

# Diagnosis on Environmental Impacts of Tourism at Caju Beach in Palmas, Tocantins, Brazil

Mary L. G. S. Senna, Veruska, C. Dutra, Jr., Keity L. F. Oliveira, Patrícia A. Santos, Alana C. M. Santana

**Abstract**—Environmental impacts are the changes in the physical, chemical or biological properties of natural areas that are most often caused by human actions on the environment and which have consequences for human health, society and the elements of nature. The identification of the environmental impacts is important so that they are mitigated, and above all that the mitigating measures are applied in the area. This work aims to identify the environmental impacts generated in the Praia do Caju area in the city of Palmas/Brazil and show that the lack of structure on the beach intensifies the environmental impacts. The present work was carried out having as parameter, the typologies of exploratory and descriptive and quantitative research through a matrix of environmental impacts through direct observation and registration. The study took place during the holidays from August to December 2016 and photographic record of impacts. From the collected data it was possible to verify that Caju beach suffers constant degradation due to irregular deposition.

**Keywords**—Leisure, tourism, environmental impacts, Brazil.

## I. INTRODUCTION

SINCE the rise of humankind, the specie was already causing impacts on the environment due to the obligation to adapting to the conditions offered by nature, the modification of climate and habitats as well as the fact that humans need feeding by collecting vegetable and fruits, hunting and fishing. Still, it is not possible to consider such impacts as critical as nowadays', because they were considered a means of survival [1].

Many things have changed since then, even the way of human survival. There are urban agglomerations that contributed to the increase of environmental impacts, so, many green areas and rivers ceased to exist to make room for entire cities. With the urbanization, many leisure options have emerged in these areas and beaches are one of them. It should also be considered that some actions practiced in tourist attractions have many impacts on nature. According to [2], human actions influence directly and indirectly in the environment they live and, at all times, generating impacts to it by using natural resources or producing debris that increases day after day. According to [3], urban beaches allow a common style of operation, less formal, guided by sociability and with a great tendency for developing activities linked to leisure, as a form of tourist attraction.

M. L. G. S. Senna and V. C. Dutra are professor of the Federal Institute of the Tocantins State, doctors of the IPEN/USP, TO 77016162 Brazil (e-mail: marysenna@ifto.edu.br e veruska@ifto.edu.br).

K. L. F. Oliveira, P. A. Santos and A. C. M. Santana are students of the Federal Institute of the Tocantins State, TO 77016162 Brazil (e-mail: marysenna@ifto.edu.br).

Leisure can be defined as:

"a set of occupations to which the individual can dedicate of free will, either to rest, to amuse, to leisure or to entertain himself as well as to develop disinterested information or formation, voluntary social participation or free creative capacity after getting rid of or disentangling himself from professional, family and social obligations" [4].

The venture known as "river beaches" can be understood, because it is located in riverside environments, where there is an agglomeration of people in the same space. The author still considers that it is necessary to direct efforts to understand, on a scientific basis, more information about this practice, which can impact the environment and local tourism [5].

Environmental impacts are considered as any changes in the chemical, physical or biological properties of natural areas. These impacts are often caused by human action on the environment and have consequences for their health, society and the elements of nature.

"Therefore, not only the identification of the main environmental impacts is important, but, above all, the mitigating measures that can be applied in the area" [6].

Environmental impact is defined as any change in the physical, chemical and biological properties of the environment caused by any form of matter or energy resulting from activities that directly or indirectly affect: The health, safety and well-being of the population; Social and economic activities; The biota; The aesthetic and sanitary conditions of the environment; The quality of environmental resources [7].

As well as sustainable development, there is also a need to understand the concept of sustainable tourism. Sustainable tourism would be capable of reducing regional asymmetries between countries and within countries. Tourism is able to meet the economic needs of tourist regions and protect the environment when the activity is planned. But the guidelines for the development of tourism must be applied in all forms of tourism [8]:

- Optimize the use of environmental resources while maintaining the essential ecological processes;
- Help in the conservation of natural resources and local biodiversity;
- Respect the sociocultural authenticity of the receiving communities, preserving their architectural cultures and their traditional values; and,
- Ensure long-term viable activities that bring socio-economic benefits to all actors.

Sustainable tourism basically involves minimizing the negative impacts and maximizing the positive impacts. The

author argues that sustainable tourism debates started after Agenda 21, when the UN Commission on Sustainable Development implemented the Tourism Program to facilitate the implementation of Agenda 21 in the tourism sector [8].

Sustainable tourism must have certain characteristics, such as:

- Planned - for the needs of current and future generations to be met;
- Integrated - to associate all the natural, cultural, historical, social and economic elements of the destination;
- Open - based on interregional collaboration and synergies;
- Seasonality: Sizing time and space - on the one hand, reducing the factor seasonality and on the other, limiting the cargo capacity of the destination. This can generate the loss of quality in the tourist experience, as well as in the economic unfeasibility of tourism in the region.
- Participatory - (participatory development), there must be talk between all agents and actors involved in the tourism activity, from companies, to the local population and visitors;
- Durable - to the extent that its effects should be planned in the medium and long term;
- Viable - that alia the economic aspects to the well-being of the local population.

Sustainable tourism development requires a multidisciplinary approach given the transversely of the sector. The authors also say that acting in the sector presupposes projects and development strategies that include as economic, social and cultural dimensions, not evading the involvement of local residents [8]

Reference [8] provides an analysis of the research of international institutions of defense, ecological preservation and ecological certification, such as the World Wildlife Foundation, Forest Stewardship, Rainforest Alliance, International Ecotourism Society, and CST Certification for Tourism Sustainability, among others. All these organizations worked and still work with the methodology and parameters of quality, preservation and environmental sustainability. Most do not care about deepening economic and political-social studies and research, resisting the idea of bringing tourism to the occupation of natural spaces and protected areas, and limiting themselves to studying the impacts in those places.

This work aims to identify the environmental impacts engendered in the beach, *Praia do Caju* (Beach of Cashew) and to reaffirm that the lack of structure on the beach intensifies the environmental impacts.

## II. METHODOLOGY

The present work will have as parameters, the typologies of exploratory, descriptive and quantitative research.

For [7], the goal of exploratory research is to develop, transcend and transform concepts and ideas, keeping in mind the most precise formulation of the problem or searchable presumptions for future studies. The author also mentions that this type of research is the one that presents less rigorous in the planning, because they are sketched with the objective of adapting an overview of a certain fact.

In the same way, the research is considered descriptive, because it was observed the impacts of the beach and the analysis was made later. According to [8], the descriptive research configures of speculative hypotheses that do not specify the causal relations and usually uses the observed data.

Consequently, a matrix of environmental impacts (Table I) was constructed based on the studies of [7] that presented the main environmental impacts that occurred on beaches, such as garbage in the area, erosion, deforestation, exposed roots, excessive number of visitors, presence of jet-skis and boats, siltation, and air pollution, among others. A field trip was chosen in the high season, post-holiday in order to verify the occurrence of such impacts in the chosen location through direct observation.

TABLE I  
MATRIX OF ENVIRONMENTAL IMPACTS

	Impact	Identified	Not identified
1	Littering in the area		
2	Erosion		
3	Deforestation		
4	Exposed roots		
5	Open sewage		
6	Human or animal waste in the water		
7	Excessive number of visitors		
8	Noise pollution		
9	Visual pollution		
10	Presence of jet-skis and boats		
11	Bathrooms (water)		
12	Air pollution (dust in the wind due to vehicle traffic)		
13	Rise on electricity demand and consumption		
14	Water supply		
15	Presence of fishermen		
16	Degradation of fauna and flora; tourists hunting and removing native plants		
17	Natural landscape change caused by disorderly construction		
18	Siltation		
19	Garbage collection (check garbage collection frequency)		

## III. RESULTS AND DISCUSSIONS

The study took place during the holidays from August to December 2016 at *Praia do Caju* in Palmas, Tocantins, Brazil. The impacts were observed and photographed. Through the collected data, it was possible to verify that the tourist attraction suffers constant degradation.

The lack of structure and supervision is the main factor that may be causing a major environmental impact on the beach. The beach access road is precarious, as the route is not asphalt paved, and as a consequence, the dust in the wind, due to the vehicles rolling on the dirt road, makes it more dangerous, as seen in Fig. 1. In addition, visual pollution and unfinished constructions were also identified. They are identified as a threat to the safety of the site (Fig. 2).

Fig. 1 Access to *Praia do Caju*

Fig. 2 Visual pollution on the beach

Other impacts were observed such as erosion near the banks of the lake (Fig. 3). In addition, since there is no basic sanitation, part of the sewage is dumped into the surroundings; thus, the environmental impact is evident. Furthermore, oil deposits from boats and jet skis are evident in the water (Fig. 4), as well camp fires were constructed among the trees by visitors, litter was found in the water and large-scale siltation was witnessed. Likewise, many trees were felled for constructing a possible parking lot and there is no adequate structure for public toilets.



Fig. 3 Erosion in the area



Fig. 4 Jet skis on the site



Fig. 5 Camp fire near trees



Fig. 6 Litter on the banks of the lake

The tourist infrastructure was considered very precarious. There is electrical equipment inside the water that serves to bring water from the beach to the public toilets. Unfortunately, there have already been fatal accidents at the site because of this. Besides, there is no public drinking water for visitors.

#### IV. FINAL CONSIDERATIONS

After analyzing the results it was noticed the need of

developing researches concerning the analyzed area, with the intention of suggesting later actions that could be implemented. It is also necessary to analyze the interrelation among the components of this environment, in order to avoid or mitigate the impacts so that tourism can contribute to environmental conservation and the sustainable development of the region.

It is expected that the data collected can contribute to the planning and management of tourism and environment policies, as well as to build parameters to support discussions and new approaches to research that consider the viability and adherence of sustainable tourism models.

The tourist attraction needs implementation and monitoring of activities, thus contributing as tools for environmental management. Therefore, it is of crucial importance to study the beach environment to avoid major socio-environmental problems, emphasizing the maintenance of the natural resources available in this environment, seeking ways to mitigate the consequences of natural and anthropogenic actions.

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**Mary Lucia Gomes Silveira Senna**, Brazilian, graduated in pedagogy, Specialist in Tourism from the Catholic University of Brasília (2005), Master in Environmental Sciences from the Federal University of Tocantins / Brazil (2008), PhD in Science from the University of São Paulo Brazil (USP / IPEN). Effective acts as Professor of the Institute Federal do Tocantins. He worked in the pedagogical disciplines of Bachelor courses. Currently, Minister disciplines of the area of Tourism, Hospitality and Leisure on campus Palmas. Research on Environmental Indicators and the Tourism Research Group member NEHTUS - Center for Studies in Education, Tourism and Sustainability CNPQ / IFTO, which possesses articles and the book "Sustainable Development Indicators: an academic view" of Sirius Network publisher, published in this area.

**Veruska, Dutra**, Brazilian, graduated in Tourism, Master in Environmental Sciences from the Federal University of Tocantins / Brazil, PhD in Science

from the University of São Paulo Brazil (USP / IPEN). Researcher and Professor of Hospitality area courses and Leisure at the Federal Institute of Tocantins. Develops research since 2002, with an interdisciplinary approach, focused on the area of Tourism and Sustainability, focusing on the study of planning methodologies and monitoring of tourism and sustainability, which possesses articles and the book "Sustainable Development Indicators: A academic view" Network Sirius publisher, published in this area. Member of NEHTUS research group - Nucleus of Studies in Education, Tourism and Sustainability CNPQ / IFTO.

**Keity L. F. Oliveira** is a student of the Federal Institute of Education, Science and Technology Tocantins State, cursing Tourism Management.

**Patrícia A. Santos** is a student of the Federal Institute of Education, Science and Technology Tocantins State, cursing Tourism Management.

**Alana C. M. Santana** is a student of the Federal Institute of Education, Science and Technology Tocantins State, cursing Tourism Management and has a scholarship of scientific initiation.