

Article

The Impacts of Tourism Development in Rural Indigenous Destinations: An Investigation of the Local Residents' Perception Using Choice Modeling

Kaowen Grace Chang ^{1,*}, Hungju Chien ², Hungyao Cheng ¹ and Hsin-i Chen ³

- ¹ Department of Landscape Architecture, National Chiayi University, Chiayi City 600, Taiwan; takumi190@gmail.com
- ² Commerce Technology Application Research Division, Commerce Development Research Institute, Taipei City 106, Taiwan; zooist@gmail.com
- ³ Department of Applied Science of Living, Chinese Culture University, Taipei City 111, Taiwan; terriechen1127@gmail.com
- * Correspondence: kaowen@mail.ncyu.edu.tw; Tel.: +886-5-271-7581

Received: 9 November 2018; Accepted: 10 December 2018; Published: 13 December 2018



Abstract: Since indigenous areas have profound ethnic culture and ecological significance and sensitivity, successful tourism development must consider the perceptions of the indigenous community in order to build a mutual relationship grounded on respect and feasibility. The local indigenous communities are influenced by both the positive and negative impacts of tourism. To recognize which tourism impacts are most anticipated and concerning, we determined which and to what extent tourism impacts affect indigenous hosts' support of alternatives for tourism plans. We used discrete choice modeling in the experiment design for empirical data collection and used mixed-logistic regression to evaluate the influence of each impact on local residents' perceptions. We rank the effects of socio-culture, economic, and environmental tourism impacts. Our findings suggest that culture-related impacts most improve indigenous residents' tourism development support. The residents expect economic impacts on both the regional and local scales. However, the results show a willingness to accept pollution following increased tourism. The residents have an adverse opinion of practices that are likely to cause environmental damage. The potential for conflict between local residents and tourists is not important to the local residents. This study contributes essential information to the understanding of tourism impacts from an indigenous perspective.

Keywords: rural area development; destination planning; indigenous tourism; tourism impact; choice experiment

1. Introduction

Tourism has been identified as a vital mechanism of sustainable development in rural indigenous areas [1–4]. Since indigenous areas have profound ethnic culture and ecological significance and sensitivity, successful tourism development must consider the perceptions of the local community in order to build a mutual relationship grounded on respect, trust, and feasibility to create local acceptance and support [2,5–8]. Increased attention is being focused on the extension from agricultural to tourism development in rural indigenous areas in order to create impacts such as economic activation, income and employment production, public infrastructure creation, culture preservation, and nature conservation [4,7,9,10]. Although tourism development has desired impacts, it can also produce undesired consequences. Depending on the case, those undesired impacts may include local culture dilution, pollution, conflicts with tourists, and damage to the natural environment [11–15].



Local communities are in direct contact with the changes in their community in which they both tolerate and benefit from the consequences of tourism development. The concerns that have arisen over indigenous residents' perceptions and opinion have become a critical consideration in sustainable tourism planning and a focus of tourism impact research [2,5]. There has been a shift in attention from a focus on tourism impacts to how the impacts are perceived and chosen by the hosting community in the context of tourism development strategies [3,5,11,12,16]. Understand the attitude and perception of the local residents is fundamental for making informed decisions and selecting optimum practices in tourism development.

1.1. Impacts of Tourism Development

In terms of tourism impact, as tourists interact with the local environment, economy, and community, tourism activities generate combined influences on the economic, natural, cultural, and societal status in the destination. A number of books and papers have focused on a wide range of multi-faceted characteristics related to tourism impacts and have stated that the consequences can be positive and beneficial as well as negative and undesired [11,14]. The following two sections provide literature reviews of tourism development concerning its impacts on the local economy, environment, and society.

1.1.1. Economic and Environmental Impacts of Tourism

There has been a wave of interest in the relationship of economic impacts in hosting communities. Much of the research on economic impacts has centered on the effects of income and employment since the local residents generally anticipate and seek to benefit from economic stimulations through job opportunities in tourism service or sales pertaining to food, accommodation, crafts, and activities [16–19]. Although tourism can negatively impact the economy through aspects such as inflation, public sectors often consider positive economic impacts as the main tourism impacts and therefore prefer to select tourism as the development approach instead of other industrial options, especially for rural area development.

Environmental impacts have been widely investigated to contribute insights into tourism. The literature suggests that the environmental impacts of tourism principally depend on local conditions, such as locality, activity type, form of tourist infrastructure, and can be the result of the planning practices [7,8,20]. In terms of carrying capacity, some places are more fragile than others, such as rural vs. urban areas; the type of activity influences the impacts on the site [15], such as hiking by foot vs. riding all-terrain vehicles. In addition, the preparation of infrastructure and construction for tourism service substantially affects impacts [17,20,21]. Newly constructed buildings, roads, parking lots, and facilities, if not carefully planned, can impact local ecological habitats, damage original visual resources, and weaken the site's resilience to natural disasters in extreme weather, such as soil erosion, landslides, and use overload. Environmental pollution due to increased tourism, such as traffic congestion, littering, and noise, is an important impact that affects the quality of residents' daily lives [12,22].

From the growing body of literature on tourism impacts, although there are positive impacts on the environment, such as environmental protection and conservation, the relationship between tourism and the environment has been unequal. Tourism is conventionally considered a substantial contributor to environmental problems rather than a vehicle for environmental protection.

1.1.2. Societal and Empowering Impacts of Tourism

Tourism also significantly impacts societal aspects [8,16]. Research has empirically documented the links between tourism development and the changes in a group of people, their interactions, attitudes, and behavior patterns, as well as impacts on cultural aspects, which involve knowledge, values, and art [13]. These aspects and their intricate relationships have been described in the literature by both qualitative and quantitative investigations. The findings of those studies reflect the

context-sensitive nature of the socio-cultural impacts of tourism [7,23]. Researchers have shown that tourism has both positive and negative socio-culture impacts. The positive impacts include the effects on the renaissance of traditional activities, arts, crafts, the revitalization of cultural social life style, as well as the stimulation of supportive resources, the preservation of traditional architectures and historical remains, and the protection of scenic landscapes [5,16,17,24,25]. The negative impacts include issues of cultural authentication, local community disturbance, and the development of adversarial relationships between locals and tourists [9,16,26].

A number of publications have indicated a renewed interest in the empowerment effects of tourism, identifying the transformation of local residents' self-identity as one important socio-culture impact of tourism. Studies have noted that the process of identity transformation involves the interactions among tourists, local residents, and the external forces that affect the representation and conversion of local identity [8,16,25,27]. In indigenous communities, studies have found that members dynamically negotiate their identities with visitors. In these interactions, residents redefine their identity and tend to develop recognition of the uniqueness of their cultural traditions and native identity [25,27].

Residents' participation and attitudes are the foundation for whether tourism development can be sustainably supported in the destination. A fairly large body of literature discusses both the positive and negative impacts of tourism. However, few studies have been published on community acceptance of tourism impacts [6,9,17,28]. Although tourism has been noted to influence residents' attitudes and perception, there has been relatively little research on measurements of the perceived tourism impacts on the acceptance of indigenous hosting residents.

1.2. The Discrete Choice Model (DCM)

The DCM describes a decision makers' choice among alternatives and provides information about the complex aspects of a decision makers' choice behavior. The elicited choice allows researcher to quantitatively examine the effect of each testing aspect through the developed choice experiment. This model has been used to estimate choice behavior in a wide range of research field, e.g., tourism development [29,30], transportation planning [31,32], and landscape management [19,33–35].

The theoretical basis of DCM is characteristics demand theory [36] and random utility maximization theory [37]. Lancaster's demand theory states that consumers derive utility not from the actual alternatives but from the characteristics or attributes of the alternatives accessible in an applicable choice set. Random utility maximization theory presumes that every individual makes a decision under rationality and maximizes the utility relative to their choice.

Discrete choice models statistically model decision makers' choices among a finite set of alternatives. The collection of alternatives is called a choice set. Alternatives must satisfy the following criteria: exhaustive, mutually exclusive, and finite number of alternatives. Each alternative generates certain levels of utility to a decision maker, who is assumed to exhibit utility maximizing behavior.

The estimation of discrete choice models requires choice data. The source can either be the revealed preference data or stated preference data. Revealed preference data or transaction data are data matrices with the actual choices made by decision makers in real settings, such as scanned data in a supermarket or the reservation records in a restaurant. Stated preference data are the real choices made by decision makers in a hypothetical or simulated environment with choice alternatives systematically constructed by the researchers.

Although the revealed preference data disclose decision makers' actual behavior, they often suffer from insufficient information about key attributes for estimating the model. Therefore, we used stated preference data as our data source, developed an experimental design to present choice alternatives with key attributes, and measured decision levels in a controlled environment, which enabled the modeling of respondents' decisions with greater flexibility and well-intentioned properties.

Although tourism development can have both positive and negative impacts on cultural identity, the economy, and the environment in rural indigenous communities, we do not know how and to

what extent people balance these impacts. Thus, research concerning how residents perceive the inseparable positive and negative tourism impacts in indigenous sites is lacking. As such, we designed an empirical study using choice modeling to provide insight into this issue. Based on the perception of indigenous communities, the purpose of this study was to investigate the aspects that influence the support for tourism development. We attempted to supplement the findings of these previous studies. This study is comparable to the earlier studies in that the focus is on tourism impacts, but differs from previous studies in the way in which the hosting indigenous communities' perception of tourism impacts is assessed.

Although in practice tourism has both desired and undesired impacts on the community, we wanted to contribute to the understanding of how different impacts affect indigenous residents' support of tourism development. The study results may assist planners to recognize local perceptions when evaluating the various impacts of planning options.

The objectives of this study were to examine which impacts influence local residents' perception of tourism development and to what extent the impacts influence the indigenous residents' perception. We used discrete choice modeling to establish experimental choice sets to elicit local residents' choices among alternatives that combine the impacts derived from the literature and match the site conditions, including the impacts of local and regional economic benefits, pollution affecting quality of lives, tourist conflicts, natural environment damage, cultural architecture and landscape promotion, and cultural self-identity.

2. Methods

The purpose of this study was to provide empirical indications as to which tourism impacts are important to the local community, and to what extent the effective impacts influence the local indigenous residents' attitudes. We designed a discrete choice experiment to collect data, to provide quantitative estimates of the influence of tourism impacts.

2.1. Study Site

The study site is located at Laiyi Township, Pingtung County, Taiwan (Figure 1). Laiyi Township is a geographically mountainous and culturally indigenous area with an area of nearly 167.8 km². Its indigenous population is 97.4% of the total population of 7428 [38]. This area is the native territory of the Paiwan Tribe and many Paiwan traditional customs and religious rituals are still performed in this area. Along with the scenic forests, streams, waterfalls, and native totems, Laiyi attracts visitors due to its natural and cultural resources supporting tourism and outdoor recreation activities. The Laiyi area is geographically mountainous with interspersed settlements patterned in the area, but is conveniently located to the immediate tourism markets: the well-populated Pingtung and Kaohsiung cities are approximately 50 km and 100 km away. Currently, the site tourism development has been under discussions between the local communities and several administrations in different levels, including the township, county, and federal levels, to evaluate the suitable development strategies and practical aids in site planning for the practices in the Laiyi area.



Figure 1. Study site location.

2.2. The Discrete Choice Model

We used the Discrete Choice Model (DCM) method in this study. The following explains the DCM estimation model in this study.

In this study, a decision maker *n* faces competing *J* alternatives. The decision maker obtains a certain level of utility v_{nj} from alternative *j*, where j = 1, ..., J. The decision maker chooses the alternative that provides the greatest utility among the alternatives. The model of choice behavior for the decision maker is therefore defined as alternative *i* is chosen by the decision maker only if $v_{ni} > v_{nj} \forall j \neq i$.

However, a certain level of utility v_{ni} is not observable to us. The observable utility to the researchers is denoted as:

$$U_{nj} = v_{nj} + \varepsilon_{nj}, \ n = 1, \dots, N \text{ and } j = 1, \dots,$$
(1)

where *n* is an index for the individual decision maker, *j* is an index for the alternatives in a choice set, v_{nj} is the non-stochastic utility component, and ε_{nj} is the error term capturing the stochastic components. The non-stochastic utility component v_{nj} is assumed to be a linear function in the parameters denoted as:

$$v_{nj} = x'_{nj}\beta \tag{2}$$

where x_{nj} is a vector of attributes of alternative *j* and β is the coefficient for the utility function. The observable utility U_{ni} can be expressed as:

$$U_{nj} = x'_{nj}\beta + \varepsilon_{nj} \tag{3}$$

Given that the decision maker chooses the alternative that generates the maximum utility and y_{nj} is the response vector for the *n*th decision maker, the response from the *n*th decision maker can be denoted as:

$$y_{nj} = \begin{cases} 1, \ if \ U_{nj} \ge \max(U_n) \\ 0, \ otherwise \end{cases}$$
(4)

where y_{nj} is 1 if U_{nj} takes the maximum value among the *j*th component of $U_n = (U_{n1}, ..., U_{nJ})$, and y_{nj} is 0 otherwise.

Thus, the probability for the decision maker n choosing alternative j is denoted as follow [37]:

$$P(y_{nj} = 1) = \Pr(U_{nj} > U_{nk} \text{ for all } k \neq j)$$

= $\Pr(v_{nj} + \varepsilon_{nj} > v_{nk} + \varepsilon_{nk} \text{ for all } k \neq j)$
= $\Pr(\varepsilon_{nk} - \varepsilon_{nj} < v_{nj} - v_{nk} \text{ for all } k \neq j)$
= $\int_{\varepsilon} I(\varepsilon_{nk} - \varepsilon_{nj} < v_{nj} - v_{nk} \text{ for all } k \neq j) f(\varepsilon_n) d\varepsilon_n$ (5)

where I(.) is the indicator function and $f(\varepsilon_n)$ is the joint density of the error terms. The choice probability for decision maker *n* choosing alternative *j* can be obtained by integrating $P(y_{nj} = 1)$ over all ε . Under the logit model, the closed form is:

$$P_n(j) = \frac{1}{1 + e^{-\mu\beta'(x_{nj} - x_{nk})}}$$
(6)

2.3. Choice Experiment and Survey Design

In this study, we used an experimental design to create sets of alternatives of hypothetical impact scenarios to determine decision makers' willingness to support tourism development. The experiment

was executed as a paper-based in-person survey. We established the choice experiment in the following steps.

First, for feature selection, we thoroughly reviewed the literature and interviewed people in the local indigenous community to identify tourism impacts and their perceived level of impact to formulate the sets of choice alternatives. The selected impacts fulfill the criteria that they must have been mentioned in literature, representative of the rural and indigenous characteristics of the site, and reflect the potential consequences of tourism development in the study site.

As a result, the filtered impacts included the aspects of economic benefit, natural environmental damage, environmental pollution, and socio-cultural promotion. In these aspects, we identified 7 attributes that were used to form the choice alternatives in the experiment. Those impacting attributes were: "pollutions affecting quality of lives", "tourist conflicts", "natural environment disturbance", "cultural architecture and landscape preservation", "cultural self-identity empowerment", "employment creation", and "tourist local expenditure". The descriptions of the study attributes and their levels are reported in Table 1.

No.	Attribute (Impact)	Definition	Level
1	Pollution affecting quality of lives	The negative influences caused by increased traffic volume, rubbish, and/or noise on local residents' daily lives.	L1: Status quo L2: Increased pollution affecting quality of lives (such as more noise, litter, or traffic)
2	Conflicts with tourist	The potentially increased conflict between local residents and tourists caused by the increasing number of tourists.	L1: Status quo L2: Increased conflict between local residents and tourists
3	Natural environment disturbance	The negative impacts on the existing natural surroundings by preparations for tourism facilities and infrastructure such as building large parking lots and visitor centers.	L1: Status quo L2: Increased disturbance to the natural environment by tourism facilities or infrastructure
4	Cultural architecture and landscape preservation	The potentially increased resource requirements and efforts for cultural architecture and landscape preservation.	L1: Status quo L2: Promoted preservation of cultural architecture and landscape
5	Cultural self-identity empowerment	The strengthening of local residents' cultural identity through the opportunity to demonstrate the cultural tradition to visitors.	L1: Status quo L2: Increased cultural self-identity
6	Employment creation	The promoted economic benefit to the local region such as new job opportunity and business growth.	L1: Status quo L2: Promoted economic benefit to the local region (such as new job opportunity and business growth)
7	Tourists local expenditure	The expenditure of each tourist inside the local community per visit. The base amount (\$100 TWD) was set on the basis of the approximate cost of a basic meal per person.	L1: \$100 TWD L2: \$300 TWD L3: \$500 TWD L4: \$700 TWD L5: \$900 TWD

Table 1. The definitions and levels of the testing impacts.

In this study, the choice experiment was constructed with an attribute-only framework to determine the main effect of the attributes. The attribute-only framework shaped a choice alternative by combining a specific level from each of the seven impacts. As a result, a choice alternative demonstrated a scenario formed by a level of the seven identified impacts. The respondents' judgment among the choice sets allowed us to examine the significance of the impacts and decide which impact was most important to the respondents.

We had seven attributes with levels in this study. The full factorial design of this experiment generated 320 ($2^5 \times 5^1$) possible combinations of the levels of the attributes. With all 320 combinations, the experiment was too inefficient and too cost-prohibitive. For these reasons, a fractional-factorial design, having fewer combinations than the full-factorial design, was used. We used SAS 9.3 version statistic software (SAS Institute Inc., Cary, NC, USA) following Kuhfeld's method [39] to generate the fractional-factorial experiment and placed alternatives into two questionnaires where each questionnaire had 10 choice assignments.

In each assignment, there were two choice alternatives: Option 1 and Option 2, and a neither option. Respondents were given time to review the choice options in each task and were asked to make a preferred choice from the three options. The following is an example of one choice task in the experiment (Figure 2). Coupled with the choice tasks, the respondents were asked to respond to a set of questions to indicate their demographic information including sex, age, education, and the name of their tribal sub-community.

Option 1	Option 2	Option 3
Quality of local living environment Status quo	Quality of local living environment Increased pollution affecting quality of lives (such as: more noise, litter, or traffic)	
<u>Tourist relationship</u> Status quo	Tourist relationship Status quo	
Natural environment Increased disturbance to the natural environment by tourism facilities or infrastructure	Natural environment Status quo	I would choose
Cultural architecture and landscape Promoted preservation of cultural architecture and landscape	Cultural architecture and landscape Promoted preservation of cultural architecture and landscape	neither of them
<u>Cultural self-identity</u> status quo	Cultural self-identity Increased cultural self-identity	
Regional economic impact Promoted economic benefit to the local region (such as new job opportunity and business growth)	Regional economic impact status quo	
<u>Tourist expenditure</u> Each tourist spends \$900 TWD in the local community per visit	<u>Tourist expenditure</u> Each tourist spends \$500 TWD in the local community per visit	

Figure 2. An example of a choice task.

2.4. Data Collection Procedure

We recruited study participants at three tribal locations: Gulou, Laiyi, and Danlin villages in the study site of Laiyi Township. The networking and snowballing sampling techniques were used for recruitment in local tribal communities. We conducted surveyor training sessions to ensure sufficient understanding of the questionnaire content and procedure.

In recruiting, two surveyors visited individual households and community centers to invite potential participants for this anonymous and voluntary survey. Once the individual agreed to participate in the experiment, we conducted an on-site face-to-face interview with the participants to collect the data. The surveys were held indoors in a generally quiet and comfortable setting where participants either sat on a sofa or chair when responding to the questionnaire. Prior to the session, we explained the survey content and the way to respond the choice task to the respondent. In the session, the questions or explanations required by respondents were explained immediately by the accompanying surveyor on site. On average, a respondent required approximately 20–40 min

to complete the survey interview. The survey interviews occurred between 9:00 a.m. to 6:00 p.m. on 4 weekdays and 4 weekend days in January and February 2017.

2.5. Statistics

For data analysis, statistic software R version 3.2.5 (R Foundation for Statistical Computing, Vienna, Austria) [40] was used to conduct the mixed logistic regression for examining the respondents' choice data on the effects of tourism development. In this study, the choices that decision makers made were multinomial unordered discrete choices.

Multinomial unordered discrete choices can be examined in the standard logit model. However, the standard logit model has three limitations: not allowing for random taste variation, unrestricted substitution patterns, and correlation in unobserved factors over time when examining discrete choices [41]. The coefficients of the standard logit model cannot be varied, which implies the coefficients are the same for all decision makers.

Mixed logit model mitigates these three limitations in standard logit models by simulating choice probabilities with unrestricted distributions. Many studies have shown that a mixed logit model can approximate the random utility model of discrete choices with appropriately specified variables and distribution of coefficients [42]. From the aspect of utility-maximizing behavior, the mixed logit model can be derived as follows.

For the mixed logit model, the utility of decision maker *n* for choosing alternative *j* is:

$$U_{nj} = x'_{nj}\beta_n + \varepsilon_{nj} \tag{1}$$

and

$$\beta_n \sim f(\beta|\theta) \tag{2}$$

where θ is the parameter of β_n and ε_{nj} is an independently and identically distributed extreme value.

The probability of decision maker *n* for choosing alternative *j* in the standard logit formula is:

$$L_{nj}(\beta_n) = \frac{e^{\beta_n x_{nj}}}{\sum_I e^{\beta_n x_{nJ}}}$$
(3)

Since β_n is random and unknown, the unconditional choice probability is the integral of the standard logit formula over all possible variables of β_n , which is given as:

$$P_{nj} = \int L_{nj}(\beta) f(\beta|\theta) d\beta = \int \frac{e^{\beta_n x_{nj}}}{\sum_J e^{\beta_n x_{nJ}}} f(\beta|\theta) d\beta$$
(4)

The formula is called the function of mixed logit probability. However, there is no closed form for this function. Therefore, P_n is calculated by simulation and the formula for the simulation is:

$$\widetilde{P}_{nj} = \frac{\sum_{r} L_n(\beta^r)}{R}$$
(5)

where *R* is the total unmber of draws and *r* is the repeated times, for r = 2, ..., R. Variations in individual decision can be captured by the random coefficient β with different or mixed distributions, such as normal or lognormal distribution [43,44], and triangular and uniform distributions [45–47].

2.6. Participants

We collected a total of 1790 choice experiments data points based on 179 indigenous interviewees who validly completed the survey questionnaire containing 10 choice tasks and 3 demographic items. Table 2 shows the socio-demographics of the respondents. About 52% of the respondents were men and 48% were woman. Nearly one-third respondents were between 18 and 20 years old (29.89%),

one-fourth were 21–30 years old (25.29%), 18.29% were 31–40 years old, 16.09% were 41–50 years old, and the remaining 10.34% were older than 50 years. Approximately 70% of the respondents were educated at the high school level or below, 20% were college-educated, and nearly 9% had post-college education.

Demographics	Percentage	Demographics	Percentage
Sex	(Ag	;e
Male	51.70%	18–20	29.89%
Female	48.30%	21–30	25.29%
Education		31–40	18.39%
High school or less	70.46%	41-50	16.09%
College	20.45%	>50	10.34%
Postgraduate or more	9.09%		

Table 2. The demographic profile of the respondents.

3. Results

We first report which impact influences the local indigenous residents' perception of tourism development. The coefficients were estimated via a mixed logit model (details in Section 2.5). The estimation was simulated using 100 draws with Halton sequences [48] and a panel data structure. Table 3 shows the significances and estimated coefficients of the parameters in the model.

Table 3. The mixed logit regression results.

	Impact	Estimate	SE	z-Value	Pr (> z)
1	Pollution affecting quality of life	0.233	0.083	2.811	0.005 **
2	Conflicts with tourists	-0.025	0.073	-0.341	0.733
3	Natural environment disturbance	-0.178	0.083	-2.158	0.031 *
4	Cultural architecture and landscape preservation	0.271	0.074	3.6733	< 0.001 ***
5	Cultural self-identity empowerment	0.273	0.074	3.6638	< 0.001 ***
6	Employment creation	0.208	0.066	3.1566	0.002 **
7	Tourists local expenditure	0.074	0.029	2.5848	0.010 **

Note: * Significant at 0.05 level; ** Significant at 0.01 level; *** Significant at 0.001 level.

Among the impacts, the results show six out of the seven impacts are effective to influence residents' perception, including the impacts of pollution affecting quality of lives, natural environment disturbance, cultural architecture and landscape preservation, cultural self-identity empowerment, employment creation, and tourism local expenditure. However, the results appear to reject the impact of conflicts with tourists, which indicates the potential increase in the conflicts with tourists is not important to the residents.

The signs of estimated coefficients indicate the relation between the impact and the willingness of local people tending to support the tourism development plan. The positive sign indicates the increasing willingness when the level of impacts increases. Negative signs indicate otherwise. Five out of the six significant impacts show influences with expected signs including the natural environment disturbance, cultural architecture and landscape preservation, cultural self-identity empowerment, employment creation, and tourism local expenditure. However, the results show an unexpected sign in the pollution impact, indicating the acceptance of pollution affecting the quality of the living environment.

The odds ratio (OR) is used to show the comparative size of influence on the residents' support when the impact status quo changes (Table 4). The odds ratio is calculated by taking the exponential of the estimated coefficients. If the odds value is greater than one, the effect of the attribute is positive; if the odds value is less than one, the effect of the attribute is negative.

	Impact	OR	Percent
1	Pollution affecting quality of life	1.263	26.30%
2	Conflicts with tourists	0.975	-1.50%
3	Natural environment disturbance	0.837	-16.30%
4	Cultural architecture and landscape preservation	1.311	31.10%
5	Cultural self-identity empowerment	1.313	31.30%
6	Employment creation	1.232	23.20%
7	Tourists local expenditure	1.077	7.70%

Table 4. The odds ratio (OR) of impacts of tourism.

As a result, we found that local residents most value the tourism plans that improve their cultural/tribal identity and act to protect their culture heritage. The impact of cultural self-identity empowerment had the largest odds ratio of 1.313. This result suggests that the increase in cultural self-identity by one unit promotes a 31.3% increase in the odds of resident support of the development plan. Similarly, cultural architecture and landscape preservation has a strong effect, creating a 31.1% improvement in odds of residents' support with a one-unit increase. The impacts of culture identity and heritage protection show similar increases in the likelihood of local indigenous residents' support of tourism development plans.

The next is the regional economic impact that promotes new job opportunities and business growth. People expect that tourism planning should benefit both regional and local economies by creating jobs in the area and increasing tourist expenditure inside the community. The regional economic impacts on new employment and business growth improve residents' support by 23.2%. The local economic impact in terms of the direct financial input into the community by increased tourist's expenditure is also effective, encouraging a 7.7% increase for every one TWD spent.

However, the impact of pollution that reduces the quality of living environment by noise, rubbish, and traffic increased residents' support by 26.3%. This result indicates local residents would tolerate a tradeoff between pollution and other impacts.

Residents expressed concerns about the negative impacts of tourism on the natural environment. The physical tourism infrastructure, such as construction and large parking lots for tourism facilities, may damage the natural environment and decreased the odds of resident support by 16.3%. However, the potential for increased conflict with tourists was not significant in the model, indicating the relationship with tourists was not considered an important factor.

4. Discussion

Planners of community-based tourism need to understand which tourism impacts are most anticipated and concern the local residents so they can make informed decisions that consider the indigenous hosting population. Hosts in tourism destinations are often influenced both by the positive and negative impact of tourism. In this study, we provide quantitative evidence of which and to what extent tourism impacts affect hosts' support of tourism plans in an indigenous destination. For the assessment of these questions, we used discrete choice modeling in the design of the experiment to collect empirical information to enable the evaluation of the influence of each tourism impact on residents' perception in the hosting communities.

The results show that the impacts of tourism do affect indigenous residents' attitude toward the project. Both the culture-related impacts on cultural identity empowerment and cultural heritage protection most improved local residents' support of the development project. The findings indicate that the residents expect the tourism project to generate economic impacts on both the regional and local scales. However, the results show a willingness to accept the negative side effects of tourism, such as noise, litter, and traffic pollution. The possible construction for land preparation for tourism use, such as parking lots and visitor centers, though these may help increase the tourist holding capacity, the residents have an adverse opinion of practices that are likely to cause environmental

damage. Although conflicts between local residents and tourists was considered in previous studies, this impact was not important to the local residents in this study.

We found that development plans that improve cultural identity and heritage were the most important to the Laiyi indigenous communities. This finding is in accordance with the results of previous studies that qualitatively researched identity transformation through tourism, despite the fact that these study sites were not in indigenous area [11,12,49]. Studies indicated that tourism can promote local culture and further transform the way in which rural hosts view their own culture and identity, from a negative self-perspective, such as the sense of being outdated, to a positive perspective, which includes the sense of being unique, healthy, and harmonious, which is admired by urban dwellers [23,25,27,50,51]. Whereas a substantial body of research has documented that economic impacts are perceived as the main expected consequence of tourism development [18,29,33], the results of this study show that the expectation of social empowerment that improves indigenous identity and revives cultural heritage is critical to the indigenous hosting community.

Historically, the indigenous tribes in Taiwan have suffered suppression of their native culture and social structure due to past colonial governmental controls. The tribal members have long been concerned about the dilution and decline of tribal cultures. Tourism may be viewed as an opportunity for the tribes to improve the cultural understanding of external visitors in the anticipation that this understanding will mitigate the historical prejudice and stereotypes and revive the sense of cultural and tribal self-identity. With the current policy of indigenous culture reform, increasing importance has been placed on the revitalization of native awareness. Tangible and intangible heritage, such as tribal spiritual culture, social structure, material arts, architecture, landscape, and ideology toward the natural environment, is highly valued. Although the social-economic status of the indigenous areas has not yet reached the overall average, the awareness of responding to the question rooted in self-identity—"Who am I?"—has become critical to the indigenous community.

After the effects of cultural promotion, the study results show economic benefits affect residents' support. This result confirms the findings of previous studies, where improvements in livelihood and employment are expected impacts of the development of tourism. The creation of economic benefits that improve the local living standard is one of the important purposes of tourism development, and Taiwan's indigenous destinations are no exception. In the case of Laiyi, its local income sources and employment opportunities are limited due to its restricted farmland area, less convenient transportation, and limited industrial options. Many Laiyi indigenous people need to work in or near cities and only can return to their tribes during weekends and holidays. The development of tourism is comparatively an acceptable industrial option that can take advantage of the unique scenery, indigenous crops, fauna and flora, landscape, and cultural resources to establish systematic tourism services that highlight indigenous experiences for economic purposes. It is important that tourism development devotes focused efforts to the economic objectives, such as suggesting local business models, evaluating markets, and facilitating practical training and resource inputs for forming the local tourism industry to create employment, increase local income, and improve the livelihood in the area.

Natural disturbance is the impact that most concerned the residents, thereby decreasing residents' support of tourism development. The literature surrounding the attitude toward environmental damage caused by tourism appears to be generally compatible with the results obtained in this study. In many previous cases, tourism development has involved construction without properly considering environmental capacity, ecological characteristics, or visual effects in the destination. These examples of environmental damage and the feeling being removed from the decision-making process may lead to distrust of tourism development. Being located in mountainous foothill terrain, Laiyi often experiences extreme weather, such as landslides caused by heavy rainfall and typhoons. These hazards may explain the residents' sensitivity to and apprehensions about alterations of the environment for tourism.

The results show that the impact of conflicts between residents and tourists is not important in this study region. The possibly increased tensions between residents and tourists does not affect residents' attitudes. This result is inconsistent with earlier findings suggesting that growing tensions between locals and tourists reduce the support for tourism development [4,15,52]. One explanation for this result could be that the current local–tourist relationships have been manageable and the number of incidents, such as uncomfortable feelings and arguments, have been relatively few. Also, Laiyi residents are not socially isolated from the majority Hen culture or today's modern society while living in a traditionally tribal area. With the long-term contact with mainstream values, indigenous hosts may have developed sufficient cultural understanding and the confidence to solve and avoid possible conflicts due to the cultural difference and inappropriate behavior, as the tourism activities are held in their own community.

Surprisingly, the results showed that the residents are optimistic about the pollution that may impact their quality of living environments. This result does not support the findings in previous studies where the issues of litter, traffic congestion, and noise caused by tourism concerned hosting residents [3,15,32,52]. For this result, the more likely explanation is that the water resources in the Laiyi area attracted tourism before the severe typhoon disaster devastated the attractions along the original river path in 2009. Based on this hosting experience, many residents understand the actual pollution impacts of noise, traffic, and litter on their lives in the community, and may have used this experience to evaluate this impact in the study. As these impacts are closely related to the number of tourists, it is also an indication of the level of prosperity of the local tourism. Thus, pollution may be perceived as an acceptable tradeoff that can possibly be solved through management efforts. Another possibility is that the visitation peak time is often concentrated on weekend days, allowing residents to experience low impact during weekdays. This periodical balance may have been a factor influencing residents' optimistic attitude.

Several practical implications can be drawn from this study. First, as the findings show that the impacts that promote cultural identity and heritage are most expected by indigenous hosts, tourism planners should particularly develop strategies for promoting both cultural physical environments and programs that facilitate opportunities for cross-culture knowledge and understanding to benefit both residents and tourists. Secondly, economic benefits are anticipated by the local communities that participate in tourism. Planners should investigate the local business potential and incorporate regional resources to plan operational business models that target increasing residents' direct incomes and job opportunities. Thirdly, the planners should carefully evaluate the extent, configuration, and construction of the necessary infrastructure required to provide tourism service, as the residents are concerned about the consequences of damage to their natural environment. For example, planners can consider small and dispersed facilities to establish the service system instead of building large and concentrated developments on a site to minimize the impact to its natural environment. Lastly, it is vital to maintain constant communication with the local residents to understand their thoughts, concerns, and strengths of the hosting communities as they are the central group that is served in tourism development.

This study has some limitations. We only selected tourism impacts that were the targets in the literature and reflective of the situation at the study site. We only carried out our study in areas where the Paiwan tribe has aggregated, in which there are particular climate and terrain conditions (tropical foothill), proximity to immediate cities (50–100 km), natural and cultural resources, and previous experience with tourists. The residents' responses may reflect those specific conditions. Future studies could consider how the variation in these conditions affects the local attitude and perception of tourism.

In the sampling technique, we used networking and snowballing methods, which are not standard randomized techniques. Although the purpose of this choice was to increase the feasibility of data collection by providing the tribal respondents essential trust to respond surveys, this limitation affected the equality of likelihood in sample selection. In addition, tourism development in indigenous areas

can be extremely complex, although issues other than tourism impacts, such as internal conflicts within tribes, indigenous rights, or local controls are also important in the field of indigenous tourism. These issues were not within the main scope of this paper. We used discreet choice modeling to understand the importance of tourism impacts and their effectiveness in relation to residents' support of tourism development. Future research could examine the reasons for the indigenous residents' choices using other research frameworks and methods. The findings of this study highlight the need for future research to investigate many of the above issues and, in particular, strategies for balancing tourism impacts.

5. Conclusions

Community-based tourism is a sustainable development option for rural indigenous areas where it can ideally lead to natural and cultural conservation while improving local living standards. However, tourism development can produce significant impacts that simultaneously concern local communities. Through a choice framework, the findings of this study indicate a ranking of local indigenous residents' concerns regarding the future effects of tourism development from socio-cultural, economic, and environmental aspects. This study contributes to a better understanding of the local feedback about tourism impacts from an indigenous perspective. This study is meaningful as local involvement has been recognized as an important and integral part of sustainable development in rural indigenous areas. In terms of the tourism objectives defined and instruments used, the understanding of the indigenous residents' balancing of the positive and negative impacts is essential, as local perceptions are considerably valuable in positioning, strategy, and other hardware and software decisions about the sustainable nature of community-based tourism development.

Author Contributions: Conceptualization, K.G.C.; Methodology, K.G.C. and H.C. (Hungju Chien); Formal Analysis, K.G.C., H.C. (Hungju Chien), H.C. (Hungyao Cheng), and H.C. (Hsin-i Chen); Investigation, K.G.C. and H.C. (Hungyao Cheng); Writing, K.G.C., H.C. (Hungju Chien), and H.C. (Hsin-i Chen).

Funding: The authors gratefully acknowledge Hungjing Co., Ltd. for providing funds for the research (number: 107A3060).

Conflicts of Interest: The authors declare no conflict of interest. The funders had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

References

- 1. Campón-Cerro, A.; Folgado-Fernández, J.; Hernández-Mogollón, J. Rural destination development based on olive oil tourism: The impact of residents' community attachment and quality of life on their support for tourism development. *Sustainability* **2017**, *9*, 1624. [CrossRef]
- 2. Canavan, B. Tourism culture: Nexus, characteristics, context and sustainability. *Tour. Manag.* 2016, 53, 229–243. [CrossRef]
- 3. Muresan, I.; Oroian, C.; Harun, R.; Arion, F.; Porutiu, A.; Chiciudean, G.; Todea, A.; Lile, R. Local residents' attitude toward sustainable rural tourism development. *Sustainability* **2016**, *8*, 100. [CrossRef]
- 4. Tsaur, S.-H.; Lin, Y.-C.; Lin, J.-H. Evaluating ecotourism sustainability from the integrated perspective of resource, community and tourism. *Tour. Manag.* **2006**, *27*, 640–653. [CrossRef]
- 5. Dyer, P.; Aberdeen, L.; Schuler, S. Tourism impacts on an Australian indigenous community: A Djabugay case study. *Tour. Manag.* 2003, 24, 83–95. [CrossRef]
- 6. Grieves, M.; Adler, M.A.; King, R. To preserve the mountains and the community: Indigenous ecotourism as a sustainable development strategy. *JSTOR* **2014**, *33*, 83–111. [CrossRef]
- 7. Lai, P.-H.; Nepal, S.K. Local perspectives of ecotourism development in Tawushan Nature Reserve, Taiwan. *Tour. Manag.* **2006**, *27*, 1117–1129. [CrossRef]
- 8. Yu, C.-Y. An application of sustainable development in indigenous people's revival: The history of an indigenous tribe's struggle in Taiwan. *Sustainability* **2018**, *10*, 3259. [CrossRef]
- 9. Lin, P.-S.; Liu, Y.-L. Niching sustainability in an Indigenous community: Protected areas, autonomous initiatives, and negotiating power in natural resource management. *Sustain. Sci.* **2015**, *11*, 103–113. [CrossRef]

- 10. Sullivan, W. Humans and conservation. Biol. Conserv. 2010, 24, 354–356.
- 11. Andereck, K.L.; Valentine, K.M.; Knopf, R.C.; Vogt, C.A. Residents' perceptions of community tourism impacts. *Ann. Tour. Res.* 2005, *32*, 1056–1076. [CrossRef]
- 12. Carmichael, B.A. A matrix model for resident attitudes and behaviours in a rapidly changing tourist area. *Tour. Manag.* **2000**, *21*, 601–611. [CrossRef]
- 13. Mason, P. (Ed.) Tourism Impacts, Planning and Management. In *Tourism Impacts, Planning and Management*, 2nd ed.; Butterworth-Heinemann: Oxford, UK, 2008.
- 14. Peters, M.; Chan, C.-S.; Legerer, A. Local perception of impact-attitudes-actions towards tourism development in the Urlaubsregion Murtal in Austria. *Sustainability* **2018**, *10*, 2360. [CrossRef]
- 15. Stoeckl, N.; Greiner, R.; Mayocchi, C. The community impacts of different types of visitors: An empirical investigation of tourism in North-west Queensland. *Tour. Manag.* **2006**, *27*, 97–112. [CrossRef]
- 16. Akis, S.; Peristianis, N.; Warner, J. Residents' attitudes to tourism development: The case of Cyprus. *Tour. Manag.* **1996**, *17*, 481–494. [CrossRef]
- Bennett, N.; Lemelin, R.H.; Koster, R.; Budke, I. A capital assets framework for appraising and building capacity for tourism development in aboriginal protected area gateway communities. *Tour. Manag.* 2012, 33, 752–766. [CrossRef]
- Choi, A.S.; Ritchie, B.W.; Papandrea, F.; Bennett, J. Economic valuation of cultural heritage sites: A choice modeling approach. *Tour. Manag.* 2010, *31*, 213–220. [CrossRef]
- 19. Rolfe, J.; Bennett, J. Respondents to contingent valuation surveys: Consumers or citizens (Blamey, Common and Quiggin, Ajae 39:3—A comment. *Aust. J. Agric. Resour. Econ.* **1996**, 40, 129–133. [CrossRef]
- 20. Hearne, R.R.; Salinas, Z.M. The use of choice experiments in the analysis of tourist preferences for ecotourism development in Costa Rica. *J. Environ. Manag.* **2002**, *65*, 153–163. [CrossRef]
- 21. Chang, K.; Sullivan, W.; Lin, Y.; Su, W.; Chang, C. The effect of biodiversity on green space users' wellbeing—An empirical investigation using physiological evidence. *Sustainability* **2016**, *8*, 1049. [CrossRef]
- 22. Smyth, R.L.; Watzin, M.C.; Manning, R.E. Investigating public preferences for managing Lake Champlain using a choice experiment. *J. Environ. Manag.* **2009**, *90*, 615–623. [CrossRef] [PubMed]
- 23. Boley, B.B.; McGehee, N.G.; Perdue, R.R.; Long, P. Empowerment and resident attitudes toward tourism: Strengthening the theoretical foundation through a Weberian lens. *Ann. Tour. Res.* **2014**, *49*, 33–50. [CrossRef]
- 24. Higgins-Desbiolles, F. More than an "industry": The forgotten power of tourism as a social force. *Tour. Manag.* **2006**, *27*, 1192–1208. [CrossRef]
- 25. Xue, L.; Kerstetter, D.; Hunt, C. Tourism development and changing rural identity in China. *Ann. Tour. Res.* **2017**, *66*, 170–182. [CrossRef]
- 26. Tolkach, D.; King, B. Strengthening community-based tourism in a new resource-based island nation: Why and how? *Tour. Manag.* **2015**, *48*, 386–398. [CrossRef]
- Nunkoo, R.; Gursoy, D. Residents' support for tourism: An identity perspective. Ann. Tour. Res. 2012, 39, 243–268.
 [CrossRef]
- Lemelin, R.H.; Koster, R.; Youroukos, N. Tangible and intangible indicators of successful aboriginal tourism initiatives: A case study of two successful aboriginal tourism lodges in Northern Canada. *Tour. Manag.* 2015, 47, 318–328. [CrossRef]
- 29. Bravi, M.; Gasca, E. Preferences evaluation with a choice experiment on cultural heritage tourism. *J. Hosp. Mark. Manag.* **2014**, *23*, 406–423. [CrossRef]
- Correia, A.; Santos, C.; Pestana Barros, C. Tourism in Latin America a choice analysis. *Ann. Tour. Res.* 2007, 34, 610–629. [CrossRef]
- 31. Louviere, J.J.; Hensher, D.A. On the design and analysis of simulated or allocation experiments in travel choice modelling. *Transp. Res. Rec.* **1982**, *890*, 11–17.
- 32. Michael, P.A.; Bhat, C. Destination choice modeling for home-based recreational trips: Analysis and implications for land use, transportation, and air quality planning. *Transp. Res. Rec.* **2002**, 47–54.
- 33. Koundouri, P.; Scarpa, R.; Stithou, M. A choice experiment for the estimation of the economic value of the river ecosystem: Management policies for Sustaining NATURA (2000) species and the coastal environment. In *Water Resources Management Sustaining Socio-Economic Welfare;* Athens University of Economics and Business: Athens, Greece, 2013.
- 34. Juutinen, A.; Mitani, Y.; Mäntymaa, E.; Shoji, Y.; Siikamäki, P.; Svento, R. Combining ecological and recreational aspects in national park management: A choice experiment application. *Ecol. Econ.* **2011**, *70*, 1231–1239. [CrossRef]

- 35. Chang, K.G.; Chien, H. The influences of landscape features on visitation of hospital green spaces—A choice experiment approach. *Int. J. Environ. Res. Public Health* **2017**, *14*, 724. [CrossRef] [PubMed]
- 36. Lancaster, K.J. A new approach to consumer theory. J. Political Econ. 1966, 74, 132–1557. [CrossRef]
- 37. McFadden, D. Conditional Logit Analysis of Qualitative Choice Behavior; Academic: New York, NY, USA, 1974; pp. 105–142.
- 38. Pingtung County Government. *Laiyi Township Cencus*; Department of Civil Affairs, Pingtung County Government: Pingtung County, Taiwan, 2017.
- 39. Kuhfeld, W.F. Marketing Research Methods in SAS: SAS Technical Paper mr2009—Experimental Design, Choice, Conjoint, and Graphical Techniques; SAS Institute Inc.: Cary, NC, USA, 2010.
- 40. R Development Core Team. *R: A Language and Environment for Statistical Computing;* R Foundation for Statistical Computing: Vienna, Austria, 2008.
- 41. Train, K. Discrete Choice Methods with Simulation; Cambridge University Press: Cambridge, UK, 2009.
- 42. McFadden, D.; Train, K. Mixed MNL models for discrete response. J. Appl. Econ. 2000, 15, 447–470. [CrossRef]
- 43. Revelt, D.; Train, K. Mixed logit with repeated choices: Households' choices of appliance efficiency level. *Rev. Econ. Stat.* **1998**, *80*, 647–657. [CrossRef]
- 44. Ben-Akiva, M.; Bolduc, D. *Multinomial Probit with a Logit Kernel and a General Parametric Specification of the Covariance Structure*; Department of Civil and Environmental Engineering, Massachusetts Institute of Technology: Cambridge, MA, USA, 1996.
- 45. David, R.; Kenneth, T. *Customer-Specific Taste Parameters and Mixed Logit: Households' Choice* of Electricity Supplier; University of California at Berkeley: Berkeley, CA, USA, 2000.
- 46. Hensher, D.A.; Greene, W.H. The Mixed Logit model: The state of practice. *Transp. J.* **2003**, *30*, 133–176. [CrossRef]
- 47. Train, K. A comparison of hierarchical Bayes and maximum simulated likelihood for mixed logit. In Proceedings of the Asilomar Invitational Choice Symposium, Asilomar, CA, USA, 2–6 June 2001.
- 48. Halton, J.H.; Smith, G.B. Algorithm 247:Radical-inverse quasi-random point sequence. *Commun. ACM* **1964**, *7*, 701–702. [CrossRef]
- 49. Lindberg, K.; Dellaert, B.G.C.; Rømer Rassing, C. Resident tradeoffs: A choice modeling approach. *Ann. Tour. Res.* **1999**, *26*, 554–569. [CrossRef]
- 50. Yang, L.; Wall, G. Ethnic tourism: A framework and an application. *Tour. Manag.* 2009, 30, 559–570. [CrossRef]
- 51. Sullivan, W. Perceptions of the rural-urban fringe: Citizen preferences for natural and developed settings. *Landsc. Urban Plan.* **1994**, *29*, 85–101. [CrossRef]
- 52. Sebele, L.S. Community-based tourism ventures, benefits and challenges: Khama Rhino Sanctuary Trust, Central District, Botswana. *Tour. Manag.* **2010**, *31*, 136–146. [CrossRef]



© 2018 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (http://creativecommons.org/licenses/by/4.0/).