

ASSESSING TOURISTS' PREFERENCES FOR RECREATIONAL AND ENVIRONMENTAL MANAGEMENT PROGRAMS CENTRAL TO THE SUSTAINABLE DEVELOPMENT OF A TOURISM AREA IN THE DOMINICAN REPUBLIC

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(Received 22 October 2001; accepted 24 May 2002)

Abstract. The main goals of this paper are to (1) highlight the need for sustainable development as a means to conserve natural resources and the environment, which often represent the basis for tourism development, (2) illustrate the importance of assessing tourists' preferences when designing programs and policies central to the sustainable development of a tourism area, and (3) study tourists' interests in sustainable development. With these goals in mind, 180 tourists from Europe, Latin America, and North America were interviewed as they were leaving the resort region of Punta Cana in the Dominican Republic. The main factors that they considered when deciding where to go on a beach vacation were evaluated, as well as their preferences regarding four programs designed to improve recreational and environmental management of the area. Preferences by tourists were elicited both in monetary and non-monetary terms. This paper reports the non-monetary analysis of the data. The results indicate that clean ocean water and beaches, quality of services, and price are the most important factors considered by the respondents before deciding to come to Punta Cana. It was not possible to obtain reliable responses on how tourists perceived the four programs contributing to the sustainable development of Punta Cana. Nevertheless, they expressed high interest and willingness to pay for two of these programs: the outdoor aquarium and the Water Management Program. The results reported in this paper show how important it is to elicit tourists' preferences of programs central to the sustainable development of tourism areas since these preferences can drive managers' development decisions in more sustainable directions.

Key words: botanical garden, Caribbean region, recreational services, responsible management, sustainable development, sustainable tourism, tourists' preferences, water management.

Abbreviations: CAST – Caribbean Alliance for Sustainable Tourism; GDP – Gross Domestic Product; HSD – Tukey's Studentized Range Test; LA – Latin America; NICs – Non-Industrialized Countries; NA – North America; UNEP – United Nations Environmental Program; USA – United States of America; WTTC – World Travel and Tourism Council; WTO – World Travel Organization.

1. Introduction

In 2001, international tourist arrivals reached 689 million, nearly 1% less than in 2000. During the first eight months of 2001 tourism arrivals grew at a rate of 3% (about 1% less than the average annual growth of 4% over the past ten years), but during the last four months it suffered a drop of 11%. The 11 September 2001 terrorists' attacks in the USA and the world economic slowdown are some of the



causes for this decrease. Nevertheless, the WTO predicts that the tourism industry will re-establish its normal pattern by the second semester of 2002 (WTO, 2002).

Although many NICs have experienced high rates of growth in tourism, they have minor shares of global arrivals and receipts. For example, in 1996, Europe accounted for 59% of world arrivals and 51% of total receipts worldwide, USA and Canada accounted for a further 11% of arrivals and 17% of receipts, while Latin American countries accounted for only 9% of world tourist arrivals and 8% of receipts (Sinclair, 1998).

In the Caribbean Region, tourism represents one of the most important means for both economic growth and management of environmental and natural resources. Between 1980 and 1996, tourist arrivals in this region more than doubled, between 1999 and 2000 tourism grew at a rate of 7% while between 2000 and 2001 it dropped by nearly 4% (CAST, 2000; WTO, 2002).

Since 1990, tourism has been one of the sectors that has made economic growth possible and has helped to offset the trade deficit in the Dominican Republic. Between 1990 and 1994, the Dominican Republic experienced growth in tourism of 14% and by late 1996, it was one of the five Caribbean destinations that had more than 10,000 hotel rooms (CAST, 2000). During 2001 tourism arrivals grew by 8.6%, but in 2001 the rate of growth decreased to 5.5% (WTTC, 2001; WTO, 2002).

Tourism can benefit NICs by providing a return from their natural resources, but tourism also has its costs. In the Caribbean Region, tourism's major environmental impacts are linked to all sub-sectors of the tourism industry, especially to construction and operation of facilities, as well as recreation. In the operational sub-sector, sewage and solid waste disposal have the highest impact (UNEP, 1997). Studies have indicated that the lack of sewer systems in this region has resulted in a proliferation of treatment plants, and as a consequence hotels and resorts operate half of the wastewater treatment plants. Nevertheless, 75% of these wastewater plants do not comply with the selected criteria for good operation. The report also noted that 80–90% of the sewage was inadequately treated and disposed (Pan-American Health Organization 1992, 1994 [cited by Island Resources Foundation, 2000]).

1.1. TOURISM AS A MEANS FOR SUSTAINABLE DEVELOPMENT IN THE CARIBBEAN REGION

Natural resources and the environment are the primary basis for tourism in the Caribbean Region, and tourism development takes place mainly in coastal areas, which are very sensitive to pollution and other human impacts. If the environmental problems highlighted above are not addressed and sustainable goals are not given high priority, short-term market goals could lead to the deterioration of the environmental resources.

Tourism planners worldwide are realizing that there is a need to establish such a balance and that sustainable development or management may be a way to achieve this goal. For example, the WTTC, the leading global coalition of travel and tourism

experts, promotes travel and tourism as a catalyst for local level sustainable development (WTTC, 1998). In the Caribbean Region, one initiative that expresses this interest, for example, is the CAST which is a non-profit organization whose main goal is to enhance tourism operation in the region by providing training related to sustainable tourism, and to serve as a liaison between all stakeholders interested in this type of tourism. The link between market competitiveness and sustainable tourism is very reasonable, especially when the tourism industry depends on the uniqueness of environmental resources, as in the Dominican Republic. In these cases, the resources must be managed in a sustainable manner to continue to draw tourists.

1.2. THE CONCEPT OF SUSTAINABLE DEVELOPMENT

It is clear that both global and regional tourism organizations are interested in sustainable development. Nevertheless, it is not clear if they are all adopting the same definition.¹ Regarding the interpretation of the sustainable development definition or the definition itself as adopted by the commercial sector and tourism managers, Stabler and Goodall (1996) argued that in some cases the use of the term has involved an alternative definition of ongoing tourism business profitability. As a consequence, the number of visitors that are consistent with the maintenance of a healthy natural environment may be exceeded (Bell, 1991; Hawkins and Roberts, 1994 [both cited by Sinclair, 1998]).

The type of sustainable development definition adopted by tourism planners may influence environmental and natural resources programs and managerial practices. At the same time, it can be expected that tourists' perceptions of sustainable development will influence tourism planners' decisions.

1.3. THE IMPORTANCE OF TOURISTS' PERCEPTIONS OF RESPONSIBLE DEVELOPMENT TO ATTAINING SUSTAINABLE MANAGEMENT OF TOURIST RESOURCES

Tourists from industrialized nations generally demand natural resources and pristine environments often available in NICs. At first, this can be seen as an advantage for NICs that are well endowed with such resources. But, usually, NICs fail to achieve the optimal use of and returns from their assets owing to problems of market failure. Hence, natural resources and the environment are frequently unpriced public goods subject to over use and degradation (Sinclair, 1998).

Tourists' preferences can be important in designing appropriate policies and planning in order to meet consumer preferences and effectively implement preventive measures to avoid or minimize potentially adverse environmental impacts (Preece and Oosterzee, 2000). These authors emphasized the need to better understand tourists' preferences in travel and to investigate the best way to (1) deliver the message of sustainable tourism, (2) provide returns to the environmental resources,

and (3) identify key natural features or aspects of the destination, which appeal to tourists without jeopardizing environmental resources. They recommended undertaking primary surveys and analyses of the data to assess such aspects in order to improve general understanding of the whole tourism market's attitude and preferences for the natural and traditional cultural environment.

Given the call for understanding the tourism market's attitude and preferences for the natural and traditional cultural environment, there is a clear need for the application of comprehensive surveys to collect primary data to assess such preferences. The attempt of this study is to assess tourists' preferences for environmental programs in Punta Cana, Dominican Republic, and to assess tourists' perceptions on how these programs could contribute to the sustainable management of this area.

2. Study area and methods

The site of the study was Punta Cana, located in the eastern most region of the Dominican Republic. Punta Cana is one of the most appealing tourist destinations in the Caribbean Region and is visited by nearly 700 thousand tourists every year (Group Punta Cana, 2000).

In order to assess tourists' preferences for recreational and environmental programs important to sustainable development, a survey was developed and pretested during the last two weeks of July 1999. The pretest consisted of the application of 18 face-to-face interviews at the Punta Cana International Airport. Results of this preliminary survey were used to develop the final survey questionnaire. The final version of the survey comprised four sections (see Appendix 1). Respondents were asked to evaluate different issues using a seven-point Likert-type scale, low to high.

2.1. SAMPLE DESIGN AND DATA COLLECTION

Fieldwork consisted of the application of the survey at the Punta Cana International Airport. Face-to-face interviews were carried out during the period 11–24 March 2000. Tourists were interviewed when leaving Punta Cana, which guaranteed that they had some knowledge of the area and of the recreational activities available. The daily list of flights departing Punta Cana was used to plan the number and nationality of visitors to be interviewed each day. The method used to select the respondents was to approach one of every five groups while they were waiting to board their flight and ask if they wanted to be interviewed. Interviews took an average of between 20 and 45 min to be completed. The first author (LM) and four trained assistants applied the surveys. The interviewers identified themselves as people working with the Group Punta Cana and the Cornell University and explained that these two institutions had signed an agreement to develop a biodiversity center at Punta Cana, which would provide recreational services and contribute to improving

the environmental management of the area, and that the main goal of the survey was to find out how interested the respondent was in these issues.

A total of 207 international tourists from Europe, LA, and NA were approached and 180 of them agreed to answer the survey. This is equivalent to a response rate of 87%. Of the 27 non-respondents, 7 (26%) declined to participate because of language problems. This means that 3% of the sample was not interviewed due to communication barriers. Four of the 180 surveys applied were eliminated because of missing data and inconsistencies; 176 surveys are, therefore, used in the data analysis. The number of people who answered the questions relating to different options varied, and for that reason the number of observations in which the analysis of each question is based fluctuates and will be presented along with the results.

2.2. STATISTICAL PROCEDURES

To statistically compare the responses from interviewees from three different regions of the world, one way ANOVA and HSD tests were performed for each question. The outcome of the ANOVA test is only discussed when the null hypothesis at $P > 0.0001$ is rejected. The HSD tests looked for significant differences at the 0.05 level and only significant results are discussed herein.

3. Results and discussion

3.1. ORIGIN OF PUNTA CANA VISITORS

The origin of the 180 tourists interviewed was distributed as follows: 31% Europe, 19% LA, and 50% NA (Figure 1). The origin of the Punta Cana visitors in 1999 and during the first months of year 2000 also is presented in Figure 1. The variation in the origin of visitors between 1999 and the first months of 2000 can be explained by two factors: (1) there is a natural seasonal variation (people from NA visit more during the first months of the year while people from LA do so during the period May–October) and (2) new flights from the USA were inaugurated in early 2000, which produced a shift in the number of visitors from this country.

3.2. PUNTA CANA VISITATION

Results of studying visitation frequency showed that of the 176 tourists interviewed, 80% were visiting Punta Cana for the first time. Of those visiting Punta Cana more than once (20%), the average number of visits in the last five years was 2.7 with a standard deviation (SD) of 2.1. The mean size of the travel group was 2.5 (SD 1.1). Group size varied with the origin of the travelers with larger groups for travelers from NA (MEAN 2.8 and SD 1.3). The HSD test found significant differences

between mean group size from NA and those from both Europe and LA. The mean time spent traveling to Punta Cana was 10 h (SD 5.7) (Table I).

The average travel cost per person (TCPP) was \$1,252 (SD \$616) (Table I). Travel cost included money spent on airfare and accommodation. Nearly all (about 99%) of the respondents came to Punta Cana with a travel package that included airfare, hotel, food, and beverages. Travel costs also varied with the origin of the respondent. For example, people coming from LA and Europe paid more for a 7–8 day package (MEAN \$1,281 and \$1,265, and SD \$508 and \$515, respectively) than people coming from NA (MEAN \$1,116 and SD \$382). The HSD test found significant differences only for mean travel cost per person between NA and Europe.

Analyzing the time spent per visit in Punta Cana, the data suggest that most visitors (64%) stay between 7 and 8 days. The time spent in Punta Cana is related to the origin of the tourists. The average visitation time for people coming from Europe was 9.5 days (SD 3.3), LA 8.3 days (SD 4.9), and NA 6.9 days (SD 1.7).

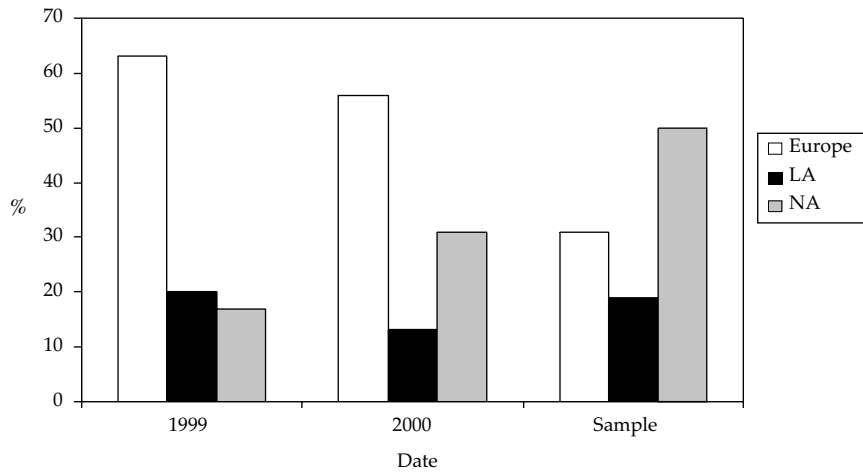


Figure 1. Percent distribution of Punta Cana visitors in 1999, January–March 2000, and those interviewed in March 2000. Source: Group Punta Cana 2000 (data for year 1999 and January–March 2000)

TABLE I. Time spent traveling and TCPP to Punta Cana.

		Time spent traveling (hours)	TCPP (\$) (7 to 8 days)	TCPP (\$) (9 to 15 days)
Pooled sample	MEAN	10.0	1252	—
	SD	5.7	616	—
Latin America	MEAN	10.9	1281	1997
	SD	6.4	508	801
Europe	MEAN	13.7	1265	1511
	SD	4.9	515	1039
North America	MEAN	7.0	1116	1642
	SD	3.7	382	263

3.3. MAIN REASONS FOR COMING TO PUNTA CANA

The results indicate that 91% of the respondents rated clean beaches and clean ocean water as 6 or 7 (both with MEAN 6.5 and SD 1.0 and 0.9, respectively). Quality of services also received a high rating since 94% of the respondents rated it as 6 or 7 (MEAN 6.6 and SD 0.92), but this question was asked of only 31 respondents. Price was rated as 6 or 7 (MEAN 5.2 and SD 1.8) by 53% of the respondents (Figure 2). The correlations between quality of services, ocean water, and clean beaches with price are 0.44, 0.23, and 0.16, respectively.

Four factors usually considered important for those interested in ecotourism were also evaluated (Holtzman, 1996): "To enjoy and learn about local marine life, local plants, local wildlife and culture." The results indicate that marine life, local plants, and wildlife had mean values between 3.5 and 3.6 and SDs between 1.9 and 2.0 (Figure 2), which may indicate low interest of respondents in these factors. Some respondents were bothered by the word 'learn.' They argued they may have enjoyed, but were not interested in learning about these resources. Culture received the highest rating with 44% of the respondents rating it as 6 or 7 (MEAN 4.7 and SD 1.7). The high rating given to clean beaches and clean ocean water was evidence that environmental issues are very important to tourists when deciding where to go for a beach vacation. Similar results were found by Goodwin (2001) in a survey of consumer attitudes toward ethical issues in tourism.

The HSD test produced significant differences for all classes except between clean ocean water, clean beaches, and quality of services. This can be interpreted as indicating that for the respondents these three factors have the same level of importance when deciding where to go for a beach vacation.

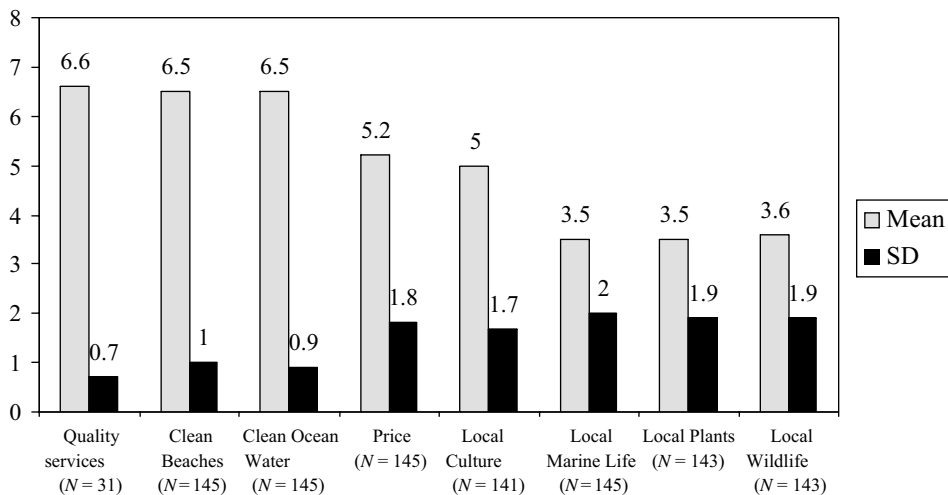


Figure 2. Tourist responses on reasons for coming to Punta Cana.

3.4. OPTIONS FOR IMPROVING RECREATIONAL AND ENVIRONMENTAL SERVICES

In this section five recreational options (including *Status quo*) are evaluated.

3.4.1. Option 1 – Status quo

This option is based on existing recreational services. To evaluate perceptions of how recreational services fit visitors' needs, respondents were asked if they participated in eight of the existent recreational services, and if they did, to rate them with the seven-point Likert-type scale. The list of services was selected based on the following criteria: (1) services that rely heavily on environmental or natural resources and (2) those mentioned by tour operators to be among the recreational activities most preferred by tourists. From the analysis of the data we found that 45% of the respondents participated in two or more recreational activities, 28% participated just in one activity, and 27% did not participate in any. Respondents' rate of satisfaction with each of the recreational activities is shown in Figure 3. The two activities with the highest participation level are kayaking and snorkeling (generally offered for no additional cost). Among the activities that have additional cost, diving was the most popular (Figure 3). Tourists' overall satisfaction with the recreational activities they participated in was also elicited. Those who did not do any of the above-mentioned activities had the opportunity to rate their level of satisfaction with what they did do at Punta Cana. Most of the people doing no recreational activities stated that they just relaxed and enjoyed the beaches, sand, and sun. The mean response for the overall rating was 6 (SD 1.0); this indicates tourists have a high level of satisfaction with the *Status quo* option and that one of the main attractions of this option are the beaches.

3.4.2. Option 2 – Botanical Garden

Option 2 comprises the development of a Botanical Garden. Respondents were told that this garden would display plants from Punta Cana, the Dominican Republic,

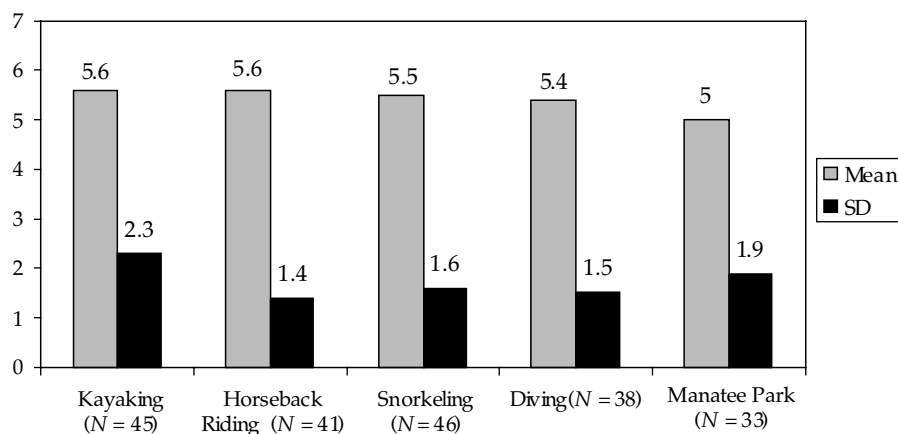


Figure 3. Tourists' satisfaction rating for existent recreational services – *Status quo* in Punta Cana.

and the Caribbean Region. It would include gardens with palm trees, medicinal, endangered, aquatic, and arid zone plants, and a local fruit and vegetable garden, as well as a garden designed to teach children about the flora of the region. Then, their opinion regarding each of the garden exhibits was elicited. The garden with the highest rating was the 'endangered species garden.' The average rating given for this garden (MEAN 5.9 and SD 1.7) resulted from nearly 73% of the respondents giving an interest rating of 6 or 7, and 14% giving an interest rating of 5 (Figure 4). This type of preferences also has been found in other studies. For example, Samples et al. (1986) investigated how an individual's reported willingness to pay to preserve a particular animal is affected by information provided about the animal's physical and behavioral characteristics and endangered status. When information on endangered status was provided (not endangered, not salvable, endangered but salvable), respondents' main allocations differed significantly across species, with study subjects allocating significantly more funds to an animal that was endangered, but salvable. Tropical tree, pond, and fruit and vegetable gardens were also of interest for respondents (Figure 4).

The overall average rate given to Option 2 (MEAN 4.9 and SE 1.6) resulted from 37% of the respondents rating this option as 6 or 7, and nearly 55% between 3 and 5 (Figure 4). The HSD test found significant differences for the endangered species garden when compared to the children's, palm, medicinal, and desert gardens. There were also significant differences between the tree, pond, and fruit and vegetable gardens when compared with the children's and desert gardens. In general, these results confirm that respondents expressed higher rates of interest for the endangered species, tree, pond, and fruit and vegetable gardens.

3.4.3. Option 3 – Option 2 plus Museum

This option consists of the development of the Botanical Garden as described above, as well as a Biodiversity and Taíno² Culture Museum. Respondents were informed that the Museum would be comprised of permanent exhibits of plants,

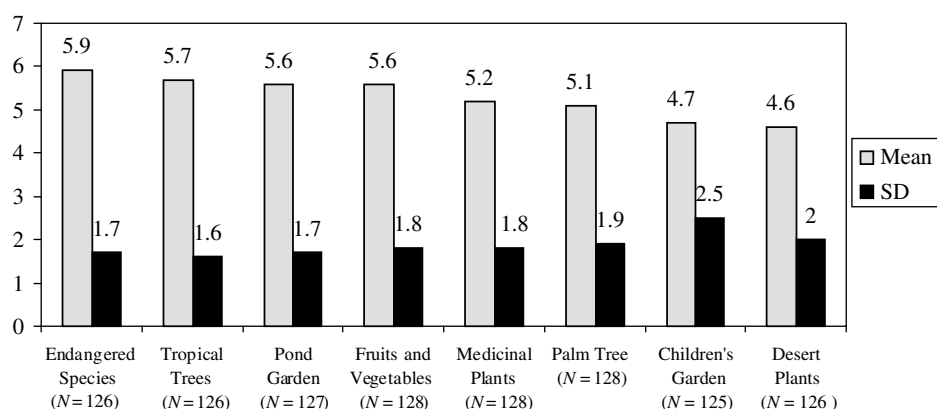


Figure 4. Tourists' interest rating for Option 2 – Botanical Garden.

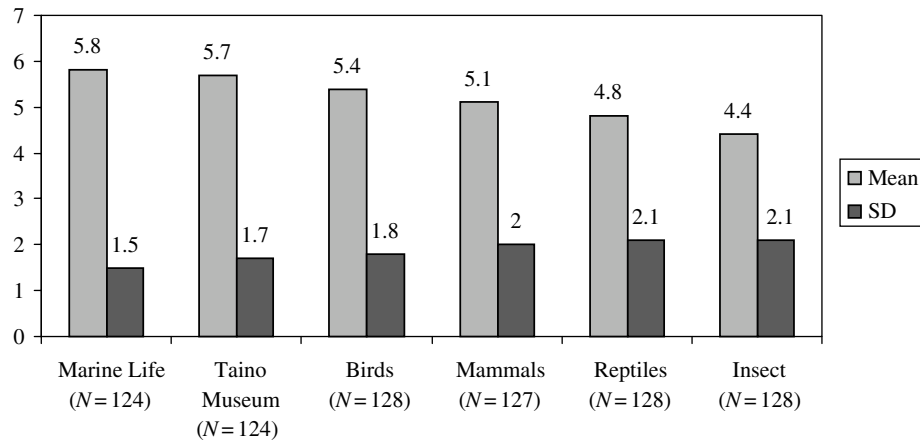


Figure 5. Tourists' interest rating for Option 3 – Botanical Garden and Museum.

wildlife, insects, and aquatic life from Punta Cana, the Dominican Republic, and the Caribbean Region, as well as Taíno cultural exhibits, and sections designed especially for children. Next, respondents' interest in each of the exhibits was elicited (Figure 5).

Marine life and Taíno cultural exhibits received the highest rating of interest. The average rating given for these exhibits (MEAN 5.8 and 5.7, and SD 1.5 and 1.7, respectively) resulted from nearly 70% of the respondents giving an interest rate of 5 or 6 to each of them. The reptile and insect exhibits received the lowest interest rating (MEAN 4.4 and 4.8, respectively, and SD 2.1 for both). This is the result of 24% and 19% of the respondents rating these options as 1 or 2, correspondingly (Figure 5). These results agree with findings of researchers on how people perceive animals. DeKay and McClelland (1996) investigated people's beliefs about the relationships among species' attributes to determine how these attributes are linked to people's expressed values for endangered species. They performed a series of studies varying the level of information and introducing into one of them the notion of probability. With only limited information, they confirmed a tendency to place greater value on species phylogenetically more similar to humans. Samples et al. (1986) also found a strong anthropomorphic tendency in how people viewed animals, since their study subjects gave larger financial allocations to help save a monkey as compared to a rabbit or rat.

The HSD test found significant differences for the insect exhibition when compared to the rest of the exhibitions, except for the reptiles' exhibition. These results confirm that respondents expressed a low rate of interest for the insects and reptiles exhibitions. The overall average rating given to Option 3 (MEAN 5.1 and SD 1.4) resulted from 45% of the respondents rating this option as 6 or 7, 5% between 3 and 5, and 5% rating it as 1 or 2 (Figure 5).

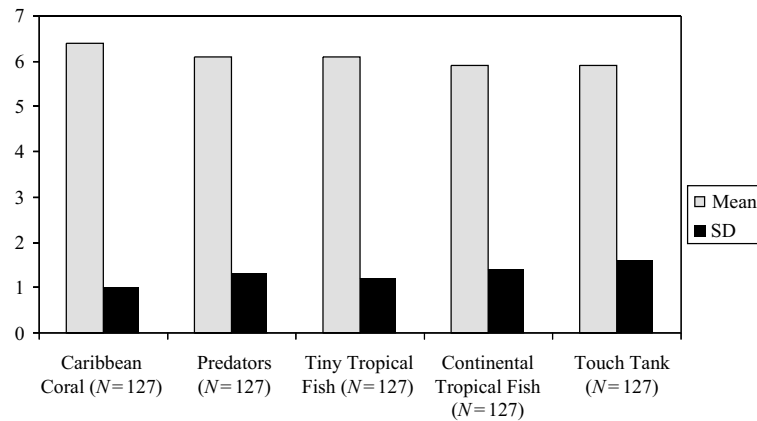


Figure 6. Tourists' interest rating for Option 4 – Botanical Garden, Museum, and Outdoor Aquarium.

3.4.4. Option 4 – Option 3 plus Outdoor Aquarium

Option 4 adds an Outdoor Aquarium to the features of Option 3 (Botanical Garden and Museum). Respondents were informed that the Outdoor Aquarium would comprise exhibits of local coral and fish in their natural environment; species of marine life ranging from sharks, rays, and barracuda to jellyfish and tiny tropical fish; and continental tropical fish, as well as a touch tank designed especially for children. Next, respondents' interest in each of the exhibits were elicited (Figure 6).

The aquarium exhibits received average ratings equal to or greater than 5.9. Caribbean coral was the exhibit with the highest average rating (MEAN 6.4 and SD 1). The rest of the exhibits had an average rating of 5.9 (continental fish and touch tank) and 6.1 (predators and tiny tropical fish). The ANOVA test gave evidence to reject the null hypothesis of equal means, but only at $P > 0.0923$. The HSD test found no significant differences between the exhibitions. The overall rating for this option was 6.1, indicating respondents had a clear preference for this option when compared with Options 2 and 3, for which the overall interest rating were 4.9 and 5.1, respectively.

3.4.5. Option 5 – Option 4 plus Water Management Program

Option 5 adds a Water Management Program to the features of Option 4 (Botanical Garden, Museum, and Outdoor Aquarium). Respondents were informed that the water program has two main goals: (1) to save clean water and (2) to reduce the risk of polluting Punta Cana's beaches with wastewater. It was argued that these goals would be accomplished through the three components of this option. Components 1 and 2, which are mainly for saving clean water, comprises the use of low-pressure showers as well as changing towels only at the request of the client. Component 3 is a water reclamation (recycling) program to treat wastewater to eliminate solids and to reduce microorganisms to a level not dangerous to human health. Once treated, the water is used for watering gardens. Respondents' ratings of each of the options' components are presented in Figure 7. Components 1 and 2 mean interest ratings are

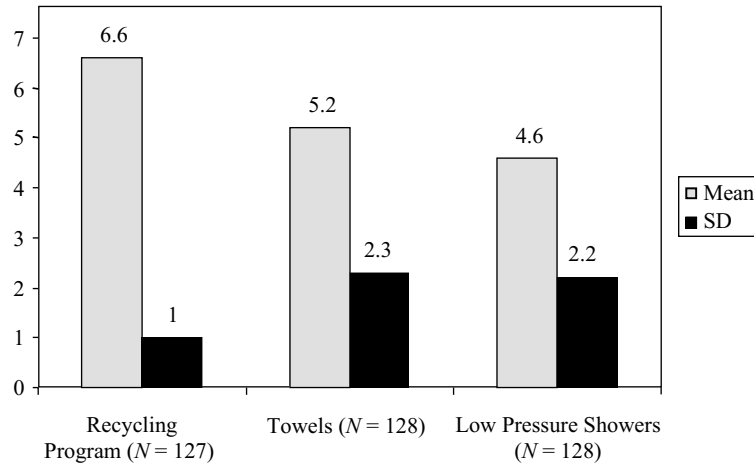


Figure 7. Tourists' interest rating for Option 5 – Botanical Garden, Museum, Outdoor Aquarium, and Water Management Program.

4.6 and 5.2, respectively. This resulted from nearly 44% and 61% of the respondents rating these components as 6 or 7, respectively, while 22% and 20% gave an interest rating of 1 or 2, respectively. These two components got low ratings compared with component 3, which was rated as 7 by nearly 80% of the respondents. As a result, the mean response was 6.6 (SD 1.0). This is the highest value given to a feature or component of any of the five options evaluated.

The HSD test found significant differences for the three components of this option, which indicates that respondents expressed highest interest for the recycling water program and disliked the idea of low-pressure showers. From these results it is possible to conclude that people agree with the concept of recycling water although they disliked having low-pressure showers and preferred their towels to be changed on a daily basis (Figure 7).

3.5. COMPARING THE GENERAL INTEREST RATINGS OF THE FIVE OPTIONS

Above we presented and compared how respondents rated their level of satisfaction and interest within the components of the five options evaluated in this study. Another interesting appraisal would be to compare how respondents rated their overall level of interest in each of the options. Figure 8 presents the overall rate of interest for Options 2–5. The average overall rating for Option 5 is 6.3 (SD 1.1), which is the highest of the five options examined.

3.6. CONTRIBUTION OF EACH OPTION TO THE SUSTAINABLE DEVELOPMENT OF PUNTA CANA

After respondents rated their interest in each of the options, a question regarding their perception of the contribution of each of the options to the sustainable

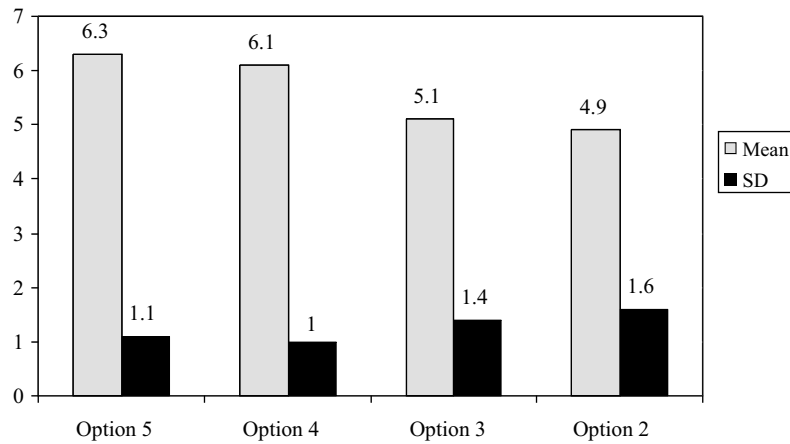


Figure 8. Tourists' overall interest rating for Options 2-5.

development of Punta Cana was asked. A brief explanation of the concept was provided at this point. Nevertheless, it was not possible to get reliable responses from the interviewees. Most of them tended to repeat the level of interest that they had just given. In other cases they argued that they did not have enough information to answer this question. Additionally, most of them were not familiar with the concept, making the task more difficult. Because the consideration of this question was taking a very long time and was not providing reasonable results, it was decided, after the first week of interviews, to exclude this question. We believe that this decision will not affect our conclusions because even when the respondents were not comfortable answering the sustainable development question they were expressing high interest and willingness to pay for the programs aimed at the sustainable development of the area. This was especially true for the water recycling (i.e. reclamation) program.

4. Conclusions and recommendations

From the study of tourist preferences, it is possible to draw conclusions with implications for both sustainable tourism development and environmental policy.

4.1. OPTION 5 (BOTANICAL GARDEN, MUSEUM, OUTDOOR AQUARIUM, AND WATER MANAGEMENT PROGRAM) WAS THE MOST PREFERRED AMONG THE FIVE OPTIONS EXAMINED

The overall rating for this option (MEAN = 6.3, SD = 1.1) was the highest observed for any option. The component with the highest rate of interest was the recycling water program (MEAN = 6.6, SD = 1.0). The Outdoor Aquarium got the second overall highest rating of interest. Options 2 (Botanical Garden) and 3 (Botanical Garden and Museum) were of interest to the respondents, but

to a lesser extent than Options 4 and 5. Within Option 2, the endangered species garden received the highest rating. It was interesting to observe how most of the respondents, independent of their nationality, knew and understood the concept of endangered species and expressed their interest in this garden.

The quantitative analysis found that the highest willingness to pay was expressed for Option 4 (Option 3 plus Outdoor Aquarium) followed by Option 5 (Option 4 plus Water Management). Willingness to pay for the Botanical Garden and Museum was also smaller compared with the willingness to pay for Options 4 and 5. It is worth noting that this analysis is based only on user values and that there are other values that may justify the development of these options, for example, the value of having biodiversity conservation *ex-* and *in-situ* through the development of the Botanical Garden.

4.2. TOURISTS EXPRESSED HIGH INTEREST IN CLEAN OCEAN WATER AND BEACHES

When the main reasons for visiting Punta Cana were analyzed, 91% of the respondents stated that clean beaches and ocean water were extremely important. However, tourists going to Punta Cana have neither information on the cleanliness of the beaches nor on the quality of the ocean water. But most of them said they assumed the beaches and the water were clean, while others stated they had information about this issue through friends who visited Punta Cana before. Comparing the percent of respondents who rated clean beaches and ocean water as 6 or 7 (91%) with the percent average who gave the same value to price (53%) and quality of services (93%), the importance of clean beaches and ocean water can be corroborated. Comparing the linear correlation between quality of services and price (0.44) with the linear correlation between ocean water and clean beaches with price (0.23 and 0.16, respectively), we found respondents understand that there is a positive relationship between price and quality of services (i.e. with higher prices one expects higher quality of services). Nevertheless, they fail to establish a similar relationship in the case of environmental goods, such as clean beaches and ocean water. The failure to relate higher prices with clean ocean water and beaches may be explained by the public good nature of these resources.

There were no statistically significant differences in the way respondents from the three regions (Europe, LA, and NA) rated the importance of ocean water quality and clean beaches. In contrast, their responses were significantly different when they rated the importance of factors such as “to learn and enjoy about local vegetation and wildlife.” At the same time the quantitative analysis indicated that tourists were willing to pay \$15, in addition to what they had already paid for staying one week in Punta Cana, for staying in a hotel or resort that had adopted a recycling water program similar to the one we presented.

Based on these results, we can conclude that respondents believe that clean ocean water and beaches are very important. Also, these findings can be used for policy

development. For example, according to these results, the government could increment the current 'departure tax' by at least \$15 and allocate this amount to the development of an infrastructure to treat and conserve clean water and recycle used water in Punta Cana. There is clearly a priority to guarantee the quality of both clean beaches and ocean water to keep tourism demand high.

Another use of these results could be for 'environmental product differentiation.'³ Currently, there are some managers who are implementing environmental friendly programs such as water recycling. These managers could take advantage of these practices in order to differentiate their offering to tourists. Reinhardt (1998) describes three requirements for successful environmental product differentiation: (1) firms must assess or create consumers' willingness to pay for public goods (e.g. ocean water quality), (2) firms must overcome barriers to the diffusion of credible information about the environmental attributes of their products, and (3) firms must defend themselves against imitation. The first of these requirements was identified in this study as we showed that visitors are willing to pay for improvements in water management practices. Success in environmental product differentiation also depends among other factors on whether or not the environmental characteristics of the product or process are linked to conventional private goods (Reinhardt 1998). For example, it would be expected that willingness to pay would be higher for goods that consumers believe directly benefit their health. In the water quality case, it is expected that tourists will visit and will be willing to pay more to visit places where they know or perceive that there is no risk to their health from ocean water pollution.

Finally, tourist interest in maintaining clean ocean water and beaches indicates that these two factors are key to keeping tourist demand high in Punta Cana. Hence, any deterioration of these two resources may have serious consequences for Punta Cana visitation rates.

4.3. DIFFICULTIES ASSESSING TOURIST PERCEPTIONS OF THE CONTRIBUTION OF EACH OPTION TO THE SUSTAINABLE DEVELOPMENT OF PUNTA CANA

Many reasons may explain why it was difficult to get reliable responses regarding the sustainable development question. One reason may be that the sustainable development concept is vague and subject to wide interpretation. This represents a main limitation in a survey when the intention is to assess people's perceptions of how some programs (options) can contribute to the sustainable development of an area. Since the concept is vague and means different things to different people, responses to such questions are not comparable. A different situation is found when evaluating people's perceptions regarding clearly defined concepts, such as 'endangered species.' Using this concept we found that all respondents, regardless of their origin and other socioeconomic characteristics, were able to express their interest in an 'endangered species garden.'

The lack of precision in the way sustainable development is defined may be the reason respondents have difficulty grasping the concept in a short time, even for

those who previously knew about it. Additionally, our survey was complex since it was designed to evaluate other issues besides the sustainable development concept. Our findings indicate that a concept such as sustainable development may need to be evaluated in a survey especially designed for this purpose so that respondents have more information and time available to answer questions related to this topic. Nevertheless we found that tourists expressed high rates of interest and willingness to pay for programs central to the sustainable development of the Punta Cana area. This may prove very important because such characteristics can drive managers' development decisions in more sustainable directions.

5. Implications for future research

This study investigated policy and program implications of assessing tourists' perception about natural resources and the environment. It was also intended to assess tourists' perception of four recreational and environmental programs aimed at improving the sustainable management of a tourist area. From the results, it is possible to draw some implications for future research. One of the most challenging implications of this study is that we need to learn more about how lay people perceive the sustainable development concept. The increasing interest of academics, as well as policy makers, in the application of sustainable development is in contrast with the little effort that has been made to learn more about how the public perceives this concept. If sustainable development is meant to make a significant change in the way development is currently perceived, it is necessary for the general public to know and understand this concept. Ultimately, it is they who will have a large influence on the way natural resources and the environment are managed. In the case of a tourism area, tourists' preferences drive most of the development decisions by tourism planners and managers. So it is important for us to know if tourists are interested in sustainable development, and if they are willing to pay for practices that help to manage the environment and natural resources in a responsible way. This need calls for more research and working with the public to help them to understand the importance of sustainable development in modern society. *One way to work with the public may be to develop facilities in tourist areas that allow tourists to learn in a relaxing environment the importance of responsible management in order to attain sustainable development.*

Acknowledgements

The fieldwork of this study was made possible by the financial and institutional support of The Cornell Biodiversity Laboratory at Punta Cana and Group Punta Cana. The authors acknowledge the support of Professor William D. Schulze, Cornell University, and the useful comment of two anonymous reviewers.

Notes

¹ The most commonly used definition was provided in the Brundtland Report as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Munasinghe and McNeely, 1995).

² Taínos were the native people who inhabited this area long before Christopher Columbus came to the region.

³ An environmentally differentiated product provides greater environmental benefits, or imposes smaller environmental costs than similar products. Alternatively, or in addition, it is produced in ways that are less environmentally burdensome than the production processes of its competitors. These changes in the products or the production process usually raise the business’ costs, but they also enable it to command a price premium in the marketplace or to capture additional market share, leaving the firm at least as well off as before (Reinhardt, 1998).

APPENDIX 1

SURVEY TO ESTIMATE TOURIST DEMAND FOR ENVIRONMENTAL SERVICES PUNTA CANA – DOMINICAN REPUBLIC

A number of facilities and services have been developed to help you enjoy Punta Cana’s natural resources. Most recreational activities rely on use of the natural environment (e.g. swimming, sunbathing, snorkeling, scuba diving, surfing, kayaking, and hiking. Group Punta Cana is interested in preserving and improving the environment. It is very important for us to know your opinion about managing the environment.

Section 1. Visits to Punta Cana

Q1 Is this your first visit to Punta Cana?

1. YES
2. NO

IF YES, GO TO Q2, OTHERWISE GO TO Q3

Q2 If YES, prior to this trip, how many times have you been here in the last ten (10) years?

1. ONCE TWICE
2. THREE TIMES
3. MORE THAN THREE TIMES (Please specify)

YOUR GROUP

In this question we want to know who is traveling with you to Punta Cana. Please include as your GROUP only those members of your family or any other companion

whose travel expenses were paid as part of your **household budget**. For example, if you are traveling with your spouse, daughter and nephew and your nephew's trip was paid as part of your household budget you should include him as part of your group.

Q3 MY GROUP INCLUDES _____ PERSONS

TIME SPENT TRAVELING

Q4 Did you come directly to Punta Cana from your home?

1. YES
2. NO

IF YES, GO TO Q5, IF NO GO TO Q7

Q5 How much time did you spend traveling to Punta Cana since leaving your home?

A Morning Or Afternoon 0–6 h	Half a Day 7–12 h	Half a Day 13–18 h	1 Day 18–24 h	More than >24 h
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MONEY SPENT ON THIS TRIP

Now, we are interested in knowing the TOTAL amount of money that you spent on this trip. In answering the following questions, please consider the TOTAL amount of money spent by you and your group as stated in Q3. First we will talk about the price of the package.

Q6 TRAVEL COST PER GROUP =

Other expenditures in Punta Cana (Please include money spent by you and your group on beverages, tours, entrance fees, and tourist guide fees etc. in Punta Cana)

Q7 OTHER EXPENDITURES =

THIS VISIT

How much time did you spend at Punta Cana on this trip?

Q8 NUMBER OF DAYS =

Q9 Where did you stay? (*Please circle the hotel indicated by the respondent*)

HOTEL/RESORT =

Section 2. Reasons for coming to Punta Cana

I will read a list of factors that may have affected your decision to come to Punta Cana. For EACH factor, please indicate how important that factor was in your decision to come to Punta Cana. Please state the number that most closely corresponds to your opinion, where 1 = not at all important, and 7 = extremely important.

Q10	Reasons for coming to Punta Cana	Not at all important					Extremely important	
		1	2	3	4	5	6	7
	Clean beaches							
	Clean ocean water							
	Price							
	To enjoy and learn about local culture							
	To enjoy and learn about local marine life							
	To enjoy and learn about local plants							
	To enjoy and learn local wildlife							
	Golf course							
	Quality of services							

Section 3. Options for improving tourist activities in Punta Cana¹

Because of the dependency of tourism upon natural resources and the environment, Group Punta Cana recognizes the importance of preserving the environment and natural attractions. Group Punta Cana realizes that it is in its best interests to sustain the quality of such resources and is trying to reduce the negative impact of traditional tourism on the environment and local people.

Group Punta Cana recently signed an agreement with Cornell University in the US in order to create the “Cornell Biodiversity Center at Punta Cana.” This center may provide some recreational activities for tourists. Please note that these options not only will improve recreational services, but they also will help to improve the

¹Color copies of the master plans of the botanical garden, biodiversity museum, and outdoor aquarium, as well as a graphic explanation of the water program were used so the respondent would have a better idea of the options.

sustainable management of the natural resources and the quality of the environment of Punta Cana. We will ask your opinion about these options. The different options have associated costs which will be explained to you later.

Q11 OPTION 1 STATUS QUO

GPC and Hotel Operators continue with their current policy at Punta Cana. As a consequence, Punta Cana environmental conditions will remain about the same as today. There will be no changes in recreational activities.

Recreational Activities/ <i>Status Quo</i>	Not at all satisfied				Extremely satisfied		
	1	2	3	4	5	6	7
Snorkeling							
Kayaking							
Diving							
Horseback riding							
Manatee park							
Golf							
Tours							
OVERALL RATING							

Q12 How satisfied are you with this option? Please state the number that most closely corresponds to your opinion, where 1 is not satisfied at all, and 7 is very satisfied

NOT SATISFIED AT ALL VERY SATISFIED
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q13 How much do you think this option would contribute to the Sustainable Development Punta Cana? Please state the number that most closely corresponds to your opinion, where 1 is not contribute at all, and 7 is contribute very much.

NOT CONTRIBUTE AT ALL CONTRIBUTE VERY MUCH
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q14 OPTION 2 BOTANICAL GARDEN

One of the options to be created is a Botanical Garden, which will include gardens displaying plants from Punta Cana, Dominican Republic and the Caribbean.

The botanical garden will include gardens with palm trees, medicinal, endangered, aquatic and arid zone plants. It will also include a local vegetable and fruit garden, as well as a garden designed to teach children about the flora of this region.

In order to help us plan the Botanical Garden, please let us know your opinion about the following types of gardens. While I read a list of the possible gardens to be developed in the Botanical Garden, please state the number that most closely corresponds to your opinion, where 1 is not interested at all, and 7 is very interested.

OPTION 2 Components	Not at all interested							Extremely interested
	1	2	3	4	5	6	7	
GARDENS								
Endangered species								
Tropical trees								
Pond garden								
Fruits and vegetables								
Medicinal plants								
Palm tree								
Children's garden								
Desert plants								

Q15 How interested would you be in this option? Recall the Botanical Garden would include all the above listed gardens. Please state the number that most closely corresponds to your opinion, where 1 is not interested at all, and 7 is very interested.

NOT INTERESTED
AT ALL

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

VERY INTERESTED

Q16 How much do you think this option would contribute to the Sustainable Development Punta Cana? Please state the number that most closely corresponds to your opinion, where 1 is not contribute at all, and 7 is contribute very much.

NOT CONTRIBUTE
AT ALL

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

CONTRIBUTE
VERY MUCH

OPTION 3 BOTANICAL GARDEN + BIODIVERSITY AND TAÍNO'S MUSEUM

This option includes the development of the Botanical Garden as described above, as well as a Biodiversity and Taíno's culture museum. The museum will be comprised

of permanent exhibits of plants, wildlife, and aquatic life of Punta Cana, Dominican Republic and the Caribbean. It will also include Taíno’s culture exhibits (Taínos were the people who inhabited this zone long before Christopher Columbus came to America). The Biodiversity museum will also include sections designed especially for children.

Q17 In order to help us plan the Biodiversity and Taíno Museum, please let us know your opinion about the following types of exhibits. While I read a list of the possible exhibits, please state the number that most closely corresponds to your opinion, where 1 is not interested at all, and 7 is very interested.

OPTION 3 Components	Not at all interested				Extremely interested		
	1	2	3	4	5	6	7
Marine Life							
Taíno Museum							
Birds							
Mammals							
Reptiles							
Insect							

Q18 How interested would you be in this option? Remember, this option comprises the Botanical Garden as described before and the Biodiversity and Taíno’s Museum with all the above listed exhibits.

NOT INTERESTED VERY INTERESTED
 AT ALL INTERESTED
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q19 How much do you think this option would contribute to the Sustainable Development Punta Cana?

NOT CONTRIBUTE CONTRIBUTE VERY MUCH
 AT ALL VERY MUCH
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

OPTION 4 BOTANICAL GARDEN + BIODIVERSITY/TAÍNO’S MUSEUM + OUTDOOR AQUARIUM

This option includes the development of the Botanical Garden and the Biodiversity and Taíno’s culture museum. It will also include the development of an outdoor aquarium with exhibits of local coral and fish in their natural environment. The aquarium will be comprised of lagoons with exhibits of Caribbean species of marine life ranging from sharks, rays and barracuda to jellyfish and a multitude of tiny tropical fish. Continental Tropical fish like piranha, angelfish and catfish will also

be exhibited. A touch tank filled with conchs, starfish, sea urchin, sea cucumbers, and crabs will be designed especially to be enjoyed by the children. The aquarium will be accessed from suspension bridges.

Q20 In order to help us plan the Aquarium, please let us know your opinion about the following types of exhibits. While I read a list of the possible exhibits, please state the number that most closely corresponds to your opinion, where 1 is not interested at all, and 7 is very interested.

OPTION 4 Components	Not at all interested				Extremely interested		
	1	2	3	4	5	6	7
Caribbean Coral							
Predators							
Tiny Tropical Fish							
Continental Tropical Fish							
Touch Tank							

Q21 How interested would you be in this option? Remember, this option comprises the Botanical Garden, the Biodiversity and Taíno’s Museum as described before, and the Outdoor Aquarium with all the above listed exhibits.

NOT INTERESTED VERY INTERESTED
 AT ALL INTERESTED
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q22 How much do you think this option would contribute to the Sustainable Development Punta Cana?

NOT CONTRIBUTE CONTRIBUTE
 AT ALL VERY MUCH
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

OPTION 5 BOTANICAL GARDEN + BIODIVERSITY/TAÍNO’S MUSEUM + OUTDOOR AQUARIUM + WATER PROGRAM

This option includes the development of the Botanical Garden, the Biodiversity and Taíno’s museum, and the Aquarium, as described above. Additionally, it includes a water program the main goals of which are to reduce the risk of polluting Punta Cana’s beaches with used waters, and to save clean water. This will be accomplished through a water reclamation program to treat used waters to eliminate solids and to reduce microorganisms to a level free from danger to human health. Once treated, the water can be used for watering gardens and golf courses.

Q23 In order to help us plan the water management program, please let us know your opinion about the following issues. Please state the number that most closely corresponds to your opinion, where 1 is not interested at all, and 7 is very interested

OPTION 5 Components	Not at all interested					Extremely interested	
	1	2	3	4	5	6	7
Low-pressure showers							
Towels							
Recycling water program							

Q24 How interested would you be in this option? Remember, this option comprises the Botanical Garden, the Biodiversity and Taíno’s Museum, the Outdoor Aquarium and the water program to save clean water and decrease the risk of polluting Punta Cana beaches by recycling polluted water and using it for watering gardens.

NOT INTERESTED VERY INTERESTED
 AT ALL INTERESTED
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q25 How much do you think this option would contribute to the Sustainable Development Punta Cana?

NOT CONTRIBUTE CONTRIBUTE VERY MUCH
 AT ALL VERY MUCH
 1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Section 4. About you and your household

H1 Gender 63.0% of respondents were females

H2 Respondent age? MEAN = 36 SD = 9.05

H4 Including yourself, how many members in your household are in each age group?

H3

	LESS THAN 18	18–64	OLDER THAN 64
MEAN	0.59	2.5	0.0
SD	0.85	3.2	0.0

H5 HOUSEHOLD SIZE = MEAN = 2.5 SD = 1.1

HIGHEST LEVEL OF EDUCATION (# of years)

MEAN 16.6
SD 2.7

H6 Respondent present employment status:

EMPLOYED FULL TIME	88.5%
EMPLOYED PART TIME	1.3%
RETIRED	1.3%
HOMEMAKER	2.6%
STUDENT	5.1%
UNEMPLOYED	1.3%

H7 Please tell us your approximate total annual 1999 household income?

MY HOUSEHOLD 1999 TOTAL ANNUAL INCOME WAS

MEAN = \$82,405.50 SD = \$71,438.82

H8 Have you donated or participated in any environmental cause in the last 3 years?

1	YES ONCE	21.7%
2	YES TWICE	8.7%
3	YES MORE THAN TWICE	8.7%
4	NO	60.9%

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