Article

Capturing Tourists' Preferences for the Management of Community-Based Ecotourism in a Forest Park

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Abstract: The development of community ecotourism will require the integration of experience, culture, and information for management decision-making. We use a choice experiment to build a community ecotourism preference model incorporating aspects of profound experience and economics in a forest park, test the tourists' heterogeneity by using a random parameter logit model, and estimate the values of various community ecotourism programs. The empirical results reveal that: (1) Tourists' preferences for community ecotourism will increase with the inclusion of a mini tour, experiential activities, and the opportunities to taste local dishes and stay at a distinctive bed & breakfast (B&B); (2) The variety of tourists' social backgrounds and recreational experiences resulted in the heterogeneity of the attributes; (3) The best combinations regarding community ecotourism were a small group size, profound or in-depth experiences, and experiential activities in a forest park. This pilot study generates useful information by demonstrating possible community ecotourism programs in the forest park, along with suggestions for a quality improvement program.

Keywords: multiple aspects in ecotourism; heterogeneity preferences; ecotourism programs; local sustainability

1. Introduction

Ecotourism can meet the goals of nature conservation and local development [1]. The main principles of ecotourism focus on active contribution to preserving natural resources, integrating the knowledge of native communities into ecotourism planning and enhancing community well-being, and having tourists organized as small groups [2]. It is also useful for managers of protected areas to have information to help them to understand tourist preferences for rural and community-based ecotourism [3]. Therefore, the estimation of tourists' preferences for communities in protected areas, viewed from a multiple-aspect standpoint, is a key issue for community ecotourism. However, ecotourism could also be considered successful if local communities are willing and have the ability to participate in the planning and implementation of ecotourism programs [4–6]. Community-based ecotourism is increasingly recognized as a form of sustainable development designed to promote the local populace's livelihood, environmental conservation, and cultural tourism [7].

From the perspective of in-depth, educational, and experiential aspects, community-based ecotourism focuses on the specification of varied customs and cultures as they involve individual ecotourism experiences with local and community resources [8,9]. The economic values of community-based ecotourism can also derive from these aspects of cultural and traditional customs [10,11]. Moreover, understanding the tourists' attitudes and preferences can help managers to establish sustainable cultural tourism packages [11,12]. However, an interesting question is how to

integrate local, cultural, and experiential aspects into the community-based ecotourism management surrounding forest parks. Thus, it is important to evaluate tourist preferences in the context of ecotourism activities [1,6,11,12], as well as the willingness to pay (WTP) for the attributes of ecotourism that communities supply, as the results of such evaluations can help establish management strategies for community-based ecotourism in rural areas.

In the economic valuation field, and for issues surrounding individuals' multiple attributes and preferences in the nonmarket field [13,14], choice experiments (CE) can provide the respondents with a menu of alternative options for the evaluation of non-market goods [14]. Moreover, this method also analyzes substitutions and tradeoffs between goods and services [1]. Incidentally, the price (or bid amount) is only one of many attributes that influence the marginal willingness to pay (MWTP), and the CE approach also avoids the yea-saying bias in the contingent valuation method (CVM). The yea-saying bias in a traditional CVM design means that the respondents have a tendency to choose the option indicating 'yes' to express their opinions in place of their true preferences [15]. Therefore, for the evaluation of non-market goods, authors have indicated over the past two decades that CE has efficiencies and advantages surpassing the CVM [1,6,13–16]. Furthermore, the CE model can capture respondents' preferences for potential quality improvement programs [13,17–19], disclose multiple attributes and levels from empirical results that can be incorporated into policy making, and generate useful information for budget allocations based on specific topics [13,16–18]. The MWTP is capable of capturing tourists' preferences regarding recreational and cultural aspects of experience activities or in ecotourism valuation fields [1,3,6,14,15,17–19].

To sum up, the CE model is suitable for estimating tourists' multiple preferences toward community-based ecotourism in a forest park. Indeed, this methodology had been widely applied in the recreation and ecotourism fields in the past two decades such as in the application of tourist preferences and MWTP for rock climbing [15], tourists' preferences for nature-based tourism in a national park [2], tourists' and local residents' preferences for ecotourism development in a protected area [14], the analysis of tourists' MWTP for cultural and experiential aspects in a heritage site [20], estimating preferences for a site and environmental functions in a national park [21], analyzing management strategy with regard to the attributes of ecology and recreation in a national park [6], estimating tourists' preferences under ecotourism planning surrounding a national park [1], estimating cyclists' preferences under the rubric of activity on bicycle routes [22], evaluating the cultural attributes of a cultural tourism and safari tour package [8,11], comparison of tourists' and locals' preferences for an environmental improvement program for local development [18], analyzing aboriginal people's cultural values for a case of freshwater in Māori culture [23], and estimating multiple attributes in an ecotourism site [19].

From the above literature review, we find no previous studies that have built a research framework integrating experiential, cultural, and managerial aspects in a utility function to analyze the relationships between multiple attributes and community-based ecotourism in relation to tourists' preferences for a forest park. Moreover, relatively little attention has been given specifically to tour packages linked to community-based programs or policies in forest parks or national parks, with a resulting dearth of information with policy implications for community-based ecotourism for local villages in forest parks [13,24–26]. The few studies that have focused on the Danongdafu Forest Park (DFP) include a case study analysis of the institutional economics of the social-ecological system [24], a numerical analysis of the forest park's plantation evaluation [25], and a comparison of farmers' and non-farmers' preferences for land use planning [13].

The foregoing literature review and discussion raises some interesting topics such as the question of which among the potential community-based ecotourism programs tourists would have the greatest preference for in the forest park. Another interesting question is whether tourists' social demographic factors and behavior while on trips give rise to their having heterogeneous preferences for community-based ecotourism programs. Moreover, it behooves us to answer the question of how the multiple possible scenarios for community-based ecotourism packages can be expected to

generate different levels of economic welfare. If the phenomena informing the above issues could be captured and summarized in a framework designed to analyze the tourists' preferences towards community-based ecotourism, and specifically their preferences related to the experiential and cultural aspects thereof, it would help local managers to set up a sustainable ecotourism program and could also strengthen the budget allocation mechanism system in the forest park.

This study aims to build up a community-based ecotourism preference framework related to the CE model. By doing so, we aim to reveal tourists' preferences for the multiple possible attributes of ecotourism tours in the forest park, test the heterogeneity of their preferences for community-based ecotourism by reference to demographic factors, and estimate the welfare effects for the various potential ecotourism tour packages for the forest park. In other words, this study focuses on the effective management of community ecotourism in a forest park, which is an important aspect of the overall management of such a protected area. This study is organized into five sections. Section 2 introduces the research area and the empirical model of community-based ecotourism based on the CE model. Next, we sketch out the attributes and our design of the levels corresponding to the community-based ecotourism in the forest park and describe the multiple scenarios we set under various attributes and levels for the ecotourism package tour. In Section 4, this study estimates the preference function of various tour packages under a random parameter logit (RPL) model, evaluates the MWTP from the attributes of the ecotourism package tour, and estimates the MWTP based on the community-based ecotourism scenarios in the forest park. Finally, the policy implications and recommendations for a management strategy for community-based ecotourism are summarized in Section 5.

2. Research Area and Method

2.1. National Forest Recreation Areas in Taiwan

In 2002, Taiwan joined the World Trade Organization (WTO), which made it necessary to reorganize domestic agriculture to allow greater competition and pursue higher environmental standards. Meanwhile, the Forestry Bureau began to promote the 'Plains Landscape Reforestation and Beautification Program' to release farmland for new purposes, creating opportunities for local communities to develop eco-tourism and outdoor recreation locations [13]. This not only shows respect for the environment but has helped to create local employment. These forest parks will also be used for environmental education so that the tourists understand and respect the environment more, discover local communities, and deepen their appreciation of nature and the circle of life [27].

Located in the Guangfu Township of Hualien County, Taiwan, within the beautiful East Rift Valley Area between Taiwan Provincial Highways No. 9 and 193, DFP covers an area of about 1250 hectares, boasting mesmerizing forest scenery and recreational features [25]. There are seven local communities surrounding the DFP that share historical, socio-economic, and cultural dimensions with the forest park [24] (Figure 1). The populations of these communities can be divided into the indigenous Amis and Chinese Han populations [24]. As a unique forest in eastern Taiwan, DFP also has a functional role in local development [13]. Thus, DFP offers a variety of cultural, experiential (activity-based), and educational community-based tours in conjunction with these seven communities. The park also contains various recreational facilities such as a bicycle trail, pond, walking path, and many other family-friendly features. The park is the event venue of the annual Hualien Hot Air Balloon Festival [28], and a variety of activities for community tour package tourism are hosted within the DFP (Figure 1 and Table 1). The Mafo, Fushing, and Daho communities have their own characteristic modes of guided tours for community-based ecotourism, including group to guide ratios, experience activities, travel information, local dining, accommodation style, and tour package fee structures (Table 1).
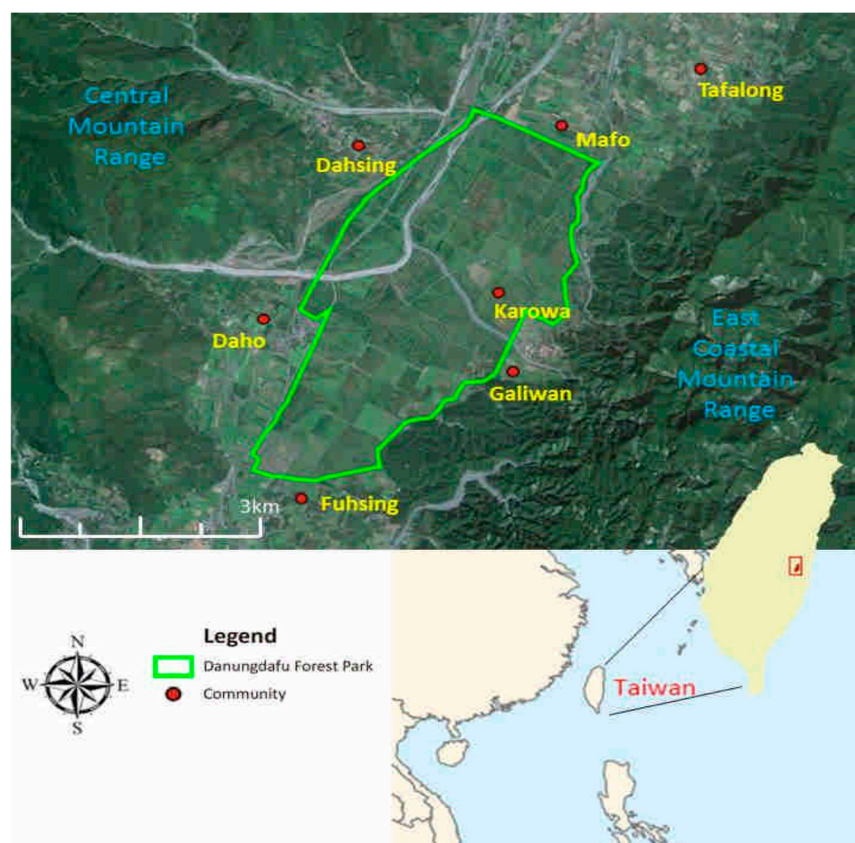
Figure 1. The location of Danongdafu Forest Park (DFP) and the related communities.

Table 1. Three communities surrounding the DFP and their attributes.

Attributes \ Community	Mafo *	Fuhsing	Daho
Tour Guide Interpretation	◎ One tour guide for 20 tourists		
Experience Activity	◎ Agricultural Experience (Vegetable, peanut) ◎ Learning Pottery ◎ Pounding Mochi ◎ Riding a Bicycle	◎ Agricultural Experience (Crops, Cutting sugar cane) ◎ Night Sky Watching	◎ Agricultural Experience (Fried brown sugar) ◎ Riding a Bicycle ◎ Night Sky Watching
Travel Information	◎ Each community has its own travel information		
Local Dining	◎ Agricultural Style Meals	◎ Agricultural Style Meals ◎ Indigenous Style Meals	◎ Agricultural Style Meals ◎ Hakka Style Meals
Accommodation Style	◎ Living in a farm house	◎ Living in a farm house z	◎ Camping
Package Tour Fee	◎ Tour Guide Interpretation: $1000 NTD ** for a 2 h tour ◎ Experience Activity: $150 NTD per person ◎ Meals: $200 NTD per person	◎ Tour Guide Interpretation: $100 NTD per person ◎ Experience Activity: $50 NTD per person ◎ Meals: $150 NTD per person ◎ Lodging: $300 NTD per person	◎ Tour Guide Interpretation: $1000 NTD for a 2 h tour ◎ Experience Activity: 150 NT dollars per person ◎ Meals: $1500 NTD for 10 person group ◎ Lodging: $600 NTD for 4 people

* All the information on communities and attributes is from an on-site survey of the community stakeholders.
** NTD is New Taiwan dollars.

2.2. The Choice Experiment Model

The CE model sets alternative options to present to the respondents and asks them to choose the most preferred among the alternative options using the random utility model [29]. The goods and services could be described as a series of attributes with their own levels and thus could capture the

respondents' option decisions based on the utility function, with the preference obtained from the alternative option given [30]. Therefore, this empirical model can take on an unobservable variable by adding an error term [31].

$$V_{ij} = \beta_{ij} X_{ij} + \varepsilon_{ij} \tag{1}$$

where the utility function 'V_{ij}' combines the observable and unobservable variables with the observable vector 'X_{ij}', with respect to the alternative 'j' and the individual 'i', which represents observed attributes for alternative options, while 'β_i' is a coefficient associated with the level change, and the error term 'ε_{ij}' represents the unobservable variable.

If and only if $V_{nk} > V_{ni}$, then the individual 'n' would choose alternative option 'k' over alternative option 'i'. Thus, there is the probability that individual 'n' would choose alternative 'k' over the alternative option 'i'; therefore Equations (2) and (3) can be presented as:

$$P_{nk} = \text{Prob}(V_{nk} > V_{ni}), \text{ for all } i \text{ in } C, \ i \neq k \tag{2}$$

$$P_{nk} = \text{Prob}(\beta_{nk} X_{nk} > \beta_{ni} X_{ni}), \text{ for all } i \text{ in } C, \ i \neq k \tag{3}$$

where 'C' is the complete set of alternative options (in this case, two alternatives, 'k' and 'i', and the status quo option) and 'ε_{nk}' and 'ε_{ni}' are both error terms [31]. The MWTP can be used for measuring non-market goods [6]. MWTP measures were calculated since the ratio of the good attributes to the financial attributes was statistically significant; if this was not done, then no meaningful WTP measure could be obtained [6]. Thus, the MWTP could be presented as:

$$MWTP_j = \frac{-\beta_j}{\beta_{ptfee}} \tag{4}$$

where β_j is the parameter of the community-based ecotourism attribute j and β_{ptfee} is the parameter of the package tour fee. The value function thereby reveals how the community ecotourism-based benefits vary according to the different attributes in the DFP.

3. Literature Review

3.1. Preference Evaluation on Community-Based Ecotourism

In their evaluation of preferences for community-based ecotourism, Hearne and Santos [14] showed how tourists' preferences could be satisfied by establishing a tour guide institution, rural cabins, eco-lodges, and national park management. In another study, tourists' MWTP was found to rise with heightened ecological and recreational integration; for example, by increasing the biodiversity, decreasing the tourist numbers on a trail, and increasing the number of resting places and information boards in Oulanka National Park in Finland [6]. Furthermore, in a study on community-based ecotourism in Kruger National Park [1], it was found that tourists expressed the highest preference for experiential craft markets, village tours, and higher quality accommodation. Similarly, tourists expressed the greatest preference for deep, specific, experiential activities in a study of Mi'kmaw cultural tourism [8]. Yet another study reported tourists having a higher MWTP based on the inclusion of more ecotourism activities and lodging type options for a safari ecotourism scenario in South Africa [11]. In the context of the management of community-based ecotourism, such tours may integrate features of small group sizes, deep experiences, and traditional knowledge into activity programs. Since these attributes of community-based ecotourism have a high correlation with tourists' preferences, it is imperative to integrate cultural and experiential aspects into park management.

Turning to the issue of individual preferences in the community-based ecotourism context, the CE methodology also can also be used to test the heterogeneity of tourists' preferences [1,6,19,23]. In the case of a national park [1], tourists may show heterogeneity in terms of their preferences, and international and higher income tourists may have a higher MWTP than domestic and lower income

groups, especially when it comes to accommodation, craft markets, and village tours. A study on combining ecology and recreation aspects in Oulanka National Park [6] found heterogeneity in tourists' preferences regarding the attributes of biodiversity, tourist numbers, information boards, resting places, and entrance fees, but found tourists were not homogenous in terms of nationality, income, and the behavior of travel groups. A study considering aboriginal cultural values in Māori community-based ecotourism [23] found heterogeneity in terms of preferences and satisfaction among tourist groups and furthermore showed that the tourists' preference heterogeneity was correlated with their social background, travel experiences, and MWTP [19]. Therefore, in the present case of community-based ecotourism in a forest park, we are also interested in testing the heterogeneity of tourists' preferences by specifically considering their behavior during the trip and their social backgrounds.

3.2. The Attribute Context for the Community-Based Ecotourism

This study focused on constructing a preference framework embodying the various attributes of community-based ecotourism in a forest park. Thus, a literature review specifically focusing on the attributes of community-based ecotourism is a key part of our study. Tourists have been reported to prefer community-based ecotourism with purposeful interpretation, and tourists have also expressed a desire to increase their knowledge by visiting interpretation centers [8]. It has been reported that the preferences of both local and non-local tourists could be better met by providing wildlife watching with a tour guide [14]. Moreover, setting up a guided tour institution can enhance the tourists' utility in an ecotourism site [19]. Thus, we chose tour guide interpretation as the first attribute on which to focus in our study.

As another highly attractive factor for tourists is aboriginal culture, cultural activities have been shown to play a major role in community-based ecotourism [8]. Specifically, village tourism activities have been shown to be an important element in community-based ecotourism in the case of a national park [1]. Thus, we chose experience activity as the second focal attribute in our study. In terms of paying to play, it is not surprising that tourists who enjoy more activities as part of a tour package have a higher WTP than others who had less [11]. Therefore, experience activity is a third important attribute for the community-based ecotourism surrounding the forest park. Fourth, travel information constitutes a basic resource for ecotourism in any recreation site. In the case of Finland's national parks, it was found that tourists' preferences may increasingly be met by adding more informational placards [6]. In a safari package case, it was revealed that tourists would have a higher WTP if given more information about the available tourism activities and lodging types [11]. Furthermore, results have shown that a tourist's utility may increase when higher quality education and information is available in the context of archaeological site tourism [20]. With the above discussion in mind, this study chose travel information as a fourth attribute for community-based ecotourism.

A local dish or distinctive cuisine is one of most important factors for tourists who visit an ecotourism site [19], as is the case in Mieang, Thailand, a locale famous for its special local dishes [32]. Moreover, tourists have shown a higher preference for eating traditional customary cuisine or dishes in community-based ecotourism trips [33]. Thus, we set the local dish style as a fifth attribute in our case of community-based ecotourism. As for accommodation, Chaminuka et al. [1] indicated that tourists highly prefer accommodation inside the Kruger National Park and would have a higher MTP for this feature compared to the other attributes considered. Lynch et al. [8] found that tourists' WTP would increase if they stayed in a particular type of accommodation, and this was especially the case for older tourists. Therefore, with a view to guiding the development of community-based ecotourism, we integrate the accommodation style into the CE framework as one of our focal attributes. The financial factor is a key variable for estimating respondents' WTP in the CE methodology [6]. Entrance fees have been used to estimate tourists' WTP for ecotourism attributes near Kruger National Park [1], while the WTP has been used to evaluate safari tour packages in Serengeti National Park [11]. Furthermore, the financial attribute has also been used in a case of ecotourism development in the Maya

Biosphere Reserve [14], and in a study of an ecotourism site in Taiwan [19]. Thus, this study integrated package tour fees into the CE set to evaluate the tourists' preferences for community-base ecotourism.

Our review of the foregoing literature provided suggestions and served as the basis for our CE design, with the selected measures aimed at allowing us to analyze and shed light on the community-based ecotourism surrounding the forest park.

4. The Choice Experiment Design for Community-Based Ecotourism in the Forest Park

4.1. The Attribute Design of the Community-Based Ecotourism

Following the past CE research [1,6,8,11,14,17–21,32,33], this study utilized a CE design to understand community-based ecotourism in the DFP area. We first built up the CE attributes and levels based on literature reviews covering the fields of community-based ecotourism and protected areas and also used onsite interviews with focus group discussions [13] such as those carried out with local government officers, community managers, economists, and the NGOs that have been working or studying in the area surrounding the DFP. Based the opinions garnered from focus group discussions (FGDs) and the literature review of land use preferences, we chose seven land use attributes on which to focus in the DFP area. Furthermore, we used pre-testing from August to October in 2014, during which time we interviewed a total of 55 tourists in the DFP area. Based on the pre-test and focus group discussions, the final CE questionnaire was developed in October 2014. We settled on six attributes of community-based ecotourism to examine, according the above discussion, tour guide interpretation [8,14,19], experience activity [1,8,11,20], travel information [6,11,20], local dish style [19,32,33], accommodation choice [1,8,14], and package tour fees [1,6,11,14,19]. The preference attributes and levels for community-based ecotourism in DFP are shown in Table 2.

Table 2. Attributes and levels of community ecotourism in Danongdafu Forest Park.

Attributes	Levels	Variable Name
Tour Guide Interpretation	1. Stays at the present state: one tour guide for 20 tourists 2. Increasing quality: one tour guide for 10 tourists 3. Increasing quality: one tour guide for 5 tourists	TG$^\pm$ **TG1** **TG2**
Experience Activity	1. Stays at the present state: one experience activity 2. Experience more: two experience activities 3. Experience more: three experience activities	EA$^\pm$ **EA1** **EA2**
Travel Information	1. Stays at the present state: each community has its travel information 2. Integrate the travel information: set up a visitor center 3. Integrate the travel information: set up a visitor center and integrated in one website	TI$^\pm$ **TI1** **TI2**
Local Meal	1. Stays at the present state: enjoy one local meal 2. Enjoy more: two local meals 3. Enjoy more: three local meals	LM$^\pm$ **LM1** **LM2**
Accommodation style	1. Stays at the present state: living in an agricultural house 2. Camping experience 3. Living in a characteristic bed & breakfast (B&B) 4. Living in a characteristic villa	AS$^\pm$ **AS1** **AS2** **AS3**
Package Tour Fee	1. Stays at the present state: $600 NTD for half a day 2. $600 NTD for two days (trip/tourist) 3.$1200 NTD for two days (trip/tourist) 4. $2400 NTD for two days (trip/tourist) 5. $3600 NTD for two days (trip/tourist)	**PTFEE**

The attribute level describes the basic alternative. TG: tour guide interpretation; TG1-2: each alternative levels of tour guide interpretation; EA: experience activity; EA1-2: each alternative levels of experience activity; TI: travel information; TI1-2: each alternative levels of travel information; LM: local meal; LM1-2: each alternative levels of local meal; AS: accommodation style; AS1-3: each alternative levels of accommodation style; PTFEE: package tour fee; NTD: the New Taiwan dollar.

4.1.1. Tour Guide Interpretation

Tourists' understanding of recreational and natural resources can be enhanced by supporting the institution of tour guide interpretation, and the development of ecotourism can benefit from using the tour guide institution [14]. The current situation in the communities surrounding the DFP is a ratio of one tour guide for 20 tourists. Based on the concept of community ecotourism, and to assess the effect of enhancing the quality of the interpretation and the experience, we added 'one tour guide for 10 tourists' and 'one tour guide for 5 tourists' so we could test the respondents' preferences for different levels by presenting them as options.

4.1.2. Experience Activity

Chaminuka et al. [1] examined the development of ecotourism in a village surrounding Kruger National Park in South Africa. The research results showed that tourists' utility could be increased by providing cultural experience activities, with these results being the same for domestic and foreign tourists. The communities surrounding DFP offer activities with unique features, including agricultural, cultural, and ecological ones. However, these experience activities last just half a day and are not integrated in the community ecotourism tour packages. Therefore, for the attribute of the experience activity, this study has set the current status to 'one experience activity (agriculture activity)' and added the options of 'enjoy two experience activities (agricultural and cultural activities), and 'enjoy three experience activities (agricultural, cultural, and ecological activities) (Table 2)'.

4.1.3. Travel Information

In the case of a national park in Finland, Juutinen et al. [6] used the CE model to estimate the recreational and ecological utility function and found that it was possible to increase visitors' MWTP with the provision of travel information. Moreover, they found that integrating all of the travel information on a website and in a travel center could significantly satisfy tourists' preferences. However, as it stands, each community around the DFP has its own travel information, and this are not integrated into one website and travel center. In addition to maintaining the status quo (i.e., each community has its own travel information), we added 'integrating the travel information (setting up a visitor center)' and 'integrating the travel information (setting up a visitor center and one integrated website)' as options.

4.1.4. Local Meals

The local meal is an important attribute for community ecotourism. There are unique and local characteristic meals in all the communities we studied such as traditional agricultural meals (all communities), indigenous style meals (Fuhsing community), and Hakka style meals (Daho community) in DFP (Table 2). Therefore, we set up three levels, comprising the options of enjoying 'one local meal (the status quo)', 'two local meals', and 'three local meals'.

4.1.5. Accommodation Style

The tourists' utility could be increased by the provision of an accommodation service. It has been reported that the MWTP of foreign tourists is higher than that of domestic tourists [14], that tourists would choose lodging in the village lodges, and that the same preferences in this regard are found across different groups [1]. Therefore, for accommodation style, we set not only the typical agricultural house but also the alternative levels of 'camping experience', 'characteristic bed & breakfast (B&B), and 'characteristic villa' as options.

4.1.6. Package Tour Fee

The financial attribute is an important indicator for the evaluation of recreational and environmental resources in the CE model [15]. Chaminuka et al. [1] estimated the economic value of the

community ecotourism industry surrounding a national park by using the price attribute. The financial attribute of our study is a package tour fee, which could be used to evaluate the multiple preferences for all tourists. Based on the package tour lasting for half a day, the current fee is just six hundred NTD per tourist per trip. We added four levels as options: $1200 NTD per person per visit, $1800 NTD per person per visit, $2400 NTD per person per visit, and $3600 NTD per person per visit.

4.2. Choice Experiment Design for the Community Ecotourism in the Forest Park

All attributes and levels of the community ecotourism in the DFP are summarized in Table 2. These attributes and levels give rise to 1620 possible profiles ($3 \times 3 \times 3 \times 3 \times 4 \times 5 = 1620$). To develop the choice experiment questions presented to the respondents in the questionnaire, this study used an orthogonal main effect design, which is one frequently used in empirical studies [6,15]. We used the procedure to reduce the 1620 possible profiles to 25 alternatives (including the current situation). To arrive at a more manageable number of alternatives, this study generated three random numbers for each alternative [6]. Each choice set included two signed alternatives and a status quo alternative in which the levels of the attributes refer to the present situation, except for the expected number of visitors, which was assumed to increase as anticipated (the basic alternative in Table 1). The first three choice sets were then used in the first version of the questionnaire and so on, resulting in four versions of the questionnaire. Therefore, the respondents faced three choice sets, and in each set they selected between three alternatives (Figure 2). In total, this study had four versions of the questionnaire.

Attributes and levels	Alternative 1	Alternative 2	Current situation
Tour Guide Interpretation	one tour guide for 10 tourists	one tour guide for 20 tourists	one tour guide for 20 tourists
Experience Activity	one experience activity	one experience activity	one experience activity
Travel Information	set up a visitor center and integrated in one website	each community has their own travel information	each community has their own travel information
Local Meal	enjoy two local meals	enjoy two local meals	enjoy one local meal
Accommodation style	Living in characteristic B&B	Camping experience	living in an agricultural house
Package Tour Fee	3600 NTD for two days	1800 NTD for two days	600 NTD for a half day
Please choose one	☐	☐	☐

Figure 2. An example of the choice experiment question.

4.3. Different Hypothetical Scenarios of Community-Based Ecotourism in the DFP

The contribution of this study is rooted in building the hypothetical scenarios based on the attributes and levels of community-based ecotourism in the DFP area. For a case study using the CE model, García-Llorente et al. [17] built up land use planning scenarios in Spain's semi-watershed area based on the RPL model, estimated the economic values associated with different land use program scenarios, and evaluated the welfare effects of land use functions in a forest park area [13]. Guimarães et al. [18] also estimated the marginal willingness to stay with reference to different recreational impact management programs and further applied the CE model in an ecotourism site to capture multiple aspects of ecotourism [19]. With respect to the empirical results of the RPL model, this study estimated the MWTP following the calculation of the coefficients of the attributes based on Equation (4) and derived hypothetical scenarios of community-based ecotourism, which allowed for a comparison pf the different alternative options. To sum up, the CE model was used to generate a comprehensive framework based on reliable attributes and levels. The following hypothetical scenarios were created for community-based ecotourism using attributes and level changes:

- **Scenario I**—Basic experiential tour: This scenario focuses on the experience activity and tasting the local dish, so we integrated the enjoyment of three experience activities, having a visitor center set up, and tasting three local meals in Scenario I. However, Scenario I retains the current status of tour guide interpretation and does not include a stay in a characteristic B&B.
- **Scenario II**—Profound and experiential tour: The second scenario focuses on combining the deep and the experiential, and thus is comprised of one tour guide for 10 tourists, the enjoyment of three experience activities, a visitor center, and the opportunity to taste three local meals. Scenario II does not include a characteristic B&B.
- **Scenario III**—Integrated package tour: This scenario integrates all characteristic community-based ecotourism aspects into one program. Thus there is one tour guide for 10 tourists, the enjoyment of three experience activities, a visitor center, the opportunity to taste three local meals, and a stay in a characteristic B&B.

4.4. Sample Design and Data

We follow 3.9% estimation bias and 95% confidence level criteria and assume that preference and non-preference are the same for the community-based ecotourism in the DFP area. This study collected a total of 630 samples. The authors chose the DFP as the research scope (see Figure 1) and then adopted purposive sampling for conducting one-on-one interviews, with 630 questionnaires distributed from 1 January 2015 to 30 August 2015 at the DFP. In terms of the socio-economic backgrounds of the tourists we interviewed, the percentages of males and females were equal (50%); there were more unmarried interviewees than married ones (342 (54.3%) were married and 288 (45.7%) were unmarried). The 20~29 year old age group was the largest group (202 people, 32.1%); the second largest group was 40~49 years old (199 people, 31.6%). As for educational background, 473 interviewees had university certificates, forming the largest group (75.1%), with 72 interviewees at the senior high school level comprising the second (11.4%) largest cohort. Regarding occupation, the 145 interviewees who were in the service industry comprised the largest group (23.0%), while 137 interviewees were public employees (21.7%), with students and housewives comprising the third (17.8%) and fourth (11.0%) largest groups, respectively. In terms of visit frequency, most respondents (76.1%) had made more than one trip to the DFP during the past year. More than half of the interviewees reported having been to other forest parks in Taiwan, and all had a high level of community ecotourism satisfaction (4.56 (Likert 5 level scale from very agree to very disagree; behavior intention also uses a Likert 5 level scale to evaluate the respondent's attitudes)) with the DFP.

5. Empirical Results

5.1. Estimating Results of the Preferences for Community-Based Ecotourism

Looking at the results of the RPL model, we see that all parameters, including the attributes of two experience activities, having a visitor center set up and integrating information in one website, enjoying two local meals, and the alternative specific constant, were found to be significant at the 10% significance level (Table 3). The value of the log likelihood ratio index indicates that the model fit is acceptable for this type of model. Regarding the tourists' preferences for community-based ecotourism, we found that having one tour guide for ten tourists, enjoying three experience activities, eating three local meals, staying in a characteristic B&B, and living in a characteristic villa would increase the probability of tourists choosing this alternative over the other choices. On the other hand, we found that the higher the tour package fee, the lower the probability of tourists choosing an alternative. However, one tour guide for five tourists and a camping experience are not desired changes among the alternative choices. The negative and significant sign of the alternative specific constants (ASC) coefficient indicates that the tourists may be more inclined to choose a package that differs from the status quo of the community-based ecotourism industry. Thus, one tour guide for ten tourists, enjoying three experience activities, eating three local meals, and staying in a characteristic B&B are all positive and significant factors in the choice of a future community-based ecotourism scenario vis-à-vis the attributes and the package tour fee.

Table 3. Estimated results of the community ecotourism preferences.

Attributes and Levels	Random Parameter Logit Model				
	Coefficient	*t* Value	Coefficien*t* Std.	*t* Value	MWTP
ASC	−0.269	−1.50	1.166	6.96 ***	—
TG1	0.309	5.54 ***	0.094	0.50	2577
TG2	−0.179	−2.40 **	0.476	3.28 **	−1467
EA1	−0.052	−0.94	0.105	0.37	—
EA2	0.272	3.95 ***	0.375	2.49 ***	2241
TI1	0.105	1.88 *	0.222	1.57	846
TI2	−0.011	−0.16	0.074	0.36	—
LM1	−0.069	−1.25	0.262	1.99 **	—
LM2	0.193	2.99 ***	0.190	0.91	1631
AS1	−0.484	−6.40 ***	0.004	0.04	−4036
AS2	0.429	5.92 ***	0.023	0.20	3581
AS3	0.145	2.03 **	0.084	0.59	1233
PTFEE	−0.00012	−3.10 ***	—	—	—
Total Values				6606	
NTD(trip/tourist) and 95% confidence interval				(6434~6778)	
Number of choice sets	5670		Log-likelihood	−1933	

***, **, *: Significance at the 1%, 5%, and 10% levels; ASC means the alternative specific constants [15]; MWTP is the marginal willingness to pay; Coefficient is a vector of coefficients with respect to the community-based ecotourism attributes in preference functions; t-Value could compare the two regression coefficients and determine the significance for the attributes of community-based ecotourism coefficients.

5.2. Welfare Results for Community-Based Ecotourism in the DFP Area

Regarding the welfare evaluation for the attributes of community-based ecotourism, this study follows the results of Equation (4) in Table 3 to estimate the MWTP. The second column in Table 3 presents the MWTP values for the attribute levels of community-based ecotourism. These calculations are based on the coefficients of the RPL model (Table 3) and show the average values of the respondents. According to the MWTP results for all respondents presented in Table 3, the tourists are willing to pay the highest tour package fee for staying in a characteristic B&B ($3581 NTD/trip/person), followed by having one tour guide for ten tourists, enjoying three experience activities, eating three local

meals, and staying in a characteristic villa. Having a visitor center set up was related to the lowest MWTP ($846 NTD/trip/person). The research results on MWTP provide real evidence to inform the management perspective on community-based ecotourism in the DFP area. We can conclude that the ideal program of community-based ecotourism would involve tourists staying in a characteristic B&B, having one tour guide for ten tourists, enjoying three experience activities, eating three local meals, and setting up a visitor center in a community-based ecotourism area adjacent to the DFP.

5.3. Tourists' Heterogeneity Test for Community-Based Ecotourism

From discussions of the cases of community-based ecotourism in rock climbing, national parks, protected areas, and heritage and ecotourism sites [1,2,6,8,11,14–16,18–23], we understand that tourists' preferences for the community-based ecotourism in the forest park may not be homogeneous. Fortunately, in the CE model, the latent class model (LCM) could capture the preference heterogeneity with multiple attributes and social background factors in a utility function under a systematic framework [6,13,31,34]. One of the advantages of the LCM over RPL is that it clarifies systematic causes of taste variation in a single framework. However, we found that there is no research that has looked at tourists' heterogeneity with multiple attributes under the aspects of community-based ecotourism in a forest park. Thus we incorporated the identified individual-specific characteristics to the LCM to identify groups of tourists that have different preferences for the considered features of the DFP. Using information generated on various groups of tourists' preferences, park managers may be able to target actions for specific groups of tourists [6].

Table 4 depicts the results of the LCM analysis with reference to two latent groups. It turned out that the respondents' location, gender, education, monthly income, and behavior in the forest park and in relation to community tourism are the variables that explain respondents' group membership. The tourists who were local, male, low-income earners (≤40 thousand NTD/month), and who had previously experienced other community tourism made up the first group. According to the LCM results, different groups have decidedly different preferences for community-based ecotourism in the forest park in terms of its characteristics (Table 4), and members of what we called Class 1 in Table 4 had a higher preference for staying in a characteristic B&B, having one tour guide for ten tourists, staying in a characteristic villa, enjoying three experience activities, eating three local meals, and having a visitor center set up. Moreover, the tourists belonging to the first group placed a higher absolute WTP value on the examined attributes compared to the other tourists and had the highest MWTP for staying in a characteristic B&B and having one tour guide for ten tourists, with these results being similar to those found in the RPL model. To sum up, we found that tourists exhibited heterogeneity in the community-based ecotourism case in that we identified two distinct groups that were heterogeneous in terms of tour package preferences. Thus, this study has pinpointed a significant market segment for community-based ecotourism in the forest park. This information regarding the attributes and levels of tour packages can be used to increasingly meet tourists' preferences when it comes to future programming of community-based ecotourism.

5.4. Welfare Effects under Different Community-Based Ecotourism Scenarios in DFP

By looking at the tourists' preferences regarding community-based ecotourism programs in the RPL model (Table 3), we could estimate the welfare effects of multiple scenarios for community-based ecotourism, as presented in Table 5. Scenario III was the most preferred scenario for the tourists in our study (confidence interval of welfare change at 95% for 10,777 to 10,975 NT dollars/trip/tourist), followed by Scenario II (confidence interval of welfare change at 95% for 7197 to 7393 NT dollars/trip/tourist). Comparatively, Scenario I (confidence interval of welfare change at 95% for 4622 to 4814 NT dollars/trip/tourist) was the least preferred scenario. Obviously, the best combination for the respondents was one tour guide for ten tourists, enjoying three experience activities, having a visitor center set up, tasting three local meals, and staying in a characteristic B&B. These results could help to inform future management strategies for the forest park.

Table 4. Parameter estimates and the MWTP values of the latent class model in the DFP.

Attributes and Levels	Class 1			Class2	
	Coefficient	*t* Value	MWTP ****	Coefficient	*t* Value
Constant	−0.377	−0.98	−	−16.783	−0.07
TG1	0.545	5.74 ***	3406	0.833	0.09
TG2	−0.172	−1.62	−	−7.287	−0.06
EA1	0.145	1.88 *	906	−7.049	−0.08
EA2	0.202	1.93 *	1262	5.400	0.06
TI1	−0.086	−1.09	−	5.508	0.03
TI2	0.240	2.73 ***	1500	−14.795	−0.04
LM1	0.085	1.17	−	−7.220	−0.07
LM2	0.118	1.38	−	−3.636	−0.06
AS1	−0.691	−5.98 ***	−4319	9.112	0.06
AS2	0.574	5.32 ***	3588	−2.309	−0.05
AS3	0.360	3.86 ***	2250	−16.404	−0.06
PTFEE	−0.00016	−2.65 ***	−	0.0016	0.06

Class membership parameters: class 1	Coefficient	*t* value
Constant	0.723	1.15
Local	0.473	2.61 ***
Male	0.277	1.65 *
College and above	0.265	1.15
Income over 40,000 NT dollars per month	−0.522	−2.92 ***
Visit other forest park(s)	0.020	0.10
Join the ecotourism group	−0.112	−0.66
Join other community tourism	0.811	2.62 ***
Trips over three times	−0.499	−0.94
Number of choice sets	5670	
Log-likelihood ratio	331.9	
Chi Squared	$x^2_{0.01}[35] = 57.3$	

, *: Significance at 1%, 10% level. * NTD (trip/tourist). AIC = 3809.2, AIC/N = 1.936.

Table 5. The MWTP results under different community ecotourism scenarios in DFP.

Attributes & Levels	Hypothetical Future Scenarios		
	Basic Experiential Tour(I)	Profound & Experiential Tour (II)	Integrated Package Tour (III)
Tour Guide Interpretation	−	One tour guide for ten tourists	One tour guide for ten tourists
Experience Activity	Enjoy three experience activities	Enjoy three experience activities	Enjoy three experience activities
Travel Information	Set up a visitor center	Set up a visitor center	Set up a visitor center
Local Meal	Taste three local meals	Taste three local meals	Taste three local meals
Accommodation Style	−	−	Staying in a characteristic B&B
Package Tour Fee *	4718	7295	10,876
Mean and 95% Conference Interval	(4622~4814)	(7197~7393)	(10,777~10,975)

* Package Tour Fee: $ NTD/trip/person.

6. Conclusions

Community-based ecotourism aims to provide deep, profound, and experience-based activities to simultaneously meet the needs and expectations of tourists and local communities while achieving the goal of sustainability. However, finding ways to best combine the various constituent cultural and experiential aspects into a community-based ecotourism package is the key challenge for the sound management of local and cultural sectors. Part of the contribution of our research consists of providing important information with respect to the marginal welfare effects of the various possible attributes of tour packages, as expressed through tourist preferences for community-based ecotourism scenarios. Based on the CE model, this study analyzes tourists' preferences for community-based ecotourism and related activities in the forest park, as well as their MWTP for five community-based ecotourism attributes, namely, orientation institutions, experience activities, travel information, local dish style, and accommodation style in communities adjacent to the DNP area. We use the RPL model to calculate the MWTP values of each respondent for the various attributes, test the level of heterogeneity of tourists' preferences for community-based ecotourism in the forest park using the LCM, and the estimate economic value of different community-based ecotourism program scenarios based on the RPL results.

This study uncovered tourists' preferences for potential community-based ecotourism tour packages in communities adjacent to the forest park. According to the empirical results of the MWTP model, the most important attributes were found to be staying in a characteristic B&B and having one tour guide for ten tourists, followed by enjoying three experience activities, eating three local meals, staying in a characteristic villa, and having a visitor center set up. These results point to the importance of focusing on providing unique and profound experiences when considering quality improvement programs for community-based ecotourism in the forest park area. Other researchers' findings on the estimation of tourists' preferences for ecotourism development using MWTP in the Maya Biosphere Reserve [14], tourists' preferences for ecotourism in a rural community nearby Kruger National Park [1], and tourists' MWTP for Mi'kmaw cultural tourism [8] are also in line with our results. Furthermore, the tourists in the present study had a higher preference for one tour guide for ten tourists, pointing to the need for organizing small-sized tour groups in community tourism. Hearne and Santos [14], in a case study of a protected area in Guatemala, also advocated developing a tour guide institution to help the development of ecotourism and satisfy respondents' preferences for ecotourism. The World Ecotourism Summit [2] in Quebec also suggested that ecotourism ought to focus on lower impact, in-depth experiences, as well as integrating native community's knowledge and organizing small-sized tour groups.

Similar to other research [6,13,35], this study found differences in preferences between tourist groups, which highlights the issue of preference heterogeneity in the context of community-based ecotourism in the forest park. In particular, explaining the sources of heterogeneity involves taking socio-economic backgrounds and trip behaviors into consideration simultaneously. The LCM analysis identified two tourist groups with respect to the observed features, both having their own specific characteristics, with Group 1 having a higher preference for community ecotourism and a higher MWTP than Group 2 and with the latter made up of tourists who were identified as local, male, low-income earners who had previously joined other community tourism activities. The results of other studies testing the heterogeneity of tourists' preferences in nature-based tourism in a national park [2], tourist's preferences for the ecology and recreation in a national park [6], and tourists' preferences in the context of aboriginal cultural values in Māori culture [23] also revealed the heterogeneity of preferences among tourist groups.

Finally, we set out a detailed and comprehensive analysis that can help in understanding the variations in groups of tourists when it comes to creating a management strategy for community-based ecotourism in the forest park. Our results reveal that the best ecotourism program would be one with one tour guide for ten tourists, in which tourists enjoy more experience activities, a visitor center is set up, and tourists can taste more local and traditional meals and stay in a B&B with local characteristics. Findings from other studies on the economic values associated with different scenarios of land use programs [17], the welfare effects of the land use function in a forest park area [13], the marginal willingness to stay with different recreational impact management programs [18], and the case of combining multiple ecotourism aspects in an ecotourism site [19] also support the importance of integrating multiple aspects into a potential high quality program.

Our research results and the above discussion point to new considerations for the managers of community-based ecotourism in the forest park. To sum up: (1) analyzing the heterogeneity of tourists' preferences regarding community-based ecotourism in a forest park by combining qualitative and quantitative data is an interesting topic for further exploration in the future [1,6,13,34–36]; (2) a comprehensive framework is needed to capture specific individual characteristics to more fully understand tourists' preferences for community-based ecotourism in the forest park, and such a framework would helpful for designing management programs and guidelines for this locale; and (3) a market segmentation strategy for community-based ecotourism in the forest park might focus on tourists who have a higher preference for small tour groups with the provision of interpretation, wish to enjoy more experience-based activities and local dishes, and wish to stay in a characteristic B&B.

Such directed focus would make community-based ecotourism more attractive to potential consumers, thereby expanding the market and increasing the satisfaction of consumers at the same time.

As for policy implications, local managers may wish to re-think community-based ecotourism in the near future and focus on the key attributes we have identified. Moreover, the local residents and other stakeholders should be encouraged to implement the new type of tour package program we have identified for community-based ecotourism near the DFP. For park management, this means coming up with better combinations of tour features. In the specific context of community ecotourism in the setting on which we focused, the ideal combination would involve small groups enjoying high quality and deeply experiential activities. These aspects should be targeted to satisfy market demand in the near future. Furthermore, it may also be desirable to segment the market differently based on tourists' various needs and to set budgets for ecotourism management in the forest park accordingly. This study yields essential information about public preferences for different community ecotourism programs and their related attributes and levels. This information can assist in improving the design of community ecotourism management programs in protected areas.

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