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# ‘Contribute! You can make a difference!’

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A nature field experiment and a choice experiment of  
the payment system of voluntary contribution. Evidence  
from Cahuita National Park in Costa Rica.

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## **ABSTRACT**

This study investigates what affects the individual's voluntary contribution to an environmental public good, more specific to Cahuita national park. This park has a unique payment system of voluntary donation. By using a natural field experiment, this study examines the socio-economic characteristics and motives behind the voluntary donation. This study also examines how information affects the voluntary donation. The written information distributed increases the voluntary donation by almost 100%, while the oral information given demonstrates a greater influence on the free-riding problem. We also estimate the marginal willingness to pay for an increase of the services in Cahuita national park by using the choice experiment method. The willingness to pay is shown to be positive for an increase in the number of environmentally friendly toilets and showers available, and an augmentation of information available inside the park. The payment system of voluntary donation is not profitable, but we find a positive marginal willingness to pay for the system, and our observations show that the visitors are positive to the system of voluntary donation.

## ABSTRACT

Este estudio investiga qué afecta a las contribuciones voluntarias de un individuo en relación a un bien público, específicamente al ingresar al Parque Nacional Cahuita. Este parque tiene un exclusivo sistema de donaciones voluntarias. Mediante el uso de un experimento de campo natural, se examinan las características socioeconómicas y los motivos detrás de la donación voluntaria. Además, este estudio analiza cómo la información influye en estas donaciones. Distribuir información escrita, aumenta la donaciones en casi un 100%, mientras que con información oral hay una mayor tendencia al problema de *free-riding*. Asimismo, se estima la disposición de pago marginal por un aumento de los servicios del Parque Nacional Cahuita, utilizando experimentos de elección. La disposición a pagar es positiva ante un aumento en el número de servicios sanitarios y duchas disponibles amigables con el ambiente, y ante un aumento de la información disponible en el interior del parque. El sistema de donaciones voluntarias no es rentable, pero nos encontramos con una disposición a pagar marginal positiva, y nuestras observaciones muestran que los visitantes reaccionan positivamente al sistema de contribuciones voluntarias.

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# **1 Introduction**

The payment system in sector Playa Blanca in Cahuita national park in Costa Rica is voluntary donation. This system is unique in Costa Rica since all the other parks have a fixed payment system with an average entrance fee of \$6. Cahuita national park is not only unique for its payment system of voluntary contribution, but also for the co-management of the park by the local community and the park authority (SINAC). The different concerns of these two interest groups, mainly the management of the park, could well imply a potential conflict. The park authority is concerned about conservation of the park and their main interest is to increase the revenue to Cahuita national park. The local community is more interested in increasing the number of visitors since it causes a positive spill-over effect on the local economy. Just as many other national parks in the world, Cahuita national park lacks funding to conduct all projects they find necessary in order to avoid deterioration of the park. Our objective with this study is to investigate what could increase the park's revenue in order to maintain the park. Therefore, our main objective for this thesis is to analyze what influences a visitor to make a donation, and the motives behind voluntary donation. Given that the visitor is making a donation, we also analyze what affects the size of the donation being made. Our second objective is to see how information about the payment system affects visitors' voluntary donations to Cahuita national park. Both these objectives are examined by using a natural field experiment method, a method where the subjective is observed in a natural setting without knowing it. The third objective is to estimate the marginal willingness to pay (MWTP) for an increase of the services in Cahuita national park. This is examined by using the choice experiment method (CE), which is a stated preferences method.

This chapter provides a background to our study. It starts with an introduction to eco-tourism and national parks. Then, it continues with more specific information about the studied area of Cahuita national park, starting with some general information about Costa Rica. This is followed by the specific questions asked.

## **1.1 Eco-tourism**

Ecotourism has grown rapidly over the past decade and is now of great importance for the economic growth in many developing countries. Ecotourism can boost the conservation of

natural resources, as well as increase the economic growth in the country. But there are also many challenges arising, for example to protect areas from being overused and degraded. Even if the developing countries have different national attractions, the difficulties of managing the ecotourism are the same. The challenge for these developing countries is to develop well functioning policies that can find a balance between economic growth and sustainable natural resource use. In addition to how to finance and manage attractive areas, the challenge is also about legitimizing conservation as a land use as an alternative to timber and agriculture. (Chase et al, 1998)

It is not difficult to understand that tourism has to be an important part of the sustainable development. The environmental burden is often caused by the increased quantity of tourists and the increasing volume can be though on the environment. Waste, contaminated water and diseases are just some of the results. This imposed environmental burden is a negative externality that arises with increased numbers of tourists and the lack of funding to address this. Therefore state involvement has been necessary and to be able to make this state involvement as effective as possible, good data is required. With detailed analysis and economic instruments, a policy can be designed so that sustainable tourism can be attained. In a small economy, like Costa Rica, where the environment is the most important reason for tourism, it is important to not only invest in the opportunity to take care of an increasing number of tourists, but also to be able to decrease the environmental burden.

## **1.2 General facts about national parks and different payment systems**

National parks exist all over the world in order to conserve our unique environment. There are often conflicts and problems arising in these areas because of their different values, both use- and non-use values<sup>2</sup>. The conflicts can therefore be local - related to the inhabitants and their everyday livelihood depending on the protected area - but also national/regional/global by concerning, for example, tourism income, research and biodiversity. Another issue is, as mentioned above, how to finance the protection and maintenance of these areas. Since ecotourism is an increasing market and many travel agencies offer exotic adventures in the national parks, it exerts a big stress on the environment. This increases the demand for funding projects so that deterioration of the national parks can be avoided. Many national

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<sup>2</sup> Use value is the value of actually using a service for an individual, direct or indirect. Non-use value is the value that an individual puts on a service even if they never intend to use it directly, for example preserve it for the future.

parks in the world today are under financial pressure and lack funding for the appropriate maintenance, and are therefore threatened to be exploited for other commercial purposes (Alpizar, 2002). The tourists visit protected areas and national parks, and enjoy the benefits of the area, but do not have to worry about the costs associated with their visit. It is important that the market captures the revenues and the benefits from ecotourism in order to preserve the protected areas, and this can be done by introducing user fees, or entrance fees, to gain access to the national parks. The entrance fee is becoming even more important as finance for the national parks when public funds are limited (Alpizar, 2002). The design of the payment system and the level of the fee are of importance in order to maximize the revenue and limit the environmental stress put on the national parks (Chase et al, 1998). If the payment system is well-designed it can help the protected areas to be self-sufficient to a higher extent, and thereby show that conservation can be profitable (Alpizar, 2002). The level of the entrance fee can increase or decrease the number of visitors to one area. Thus, one way to spread the number of visitors to several national parks can be to use differential pricing. This can be an effective way to solve problems with overcrowded parks in one area, and encourage economic development in another park area (Chase et al, 1998). Of course, this transfer of visitors can be limited by parks having unique characteristics.

The level of the entrance fee does not necessarily reflect the maximum willingness to pay for a national park (Chase et al, 1998). The visitor seems to have the level of the entrance fee in one national park as a reference point when visiting other national park (Chase et al, 1998). A tourist coming from a rich country could be willing to pay a higher amount to enter a national park in her home country, rather than the entrance fee in a park situated in a poor country (Alpizar, 2002). There is also an alternative to the fixed payment system: the system of voluntary donation. In Costa Rica today there is only one park, sector Playa Blanca in Cahuita national park, which has implemented the system of voluntary donation (see section 1.2). This is the park where we chose to conduct our study. Finding a well-functioning payment system and price criteria is of great importance in order to develop a sustainable ecotourism strategy. It is about maximizing the utility for the visitors, maximizing the profit for the national parks, and minimizing the environmental burden.

### **1.3 Costa Rica and Cahuita national park – background to the study area**

Costa Rica is situated in Central America bordering Nicaragua in the north and Panama in the south, and with the Pacific and the Caribbean ocean on each side. It has a population of 4.4 millions (2006) in an area of only 51,100 sq km. Costa Rica has not had a national army since 1948. Coffee, bananas and tourism are some of the top sources of foreign income. Despite its modest size, Costa Rica has a varied topography, landscape, and climate. Costa Rica is one of the countries that have the richest biodiversity in the world. As many other developing countries, Costa Rica have experienced a rapid deforestation mainly due to agricultural use of the land, and from 1950 to 1990, Costa Rica lost almost 50% of its forests (Chase et al, 1998). But this trend has now changed as the national park system has been implemented. In the 1960's, the government started to conserve big parts of the country that were of great environmental value (Buckles, 1999). Due to this system and the protection of the national parks, Costa Rica has experienced a huge increase of foreign tourism. In 1993, the tourism had taken over coffee and bananas as being the largest single source of foreign exchange earnings (Chase et al, 1998). The ecotourism in Costa Rica is a success story, and the international tourism has increased rapidly. Most of it because of all the national parks that now cover approximately 24% of the national territory, and 71% of the tourists coming to Costa Rica visit at least one national park (Alpízar, 2002).

When the tourism boom hit, it caused environmental degradation and some parks were crammed with tourists. Despite the increased importance of the national park for the tourism, the budget for maintenance did not grow (Alpízar, 2002). As a result, the government raised the entrance fees in the parks. On the first of September 1994, the entrance fees for foreign tourists were raised by 1,100%, from about \$1.25 to \$15 (Chase et al, 1998). This change encouraged an ecologically more sensitive management, but it also created great conflicts. Since then, many price changes have occurred, but the changes have to a large extent not been changed after formal criteria. However, Costa Rica is one of the leaders in designing and implementing policies that can capture the economic benefits of ecotourism, which could be of guidance to other developing countries (Chase et al, 1998).

The section of the government handling environmental affairs is The Ministry of Resources, Energy and Mines, today known as the Ministry of Environment and Energy (MINAE). The administration of the conservation areas is run by Sistema Nacional de Áreas de Conservación (SINAC; National System of Conservation Areas). SINAC was introduced by the government

in 1995 and manages today 10 conservation areas established in the country (Buckles, 1999), see Appendix I: Map Conservations areas in Costa Rica. These areas are divided into even smaller management areas, where Cahuita national park is one. Cahuita national park has two entrances. Puerto Vargas on the south west side of the park, where the fixed entrance fee is \$6, and sector Playa Blanca on the north side of the park, where the entrance is paid by a voluntary donation.

Cahuita town is located in the Limón province on the Caribbean coast of Costa Rica, close to the border of Panama and 241 kilometers from the capital San José. Sector Playa Blanca in Cahuita national park, where this field study was made, is situated on the outskirts of Cahuita town. The Cahuita national park measures 1067 hectares of land, 600 hectares of coral reef that extends from Cahuita Point, and 22,400 hectares of marine territory. The park is famous for its white sand beach with coconut trees, and also the coral reefs just off-shore which has a rich marine life including many endemic species. The mainland is home to a variety of animals such as howler monkeys, kingfishers, night herons, white-nosed coatis, frogs and snakes. Most of Cahuita national park consists of swamp that lies between the coral reefs and the mainland (see Appendix II: Map Cahuita national park). Today, the park has around 100-150 visitors a day coming from all over the world. In April 22nd in 1991, an earthquake occurred and all of the park's facilities were destroyed, several trees toppled and part of the coast rose above sea level, thus killing a lot of the coral. The park is one of the most frequently visited parks in Costa Rica, and it has a system of admission being paid by voluntary donation. This unique system has been developed by the local inhabitants and has its roots in the conflict over the land that started in the 1970's. At that time, the government had started to protect land all over Costa Rica and implemented the national park system. The area around Cahuita was expropriated by the government and activities like hunting, fishing and coconut harvesting, which were vital to the livelihood of the locals, were banned. The local inhabitants were shut out of the park and made their displeasure known to the government, who allowed for some of the people to return to their daily work in the park. Eventually the town's economy changed into being a tourist based economy, and the local community revolted against the government by peacefully taking control over the park. They did so by sitting by the entrance of the park and letting tourists know that they did not have to pay an entrance fee, but that the community of Cahuita was inviting them in. The government officials left the area and accepted a co-management of the park, maintained until this day. (Buckles, 1999) However, this co-management shared between the local community and the

park authority (SINAC) has different concerns about the management of the park. The park authority is concerned about the conservation of the park and their main interest is to increase the revenue to Cahuita national park. The local community is more interested in increasing the number of visitors since it causes a positive spill-over effect on the local economy.

#### **1.4 Main questions**

Our objective with this study is to investigate what could increase the park's revenue in order to maintain the park. The main questions used to examine this objective, are divided into two different groups, natural field experiment and choice experiment, depending on which method were used.

Natural field experiment:

- 1. What influences a visitor to make a voluntary donation to Cahuita national park?*
- 2. What affects the visitor's size of the donation?*
- 3. What are the psychosocial motives behind voluntary donation?*
- 4. Can information increase the donation?*

Choice experiment:

- 5. What is the marginal willingness to pay for increasing the facilities in Cahuita national park?*

These questions were examined and answered through collected data in Cahuita national park March-May 2007.

## **2 Natural field experiment**

This chapter starts with a brief description of the method of natural field experiment. Then follows a section describing different theories on why people voluntarily contribute to a public good, and ends with a section on how information affects the voluntary contribution.

### **2.1 The natural field experiment method**

The main part of our study will be in the area of natural field experiment, which is a method where we observe a subject in a controlled setting without the subject knowing that it is being observed. By a field study, the researcher is able to observe the subjects in their natural setting, and with a natural field experiment the subject's behaviour will not be affected by the knowledge of being observed. (Harrison and List, 2004)

#### **2.1.1 Why giving?**

According to neo-classical economic theory, it is not in a rational individual's own interest to voluntarily donating money to a public good. But people do. Many theories try to explain the reasons and motives behind why individuals contribute to a public good, in our case by donating money voluntarily to Cahuita national park, even though it is not in their own interest to do so. There are also studies being conducted in order to find out, not only the motives behind, but what affects the size of these voluntary donations.

##### *2.1.1.1 The individual's characteristics impact on giving*

Studies show that voluntary contribution to an environmental public good varies systematically with the individual characteristics of the respondent (Borck, Frank and Robledo, 2006. List, 2004). Observable characteristics of individuals could therefore give the economists important information when trying to understand behaviours like voluntary contribution to an environmental public good. It can also be of importance when collecting and analyzing data, since many characteristics can influence the result, and it could therefore be difficult to ascertain the economical factors behind the behavior (Andreoni and Vesterlund, 2001). Contribution in the meaning of willingness to pay for an environmental public good is shown to depend on gender, income, experiences, education level and age (Pruckner and Sausgruber, 2006. Andreoni and Vesterlund, 2001. Krarup and Russel, 2005; Ch 11. Alberini

et al., Lanza et al., 2005). John A. List (2004) explains that age and contribution behaviour is correlated, when examining social preferences in three field experiments in different environments. He further shows that older people tend to contribute a larger amount of their endowments than younger people. Even after correcting for individual-specific factors, his data indicates that the probability of contribution, as well as the size of the contribution, is related to age. Pruckner and Sausgruber (2006) tries to find individual factors that can have an influence on trustworthiness by conducting a natural field experiment trying to identify motives behind payments of newspapers in the streets. Their findings show effects of gender, age, family status, church attendance, measure of reciprocity, social connectedness, and social risk. They also found, in contrast to List, that older people pay less than younger ones. Furthermore, they find that males pay less than females, that families with children pay more than singles and people working as volunteers (social connectedness) are positively associated with payments. Frequent churchgoers pay less, people trusting the legal system and those willing to return a favor pay more, people who care about what others think of them pay more than others, and finally people who evade paying tax pay less.

An important issue to take into consideration in order to find the respondent's willingness to pay, is the respondent's knowledge about, or experience with the environmental good being valued (Gérard-Varet, Kolm and Ythier, 2000; Ch 1. Kolm). A study made by Carlsson and Martinsson (2006) concerning the willingness to pay for avoiding power failure shows that the willingness to pay can differ before and after a change has taken place, and that the reasons for this are more experiences and new attitudes. This was also examined by Cameron and Englin (1997) and their results show that the expected value of willingness to pay increases significantly with any positive experience.

#### *2.1.1.2 The individual's motives impact on giving*

There are several motivational factors behind why people contribute voluntarily, and do not free-ride. These are aspects such as self-image, self-interest, altruism, warm-glow, social norm, social interaction, knowledge, interests, experiences, fairness, cognitive dissonance and self-perception (Gérard-Varet, Kolm and Ythier, 2000; Ch 1. Kolm, Ch 4. Schokaert and Van Ootegem, Ch 19. Antoci, Sacco and Zamagni). There are many studies showing that pro-social behavior have an effect on the contribution level, that is, that the contribution level for an individual is strongly depending on how high the level of contributions are from others (Heldt, 2005), and that this is due to factors such as conformity, social norms, or reciprocity.

A field study about charitable giving made at a university in Zürich by Frey and Meier (2004) shows that contributions increase on average if people who are about to make a contribution receive information that others have contributed before them. This large scale field experiment supports the theory of conditional co-operation, meaning that people behave pro-socially depending on the pro-social behavior of others. The theoretical explanation for this is that; (1) people want to behave according with the social norm, (2) people have some levels of fairness, and (3) if others contribute to the public good it can be an indicator of the quality of the good (Frey and Meier, 2004). In addition, Frey and Meier (2004) state that the pro-social effect varies between people, and that the explanation could be past contribution behavior and personal preferences. The people that never or always contribute do not change their behavior, meaning that the persons were consistent in their behavior. But the people that have changed their contribution behavior in the past strongly react to the information that others have contributed. They also find that people react to a relatively small change in the contribution level of others. The higher people's expectations are on that others contribute, the more likely it is that they contribute themselves.

Rege (2004) also analyzes social norms in the context of voluntary contributions by conducting a game in which people have preferences for private consumption, public good and social approval. Social norms are defined to be aspects such as approval or disapproval from the people positive to the norm. One thing that is discussed is that the person adhering the norm gets a greater social approval, and experience a greater feeling of social approval, if the population sharing the norm is large. Hence, an increase of the number of people adhering the social norm, the stronger the feeling of the social norm. If a person is contributing when the social norm of contributing among others are small, the person will receive a small increase in social approval, and therefore contributors can improve their social approval by not contributing. This also works the other way around: when there are many contributors, the person contributing will improve the social approval. Finally, Rege (2004) discusses whether the incentives for social approval are depending on the situation, more specifically, if one is among strangers or non-strangers. There have been studies showing that both groups can have a significant effect on the person's incentives for social approval. One experiment shows that a person's contribution level almost increased with 100% when it was written on a black board and shown for other participants, compared to an anonymous treatment. Croson and Marks (1998) also claim, in their threshold public goods experiment, that contribution increases if the visitor's contribution is identified.

Pruckner and Sausgruber’s (2006) natural field experiment examined what trustworthiness is based on by changing the information given in the experiment. One is expressing the legal norm (“Stealing paper is illegal”), one the social norm (“Thank you for being honest”), and one is just for control (“The paper costs 60 cents”). The results show that the social norm has a strong positive effect on the payments, and that the legal norm gives no effect. The other result is that the number of free-riders does not change and is constant through the different norms. One explanation for this is that free-riders do not comply with the norm, and because of this, they tend not to react to social norm information.

Andreoni (1990) discusses why people give voluntary donations, and focuses on how altruism influences the giving. He argues that the individual’s preferences depending on donations to a public good often is neglected, and that the most common assumption in the existing literature has been that a person’s preferences depend only on the private consumption and on the total supply of the public good. His conclusion is that when a person makes donation to the public good she gains utility, not only from the increased supply of the public good, but from the actual giving. This is what is referred to as the “warm-glow”- feeling that the visitor experiences when making a donation. From this, Andreoni (1990) uses the following utility function:

$$(1) \quad U_i = U_i(x_i, G, g_i)$$

Where the individuals wealth can be allocated between the private good consumption,  $x_i$ , and the contribution to the public good,  $g_i$ , the total amount of public good with n individuals is  $G = \sum_{i=1}^n g_i$ . Since  $g_i$  enters the function twice, it captures the fact that the individuals own contribution has an impact on both the private utility and the amount of public good provided.

Andreoni describes a person who is purely altruistic having the utility function where  $g_i$  is equal to zero,  $U_i = U_i(x_i, G)$ , claiming that the individual does not care about the private contribution to the private good. He continues by describing the purely egoistic person to have the following utility function:  $U_i = U_i(x_i, g_i)$ , where the person is motivated to give to the public good by the warm-glow feeling. And finally, impurely altruistic is a person with a

utility function of  $U_i = U_i(x_i, G, g_i)$ . In an impurely altruistic model, the individual gains utility not only from the supply of the public good, but from contributing to the public good herself.

When the individual is giving money and thereby contributing herself to the quantity of the public good, she is better off than if someone else is contributing, even though the public good is provided (Johansson-Stenman and Svedsäter, 2003). This can be defined as the warm-glow effect of giving. Johansson-Stenman and Svedsäter (2003) have developed the utility function even further by the hypothesis that this warm-glow feeling is coming from the effects of the self-image. By including the self-image in the utility function, they are able to extend the model's ability to analyze the factors behind why individuals are giving to public goods.

Utility function (Johansson-Stenman and Svedsäter, 2003):

$$(2) \quad u_i = u(x_i, G, s_i)$$

where  $s_i$  is individual  $i$ 's self-image.  $\frac{\partial u}{\partial s} > 0$  means that the individual is experiencing higher utility the better the self-image is attained.

Hur (2006) explores other motivation factors than warm-glow behind charity giving, and focuses on six main factors: a good deed, altruism, a desire for social responsibility, a desire for the common good, mass psychology, and a showing off and reward-expecting manner. Among these factors, two key networks are found to show the value structure of charitable giving. One is representing the social and individual good qualities, and the other is in reference to selfishness. His conclusion is that people give to charities to demonstrate their good quality and to satisfy their selfishness, and that people therefore are ambivalent when giving to charity: since they give both to express their social and individual good quality, and to satisfy their selfishness. Hur (2006) also talks about that charity giving as something that develops over time and that leading social forces, for example non-profit organizations and the direction of public policies, have an impact on the charity giving. Croson and Shang (2005) experimentally examine how the contribution level of others influences the individual behavior and find that social influences have an effect on the individual's behavior. Carlsson and Martinsson (2006) tested how the view discussed in media affected the willingness to pay for individuals in the society, and they also claim that individuals sometimes are acting in accordance with the general view in the society.

We have considered all of these factors and motives behind why people voluntarily contribute to a public good when designing the questionnaire used in the study, see section 4.3.3 and Appendix III: Questionnaire CNP.

### **2.1.2 Information effects on voluntary donation**

Information can be an important tool when solving environmental problems. The effectiveness of an economic incentive to change behavior is shown to depend on the information provided (Krarup and Russel, 2005; Ch 3 Thogersen). Information and motivation are found to be two properties which base and determine individuals' choices and actions (Gérard, Kolm and Ythier, 2000; Ch 1. Kolm). Previous studies that have investigated voluntary contribution to a public good show that information has a statistically significant impact on the contribution (Richard and Randal, 2005). Sell and Wilson (1991) examined what effect information about other group members donations have on the individual's voluntary donation to a public good. They compared providing no information, providing information on aggregated behavior and providing information on individual contributions. Their result show that individualized information gives the highest contribution to the public good, but that the contribution levels for no information and aggregated information did not vary. Jones and McKee (2004) experimentally investigated if the nature of the information concerning the level of the contributions by others affects the individual's contributions to a fund-raising campaign. They focused on two different types of information: aggregated and relative contribution levels. Aggregated information reported the group behavior, for example the total amount collected in the fund-raising campaign. Relative information reported the individual's contribution relative to some measure of the group behavior, for example the average contribution. Their results show that information about relative individual contributions could raise the average contribution level, and lower the number of free-riders. They also found that aggregated group contributions had a lower impact on the donation.

These studies all show that information has an effect on the contribution, and we used this as an incentive for our information treatment. We only had one information treatment in our study and this included relative information about the average entrance fee level to other national parks in Costa Rica.

## 2.2 Econometric model in the natural field experiment

In this study we use a two stage model. In the first stage we look at the decision to contribute. By using a Probit model we examine the probability that an individual is voluntarily contributing money to Cahuita national park. In the second stage we look at what affects the level of the voluntary contribution by using a conditional ordinary least of square (OLS) model. The OLS is a regression analysis that examines the relationship between the dependent variable and the explanatory variables.

An individual is expected to voluntarily contribute to an environmental public only if her utility of giving is greater than her utility of not giving. When not contributing, the individual can still get utility from the supply of the public good. Therefore, if an individual contributes, the utility achieved from the supply of the public good and the actual contribution made, should be bigger than the utility achieved only from the supply of the public good. The following utility model is used to explanation for the probability that an individual is voluntary choosing to contribute:

$$(3) \quad \Pr VC = Yes = \Pr \left[ U(x_i, EP, d_i) > U(x_i, EP) \right]$$

$VC$  = Voluntary contribution for individual  $i$ .

Where  $x_i$  is the private consumption for individual  $i$  which is included in the model since the individual's wealth is assumed to be distributed between private and public consumption.  $EP_i$  is the supply of the environmental public good, and  $d_i$  is the voluntary donation made by individual  $i$  to the environmental public good.

To further investigate what affects the level of the voluntary contribution, we only look at the sub-sample that made a donation and we therefore use the following conditional OLS model:

$$(4) \quad VC_i \mid VC_i > 0 = \alpha_i + \beta_1 C_i + \beta_2 E_i + \beta_3 M_i + \varepsilon_i$$

Where  $VC_i$  is the voluntary contribution to the environmental public good made by individual  $i$ , given that you choose to donate.  $\alpha$  is the intercept for individual  $i$ ,  $\beta$  is the coefficients,  $C_i$  is the socio-economic characteristics of individual  $i$ ,  $E_i$  is the experience,

knowledge and interest of individual  $i$ ,  $M_i$  is the motives behind why individual  $i$  would voluntary contribute, and  $\varepsilon_i$  is the error term or the random variable of individual  $i$ .

### **3 Choice experiment**

In this chapter we discuss why and how to put a value on the environment. We also discuss how the method of choice experiment is functioning and how it is designed, and present the economic and econometric models used in the choice experiment in this study.

#### **3.1 Valuing the environment**

Real economies are usually not satisfying the conditions of optimality and efficiency used in the “ideal” functioning market economy. Real markets are often imperfect, meaning that not everything is included in the trading, that the information behind the trade often is imperfect and, therefore, the real markets are often not perfectly competitive. A great deal of environmental economics is about identifying and correcting market failures that may occur concerning the services that the environment supplies to the economy. Economic activities, production or consumption, often imply external effects or externalities. This is an effect that arises when the economic activity of one agent has an impact on another agent’s utility or profit. One example of a negative externality is when an industry’s production leads to polluting a river which is ending in a lake used for fishery and drinking water. Externalities are effects such as market failure, which can be corrected with a payment and compensation, and are therefore closely linked to property rights. Many policies are created to correct the market failures in order to achieve a higher efficiency. There are several objectives that are necessary for a market to produce efficient allocations. First of all, a market for the goods and services must exist, and this demands fully assigned private property rights. Another objective is that all goods and services are private, meaning that there are no public goods. Many of the environmental services have the characteristics of a public good, and, therefore, market problems may arise. Two characteristics can help to explain the difference between private and public goods, and these are rivalry and excludability. Rivalry is when one person’s consumption of a good is at the expense of another person’s consumption. Excludability is when a person can be excluded from consuming the good. Pure private goods are both rival and excludable, for example food. Pure public goods are neither rival nor excludable, for example the street lights. Open-access natural resources, for example ocean fishery, are rival but not excludable. Resources that are non-rival but excludable are called congestible resources. An example of this is wilderness areas, and they are non-rival as long as one individual’s visit does not reduce another visitor’s enjoyment of the area. The government often supplies the public good, and the question is how much should the government supply

in order to achieve efficiency. The rule is that the level of public good supplied should be where the aggregated marginal willingness to pay for the good is equal to the marginal cost of the good. This does not seem to be very difficult in theory. However, it is in practice because the government needs to know the preferences, meaning the marginal willingness to pay, for all the relevant individuals. It is difficult for the government not only to find these preferences, but also to know if they are truthfully revealed, because there exist incentives for the individuals to free-ride. Say for example that the government is planning to build a new subway financed with taxes in proportion to the individuals' marginal willingness to pay. By questioning, the individual can say that the marginal willingness to pay for a new subway is \$100, but the real amount is \$180. There are incentives for the individual to understate the amount in order to get a lower tax and free-ride. It is not easy to find systems that can find the truthful preferences in order to value a public good. (Perman et. al., 2003)

As mentioned above, it is not easy to put a value on the environment, however, it can be done. The original and major reason for valuing the environment was to include environmental impact in a cost-benefit analysis. In order to find where the costs and the benefits equal, it is important to put a monetary value on the favorable or unfavorable environmental impacts associated with a project. If a project should go on or not is decided by the cost-benefit analysis, corrected for market failures. When a change is considered, it is important to know how the utility changes in monetary terms in order to make a cost-benefit analysis of the project. For example, how a change in the level of the environmental services provided affects the individual's utility. In order to find this monetary value, there are several valuation methods that can be used. To begin, we must distinguish between a use value and a non-use value. Use value is the value of actually using a service for an individual, direct or indirect. Non-use value is the value that an individual puts on a service even if they never intend to use it directly, for example preserve it for the future. For use values, there are indirect valuation methods that can be used, meaning that the behavior of the individual is observed in related situations. Examples of these methods are the Travel Cost Method and the Hedonic Pricing Method. The Travel Cost Method is based on the idea that it is possible to find the value that the individual puts on the environmental services from the costs that the individual gains in order to experience the service. The questions involved in this method are usually: how much did it cost, in time and monetary terms, for the individual to travel to the recreational area, for example a national park? These figures will then represent a base for estimating the individual's value on the service. Hedonic Pricing Method has often been used in the context

of atmospheric pollution. In this case it is suggested that, all other things being equal, the price that the individuals are willing to pay for housing has a positive relation to the air quality. From this, it can then be possible to put a value on clean air. The problem with these indirect methods is that there could be things apart from the environmental services that the individual values in the specific setting, which might have an effect on the willingness to pay. (Perman et. al., 2003)

Direct methods or stated preferences are used in order to value non-use values (but also use values) since there is no specific behaviour that can be observed. The most common direct methods are Contingent Valuation Method (CVM) and Choice experiment (CE), and these involve asking the individuals about their willingness to pay for (or willingness to accept) a change in a hypothetical setting. The main use of these methods is to provide inputs to analyze a change in the supply of an environmental service, and these methods are especially used for environmental services that are non-excludable. The problem with these methods could be that conclusions are drawn from hypothetical questions, compared to the indirect methods that are observing actual behaviour. But the advantages are that it can value both non-use values and use values. (Perman et. al., 2003)

The stated preferences method, choice experiment, is used in this study since we are interested in putting a value on future services that do not exist today, hence, it is not possible to use a revealed method.

### **3.2 Using choice experiment to value non-market environmental public goods**

Choice experiment has primarily been used for private market goods, and was, to our best knowledge, first used for environmental problems by Adamowicz et al. (1994). Choice experiment is a stated preferences method, that is, a direct method where the respondent is asked directly about his or her preferences for different attributes. The idea behind it, formalized by Lancaster in 1966 (Perman et al. 2003), is that a good should be treated as a bundle of attributes, and that those attributes are the primary utility for the individual. Choice experiment is a good approach when planning effective tourism expansion. The advantage of using the choice experiment method, compared to other stated preferences methods or revealed preferences methods, is that it is valuing attributes separately and not as a bundle. Moreover, it reveals preferences for attributes, and attribute levels that do not currently exist

(Lanza et al., 2005; Ch11. Morimoto. Adamowicz et al., 1998). We chose to use choice experiment to value the marginal willingness to pay (MWTP) for different attributes that Cahuita national park possesses. By using the choice experiment method, it was possible for us to obtain information about the trade-offs between different attributes. Therefore, it contains more information than for example a contingent valuation method. Adamowicz et al. (1998) used choice experiment to measure passive use values and to compare this to a contingent valuation method exercise. Their result showed that there is no significant difference in the preferences between choice experiment and contingent valuation method. Instead, the interesting differences are in the attributes of the environmental good. Pendleton and Scott (2001) strengthen this result by showing that there are great advantages to be made by treating the attributes separately and not as a bundle good.

The choice experiment is revealing preferences by letting the individual make repeated choices. By focusing on the trade-off that the individual does between the attributes, the marginal rate of substitution (MRS) can be calculated and, if the alternatives are combined with a cost attribute, the marginal willingness to pay can also be calculated from the responses (Carlsson and Martinsson, 2003).

There are several groups of biases in a choice experiment. When designing the experiment, the attributes and the attribute levels have to be clearly defined so that we researchers know what respondents are valuing. It is important to be extra careful when describing the payment vehicle and the environmental good. Another group of biases include interviewer bias. The interviewer bias occur when the respondent answers with a willingness to pay (WTP) higher than their true willingness to pay because they want to please the interviewer. Many biases can be avoided by a well-designed experiment. It is therefore of great importance to pre-test the formulary to make sure the questions asked are well understood.

### **3.3 Design of the choice experiment**

The design of the questionnaire for a choice experiment faces much of the same difficulties as when designing a contingent valuation formulary. First, the environmental good or service and the payment vehicle need to be clearly defined. The choice experiment design contains: the number of attributes and what these attributes should be, the number of attribute levels and what these levels should be. When this is clearly defined, the attributes and the levels of

the attributes have to be combined into alternatives. These alternatives in combination with one another create choice sets. (Hanley et al., 1998) The respondents choose one alternative in a choice set with a number of alternatives. Before the choice experiment starts, some socio-economic questions are often asked to the respondent. A debriefing question, for example “what made you prefer alternative A and not B?”, can be asked at the end of the experiment to better understand the individual’s choice.

There is risk that the individuals interpret the attributes and the level of the attributes differently. Therefore, it is of great importance that the attributes and the levels of the attributes are well defined and explained to the respondents. Visualizing by showing pictures is one way to eliminate the risk that individuals interpret the attributes and the levels of the attributes differently, and this will make the analysis more convenient (Hanley et al., 1998). Individuals’ preferences are stated by the alternatives the individual chooses. The design of the experiment should be in such a way that as much information as possible is attained so that the respondents’ true preferences could be revealed. This has to be done without affecting the respondents in any way, meaning that all the respondents has to be approached in the same way and the questions asked should not be leading in any way. This can in turn determine how well the estimated willingness to pay corresponds to the respondent’s actual willingness to pay (Carlsson and Martinsson, 2003). The validity of choice experiment has been questioned for not revealing the true preferences of the respondents, see further section 3.4.

The benefit of the alternatives and the cost of choosing one alternative have to be considered carefully when designing the choice-sets. If one of the alternatives is associated with a high benefit for the respondent at a low cost, and another alternative with a low benefit at a higher cost, the respondents will always choose the alternative with highest benefit to the lowest cost. This is called a dominant alternative. Designing the choice set in such a way that there is always one dominant alternative in each choice-set would eliminate the information that could have been obtained if the design had been different. Hence the degree of success for a choice experiment is depending on that the individual is actually making a trade-off between the attributes (Carlsson and Martinsson, 2003).

Carlsson and Martinsson’s (2001) result suggests that individuals need some “warm-up” choices since there is some instability in the first choice sets which might be explained by a

learning effect. This indicates that there is a positive effect of having a larger number of choice sets. On the other hand, this might cause the respondents to grow tired and lose interest, which could lead to that the true preferences are not revealed.

### **3.4 Hypothetical versus actual payment**

To test the validity of the choice experiment method it is convenient to use the stated willingness to pay and compare it with the real or actual payment. When using stated preferences methods, the willingness to pay has been claimed to be overstated in a hypothetical setting (Micheal, 2007, Murphy and Scott, 2004, Johansson-Stenman and Svedsäter, 2001) which could be explained by a couple of reasons, but is often correlated with the warm-glow feeling that people can achieve when giving, see section 2.2.1. The studies made in this area are often conducted with private market goods (Lusk and Schroeder, 2004), but there are a few studies made on public non-market environmental goods.

Carlsson and Martinsson (2001) conducted a choice experiment to reveal the respondents' preferences on different environmental projects run by World Wildlife Foundation (WWF). The choice set had two alternatives and each alternative had three attributes: the project, the amount of money that would be paid to the respondent, and the amount that would be donated to the project. First, the respondents made 16 pair-wise hypothetical choices. In the second section, the same respondent had to make 16 pair-wise other similar choices, but this time in a non-hypothetical setting. In the non-hypothetical section, the respondents were informed that one of the choice-sets would be drawn randomly as the actual choice-set, and the alternative chosen in this choice-set would be the alternative that the actual money would be donated to. The donation would be made anonymously. The result indicated that there was no significant differences in the hypothetical and actual choice experiment. However, a study made by Johansson-Stenman and Svedsäter (2003) showed that there was a difference and that the hypothetical willingness to pay exceeds actual willingness to pay in the cases where ethical dimensions are involved. Their result is based on the theory that the individual's self-image is one of the main factors when the individual is making choices. Johansson-Stenman and Svedsäter (2003) explain Carlsson and Martinsson's (2001) result by the individual's consistency in her behavior. This behavior is closely related to the theory of cognitive dissonance (Festinger, 1957), that claims that individuals are avoiding the anxiety that the individual will experience when not being consistent in her choices. Comparing the

willingness to pay from the hypothetical with the non-hypothetical will therefore not show any differences using the same individuals.

So far we have only looked at the external test, which tests to what extent the stated willingness to pay from the choice experiment correspond to the actual payment. But there are a couple of internal tests that can be done. All tests are conducted to test how well the assumptions made in microeconomics are fulfilled. One of the assumptions in microeconomics is that individuals are maximizing their utility and are assumed to prefer more to less. The indifferent curves are, thus, assumed to be convex. The individual is further assumed to be consistent in her preferences, referred to as the transitivity theory, arguing that if an individual prefer A to B and B to C, then the individual is assumed to prefer A to C. To test for transitivity in a choice experiment you have to have a large number of choice-sets. Our study has been made in the field, and it was therefore inconvenient to have a large number of choice-sets. As a consequence of this limitation we did not test for transitivity. One could also test for consistency and stability in preferences by dividing the choice-sets into 2 sequences when conducting the choice experiment (Carlsson and Martinsson, 2001). For example, choice sequence 1 = 123 456 and choice sequence 2 = 456 123, where 1-6 are the different choice-sets. However, as explained earlier, we did not test for stability in preferences since our study was conducted in the field and therefore limited to a smaller amount of choice-sets.

### **3.5 Economic model in the choice experiment**

Most microeconomic theory is based on the assumption that individuals are maximizing utility from a budget constraint. Other common assumptions in microeconomics are that the individual is behaving rationally, and that the individual experience increased utility of consuming more. In a choice experiment, the individual derives utility from a bundle of goods. If the price or levels are change the individual may change from one bundle of goods to another. This change in utility between different alternatives is being analyzed by using the method of choice experiment.

The choice in a pair-wise choice experiment is depending on the available substitutes. A random utility model (RUM) estimates the probability that an individual will choose an alternative depending of the characteristics of that specific alternative and the characteristics

of the other available alternative. Further, random utility model estimates the coefficients of the attributes that maximize the probability of an alternative being chosen. This means that the higher utility that the individual finds in the characteristics in the specific alternative, the higher is the probability that this specific alternative will be chosen. (Sandefur et al. 1996)

Let individual  $i$ 's utility of choosing alternative A be given by:

$$(5) \quad U_{iA} = u_{iA} + \varepsilon_{iA} \quad (\text{McFadden, 1974})$$

$U_{iA}$  is the total utility that the respondent experience when choosing alternative A. This utility is determined by the utility that the attributes in alternative A has,  $u_{iA}$ , and the utility not determined by the attributes of alternative A,  $\varepsilon_{iA}$ , also known as the error term. By using a random utility model we assume  $u_{iA}$  to be linear in parameters, meaning that the parameters appearing in the regression are only raised to the power of one. This does not necessarily mean that the explanatory variables have to be linear. The functional form of the utility attained from alternative A can be expressed as:

$$(6) \quad U_{iA} = \alpha_A + \beta_1 X_{iA} + \beta_2 P_{iA} + \varepsilon_{iA}$$

Where  $\alpha$  is the intercept in alternative A for individual  $i$ ,  $\beta$  is the coefficients,  $X_{iA}$  is an attribute used to describe alternative A for individual  $i$ .  $P_{iA}$  is the price attribute in alternative A for individual  $i$ , which is the monetary cost for alternative A.

### 3.6 Econometric model in the choice experiment

The general function of the random utility model that we analyzed in this study is the following:

$$(7) \quad U_i = \alpha + \beta_1 X_i + \beta_2 P_i + \varepsilon_i$$

The utility in (7) is the total utility that individual  $i$  experience from Cahuita national park, and this utility can be divided in to the utility of the two alternatives.

$$(8) \quad u_{iA} = \alpha_A + \beta_1 X_{iA} + \beta_2 P_{iA} + \varepsilon_{iA}$$

$$(9) \quad u_{iB} = \alpha_B + \beta_1 X_{iB} + \beta_2 P_{iB} + \varepsilon_{iB}$$

The probability that an individual is choosing alternative A equals the probability that the utility from this alternative is greater than the utility of alternative B.

$$(10) \quad \Pr C_i = A = \Pr u_{iA} + \varepsilon_{iA} > u_{iB} + \varepsilon_{iB}$$

$C_i = \text{Choice}$  for individual  $i$ .

To obtain the difference in utility between the two alternatives (A and B), the intercepts in alternative A and B are assumed to be equal,  $\alpha_A - \alpha_B = 0$ . The logic behind this is that the intercept represents the utility that the individual gains from all other variables in her life and this is the same in alternative A as in alternative B. In other words, the utility that an individual has when entering Cahuita national park without the attributes, are the same between the two alternatives. The difference in utility between the alternatives then becomes:

$$(11) \quad \begin{aligned} \Delta U = U_A - U_B &= \alpha_A + \beta_1 X_{iA} + \beta_2 P_{iA} + \varepsilon_{iA} - \alpha_B + \beta_1 X_{iB} + \beta_2 P_{iB} + \varepsilon_{iB} \\ &= \beta_1 X_{iA} - X_{iB} + \beta_2 P_{iA} - P_{iB} + \varepsilon_{iA} - \varepsilon_{iB} \end{aligned}$$

The intercepts are the same in alternative A and B, since it is the same individual making the choice between the alternatives, and therefore they disappear when one looks at the difference between the alternative that the individual preferred and the one that she rejected. To evaluate the effect of socioeconomic variables on the individual's choice, interaction terms would have to be created between the socioeconomic variables and the difference in the attribute levels. This was out of the scope of this study.

To further decide which model to use in the analysis one has to make an assumption about the error term. The error term is also known as a random variable since it can not be known in prior. The random variables are defined from the probability distribution of the values that the random variables can take. We assumed the error term to be normally distributed across the alternatives, A and B, and between the respondents. One of the most commonly used econometric models for a binary discrete choice is the Probit model. In the Probit model the error terms are specified as normally distributed, and, therefore, this model was used when estimating the random utility model of the choice experiment.

### 3.7 Estimation of the marginal willingness to pay

We are interested in the marginal willingness to pay for the attributes. This can be done by using the probabilities of choosing a specific alternative if one of the attributes in the alternatives is a price attribute. The mean marginal willingness to pay for each attribute is estimated by dividing the specific attribute coefficient with the price coefficient;

$$(11) \quad \text{meanMWTP} = -\frac{\beta_1}{\beta_2}$$

In order to calculate the total mean marginal willingness to pay, the specific constant is divided by the price coefficient, and therefore we can not calculate the total marginal willingness to pay for Cahuita national park.

## **4 The project performance in Cahuita national park**

In this chapter the practical performance of the field work is explained and followed by a description on how the pilot study has been used to create the final questionnaire. Then, the natural field experiment is discussed. The fourth section in this chapter explains the choice experiment.

### **4.1 Project performance**

The reason for choosing Cahuita national park as a study area was the unique system of voluntary donation. This system made it possible for us to analyze questions around the visitors' voluntary donation since the donation can vary. The system of voluntary donation also made it possible for us to see directly if the information treatment affected the voluntary donation. A fixed payment system would not have given us the same possibility. We focused on visitors from Europe and North America, and only conducted interviews in English. The reason for this is that our Spanish is insufficient, and that we decided not to include Costa Ricans since we wanted to analyze the behaviour of foreign tourists who come as visitors to the park.

In a country with a rain season it is expected that the landscape will vary, and this in turn has an effect on the tourism values. Thus, it is of importance that a study regarding tourism in a country with a rain season takes the effects of seasonality on natural resources into consideration. (Lanza et al., 2005; Ch11. Morimoto) Due to this, we conducted the field work just before the rain season started, in May. All respondents in the study were visitors to Cahuita National Park entering the park through sector Playa Blanca.

The data collection was made in three stages during the three weeks that the field work was carried out. Data about all the visitors' nationalities, gender, actual donation and if the visitor was in company with somebody or alone were collected at the entrance all weeks (see Appendix II: Map Cahuita national park, stage 1). This data was collected by copying the registration book, that is, the registration sheet that all visitors have to fill out in person before entering the park (see Appendix IV: Registration sheet). At the entrance, a number of representative visitors were selected as samples for the choice experiment. The choice experiment took place further inside the park (see Appendix II: Map Cahuita national park, stage 2) after the respondents had been able to get some experience of the park. The choice

experiment was conducted for two weeks and there was no information flyer distributed to the visitors these two weeks. The third week, an information flyer was distributed to all visitors entering the park through the sector Playa Blanca. The information was provided in both English and Spanish (see Appendix V: The information flyer in English and Spanish).

There were two treatments in this study, distribution of an information flyer, which was conducted for one week, and the oral information about the payment system of voluntary donation given by the person working at entrance. The oral information was given to visitors that seem insecure about how the payment system works or who asks about it. The oral information was not needed when the written information was distributed. The control group was the data collected at the entrance during the two weeks that the choice experiment was conducted.

## **4.2 The pilot study**

We conducted a pilot study for four days, one week before the actual study was carried out. During the pilot study in Cahuita national park, we concentrated on the choice experiment in order to test the design, by this, the number of attributes and the levels of the attributes of the choice experiment. We evaluated this by asking the respondents to “think aloud” and then listened and observed their behaviour. We also asked the respondents after conducting the choice experiment, to rank the attributes in order of the importance that the attribute had when making their choices. The result showed that the respondents had a good understanding about how to respond to the choice experiment, but we noticed that one of the attribute was dominant. We therefore changed the design by first changing the dominant attribute from “An environmental campaign to increase the protection of the coral reef” into “Lifejackets required”. The reason behind this change in the attribute was that we realized that the description was misleading since the individuals thought that the campaign was necessary in order to protect the coral reef. Our expectation was that this change in description of the attribute would lead to less focus on this attribute and to an increased trade-off between all the attributes. But it didn't. This attribute was still ranked as the most important attribute when the respondent made her choice. We therefore decided to exclude this attribute and tested the choice experiment with only four attributes instead of five. These attributes are well explained in section 4.4. Another reason for excluding this attribute was that most of the degradation of the coral reef is not made by the visitors of the park but from polluted water and soil erosion.

The attribute “donation allowed”, meaning that a system exists to handle voluntary donations and, therefore, donations are welcome, was often ranked low. However, the respondents told us that they were in general very positive to the system of voluntary donation. By asking the respondents to “think aloud” we found out that the respondents did not seem to put a monetary value into the attribute “donation allowed” when making their choice between the two alternatives. This was important in order to keep the control of the design. The respondents seemed to rather made their choice between preferring to have the system of voluntary donation or not.

In order to combine the actual donation made by the respondent with the socioeconomic characteristics from the interview, we communicated through walkie-talkies. We decided to focus on selecting visitors going to the beach, since these individuals were more relaxed and had more time for an interview including the choice experiment. The total time of the interview, including the choice experiment, took about twenty minutes.

The system of copying the registration book worked well, but we soon realized that it was hard to do the matching when there were a lot of visitors entering at the same time. As a consequence, we decided not to do many matching during these time periods. During the pilot study we collected statistics of how many visitors entered the park even when we were not there (we continued to do this during the whole study). The result of this showed that most of the visitors entered the park between 8 am and 1 pm. Due to this, it was during this time a day we collected the data and conducted the choice experiment.

The distribution of the information flyer took place at the entrance of the bridge, which all the visitors have to cross before getting to the park entrance where all visitors have to be registered, every day. Most of the respondents read the information between the bridge and the entrance, which is a distance of around 50 meters.

We chose not to include Sundays in our study. The reason for this was that the numbers of visitors was increased drastically on Sundays, which made it more difficult for us to fill in the registration sheet and to identify international visitors to interview.

### **4.3 The field study in Cahuita national park**

The field study consists of four parts: data from the registration book, a questionnaire consisting of socio-economic variables and psychosocial variables, the distributed information, both oral and written, and the choice experiment.

#### **4.3.1 Registration book**

All the visitors had to fill out a registration sheet in a registration book when entering Cahuita national park. Here, they had to write their name, their country of origin, and their city of origin. For every visitor that made a donation, the people working at the entrance of sector Playa Blanca wrote down how many persons that the donation concerned, and which country they came from. They also gave the visitors a receipt. We made an extended registration sheet that we filled in ourselves for the visitors entering. This included name, country and city of origin, gender, if the visitor were in company of children, if the visitors came in a group, if the visitors came as a family, the donation made, who made the donation, and if they got oral information or not (see Appendix IV: Registration sheet). We also wrote down an ID-number and specific characteristics for the ones that we selected as representative individuals for the interviews and the choice experiment. If people came together, we divided the total donation made with the number of adults (children excluded). This was done both for people coming as a group and people coming as a family. We defined the distinction between coming as a group and coming as a family as followed; if there were a man and a woman coming, we registered them as a family, if there were two women or two men coming or if there were more than two adults coming, we registered them as a group. We are aware of that this is not politically correct, and can be a bias. Costa Ricans sometimes came in big groups, and when many big groups came at the same time, we then registered them as one group and divided the donation with the number of people in the whole group. This can also be a bias that we are aware of.

The communication between the one of us situated at the entrance (stage 1) and the other situated inside the park (stage 2) was made by walkie-talkies. The one at the entrance gave descriptions of the characteristics of the visitor selected as a representative individual for the CE, and information about the actual donation made by this visitor was also given. This visitor was then, without knowing it, observed by the one of us inside the park to make sure

that the respondent could be identified with the registration book but also to make sure that the respondent had been inside the park for at least twenty minutes.

#### **4.3.2 The questionnaire**

We started the questionnaire with some socio-economic questions, including questions about the trip to Costa Rica and Cahuita. These questions were based on earlier studies made on what affects the donation (see section 2.1.1). See Appendix III: Questionnaire CNP for exact wording of the questions. This was followed by a choice experiment (see further section 4.4). The final section in the questionnaire was a psycho-social part where we analyzed the motives behind giving. This section was also based on previous studies made (see section 2.1.1). Good deed, social norm, altruism, and warm-glow were the motives that we decided to use in order to analyze why people contribute to a public good. To find the strongest motive behind contributing to the maintenance of a national park, we used cards with different statements associated with the motives (See Appendix VIII: Respondent card for the psychosocial motives). These statements were developed from the statements and categories that Hur (2006) used in his study in order to find the motives behind charity giving (see Hur 2006:668 table 2: *Behavioral categories and individual questions for charitable giving*). The respondents were asked to point out how strongly they agreed or disagreed with each of the statements for why they would make a donation. We used the following statements:

*“I feel good when I contribute to the environment”* (“warm glow”)

*“I want to do something good”* (Good deed)

*“I donate since others do it as well”* (Social norm)

*“I care about the environment”* (Altruism)

Thereafter the respondent were asked to do the same procedure all over again, but then instead stated how strongly she thought other tourists visiting Cahuita national park agreed or disagreed with the same statements.

#### **4.3.3 Information**

Two different pieces of information were given to the visitors: oral and written. The oral information was given to the visitors by the person working at the entrance of sector Playa Blanca, and it was randomly told to the visitors depending on who was sitting at the entrance,

if the visitor looked insecure about the payment system or if the visitor asked for the information. The information provided was about the system of voluntary donation and what it was used for, but the exact wording of the information given was depending on who was sitting at the entrance. This could be a bias since we did not take notes of who was sitting at the entrance each day.

As mentioned above, the written information was a flyer distributed in the third week of the study. It was distributed to all the visitors, in both English and Spanish, and included information about the payment system, what the average fixed fee is in other national parks in Costa Rica, what the money is used for, and that the donation made can make a difference (see Appendix V: Information flyer in English and Spanish). The flyer was distributed about 50 m from the entrance of sector Playa Blanca, on the other side of the bridge leading to the entrance, and it was recollected at the entrance of the park in order to avoid littering the park. The data from this week was controlled by the data from the two previous weeks without written information.

#### **4.4 The choice experiment in Cahuita national park**

The choice experiment conducted in Cahuita National Park had three attributes in addition to the cost attribute; toilets and showers, information, and the possibility to donate money to the park. Each alternative was combined with a number of attribute levels, see table 1.

The attributes were explained to the respondents with a card that explained the different attributes and the levels (See Appendix VI: Respondents card for the attributes and the levels). The attributes were accounted for as characteristics of the park, since we found it easier to relate this to than attributes. We explained the attributes in the following way for the respondents:

*“I will soon present four cards to you, one at a time. (SHOW THE RESPONDENT THE EXAMPLE CARD, see Appendix VII: Respondent card, example of a choice-set). And here can you see an example. As you can see here on the example card, each card will have two different alternatives. Each alternative describes how Cahuita National Park could look like next time you visit it. For each card, your task is to choose the alternative that you prefer. The alternatives are described by different characteristics (same as attributes) and they are explained on this card (GIVE THE RESPONDENT THE CARD WITH THE EXPLANATION OF THE CHARACTERISTICS, see Appendix VI: Respondent card for the attributes and levels). Some of them already exist today while others don't. As you can see there are five characteristics with different levels.*

- 1. The first characteristic is environmentally friendly toilets and showers. This could either mean toilets and showers by the entrance or toilets and showers by the entrance as well as in Punta Cahuita. (POINT OUT PUNTA CAHUITA)*
- 2. The next characteristic is information which is general information about Cahuita national park, information about the animals and plants you can see in the park, about the coral reef and about the trail. There are three different levels of the information provided. Information provided by signs at the entrance and in Punta Cahuita, information provided by signs at the entrance and small signs along the trail, which includes Punta Cahuita, and information provided by signs at the entrance, small signs along the trail, which again includes Punta Cahuita, but also information brochures for free at the entrance.*
- 3. Next, you have the entrance fee per person which is a fixed amount of money that you have to pay when you enter the park. There are five different levels of the entrance fee: 0 US dollar, 1 US dollar, 3 US dollars, 5 US dollars or 7 US dollars.*
- 4. The final characteristic is the donation which allows voluntary donation to the park at the entrance. Here, you have two different levels. No donation is allowed or donations are welcome.”*

By environmentally friendly toilets and showers we meant that, just like the toilets and showers that exist today at the entrance of sector Playa Blanca, it is not allowed to use soap or shampoo in the showers inside the park. When the attributes and the attribute levels were well defined, the next step in the design of the choice experiment was to create alternatives by combining different attributes with different attribute levels. This was done by Fredrik Carlsson at the University of Gothenburg using SAS, a statistical software program (see section 4.4.2). These alternatives were then combined into choice sets, using a cyclical design (see section 4.4.2), with two alternatives in each choice-set. We combined these choice-sets into four blocks with four choice-sets in each.

The choice experiment was conducted inside Cahuita national park (see Appendix II: Map Cahuita national park, stage 2). As mentioned earlier, data about the visitors' nationality, gender, number and gender of the adults present during the registration, number of children present during the registration and actual donation was collected at stage 1 in a natural field experiment setting, without them knowing that they were being observed. In the choice experiment the respondents were asked to make four pair-wise choices (see Appendix III: Questionnaire CNP, for wordings of the instructions given to the respondents). Each choice-set consisted of two alternatives (A, B) and each alternative was combined with the four attributes, including the cost attribute, with different attribute levels.

Table 1: Attributes and attribute levels in the CE

<i>Attributes</i>	<i>Number of levels</i>	<i>Attribute levels</i>	<i>Code*</i>
<i>Toilets and showers</i>	2	<ul style="list-style-type: none"> <li>▪ By the entrance</li> <li>▪ By the entrance and in Punta Cahuita</li> </ul>	f1 f2
<i>Information</i>	3	<ul style="list-style-type: none"> <li>▪ Information by the entrance and in Punta Cahuita</li> <li>▪ Information by the entrance and along the trails</li> <li>▪ Information by the entrance, along the trail and information brochures</li> </ul>	i1 i2 i3
<i>Entrance fee</i>	5	<ul style="list-style-type: none"> <li>▪ \$0</li> <li>▪ \$1</li> <li>▪ \$3</li> <li>▪ \$5</li> <li>▪ \$7</li> </ul>	0 1 3 5 7
<i>Donation</i>	2	<ul style="list-style-type: none"> <li>▪ No donation is allowed</li> <li>▪ Donations are welcomed</li> </ul>	d1 d2

\* Codes are included to explain the cyclical design, see section 4.4.1

Carlsson and Martinsson (2001) talked about a learning effect, claiming that there was instability in the first choice-sets (see section 3.2.1) and that it could be avoided by some warm up choice-sets. In order to control for the bias that can occur from the learning effect, we showed the respondents the choice-sets in a random order, since our study was conducted in the field and we could not include a larger number of choice-sets. We explained the choice experiment for the respondents by using an example of how the choice-sets would look like (see Appendix VII: Respondent card, example of a choice-set). In this way we made sure that the first choice-set that was showed for the respondents were not totally new and in this way we limited the bias of the learning effect even though we had only four choice-sets for each respondent.

#### **4.4.1 Design of the choice-sets - Cyclical design**

The design of the choice experiment used in this study has been developed by using the method of cyclical design. This typical design can only be used when all the attributes and the levels of the attributes are the same for all the alternatives. This was the case in our study, and we used the attributes and levels presented in table 1 above. We used a standard approach for constructing the choice-sets in SAS from the attributes and levels, see table 2.

Table 2: The construction of a choice set

<i>Alternative 1</i>		<i>Alternative 2</i>	
<i>Attributes</i>	<i>Levels of the attributes</i>	<i>Attributes</i>	<i>Levels of the attributes</i>
X1 = Toilets and showers	f1 / f2	X5 = Toilets and showers	f1 / f2
X2 = Information	i1 / i2 / i3	X6 = Information	i1/ i2 / i3
X3 = Entrance fee	0 / 1 / 3 / 5 / 7	X7 = Entrance fee	0 / 1 / 3 / 5 / 7
X4 = Donation	d1 / d2	X8 = Donation	d1 / d2

In our study we chose to use four blocks, with four different choice-sets in each one and with two different alternatives in each choice-set. The total number of different alternatives would therefore be 32. However, this combination was not possible for SAS to run using the standard model above since it indicates for SAS that we had 8 different characteristics, the factors x1-x8, and this demands having a minimum of 36 choice-sets, not 16 as in our case. Hence, we had to run SAS with only 4 factors, x1-x4, and thereby received 16 different alternatives instead of the total amount of 32. The result from SAS is presented in Appendix X: The results from SAS.

The 16 alternatives that we received were the optimal constellations for the A alternatives in the 16 different choice sets. From this we had to construct the B alternatives. This was done by using the attribute levels in the A alternatives as an initial point, and then shift the levels one stage. For example, if the level of the attribute “entrance fee” in alternative A is \$3 (3), then the level in alternative B will be \$5 (5). And if the level of the attribute “toilets and showers” in alternative A is “by the entrance and in Punta Cahuita” (f2), then the level in alternative B will be “by the entrance” (f1). This design is called cyclical design since the changes are made by cycling or rotating the levels of the attributes. The procedure was repeated for all the choice-sets. There is an example of a choice-set in table 3 below.

Table 3: An example of a choice-set

<i>Attributes</i>	<i>Alternative A Created by SAS</i>	<i>Alternative B Created by us</i>
<i>Toilets and showers</i>	By the entrance ( <b>f1</b> )	By the entrance and in Punta Cahuita ( <b>f2</b> )
<i>Information</i>	Information by the entrance, along the trail and information brochures ( <b>i3</b> )	Information by the entrance and in Punta Cahuita ( <b>i1</b> )
<i>Entrance fee</i>	\$7 ( <b>7</b> )	\$0 ( <b>0</b> )
<i>Donation</i>	No donation is allowed ( <b>d1</b> )	Donations are welcome ( <b>d2</b> )

By using this design, the levels of the characteristics will almost always be higher in alternative B. Therefore, in the final design we switched position of the alternatives for every other choice-set. By doing this we minimized the bias that may occur when the respondent always sees the alternative with the lowest levels first. We have corrected for the alternatives that are dominant in the sense that it is for free, meaning that there was no entrance fee and donations were not allowed. These alternatives were changed so that donations were allowed. One drawback with the cyclical design, when most of the attributes only have two levels, is that the alternatives become very similar. Another drawback is that the attribute “entrance fee”, which has five levels, in some choice-sets will have one alternative with 0 dollars, while the other has 7 dollar.

## 5 Results

The result chapter starts with a description of the sample. The second section of the chapter includes results from the natural field experiment. The third section presents the results from the choice experiment where the marginal willingness to pay (MWTP) for the different attributes are estimated.

### 5.1 Characteristics of the sample

Our data is divided into two different groups. The first group consists of collected data from the registration book at the entrance of sector Playa Blanca in Cahuita national park, where one observation is equal to one visitor, the total number of observations is 929 including the 60 respondents. The second group is the data collected from the questionnaire inside the park: total number of observation in this data-set is 60. The socioeconomic characteristics of the visitors (excluding the 60 respondents) in Cahuita national park, and the same socioeconomic characteristics of the 60 respondents, are found in table 4. To make sure that our findings are due to economic factors, and not to the composition of the sample, we ran a chi-square test in SPSS. The test showed that it is statistically significant, at a significance level of 1%, that the respondents are a representative sample for all the visitors to Cahuita national park of European and North American origin. This result means that we can draw general conclusions from the sample regarding the effect that the country of origin has on the voluntary donation. The composition of the visitors to Cahuita national park is 53% men and 47% women, while our sample is 48 % men and 52% women. However, the chi-square test showed that gender is not statistically significant, even at a 10% significance level, showing that we cannot draw general conclusions about gender from the sample. When the sample for the choice experiment was selected, the most important thing was to select the ones actually paying the donation: “picking up the wallet”. Our result shows that 55 % of the visitors making the payment of the donation were females, and therefore our sample could have been even more representative if we had had an even larger proportion of females. According to the park rangers, however, it is more common that men are the ones paying the donation. Our result shows the opposite: that it was more common that females paid than men. 68% of the respondents are from Europe, while 32% are from North America. Since visitors from South America are representing a large proportion of the total amount of visitors to Cahuita national park, 34%, it could be argued that they should be included in the respondent sample. But Spanish speaking visitors were not included in the choice experiment since we focused on the

English speaking visitors from Europe and North America. Looking only at the proportion of visitors from Europe and North America, we can see that 62% of the visitors come from Europe, and 38% are North Americans. 91% of the visitors enter the park in company of others: in our sample only 72% of the respondents entered the park in company of others. This is explained by the fact that visitors entering the park alone were exceptional, and therefore easier to find inside the park and to connect with the data collected at the entrance. 31% of the visitors to Cahuita national park were given oral information about the payment system of voluntary donation, while 53% of the respondents were given oral information. During the three week of data collection in the park, 27% of the visitors received written information about the payment system of voluntary donation through an information flyer. The average voluntary donation made by the visitors entering Cahuita national park through sector Playa Blanca was \$1.12 (independently of gender, in company or not, and information). The average voluntary donation made by the respondents was \$1.92, which is higher than the average for the visitors, and can be a bias in the marginal willingness to pay in the hypothetical setting.

Table 4: Socioeconomic characteristics of the visitors to Cahuita national park

<i>Variable</i>	<i>Proportion of visitors in % (standard deviation)</i>	<i>Proportion of respondents in % (standard deviation)</i>
<i>Total number of observations</i>	869	60
<i>Sex (Male)</i>	47% (0.50)	52% (0.50)
<i>Country of origin</i>		
- <i>Europe</i> (incl. Korea, New Z. Australia & South Africa)	41% (0.49)	68% (0.47)
- <i>North America</i>	25% (0.43)	32% (0.47)
- <i>South America</i>	34% (0.47)	0%
<i>In company of others</i>	91% (0.29)	72% (0.45)
<i>Donation paid by a woman</i>	55% <sup>1</sup>	48% (0.50)
<i>Oral information is given</i>	31% (0.46)	53% (0.50)
<i>Information flyers are distributed</i>	27% (0.44)	No flyers distributed to respondents
<i>Mean actual donation made</i>	\$1.12	\$1.92

<sup>1</sup> Of all the visitors paying, 45% were men and 55% were women. This was of importance when picking our sample for the interview and the choice experiment, since we were interested in the WTP of those how actually made the donation, "picked out the wallet".

The additional socioeconomic characteristics of the respondents are presented in table 5. The average age of the respondents is 37.7 years which we observed seems to be a representative age for the visitors to Cahuita national park. The respondents in our sample have a relatively high level of education, 82% of the respondents have an education level higher than secondary school. 62% of the respondents are currently working, stating that this proportion of the respondents can be assumed to have a stable income. Data was not collected about the

respondents' income, but the variable of expenditure on accommodation per night and per person was used as an indicator of the traveling budget and, further, on the respondents ability to make a donation to Cahuita national park. 45% of the respondents were staying in an accommodation that is a so called budget accommodation, where the price per person per night is less then \$10. The more luxurious alternative, that is, paying more than \$20 per night for accommodation, is only connected with 21% of the respondents. In general, 73% of the respondents are on a trip longer then 15 days. 38% of the respondents are visiting other countries than Costa Rica during their trip. On average, the respondents are staying 3.96 days in Cahuita, and they had on average visited Cahuita national park 1.62 times before they conducted the choice experiment. For 49% of the respondents, the main purpose of visiting Cahuita national park is to see animals and do some trekking. This is closely followed by going to the beach, which is the purpose for 41% of the respondents. This is strengthened by the fact that 75% of the visitors are in Costa Rica on a holiday. Before coming to Cahuita national park, 2.22 parks had on average been visited by the respondents. 65% of the respondents have knowledge about the entrance fee to other parks in Costa Rica. The respondents believe that other visitors were paying a donation on average equal to \$2.50. The expectations on Cahuita national park are either very high or high for 43% of the respondents, and only 5% have low expectations. The respondents are in general satisfied or even more than satisfied with the park since 45% of the respondents feel that their expectations are more than fulfilled. 44% of the respondents feel that their expectations are fulfilled as expected. According to our result 38% of our respondents are religious.

Table 5: Socioeconomic characteristics of the respondents in the choice experiment

<i>Variable</i>	<i>Proportion in % (standard deviation)</i>
<i>Total number of observations</i>	60
<i>Age (Years)</i>	37.7 (14.09)
<i>Highest level of education attained</i>	
-Primary school	2% (0.13)
-Secondary school	16% (0.36)
-University without degree	14% (0.34)
- University with degree	68% (0.48)
<i>Occupation</i>	
-Work	62% (0.48)
-Study	18% (0.39)
- Non-work (incl. Retired)	20% (0.40)
<i>Religious</i>	38% (0.49)
<i>Accommodation per person per night</i>	
- Budget >\$10	45% (0.48)
- Middle \$10-20	34% (0.45)
- Luxury <\$20	21% (0.37)

<i>Duration in Cahuita (Days)</i>	3,96 (4.00)
<i>Duration of the trip in total</i>	
-Short trip >15days	27% (0.44)
-Long trip <15 days	73% (0.44)
<i>Costa Rica only country visit this trip</i>	62% (0.48)
<i>Times visited Cahuita national park</i>	1.62 (1.40)
<i>Parks visit before</i>	2.22 (1.77)
<i>Mean donation of others (US dollar)</i>	2.50 (1.64)
<i>Knowledge about the entrance fee to Other parks in Costa Rica<sup>3</sup></i>	65% (0.48)
<i>Purpose of visiting Costa Rica</i>	
-Holiday	75% (0.32)
-Work	3% (0.18)
-Study/voluntary work	9% (0.30)
-Other (like visiting family)	14% (0.37)
<i>Purpose of visiting Cahuita national park</i>	
-Animals/trekking	49% (0.43)
-Beaches	41% (0.49)
-Other	10% (0.36)
<i>Expectations on Cahuita national park Before entering the park</i>	
-Very high	10% (0.30)
- High	33% (0.47)
- Neither high or low	32% (0.47)
- Low	5% (0.22)
- None	20% (0.40)
<i>Expectations fulfilled after entering the park</i>	
- Fulfilled more than expected	45% (0.44)
- Fulfilled as expected	44% (0.50)
-Not fulfilled	3% (0.18)
- Definitely not fulfilled	0% (0.00)
- No opinion	8% (0.28)

## 5.2 Results from the natural field experiment

### 5.2.1 Mean values of the donation integrated with information and Free-riding

Since the oral information was not given to all the visitors, as mentioned in section 4.3.3, we first tested for the indirect effect that oral information could have on the voluntary donation. We tested if gender, entering the park in company of others or alone, and where people came from had a significant effect on the probability of getting oral information. We ran a Probit model, and the estimated coefficients, standard errors and p-values are represented in table 6.

<sup>3</sup> We defined knowledge about the entrance fee to other parks in Costa Rica as a yes answer to the question: *Do you know how much the average entrance fee is in other national parks in Costa Rica?*. This does not mean that the respondent knew the exact amount of the entrance fee to other national parks in Costa Rica, but we were interested in if the respondents considered herself having knowledge about the entrance fee.

Table 6: Parameters of the Probit model concerning the probability of getting oral information.

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>P-value</i>
<i>Constant</i>	-0.82***	0.17	0.00
<i>Male (Male)</i>	0.17**	0.07	0.04
<i>Company (Company)</i>	0.46***	0.16	0.00
<i>Country of origin is North America (NA)</i>	-0.24**	0.11	0.01
<i>Country of origin is South America (SA)</i>	-0.28**	0.10	0.01

Coefficients are marked with \*\*\* if significant at a 1% level of significance, with \*\* if significant at a 5% level of significance and with \* if significant at a 10% level of significance.

Number of observations: 929

The results tell us that the probability of getting oral information is significantly higher if the visitor is a man or in company of others. Having North or South America as an origin compared to Europe gives a lower probability of getting oral information. This is important to take into consideration when discussing the effect that oral information has on the actual donation, since our result shows that oral information has a positive effect on the actual donation.

To examine if information has an influence on the voluntary contribution, the mean values of the actual voluntary donation to Cahuita national park were estimated using Limdep. The mean values, the standard deviations of the mean values and the total number of observations included in the estimation are presented in table 7. The results from the Chi-square test on the different treatments are presented in table 8.

The results from the natural field experiment shows that the mean value of the voluntary donation paid by the visitors to Cahuita national park is positively affected by both oral and written information. Not only can we observe this effect in increasing mean values, arguing that those who give, give more, but also in the decreasing free-riding problem. We did two different runnings when analyzing the mean values: one with all the visitors donations included, and one conditional running where only the visitors who actually gave a donation were included. This is both to analyze how the non-free-riders are affected by the information, and to analyze how the free-riding problem is influenced by information. The mean value of voluntary donation, irrespective of if the visitor is entering the park in company or not (see further *total* in table 7), is \$1.12 per visitor when no information is distributed. When oral information is given the mean donation is \$1.89, and when written information is distributed the mean donation is \$2.22. When oral information is given, visitors entering the park without company are in average paying a higher donation than visitors entering the park in company

of others. It is important to remember that oral information was given randomly to visitors that looked confused or who asked about the entrance fee. The influence on the voluntary donation when oral information is given does not only have a direct effect. Our former result, see table 6, shows that entering the park in company of other gives a higher probability of getting oral information. Therefore, it is difficult to compare the result between the oral information and the written information distributed. This is because the written information was distributed to all visitors irrespective of if they knew about the payment system of voluntary donation or if they entered the park in company of others or not. The conditional mean values are in general showing the same trend as the mean values when all the visitors are included; information has a positive effect on the donation.

To analyze the free-riding problem, all data was corrected for visitors who entered the park several days, but without paying every time. The modification is made as follows: if a visitor enters the park three days in a row and makes a donation of \$1 the first day, \$2 the second day, and \$0 the third day, the total donation of the visitor is \$3. This total donation is divided by the amount of days the visitor enters the park, and instead of analyzing each visit, the visitor only appears once in the dataset and is only paying \$1 per day. The visitor is outlined by the name and the city of origin. Information, both written and oral information has a positive affect on the free-riding problem, showing that the numbers of free-riders are decreasing when information is given. The number of free-riders is decreasing more when oral information is given. One explanation for this could be that the visitor is then not anonymous. The result also shows that all the visitors who get the oral information and enter the park without company are giving a voluntary donation: 0% is free-riders.

When no information flyer was distributed, only 3% of the visitors to Cahuita national park were voluntary giving a donation higher, or equal to, the average entrance fee in other parks in Costa Rica, \$6. By using Excel, we analyzed if the distribution of the information flyer affected the share of visitors who gave a voluntary donation higher, or equal to, the average entrance fee to other parks. Our result shows that distributing the information flyer increased the share of visitors giving a voluntary donation higher, or equal to, \$6, with 6 percentage units.

Table 7: Mean values of the actual voluntary donation to Cahuita national park with different treatments and the free-riding

	Total			Without company			With company		
	Mean value (St.Dev)	Free-riders	Conditional <sup>1</sup> Mean value (St.Dev)	Mean value (St.Dev)	Free-riders	Conditional <sup>1</sup> Mean value (St.Dev)	Mean value (St.Dev)	Free-riders	Conditional <sup>1</sup> Mean value (St.Dev)
No treatments	\$1.12 (1.67) n=395	37%	\$1.76 (1.80) N=248	\$1.02 (1.67) n=54	52%	\$2.12 (2.46) n=26	\$1,14 (1.61) n=341	35%	\$1.75 (1.71) n=222
With oral information	\$1.89 (1.84) n=301	13%	\$2.18 (1.81) N=261	\$2.77 (2.39) n=18	0%	\$2.77 (2.39) n=18	\$1.83 (1.79) n=283	14%	\$2.13 (1.76) N=243
With information flyer	\$2.22 (2.31) n=233	21%	\$2.80 (2.26) N=185	\$1.45 (1.73) n=21	38%	\$2.35 (1.65) n=13	\$2.30 (2.35) n=212	19%	\$2.83 (2.30) N=172

<sup>1</sup> Conditional mean value is the mean value of the donation when free-riders are excluded.

Our result from the Chi-square test shows that at a 5% significance level the null hypothesis; “there is no difference between the different treatments or groups”, can not be rejected at a 5% significant level for with and without company for no treatment, information flyer and no treatment, and information flyer without company. In other words there is no difference in the voluntary donation between individuals within these groups.

Table 8: Results from the Chi-square test on the different treatments

Null hypothesis; there is no difference between the different treatments	P-value
Total: No treatments = Oral information	0.00
Total: No treatments = Information flyer	0.00
Total: Oral information = Information flyer	0.00
Without Company: No treatments = Oral information	0.00
Without Company: No treatments = Information flyer	0.51 <sup>1</sup>
Without Company: Oral information = Information flyer	0.04
With Company: No treatments = Oral information	0.00
With Company: No treatments = Information flyer	0.00
With Company: Oral information = Information flyer	0.00
Without Company: No treatments = Company No treatment	0.29 <sup>1</sup>
Without Company: Oral information = With Company: Oral information	0.04
Without Company: Information flyer = With Company: Information flyer	0.99 <sup>1</sup>

<sup>1</sup> meaning that the null hypothesis can not be rejected at a 5% significant level.

### 5.2.2 Estimation of parameters affecting the donation from the registration book

From the registration book data we were able to analyze the question; *what affects the probability for a visitor to make a voluntary donation to Cahuita national park?*. This was

done by running a Probit model in Limdep. The results in the previous section showed that oral information, an information flyer, and company had a positive affect on the mean donation. We examined this further by creating two integrated dummy variables, Compinfo and CompFly, where the information flyer (Flyers) and oral information (InfoEn) are integrated with company (company). The coefficients, standard errors of the coefficients, and the p-values from the estimation based on the data from the registration sheet are found in table 9. The variable names inside the brackets were used in the coding of the data-sets (see further explanation of the variables in Appendix IX: Explanation of variables). When the information flyer was distributed, the oral information was not given since this information was substituted by written information about the payment system of voluntary donation.

We also ran a conditional OLS model in order to examine what affects the level of the voluntary donation to Cahuita national park. In contrast to the results of the Probit model, the OLS model interprets the level of the donation instead of the probability of making a donation. Below is the regression model being analyzed in the conditional OLS model:

$$(12) \quad ActDon \text{ } ActDon > 0 = \alpha + \beta_1 Male + \beta_2 InfoEn + \beta_3 flyers + \beta_4 Maleinfo + \beta_5 Malefly + \beta_6 Company + \beta_7 Compinfo + \beta_8 Compfly + \beta_9 SA + \beta_{10} NA + \varepsilon$$

The result from this regression is also presented in table 9. All variables in this regression are binary variables and the explanation of each variable is further explained in Appendix IX: Explanation of variables.

Our result shows that being a man or a woman has no significant effect on the probability of making a donation, or on the level of the donation. If the visitor enters the park in company of others, there is a significantly higher probability that this visitor will make a donation. As mentioned above, it is important to think about that entering the park in company of others rendered it more likely to receive oral information, which in turn is showed to have a positive effect on the donation. In the conditional OLS model, entering the park in company of others is not significantly different from zero, meaning that company does not seem to have an effect on the level of the voluntary donation. However, receiving oral information clearly has a positive effect on the probability of making a donation, and it has an even bigger positive influence on the level of the donation.

Table 9: Parameters of the Probit model and parameters of the conditional OLS model expected to affect the voluntary donation.

<i>Variables</i>	<i>Coefficient (Probit)</i>	<i>Standard error(Probit)</i>	<i>P-values (Probit)</i>	<i>Coefficient (OLS)</i>	<i>Standard error (OLS)</i>	<i>P-values (OLS)</i>
<i>Constant</i>	-0.02	0.16	0.91	1.92***	0.30	0.00
<i>Male (Male)</i>	0.13	0.13	0.32	0.02	0.25	0.92
<i>Oral information (InfoEn)</i>	0.63***	0.16	0.00	0.70***	0.26	0.01
<i>Information flyer (Flyers)</i>	0.58***	0.16	0.00	1.07***	0.27	0.00
<i>Maleinfo (integrated)</i>	0.16	0.23	0.48	-0.36	0.34	0.30
<i>MaleFly (integrated)</i>	-0.05	0.23	0.82	0.30	0.31	0.42
<i>In company of others (Company)</i>	0.38**	0.17	0.02	0.24	0.30	0.43
<i>Compinfo (integrated)</i>	0.11	0.15	0.45	-0.33	0.23	0.14
<i>CompFly (integrated)</i>	-0.19	0.14	0.19	-0.41**	0.21	0.05

Coefficients are marked with \*\*\* if significant at a 1% level of significance, with \*\* if significant at a 5% level of significance and with \* if significant at a 10% level of significance.

Number of observations in the Probit model: 929. Number of observations in the conditional OLS model: 694.

The information flyer presents exactly the same result. Moreover, our result shows that information, both oral and written, has a positive effect on both the probability of making a donation and the level of the donation. The interacted variables are not significant in the Probit model, but one of the integrated variables is significant in the conditional OLS model, and that is company and flyer (*CompFly*). This means that it has a negative influence on the level of donation if a visitor comes in company and is given a flyer.

### 5.2.3 Estimation of parameters affecting the donation from the questionnaire

To analyze the question; *what affects the visitor's level of the donation?*, we used the data collected from the questionnaire and estimated the parameters in a conditional OLS model under the condition that the respondents have actually made a donation, meaning that Free-riders were excluded. 30% of the respondents were free-riding. Due to this, they are not included in the conditional OLS running.

We ran a correlation test before estimating these parameters, and found that the variables “good deed”, “altruism”, and “social norm” are all highly correlated with “warm-glow”. Hence, we ran the conditional OLS model including only “warm-glow” as a motive behind

voluntary donation. The parameters were estimated in Limdep using a conditional OLS model, where the dependent variable was the actual donation made by the respondent when entering the park. Our result indicates that the only variable that has a significant effect (at a significant level of 5%) on the actual donation, once the visitor made the decision of voluntary donating money to Cahuita national park, is the expected donation of others. This means that for every dollar the visitor expect others' donations to increase, the visitor's own donation will increase with \$0.73 (std. 0.28). This result strengthens the theory of conditional co-operation, more specifically, that the individual's donation is depending on the donation of others, see previous discussion on conditional co-operation in section 2.1.1.2.

**5.2.4 Estimation of psychosocial motives behind voluntary donation**

In this section we further analyze the respondents' motives behind voluntary donation. The mean values of the motives behind why the respondents would voluntary donate money to Cahuita national park, were estimated using Limdep. The result is presented in table 10, where the mean values of the motives behind why other tourists would make a donation is presented as well. The observations differ in the estimations, and this is due to the fact that two of the respondents were not willing to give their opinion about the reasons for others to donate. The standard deviations are presented in the brackets.

Table 10: Mean values of the respondent's motives behind voluntary donation and what the respondent believe is other tourists' motive behind the donation

<i>Motives behind voluntary donation</i>	<i>Mean value respondents (n=59)</i>	<i>Mean value other tourists (n=58)</i>	<i>P-value<sup>1</sup></i>
<i>“Warm glow”</i>	3.47 (0.65)	3.09 (0.57)	0.00
<i>Good deed</i>	3.27 (0.67)	2.95 (0.60)	0.00
<i>Social norm</i>	1.76 (1.06)	2.74 (0.87)	0.00
<i>Altruism</i>	3.68 (0.47)	2.90 (0.74)	0.00

<sup>1</sup>P-values from Wilcoxon Signed Ranked Test

In order to be able to analyze if the respondent is looking at her motives behind giving in the same way as she looks at the motives behind others giving, we ran a Wilcoxon test. Our null hypothesis in the Wilcoxon test is that you look at yourself in the same way that you look at others. This null hypothesis can be rejected at a 1% significance level, meaning that the respondent looks at her own motives behind giving in a different way compared to how she looks at others' motives.

In general, our findings show that the mean value of the social norm (“I donate since other do it as well”) as a motive behind voluntary donation for the respondents, significantly differ from the other motives. More specifically, altruism (“I care about the environment”) seems to be the strongest motive behind the respondent’s voluntary contribution, while social norm (“I donate since others do it as well”) seems to be the weakest. Our analysis of this is that the individuals consider themselves to be socially responsible, but that their behaviour is not dependent on the behaviour of other’s. This indicates that the respondents have a self-image of behaving independently, which is strengthened by the fact that the respondents disagree with “I donate since others do it as well” (social norm) as a reason for donating money to Cahuita national park, but consider it to be a stronger motive for other tourists compared to themselves. Further, our findings show that the mean values behind voluntary donation for other tourists are not varying as much as the mean values for the individual. The explanation might be that the respondent is more secure about the motives behind her own donation, but is more generalizing about others motives. Altruism, however, (“I care about the environment”) seems to be the strongest motive behind the respondent’s voluntary contribution, while the respondent consider that other tourists voluntary contribute because of “warm glow” (“I feel good when I donate to the environment”). Even so, the mean value of the “warm glow” motive in numbers is higher for the respondent’s own motive. Our analysis of this is that the individuals consider others to be more egoistic than them regarding the motives behind voluntary donation.

### **5.3 Result from the choice experiment**

#### **5.3.1 Estimation of the marginal willingness to pay from the choice experiment**

The analysis of the CE data began with an estimation of the parameters of the choice experiment. Parameters of the Probit model were estimated using Limdep. The coefficients, standard errors of the coefficients, and the p-values from the estimation based on the data from the respondents are found in table 11. The total number of observations included in the estimation of this model was 479. One observation is the same as the choice in one choice-set.

Table 11: Parameters of the Probit model expected to affect the voluntary donation from the choice experiment

<i>Variable</i>	<i>Coefficient</i>	<i>Standard error</i>	<i>P-value</i>
<i>Environmentally friendly Toilets and Showers</i>	0.54***	0.11	0.00
<i>Information</i>	0.05	0.67	0.47
<i>Entrance Fee</i>	-0.10***	0.20	0.00
<i>Donations are welcome</i>	0.18*	0.10	0.08

Coefficients are marked with \*\*\* if significant at a 1% level of significance, with \*\* if significant at a 5% level of significance and with \* if significant at a 10% level of significance.  
Number of observations: 479

The estimation shows that all attributes except information have an effect on the choice being made between alternative A and B. This can be rejected for all the attributes except information, hence, the coefficient *Information* is not significantly different from zero, indicating that the amount of available information inside the park is unimportant for the respondent when making her choice between alternative A and B in a choice-set. The estimated significant coefficients are indicating the probability for an alternative to be chosen. If the alternative includes a higher level of environmentally friendly toilets and showers, this increases the probability of choosing this alternative with 54 %. The probability of choosing an alternative which allows donation is positive with 18 %. The probability of choosing an alternative decreases with 10 % for each increase in the level of the fixed entrance fee.

We are interested in the mean marginal willingness to pay for the different attributes because it can be of interest for policy makers. By using the models below we estimated the mean marginal willingness to pay, result presented in table 12.

$$(13) \quad meanMWTP_{ToSh} = -\frac{\beta_i}{\beta_f} = -\frac{0,54}{-0,10} = \$5,40$$

$$(14) \quad meanMWTP_{Info} = -\frac{\beta_i}{\beta_f} = -\frac{0,05}{-0,10} = \$0,50$$

$$(15) \quad meanMWTP_{AllDon} = -\frac{\beta_i}{\beta_f} = -\frac{0,18}{-0,10} = \$1,80$$

Table 12: Mean marginal willingness to pay (Mean MWTP)

Attributes	Mean MWTP
Toilets and Showers	\$5.40
Information	\$0.50
Allowed donation	\$1.80

The estimated marginal willingness to pay for each attribute shows us that the respondents are willing to pay \$5.40 to increase the numbers of environmental friendly toilets and showers

inside the park. Due to an increased supply of information inside the park, such as small signs along the trail inside the park, the marginal willingness to pay is \$0.50. Remember that this result is not significantly different from zero. Our former results showed that the possibility of making a donation had a positive impact on the probability of choosing that alternative. Visitors tend to be positive about the system of voluntary contribution. This is not very surprising since the visitors are then in control of how much they want to give and the services in the park can also be chosen to be used for free. Another explanation could simply be that the visitors like the idea of a system of voluntary donation.

We also analyzed the choice experiment by examining if the respondents have any lexicographic preferences toward the price attribute, the *entrance fee*. Only 13% of the respondents are lexicographic in their behavior towards the entrance fee. This means that these respondents always choose the alternative with the lowest entrance fee. One explanation for a lexicographic behavior could be that focusing only on one of the four attributes makes the choice cognitively easier for the respondent. Another explanation could be the design of the choice experiment. In our study we used a cyclical design which gave us choice-sets where the entrance fee always followed a cyclical order. The trouble with this design, as mentioned in section 4.4.2, is that it could encourage a lexicographic behavior towards the entrance fee in the choice-sets where one alternative has 0 dollar as the fixed entrance fee, while the other has 7 dollars.

## **6 Conclusions and discussion**

This study, as many studies before ours, has tried to explain the reasons and motives behind why individuals voluntarily contribute to an environmental public good. According to neo-classical economic theory, it is not in a rational and selfish individual's own interest to voluntarily donate money to a public good. But most of the visitors entering Cahuita national park are actually donating voluntarily. Our study shows, that even with a system of voluntary donation, the park could increase its revenue by increasing the amount of the voluntary donations or/and by decreasing the number of free-riders. This study shows that by distributing information flyers with information about the system of voluntary donation, the average entrance fee to other parks in Costa Rica (\$6), and what the money is used for, the average voluntary donation increases by almost 100% and the free-riding is decreasing drastically. To include the average entrance fee in the information is proved by both Jones and McKee (2004), and Richard and Randal (2005) to have a positive effect on the giving of the individual. Distributing written information is combined with a cost, which in turn would reduce this potential revenue to the park. Our suggestion to the park is therefore to have a permanent sign with this information at the entrance to the park since this is a one time cost alternative. Another alternative is to give oral information to all the visitors, when getting registered at the entrance to the park. Oral information is given today, but only to some of the visitors, and we recommend that oral information should be given to all the visitors, but we cannot know for sure how people will react to the information.

The voluntary donation level for a visitor to Cahuita national park is, among other things, depending on how the level of contribution of other people is expected to be. This result supports that one motive behind one individual's contribution is that the individual is acting pro-socially (Heldt, 2005). Our study shows that the higher the individual's expectation is on others' donations, the higher the donation of the individual will be. This behaviour is referred to as conditional co-operation, implying that individuals are behaving pro-socially depending on the pro-social behavior of others (Frey and Meier, 2004). Since most of the visitors are voluntarily giving a donation to Cahuita national park, we argue that this strengthens the findings that claim that an individual gains utility from both the increase of the supply of the public good, and from the actual giving when contributing voluntarily to an environmental public good (Andreoni, 1990), in this case Cahuita national park. This result further indicates

that there is a social norm, namely that of contributing to an environmental public good. Social norms are created by society: they are unwritten rules telling us what behavior is socially accepted. One way to strengthen this social norm, and to raise the revenues to the park, could be to make the donation non-anonymous (Croson and Marks, 1998). Thus, we recommend including the donation made by the visitor in the registration book, so that all visitors can see the prior donations made by others. Giving oral information is another way to make the act of giving less anonymous. When oral information is given, the visitor is identified to a higher extent, and our result shows that this gives a lower level of free-riding. There are other motives affecting the individual's contribution. The individuals stated that the strongest motive behind their giving is altruism: they donated since they care about the environment. The difference between the different motives, "warm-glow", altruism and good deed, is not great. Our result therefore strengthens Hur's (2006) findings that people are ambivalent when making a voluntary donation since they give both to express their social and individual good qualities (social norm, good deed and altruism), and to satisfy their selfishness ("warm-glow").

In the choice experiment, we found the marginal willingness to pay to be positive for a larger number of services in Cahuita national park. The marginal willingness to pay for an increase in the numbers of available environmentally friendly toilets and showers inside the park is \$5.40. The marginal willingness to pay for an increase in the information available inside the park is \$0.50. The conclusion to be drawn from this is that the park management is recommended to consider an increase in facilities, such as environmentally friendly toilets and showers, by conducting a cost benefit analysis. Visitors to Cahuita national park have a low marginal willingness to pay for more information about the park. This could be due to the fact that visitors are satisfied with the information that they receive today, or that they find it disturbing with information signs along the trail. The marginal willingness to pay for the system of voluntary donation is \$1.80.

Today, a visitor entering Cahuita national park, through sector Playa Blanca, gives an average voluntary donation of \$1.12. In order to finance the protection and the maintenance of natural resources, the revenue to the park has to increase. It is not difficult to understand that a fixed entrance fee, even with high price elasticity, would increase the revenue to the park. One of the spill-over effects that the local community's economy gains from is the duration of the visit to Cahuita. Today the average duration of a tourist's stay in Cahuita is almost four days.

With a fixed entrance fee the local community is worried that this duration would be negatively affected, and they are therefore not very fond of the idea of a fixed entrance fee. We still recommend the park to have a small fixed entrance fee, but to open up for possibilities of different types of day- and week-passes which might reduce a possible negative duration effect. Even though the payment system of voluntary donation is not profitable for the park, the positive marginal willingness to pay for the system and our observations show that the visitors are positive to the system of voluntary donation. With comments like “donations should always be allowed”, we believe that the system of voluntary contribution could actually work in combination with a fixed entrance fee. This is a system where a fixed entrance fee is combined with a voluntary donation system. There is a potential crowding-out effect of the voluntary donation in a mixed payment system, and more research is needed to investigate this further. However, we would still recommend the park authorities in Costa Rica to open up for the system of voluntary donation as a complement to the fixed entrance fee.

## **Epilogue**

After this study was conducted some changes has been made in the park. We recommended the park to include the donation made by the visitor entering Cahuita national park, through sector playa Blanca. Today, the registration book has been extended with a column where the visitors are writing down their donation made. Further, new environmentally friendly toilets and showers have been built and are now in use.

This study has also been used as the pilot study for further research to find ways for sustainable management and financing of protected areas. This research is also conducted in Cahuita national park, Costa Rica.

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APPENDIX I: Map Conservation areas in Costa Rica

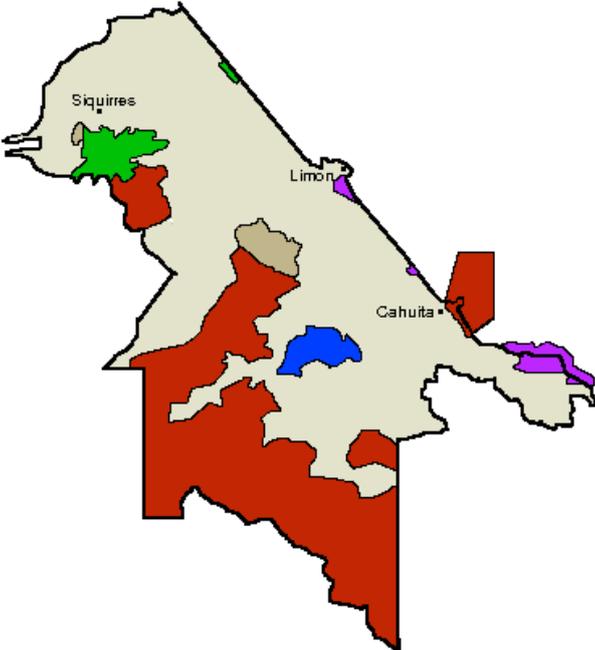
**A map of the conservation areas in Costa Rica**

Costa Rica has 10 different conservation areas. Cahuita national park is the area ACLA-C (Caribbean La Amistad Conservation Area).



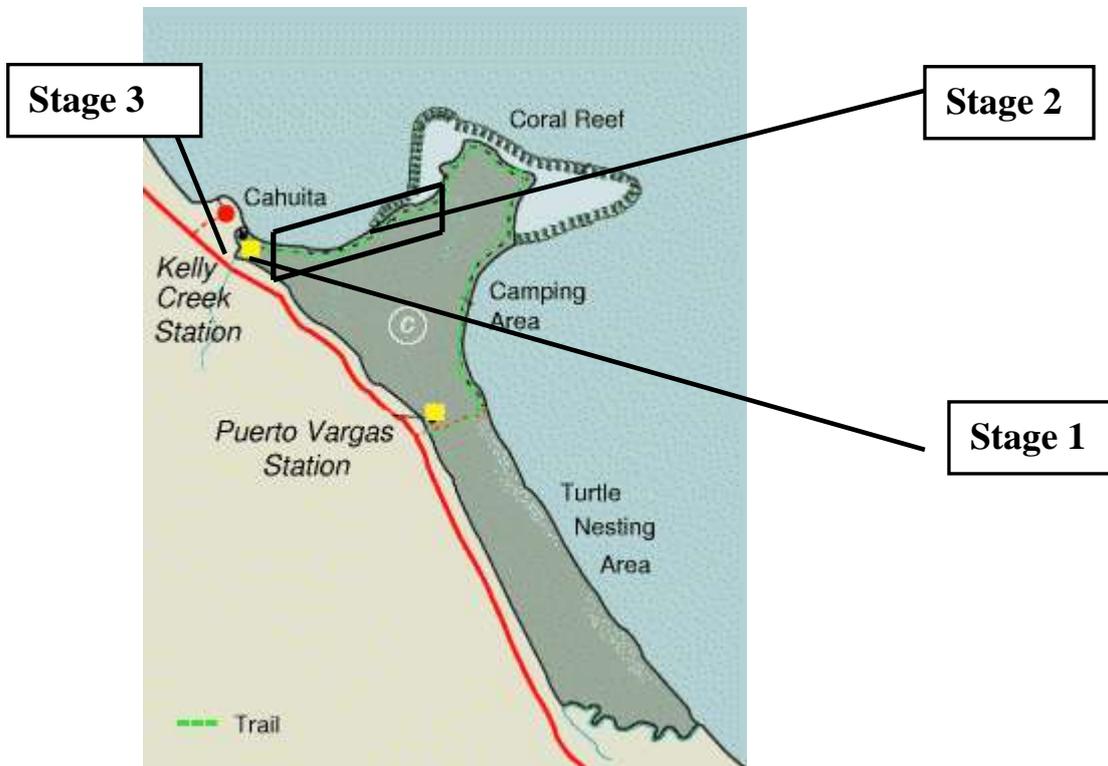
<http://www.costarica-nationalparks.com/>, 070907.

Cahuita national park is situated on the coastline near the border to Panama. Map showing the area ACLA-C:



<http://www.costarica-nationalparks.com/caribbeanlaamistadconservationarea.html>, 070907.

## Map of Cahuita National park



<http://www.costarica-nationalparks.com/cahuitanationalpark.html> 070907

This study was made in three stages. Data about all the visitors' nationalities, gender and actual donation was collected from Stage 1 (at the entrance) all weeks. At stage 1, one of us selected a number of representative visitors who were interviewed at stage 2, inside the park. The written information about the payment system of voluntary donation was distributed to all the visitors before entering the park at stage 3.



Q6. *What is your main purpose for visiting Costa Rica? (DO NOT READ OPTIONS BUT MARK THE CORRECT ANSWER, YOU CAN MARK SEVERAL OPTIONS)*

- Work                                       Holiday                                       Study  
 Voluntary work                               Other.....  
(WRITE DOWN ANSWER)

Q7. *What is your main purpose for visiting Cahuita national park today? (DO NOT READ OPTIONS BUT MARK THE CORRECT ANSWER, YOU CAN MARK SEVERAL OPTIONS)*

- The beach                                       Trekking                                       See animals  
 Photographing                                       Other.....  
(WRITE DOWN ANSWER)

Q8. *Is Costa Rica the only country you are visiting during this trip?*

- Yes                                       No → *How long is your trip in total? .....*  days /  weeks (CODE THE DURATION IN DAYS)

Q9. *For how long are you staying in Costa Rica? .....*  days /  weeks (CODE THE DURATION IN DAYS)

Q10. *How many other national parks have you visited during this trip to Costa Rica?.....*  
national parks

Q11. *How many times have you visited Cahuita national park, including this one?*  
..... times

Q12. *How many days are you planning to stay here in Cahuita? .....* days

Q13. *How would you describe your general expectations of your visit here in Cahuita national park?*

(READ OUT THE OPTIONS AND MARK THE CORRECT ANSWER):

- Very high  
 High  
 Neither high nor low  
 Low  
 None

Q14. *Would you say that your expectations have been fulfilled so far? (DO NOT READ OPTIONS BUT MARK THE CORRECT ANSWER)*

- More than expected                       As expected                       No  
 No, definitely not                       No opinion

Q15. *Do you know how much the average entrance fee is in other national parks in Costa Rica?*

- No                       Yes → ..... Colones, or .....US dollars  
(WRITE DOWN THE AMOUNT)

Q16. *How much do you generally spend on accommodation per night per person?*  
..... Colones, or ..... US dollars

## **SECTION B: CHOICE EXPERIMENT**

*I will soon present four cards to you, one at a time. (SHOW THE RESPONDENT THE EXAMPLE CARD). And here can you see an example. As you can see here on the example card, each card will have two different alternatives. Each alternative describes how Cahuita National Park could look like next time you visit it. For each card, your task is to choose the alternative that you prefer. The alternatives are described by different characteristics and they are explained on this card (GIVE THE RESPONDENT THE CARD WITH THE EXPLANATION OF THE CHARACTERISTICS). Some of them already exist today while others don't. As you can see there are five characteristics with different levels.*

- 1. The first characteristic is environmentally friendly toilets and showers. This could either mean toilets and showers by the entrance or toilets and showers by the entrance as well as in Punta Cahuita. (POINT OUT PUNTA CAHUITA)*
- 2. The next characteristic is information which is general information about Cahuita national park, information about the animals and plants you can see in the park, about the coral reef and about the trail. There are three different levels of the information provided. Information provided by signs at the entrance and in Punta Cahuita, information provided by signs at the entrance and small signs along the trail, which includes Punta Cahuita, and information provided by signs at the entrance, small signs along the trail, which again includes Punta Cahuita, but also information brochures for free at the entrance.*
- 3. Next you have the entrance fee per person which is a fixed amount of money that you have to pay when you enter the park. There are five different levels of the entrance fee. 0 US dollar, 1 US dollar, 3 US dollars, 5 US dollars or 7 US dollars.*
- 4. The final characteristic is the donation which allows voluntary donation to the park at the entrance. Here you have two different levels. No donation is allowed or donations are welcome.*

*(GO BACK TO THE EXAMPLE CARD AND EXPLAIN IT) Let's go back to the example card again. In this case Alternative B has more information provided than Alternative A, as you can see here (POINT ON THE CARD). On the other hand Alternative A has more environmentally friendly toilets and showers available inside the park (POINT ON THE CARD). As you can see the entrance fee per person in Alternative A is 3 USD and in Alternative B it's 7 USD (POINT ON THE CARD). In Alternative A donations are welcome while it is not in Alternative B. If the alternative that you preferred have "donations are welcome", as in Alternative A here, I will ask you how much you maximum would like to donate to this alternative.*

*Do you have any questions? I will now start with the first card. Imagine that each alternative describes how Cahuita national park could look like next time you visit it. Look at each alternative and tell me which one that you prefer. Please, take your time!*

*(SHOW ONE CHOICE-SET CARD AT THE TIME, TOTAL AMOUNT OF CHOICE-SETS ARE FOUR)  
You have chosen an alternative where "donations are welcome" –If your situation is just as it is today, how much would you maximum have donated to this alternative? (REMIND THE RESPONDENTS OF THE FIXED ENTRANCE FEE THAT HAS TO BE PAID PER PERSON)*

*(FILL IN THE NUMBER OF THE CHOICE-SET CARD THAT YOU SHOW THE RESPONDENT. FILL IN THE ALTERNATIVE THAT THE RESPONDENT CHOOSES. IF THE ALTERNATIVE THAT THE RESPONDENT HAS CHOSEN HAS THE LEVEL OF "DONATIONS ARE WELCOME", ASK THE RESPONDENT IF HE/SHE WANTS TO MAKE A DONATION AND FILL IN THE AMOUNT THAT THE RESPONDENT MAKES. FILL IN ZERO IF THE RESPONDENT DOESN'T WANT TO MAKE A DONATION)*

Choice-set number				
Chosen alternative				
Donation made (if possible)				

**SECTION C: PSYCHOSOCIAL**

Q17. When you entered Cahuita national park today, did you make a donation?  
 No  Yes → How much did you donate? .....  
Colones, or .....US dollars

DOWN THE AMOUNT)

(WRITE

Q18. How much do you think other visitors on average donated when entering Cahuita national park?

..... Colones, or .....US dollars  
(WRITE DOWN THE AMOUNT)

(IF THE RESPONDENT DIDN'T MAKE A DONATION DO THE NEXT SECTION HYPOTHETICAL)

I will now show you a card with different statements describing reasons for donating money to Cahuita National Park. How strongly do you agree or disagree with each of the following statements?

(SHOW THE RESPONDENT THE DIFFERENT STATEMENTS ON A PLASTIC CARD. MARK THE OPTION THAT THE RESPONDENT MAKE)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<i>I feel good when I contribute to the environment</i>					
<i>I want to do something good</i>					
<i>I donate since others do it as well</i>					
<i>I care about the environment</i>					

Now I would like you to do the same procedure but instead state how strongly you think other tourists visiting Cahuita National Park agree or disagree with the same statements?

(SHOW THE RESPONDENT THE DIFFERENT STATEMENTS ON A PLASTIC CARD. MARK THE OPTION THAT THE RESPONDENT MAKE)

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
<i>They feel good when they contribute to the environment</i>					
<i>They want to do something good</i>					
<i>They donate since others do it as well</i>					
<i>They care about the environment</i>					

That was everything! Thank you so much for your participation! Have a nice day!



APPENDIX V: The information flyer in English and Spanish

**The information flyer in English**

Welcome to Cahuita National Park  
Costa Rica

**Dear Visitor,**  
Sector Playa Blanca in Cahuita National Park has a system of voluntary contribution instead of a fixed entrance fee, as in other parks in Costa Rica. The average fee in other parks is \$6. Your contribution will mainly be used for the maintenance of the park, management and protection of natural resources but also for projects in the local community.

*Please, contribute!  
You can make a difference!*

A treasure from nature in the caribbean

**The information flyer in Spanish**

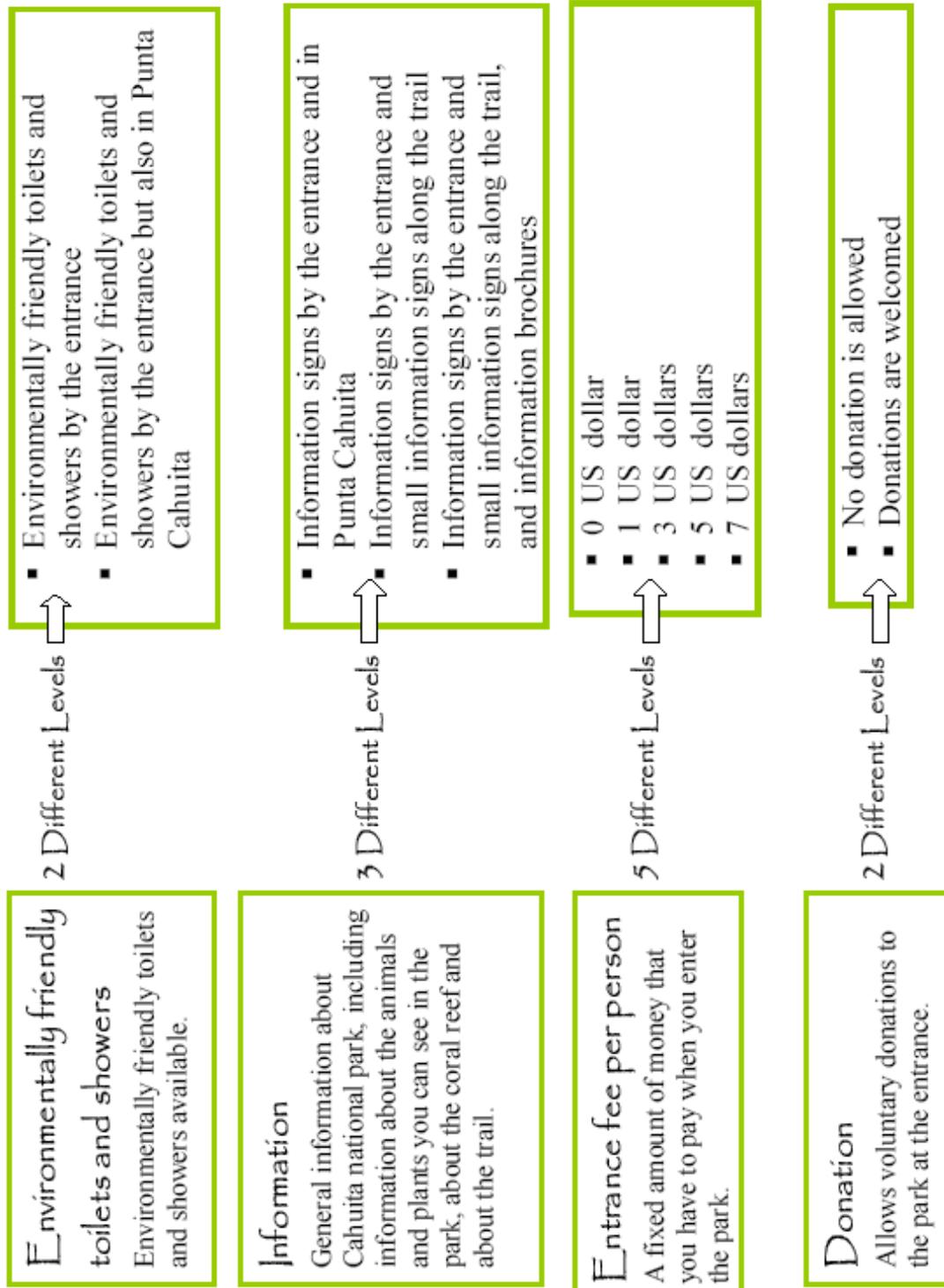
Bienvenidos al Parque Nacional Cahuita  
Costa Rica

**Estimado visitante,**  
A diferencia de los demás parques nacionales en Costa Rica, el Sector de Playa Blanca del Parque Nacional Cahuita cuenta con un sistema de contribuciones voluntarias en lugar de una tarifa fija. El promedio de entrada en los demás parques es de \$6. Su contribucion será utilizada para el mantenimiento del parque, para el manejo y protección de recursos naturales, y también para llevar a cabo proyectos en las comunidades de la localidad.

*Favor contribuya!  
Usted puede hacer la diferencia!*

Un tesoro de la naturaleza en el Caribe.

APPENDIX VI: Respondent card for the attributes and levels



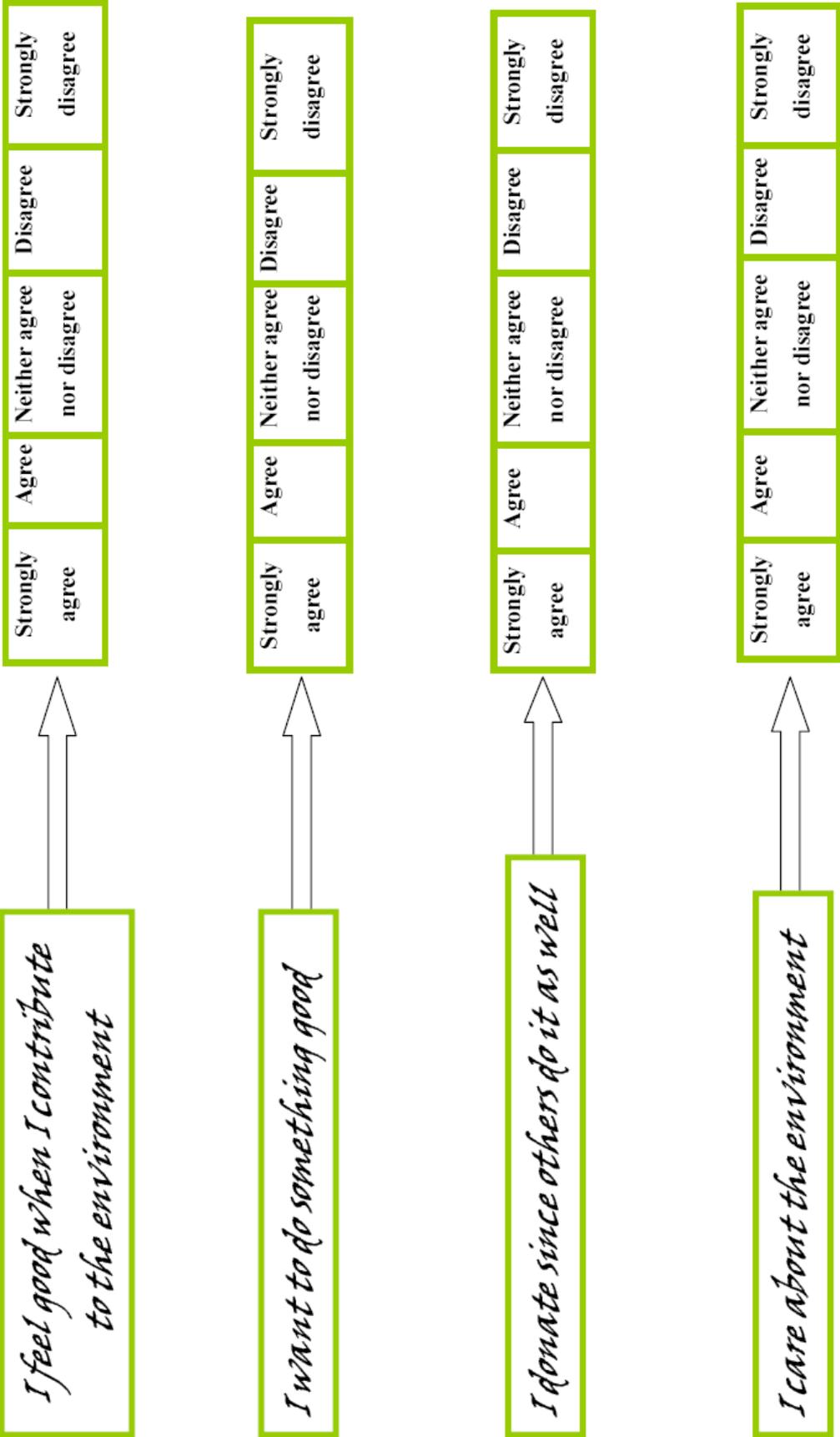
APPENDIX VII: Respondent card, example of a choice-set

EXAMPLE CARD

Characteristics	Alternative A	Alternative B
Environmentally friendly toilets and showers	By the entrance and in Punta Cahuita	By the entrance
Information	Information signs by the entrance and in Punta Cahuita	Information signs by the entrance, small information signs along the trail and information brochures
Entrance fee per person	\$3	\$7
Donation	Donations are welcomed	No donation is allowed

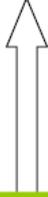
Which alternative would you prefer?

APPENDIX VIII: Respondent card for the psychosocial motives



Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
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*They feel good when they contribute to the environment*



Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

*They want to do something good*



Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
----------------	-------	----------------------------	----------	-------------------

*They donate since others do it as well*



Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
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*They care about the environment*



## Appendix IX: Explanation of variables

### Variables explanation

Description of the variables used in the Choice Experiment, the Questionnaire and the registration sheet.

Variable name	Description
IdCNP	An Id number to match the respondents with the actual voluntary donation. The survey id CNP is the same at both the questionnaire and the registration sheet.
Ind	Individual 1-60 in the Choice experiment.
Block	The number of the choice block used, 1-4.
Ceset	The number of the choice-set used, 1-4.
ToSh	Environmentally friendly toilets and showers available, inside the park, in the Choice experiment. 0=by the entrance 1=by the entrance and in Punta Cahuita
Info	Information available, inside the park, in the Choice experiment 0=by the entrance 1=by the entrance and along the trail 2=by the entrance, along the trail and brochures
Fee	Amount of money, in US dollar (500 colones=\$1), of fixed entrance fee in the choice experiment.
AllDon	Allows for donation in the choice experiment. 1=donations are welcome 0=no donation is allowed
Choice	The respondents choice in the choice experiment. 1=chosen 0=not chosen
CEDon	Amount of money, in US dollar (500 colones=\$1), donated to the alternative that allows for donation, in the choice experiment.
TimeEn	Time of entering the park.
Time	Time of interview.
Date	Date of interview.
Name	Name of the interviewer. 1=Ida Hellmark 0=Anna Nordén
Male	Gender. 1=male 0=female blanc=child
AdultM	Amount of male adults present during the interview. 0=None
AdultF	Amount of female adults present during the interview. 0=None
Children	Amount of children present during the interview. 0=None
Nation	Country of origin. See Country codes.
Age	Age of the respondent.
OccEm	Occupation employee. 1=employee 0=other

OccSt	Occupation student. 1=student 0=other
OccUn	Occupation unemployed. 1=unemployed 0=other
OccMa	Occupation manager. 1=manager 0=other
OccRe	Occupation retired. 1=retired 0=other
OccOt	Occupation is other than above. 1=other than above 0=other
EduNo	No formal education level. 1=no formal education 0=other
EduPri	Completed education level primary school 1=completed primary 0=other
EduSec	Completed education level secondary school, 1=completed secondary 0=other
EduUnD	Education level university level without degree, 1=university without degree 0=other
EduUD	Education level university level with degree, 1=university with degree 0=other
EduOt	Education level other than above 1=other than above 0=other
Rel	The respondent is religious. 1=yes 0=no
PurWork	Purpose of visiting Costa Rica is work. 1=work 0=other
PurHoli	Purpose of visiting Costa Rica is holiday 1=holiday 0=other
Purstud	Purpose of visiting Costa Rica is study. 1=study 0=other
PurVol	Purpose of visiting Costa Rica is voluntary work 1=voluntary work 0=other
PurOt	Purpose of visiting Costa Rica is other than above 1=other than above 0=other
CaPurBe	Purpose of visiting Cahuita national park is the beach 1=beach 0=other
CaPurTr	Purpose of visiting Cahuita national park is trekking. 1=trekking 0=other

CaPurAn	Purpose of visiting Cahuita national park is to look for animals 1=animals 0=other
CaPurPh	Purpose of visiting Cahuita national park is photographing 1=photographing 0=other
CaPurOt	Purpose of visiting Cahuita national park is other than above 1=other 0=other
CostaR	Costa Rica is the only country visited during this trip 1=yes 0=no
DurTo	Length of the total trip in days, if the respondent is visiting other countries during this trip.
Trip	Length of trip in days of the trip in Costa Rica.
Parks	Amount of other parks visited in Costa Rica before coming to Cahuita national park.
Times	Amount of times visited Cahuita national park including this visit.
DurCa	Duration of this visit to Cahuita in days.
ExpVH	Expectations before visiting Cahuita national park were very high. 1=yes 0=no
ExpH	Expectations before visiting Cahuita national park were high. 1=yes 0=no
ExpHL	Expectations before visiting Cahuita national park were neither high nor low. 1=yes 0=no
ExpL	Expectations before visiting Cahuita national park were low. 1=yes 0=no
ExpNone	No expectations before visiting Cahuita national park. 1=yes 0=no
FullME	Expectations fulfilled more than expected. 1=yes 0=no
FullE	Expectations fulfilled as expected. 1=yes, 0=no
FullN	Expectations not fulfilled 1=yes 0=no
FullND	Expectations definitely not fulfilled 1=yes 0=no
FullNo	No opinion 1=yes 0=no
EntFee	Knowledge about the average entrance fee to other parks in Costa Rica. Amount of the average entrance fee in US dollar (500 colones=\$1). Blanc=no
Accom	Amount of money, in US dollar (500 colones=\$1), spent per night per person on accommodation.
ResDon	Amount of money, in US dollar (500 colones=\$1), the respondent says are donated at the entrance to the park.
OtDon	Amount of money, in US dollar (500 colones=\$1), the respondent thinks that others donated at

	the entrance to the park.
WarmGlow	The respondent donate money to Cahuita National Park because of warm-glow. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
GoodDeed	The respondent donates money to Cahuita National Park because of a good deed. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
SocNorm	The respondent donate money to Cahuita National Park because of social norm. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
Altruism	The respondent donate money to Cahuita National Park because of altruism. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
OtWG	Other tourists donate money to Cahuita National Park because of warm-glow. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
OtGD	Other tourists donate money to Cahuita National Park because of a good-deed. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
OtSN	Other tourists donate money to Cahuita National Park because of social norm. 4=strongly agree 3=agree, 2=Neither agree nor disagree, 1=Disagree 0=strongly disagree
OtA	Other tourists donate money to Cahuita National Park because of altruism. 4=strongly agree 3=agree 2=Neither agree nor disagree 1=Disagree 0=strongly disagree
ActDon	Actual voluntary donation made, in dollars (500 colones=\$1), by the respondent/the visitor at the entrance to Cahuita national park (registration sheet)
ActDonCo	Actual donation made, in dollars (500 colones=\$1), by the respondent/the visitor at the entrance to Cahuita national park (registration sheet), corrected for several visits to analyze the free-riders.
Child	The amount of children that the visitor has when register.
Group	The visitor is part of a group, a group is more than one person that not goes under the definition family. 1=yes 0=no
Fam	The visitor is part of a family, family is one man and one woman coming together with or

	without children. 1=yes 0=no
Paid	The visitor who actually paid the donation (taking out the wallet) 1=paid 0=did not pay
InfoEn	The visitor received oral information about the system of voluntary donation by the entrance. 1=yes 0=no
Flyers	The visitor received a flyer with information about the system of voluntary donation. 1=yes 0=no

Description of the dummy variables created in LimDep.

Comp	In company of others during the interview. 1=if (AdultM=1 or AdultF=1 or children>0) 0=no company
Company	In company of others during the registration. 1=if (Fam=1 or Group=1 or children>0) 0=no company
NA	Origin from USA or Canada
EU	Origin from country in Europe (including South Africa, New Zealand, Israel, Korea and Australia).
SA	Origin from country in South America.
W	Working. 1=if (OccEm=1 or OccMa=1) 0=non-working
NW	Non-working. 1=if (OccUn=1 or OccRe=1 or OccOt=1) 0=working
LE	Low education, completed secondary school or lower. 1=if (EduNo=1 or EduPri=1 or EduSec=1) 0=higher education
HE	High education, higher than secondary school. 1=is (EduUnD=1 or EduUD=1) 0=lower education
Bud	Budget accommodation. 1=if (Accom<\$10) 0= Accom>\$10
M	Middle accommodation 1=if (\$10<Accom <\$20) 0=other
L	Luxury accommodation 1=if (Accom>\$20) 0=Accom<\$20
Short	Short trip 1=if (Trip<15 days) 0= long trip
Long	Long trip 1=if (Trip>15 days) 0=short trip
Exp	Expectation of Cahuita national park are either very high or high. 1=if(ExpVH=1 or ExpH=1) 0= lower expectations that high
LowExp	Expectation of Cahuita national park are lower than high. 1=if (ExpHL=1 or ExpL=1 or ExpNone=1) 0=high expertations
PurStV	Purpose of visiting Costa Rica are studies or voluntary work.

	1=if (PurStud=1 or PurVol=1) 0=purpose is other
CaPurPO	Purpose of visiting Cahuita national park is either photographing or other. 1=if (PurCaPh=1 or PurCaOt=1) 0=purpose is other
CaPurAn	Purpose of visiting Cahuita national park is either see animals or trekking. 1=if (PurCaAn=1 or PurCaTr=1) 0=purpose is other
CaPurOB	Purpose of visiting Cahuita national park is other than going to the beach. 1=if (PurCaBe=0) 0=PurBe=1
EntKnow	The respondent has knowledge about the entrance fee to other parks in Costa Rica. 1= if (EntFee>0) 0=EntFee=0
VP	Visited other parks before Cahuita national park. 1=if (Parks>0) 0=Parks=0
Cbefore	Visited Cahuita national park before 1=if (Times>1) 0=Times =1
Don	Voluntary donation at the entrance to Cahuita national park is made 1=if (ActDon>0) 0=ActDon=0

Description of the integrated dummy variables created in LimDep.

MaleInfo	1=if (Male=1 and InfoEn=1) 0=Male=0 or/and InfoEn=0
MaleFly	1=if (Male=1 and Flyers=1) 0= Male=0 or/and Flyers=0
CompInfo	1= if (Company=1 and InfoEn=1) 0= Company=0 or/and InfoEn=0
CompFly	1=if (Company=1 and Flyers=1) 0= Company=0 or/and Flyers=0

Appendix X: The result from SAS.

<i>Obs</i>	<i>Block</i>	<i>Toilets &amp; Showers</i>	<i>Information</i>	<i>Entrance fee</i>	<i>Donation</i>
1	1	By the entrance	Information by the entrance, along the trail and information brochures	\$7	No donation is allowed
2	1	By the entrance and in Punta Cahuita	Information by the entrance and in Punta Cahuita	\$5	No donation is allowed
3	1	By the entrance	Information by the entrance, along the trail and information brochures	\$1	Donations are welcome
4	1	By the entrance and in Punta Cahuita	Information by the entrance and along the trails	\$3	Donations are welcome
5	2	By the entrance	Information by the entrance and along the trails	\$0	No donation is allowed
6	2	By the entrance and in Punta Cahuita	Information by the entrance and along the trails	\$7	Donations are welcome
7	2	By the entrance and in Punta Cahuita	Information by the entrance, along the trail and information brochures	\$5	No donation is allowed
8	2	By the entrance and in Punta Cahuita	Information by the entrance and in Punta Cahuita	\$1	Donations are welcome
9	3	By the entrance and in Punta Cahuita	Information by the entrance and in Punta Cahuita	\$0	Donations are welcome
10	3	By the entrance and in Punta Cahuita	Information by the entrance and along the trails	\$1	No donation is allowed
11	3	By the entrance	Information by the entrance, along the trail and information brochures	\$3	Donations are welcome
12	3	By the entrance	Information by the entrance and in Punta Cahuita	\$7	Donations are welcome
13	4	By the entrance and in Punta Cahuita	Information by the entrance, along the trail and information brochures	\$0	Donations are welcome
14	4	By the entrance	Information by the entrance and along the trails	\$5	Donations are welcome
15	4	By the entrance and in Punta Cahuita	Information by the entrance, along the trail and information brochures	\$7	No donation is allowed
16	4	By the entrance	Information by the entrance and in Punta Cahuita	\$3	No donation is allowed