers.	14.158	0.000
b23. Servicepersons understand the specific needs of customers.	14.503	0.000
b24. Customer interests will be prioritized.	15.645	0.000
b25. Servicepersons are willing to listen to customer complaints and suggestions.	19.221	0.000

Table 3. One-sample t-test of positive tourism impact.

Items of the questionnaire	test value =3	
	t-value	p-value(significance, upper tail)
c1. Increase local revenue.	25.263	0.000
c2. Increase local job opportunities.	25.911	0.000
c3. Enhance local living standard.	22.437	0.000
c4. Improve the economic environment.	25.395	0.000
c5. Stimulate local business opportunities.	31.473	0.000
c6. Enhance local living quality.	20.400	0.000
c7. Shape local cultural features.	26.063	0.000
c8. Develop unique products.	25.214	0.000
c9. Hold various cultural activities.	23.958	0.000
c10. Allow visitors to have personal experience.	28.522	0.000
c11. Protect the natural environment.	13.487	0.000
c12. Improve public facilities (roads and traffic networks).	17.564	0.000
c13. Increase the basic infrastructure (water, electricity, communication, and transportation).	18.503	0.000
c14. Feature unique and natural landscapes.	18.788	0.000
c15. Enhance the environmental quality.	18.080	0.000

Table 4. One-sample t-test of negative tourism impact.

Items of the questionnaire	test value=3	
	t-value	p-value(significance, upper tail)
d1. Increase of real estate cost (land and house).	10.037	0.000
d2. Increase of the expenditure of life.	6.443	0.000
d3. Inflation (soaring of commodity price).	5.92	0.000
d4. Widening of the rich and the poor.	3.083	0.002
d5. Increase of income taxes (such as business tax and invoice tax).	4.839	0.000
d6. Increase of traffic accidents.	4.165	0.000
d7. Malicious destruction.	8.257	0.000
d8. Over-crowding.	9.915	0.000
d9. Destruction of local cultures.	5.353	0.000
d10. Affecting the life of nearby residents.	4.656	0.000
d11. Destruction of the natural landscapes.	5.162	0.000
d12. Increase of environmental and sanitary pollution.	6.951	0.000
d13. Traffic congestion or the parking problem.	9.223	0.000
d14. Destruction of the original ecological system.	5.788	0.000
d15. Over artificial development of the natural landscape.	7.233	0.000

Table 5. One-sample t-test of total tourist satisfaction

Item of the questionnaire	test value=3	
	t-value	p-value(significance, upper tail)
e1. Overall, do you feel satisfied after visiting this leisure farming spot?	16.610	0.000

Test of relationship among negative tourism impact, total tourist satisfaction, and choice of leisure farming type

The correlation coefficient between negative tourism impact and total tourist satisfaction was -0.307 (p-value = 0.000 < = 0.05). Therefore, there is a significant relationship between negative tourism impact and total tourist satisfaction. In addition, the correlation coefficient between negative tourism impact and choice of leisure farming type was -0.056 (p-value = 0.196 > = 0.05). Therefore, there is no significant relationship between negative tourism impact and choice of leisure farming type.

Test of relationship between total tourist satisfaction and choice of leisure farming type

The correlation coefficient between total tourist satisfac-tion and choice of leisure farming type was 0.052 (p-value = 0.223 > = 0.05). Therefore, there is no significant relationship between total tourist satisfaction and choice of leisure farming type.

The correlation analyses among service quality, positive/ negative tourism impact, total tourist satisfaction, and choice of leisure farming type are shown in Table 6.

Factor analysis

Principal component analysis was adopted in this section, and the Varimax was used to maximize the sum of variance of the loading factors. According to Kaiser (1974), data with KMO (measure of sampling adequacy) value lower than 0.6 are not suitable for factor analysis. KMO higher than 0.80 is good and indicates that there is a common factor among the variables. The data are good for factor analysis. In this study, factors with an eigenvalue greater than 1, and a factor loading greater than 0.4 were extracted.

Service quality

The dimension of service quality consisted of 25 items. From the factor analysis, the KMO value of 0.933 and significance level of 0.000 were obtained. Five factors were then extracted. According to the meaning of each question, the items were classified into the following factors, including "assurance", "reliability", "empathy", "responsiveness", and "tangibles". The eigenvalues of these factors were 9.912, 1.635, 1.480, 1.311, and 1.026, respectively. All of these values were greater than 1, indicating the clustering method was adequate and meaningful. Besides, the cumulative variance explained

Table 6. Correlation analysis among service quality, positive/negative tourism impact, total tourist satisfaction, and choice of leisure farming type.

Dimensions		Service quality	Positive tourism impact	Negative tourism impact	Total tourist satisfaction	Choice of leisure farming type
Service quality	Pearson correlation	1				
	Significance (two-tailed)					
Positive tourism impact	Pearson correlation	0.443 (*)	1			
	Significance (two-tailed)	0.000				
Negative tourism impact	Pearson correlation	-0.103(*)	0.103(*)	1		
	Significance (two-tailed)	0.015	0.015			
Total tourist satisfaction	Pearson correlation	0.246(*)	0.213(*)	-0.307(*)	1	
	Significance (two-tailed)	0.000	0.000	0.000		
Choice of leisure farming type	Pearson correlation	0.062	0.021	-0.056	0.052	1
	Significance (two-tailed)	0.149	0.615	0.196	0.223	

Note: * $p < 0.05$, (two-tailed test).

reached 61.455%, as shown in Table 7.

Positive tourism impact

In the factor analysis, it was found that of the 15 items in the dimension of positive tourism impact, Item 10 had a factor loading 0.391 under 0.4. Item 10 was then removed. In the factor analysis of positive tourism impact, the KMO value of 0.866 and significance level of 0.000 were obtained. Three factors were extracted. According to the meaning of each question, the items were classified into the following factors, including "positive economic impact", "positive environmental impact", and "positive socio-cultural impact". The eigenvalues of these factors were 5.421, 1.686, and 1.230, respectively. All of these values were greater than 1, indicating the clustering method was adequate and meaningful. Besides, the cumulative variance explained reached 59.554%, as shown in Table 8.

Negative tourism impact

In the factor analysis of negative tourism impact, the KMO value of 0.940 and significance level of 0.000 were obtained. Two factors were extracted. According to the meaning of each question, the items were classified into "negative environmental impact" and "negative socio-economic impact". The eigenvalues of these factors were 8.048 and 1.171, respectively. Both values were greater than 1, indicating the clustering method was adequate and meaningful. Besides, the cumulative variance explained

reached 65.063%, as shown in Table 9.

One-way ANOVA

In this section, one-way ANOVA was conducted to explore if demographic variables have significant effects on consumers' perceptions of service quality, positive/ negative tourism impact, and total tourist satisfaction.

Service quality

In the test for the homogeneity test of the population variance, the p-values of "gender", "marital status", "occupation", "education", and "monthly income" were 0.339, 0.006, 0.309, 0.372, and 0.953, respectively. All of these values were greater than the level of significance of = 0.05. This implied that the difference of the population variance did not violate the homogeneity test of the population variance, and one-way ANOVA could be conducted.

Besides, the p-value of "age" was 0.033, and that of "residential area" was 0.002. Both values were under the level of significance of = 0.05. Due to a significant difference in the homogeneity test of the population variance, "age" and "residential area" were not good for ANOVA.

In the ANOVA of "gender" on service quality, the p-value was 0.048, which was below the level of significance of = 0.05. Therefore, multiple comparison procedures were further conducted. There were no more than two groups of "gender", so the multiple comparison procedure was not performed. Instead, the mean comparison test was utilized

Table 7. Factor analysis of service quality.

Factors	Item no.	Factor loadings	Engenvalues	Variance explained (%)	Cumulative% of variance explained
Assurance	b16.	0.744	9.912	39.649	39.649
	b18.	0.731			
	b17.	0.680			
	b19.	0.634			
	b20.	0.532			
Reliability	b7.	0.762	1.635	6.539	46.188
	b8.	0.711			
	b6.	0.672			
	b9.	0.599			
	b10.	0.579			
	b5.	0.502			
Empathy	b22.	0.816	1.480	5.919	52.107
	b23.	0.775			
	b21.	0.697			
	b24.	0.694			
	b25.	0.460			
Responsiveness	b12.	0.706	1.311	5.245	57.352
	b13.	0.643			
	b14.	0.618			
	b11.	0.589			
	b15.	0.507			
Tangibles	b1.	0.794	1.026	4.104	61.456
	b2.	0.790			
	b3.	0.652			
	b4.	0.529			

Table 8. Factor analysis of positive tourism impact.

Factors	Item no.	Factor loadings	Engenvalues	Variance explained (%)	Cumulative % of variance explained (%)
Positive economic impact	c2.	0.838	5.421	38.725	38.725
	c1.	0.780			
	c4.	0.680			
	c5.	0.664			
	c3.	0.623			
Positive environmental impact	c12.	0.735	1.686	12.044	50.769
	c15.	0.726			
	c13.	0.718			
	c11.	0.640			
	c14.	0.628			
Positive socio-cultural impact	c7.	0.767	1.230	8.785	59.554
	c8.	0.737			
	c6.	0.597			
	c9.	0.557			

Table 9. Factor analysis of negative tourism impact.

Factors	Item no.	Factor loadings	Engenvalues	Variance explained (%)	Cumulative % of variance explained
	c11.	0.851			
	c12.	0.847			
	c14.	0.829			
	c10.	0.822			
Negative environmental impact	c15.	0.788	8.048	53.656	53.656%
	c9.	0.784			
	c7.	0.729			
	c13.	0.718			
	c8.	0.705			
	c4.	0.832			
	c3.	0.816			
Negative socio-economic impact	c5.	0.802	1.171	11.407	65.063%
	c2.	0.643			
	c6.	0.607			
	c1.	0.518			

to find out that the male participants had a higher satisfaction with service quality than the female ones. In the test of the effect of "occupation" on service quality, the p-value was 0.014, which was below the level of significance of = 0.05.

In the further multiple comparison procedure, it was found tourists from the manufacturing industry had a significantly higher satisfaction with service quality than students. In the test of the effect of "education" on service quality, the p-value = 0.031, which was smaller than the level of significance of = 0.05. Through the multiple comparison procedure, it was found that tourists who had received college/university education had a higher satisfaction with service quality than those who had received only junior high school education or education under this level. Besides, tourists who had received graduate school education or above had a significantly higher satisfaction with service quality than those who had received under junior high school education or education under this level. In the aspect of "monthly income", the p-value was 0.030, which was smaller than the level of significance of = 0.05.

The multiple comparison procedure results indicated that tourists with a monthly income between $40,001 ~ $50,000 had a significantly higher satisfaction with service quality than those with a monthly income below $20,000 (including). The ANOVA results of service quality are shown in Table 10.

Positive tourism impact

In the test of the effect of demographic variables on positive tourism impact, the p-values of "gender", "marital

status", "age", "occupation", "monthly income", and "residential area" were 0.391, 0.218, 0.316, 0.159, 0.088, and 0.336 respectively. All of these values were greater than the level of significance of = 0.05. This implied that the difference of the population variance did not violate the homogeneity test of the population variance, and one-way ANOVA could be conducted. Besides, the p- value of "education" was 0.022, which was under the level of significance of = 0.05. Due to a significant difference in the homogeneity test of the population variance, "education" was not good for ANOVA.

In the ANOVA of "residential area" on positive tourism impact, the p-value was 0.017, which was under the level of significance of = 0.05. The further multiple comparison procedure indicated that tourists living in northern Taiwan showed a higher level of agreement on positive tourism impact than those living in southern Taiwan; tourists living in central Taiwan also showed a higher level of agreement on positive tourism impact than those living in southern Taiwan.

Negative tourism impact

In the test of the effects of demographic variables on negative tourism impact, the p-values of "gender", "marital status", "age", "occupation", "education", "monthly income", and "residential area" were 0.074, 0.770, 0.178, 0.439, 0.409, 0.470, and 0.855, respectively. All of these values were greater than the level of significance of = 0.05.

Hence, the difference of the population variance did not violate the homogeneity test of the population variance, and one-way ANOVA could be conducted.

In the test of the effect of "residential area" on negative tourism impact, the p-value 0.024 was under the level of

Table 10. ANOVA of demographic variables on service quality.

Demographic variables	Homogeneity test	F-test	p-value (significance)	Tukey (multiple comparison procedures)
Gender	0.339	3.921	0.048*	There were no more than 3 groups of gender, so multiple comparison procedure was not conducted. In the comparison of means, the result can be obtained as follows. 1. Male > Female
Marital status	0.06	1.700	0.184	-
Age	0.033	-	-	-
Occupation	0.309	2.427	0.014*	1. Manufacturing Industry > Students
Education	0.372	2.680	0.031*	1. College/university education> Junior high school education or education under this level 2. Graduate school education or above> Junior high school education or education under this level
Monthly income	0.953	2.503	0.030*	1. $40,001~$50,000 > below $20,000 (including)
Residential area	0.002	-	-	-

Note: * p < 0.05.

Table 11. ANOVA of demographic variables on total tourist satisfaction.

Demographic variables	Homogeneity test	F-test	p-value (significance)	Tukey (multiple comparison procedures)
Gender	0.778	1.197	0.274	-
Marital status	0.428	2.657	0.071	-
Age	0.523	3.307	0.006*	21 - 30 > 41 - 50
Occupation	0.001	-	-	-
Education	0.086	2.334	0.055	-
Monthly income	0.553	0.431	0.827	-
Residential area	0.024	-	-	-

Note: * p< 0.05.

significance of = 0.05. In the further multiple comparison procedure, it was found that tourists living in central Taiwan had a higher level of agreement on negative tourism impact than those living in northern Taiwan.

Total tourist satisfaction

In the test of the effects of demographic variables on total tourist satisfaction, the p- values of "gender", "marital status", "age", "education", and "monthly income" were 0.778, 0.428, 0.523, 0.086, and 0.553, respectively. All of these values were greater than the level of significance of = 0.05. Hence, the difference of the population variance did not violate the homogeneity test of the population variance, and one-way ANOVA could be conducted. Besides, the p-values of "occupation" and "residential area" were 0.001 and 0.024, respectively. Both values were under the level of significance of = 0.05. Due to the significant difference in the homogeneity test of the population variance, "occupation" and "residential area" were not suitable for further ANOVA.

In the test of the effect of "age" on total tourist satis-faction, the p-value was 0.006, which was below the level of significance of = 0.05. Therefore, the multiple comparison procedure was performed. It was found, tourists aged between 21 ~ 30 had a higher total tourist satisfaction than those aged between 41 ~ 50. The ANOVA results of total tourist satisfaction are shown in Table 11.

Chi-square test analysis

This section was aimed to understand whether service quality, positive/negative tourism impact or demographic variables have significant influence on choice of leisure farming type through chi-square test analysis.

The chi-square test analysis of the effect of service quality on choice of leisure farming type

The analytical result of the chi-square test showed that

Table 12. The contingency table of b1 versus choice of leisure farming type.

			Choice of leisure farming type			Total
			Tourist farm	Urban allotment	Leisure farms	
b1 (The leisure farming type features modern and new facilities)	Strongly disagree	Individual	3	4	4	11
		% of total	0. 5	0. 7	0. 7	2. 0
	Disagree	Individual	15	4	25	44
		% of total	2.7	0.7	4.5	8.0
	Fair	Individual	57	23	152	232
		% of total	10.3	4.2	27.5	42.0
	Agree	Individual	50	8	135	193
		% of total	9.1	1.4	24.5	35.0
	Strongly Agree	Individual	18	7	47	72
		% of total	3.3	1.3	8.5	13.0
Total		Individual	143	46	363	552
		% of total	25.9	8.3	65.8	100.0

reliability (p = 0.210), responsiveness (p = 0.180), and empathy (p = 0.467) all have a p value greater than the level of significance of = 0.05, indicating that three factors "reliability", "responsiveness", and "empathy" of service quality would not significantly affect tourists' choice of leisure farming type.

As to the factor of tangibles, the Pearson chi-square value was 77.773 with the significance probability p = 0.000 smaller than the level of significance of = 0.05. Therefore, tourists' satisfaction with service quality in the factor of tangibles would significantly affect their choice of leisure farming type.

In the contingency table of b1 (The leisure farming type features modern and new facilities), b2 (The leisure farming type features an attractive appearance and facilities), and b3 (Servicepersons in this leisure farming type all wear uniformed and clean clothes) versus the three choices of leisure farming, it was found that the percentage of those choosing "leisure farms" was significantly greater than the percentage of those choosing "tourist farm" or "urban allotment".

As to the factor of assurance, the Pearson chi-square value was 60.359 with the significance probability p = 0.002 smaller than the level of significance of = 0.05. Therefore, tourists' satisfaction with service quality in the factor of assurance would significantly affect their choice of leisure farming type.

In the contingency table of b16 (Service persons are polite and friendly) and b17 (Service persons will not neglect customers' needs when they are busy) versus the three choices of leisure farming, it was found that the percentage of those choosing "leisure farms" was

significantly greater than the percentage of those choosing "tourist farm" or "urban allotment". The contingency table of b1 (The leisure farming type features modern and new facilities) versus the three choices of leisure farming is shown in Table 12.

The chi-square test analysis of the effect of positive tourism impact on choice of leisure farming type

The positive economic factor of positive tourism impact had a Pearson's chi-square value of 70.290, with the significance probability p = 0.001, which was less than the level of significance of = 0.05. This indicated that the positive economic factor of positive tourism impact would significantly affect tourists' choice of leisure farming type. However, the positive environmental factor of positive tourism impact would not significantly affect tourists' choice of leisure farming type because the p value was greater than the level of significance of = 0.05.

In the contingency table of c2 (Increase local job opportunities), c3 (Enhance local living standard), c4 (Improve the economic environment), and c5 (Stimulate local business opportunities) versus the three choices of leisure farming, it was found that the percentage of those choosing "leisure farms" was significantly greater than the percentage of those choosing "tourist farm" or "urban allotment".

In addition, the positive socio-cultural factor of positive tourism impact had a Pearson's chi-square value of 48.208, with significance probability p = 0.010, which was less than the level of significance of = 0.05. This indicated that the positive socio-cultural factor of positive tourism impact

Table 13. The contingency table of residential area versus choice of leisure farming type.

			Choice of leisure farming type			Total
			Tourist farm	Urban allotment	Leisure farms	
Residential area	Northern area	Individual	55	16	162	233
		% of total	10.0	2.9	29.3	42.2
	Central area	Individual	49	13	77	139
		% of total	8.9	2.4	13.9	25.2
	Southern area	Individual	27	13	114	154
		% of total	4.9	2.4	20.7	27.9
	Eastern area	Individual	12	4	10	26
		% of total	2.2	0.7	1.8	4.7
Total		Individual	143	46	363	552
		% of total	25.9	8.3	65.8	100.0

would significantly affect tourists' choice of leisure farming type.

In the contingency table of c6 (Enhance local living quality) versus the three choices of leisure farming, it was found that the percentage of those choosing "leisure farms" was significantly greater than the percentage of those choosing "tourist farm" or "urban allotment".

The chi- square test analysis of the effect of negative tourism impact on choice of leisure farming type

The negative socio-economic factor of negative tourism impact had a significance probability p = 0.690, which was greater than the level of significance of = 0.05. This implied that the negative socio-economic factor of negative tourism impact would not significantly affect tourists' choice of leisure farming type.

In addition, the negative environmental factor of negative tourism impact had a Pearson's chi-square value of 93.702, with significance probability p=0.044, which was less than the level of significance of =0.05. This indicated that this factor of negative tourism impact would significantly affect tourists' choice of leisure farming type.

The chi-square test analysis of the effect of total tourist satisfaction on choice of leisure farming type

Total tourist satisfaction had a Pearson's chi-square value of 10.427, with significance probability p = 0.236, which was greater than the level of significance of = 0.05 through the chi-square test analysis. This indicated that total tourist satisfaction would not significantly affect tourists' choice of leisure farming type.

The chi-square test analysis of the effect of demographic variables on choice of leisure farming type

In the chi-square test analysis of whether demographic variables would significantly affect tourists' perceptions of leisure farming choices, it was found that p values of gender and marital status were greater than the level of significance of = 0.05. In other words, gender and marital status would not significantly affect tourists' perceptions of leisure farming choices. However, p values of age, occupation, education, monthly income, and residential area on choice of leisure farming type less than the level of significance of = 0.05, indicating that tourists' perceptions of leisure farming choices would be affected by their age, occupation, education, monthly income, and residential area. The contingency table of residential area versus the three choices of leisure farming is shown in Table 13.

Structural equation modeling analysis

To ensure the efficiency of the designed research framework, the software AMOS (analysis of moment structure) was applied to test the fit of the factors (dimensions) of service quality, positive/negative tourism impact, and total tourist satisfaction, respectively. Besides, the three steps of observing and modifying indexes proposed by Sethi and King (1994) were followed to improve the fit of the measurement model.

(1) Variables with a factor loading under 0.6 should be deleted;
(2) If the goodness of fit index is under the acceptable
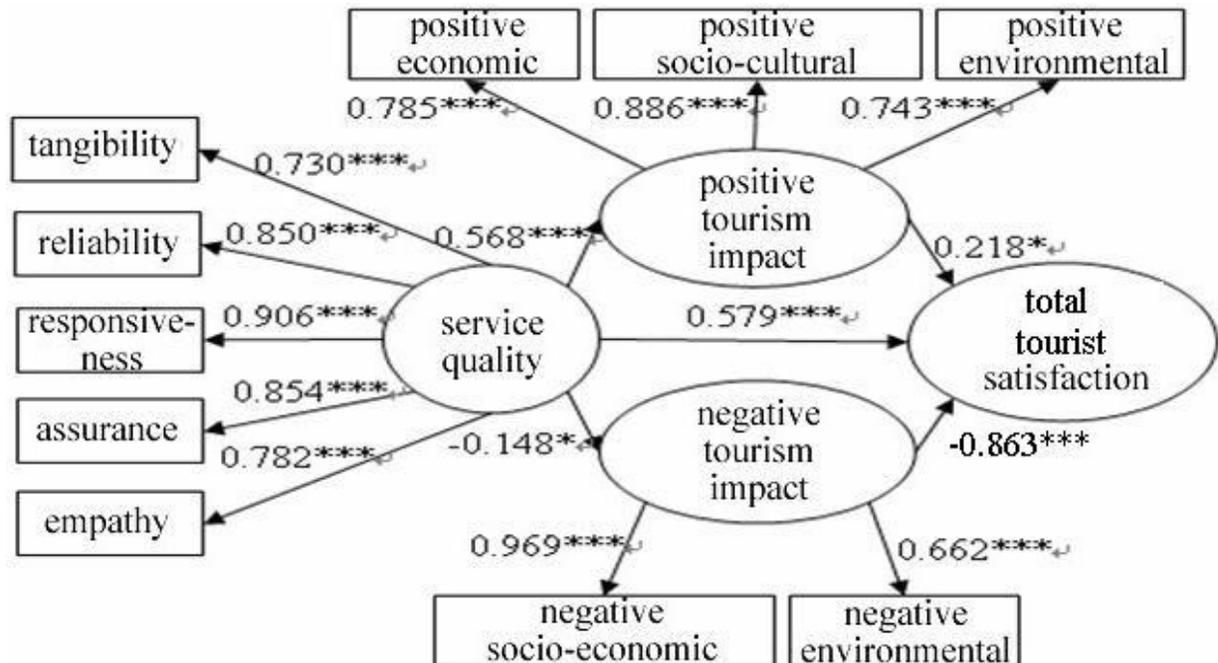
Figure 2. Path analysis of the model.
Note: * p< 0.05; *** p< 0.001.

level, variables with higher modification index (MI) and lower factor loading should be deleted;
(3) If the goodness of fit is low, variables with significantly low effects should be deleted.

Besides, according to Joreskog and Sorbom (1989), GFI (goodness of fit index), AGFI (adjusted goodness of fit index), NFI (normed fit index), and CFI (comparative fit index) should all be greater than 0.9, RMR (root mean square residual) should be under 0.05, and RMSEA (root mean square error of approximation) should be under 0.05. For a model with good fit, the ratio of chi-square value to degree of freedom (x^2/df) should be smaller than 5 (Wheaton et al., 1977). A stricter criterion is that the ratio of chi-square value to degree freedom (x^2/df) should be no greater than 3 (MacIver and Carmines, 1981).
The fit indexes of the model were as follows: GFI was 0.915, AGFI was 0.897, NFI was 0.918, and CFI was 0.988. GFI, NFI, and CFI were above the acceptable level of 0.9, and only AGFI was slightly lower than 0.9. However, the overall fit of the model was good. RMR (root mean square of residual) should be close to zero. The closer RMR is to zero, the better the model is. Generally, the acceptable range of RMR is within 0.05. In this study, RMR was 0.043, which could be accepted. RMSEA should also be close to zero. In this study, the RMSEA value was 0.016, which was also within the acceptable range. The path analysis of the research framework is shown in Figure 2.
To sum up, the overall fit of the model was good. Through the path analysis, it was found that "service

quality" had positive and direct influence on "positive tourism impact" and "total tourist satisfaction". In other words, tourists with higher satisfaction with service quality would have positive influence on the positive tourism impact and show higher total tourist satisfaction. "Service quality" had negative influence on "negative tourism impact". This implied that higher satisfaction with service quality would lead to negative effect on negative tourism impact. Moreover, "positive tourism impact" had positive and direct influence on "total tourist satisfaction", and "negative tourism impact" had negative and direct influence on "total tourist satisfaction", meaning that tourists who showed more agreement on the positive impact of tourism also had a higher level of total tourist satisfaction, but tourists who showed more agreement on the negative impact of tourism had a lower level of total tourist satisfaction. The result is presented in Table 14.
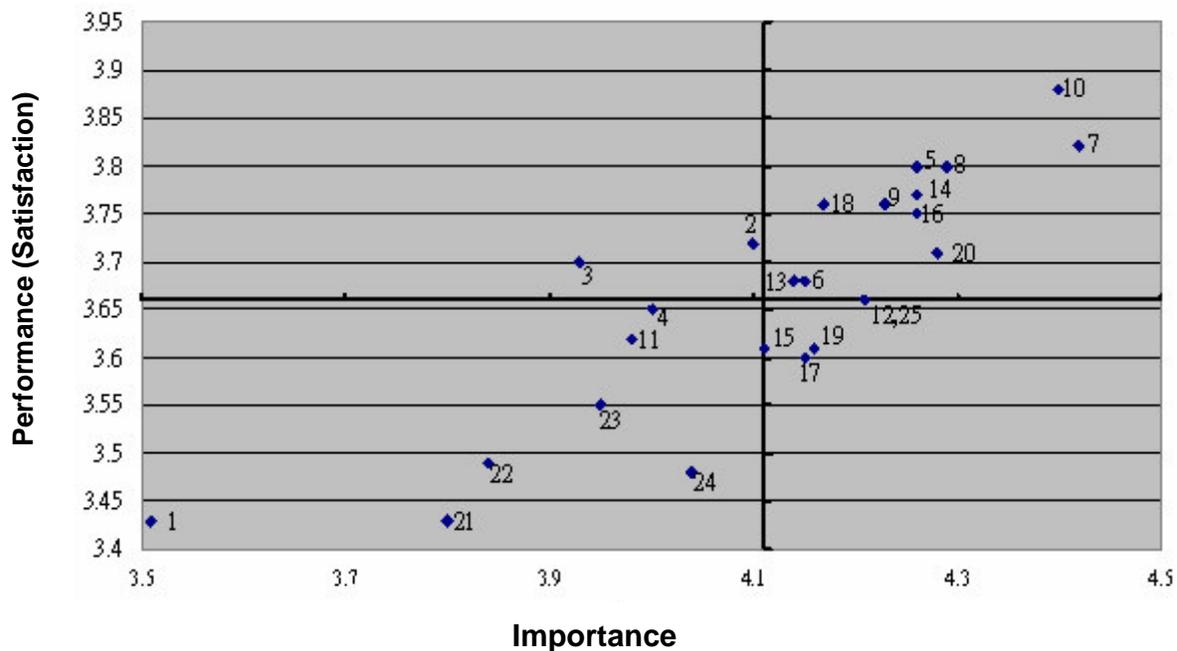
Importance-performance analysis

Importance-performance analysis was used to measure importance and satisfaction of each item with service quality of the questionnaire. The result of IPA (importance-performance analysis) shows that items related to assurance factor of service quality "Servicepersons will not neglect customer services when they are busy" and "Servicepersons will help one another to offer the best service to customers" in quadrant IV (focus area) should be prioritized and first improved by leisure farming

Table 14. AMOS model fit test result.

Hypotheses		Standardized factor loadings	P- values	Results
H1	Service quality has significant relationship and effect on positive tourism impact.	0.568	0.000***	Supported
H2	Service quality has significant relationship and effect on negative tourism impact.	-0.148	0.011*	Supported
H3	Service quality has significant relationship and effect on total tourist satisfaction.	0.493	0.000***	Supported
H4	Positive tourism impact has significant relationship and effect on total tourist satisfaction.	0.218	0.050*	Supported
H5	Negative tourism impact has significant relationship and effect on total tourist satisfaction.	-0.863	0.000***	Supported

Note: * indicates significance level = 0.05, p < = 0.05; *** indicates significance level =0.001, p < = 0.001.

Figure 3. Importance-performance analysis of service quality of leisure farming.

operators because they represent items with higher importance and lower satisfaction as shown in Figure 3.

The results of research hypothesis tests

The results of the proposed hypothesis tests are listed in Table 15.

Conclusion

In this study, leisure farming tourists were selected as research subjects. Through statistic analyses, we attempted to explore the effects of service quality, positive/negative impact, and total tourist satisfaction on tourists' choice of leisure farming type. Besides, the effects of demographic variables on tourists' perceptions of service quality, positive/negative tourism impact, total tourist satisfaction, and choice of leisure farming types were also investigated. From the research findings, the conclusions are shown as:

(1) The correlation analysis showed significant relationships among service quality, positive/negative tourism impact, and total tourist satisfaction; (2) In the test of the effects of demographic variables on perceptions of service quality, positive/ negative tourism impact, and total tourist

Table 15. Results of research hypothesis tests.

Hypotheses		Results
H1	Service quality has significant relationship and effect on positive tourism impact.	Supported
H2	Service quality has significant relationship and effect on negative tourism impact.	Supported
H3	Service quality has significant relationship and effect on total tourist satisfaction.	Supported
H4	Positive tourism impact has significant relationship and effect on total tourist satisfaction.	Supported
H5	Negative tourism impact has significant relationship and effect on total tourist satisfaction.	Supported
H6	Positive tourism impact has significant relationship and effect on choice of leisure farming type.	Partially supported
H7	Negative tourism impact has significant relationship and effect on choice of leisure farming type.	Partially supported
H8	Total tourist satisfaction has significant relationship and effect on choice of leisure farming type.	Not supported
H9	Service quality has significant relationship and effect on choice of leisure farming type.	Partially supported
H10	Demographic variables have significant differences in tourists' perceptions of service quality, positive/negative tourism impact, total tourist satisfaction, and choice of leisure farming type.	Partially supported

satisfaction, the one-way ANOVA result indicated that there were significant differences in perceptions of satisfaction with service quality among tourists of different genders, occupations, education levels, and monthly incomes. However, residential area also affected their perceptions of positive tourism impact and negative tourism impact. Finally, the tourists' perceptions of total tourist satisfaction were also significantly affected by their age; (3) In the chi-square test analysis of the effects of service quality, positive/negative tourism impact, and total tourist satisfaction on choice of leisure farming type, it was found that tangibles and assurance of service quality, positive economic and positive socio-cultural factors of positive tourism impact would all significantly affect the tourists' choice of leisure farming type. The negative environ- mental factor of negative tourism impact would also significantly affect the tourists' choice of leisure farming type; (4) In the test of the effects of demographic variables on perceptions of leisure farming choice, the chi-square test analysis showed that age, occupation, education, monthly income, and residential area would all significantly affect the tourists' choice of leisure farming type, while gender and martial status would not signi-ficantly affect their choice of leisure farming type; (5) The fit of the model was also tested using AMOS. The result showed that that there were positive and direct effects among service quality, positive tourism impact; and total tourist satisfaction. However, there were significantly negative and direct effects among service quality, negative tourism impact, and total tourist satisfaction.

SUGGESTIONS

Based on the research findings, it was suggested that leisure farming operators pay attention to factors that affect tourists' perceptions of service quality, positive tourism impact, and total tourist satisfaction and also attempt to understand the difference among different types of tourists in their choice of leisure farming type, so as to

enhance their business performance. Four major suggestions are proposed as:

(1) There is a significant effect between service quality and choice of leisure farming type, so tourists' satisfaction with service quality affects their choice of leisure farming type. It is thus suggested that leisure farming operators take leisure farms with higher customer satisfaction with their service quality as their model to enhance their total tourist satisfaction; (2) Customers' satisfaction with service quality in the factors of tangibles and assurance significantly affects their choice of leisure farming type. Hence, leisure farming operators can introduce modern facilities, create an attractive appearance of the farm, enhance the friendliness of their servicepersons, and ensure the cleanness of their wears to further improve tourists' satisfaction with their service quality. Besides, for tourists who attach much importance to the tangibles and assurance of service quality, leisure farms may be their first choice; (3) Tourists' satisfaction in the factors of positive economic and socio-cultural tourism impact significantly affects their choice of leisure farming type. Therefore, leisure farming operators are suggested to improve items which tourists are more satisfied with. Besides, they can also create special landscapes according to local characteristics and hold DIY (do-it-yourself) activities associated with local cultures to shape local cultural features. For tourists who are more satisfied with the positive economic and socio-cultural tourism impact, leisure farms may be their first choice; (4) In terms of demographic variables, it was found that tourists aged between 21 ~ 30 tended to choose leisure farms. Thus, leisure farm operators can provide special offers or sell bundled tickets to attract this young age group and expand the age range of their visitors; (5) Through IPA, the service staffs of leisure farming should provide tourists with timely services to meet their needs. In addition, they also help each other to give better service quality and customized services to tourists in order to increase the tourist satisfaction.

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