



Sea turtles' release in S. Tomé and Príncipe is used to educate local population on the importance of nature conservation, namely young children.

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Ecotourism based on the observation of sea turtles – A sustainable solution for the touristic promotion of são tomé and príncipe

Susana Mendes¹, Joana Martins² and Teresa Mougá^{1*}

Abstract: Wildlife-based ecotourism has been stated as an efficient tool to promote the conservation of endangered species and habitats. These activities also aim to create economic revenue for local communities. Likewise, ecotourism, intends to involve these communities in the management of the conservation programs and develop educational activities, either for children, locals, or tourists, in order to increase awareness about target species and habitats. This study addressed the recent ecotourism activities in the observation of sea turtles which are being developed in São Tomé and Príncipe. These charismatic marine reptiles are vulnerable or endangered due to human activities, such as meat and egg consumption, illegal trade, habitat loss, climatic change, pollution and fisheries bycatch. Therefore, ecotourism using flagship species, like a sea turtle, establishes a sustainable alternative to destructive activities, promoting the country's environmental, economic and social development, the three pillars of sustainability. In this context, the objective of this study is to know the potential of São Tomé and Príncipe as a turtle watching-based ecotourism destination. An exploratory analysis

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PUBLIC INTEREST STATEMENT

Ecotourism activities are growing fast, for people are eager to experience pristine environments where wild animals thrive in their natural habitats. This is the case of S. Tomé and Príncipe where sea turtle's nature-based tourism is being established for the past few years. These tourism activities must be implemented with care, so to allow tourists to watch sea turtles without disturbing their habitats or their activities. Also, income attained from ecotourism must revert both to local populations, leveraging local development, and to nature conservation, improving natural habitats. Finally, educational activities must be developed, so as to increase environmental awareness.

This study aimed to assess the potential of S. Tomé and Príncipe as a turtle watching-based nature-based tourism destination and we concluded that both local population and tourists generally comply with the ecotourism principles. Thus, if well managed S. Tomé and Príncipe may become a long-term successful ecotourism destination.

was carried out through two questionnaires (one focused to the Morro Peixe's local community and another to the tourists that were engaged in turtle watching activities), in order to know the perception of the inhabitants and tourists regarding the programs and initiatives for the conservation of sea turtles. Despite the awareness that already exists among inhabitants regarding the conservation of sea turtles, the results showed that they do not straightforwardly accept the prohibition for the capture of sea turtles, but most of the population of Morro de Peixe is receptive to changes in the community regarding their protection. In fact, the population is beginning to recognize that tourism, due to the protection given to these endangered species, may become (in the medium term) a sustainable source of income. Regarding tourists' profile, these are mostly Portuguese, with a high level of education and income. They are well informed about the need for sea turtle conservation and seek to carry out tourism activities that pursue this protection. In fact, this also demonstrates the potential the country has as a turtle watching-based ecotourism destination.

Subjects: Niche Tourism; Tourism and the Environment; Tourism Development/Impacts

Keywords: Turtle-watching; sea turtles' conservation; flagship species; local communities' development; marine ecotourism; wildlife-tourism; sustainable tourism

1. Introduction

Tourism is one of the most profitable economical activities in the world, and one of the fastest growing (UNWTO, 2019b). Yet tourism constitutes an environmental challenge for it has a direct impact on all three "pillars" of sustainability—economic, social and environmental and these (Buckley, 2012; Eagles, McCool, & Haynes, 2002; Hall, 2011). In fact, tourism activities often do not comply with the United Nations World Tourism Organization definition of sustainable tourism being a form of "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNWTO, 2019a), being responsible, for instance, for 8% of global greenhouse gas emissions, for changes in land cover and land use, extinction of wild species, dispersion of diseases, among other negative impacts (Hall, 2011; Lenzen et al., 2018). This means that frequently tourism is unbalanced, in the sense that it does not create value in the socio-economic and environmental dimensions of sustainability. Paradoxically tourism is severely impacted by the consequences of an unsustainable environment, being extremely dependent on a healthy natural and safe environment. Hence, there is an urge to reduce tourism negative impacts which can be achieved by oriented long-term environmental policies, management measures and technologies (Buckley, 2012; Butler, 1999; Postma, Cavagnaro, & Spruyt, 2017).

Hence, policymakers are increasingly seeking for balanced sustainable tourism (Budeanu, Miller, Moscardo, & Ooi, 2016; Hall, 2011) and a social change seems to be arising within tourists that seek for more sustainable destinations (Hall, 2011; Liu, 2003). Consequently, the relationship of tourists towards environment appears to be changing into more environmentally friendly practices. The ecological behavior and awareness of tourists have been accompanied by their touristic choices, due to environmental concern regarding tourism impact. The development of ecotourism and other nature-based tourism operations are, thus, examples of more sustainable options, providing opportunities to appreciate and enjoy nature with less negative impact, and also to develop visitors' knowledge and awareness regarding environmentally friendly attitudes and nature conservation (Eagles et al., 2002; Lee & Moscardo, 2005; Peake, Innes, & Dyer, 2009).

2. Wildlife-based tourism

In the past decades, the growth of non-consumptive wildlife-oriented recreation, ecotourism and the increase of economic prosperity supporting wildlife conservation, became a reality (Griffin et al., 2017; Wilson & Tisdell, 2000). Although the concept of ecotourism remains rather uncertain (Mtapuri & Giampiccoli, 2019), according to The International Ecotourism Organization it can be defined as “responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education” (The International Ecotourism Organization, 2019). Indeed, the principles followed by ecotourism are quite clear and include minimizing all negative impacts, increase awareness, promote direct financial benefits for natural and cultural conservation, as well as improve of welfare of local populations (Cobbinah, 2015; Coria & Calfucura, 2012; Eagles et al., 2002). Thus, well-implemented ecotourism activities must provide the enjoyment of the visitors as well as fulfill the corresponding component of nature conservation, that is, conserve the scenery, the natural and historic objects and wildlife, for high natural standards play a key role in attracting international visitors to tourist destinations (Kaltenborn, Nyahongo, & Kideghesho, 2011). On the other hand, tourism has positive impacts on local human communities if the revenues obtained from ecotourism allow the development of management measures for habitats and wildlife conservation. Besides, tourism also plays a major role in improving the well-being and living conditions of local communities, if managed properly (Adams & Infield, 2003; Briedenhann & Wickens, 2004; Buckley, 2010; Ceballos-Lascurain, 2001; Coria & Calfucura, 2012; Das & Chatterjee, 2015; Inamdar, Jode, Lindsay, & Cobb, 1999; Jitpakdee & Thapa, 2012; Li & Han, 2001; Mbaiwa, 2005; Queiroz, Guerreiro, & Ventura, 2014; Santarém & Paiva, 2015; Walpole & Goodwin, 2000; Wilson & Tisdell, 2000). Although, it is also documented that, if poorly managed, nature-based tourism may too have significant negative socioeconomic impacts. In parallel, poor management of tourism have detrimental effects on either habitats or wild animals, due to the nonexistence involvement of the local community, revenue leakage, overcrowding, high patterns of visitor consumption, waste generation, wildlife damage, negative impact in animal health, physiology, reproduction rate and behavior, among others negative consequences (Das & Chatterjee, 2015; Jitpakdee & Thapa, 2012; Kafyri, Hovardas, & Poirazidis, 2012; Kaltenborn et al., 2011; Kroeker-Maus, 2014; Krüger, 2005; Stronza & Gordillo, 2008; Yacob, Radam, & Rawi, 2009; Zal & Breda, 2010). Therefore, the implementation of effective long-term sustainable ecotourism management plans will help to ensure economically viable ecotourism operations, that decrease negative impacts on local communities, wildlife, and habitats. These plans aim to reduce social and biophysical impacts, reduce leakage of potential benefits, increase environmental awareness and action among tourists and local populations, develop activities with educational purpose, preserve local culture and create opportunities for local people when they participate directly in the management (Ceballos-Lascurain, 1996; Cengiz, 2007; Griffin et al., 2017; Jitpakdee & Thapa, 2012; Kaltenborn et al., 2011; Kiper, 2011; Pegas, Coghlan, Stronza, & Rocha, 2013; Queiroz et al., 2014; Waligo, Clarke, & Hawkins, 2015). The direct engagement of the local population in management activities ensures their interests in ecotourism and aligns them with sustainable objectives (Dehoorne, Murat, & Petit-Charles, 2010; Lequin, 2002; Waligo et al., 2015). This must be accompanied by proper education of local population which will enhance benefits and helps local communities to make the necessary social and economic adjustments to ecotourism (Das & Chatterjee, 2015; Pegas et al., 2013; Stronza & Gordillo, 2008; Stronza & Pêgas, 2008; Wearing & Neil, 2009). In addition, the development of an educational program for tourists, tourist operators and local people, allows the improvement of their awareness regarding natural values. In fact, those programs can contribute to decrease negative impacts of visitation and to increase the long-term sustainability of natural areas through the conservation of both habitats and wildlife (Pegas et al., 2013; Queiroz et al., 2014). Therefore, ecotourism may promote conservation through economic benefits. Moreover, through ecotourism the role of local communities in the management will help sustain success over time (Stronza & Pêgas, 2008).

3. Ecotourism based on sea turtles' conservation

Ecotourism has been used as a tool to implement conservation program of several endangered charismatic species, such as elephants, pandas, tigers, rhinoceroses, lions, whales, dolphins, sea

lions, whale sharks, and sea turtles, among other large vertebrates. Although negative impacts due to tourism activities have been reported (Davenport & Davenport, 2006) some successful well-known non-consumptive wildlife-oriented recreational tourism activities have been implemented regarding the observation of sea turtles. Examples of such successful cases are Mon Repos Conservation Park and Heron Island National Park in Australia (Tisdell & Wilson, 2002; Wilson & Tisdell, 2000), Tortuguero in Costa Rica (Meletis & Campbell, 2007), Gandoca in Costa Rica (Gray & Campbell, 2007) and Praia do Forte in Brazil (Pegas et al., 2013; Pegas & Stronza, 2010; Stronza & Pêgas, 2008). Turtle-based tourism provides employment to local people, including tourists' guiding, nature conservation guarding, craft selling, and so forth (Cope, 2015; Jacobson & Robles, 1992; Marcovaldi & Dei Marcovaldi, 1999; Pegas & Stronza, 2010; Tisdell & Wilson, 2002). Revenue obtained from turtle-based tourism also contributes to the conservation of these endangered species, through the implementation of conservation plans and educational strategies. It has also been stated that this type of tourism benefits conservation through raising tourists awareness and appreciation of these reptiles (Ballantyne, Packer, & Sutherland, 2011; Griffin et al., 2017; Wilson & Tisdell, 2000). Moreover, conservation improvements may be due to social, culture and economic dynamics of the local population. Tourist can witness sea turtles dragging their bodies ashore, nest excavating, egg-laying, egg hatching and baby turtles first walk to the ocean. Yet, tourist activities may adversely affect turtle behavior (such as feeding, breathing, and nesting activities) through flashlights, physical blocking, touching, noise, recreational diving, and other human activities (Griffin et al., 2017; Hayes, Baumbach, Juma, & Dunbar, 2017; Kamrowski, Sutton, Tobin, & Hamann, 2015; Pegas et al., 2013; Wilson & Tisdell, 2000). Therefore, new tourist activities regarding sea-turtles' observation must be implemented with the least disturbance possible, preventing any negative impact on the animal populations, conversely building long-lasting experiences that encourage tourists to adopt a more environmental responsible behavior.

4. Study area

The Archipelago of São Tomé and Príncipe is a republic comprising mainly two islands—São Tomé Island and Príncipe Island—and a few other islets, most of them desert. The Archipelago is in the Atlantic Ocean, in the Gulf of Guinea, off the western equatorial coast of central Africa, the Equator passing through the archipelago (Figure 1). The islands are volcanic, and the climate is tropical hot

Figure 1. Location of São Tomé and Príncipe in the Gulf of Guinea, West Coast of the African Continent.

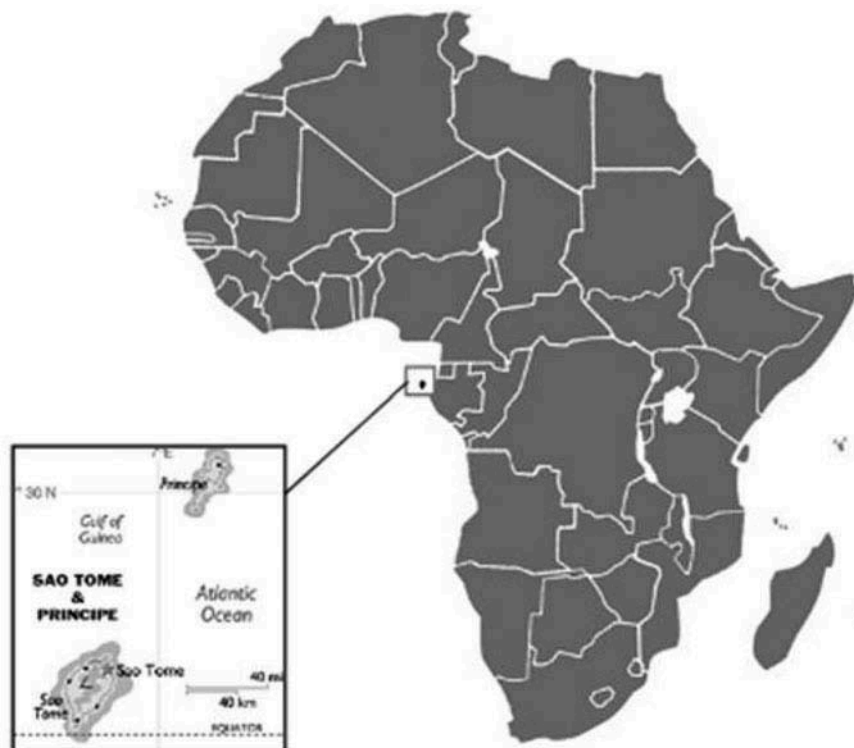


Table 1. Number of tourists to S. Tomé and Príncipe from the main five source countries, and total arrivals between 2010 and 2014

	2010	2011	2012	2013	2014
Portugal	3578	4385	5811	5447	7462
Angola	1105	1475	1866	1403	3051
France	514	673	843	765	1190
USA	280	-	-	-	410
UK	229	-	-	-	-
Nigéria	-	555	396	-	-
Cape verde		409	494	327	-
Spain				195	-
Gabon					443
Other countries	2257	3786	4223	6093	6074
TOTAL ARRIVALS	7963	10,319	12,743	13,708	18,187

Source: Data from the Direção Geral do Turismo of S. Tomé and Príncipe

and humid, therefore the main vegetation is a tropical forest. The main economic activities are artisanal fisheries and agriculture, mainly sugar cane, cocoa, coffee and palm oil (Frynas & Wood, 2003). Tourism is an emerging activity in S. Tomé and Príncipe, with only 8 thousand arrivals in 2010 (UNWTO, 2019b). Other unpublished data from the Tourism Office of S. Tomé and Príncipe (Table 1), demonstrate a small but steadily growing influx of tourists into S. Tomé and Príncipe, mainly from Portugal, Angola and France, up to more than 18 thousand tourists in 2014.

São Tomé and Príncipe is an important marine turtle nesting site, where four of the seven species of sea turtles visit the sandy beaches for nesting, with nesting season reaching mostly from August to May (Girondot, 2016). Sea turtles are ancient marine reptiles, existing for more than 200 million years (Spotila, 2004). The species existing in São Tomé and Príncipe are Loggerhead Turtle (*Caretta caretta*), Olive Ridley (*Lepidochelys olivacea*), Green Turtle (*Chelonia mydas*), Leatherback (*Dermochelys coriacea*) and Hawksbill Turtle (*Eretmochelys imbricata*), all of them being classified as vulnerable or endangered (IUCN, 2017). Of these species, *C. caretta* uses the area only as a feeding area, but all the other species use the coast of the islands of S. Tomé and Príncipe as nesting areas (Girondot, 2016). These species exhibit complex and very slow growth, reaching sexual maturity between 15 and 50 years of age and come ashore mainly at night to nest and lay their eggs (Wallace et al., 2011). These charismatic animals play a vital ecological role in the health of marine ecosystems (Hamann et al., 2010).

Sea turtles face a wide variety of threats such as natural predation, climate change, international commercial fisheries bycatch, pollution, and other anthropogenic factors including degradation of terrestrial coastal habitats, illegal trade, direct consumption of meat and eggs, and craftwork production (Girondot, 2016; Hamann et al., 2010; Hancock, 2013; Pegas et al., 2013; Wallace et al., 2011). The archipelago represents a strategic area for feeding, reproduction, and nesting, allowing the development of the entire life cycle of sea turtles. The size of the sea turtles' populations and the variety of species make turtle-based tourism attractive for international tourists visiting S. Tomé and Príncipe. Yet, it is estimated that S. Tomé and Príncipe may be losing most of its natural patrimony in consequence of international industrial fisheries agreements, and due to lack of surveillance of exclusive economic zone of the country (Frynas & Wood, 2003). In fact, international commercial fisheries, namely from East Asian Countries operating in the Gulf of Guinea, are severely disturbing the marine ecosystem, namely the populations of sea turtles (Girondot, 2016), and other large organisms such as stingrays and sharks. Therefore, ecotourism may be an interesting economic alternative contributing to the implementation of conservation

Figure 2. Species of sea turtles occurring in S. Tomé island.
 Adapted from Jiménez & Vieira 2016, Tatô Program (ATM).



measures of sea turtles and other large vertebrates, also increasing the income of local people, most of them leaving below the poverty line.

This last decade, a large panel of sea turtle conservation initiatives have been established in Africa. Due to their political stability, some African countries, namely S. Tome and Príncipe, are developing sea turtle-based ecotourism activities. Furthermore, a public awareness campaign conducted for foreigner tourists has led to a reduction of the shell trade in S. Tome and Príncipe (Girondot, 2016). Other conservation initiatives undertaken are nest surveillance, construction of incubation centers, illegal trade surveillance, and educational initiatives with the local population. All these initiatives are being developed since 2008 within a conservation program called Tatô, the native name for Olive Rodley sea turtle, under the responsibility of the local nongovernmental organization MARAPA (*Mar Ambiente e Pesca Artesanal*) and the Portuguese nongovernmental organization ATM (*Associação Tartarugas Marinhas*).

Some of the sandy beaches being surveilled and protected are in Lobata district, namely Morro Peixe and Micoló (Figure 2). In this area, a turtle-watching ecotourism activity started in 2015, supervised by ATM and MARAPA, including a small museum, educational activities, programmed tours to observe sea turtles' nesting activities and release of offspring, and logistic support to staff and volunteers.

Thus, the research objective of this study was to evaluate the potential of São Tomé and Príncipe as a turtle watching-based ecotourism destination. An exploratory analysis was carried out on the Morro Peixe's local community, to assess the perception of the inhabitants regarding turtle-watching ecotourism and their willingness to support this activity and sea turtle conservation. We also questioned tourists engaged in sea turtles' observation activities in S. Tomé and Príncipe and assessed their motivation to carry out such activities, their behaviour and knowledge regarding ecotourism, as well as their willingness to pay for sea turtle conservation efforts.

5. Methods

5.1. Data collection

Aligned with the objectives, two different surveys were carried out. The first one with the purpose of knowing the local community and the information locals have regarding Tatô program and sea turtle conservation, and another survey characterizing the tourists. The methodological choice of

the questionnaire addressed to the community consisted in the application of a questionnaire survey, with direct on-site management and addressed to residents of Morro Peixe (a small fisherman village, with around 195 habitants¹). The questionnaire included 19 questions, mostly closed, involving factual aspects, with a predominance of qualitative variables, namely nominal scales. Both the qualitative and quantitative approaches have their advantages, disadvantages, positives and negatives points, and the chosen method should always be appropriate to the research question. However, opting for a quantitative approach allows an objective analysis of the data, where it is possible to establish and test relationships between the items under study. On the other hand, it allows the use of statistical methods (deductive process), which allows the construction of patterns of association or dissociation between the profiles under analysis. Thus, it was possible to achieve results that contributed to the understanding of the phenomenon under study.

Accordingly, the typology used was chosen taking into account the nature of the research, since it was intended to measure that, despite the prohibition, residents still have turtle meat consumption habits, as well as assess specific characteristics of the community under study (ascertain how many inhabitants capture turtles, the importance given to the conservation of these animals and to assess their knowledge of the decree regulating the capture and trade of sea turtles and their products) (Annex I). The questionnaire was applied between March 11 and 19 April 2016. A sample of 56 residents (working adults) was determined using the most conservative estimate for a single proportion (0.5), a confidence level of 95% and a margin of error of 11%. This was estimated in order to obtain the minimum number of elements necessary for the validity of the conclusions obtained through the survey (and based on the universe under analysis, which is 195 individuals).

Regarding the questionnaire addressed to tourists, this was performed with the aim of outlining their profile. Specifically, this was intended for tourists who carried out turtle watching. The questionnaire included 15 questions, with a structure similar to the questionnaire addressed to residents (namely, predominantly qualitative variables and nominal scales) (Annex II). The type of survey was selected based on the research objective, that is, to know the motivations that lead tourists to carry out the activity, their opinions on turtle conservation and protection programs (as a form of social and economic development of underdeveloped communities) and what resources they have accessed, to know these tourist activities. The questionnaire was applied during the spawning season 2015/2016 of sea turtles in São Tomé (that is, between January 1 and 8 April 2016). The surveys were applied in the communities of Morro Peixe, Micoló and Porto Alegre. A sample of 55 tourists (older than 18 years old) was determined using the most conservative estimate for a single proportion (0.5), a confidence level of 95% and a margin of error of 13%. This was estimated in order to obtain the minimum number of elements necessary for the validity of the conclusions obtained through the survey (based on an unknown universe and contemplating the totality of the 22 guided visits made for the turtle watching).

6. Data analysis

Data analysis begins with the descriptive assessment of residents' behavior and tourists' motivations. This is followed by a data analysis using the Chi-squared tests of independence that compare the squared deviations between observed and expected frequencies by means of association in contingency tables (Agresti, 1992; Fienberg, 1980). When a large difference occurs, the Chi-squared value is high, which suggests dependence between the variables. In order to assess if this difference is significant, the test statistic is compared to the value of the Chi-squared distribution for a specific significance level (the critical value). When the test statistic exceeds the critical value, the hypothesis of independence between the variables is rejected. In this case, the p-value of the test is lower than the significance level. Therefore, it was possible to detect and describe patterns of association (or dissociation) between the various issues addressed throughout the two questionnaires. All results were considered statistically significant at the 5% level (that is,

Table 2. Community profile

Variables	Categories	% (n)
Gender	Male	66.0% (37)
	Female	33.0% (19)
Age	15–28	33.9% (19)
	29–39	37.5% (21)
	40–51	19.6% (11)
	≥51	8.9% (5)
Education	Elementary school	92.9% (52)
	High school	7.1% (4)
Profession	Fisherman	62.5% (35)
	<i>Palaiê</i> ^(a)	19.6% (11)
	Housewife	8.9% (5)
	Other activities	8.9% (5)

^(a) Name by which the woman fishmonger is identified (in the fisherman village of Morro de Peixe)

when p -value < 0.05). All data collected were treated with the statistical program IBM SPSS Statistics 22.0.

7. Results

This section is divided into two parts: (1) the community profile that refers to the data collected through the questionnaires applied to S. Tomé residents; and (2) the tourist behaviour and profile addressed to the analysis of the collected data through the questionnaires applied to tourists.

7.1. Community profile

A summary of the main socio-demographic characteristics of the residents analyzed is provided in Table 2. The results showed that most of the respondents were male (66%), aged between 29 and 39 years old (37.5%) and hold the elementary education level (92.9%). Additionally, most of the respondents were engaged in fishing activities (fisherman and fishmonger).

Concerning the general residents' behavioral characteristics and attitude towards sea turtles, the answers given to the question "Have you ever eaten turtle meat?" were mostly positive (67.9%). However, it is noteworthy that several relevant reactions have been observed on this issue. Thus, some of the respondents felt ashamed that they had already eaten the turtle's meat (some revealed that they no longer did), while others were afraid to respond affirmatively to the question due to the existence of a law prohibiting the capture and consumption. Nonetheless, a large number have stated convincingly that they have this eating habit and revealing that they greatly appreciate it. Likewise, residents' reactions to the question "Have you ever caught a turtle?" revealed some reluctance to respond. However, 35.7% of the answers were affirmative, of which 55% indicated that they had done it accidentally. In addition, it should be noted that the affirmative responses were significantly male (p -value < 0.05). On the other hand, it should be noted the significant association of this issue with the daily occupation, given that in the majority the residents are engaged in fishing activities (p -value < 0.05). When questioned about what they had done with the captured animal, most claimed to have sold it to the *Palaiês* (fishmongers). Although, 14.3% stated that the catch was carried out to serve as food, 28.6% of respondents reported that they had released the captured turtle. It should be noted that fishermen who catch turtles do not generally kill them. They sell it alive to the *Palaiês*, who kill it for later sale in the local market. In this way, the fishermen cannot be accused of acting in a pre-determined manner regarding the capture and death of the turtles. Regarding the perception of residents to the protection and conservation of sea turtles, a relevant number of respondents (33.9%) revealed to be unaware of their importance and necessity (being the lack of knowledge significant and extensive to both sexes) (p -value < 0.05). However, residents who answered differently (significantly associated with individuals with a higher educational level; p -value < 0.05) identified the fact that the sea turtles are part of the country's natural heritage and are endangered of extinction as one

of the elements that drive the protection and conservation strategy of the species (46.4%). On the other hand, also tourism has proven to play an important role in this issue (14.3%). In fact, most respondents (82.1%) are aware of the law imposed by the government to regulate the capture, protection and conservation of sea turtles. The tourist presence in the community was the last topic addressed in the questionnaire, whose main objective was to evaluate and know how the local population reacted to the presence of tourists. Therefore, when asked if “Did you know people from other countries come to see turtles?” all the answers were affirmative. This means that the community is perfectly aware of how turtle watching can boost tourism in São Tomé, specifically in Morro Peixe. The answers to the question “Does the presence of tourists bother you?” were crucial to understanding that the activities associated with the conservation of sea turtles would not be detrimental to the well-being of the local community. In fact, all the individuals answered that they did not feel uncomfortable with the presence of tourists in the community, evidencing the hospitable spirit that characterizes the resident community. Nonetheless, when asked why the advantage of attracting tourists to the community through the observation of turtles, they revealed a lack of information and knowledge. This highlighted the urgent need to clarify the economic and social benefits that the community could obtain from the presence of ecotourism activities on São Tomé.

7.2. Tourist behaviour

A summary of the main socio-demographic characteristics of the tourists is provided in Table 3. The results showed that most of the respondents were female (63.6%), aged between 40 and 50 years old (38.2%) and hold a master education level (43.6%). Additionally, the majority of visitors came from Portugal (52.7%) with an average income higher than 2000 euros (54.5%).

Most of the visitors traveled with the family or with their companion (61.8%), being residual the number of tourists that traveled alone (5.5%). Regarding the periodicity and reason for the visit to São Tomé and Príncipe, it was observed that most of the visitors were in the country for the first time (83.6%), and the main motivation was tourism (90.9%). In fact, the level of tourist information available on the island was considered good by 45.5% of the individuals. Specifically, in relation to turtle watching most tourists (65.5%) were doing it for the first time, although showing prior knowledge of the activities associated. The communities of Morro de Peixe and Porto Alegre were the ones that aroused a greater interest (45.5% and 41.8%, respectively). In relation to the importance of sea turtles to the environment, the majority of respondents (85.5%) recognized their importance in maintaining the balance of marine ecosystems. When questioned about whether “It

Table 3. Tourist profile

Variables	Categories	% (n)
Gender	Male	36.4% (20)
	Female	63.6% (35)
Age	18–28	9.1% (5)
	29–39	29.1% (16)
	40–50	38.2% (21)
	≥51	14.5% (8)
Education	Elementary school	9.1% (5)
	High school	9.1% (5)
	Graduation level	25.5% (14)
	Master	43.6% (24)
	PhD	12.7% (7)
Monthly income (net values)	No answer	18.2% (10)
	<1000€	3.6% (2)
	1000€–2000€	23.6% (13)
	>2000€	54.5% (30)
Nationality	Portugal	52.7% (29)
	Other countries in Europe	38.2% (21)
	Other World Countries	9.1% (5)

considers that this type of ecotourism programs is useful for the sustainable development of São Tomé”, the majority demonstrated to agree in totality (89.1%). This demonstrates the awareness and sensitivity of tourists to promote the conservation and protection of the species. Therefore, the sustainability and success of sea turtle protection initiatives play a leading role within local communities in terms of cultural, economic and social development. Positive satisfaction with tourism experience is also demonstrated by most respondents (72.7%). The same pattern is observed in the evaluation of the quality–price relation of the service, in association with the salary level of tourists (p -value < 0.05), where the majority of the respondents (76.4%) consider it adequate and fair.

8. Discussion

An ecotourist is someone environmentally concerned and assess the importance of environmental sustainability. Age, sex, education and income contribute to their vacation choices (Hedlund, Marell, & Gärling, 2012). These tourists tend to cause less negative impact because they are more environmentally aware. Tourists are also motivated to visit the island for the nature attributes, and for the conviviality. Our findings are consistent with other studies regarding the motivation for the visit to São Tomé and Príncipe (Alaeddinoglu, Turker, Can, & Ozturk, 2013; Ballantine & Eagles, 1994; Holden & Sparrowhawk, 2002; Reinius & Fredman, 2007; Wood, 2002; Yacob et al., 2009) which found that tourist’s motivations when visiting protected areas are related to experiencing pristine natural areas and to the observation and appreciation of natural features, along with cultural and historical sites. These can be associated with nature-based tourism and to ecotourist.

There are many researchers studying the relationship between gender and environment concern (Alexander, 2012; Blocker & Eckberg, 1997; Casey & Scott, 2006; Guimarães, Amaral, Santos, & Santos, 2009; Leonidou, Coudounaris, Kvasova, & Christodoulides, 2015; Sakellari & Skanavis, 2013; Scott & Willits, 1994) which indicates that the female subjects are more concerned with the environment than male subjects and in other cases there is no difference between genders. Cultural, social or economic aspects, however, may be more important than gender regarding ecological attitudes (Alibeli & White, 2011; Omoogun & Odok, 2013). Some authors have been studying the effect of age on environmental behavior and the results obtained suggest a complex relationship, as it has not been possible to establish consistent significant patterns in the correlation between age and environmental behaviors (Gabriel & Silva, 2005; Hedlund et al., 2012; Liere & Dunlap, 1980; Schultz, Oskamp, & Mainieri, 1995). Moreover, Gabriel & Silva, 2005), correlated age with education level, and found out that both were significant, being education positive and age negative. This means that the people with higher education have more pro-environmental attitudes than the elder people that probably have few qualifications than the younger people or the middle-aged tourists. As we could confirm with our results, ecotourists, thus, tend to be middle age, have a relatively high income and level of education, and are involved in the environmental cause (Ballantine & Eagles, 1994; Hill & Gale, 2009).

Higher education is generally positively associated with environmental concern, since people who studied longer are more exposed to information and are more able to understand it, to critically analyze it and question it (Hill & Gale, 2009; Howell & Laska, 1992; Ogunbode, 2013; Queiroz et al., 2014). Also, Queiroz et al. (2014), suggest that most tourists with higher education seek for alternative tourism, namely, protected areas and have positive perceptions of biodiversity conservation of the protected areas. In the study of Filby, Stockin, and Scarpaci (2015), the results reinforce that education is wanted by participants, that they expect interpretation as part of their tour, and indicates that tour guides are central to the tourist experience. This means that it is expected that the tour leaders can provide information about the site that they were motivated to visit. Therefore, efforts must be further implemented on-site to fulfill the expectation of ecotourists visiting S. Tomé and Príncipe, so to educate tour guides with enough information on sea-turtles biology and ecology, environmental issues and conservation programs.

Environment education should be carried out not only among tourists and tour guides at the destination but also among local children through outdoor education programs, wherein environmental issues should be incorporated, starting to develop a deeper environmental awareness and sustainable behavior. The development of educational experiences will increase the knowledge regarding existing values, thus, increasing environmental awareness (Benckendorff, Moscardo, & Murphy, 2012; Reinius & Fredman, 2007). Likewise, environmental education must be provided for other stakeholders, to encourage good environmental practices enhancing conservation practices (Lee 2013), namely to managers, local people and tourism operators.

These activities are already being undertaken by ATM and MARAPA, under Tatô program, and hopefully, in the short term the awareness of the population regarding the need for the conservation of the sea turtle will increase, for our results indicate that further work is required among the local population.

The profile of the tourist in our study can be related to the ecotourist, that is, someone with a higher level of education and income, more environmentally aware and active than the general tourists and usually travels in small groups or alone. Because these tourists are more aware of environmental practices, they are more willing to pay for green products and perform activities with educational and ecological purposes that support the preservation of the conservation of the natural environment and wildlife. Ecotourism, if managed properly, allows the maintenance of good ecological conditions, because it depends on it (Yacob et al., 2009). The growing number of nature-based tourists in protected areas causes degradation of sensitive ecosystems. So, limiting the number of visitors, namely through ecotourism, is easier in an island than in mainland, and it is a crucial tool to allow nature conservation (Queiroz et al., 2014; Yacob et al., 2009). Moreover, management is a major concern when dealing with pristine natural ecosystems, because minor disturbance caused by tourist activities may have negative impacts on the equilibrium of such ecosystems. Studies such as Remacha, Pérez-Tris, and Delgado (2011) concluded that reducing the size of visitors' groups not only helped to minimize the impacts on wildlife derived from leisure activities, but also allowed visitors to watch more wildlife increasing the satisfaction of the visitor. Therefore, organizing visitors in smaller groups is recommended so to control the impact of such activities.

In fact, in this research, most respondents demonstrated their support to turtle conservation since it contributes to the local tourism economy. This is a key shift in value where turtles are now more valuable alive than dead. This sustains the claim that ecotourism can create an incentive for locals to change the way they use and value wildlife (Pegas et al., 2013).

9. Conclusions

S. Tomé and Príncipe is an important archipelago for the observation of sea turtles and the tourism activities are increasing. Through our study, we can conclude that the destination has the potential to become a reference for sea turtle-based ecotourism activities, if managed properly. The implementation of a management plan for ecotourism is needed, one that keeps ecological integrity, satisfies the needs of nature conservation, rewards the local community, and satisfies the expectations of tourists. Being an archipelago, the management can control of the influx of tourists and establish a maximum number of tourists to prevent any highly detrimental impacts. This maximum must take into account that most tourists visiting the archipelago have the profile of ecotourists, having a higher level of education and income, and being more environmentally aware and willing to perform activities that support the conservation of the natural habitats and wildlife. These ecotourists tend to cause less negative impact than others, and to spend more money in such activities. Hence, the management of tourism in S. Tomé and Príncipe has the opportunity to take advantage of this market niche to implement limited but expensive tourism activities with high-quality standards.

The population is also increasingly sensible regarding the importance of sea turtles and well-preserved habitats, all being aware of the national law that regulates capture, protection and

conservation of sea turtles. The residents are getting more involved in tourism activities and are also conscious of the importance of these activities to boost the country's economy. Besides, they seem very comfortable with the increasing presence of tourists. Thus, being further encouraged the population should be willing to become more involved in tourism activities, namely by offering hospitality and accommodation facilities, implementing various events, producing local products, and so forth. Population's long-term involvement is key to the success of ecotourism in S. Tomé and Príncipe promoting responsible behavior and diminishing the negative impacts on the environment.

The development of an ecotourism practice guide should be implemented, following the principals defined for ecotourism: defining alternative products that can be appropriate for the area and evaluating the suitability of each tourist product already existing. The challenge, therefore, is to convert the paradigm of tourism from nature-based tourism into ecotourism.

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Note

1. According to the latest census carried out in 2001 by the National Statistics Institute of S. Tomé and Príncipe.

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