

ECOTOURISM BASED ON THE GEOGRAPHIC MAPPING OF THE ITATIAIA NATIONAL PARK IN THE STATE OF RIO DE JANEIRO



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ABSTRACT

Ecotourism is a branch of conventional tourism, where it uses the practice of sustainability, protection and responsibility with Environmental Preservation Areas or Conservation Units (UCs). Therefore, it is characterized as a sustainable tourist activity, where the main focus is the conservation of the environment and the cultural enrichment of visitors, without harming beings or the environment; Since, sustainability seeks development in balance between the ecological, economic and social world. The Itatiaia National Park (PNI), located in the south of the state of Rio de Janeiro, is the first national park in Brazil. Currently the park is divided into two large areas with different geographical characteristics, called the Upper Part and the Lower Part. The project was developed with students of the Environmental Engineering Course, School of Engineering of Lorena, University of São Paulo, Brazil. The project offered the opportunity to visit and study conservation areas in the Lower Part of the PNI. In this way, ecotourism plays a key role in the formation of conscious and engaged students, preparing them to face the environmental challenges of the current and future world. These experiences provide unique opportunities for people to learn about the importance of preserving ecosystems, biodiversity, and the impacts of human activities on the environment. By connecting people with nature in a respectful and sustainable way, ecotourism inspires individual and collective actions in favor of conservation, thus contributing to the formation of a society that is more aware and engaged in protecting the planet.

Keywords: Itatiaia National Park. Environmental education. Ecological Tourism.

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INTRODUCTION

National parks are extremely important for encouraging the protection of natural areas with vast biodiversity. National parks have been defined by the International Union for Conservation of Nature (IUCN) as Category II protected areas, being characterized as: "extensive natural area of land or sea of great relevance for the conservation of nature and biodiversity, intended to: (1) protect the ecological integrity of one or more ecosystems for present and future generations; (2) exclude exploration or occupation not linked to the protection of the area; and (3) to provide the basis for visitors to make educational, playful, or scientific use in a way that is compatible with the conservation of nature and existing cultural assets".

The Itatiaia National Park (PNI), located in the south of the state of Rio de Janeiro, is the first national park in Brazil. Created as a Brazilian conservation unit of full environmental protection through Decree No. 1713, of June 14, 1937, issued by Getúlio Vargas, from the Itatiaia Biological Station. Currently the park is divided into two large areas with different geographical characteristics, called the Upper Part and the Lower Part. The Upper Part of the Park is located in the Agulhas Negras massif, which is the main elevation on the plateau, its peak reaches 2,791.55 m, the highest point in the Park and fifth highest in the country according to IBGE data from December 2004 (IBGE, 2004). The Lower Part of the Park is characterized mainly by its lush vegetation and rich hydrological area, with several areas suitable for bathing.

During the execution of the project, the lower part was analyzed mainly for its biology, seeking to present to the students the great diversity found in this region, since this area of national environmental protection is located within the Atlantic Forest, while the Upper Part was analyzed for the geological formation present in the region.

The Lower Part of the park features a diversity of ecosystems, including rainforests and stunning waterfalls, providing opportunities for wildlife viewing and outdoor recreational activities. On the other hand, the Upper Part of the park is home to towering peaks, such as Pico das Agulhas Negras, and high mountain ecosystems, offering unique habitats for a variety of plant and animal species. This area serves as a vital refuge for endemic fauna and flora, in addition to contributing to the preservation of important regional water sources.

Both parts of the park play a complementary role in environmental education, allowing visitors and researchers to understand the interconnection between different habitats and the impacts of human activities on nature conservation. In addition, the

presence of trails and environmental education programs in both areas provides opportunities to raise awareness and engage the public in the protection and preservation of these precious ecosystems. Therefore, the importance of the upper and lower part of the Itatiaia National Park lies not only in its natural richness, but also in its potential to inspire conservation and respect for nature in all its forms.

The development of the project involved the planning of a schedule and production of didactic materials for an expository class and the organization of a visit to the Lower Part of the Itatiaia National Park, carried out for students of the discipline of Basic Ecology (LOB 1205) of the School of Engineering Campus of Lorena, as well as the preparation of a certificate attesting to the presence in the visit to the PNI, and participation in the project.

The project aimed to bring to the students, from the undergraduate course in Environmental Engineering at the School of Engineering of Lorena (EEL-USP), an immersive experience in environmental protection areas, which are extremely important for the conservation of our biodiversity, highlighting environmental education. As part of this objective, an exhibition seminar was held at the Campus in question (EEL-USP) and a pamphlet ecotourism, which was offered to interested Environmental Engineering students from the School of Engineering of Lorena, through a face-to-face excursion to the Lower Part of the Park. focusing on the importance of the park for the country and on the geographical study in the Itatiaia National Park.

MATERIAL AND METHODS

This work is the result of a project of the Unified Scholarship Program (PUB), of the University of São Paulo, entitled "Ecotourism Based on the Geographic Mapping of the Upper and Lower Part of the Itatiaia National Park in the State of Rio de Janeiro. The target students of the Project were mostly enrolled in the Basic Ecology Discipline (in the first semester of the Course) and in the Academic Center of Environmental Engineering.

In this project, we carried out a visit to the Lower Part of the Itatiaia National Park (PNI), which aimed to promote, in addition to a greater use during the discipline of Basic Ecology, an immersive experience in the first conservation unit (UC) in Brazil, in addition to an andragogical process in relation to the importance of these UCs and the practice of ecotourism.

Andragogy was one of the main theoretical bases for the realization of the project, being an educational approach centered on adult learning. Unlike pedagogy, which focuses

on the education of children, andragogy recognizes the specific characteristics and needs of adults in their learning process. It is based on the assumption that adults are self-directed and have a vast accumulated experience that can be used in the educational process. Therefore, andragagogical strategies emphasize the active participation of adults in defining their learning objectives, applying knowledge in practical situations, and solving problems relevant to their personal and professional lives. The role of the educator in andragogy is to facilitate the learning process, providing an environment that encourages reflection, dialogue and collaboration among adult learners. This approach has been widely adopted in continuing education, professional training, and adult education programs, recognizing the importance of an approach tailored to the specific characteristics and needs of this audience.

The development of this project was carried out in different stages with activities for two scholarship holders who worked together and individually. The work began with the bibliographic review and data collection by the scholarship holders through the search for bibliographic materials referring to the specificities of the areas under study, as well as field research in the park in question. Followed by the study of the history of the Itatiaia National Park through bibliographic research and search for information about the creation and development of the park over the years, with the dedication to study the geography of the Park. Then, the preparation of the exhibition content and the material to be exhibited before and during the excursion was carried out.

For the logistics of the excursion, each scholarship holder was responsible for a part of the organization of the excursion, from transportation to getting the accompaniment of a guide to accompany the ecotourism.

For the development of this project, the participation of two scholarship holders was necessary. The plan of activities developed by the scholarship holders is shown in Chart 1.

Chart 1: Activities developed by the scholarship holders

Literature review and data collection for the project	
Study of the history and geography of the National Park	
Preparation of a seminar on the information collected (presented before the visitation)	Preparation of a pamphlet about the information collected (delivered during the visitation)
Selection of students who will go on the excursion	
Searching for bus companies and working in transport logistics	Conversations with the Park Secretariat about the excursion and definition of a guide to accompany the ecotourism
Construction of an article about the Itatiaia National Park	
Preparation of the project report	

To start the development of the project, meetings were held between the scholarship holders who carried out a data survey and bibliographic reviews to assist studies on the PNI. For better organization of the scholarship holders, a shared folder was created in Drive for the combination of all research materials found, in addition to the creation of folders and documents. Subsequently, the scholarship holders contacted the park's secretariat to proceed with the requirements for the visit. As it was a didactic visit to a federal conservation site, an application through the Biodiversity Authorization and Information System (SISBIO) was necessary. After the authorization granted by SISBIO, we were also given an exemption from the entrance fee, and then the date of the visit was set (which took place on June 2, 2023). The participants, for the first vacancies, students from the discipline of Basic Ecology were selected. The choice of this discipline was due not only to the area of knowledge, but also because it is offered to students entering the Environmental Engineering Course. For the remaining vacancies, a form was sent in the WhatsApp groups of undergraduate students in Environmental Engineering and participants of the Academic Center of Environmental Engineering.

Throughout the project, the scholarship holders obtained information about the history of the Park, its geography and its biodiversity, in the collection present on the Park's website. This content was used for a presentation by scholarship students in class. In addition, a form was prepared seeking to assess the participants' previous knowledge in relation to what we addressed during the project.

One of the proposals of the scholarship holders was the elaboration of an evaluative questionnaire on the satisfaction of the participants of the first edition of the project. This research aimed to know the degree of knowledge acquired, such as: quality of the materials used, methods used by the scholarship holders, etc. In addition, a survey was carried out on the interest in participating in future editions.

Organizing ecotourism in the Itatiaia National Park (PNI) requires a careful and sustainable approach to ensure the preservation of natural resources and provide enriching experiences for visitors. Here are some steps worked on and developed during the planning of activities.

It began by conducting a detailed research on the natural resources of the park, its trails, attractions and limitations. Developing an ecotourism plan that would take into account environmental conservation, socioeconomic impacts, and visitor safety. After identifying the trail routes and the main natural attractions of the park, such as mountains,

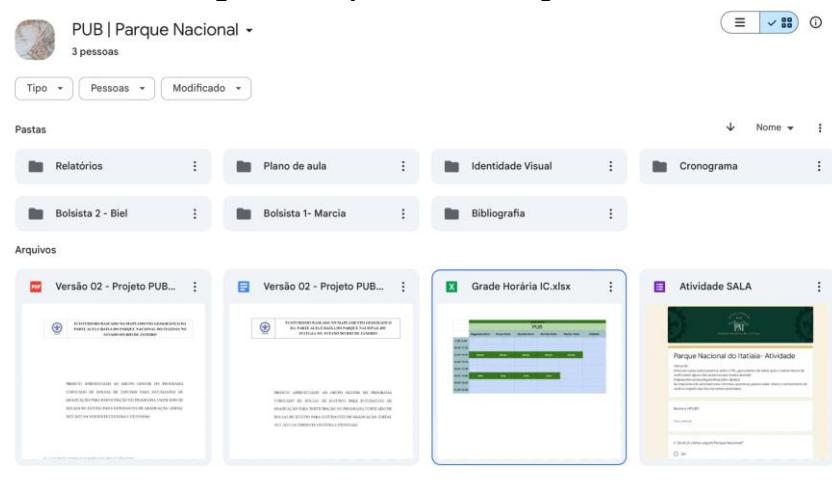
waterfalls, viewpoints and areas for observing fauna and flora, the scholarship holders contacted the Park to carry out the free visitation and with bus companies to conclude the best transportation possibility.

In addition to the points mentioned above, it was important during the realization of the project, the implementation of environmental education programs for visitors, highlighting the importance of conservation and practices of minimal impact. Process carried out as an expository class, which all visitors would need to attend.

RESULTS AND DISCUSSION

The project began with the planning and acquisition of information, so a drive was created to facilitate the disposal of the information collected during the research on the PNI (Figure 1).

Figure 1: Project Drive for Organization



Then, the contact with the park was made via e-mail, where it was possible to ask questions about the possibility of the visit and the necessary requirements for it, also creating the structure of the visit. The students selected for the visit answered an application form and the data were passed, in PDF format, to the secretariat of the Department of Basic and Environmental Sciences of the Campus of the University of São Paulo in Lorena, with the request and the request for the bus.

After data collection, the material for the lecture and the questionnaire were prepared, for which CANVA and Google Form were used. The class was taught by the scholarship holders on the day before the visit and was open to the entire EEL-USP public,

being taught on the Upper Part by the scholarship holder Gabriel da Silva Albuquerque, and on the Lower Part by the scholarship holder Marcia Christini Chagas Rodrigues. During the class, information was given about what would happen the next day and questions were answered by the participants.

Figure 2: Project scholarship holder teaching a class on ecotourism and the Itatiaia National Park. Part of the presentation made about the project, ecotourism and environmental education



A questionnaire was prepared with the objective of evaluating the students' previous knowledge, being able to explain the impact that the project had on the lives of those involved, in this form specific knowledge that would be talked about in the future was addressed. An evaluative questionnaire plays a key role in collecting information and *feedback* from the participants of an event, program, service, or product, and can show whether the expected results were achieved during the realization of the project or research addressed. Its importance lies in several areas, allowing you to evaluate the performance of an event, program or service against the established objectives, providing concrete data on what worked well and what needs to be improved. In addition to offering a way for customers or users to express their opinions, suggestions, and concerns, through the analysis of the questionnaire data, it is possible to identify areas for improvement and implement changes to improve the quality and effectiveness of what is being evaluated. This contributes to a culture of continuous improvement and innovation.

The questionnaires were offered before and after the visit, with the aim of collecting expectations and previous knowledge and, later, receiving feedback for improvements in future years, so this method was useful to assess the impact of specific interventions or initiatives. They made it possible to measure progress against the established objectives and to determine the added value of certain actions.

In summary, an evaluative questionnaire is a powerful tool to collect valuable data and feedback that can inform decision-making, promote continuous improvements, and ensure the satisfaction of the target audience, being one of the main indicators of success for the project "ECOTOURISM BASED ON THE GEOGRAPHIC MAPPING OF THE UPPER AND LOWER PART OF THE ITATIAIA NATIONAL PARK IN THE STATE OF RIO DE JANEIRO".

Figures 4 to 8 present the answers to some questions of the questionnaire carried out before the trip.

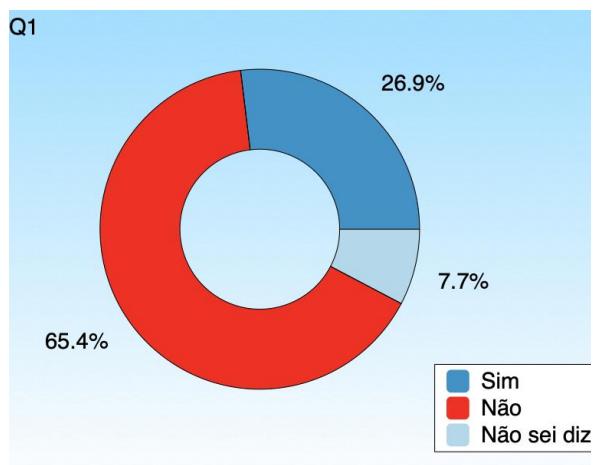


Figure 4: Question from the evaluative questionnaire: "Have you ever visited a National Park?" (n = 26).

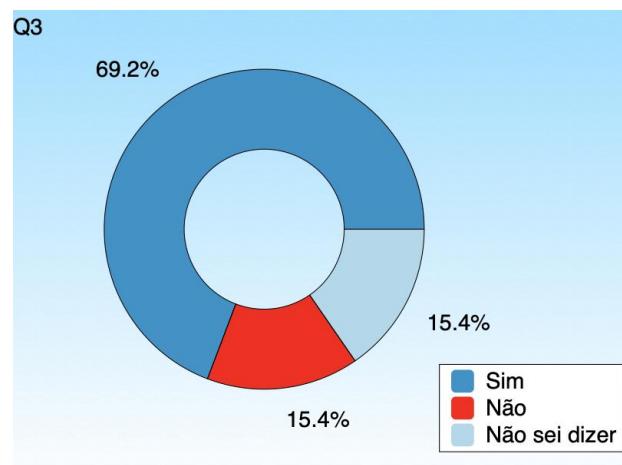


Figure 5: Question from the evaluative questionnaire: "Do you know the importance of a National Park?" (n = 26).

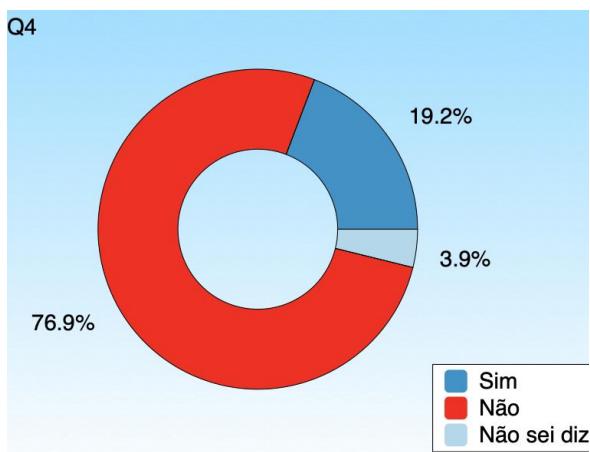


Figure 6: Question from the evaluative questionnaire: "Do you know what the Flamenguinho Frog is?" (n = 26).

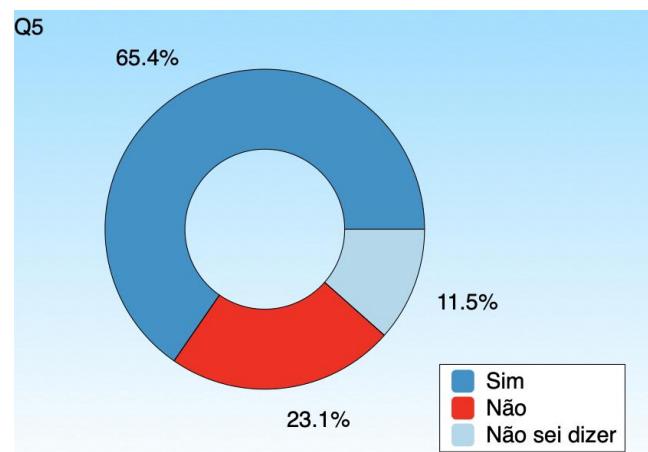
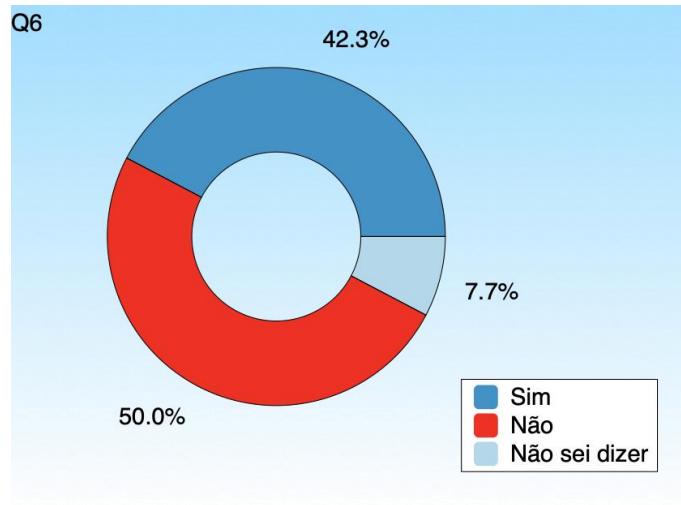


Figure 7: Evaluative questionnaire question: "Have you ever heard of *Environmental Hotspots*?" (n = 26).

Figure 8: Question from the evaluation questionnaire: "Did you know that the PNI was the first national park in Brazil?" (n = 26).



During the analysis of the responses to the questionnaire assigned to the project, the group identified a significant gap regarding the essential environmental information that participants should have. This information is crucial to promote the awareness and engagement of participants in pertinent environmental issues, in this case environmental education, and ecological tourism, as well as geographical characteristics of the region, since the theme is directly linked to the training of the Environmental Engineer. Therefore, we recognize the urgent need to integrate this information more comprehensively and accessible into the project and questionnaire in order to ensure that participants are well informed and empowered after participation.

After the class and the trip to the Itatiaia National Park, the participants were asked to answer a feedback questionnaire, giving their opinions about the experience. Figures 9 and 10 show the answers to some questions in the questionnaire conducted after the trip:

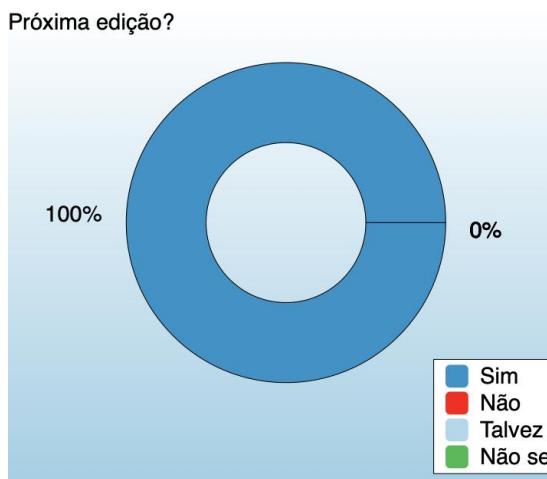


Figure 9 – Feedback questionnaire question: "Would you participate in a next edition of the project?" (n = 19).

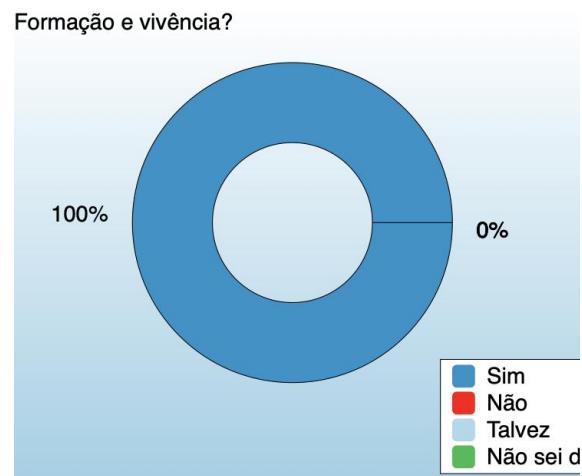


Figure 10 – Feedback questionnaire question: Do you think that visits, such as the PNI, are interesting for your training and experience?" (n = 19).

We interpret that this work had a great contribution to the academic training of scholarship holders and visiting students, enabling an andragogy, where students were able to acquire and improve their vision in relation to environmental education activities, recreation in contact with nature and ecological tourism, in addition to experiencing an immersive experience. Therefore, the project had a considerable positive impact on the lives of the participants.

FINAL CONSIDERATIONS

The Ecotourism project fulfilled its objectives, with regard to offering an immersive experience in an area of conservation and extreme environmental importance, as evidenced by the final results present in this article, and in relation to the learning of the responsible scholarship holders, who had the opportunity to delve into the subjects in question. As an indication of the result, the visit to environmental preservation areas by EEL-USP students is gradually being inserted in the university, and the Ecotourism project Based on the Geographic Mapping of the Upper and Lower Part of the Itatiaia National Park in the State of Rio de Janeiro contributed in a relevant way in this aspect, positively impacting the Lorena Campus. Finally, the project enabled direct contact between undergraduate students in Environmental Engineering and the first National Park in Brazil.

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