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Ecotourist Behaviour as a Green Consumer

Masahiro Yabuta* and Noel Scott**

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Abstract

This paper discusses the definition of an eco-tourist based on their attitudes towards environmental issues. A number of such definitions have been formulated but usually from an empirical rather than a theoretical viewpoint. In this paper a choice model of tourist destinations leads to an alternative definition of the eco-tourist. It is shown that the tourists' attitudes to paying for environmental preservation expressed here in terms of the marginal willingness has a crucial role in identifying an eco-tourist. The behaviour of tourists who demonstrate green consistency is also investigated, leading to identification of additional characteristics of eco-tourists. Based on these discussions, policy measures that may be used to affect tourist behaviour are examined.

Keywords; eco-tourist, green consumer, green consistency, environmental-friend
marginal willingness to pay

* Faculty of Economics, Chuo University & the University of Queensland

** School of Tourism, the University of Queensland

(The first author, a visitor of the University of Queensland, School of Tourism, Faculty of Business, Economic and Law, really appreciates its hospitality over his stay. Initially, this paper was inspired by a discussion with Mr. J.Ogawa, who was a graduate student at Chuo University.)

Introduction

In this paper, we shall investigate the behaviour of green consumers, in particular, focusing on consumption of tourism services. In general, green consumers are defined as consumers who have a special concern about the environmental attributes of the goods and services that they purchase. Green consumers for example prefer the products they purchase to be produced in environmentally-friendly ways. By analogy with this definition, eco-tourists, or green tourists, can be defined as those who have a special concern about the environmental attributes of the tourist destinations they visit. Eco-tourists choose a tourism destination based on its environmental condition and the type of experiences which they may expect there. Accordingly, factors such as nature-based tourism attractions and the environmental credentials of each tourism service should be important for them. In this regard, the following question might be posed. Is a consumer who purchases an eco-car considered a green consumer? and by analogy, is a tourist who participates in a nature-based tour an eco-tourist?

To address these questions, assume that the basic attributes of a car are performance, quality and environment. Moreover, assume that there are two types of cars in the market, called H and T, and there is no difference in either performance or quality between them. The only difference is that car T is an eco-car while H is not. If their prices, p_T and p_H , are the same, it is logical that consumers would prefer car T rather than H because of a preference for a better environment whenever other conditions are the same. In this case, can we say that all consumers who buy car T are green consumers?

Unfortunately, in this situation we cannot confirm exactly who is a green consumer and who is not. Let the marginal utility, or equivalently, the marginal willingness to pay (MWTP) for environmental preservation by a car be u . Moreover, assume p_T is greater than p_H . Clearly, whether a consumer purchases car T instead of car H depends on their relative price level. If $p_T - p_H < u$, then all consumers would choose car T. However, if $p_T - p_H > u$, consumers would choose car H. Because MWTP varies from consumer to consumer, some differences in consumer behaviour

would be expected. Let MWTP of consumer k be u_k and assume $u_i < u_j$. If $u_i < p_T - p_H < u_j$, then the consumer j will purchase car T but consumer i will buy car H. This is because, whereas p_T is higher than p_H , consumer j tends to appreciate the environmental value more than its cost. In this case can we say that the consumer j is the green consumer? In this regard, the following points (1) to (6) are notable;

- (1) We implicitly assume that every consumer joins the car market. If there are some consumers who never think about purchasing a car at any time, it is impossible to recognize who amongst those non-purchasers is a green consumer with respect to the car market.
- (2) Complete information about each car's attributes should be communicated from producers to consumers, such that consumers can estimate their own MWTP for the environment.
- (3) The MWTP of each consumer varies. Even if all consumers received the same information about the cars, their evaluations would be different from each other. Income, education, social relationships or other factors may affect choice behaviour as the green consumers¹.
- (4) All products and services should be considered from long-term perspectives. Consuming products is a utility-generating process. In the case of a car, consumption lasts until it is scrapped or resold. If a green consumer buys an eco-car, their positive contribution to the environment will be long lasting. A long-run perspective may affect the current discounted value and MWTP of each consumer.
- (5) We should assume both heterogeneity of producers and consumers with respect to the environment. Various factors, such as production technology, environmental management and company's targets, may improve the environmental attributes of products from day to day, but heterogeneity will

¹ Behavioural consistency is important in regard to environmental preservation (Mischel 1968; Watanabe and Sato 1994). Consistency here includes both the temporal stability and cross-sectional stability, which makes it possible to recognize that a consumer will always be a green consumer whenever they purchase products. This would allow a consumer to be labelled a green consumer even if we only know that they bought an eco-car. As Mischel (1968) showed however, little empirical research supports such behavioural consistency. Practically, this means that we can only prove that a consumer is a green consumer with respect to a specific product or service.

remain. Environmental concern, education and public opinion will not remove heterogeneity among consumers. This means that the "greenness", both of consumers and of producers, is a relative concept, which we can estimate in terms of a percentage of the total consumers only.

- (6) The market for cars still plays an important role both for producers and consumers, through which they meet to set the market price.

Eco-tourists in tourism destinations

In this section we will apply the same argument discussed above to tourism. For tourism it is more difficult to tell whether a visitor is an eco-tourist because visiting a tourism destination involves consumption of a series of tourism services, including attractions, accommodation and hotels. In addition a visitors' choice of destination might be inconsistent with their environmental values. Clearly, each tourism product can be investigated as to its purpose; choice of the eco-friendly hotels, for example, allows us to identify eco-tourists, but only for the hotel services. In this regard, we can investigate individually the choice of hotel or attractions visited, but in this paper we shall assume that a tourism destination provides a "package" of tourism services consumed by visitors. A package eco-tour, for example, would provide environmentally friendly foods, accommodation and attractions.

As already mentioned, similar to the green car consumer, eco-tourists may be defined as those who show a deep interest in the environment of the tourist destinations they visit. Therefore, the choice model and all the points, from (1) to (6) listed above regarding green car consumers also apply to the case of eco-tourists. In addition to them, some further points should be noted for the eco-tourists. Choice of the destination is made before visiting, in the same way as green consumers decide to purchase the eco-friendly goods before usage. However, for the eco-tourists, the consummation of the tourism services extends over the stay at the tourism destination. In the consumption process, tourists' attitudes towards environmentally friendly activities will be still different from tourist to tourist, meaning that the consuming process is also important for the eco-tourists. Moreover, it should be

noted that the consumption of tourism services includes educational and learning experiences. The higher the preference for such experiences, the larger a tourist's MWTP will be, whereas each tourist has a different MTWP for the same experiences in a tourism site. Sometimes, an emotional experience during a trip may change a person's life and attitudes to the environment. Because, in general, a choice of a tourism destination is made before visiting, tourists must estimate the MWTP based on the expected utility which they would gain there, not only from tourism activity but also from their quality of experience.

To introduce a simple model, the following is assumed: there are two tourism destinations but there are many tourists who choose and enjoy them. There is no difference in performance and quality, except for the environment between two destinations. For example, each tourism destination covers a specific natural area but they are classified into two kinds: a clean (eco-) destination and a dirty (non eco-) destination². In a clean destination, considered an ecotourism destination, marketing is consistent with environmental sustainability whenever tourism services are discussed. From the demand perspective, tourists as consumers of tourism services can be classified based on their eco-consciousness or eco-friendly attitudes. Eco-tourists are those who carefully choose and consider the destinations, those who know their environmental influence on the destinations, and those who play positive role in environmental preservation on their holidays. Motivations for such environment-oriented behaviour are the innate personal reward due to preserving the environment, as well as perhaps social recognition from others in society. In contrast, dirty tourists or non eco-tourists are those who have no environmental concerns, who neglect tourism-related environmental issues, and who may sometimes undertake destructive behaviour such as killing animals. In practice the disparity between eco-tourists and dirty tourists might be not so clearly defined because each tourist may exhibit a mix of behaviours.

² Here the notation of 'clean' or 'dirty' is analogous to 'clean industry' or 'dirty industry'.

What happens when producers meet a mix of the consumer types mentioned above? As far as tourism is concerned, the main question is how tourists can be considered eco-tourists when different types of tourists visit a tourism destination. A number of prior papers have investigated the behaviour of eco-tourists, and how ecotourism destinations affect tourists' behaviour and their environmental concern. However, there has been no systematic examination of the consumer-producer relationship and its outcome from an environmental perspective. A systematic conceptual framework including both consumers and producers is required that allows us to identify eco-tourists. In this paper, we shall focus our attention on tourist choice behaviour and its effects on tourism destinations.

A review of research on tourists as consumers

Before developing a model, a brief review of papers on tourists or consumers' behaviour with respect to environmental consideration is presented. This review focuses on eco-tourists or green-tourists, including their definition, major issues, analytical measures and conclusions. Unfortunately, as Dolnicar, et al. (2008) found in a review of research papers about tourist environmental behaviour, there is little consensus about who eco-tourists (or environment-friendly tourists) are. These researchers suggested that empirical analysis is needed to examine the relationship between eco-tourists and all tourists, in terms of their behaviour. The aim of this paper is to address this suggestion from a theoretical perspective because the authors consider the theoretical basis of existing research needs attention before further empirical research is undertaken.

Swarbrooke and Horner (2007) discuss 'the green tourist'³ and make a number of useful points as follows: firstly, there can be some different shades of 'green' depending mainly on tourists' awareness, knowledge and attitude to environmental issues. For example, (dark) green tourists are those who reject or boycott tourism services which are not eco-friendly and those who make sacrifices because of views

³ Though the name they used is different from ours and 'eco-tourist' itself is used in a limited area, hereafter only 'eco-tourist' is used as a simple standardized notation.

and interests in environmental issues. Secondly, issues that would concern a green tourist such as conservation of wildlife, pollution, environmentally destructive development and so on are explained in detail at the tourism destinations. If green tourists are aware of these issues, how do they behave? It would be expected that they will give up their choice to visit a destination where there are environmental problems. In this case, tourists' behaviour should be determined not only by their attitude towards the environmental issues in daily life but also by information they receive about the environmental situation of different tourist destinations.

Thirdly, motivations that influence green tourists include not only self-interest but also altruism. Their belief in the need of environmental preservation can be considered as impure altruism, in that their actions have a benefit to themselves as well. In the framework of environmental economics, altruistic behaviour has already been incorporated in theories to explain people's donations to charity or high willingness-to-pay as is found in the works of Cornes and Sandler (1994), Andreoni (1989), and Kotchen (2005, 2007). Fourthly, determinants of green behaviour include external factors, such as information or advice from the tourism companies and government-led green that affect tourists' preference and choice behaviour. In this regard, the industry and tourists themselves may be positive agents for a change toward green tourism.

Accordingly, a definition of eco-tourists in terms of their behaviour requires inclusion of the behaviours of both the tourist and tourism destination provider. In a market framework, the tourist as a consumer interacts with the tourism destination as a producer. Through the market mechanism and complimentary policy to tackle market failures, tourists should influence tourism destinations decisions and vice versa. This interdependency is the key to identifying who is an eco-tourist. This interdependency is implicit in recent discussion of the potential for changing tourists' behaviour from passive to active contributors for environmental preservation (Ballantyne, Packer and Hughes 2009), and to encourage eco-friendly behaviour (Orams 1995).

Tourists affects tourism producers' behaviour by their choice of tourism services; for example, in one study three in four tourists considered themselves to be environmentally friendly and intended to stay in a hotel with an environmental strategy (Watkins 1994; Gustin and Weaver 1996)⁴. Moreover, tourists' support for energy saving technology can increase the overall eco-efficiency of destinations (Kelly et al. 2007). According to Dalton, Lockington and Baldock (2008), almost half of tourists have a desire for environmentally friendly hotels with renewable energy supply and are willing to pay extra, between 1% and 5% for a renewable energy supply. Tourists with a stronger orientation towards nature also have more positive views of the environmentally responsible practices of tourist businesses than those not nature-oriented (Andreck 2009).

Effective coordination of tourist support and management practices by tourism destinations can be helpful in achieving sustainable outcomes (Ballantyne and Packer 2005; Ballantyne, Packer and Hughes 2009). Whereas consumer goods may have an instruction book allowing learning about the safe use of the product, tourism services, and particularly those in a nature-based destination, provide interpretation in order to maximize consumer's satisfaction. This interpretive material may encourage tourists to move from a passive to an active role in preserving the natural environment. As mentioned before, behaviour related to preserving the natural environment can be considered altruism. Managers can provide enjoyable experiences as well as opportunities for learning, which may change visitor's attitudes about environmental preservation (Orams 1995; Lim and McAleer 2005).

However, these experiences are not found in every natural tourism destination. For example, wildlife tourists in general demonstrate more eco-consciousness and concern for conservation issues than other tourists. Moreover, it is necessary for tourism destinations to address the tourists' need of information, because wildlife tourists tend to want practical information along with a conservation message

⁴ Gustin and Weaver (1996) have also found that some tourists show negative attitude to some services such as changing towels and low flow showers. This implies that except for overall effects, the marginal private benefit of each service may exceed the social marginal cost depending on its characteristics.

(Ballantyne, Packer and Hughes 2009). Recently, volunteer ecotourism, whereby tourists do volunteer work conserving the natural environment, has been developed by some conservation/tourism agencies. According to Wearing (2003) and Cousins (2007), 'hard' eco-tourists are interested in direct interactive conservation experiences during their holidays. In conservation tourism, a business provides conservation holiday packages and the tourists enjoy their volunteer activities⁵. Thus a demand for conservation activities creates its own supply and, on the other hand, a supply of conservation tourism packages may increase demand.

A procedure of clustering the tourists' behaviour has been applied that splits tourists into three groups (Dolnicar and Leisch 2008). Using scores measuring past environmental behaviour at a destination, respondents are classified into those with small, and medium and large environmental footprints. Their finding was that tourism destinations could attract environmental friendly tourists using a selective marketing approach⁶.

A basic model

Assume that there are two tourism destinations ($i = 1,2$); tourism destination 1 is "clean" in a sense that it provides eco-friendly tourism services, while destination 2 is dirty because there is no consideration of environment. In each, tourism services are produced by using resources; for simplicity, a single resource and a compound tourism service are assumed. Common services at each tourism destination, such as accommodation, catering and tour guides, can be provided in both destinations by using same technology, so that marginal cost is the same in both destinations and is

⁵ Cousins (2007) has investigated the 21 UK-based conservation tourism providers and shown that 6 in 21 are non-profit organisations; 11 are companies and the other are charities or charity and company based. However, their customers are mainly from university related activities and only 6 in 21 organisations have a general public base. The type of experience that conservation tourism offers is different from organisation to organisation, including building, business, community development, conservation and so on. The top three destinations are Africa, Asia and Central Africa and the top three biome types are Tropical rainforest, Savannah and Marine, respectively.

⁶ Dolnicar (2004) analysed an Austrian case. Tourists were classified into two groups; sustainable tourists and non-sustainable tourists. A sustainable tourist is a respondent who strongly agreed with the statement that on holiday the efforts to maintain unspoiled surroundings play a major role for you. It was found that around 70% of tourists were sustainable tourists and they could offer a sound basis for tourism business creation.

given by c . The difference in ‘cleanness’ between both destinations depends on the marginal costs that each pays for environmental preservation⁷. The marginal environmental cost paid at each destination is assumed to be e_i ($e_1 > e_2 \geq 0$)⁸. Then the profit for each tourism destination (π_i) can be given by

$$(1) \pi_1 = x(p_1 - (1-s)(c + e_1))$$

$$(2) \pi_2 = (1-x)(p_2 - (1-s)(c + e_2))$$

where p_i is price of tourism service provided at each destination⁹. In (1) and (2), the total demand for tourism is assumed to be unity, so that x shows the share of total demand for tourism service at tourism destination 1. s show the environmental subsidy.

Tourists' behaviour

Each consumer enjoys a common level of utility (u) at either tourism destination because there is no difference in tourism services except for the environment between two destinations. However, as far as environmental preservation is concerned, consumers are assumed to have different preferences so that their choice of destination gives them different outcomes. Here the tourists' evaluation of environmental preservation at each tourism destination is simply given by

$$(3) W_i = \theta e_i .$$

In (3), W_i is tourists' marginal willingness to pay (MWTP) for environmental preservation, and θ is a consumer's actual evaluation on e_i and assumed to be uniform distribution bounded in $[\underline{\theta}, \bar{\theta}]$. Then the average is $\mu = (\bar{\theta} + \underline{\theta})/2$ and the variance is $\sigma = (\bar{\theta} - \underline{\theta})^2 / 12$.

⁷ This type of choice model of consumers was developed by Bansal (2008) and Ericksson (2004), both of which analysed a choice behaviour of the green energy. Fairchild (2008) also used a similar model whereas his major concern is the investment behaviour of the firms to discriminate their environmental cleanness.

⁸ It is assumed that each e_i also determines the situation of environmental preservation at each site. Therefore, more expenditure for environmental costs means better preservation of tourism resources. This is given by a functional form: $E_i = E_i(e_i), E_i' > 0$ but, for simplicity, assume $E_i = e_i$.

⁹ As for the price level, assume that price at a clean site is more expensive than that at dirty site. Actually, nobody choose dirty site when price at dirty site is higher than at clean site because they loose utility from environmental preservation. This means that somebody can choose the dirty site when $p_1 > p_2$ is assured.

In this regard, the followings may be observed. In real world, consumer behaviour, especially related to the environmental is too complicated to estimate. Even if a tourist knows exactly how much the tourism destination spends on environmental preservation and how well the environment of the tourism destination is preserved by this expenditure, different tourist do not always give the same estimate for the value of this preservation. Consumers however can give similar evaluations of the environmental preservation when more accurate information about environmental preservation is given for each tourism destination. Recently tourism destinations have been able to receive environmental certification, using schemes such as that by Ecotourism Australia.

As far as these eco-certificates or eco-labels are credible and well advertised, tourists can give a fair and accurate judgement on the evaluation of environmental preservation, with the result that the variance of evaluations (σ) becomes smaller and the average of evaluations (μ) will be close to unity. Tourists' usual eco-friendly stance may significantly affect σ and μ . It may be expected that the more environmentally friendly a person is regarding energy-savings or waste-abatement in daily life, the greater their MWTP will be. It is hard to confirm, however, whether their eco-friendly behaviour will decrease the variance of MWTP, as recognition of the need for environmental preservation may be affected by the amount of environmental information people receive. Further, environmental education, will affect MWTP differently. Moreover, there is an income effect on MWTP. Therefore, as far as the effect of environmentally friendly behavior on the variance of MWTP is concerned, it can be negative or positive depending on various factors, including environmental education.

Tourists' choice of the destination

Tourists choose where to go. In the model discussed here, tourists may only choose either destination 1 (clean) or destination 2 (dirty). From a spatial perspective, equilibrium can be attained when there is no difference in marginal utility between the two tourism destinations. This condition is given by

$$(4) \quad u - p_1 + \theta e_1 + \rho(e_1 - e_2) = u - p_2 + \theta e_2$$

where ρ is the marginal utility of social-related evaluation, which gives tourists who choose destination 1 a sense of satisfaction via direct returns and/or social recognition for their contribution to preserving the natural environment. In (4), it is assumed that the overall effect of the altruistic behaviour of each individual should be reflected by a large difference in preservation between both tourism destinations. From (4) we may derive (5).

$$(5) \quad \theta^* = \frac{p_1 - p_2 - \rho(e_1 - e_2)}{e_1 - e_2}$$

In (5), tourists with $\theta \in (\theta^*, \bar{\theta}]$ will choose destination 1 but tourists with $\theta \in [\underline{\theta}, \theta^*)$ will choose destination 2 because they can get more utility in doing so. Hence the share of demand for tourist destination 1 (the clean destination) can be given by (6).

$$(6) \quad x = \frac{\bar{\theta} - \theta^*}{\bar{\theta} - \underline{\theta}}.$$

Bertrand-Nash equilibrium

In this model, each tourism destination has a strategic variable; the price of tourism services. By controlling the price, each tourism destination can increase its visitors. The strategy employed here is a type of Bertrand-Nash competition. The reason to employ the Bertrand-Nash competition is because tourism services have difficulty in controlling their production volume. Moreover, tourism destinations must be price competitive because tourists choose them by considering their value as shown by (4). From (1), (2) and (6), the reaction functions are given by

$$(7-1) \quad p_1 = \frac{p_2 + (\bar{\theta} + \rho)(e_1 - e_2) + (1-s)(c + e_1)}{2}$$

$$(7-2) \quad p_2 = \frac{p_1 - (\underline{\theta} + \rho)(e_1 - e_2) + (1-s)(c + e_2)}{2}.$$

Then the difference in prices between both tourism destinations becomes

$$(8) \quad p_1^* - p_2^* = \frac{(\bar{\theta} + \underline{\theta} + 1 - s + 2\rho)(e_1 - e_2)}{3}.$$

Taking (5),(6) and (8) together leads to

$$(9) \quad x^* = \frac{2\bar{\theta} - \underline{\theta} - 1 + s + \rho}{3(\bar{\theta} - \underline{\theta})}$$

A condition that the services are provided at the destination 1 is $x^* \in (0,1]$ and this is given by

$$(10) \quad \left\{ \begin{array}{ll} \bar{\theta} \geq \underline{\theta}/2 + (1-s-\rho)/2 & \text{for } 0 \leq \underline{\theta} \leq 1-s-\rho \\ \bar{\theta} > 2\underline{\theta} - (1-s-\rho) & \text{for } 1-s-\rho < \underline{\theta} \end{array} \right.$$

In this regard, the followings can be derived on the assumption of $\bar{\theta} > \underline{\theta}$.

$$(11) \quad \left\{ \begin{array}{l} \text{Only the dirty destination is chosen} \\ \text{when } \bar{\theta} < \underline{\theta}/2 + (1-s-\rho)/2 \text{ for } 0 \leq \underline{\theta} \leq 1-s-\rho \\ \text{Only clean destination is chosen} \\ \text{when } \bar{\theta} < 2\underline{\theta} - (1-s-\rho) \text{ for } 1-s-\rho < \underline{\theta} \end{array} \right.$$

Conditions (10) and (11) shows that both tourism destinations may be chosen by tourists when $\bar{\theta}$ is large enough to compare with $\underline{\theta}$. If tourists can estimate their MWTP via rigorous information about environmental preservation costs, the average of MWTP should approach unity. Then it is reasonable to assume that $\bar{\theta} > 1 > \underline{\theta}$ without loss of generality. In this case, services can be provided at both tourism destinations. This shall apply hereinafter.

Total differentiation with respect to (9) yields

$$(12) \quad dx^* = \frac{-\underline{\theta} + 1 - s}{3(\bar{\theta} - \underline{\theta})^2} d\bar{\theta} + \frac{\bar{\theta} - 1 + s}{3(\bar{\theta} - \underline{\theta})^2} d\underline{\theta} + \frac{1}{3(\bar{\theta} - \underline{\theta})} ds.^{10}$$

In addition to (12), the following formulas are useful for μ and σ .

$$(13) \quad d\mu = \frac{1}{2}(d\bar{\theta} + d\underline{\theta}), \quad d\sigma = \frac{(\bar{\theta} - \underline{\theta})}{6}(d\bar{\theta} - d\underline{\theta})$$

As mentioned before, tourists' MWTP for environmental preservation can be affected by their degree of environmental concern as well as their information about tourism destinations where the environment is preserved. From (12) and (13), the relationship between $d\bar{\theta}$ and $d\underline{\theta}$ is given in figure 1.

¹⁰ It is clear that ρ has the same effect as s as shown in (9). This means discussions about s can be applied to ρ .

It might be usual to name those who choose the clean destination ‘eco-tourists’; however such eco-tourists may not always have high environmental concern before deciding where to visit. This can be easily shown as those who once chose the clean destination could change their choice due to the others’ changes in preferences (see Figure 1). When the average or the variance of tourists’ MWTP changes, a tourist’s choice may change even if their own MWTP did not change. For example, let tourists’ behaviour as a whole change towards a lower variance and a lower average of MWTP. This is shown as point A in Figure 1 where $d\mu < 0, d\sigma < 0$ and $dx^* < 0$. In this case, it is possible for some tourists who once visited the clean destination to change their destination to the dirty destination even though they do not change their MWTP.

It should also be noted that a gradient of $dx^* = 0$ in (12) depends on μ and ds . The gradient of $dx^* = 0$ is less than -45° if $\mu > 1$, whereas it is greater than -45° if $\mu < 1$. Figure 1 shows the latter case. When $ds > 0$, meaning that there is an increment of environmental subsidy, the line of $dx^* = 0$ will shift downward as shown in Figure 1 ($dx^* = 0 (ds > 0)$). In this regard, an important point is how an environmental subsidy affects the clean tourism destination.

FIGURE 1 about here

It is clear from (12) that an increase in (marginal) environmental subsidy leads to an increase in service production at the clean tourism destination (or to a decrease at dirty tourism destination). The reason why this occurs is understandable from (8). An increase in the environmental subsidy causes price increases in both destinations, but it affects the service price at clean destinations more, because the marginal environmental cost at the clean destination is greater than that at the dirty destination. As a result, it becomes comparatively cheaper for tourists to choose the services provided at the clean destination. For example, decreases in μ and σ shown at point B in Figure 1 can lead to a decline of service demand for the clean destination unless the environmental subsidy is increased. However, an increase in the environmental

subsidy can completely alter the situation. A sufficient increase in the environmental subsidy, as shown in Figure 1, can increase the service production at the clean destination because the clean destination derives price benefits more than those at the dirty destination.

Discussion

In this section, two additional issues concerning tourists' decision behaviour of their destinations are discussed; the definition of 'eco-tourists', and policy instruments and their effect on the destination-choice behaviour of tourists.

There are at least two definitions of 'eco-tourist'. One insists that eco-tourists should be those who have 'high' eco-consciousness and always exhibit eco-friendly behaviour. For this definition, the life-style of eco-tourists must be considered. When these tourists choose their destinations, however, they need to know exactly which destination is 'clean'. As mentioned before, a lack of sufficient information about the environmental preservation of destinations can mislead eco-tourists into visiting 'dirty' destinations. Therefore, the details of the tourism destinations regarding whether they are 'clean' or 'dirty' are important. Some eco-tourists may be found in the 'dirty' destination. In the model analysis developed above, tourists' MWTP for preservation are assumed to be uniformly distributed and bounded by $[\underline{\theta}, \bar{\theta}]$. If the income effect on destination evaluation is negligible, eco-tourists are tourists whose MWTP are greater than a certain level of θ . Unfortunately, it is hard to show a priori which θ divides eco-tourists from others. Meaningful values of θ are the mean ($\theta = \mu$) or unity ($\theta = 1$). Then, either $(\bar{\theta} - \mu)/(\bar{\theta} - \underline{\theta}) \times 100\%$ of tourists or $(\bar{\theta} - 1)/(\bar{\theta} - \underline{\theta}) \times 100\%$ of tourists are classified as the eco-tourists (hereafter referred as Def. 1 and Def.2, respectively)¹¹. Another definition of eco-tourists is those who actually choose the clean destinations rather than dirty (Def. 3),

¹¹ According to Dolnicar et al. (2008), a third of tourists were classified as 'Small Environmental Foot Print Tourists'. If their definition of the tourist who is Small Environmental Foot Print can be considered an 'eco-tourist', then, unlike Def.1, eco-tourists always account for 33% of all tourists. See table 1.

and these comprise $(2\bar{\theta} - \underline{\theta} - 1 + s + \rho) / 3(\bar{\theta} - \underline{\theta}) \times 100\%$ of tourists. In this case, information on whether a tourism destination is clean or dirty is required.

It is difficult to frame a definition of an eco-tourist that is both comprehensive and accurate. Is there a synthesis of these definitions? To answer this problem, definitions of eco-tourists are compared below and then investigated as to differences. The difference in numbers of eco-tourists among definitions is given by

$$(14) \text{ Def.1 - Def.3} = \frac{1 - s - \rho - (\bar{\theta} + \underline{\theta}) / 2}{3(\bar{\theta} - \underline{\theta})} \text{ or } = \frac{1 - s - \rho - \mu}{3(\bar{\theta} - \underline{\theta})}.$$

Or,

$$(15) \text{ Def.2 - Def.3} = \frac{2[(\bar{\theta} + \underline{\theta}) / 2 - 1 - (s + \rho) / 2]}{3(\bar{\theta} - \underline{\theta})} \text{ or } = \frac{2(\mu - 1 - (s + \rho) / 2)}{3(\bar{\theta} - \underline{\theta})}.$$

Both (14) and (15) shows that there is no difference in definitions as far as $s = 0$ and $\mu = 1$, when tourists can accurately evaluate the environmental preservation of the tourism destinations. However, as far as $s = 0$ and $\rho = 0$, if tourists on average underestimate the environmental preservation (i.e. $\mu < 1$), then the number of eco-tourists becomes $\text{Def.1} > \text{Def.3} > \text{Def.2}$. Let $\bar{\theta} = 1.2$ and $\underline{\theta} = 0.5$, then 50%, 29% or 43% of tourists are eco-tourists using Def.1, Def.2 or Def.3 respectively. On the contrary, in case of overestimation ($\mu > 1$), then $\text{Def.1} < \text{Def.3} < \text{Def.2}$. Let $\bar{\theta} = 1.2$ and $\underline{\theta} = 0.9$, then 50%, 67% or 56% of tourists are eco-tourists by Def.1, Def.2 and Def. 3 respectively. Some numerical examples are shown in Table 1. In this regard, it is clear that the environmental subsidy affects eco-tourist numbers by Def. 3. As shown in Table 1, an increase in s leads to an increase in the number of eco-tourists because it confers a price-advantage to the clean tourism destination as compared with the dirty destination.

TABLE 1 about here

As shown above, there is uncertainty in eco-tourists numbers due to the different definitions. How can the difference between Def.2 and Def.3 be interpreted? The following gives a simple explanation. Assume $\bar{\theta} = 1.2$ and $\underline{\theta} = 0.5$,

and there are one hundred tourists. Then, using Def. 2, 14 tourists (43 - 29) are not eco-tourists because they have a lower MWTP than unity. However, they may be classified as eco-tourists by Def. 3 because they have actually chosen the clean tourism destination. A possible explanation of this difference is that 14 of 43 tourists are not always environmentally concerned in their daily life but happen to choose a clean tourism destination. On the other hand, in the case of $\bar{\theta} = 1.2$ and $\underline{\theta} = 0.9$, then 11 of one hundred tourists chose the dirty tourism destination and actually are eco-tourists due to their eco-friendly behaviour. The reason why they chose a dirty destination might be a lack of adequate information on the 'cleanliness' of the tourism destinations. In this case, 11 tourists should have chosen a clean tourism destination and must regret their decision after their visit to the dirty tourism destination.

Each individual's (impure) altruistic behaviour could be understood by looking at the effect of s in Table 1 because ρ , the marginal evaluation of social-related actions, has the same effects as s . Therefore, the larger altruistic behaviour is, the more tourists can be classified as eco-tourists.

From an empirical research perspective, eco-tourists, using Def.1 or Def.2 may be recognized using surveys containing questions about their knowledge and their behaviour regarding environmental preservation in daily life. Such a survey could seek to estimate directly the tourists' MWTP for environmental preservation, using a contingent valuation method (CVM) or conjoint analysis. On the other hand, in case of Def.3, a clustering method could be applied to a number of tourism destinations, to discriminate clean tourism destinations from dirty. In this regard, the survey must include questions related to the knowledge of environmental preservation at each tourism destination, impressions of destinations and the gap between actual travel and expectations in order to estimate ρ . In particular, questions about how tourists could be responsible for their activities in tourism destinations may be useful. Then, statistical data concerning the number of tourists at each tourism destination could be used to estimate the share of tourists either for the clean or the dirty destinations. Moreover, questions, about destinations where

tourists have decided to go before, frequency, main concerns, things learnt by experience and intention to the next visit, may also be asked.

In this model analysis, only an environmental subsidy on the total marginal cost (marginal cost plus marginal environmental cost) is considered. In reality, there are various public policy tools that may encourage environmental preservation at a tourism destination. They include, for example, an environmental tax, regulations by government, voluntary action, and cooperative agreements among local stakeholders. In addition, mechanisms that increase the social status of a individual choosing a environmental destination can be incorporated as a policy tools. For example, being a member of an organization that supports a specific natural resource may arouse feelings of pride in the individual.

Accordingly, many factors influence environmental preservation of tourisms destinations. To better understand these factors, a survey including questions about tourists' knowledge of these policy measures, along with variables increasing policy implementation for each tourism destination may be useful.

An extended model with 'green consistency'

In the basic model discussed above, uniformity in the distribution of tourists with respect to their MWTP is assumed. In this regard, we have shown that the average and variance of the distribution plays an important role, and that they are affected by policy measures that increase the number of eco-tourists. Therefore, the type of probability distribution employed is a decisive factor affecting the results of this paper. It is clear that the consistency in tourist behaviour with respect to environment is a fundamental assumption of all models. However, it is likely that some tourists will be consistent in their behaviour towards preserving the environment. Thus, some tourists behave in the eco-friendly manner without any exceptions. If we introduce heterogeneity among tourists, and assume that some tourists are consistent in their choice behaviour but the others are not, the shape of the distribution for these two groups of tourists may have two peaks, not a single peak like in a Gaussian distribution (a uniform distribution has no peak). The second

point concerns the factors which affect the preference behaviour of eco-tourists. As is shown in equation (4), if the consumers choose a clean destination instead of a dirty destination, they will gain not only the utility from a better environment (the third term of the L.H.S. in equation 4) but also from socially related evaluation. In addition to these factors, other attributes of each consumer, such as income and education and so on, should affect the choice of the destinations.

Assume that $\omega\%$ of consumers in the market are regarded as having cross-situational consistency with respect to the environment. These consumers will always assign top priority to eco-friendly products and choose them. In the model framework, this means that the share of demand for destination 1 (clean destination) becomes $x + \omega$, and the share for destination 2 (dirty) is $1 - x - \omega$. Therefore, x in (1) and $1-x$ in (2) must be replaced by $x + \omega$ and $1 - x - \omega$, respectively. Whereas the proportion of such tourists in society who are consistently green might be low, their MWTP should be large, the average being higher but the variance being lower in comparison to other tourists. On the other hand, those who behave always in an inconsistent manner toward the environmental have relatively small MWTP, and the average of their MWTP should be smaller but their variance would be larger in comparison to tourists with consistency.

Supposing the probability distribution of each type of tourists is uniform, we shall distinguish between these two types of tourists.

$$(4-1) \quad u - p_1 + \theta^C e_1 + \rho(e_1 - e_2) + \alpha^C > u - p_2 + \theta^C e_2, \quad \underline{\theta}^C \leq \theta^C \leq \bar{\theta}^C$$

$$(4-2) \quad u - p_1 + \theta e_1 + \rho(e_1 - e_2) + \alpha = u - p_2 + \theta e_2, \quad \underline{\theta} \leq \theta \leq \bar{\theta}.$$

In (4-1) and (4-2), α or α^C is a factor that discriminates eco-tourists with green consistency from other general tourists without such consistency. Because an assessment of the environmental situation would be larger for eco-tourists than others, we assume that α^C is larger than α . As to the average and the variance of MWTP, we have:

$$(16) \quad \mu = [\bar{\theta} + \underline{\theta}] / 2 < \mu^C = [\bar{\theta}^C + \underline{\theta}^C] / 2, \quad \sigma = [\bar{\theta} - \underline{\theta}]^2 / 12 > \sigma^C = [\bar{\theta}^C - \underline{\theta}^C]^2 / 12.$$

In this regard, (5) for the tourists without consistency becomes

$$(5-1) \theta^* = \frac{p_1 - p_2 - \rho(e_1 - e_2) - \alpha}{e_1 - e_2}.$$

Hence, the reaction functions of each tourism destination becomes:

$$(7-1-1) p_1 = \frac{p_2 + [\bar{\theta} + \rho + \omega(\bar{\theta} - \underline{\theta})](e_1 - e_2) + (1-s)(c + e_1) + \alpha}{2}$$

$$(7-2-1) p_2 = \frac{p_1 - [\underline{\theta} + \rho + \omega(\bar{\theta} - \underline{\theta})](e_1 - e_2) + (1-s)(c + e_2) - \alpha}{2}.$$

Then the difference in prices between two tourism destinations becomes:

$$(8-1) p_1^* - p_2^* = \frac{[\bar{\theta} + \underline{\theta} + 1 - s + 2\rho + 2\omega(\bar{\theta} - \underline{\theta})](e_1 - e_2) + 2\alpha}{3}.$$

Taking (5-1), (6) and (8-1) together, the demand for tourism service at destination 1 can be given by:

$$(9-1) x^{**} = \frac{2\bar{\theta} - \underline{\theta} - 1 + s + \rho + \omega(\bar{\theta} - \underline{\theta}) + \alpha / (e_1 - e_2)}{3(\bar{\theta} - \underline{\theta})}.$$

Because ω % of tourism services are consumed by the tourists who behave consistently with respect to the environment, only:

$$(9-2) x^* = \frac{2\bar{\theta} - \underline{\theta} - 1 + s + \rho - 2\omega(\bar{\theta} - \underline{\theta}) + \alpha / (e_1 - e_2)}{3(\bar{\theta} - \underline{\theta})},$$

in x^{**} would be consumed by the tourists who behave inconsistently with respect to the environment. (9-2) means that $x^*/(1-\omega)$ % of those, who usually behave inconsistently with regard to environmental preservation, have actually chosen a clean destination. However, it does not mean that they should be classified as the eco-tourists just because they have chosen the clean destination by chance. Instead, an empirical investigation of who is an eco-tourist is needed just as discussed in the former section.

As to the policy measures, we shall focus our attention on the parameters, α and ω . One possible policy, though it might be hard to execute, is to increase the number of consumers who always behave in an environmentally friendly manner. Measures to increase these parameters include environmental education or other activities, which would contribute to increase the proportion of those people with

green consistency. In order for consumers to behave eco-friendly, adequate information is required. The more information consumers receive about eco-friendly consumption, the more green they will behave. During their daily activities, people experience and learn through communication. In schools, businesses, governments and local communities or web-sites, people may share information about environmental issues. Ecotourism or sustainable tourism may have such an educational effect on consumers. When visitors experience a beautiful natural environment, or see people there contributing to environmental preservation, their environmental commitment may increase. This means that it is important for those who have never visited such eco-tourism sites to have a chance to visit. In this regard, policy measures for increasing consumers' green consistency may include promoting environmental communication, environmental education and providing opportunities for experiencing a clean environment.

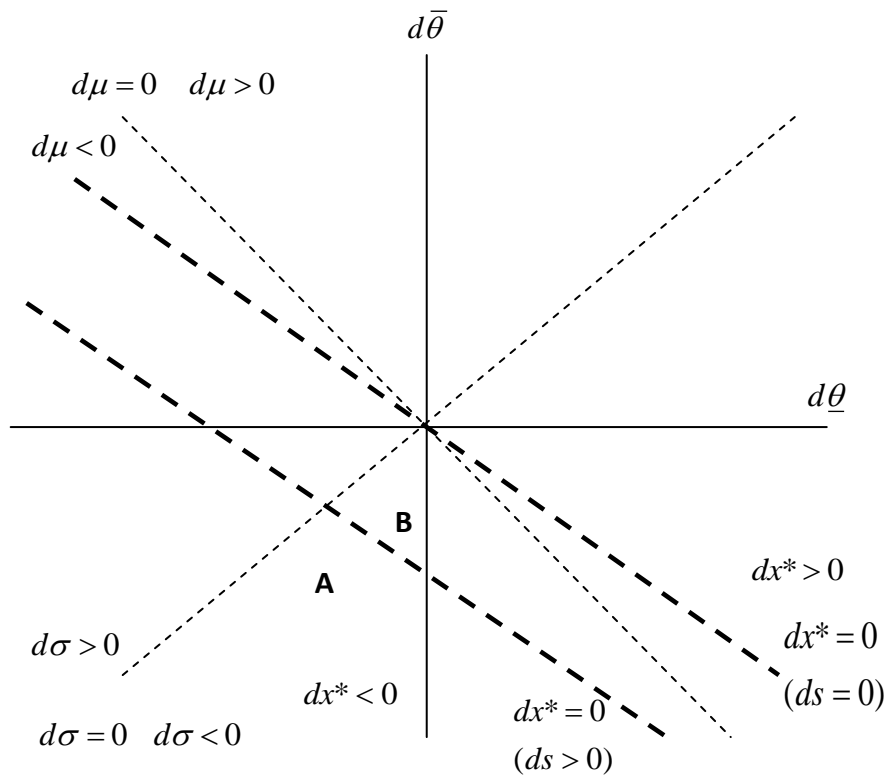
In this regard, another issue is a divergence between consumer's recognition, or knowledge, and their behaviour. In an economics framework, it is assumed that every consumer can choose goods and services so as to maximize his/her benefits. However, this does not mean that he/she always chooses eco-friendly ones. Even if they know that "A" is good but "B" is bad for the environment, they may choose "B". This is because their evaluation of, or MWTP for, goods and services is low enough to offset the difference in prices. If this occurs due to a lack of sufficient information about "A" and they happen to choose "B", policy measures such as environmental communication may become important. However, if the choice is made in full knowledge about "A" and "B", then some other policy measures are needed to fill the gap between eco-consciousness and eco-behaviour. If we implement policies that address the decision process, considering that the conscious mind determines behaviour, we may encourage green consistent behaviour.

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Figure 1. Effects of policy measures to change the average or variance of MWTP

Table 1. Eco-tourists by definitions ($\bar{\theta} = 1.2$)

min θ	μ	σ	Def.1	Def.2	Def.3(max $\theta = 1.2$)		
					s=0	s=0.1	s=0.4
0.20	0.70	0.08	0.50	0.20	0.40	0.43	0.53
0.30	0.75	0.07	0.50	0.22	0.41	0.44	0.56
0.40	0.80	0.05	0.50	0.25	0.42	0.46	0.58
0.50	0.85	0.04	0.50	0.29	0.43	0.48	0.62
0.60	0.90	0.03	0.50	0.33	0.44	0.50	0.67
0.70	0.95	0.02	0.50	0.40	0.47	0.53	0.73
0.80	1.00	0.01	0.50	0.50	0.50	0.58	0.83
0.90	1.05	0.01	0.50	0.67	0.56	0.67	1.00

*Numbers in each rank for Def. i show the share of eco-tourists amongst total tourists.