

**ENVIRONMENTAL EDUCATION AND ECOTOURISM: THE CASE OF SÍTIO
FUNDÃO IN THE MUNICIPALITY OF CRATO- CE**

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ABSTRACT

The Environmental Education and Ecotourism activities are structured based on the sustainable use of space, the strengthening of local communities, and sustainable economic and cultural practices. This study aims to analyze the Environmental Education and Ecotourism strategies developed in the Sítio Fundão State Park in the municipality of Crato, Ceará. It also aims to contribute by giving examples of actions that can be structured in alignment with the Sustainable Development Goals and can be applied to the conservation of other protected areas. The qualitative research used bibliographic research, photographic records and interviews with the environmental educator of the Sítio Fundão Park to identify the activities developed in the Park and the strategies used that relate to Environmental Education and Ecotourism. It was found that the activities developed in the ecological trails of the Sítio Fundão State Park not only have strategies aimed at environmental preservation and Ecotourism but also develop inclusive actions, which have a direct relationship with the Sustainable Development Goals - SDGs.

Keywords: Environmental Education; Ecotourism; Conservation Unit.

**EDUCAÇÃO AMBIENTAL E ECOTURISMO: O CASO DO SÍTIO FUNDÃO
NO MUNICÍPIO DO CRATO- CE**

RESUMO

A Educação Ambiental e o Ecoturismo desenvolvem suas atividades por meio de mecanismos relacionados ao uso sustentável do espaço, fortalecimento das comunidades locais e práticas econômicas e culturais sustentáveis. O presente estudo tem por objetivo analisar as estratégias de Educação Ambiental e Ecoturismo desenvolvidas no Parque Estadual Sítio Fundão no município do Crato, Ceará, auxiliando como exemplo de ações, que podem ser utilizadas por outras Unidades de Conservação e ainda se elas estão em consonância com os Objetivos de Desenvolvimento Sustentável. A pesquisa de caráter qualitativa, utilizou de pesquisa bibliográfica, registros fotográficos e entrevista ao educador ambiental do Parque Sítio Fundão para identificar as atividades desenvolvidas no Parque e as estratégias utilizadas que relacionam

a Educação Ambiental e o Ecoturismo. Constatou-se que as atividades desenvolvidas nas trilhas ecológicas no Parque Estadual Sítio Fundão não só possuem estratégias voltadas à preservação ambiental e Ecoturismo, como também desenvolvem ações inclusivas, as quais possuem relação direta com os Objetivos do Desenvolvimento Sustentável- ODS.

Palavras-chave: Educação Ambiental; Ecoturismo; Unidade de Conservação.

INTRODUCTION

Nature with its landscapes full of scenic beauty and biodiversity of flora and fauna, in addition to abiotic elements such as soil, water (waterfalls, rivers, and headwaters), geology, and archaeology, form elements that attract the attention and curiosity of several people. In this context, it becomes interesting to take advantage of these natural wonders to transmit to people, either through Environmental Education and/or Ecotourism, ways and the importance of conserving and protecting natural resources.

Thus, it is essential to take advantage of the natural riches of Sítio Fundão, which was transformed in 2008 into an Integral Protection Conservation Unit by the Government of the State of Ceará, precisely because it has all the characteristics of a State Park, namely: abundant natural (biodiversity and geodiversity) and historical-cultural (buildings) heritage of significant value to Crato and the state of Ceará (FERNANDES *et. al*, 2017).

According to Law 9.795/99 Brazil (1999), Environmental Education is defined as "the processes by which the individual and the community build social values, knowledge, abilities, attitudes, and skills aimed at environmental conservation. "Therefore, it is very important to define well the strategies, techniques, methodologies, in short, the appropriate means for making people aware and develop a more ecological perception and better behavior to improve environmental quality and sustainability.

Ecotourism is another means by which it is possible to use natural and cultural heritage in a sustainable way to convey to people the importance of conserving natural resources. Bezerra (2009) points out that there are different definitions and concepts of Ecotourism, however, some aspects are indispensable, such as community participation and appreciation of culture and the environment.

In 2015 the United Nations Organization developed 17 Sustainable Development Goals (SDGs) and 169 targets for countries to achieve by 2030, aiming at sustainability in various social, environmental, economic, and institutional spheres. Among these goals, some of them are related to protected areas and ecological trails.

Although there is not a single approach, technique, or methodology to work Environmental Education and Ecotourism in protected areas, these activities must present elements that awaken in people another vision of protecting the environment. It is also necessary that these actions are linked to the SDGs that deal with the preservation of ecosystems, species of fauna and flora, and other aspects existing in the habitat and the development of activities such as Ecotourism.

Given the context, this research aims to analyze the strategies for Environmental Education and Ecotourism developed in the Sítio Fundão State Park, in the municipality of Crato, state of Ceará, helping as an example of actions that can be used by other protected areas and whether they are in line with the Sustainable Development Goals.

THEORETICAL FRAMEWORK

CHARACTERIZATION OF THE ENVIRONMENTAL CONSERVATION UNIT SÍTIO FUNDÃO IN THE BATATEIRAS GEOSITE

With the creation of the geoparks, a few years ago, several terminologies were emerging to define terms related to geology, such as geosites, geodiversity, and geoconservation, among others. Geodiversity deals with the abiotic elements of nature, whether minerals, rocks, fossils, landscapes, and active processes. The geosites, in turn, can be defined as the occurrence of one or more elements of geodiversity, geographically delimited and that have a particular value in scientific, cultural, and touristic conception (CAVALEIRO; MORGADO, 2021).

The geosites show the significant geodiversity of a region which is linked to the elements of biodiversity and culture under material and immaterial expressions providing various forms of geotourism and geo education activities. Geodiversity integrates the geological, geomorphological, and pedological diversity of a place, as well as the processes that originated and shaped them. It should be preserved as a fundamental part of the natural heritage, especially for educational, cultural, and scientific purposes. Geosites, in their form as natural sites, also have some fundamental values such as: intrinsic, aesthetic, cultural, functional, economic, didactic, and scientific (CEARÁ, 2019).

The United Nations Educational, Scientific and Cultural Organization - UNESCO uses a seal, entitled GeoPark, for areas with significant geological heritage, which contain attributes of rich natural value and integrate natural sites and tourist attractions of cultural interest, built in spaces for the protection of natural resources and which have a special scientific interest. The only GeoPark of the Americas recognized by the organization is the Araripe GeoPark, located in the state of Ceará, having its territory constituted by the municipalities of Barbalha, Crato, Juazeiro do Norte, Missão Velha, Nova Olinda and Santana do Cariri (CABRAL; MOTA, 2010).

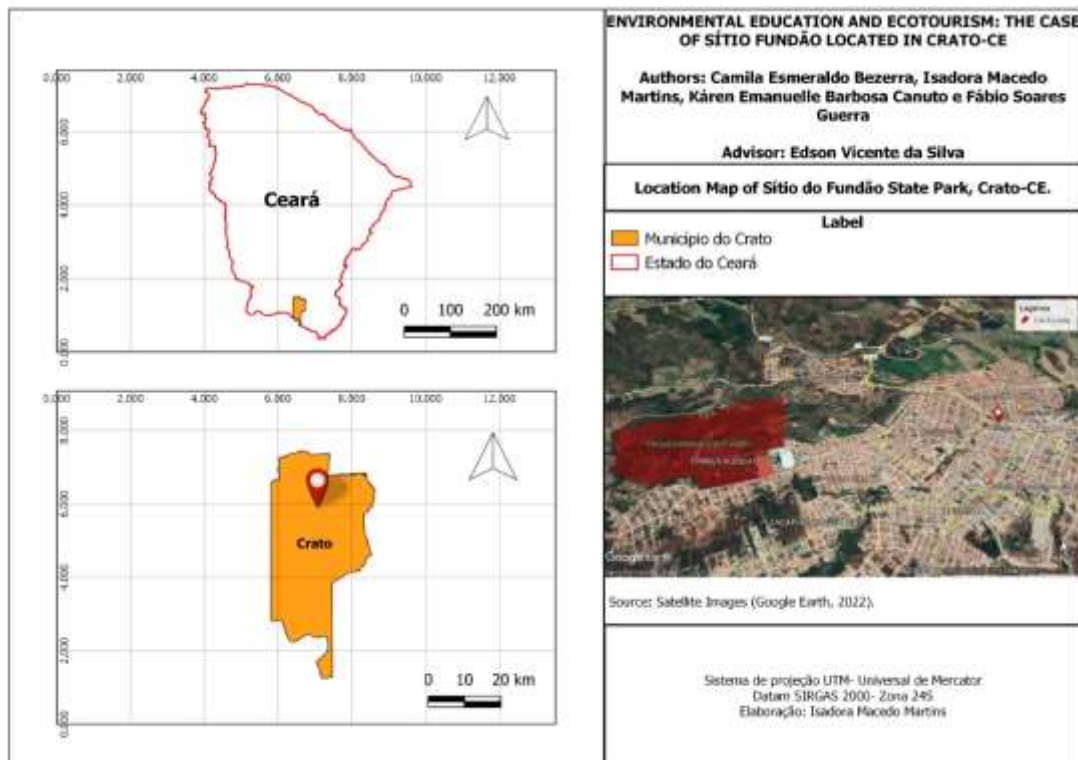
According to Cabral and Mota (2010), there are nine conservation units integrating the Araripe-CE GeoPark, which are: Araripe-Apodi National Forest, Timbaúbas Ecological Park, Sítio Fundão State Park, Chapada do Araripe Environmental Protected Area, Arajara Park RPPN, Sítio Canabrava Natural Monument, Pontal da Santa Cruz Natural Monument, Sítio Riacho do Meio Natural Monument and Cachoeira do Rio Batateira Natural Monument. The object of this study, in turn, is the Sítio do Fundão Park, which is administered at the state level and has the category of Full Protection.

The Sítio do Fundão property was transformed into an Integral Protection Conservation Unit in 2008, from Decree No. 29.307, once recognized as an area that presented conditions to be a State Park, for having rich cultural heritage, linked to geodiversity and biodiversity, relevant historical and cultural importance to the municipality of Crato and the state of Ceará. In addition to the environmental and cultural purposes of preservation of historical and natural resources, the Sítio Fundão State Park has an exuberant beauty and covers part of the Batateiras Geosite (FERNANDES *et. al.*, 2017).

The Sítio Fundão State Park is located 3 kilometers from the city center of Crato and occupies an area of 93,520 hectares. The climate of Crato lies between the tropical hot, semi-arid mild, and sub-humid areas, where various vegetational types develop in the area, such as cerrado, caatinga, and riparian forest, forming carrasco, deciduous,

subcaducifolia, and xeromorphic tropical forest in the region (JUSTO; RODRIGUES, 2014). Map 1 shows the geographical location of Sítio Fundão.

Map 1- Geographical location of Sítio Fundão in the municipality of Crato-CE



The former property of the current park belonged to Mr. Jefferson de França Alencar and had an area of 123 hectares, but currently has a forest area of 93 hectares, because part of the property was sold to the footwear industry. As already explained, the area is rich in biodiversity and the site is crossed by the Rio Batateiras, having very varied wildlife. Moreover, in the property there is a wooden mill, known as *engenho de pau*, which is characterized as a house of mud differentiated by its architecture, the referred mill was created in the middle of the year 1904 (ALENCAR; SANTOS, 2019).

According to Alencar and Santos (2019), regarding the environmental issue, Sítio Fundão has a series of qualities, such as flora and fauna of scientific value, presence of water body of extreme value for the community, occurrence of archaeological sites, and vast biodiversity of remaining Atlantic Forest species. It brings together all the elements of a forest reserve. The forests present in the site have fruit trees and medicinal plants, such as *toré* and *imbrica*, as well as coconut, *pequi*, avocado, and breadfruit trees, among others.

The quality of urban life is directly related to the social-economic development and those factors related to the environmental issue of the region. According to a study by the Institute for Research and Economic Strategy of Ceará- IPECE (2018), Crato is ranked 36th in the State's Municipal Development Index. Although the Municipality of Crato has been highlighted by the Municipal Governance Index for the quality of management,

according to the evaluation of the Superintendence of Development of the Northeast (Sudene) and the Federal Administration Council (CFA), the municipality still needs to sign partnerships aimed at projects for the development of Crato, proposing resumption of economic growth in times of pandemic (CRATO, 2021).

Regarding environmental issues, it can be said that the Sítio Fundão State Park contributes positively to the development of the municipality, as it is a tourist attraction, a leisure area, an area for students to visit, and an object of study for scientific research, generating a development effect for conservationist actions.

However, the Araripe Geopark, as well as the geosites present in the municipality of Crato have no enforcement function, thus a challenge arises regarding the preservation of geological heritage and local biodiversity in the park as a whole. To overcome this challenge it is essential to adopt educational actions related to collective awareness and participation in defending the environment. Different social and political actors can act in this direction, the public authorities, for example, can act in the promotion and dissemination of educational campaigns focused on geodiversity, as well as the participation of companies, NGOs, schools, media, and society in the creation and development of programs linked to Environmental Education. Therefore, allowing the articulation between the object to be conserved and the educational tool (OLIVEIRA *et al.*, 2022).

ENVIRONMENTAL EDUCATION AND ECOTOURISM: PRINCIPLES AND CONCEPTS FOR PLACE-BASED DEVELOPMENT

Environmental Education (EE) is a mechanism for understanding the natural environment and the consequences of social and cultural interventions on it. Moreover, it has consistent theoretical and methodological bases to support technical processes for mitigation or solution of environmental impacts arising from the relationship between society and nature. EE is a path that has as its horizon the sustainable development with a view to social and environmental justice (RODRIGUEZ; SILVA, 2010).

It is considered of utmost importance to discuss the conceptual aspects relating to Environmental Education, linking it to related approaches such as Ecotourism, so it will be possible to glimpse paths for locally based development. Moreover, to prioritize communities and traditional knowledge, as well as the natural dimension as a means of livelihood and generator of products and eco-social services, having the learner as the protagonist of the teaching and learning process (WAR, 2019).

It is important to mention that EE does not have a closed and consolidated concept, the understanding of what it means depends largely on the training, perception, understanding, and goals of those who propose to define it. Within this broad set of definitions and conceptualizations, there is a point of convergence between them, namely: the environmental impacts resulting from human activities. This makes Environmental Education a process of awareness, and construction of values and principles that enable changes in perception and attitudes related to the natural environment (FIGUEIREDO, 2007).

Reigota (2010), believes that EE cannot be detached from the political dimension and participatory social practice in which democracy is both background and guiding link of the pedagogical practices of this field of knowledge. Therefore, the author mentions that environmental education is:

A political education, grounded in the political philosophy of education science anti-totalitarian, pacifist, and less utopian, in the sense of demanding and reaching basic principles of social justice, seeking a 'new alliance' (Prigogine & Stengers) with nature through dialogical pedagogical practices (REIGOTA, 2010, p. 63).

Reigota (2020) also emphasizes the dialogic pedagogical practices as a premise for Environmental Education. According to Freire (2000), dialogicity allows the joint construction of knowledge, in which autonomy has a guaranteed space in this process, in addition to plurality and alterity under the aspect of contextuality. Following this line of reasoning, Figueiredo (2003) proposes the eco-relational perspective for work with EE in contrast to banking and mnemonic education. Explaining his proposition Figueiredo (2003, p. 45) says:

The *eco-relational* portrays the interaction of 'everything with everything' and the whole totality. It is a proposal that represents the understanding of the Universe, in which totalities are intermingled parcels, inserted in even greater totalities, structuring, from the simplest to the most complex level, a link of interdependence in search of continuous eco-evolution.

Assuming the eco-relational perspective as one of the possible epistemological assumptions, Environmental Education opens paths to a holistic, analytical, and integral pedagogical work, based on systemic complexity. In such a way, the understanding of environmental issues is expanded and allows the combination of this field of knowledge with a diverse set of themes, among them stands out Ecotourism.

Ecotourism is not only a contemplative walk in nature, it goes far beyond this reductionist and simplifying view. It involves sustainable economic practices, understanding of the socio-environmental interaction and consequences, and the development of awareness about the need to recover, preserve and restore the environment, among other aspects. According to Dias (2003, p. 103),

Ecotourism is not only a nature-oriented trip, but also constitutes a new conception of the activity, both a social and economic practice. It aims to improve the living conditions of the receiving populations while preserving the resources and the environment, making the load capacity and sensitivity of a natural and cultural environment compatible with tourism practice

It is observed that Ecotourism aims to reconcile economic development with environmental sustainability, requiring for this the work of Environmental Education for its effectiveness. This characterizes Ecotourism as having a political and environmental positioning, as a result of a new perception of nature and the relationships established with it. It differs from traditional tourism because it points to social, cultural, and environmental aspects, besides valuing the role and knowledge of local communities (FENNEL, 2002). Ecotourism is, therefore, a participative, dialogical and contextual

activity, and has foundations that also underpin environmental education, as mentioned above. In this case, linking Environmental Education to Ecotourism, sustainable development becomes the north of the activities undertaken. For Rodriguez and Silva (2010), sustainable development involves the rational use of resources, systems, and environmental services to ensure the survival of current and future generations, besides ensuring the existence of the environmental and social situation itself.

Nevertheless, the objective is not to annul the economic growth and the productive activities, but, yes, to print the notion of sustainability in the core of the production activities. Within this framework, Ecotourism can be configured as a viable and rational economic activity, substantiated by Environmental Education practices, that promote local development against external capital tourism that privatizes profits and socializes impacts (SILVA, 2011).

METHODOLOGICAL PROCEDURES OF THE RESEARCH

For the preparation of this qualitative study, a bibliographic survey of the Sítio Fundão State Park located in Crato-CE was conducted using the main platforms in the search for scientific articles, especially the CAPES Periodical Portal. Through the theoretical analysis, it was possible to identify and discuss the relevance of this park, as well as its purposes and activities developed.

After the bibliographical survey, a visit was made to the Sítio Fundão Park on March 29, 2022, to enrich the research, making it more complete. On the occasion, a representative of the State Department of Environment whose function is the environmental educator of the Sítio Fundão State Park showed a little of the trail and also answered some questions regarding the strategies used for Environmental Education and Ecotourism, the target audience, the events held, among other questions. Field research allows the observation of facts and phenomena in the way they occur in reality through data collection and taking photographs.

The collected data were directed to the Laboratory of Landscape Geocology and Environmental Planning (LAGEPLAN) of the Federal University of Ceará - Fortaleza Campus, where they were tabulated by the authors of the present study.

RESULTS AND DISCUSSION

THE 2030 AGENDA FOR SUSTAINABLE DEVELOPMENT AND ITS RELATIONSHIP WITH ENVIRONMENTAL EDUCATION AND ECOTOURISM ESTABLISHED AT THE SÍTIO FUNDÃO

The Conservation Unit Sítio Fundão State Park has great relevance not only for the municipality of Crato but for the entire region of Cariri Ceará for its natural and historical-cultural heritage. The activities developed in the park seek to reconcile Ecotourism and Environmental Education with the history of the region, aiming to permanently change education through the transmission of knowledge about the rational use of natural resources and living with the environment without degrading it.

Environmental Education must be developed so that society can rethink the reconstruction of new realities based on the principles of sustainable development that enable effective programs of Environmental Education with the community in general, using participatory

management as an instrument in conducting this process based on the social and environmental responsibility of the protected areas (SANTOS; FROTA, 2019). Santos and Frota (2019) point out that generally, the communities that live around the protected areas do not have a culture of participation in the management of these natural areas, and thus, the creation and strengthening of elements that enable more democratic and efficient management actions are necessary.

The region where the Sítio Fundão Park is located is cut by the Batateira river and close to the Lameiro waterfall. Its source holds stories and indigenous legends and is surrounded by ecological trails where you can not only contemplate the natural beauty of the region but also observe the existing buildings dating from the nineteenth century as the ruins of a sugar cane mill built around 1880 (CEARÁ, 2010).

The ecological trails in the park are instruments for generating employment and income, leisure and environmental education, and preservation insofar as they value the local heritage and the connection between them promotes the creation of ecological corridors that allow the movement of wildlife between the areas along with the protected areas.

Meyer (2019) highlights the importance of linking nature trails in conservation areas to avoid the loss of ecosystem services:

The connectivity between the ecological trails is a strategy to mitigate the process of habitat fragmentation which is one of the most profound anthropic modifications in the environment. Many continuous natural habitats have been transformed into isolated areas due to the expansion of agricultural activities, the difficulties in the planning of rural and urban areas, and large enterprises.

Environmental Education and Sustainability when developed in ecological trails bring to the communities and to those who visit them the reality in which the Planet Earth finds itself and how the interaction with the environment can raise awareness regarding the limitation of natural resources so that people can enjoy nature without degrading it (VICENTINI; FARIAS, 2019).

The presence of the ecological trails also provides the connection and maintenance of ecological corridors/landscape connectors that allow the movement of wildlife throughout the protected area. The trails play a significant role in spreading a culture of sustainable development in the region, especially since the activities developed are aligned with the 2030 agenda.

The 2030 Agenda of the United Nations (UN) is a compilation of goals and targets in which the 193 member states of the UN, including Brazil, have committed to mobilize to end poverty and promote improvements in education, health, work, social protection, combating climate change and environmental protection. The 17 Sustainable Development Goals are distributed into 169 goals and cover five areas of great importance to humanity and the planet, which are the so-called 5Ps: People, Planet, Prosperity, Peace, and Partnerships (UN, 2015).

In Brazil, these 169 goals, were discussed and analyzed by the Institute of Applied Economics (IPEA) which had the task of adapting the global goals to the national reality, the adherence to Brazilian problems and priorities, and the possibility of scaling or resizing the original goals without reducing the relevance and scope of the global goals (IPEA, 2018).

Specifically, protected areas are related to the preservation of the ecosystem by which they are inserted, through the concern with the existence of species, both fauna and flora, natural habitats, and among others, as stated in SDG 15, which deals with terrestrial life, according to Chart 1.

The existing ecological trails in the Sítio Fundão Park through the project of accessibility for people with physical limitations (SDG 11), the activities focused on Environmental Education (SDG 4 and SDG 12) and the historical and cultural heritage (SDG 11), ecological tourism (SDG 12) and restoration and protection of natural resources such as forests and rivers (SDG 6 and SDG 12) also make up the 2030 agenda. In this way, there is a direct relationship between the Sustainable Development Goals and the existence of Conservation Units, both having as their main objective the promotion of sustainability (MEDEIROS; CARVALHO, 2021).

CHART 1 - OBJECTIVES (BRAZIL GOALS) OF SUSTAINABLE DEVELOPMENT CORRELATED TO THE ACTIONS AIMED AT CONSERVATION UNITS

Goals	Description
	SDG 4 Quality education

4.7	By 2030, ensure that all learners acquire the knowledge and skills necessary to promote sustainable development, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship, and appreciation of cultural diversity and culture's contribution to sustainable development.
SDG 6 Safe drinking water and basic sanitation	
6.6	By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers, and lakes, reducing the impacts of human action.
SDG 11 Sustainable Cities and Communities	
11.4	To strengthen initiatives to protect and safeguard Brazil's natural and cultural heritage, including its tangible and intangible heritage.
11.7	By 2030, provide universal access to safe, inclusive, accessible, and green public spaces, in particular for women, children and adolescents, older persons and persons with disabilities, and other groups in situations of vulnerability.
11.a	To support economic, social, and environmental integration in metropolitan areas and between urban, peri-urban, rural, and twin-city areas, considering territories of traditional peoples and communities, through interfederative cooperation, reinforcing national, regional, and local development planning.
SDG 12 Sustainable Consumption and Production	
12.2	By 2030, achieve sustainable management and efficient use of natural resources.
12.8	By 2030, ensure that people have relevant information and awareness about sustainable development and lifestyles in harmony with nature, in line with the National Environmental Education Programme (PRONEA).
12.b	Develop and implement tools to monitor the impacts of sustainable development for tourism that is accessible to all, generates employment and decent work, improves income distribution, and promotes local culture and products.
SDG 15 Terrestrial life	
15.1.1 br	By 2020, at least 30% of the Amazon will be conserved, through the conservation unit systems provided for in the National System of Conservation Units Law (SNUC), and other categories of officially protected areas such as Permanent Preservation Areas (APPs), Legal Reserves (RLs) and indigenous lands with native vegetation, 17% of each of the other terrestrial biomes and 10% of marine and coastal areas, especially areas of special importance for biodiversity and ecosystem services, ensuring and respecting the demarcation, regularization and effective and equitable management, to ensure the interconnection, integration and ecological representation in wider terrestrial and marine landscapes.
15.a	Mobilize and significantly increase, from all sources, financial resources for the conservation and sustainable use of biodiversity and ecosystems, to enable the implementation of national and international biodiversity-related commitments.
15.b	Significantly mobilize resources from all sources and at all levels to finance and provide adequate incentives for sustainable forest management, including conservation and reforestation.

Source: Ipea, 2018.

The Management Plan of the Conservation Unit Sítio Fundão State Park, approved through Ordinance No. 165/2019, developed a strategic assessment matrix in which the strengths are presented based on the existing elements in the Conservation Unit and the opportunities which are the potentialities that the Conservation Units can develop based on actions carried out and driven by the public management, the local community and public-private partnerships.

Therefore, the offensives and advances of the strategic evaluation matrix are correlated to the objectives and goals established in the Agenda 2030 which the tourism potential of

various forms is verified, besides the ecological one, such as the historical, religious, scientific, and adventure related to Environmental Education by visitors and residents.

ENVIRONMENTAL EDUCATION AND ECOTOURISM STRATEGIES USED IN SÍTIO FUNDÃO

During the visits guided by monitors of the State Secretariat of Environment (SEMA) with students in the Sítio Fundão Park, Environmental Education practices are performed, among them, the planting of seedlings of native plants by children with the help of park staff. This activity encourages reforestation, and recovery of degraded areas contributing to the management and conservation of local flora, besides reinforcing the relevance of preservation and conservation of nature through this direct experience of children with the environment. For undergraduate education students, the script will be according to the purpose of the class, when a guided visit occurs, the natural and historical-cultural aspects are pointed out, similarly to tourists (FERNANDES *et. al*, 2017).

These different approaches varying according to the target audience allows to make the visits more objective and contribute to education about environmental issues, considering that the diversity of activities or content can reach visitors, whether they are children, students of high or undergraduate education, or tourists, according to their interests and needs.

Through the *on-site* visit to the Sítio Fundão State Park, it was possible to get to know better some stretches of the trail, in addition to obtaining information provided by the environmental educator. The park has 5 interpretative trails. They are the trail of the senses and the trail of the tree circuit which is the largest one and has a greater number of trees. After the Visitor Center, there are three other trails, one that gives access to the river and the wall, a reduced trail of 200m, and another where there is the symbol tree Timbaúba and the ruins of the mill.

Nowadays, through guided tours, the tree circuit is being exposed, located on the access road to the Taipa house, being the main trail of the conservation unit, where it is possible to verify identification plates of native flora species, which allows visitors to show information related to the species as popular and scientific names, phenological aspects, economic, environmental and medicinal relevance (FERNANDES *et. al*, 2017).

The Senses Trail (Figure 2A) is an accessibility trail adapted for people with disabilities. It is 250m long and is formed by wooden pallets, to facilitate locomotion. At the end of the trail, there is a small waterfall, which allows a therapeutic moment, the disabled person stands in the artificial waterfall and can feel and hear the water falling.

According to Melo et al. (2020), Tourism and Accessibility, are two definitions that when they intersect result in joint benefits for the tourism market. Ensuring accessibility in tourism activities becomes a differential intervening in the sector competitiveness and fulfills the social responsibility of inclusion, meeting the wishes of tourists, among whom are also people with disabilities.

In terms of accessibility, Sítio Fundão has another resource, an adapted chair (Figure 2B) for people with reduced mobility. According to the environmental educator, the chair is named Juliete after a woman who had an accident and became paraplegic while walking in the Cariri region. In order not to lose contact with nature, her husband put her in an

adapted wheelchair and helped her to continue her hikes in Cariri. When the case reach the Sítio Fundão, it had great repercussions and was shown on a famous television program, which gifted the park with the Juliete chair, and now people with reduced mobility can use the chair and have access to the trails.

The adapted chair is a great alternative, considering that it allows people with reduced mobility to participate in the trails and maintain contact with nature, socialize with friends and acquire knowledge, in addition to influencing the quality of life and social inclusion. The chairs adapted for the accessibility of people with physical disabilities are part of the Assistive Technology, which according to Souza *et al.* (2021), is an area of interdisciplinary knowledge that involves solutions, methodologies, and services to provide the functionality regarding the activity and participation of people with disabilities and/or reduced mobility, considering their autonomy, independence, quality of life and social inclusion.

Sítio Fundão has an application called ECOMAPSS, which reads information about fauna, flora, and stories with the camera of a mobile phone through a QR Code on the plaques. It was a pioneer in this tool, as well as serving as a model for other ecological parks.

The development of this application and the use of smartphones to search data related to elements of the park allows the decentralization of information and faster access to it, changing the way of interaction with the conservation unit. Furthermore, such technologies are configured as a potential awareness-raising strategy for park visitors regarding the preservation and responsibility of protecting nature. There is another aspect that is also extremely important, besides awareness, the technological resources can awaken the citizen knowledge of the users of these parks, raising the reflection about several political, socio-cultural, historical, and economic dimensions and shaping the conceptual principles of non-formal education (SILVEIRA JUNIOR; AUGUSTO, 2020).

The Jeferson da Franca Alencar Visitor Center (Figure 2C) is a house built in 1950 by Mr. Jeferson da Franca Alencar, who was the owner, and today it is a kind of museum. It is a mud house built with materials from the forest and today it has some rooms, where it houses maquettes (Figure 2D) of the Sítio Fundão Park and the Araripe National Forest, lithograph monuments of the Conservation Units of Ceará, fossils, insects of the cretaceous period (Figure 2E) and a covering (Figure 2F) that allows a better view of the natural landscape. Visitors can view the entire area through the maquette and also learn a little about the history and riches of the region through the fossils.

On one of the trails, it is possible to see the ruins of the mill (Figure 2G) that operated from 1904 to 1944 and was used by the workers to produce *rapadura*, a typical regional sugar candy, for Crato and Juazeiro. This mill attracted the attention of many visitors as pilgrims and was an activity that added much to the economy of Crato.

Unfortunately in the year 2018, a bush fire occurred in an area of Sítio Fundão and ended up reaching the structure of the mill, destroying a bit of the history of the State Park. Through a report on the News Cariri website, Rodrigues (2018) reports the damage to the material and cultural heritage of Cariri, to extinguish the oldest wooden mill of Crato moved by animal traction. This sad event is an example to the people who visit the Sítio Fundão of the importance of preserving the historical heritage because there is the

memory of the past and also about the care that must be taken to avoid fires in places like this, which require protection. The environmental educator showed the park's symbol tree of the species *Enterolobium contortisiliquum* (Vell.), popularly known as *Timbaúba* (Figure 2H), native to the Caatinga. According to him, the moment of the visit to this tree is a therapeutic moment for students and other visitors. They are arranged in a circle and start a talk about the importance of trees for the environment and production of oxygen, about the soil, and ways to irrigate the trees, and then it is asked to close their eyes and listen to the sound of the birds and the silence of the place.

After passing through some sections of the trail, the environmental educator was asked some questions.

Question 1: What is the public who are received at Sítio Fundão?

- Answer: "They are students from state schools and universities, as well as other visitors who come with their families and tourists".

Question 2: What is the average number of people that the park receives per month and year?

- Answer: " It receives between 2.500 to 3.000 people per month and has already received around 50.000 people per year, but in the last few years, due to the Covid 19 pandemic, the number has decreased a little, so nowadays it receives between 30.000 to 35.000 people per year, to participate in the actions and get to know the Park. "

Question 3: What types of partnerships does Sítio Fundão have? And what actions are developed with them?

- Answer: "... The partnerships we have here are with companies in the region, with a shoe industry that we have had a partnership with for years, where we exchange seedlings for kilos of food with the employees, and we give talks on Environmental Education to the employees. Thus, these types of partnerships happen to aggregate both the employees' knowledge about the environment and benefit families with the donation of food in exchange for tree seedlings and also with the planting of seedlings to contribute to the environment. We also have partnerships with Ceasa and Sítio Barreiras, which send fruit to the Park, for us to distribute to the children and with the municipal schools, they also contribute with pallets for the trails such as the senses, and the Sítio Fundão also sends them signs and actions with the employees and lectures on Environmental Education."

Through the partnership of a shoe industry with the Secretary of the Environment, a few events were held in October of the years 2016 to 2019 with children from some public and private schools, scouts, and children who live around the Park. The intention of this social event in Sítio Fundão is precisely to transmit Environmental Education playfully. The themes are the most variable, encompassing issues related to water, soil, forest fires, solid waste, and Sustainable Development Goals (SDGs) among others, through games, theatre, trails, recycling workshops, and other activities that manage to involve children and stimulate the perception and care of the environment. These partnerships are very positive, because everyone wins through them, either by providing food, materials, and also knowledge.

Question 4: What other strategies do you develop throughout the year? Are there other specific dates such as Environment Week or other types of activities that you develop that are environmental education strategies?

- Answer from the environmental educator: "The strategies that we have during the year here at the park are actions already set up at the beginning of the year. So, every year we have the Tree and Water Week, with a week full of actions focused on Environmental Education, that we bring municipal schools here, with students to have these lectures about plants, the river, and solid waste. They also come here to have this notion of how to clean the environment, how to clean the rivers, as this Environmental Education that comes from home starting with the separation of residues, we also talk a little about our garbage disposal that has to be disposed of in the right way. There are annual actions like the Environment Week that are of utmost importance for the park, besides differentiating monthly these types of activities to aggregate and bring these visitors here to leave with another mentality."

Question 5: Do you have other activities developed for a specific target audience?

- Answer: "Of course, we have a program for specific and priority publics that are the elderly, for example. They come here to the park, we are now with a project, including a project to make every month a certain day for people to have another mentality of only using the park to go to the river, but to visit it in another way. So, the elderly, we will do stretching activities with them here in the park, do some physical activities, and talk to them about the importance of the environment, so they will have that therapeutic and fun moment. We have recently acted for the garbage men, which was a tribute to the garbage men for their ecological role on our planet, which is to take the waste to the correct place. So, we have programs for the elderly, garbage collectors over the years, and fire prevention agents. We have all these programs for this kind of public. "

Conducting nature walks brings numerous benefits for the elderly, allowing evidence of new experiences such as meeting new people, other natural landscapes such as flora, fauna, rivers, and waterfalls, and the well-being of listening to the sound of the woods. It is also important to mention how this practice is positive for health, considering that the elderly do physical activity (LARA *et. al.*, 2014).

Question 6: What is this fire prevention program like?

- Environmental educator's answer: "We have the Previna Program, which begins in August and we count on all the park's employees who participate in Previna. They are fire prevention agents and firefighters trained in a course that we recently offered. We start the work in August, which lasts until December, going around the whole park on this issue of fire prevention, controlling the forest, looking for fire outbreaks to avoid any kind of fire in our conservation unit."

Question 7: The public you receive here is from which locations?

- Answer: "We receive public from all over the world, not only from the country. Here in Brazil specifically we receive a lot of tourists from São Paulo, Rio de Janeiro, and communities that come here for studies, from Fortaleza and the world. We receive people from different countries such as South Korea, Vietnam, and Germany, recently a family

came from Frankfurt, Portugal, these are the countries specifically that come here to meet us and leave here amazed at our natural beauty."

The Sítio Fundão State Park develops various activities according to its target audience and thus facilitates the transmission of environmental education reaching the various stakeholders. These events help to disseminate knowledge about environmental issues. The Geopark encompasses several socio-environmental features (biodiversity, geodiversity, and culture) that make it very important and enable visitors to acquire learning through environmental and heritage education, stimulating the understanding of cultural and environmental identity conservation (SALVETTI, 2020). It is always necessary to seek new approaches so that it can reach more and more visitors and enhance the knowledge related to natural wealth and the importance of conserving it.

Figure 2 shows a mosaic of images that represents the enormous natural and cultural diversity of the Sítio Fundão.



Figure 2 Image mosaic having in (A) Trail of Senses (Photo: the authors, 2022); (B) Adapted chair for those with reduced mobility (Photo: the authors, 2022); (C) Jeferson da Franca Alencar Visitor Center (Photo: the authors, 2022); (D) Mockup with the complete view of the Sítio Fundão (Photo: the authors, 2022); (E) Fossils and insects from the cretaceous period (Photo: the authors, 2022); (F) Jeferson Alencar Visitor Centre cover (Photo: the authors, 2022); (G) Ruins of the mill (Photo: the authors, 2022); (H) Timbaúba tree of paramount importance for the park and visitors (Photo: the authors, 2022).

CONCLUSIONS

The Conservation Unit of the Sítio Fundão State Park has great relevance in the municipality of Crato and the entire region of Cariri, Ceará due to its rich natural and historical-cultural heritage. In the park, activities are developed that combine Ecotourism and Environmental Education with the regional history, seeking to rebuild education by transmitting knowledge about the rational use of natural resources and coexistence with the environment.

The presence of part of the Batateira River, the Lameiro waterfall, and the ecological trails make the region a place where it is possible to contemplate the natural beauty. Furthermore, the ecological trails in the park are instruments for generating employment and income, leisure, education, and environmental preservation, whereas they value the local heritage and the interaction between them promotes the creation and use of ecological corridors. The importance of interconnecting the ecological trails is in the precaution of losses of ecosystem services in conservation areas. Another aspect that plays a significant role in Sítio Fundão is the historical heritage, which identifies the culture and shows the history, customs, styles, and traditions of the region.

The work done on the park's ecological trails is directly related to the Sustainable Development Goals - SDGs, mainly involving goals 4, 6, 11, and 12. The Conservation Units and the SDGs have as their main goal the promotion of sustainability.

The visits to the park are guided by monitors of the State Secretariat of Environment (SEMA) and may have different approaches varying according to the target audience, allowing to make the visits more objective and facilitating the transmission of environmental education, whereas the diversity of activities or content can reach visitors according to their interests and needs. Knowing the strong potential influence of the Park's activities, it is necessary to always seek new approaches to reach more and more visitors and increase the knowledge related to the natural wealth and the importance of conserving it.

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