
**Analysis of the environmental education of exploratory tourism in
Capitólio-MG by a tour guide**

**Análise da educação ambiental do turismo exploratório em Capitólio-MG por um
guia turístico**

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ABSTRACT

Brazil can be considered a developing country in terms of tourism, in 2016, according to data from the World Travel and Tourism Council, the tourism sector generated more than 7 million jobs. This branch, due to its production chain, is still necessary for manpower, where new technologies cannot replace job positions. The Brazilian tourism sector has gained strength and status as a developer of the regional economy. However, the municipality of Capitólio, in Minas Gerais, had greater recognition for tourist demand in mid-2016. In view of this factor, this study was developed to assess the relationship between the environment and tourism activity in protected areas., presenting an experience report of the consequences arising from an exploratory tourism in the surroundings of Capitólio Municipality. The purpose of the study was to report the environment professional of the experience of driving on trails in the region of seaside resorts and to identify the characteristics of tourist exploration and the concept of ecotourism by the drivers on trails who work there. When well planned, ecotourism can bring benefits to both visitors and local communities, being an important conservation tool that can be worked on more concretely way.

Keywords: Tourism; ecotourism; environmental impacts; conservation; environment.

RESUMO

O Brasil pode ser considerado um país em desenvolvimento no que tange o turismo, em 2016, segundo dados do Conselho Mundial de Viagens e Turismo, o setor turístico gerou mais de 7 milhões de postos de trabalho. Para este ramo se faz necessário mão de obra, onde novas tecnologias não podem substituírem os cargos de trabalho. O setor turístico brasileiro tem ganhado força e status de desenvolvedor da economia regional; no entanto, o município de Capitólio-MG, teve maior reconhecimento pela procura turística em meados de 2016. O presente trabalho foi desenvolvido para avaliar a relação entre o meio ambiente e a atividade turística nas unidades de conservação, apresentando um relato de experiência das consequências oriundas de um turismo exploratório. O intuito do estudo foi relatar a visão do profissional sobre a experiência de condução em trilhas na região das estâncias balneárias e identificar as características da exploração turística e sobre a concepção de ecoturismo dos condutores em trilhas que ali trabalham. Quando bem planejado, o ecoturismo pode trazer benefícios tanto para os visitantes quanto para as comunidades locais, sendo um importante instrumento de conservação que pode ser trabalhado de forma mais concreta.

Palavras-chave: Turismo; ecoturismo; impactos ambientais; conservação; meio ambiente.

INTRODUCTION

Tourism, in a general concept, is an activity related to leisure, entertainment, recreation, hospitality (NETTO, 2009), rest, in which people seek a place that presents artistic and historical attractions, exotic landscapes, ecological reserves, zoos and places that allow a more direct contact with nature. The search for places related to nature generated the term ecotourism, which appeared in the 1980s as a result of concerns to explain global sustainability practices in nature tourism (DIAMANTIS, 1999).

In this sense, the importance of ecotourism is related to sustainable practices that go back to the natural conservation and, therefore, to the environmental education of the people involved, besides the economic importance for the people of the region (BARROS, 2013; McINTOSH *et al.*, 2000) that will have more job opportunities due to the increase of services.

The environmental education, specifically ecotourism has multicultural aspects (ARAUJO; GODOY, 2016), with a social focus, and needs to be of quality to benefit the population and generate health and employment, with results on the economy for a better qualification for the labor market (CANDIOTTO; BONETTI, 2015) in the region that provides this activity.

As environmental education is incipient in relation to other areas of education, its implementation process still goes through the need to improve school curricula to contemplate disciplines aimed at sustainable and environmental studies in pre-school, university, and post-graduate education (LEAL FILHO *et al.*, 2018; VON BLOTTNITZ; CASER; FRASER., 2015), whose structures are interconnected (MASSA, 2015). The lack of specialized teachers and specific and isolated disciplines on environmental education are the main problems in high school, for example (FARIA *et al.*, 2022).

The problems of teaching about the environment and sustainability, modernly, go through, in addition to those cited, by false information (fake news) that affects mainly those with lower education (GOMES; PENNA; ARROIO, 2020) and interferes negatively on the action of people in preserving the environment, because they affect the effort and engagement by the search for sustainable alternatives for the development of the society (JACOBI, 2003).

The ineffective or absent environmental education has shown itself in ecotourism with harmful modifications to the environment (BARROS, 2013; COSTA, 2011) due to consumerist actions via anthropic actions harmful to the ecosystem (SANDEVILLE-JR; SUGIMOTO, 2010) generating pollution and destruction (COSTA, 2011; SILVA, 2010).

Environmental protection actions are social responsibilities of agencies, companies and people linked to tourism that should preserve the environment and protect the traditions and customs of native populations (COSTA; COLESANTI, 2002; FARIA *et al.*, 2022; OLIVEIRA, 2011).

There is, then, an interface between tourism activities and environmental education that should guide people towards a posture that preserves the environment and encourages sustainable practices (LAYRARGUES, 2004) and ecological awareness (MÜLLER *et al.*, 2011).

In terms of this responsibility, considering the individual actions, the tour guide can act to minimize the lack of ecologically correct postures of tourists both as a fiscal to avoid destructive and polluting actions (BARBOSA; ZAMBONI, 2000; TORRES, 2008) and as an intermediary for teaching environmental education (RABOTIC, 2010). His functions need to be directed, even legally, in relation to his responsibilities (REISINGER; STEINER, 2006) as to his instrumental, social, interactive and communicative functions (BIANCHINI *et al.*, 2014).

In this sense, the academic/cultural formation of the tourist driver must be directed to teach and properly lead people to the desired locations, supervise actions that go against the environmental awareness, and prevent accidents. In fact, at the Furnas dam in Capitólio-MG, the target of this study, in 2022, a block of rocks detached from the ground and fell on a boat causing about 10 deaths, which was widely reported in the national media; besides, in this site, it is not uncommon the occurrence of events such as water heads that carry tourists into the torrent causing injuries and deaths (BARBOSA; ZAMBONI, 2000; TORRES, 2008).

The basin generated by the Furnas dam in the south of Minas Gerais has produced a tourist attraction site with a high demand in the last 15 years as a source of exploratory environmental tourism, mainly in the municipality of Capitólio, despite the

fact that the dam waters reach 32 municipalities. Several boats, improvised inns, restaurants on the banks of the dam, and leisure sites are used by tourists, and, perhaps due to a sudden increase in the searches for the site, the conditions offered for the tourism are precarious on several levels, including in relation to people's safety (LEMOS-JR, 2011).

In general terms, as far as environmental tourism is concerned, the guide's responsibilities become indispensable for a sustainable action with global effects, teaching about the ecological awareness and preventing accidents in risk areas, as in the Capitólio region. Within this context, it is reasonable to ask about the role of the tour guide in the environmental education of tourists and how tourists behave when in contact with the environment.

Therefore, the objective of this work was to study the anthropic behavior in exploratory tourism in Capitólio-MG via the experience report of a tour guide, and also his role in the environmental preservation.

MATERIAL AND METHODS

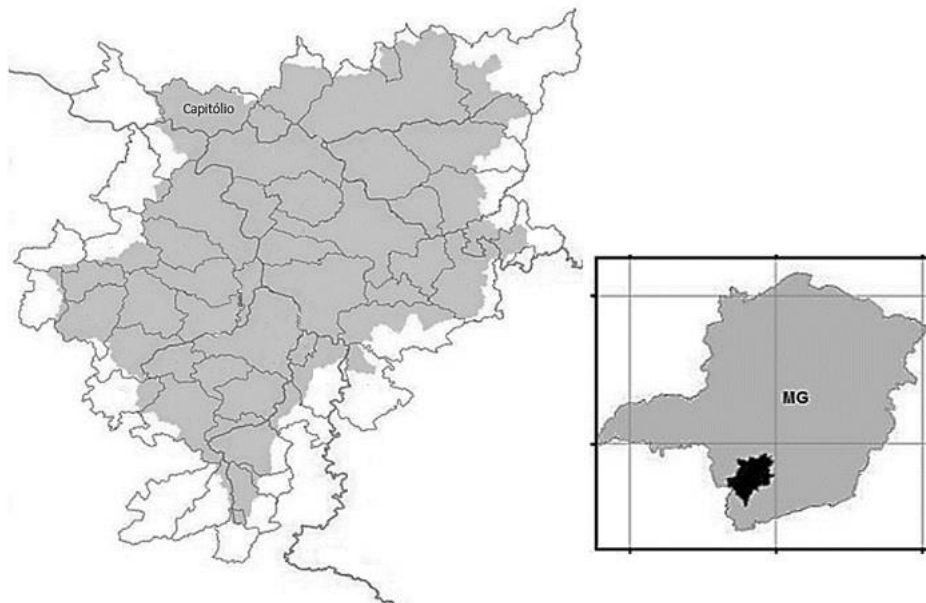
Municipality of Capitólio and Furnas Reservoir

Capitólio is located in the southwest of the state of Minas Gerais, with 521,802 km² of land area, whose predominant biome is Cerrado; according to the 2010 census, there were 8,183 inhabitants, but its population is currently estimated at 8,663 inhabitants (IBGE, 2020).

Capitólio is one of the municipalities that contains the waters of the Furnas Hydroelectric Plant dam, which is located on Rio Grande (**figure 1**), between the municipalities of São José da Barra and São João Batista do Glória, in Minas Gerais.

The land flooding project covered 32 municipalities in the state of Minas Gerais, forcing the evasion of thirty-five thousand people who inhabited those areas generating a flooded area of 1440 km² and a total volume of 22.5 billion m³ of water (LEMOS-JR, 2011).

Figure 1 - Map of the Minas Gerais State on the right focusing the southwest in black where is represented as gray the Capitólio city.



Source: Prefeitura Municipal de Capitólio (www.capitolio.mg.gov.br/) (2022).

Tourism in Capitólio became better known in mid-2016, mainly in the microregion of Capitólio, Piumhi, São Roque de Minas and Vargem Bonita that encompass Serra da Canastra National Park. This region is supplied by the Furnas dam and numerous waterfalls and natural pools. Moreover, Capitólio is part of the Nascentes das Gerais Touristic Circuit, which is composed of cities such as Carmo do Rio Claro, Cássia, Delfinópolis, Guapé, Ibiraci, Itaú de Minas, Passos, Pratápolis and São João Batista do Glória (PREFEITURA MUNICIPAL DE CAPITÓLIO, 2021) (**figure 2**).

The formation of the dam allowed the navigation between the canyons and the surface water areas allowing the transit of small boats, spears, canoes, and jet skis. The natural beauty highlighted after the flood added to the extensive navigable lagoon are the main reasons for an exploratory tourism where tour guides are in demand, including for off road vehicle tours in the surroundings.

The main type of tour offered is the speedboat ride that lasts three, four, or even seven hours, where the Cascata Eco Parque, Lagoa Azul waterfall, Vale dos Tucanos, Cachoeira dos Cãnions, Cachoeirinha da Ilha, and some floating bars are visited.

Tourism with off road vehicles occurs at the tourist sites 1] Lagoa Azul Quarry, 2] Paraíso Achado Complex, 3] Beija-flor Waterfall, 4] Retiro Vikings Complex, 5] Poço Dourado Waterfall, 6] Fecho da Serra Waterfall, 7] Capivara Ecological Complex, 8] Canyons Viewpoint and the various trails in Serra da Canastra. At each tourist site, the owner charges a visitation fee that varies, in the year 2022, from R\$25 to R\$50.

There are more sites (**figure 2**), but 8 of them have been described below, which are the ones where the tours with off road vehicles take place and in 11 the ecological/environmental aspects were observed in this work. Several private farms and ranches are used on weekends without being open to the public directly, so the sampling was made for the places that received the most tourists.

Lagoa Azul Quarry

The site is a site of an old quarry for rock and mineral exploration, mainly quartzite, and popularly known as "Rocha São Thomé" or "Pedra Mineira". Its access is difficult and is made through a dirt road, requiring vehicles adapted for off road terrain, such as SUVs or 4x4s. A visitation fee is charged at the entrance of the quarry and the attraction does not have any kind of infrastructure to receive tourists.

There are three lakes formed by the springing of the water from the water table from the dynamite explosions used to remove the rocks. Still, there are no signs or explanatory plaques about the proper way to use that water for bathers, nor information about the ecological awareness; moreover, there are no bathrooms on site. On weekends, meat skewers and drinks are sold in an adapted construction made of quartzite rocks at the site.

Paradiso Achado Complex

The attraction is a complex of waterfalls, whose the most visited are the Coca Waterfall, the Poço da Coca (Coca Well), and the Poço do Mergulho (Diving Well).

The access to the site depends on off-road vehicles, due to the difficulty of passage and wet stretches. An access fee is charged per person.

The complex has masonry bathrooms with a septic tank and the proper sewage treatment. There is a headquarter infrastructure to receive visitors with large tents and on weekends meat skewers and drinks are sold.

The tourist spot has several recommendations, signaling and indicative signs. In addition to this, there are, in some points, reforested wooden handrails to support the access to the waterfalls. In cases of need, the site has a first-aid kit and equipment for aquatic search and rescue.

Beija-flor Waterfall

This site is on the way to the Paraíso Achado Waterfalls Complex and has the same characteristics as the road and the access to the latter. An entrance fee is charged per person. This tourist site has a short 200-meter trail to the waterfall and no handrails to support the tourists. The site has life rafts near the water; but no other safety and rescue equipment; there is only a sign with recommendations for tourists about the site and no information about environmental and ecological education; it has no bathrooms and no infrastructure to receive tourists.

Vikings Complex

It is a complex of six waterfalls of varying levels of difficulty to access the trails. An access fee is charged per person. There are 2,600 meters of internal route in the attraction that, for the most part, can be done in 4x4 vehicles, and the footpath is used only during the access to the waterfalls.

There is a simple infrastructure for receiving tourists; there are also masonry bathrooms with a sewage system, and a snack bar that is being finished. There is no rescue equipment or supervision of tourists; there is also no information or rules exposed to tourists for the access to this site.

Poço Dourado Waterfall

There are two small cascades along with two pools for bathing, with the payment of an individual fee, with an easy access road to the gatehouse, however, inside the site it is necessary to drive 500 meters on a dirt road to the trail down to the waterfall and it is recommended for off road and/or 4x4 cars.

There is no infrastructure in place, nor are there any indicative signs for the access or recommendations about the waterfall or the environmental care. The trail on foot is downhill/uphill on rocks, also without ropes or handrails. No rescue or first-aid equipment and garbage cans were observed.

Fecho da Serra Waterfall

This is a tourist attraction that has a 30-meter waterfall and a large pool for bathing. An individual entrance fee is charged and there is a trail of approximately 300 meters that can be walked. The route to the tourist spot is on a dirt road that is often compromised due to the rains, so it is recommended to go there with off road and/or 4x4 cars. The place has an infrastructure to receive tourists and a restaurant to serve meals on weekends. However, there are no indicative signs with environmental information, there are a few garbage cans along the trail. No rescue or first-aid equipment was found either.

Capivara Ecological Complex

This Complex has two main waterfalls and more than forty natural pools, and to have access it is charged a fee per person. The place has a reception, bathrooms, a restaurant and information points throughout the trail, where there are employees to help tourists. There are indicative signs for directions, environmental rules and guidelines for

drivers. The site also has garbage recycling, safety equipment and rescue and first-aid assistance. There is a 900-meter trail to the last waterfall.

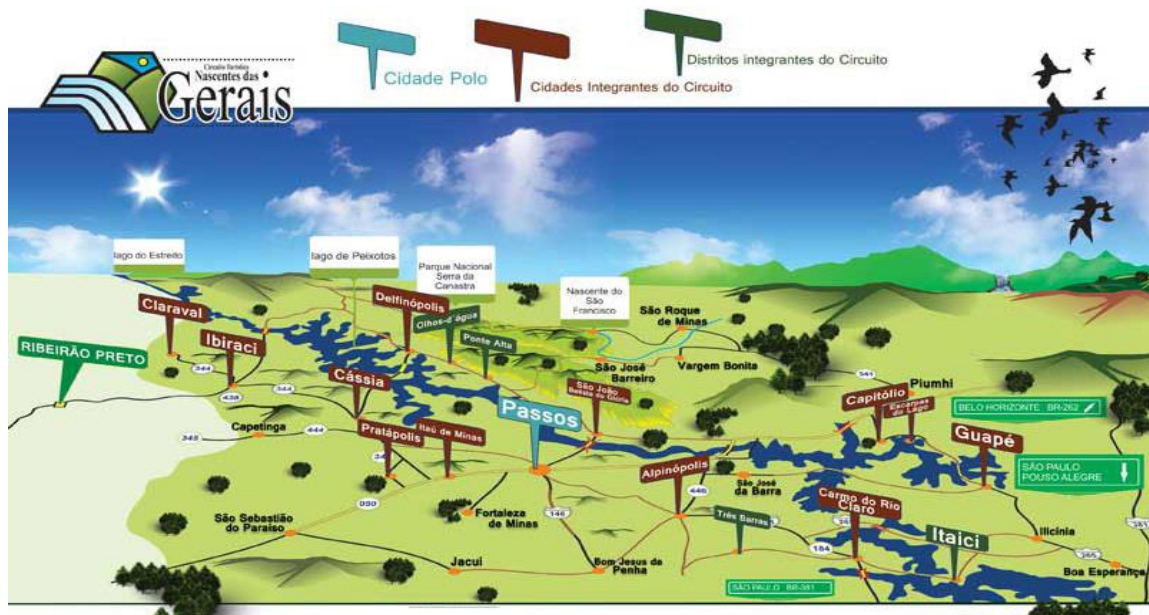
Canyons Viewpoint

The Canyons Viewpoint Park was recently implemented and it is known as Capitólio's "Postcard". Easy to be accessed, there is an entrance fee per person and it has two trails that lead to the Mirante Escondido (Hidden Lookout) attraction, a zip line, natural pools, a hanging bridge (a wooden suspension bridge 110 meters long and 40 meters high), a snack bar called Pato Mergulhão (Diving Duck), and the Mirante Clássico (Classic Lookout). The first trail is approximately 750 meters long and the second is 400 meters long.

There are reception facilities for tourists, large and easily accessible bathrooms, snack bars and tourist support points. During all the trails there are signs indicating the general and specific environmental rules of the park, a supervision by employees and a support for tourists. There are abundant garbage cans distributed throughout the area, but there is no separation for recycling. The attraction has an infirmary and presents rescue and first-aid equipment.

This site used to be an area with intact vegetation, but there have been several modifications for the construction of the resort and, as a result, the vegetation and soil have undergone anthropological changes.

Figure 2 - Touristic places in the Capitólio



Source: Nascente das Geraís (www.nascentedasgerais.com.br) (2022).

Tourist driver

The report was made by a tour conductor, the author J. S. M. S., with a bachelor's degree in biology and pursuing a master's degree in environmental sciences at the time of the data collection; she attended the trail conductor course offered by the National Service for Rural Learning [SENAR] and worked as a tour agent at a guesthouse in the municipality of Capitólio, where she brokered boat tours, indicated tourist routes to guests, and was a driver on off-road tours.

Variables observed and time of the study

Sanitary aspects of the sites visited, tourist behavior, garbage disposal, respect for fauna and flora, and access price were the aspects observed and critically analyzed from September 2020 to September 2021, with an average for off Road tourism of 70 people per month.

Off Road use was the best option for this study because it generates more observation points and at higher altitudes, besides allowing a better observation of

anthropic actions by the guide in a larger and less controlled environment than the boat environment.

In contact with other off-road vehicle drivers, it was verified that many had not taken the tourist driver course offered by the City Hall of Capitólio-MG, therefore, the inspection for tourist guides does not seem to occur.

RESULTS AND DISCUSSION

Of the 11 sites visited by off road tourism, the ecological complex of Capivara and Paraíso Achado are tourist attractions whose administration has shown to appreciate more the respect for sustainability and responsibility with the environment, as they have places with comfortable resting and resting toilets for tourists with monitoring and signs to prevent environmental depredation.

At Paraíso Achado, the constructions follow the sustainability requisites, such as the presence of a septic tank with a biodigester (**figure 3**) and an on-site sewage treatment; there is a selective garbage collection, and tourists are forbidden to enter the site with bottles/cans and food.

The Capivara Complex has photovoltaic panels for solar energy and structures have been created to facilitate the passage of people on the way down to the waterfalls with sustainable materials such as reforested treated wood (**figure 4**). They carry out inspections to avoid the removal of fauna and flora specimens from the sites, such as the extraction of seedlings and removal of rocks. These aspects were not observed in the other sites visited.

Regarding tourists, in all the sites analyzed, it was observed the improper disposal of waste in the natural environment; the delimitations for human actions were not respected, such as the places where it is forbidden to step on or even access; it was observed by the guide, a depredation of the sites visited as a removal of rocks, "graffiti", a removal of native plant seedlings, not respecting the guide's instructions that warned them.

Other aggressions to the environment were observed, such as water and soil pollution with bottles and cans; high noise pollution with noise from speedboats, jet skis,

car engines and automobile sounds. Irregular constructions were observed at the tourist sites, without the authorization of the municipality on land and without a housing permit, sometimes invaded, according to data obtained verbally by the guide. Improper dumping of human waste directly into the waters of the reservoir was also observed.

In general, in regions other than the sites mentioned above, but in the surroundings, the owners of inns, often without a license from the municipality to operate, organized in rented houses and ranches, and also the owners of tourist sites, showed no actions to avoid wasting water, electric energy, or safety on the banks of the reservoir, such as the use of lifeguards in lagoon activities. Little was observed in the general infrastructure and promotion of sustainable alternatives for rainwater harvesting, the use of alternative energy, steelframe or woodframe houses (**table 1**).

Figure 3 - Toilets with septic tanks in the Complexo do Paraíso Achado.



Source: Moraes, J. S. M. (2021).

In terms of analyzing the sites in relation to the social and environmental responsibility, the data are cited below. Easy access roads were verified in 45.5% of the tourist sites, among them the waterfalls Trilha do Sol, Canela de Ema, Casca D'anta, and Capivara; and Mirante dos Cânions.

Infrastructures such as bathrooms, sidewalks, and headquarters were observed in 54.5% of the observed tourist sites, standing out with the best infrastructure the Paraíso Achado, the waterfalls Trilha do Sol, Canela de Ema, Fecho da Serra and Capivara, and Mirante dos Cânions.

Toilets with septic tanks were observed in 72.7% of the tourist sites, among them the waterfalls Trilha do Sol, Canela de Ema, Fecho da Serra, Capivara and Casca D'anta; Retiro Vikings; Mirante dos Cânions and Paraíso Achado.

Figure 4 - Reforested wood sidewalk as support for tourist walk.



Source: Moraes, J. S. M. (2021).

In the tourist sites Paraíso Achado; Mirante dos Cânions; and the waterfalls Beija-Flor, Trilha do Sol, Canela de Ema, and Capivara the presence of rescue equipment was observed, i.e., in 54.5% of the sites studied.

Employees were observed to carry out safety inspections in 54.5% of the tourist sites, among them Paraíso Achado, the waterfalls Poço Dourado, Trilha do Sol, Canela de Ema and Capivara, and Mirante dos Cânions.

The selective collection of garbage was observed in 54.5% of the sites analyzed which are the waterfalls Trilha do Sol, Canela de Ema, Casca D'anta and Capivara, Paraíso Achado and Mirante dos Cânions.

Signs with environmental behavior rules were found in 63.6% of the sites, among them Paraíso Achado, Mirante dos Cânions, and the waterfalls Beija-Flor, Trilha do Sol, Canela de Ema, Casca D'anta, and Capivara.

General analysis on the respect for environmental rules in the tourist region of Capitólio-MG

Based on the analysis of the results, it can be inferred that the attention to tourists and the care for the environment occurs in about 60% of the 11 places studied in this work (**table 1**).

Considering the lack of inspection by the municipal, state and federal authorities in the studied region, the environmental responsibility is due to those owners or tenants who care for the local environment and/or for the safety of the tourists who are afraid of having some accident in the locality.

The lack of inspection of public entities was evident in the accident that occurred with the falling stone block that detached and generated 10 deaths in 2022, which could have been avoided if the site had been visited by specialists who could have foreseen the possibility of an accident, since the crack was visible, as it was attested by several tourists.

Accidents with waterfalls are cited every year in the Capitol region with tourists' deaths in the natural watersheds near the waterfalls, a fact that attentive inspections with trained guides could avoid.

For these cases, an inspection at the springs, in relation to the rainfall at the locations, should be effective and reported to the guides who take the tourists to the baths, or, at least, not allowing the visit to dangerous locations on rainy days at the springs. This activity is a governmental responsibility also according to some authors (COSTA; COLESANTI, 2002; FARIA *et al.*, 2022; OLIVEIRA, 2011).

Table 1 - Information about tourist attractions in Capit6lio, MG.

Touristic places	EASY ACCESS ROAD		MAIN STRUCTURE		SEPTIC TANKS		SAFETY EQUIPMENT		SAFETY INSPECTION EMPLOYEES		SELECTIVE COLLECT OF TRASH		ENVIRONMENTAL RULES	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Paraíso Achado		X	X		X		X		X		X		X	
Cachoeira		X		X		X	X			X		X	X	
Beija-flor														
Pedreira da Lagoa Azul		X		X		X		X		X		X		X
Cachoeira Poço Dourado		X		X		X		X	X		X		X	
Cachoeira Trilha do Sol	X		X		X		X		X		X		X	
Cachoeira Canela de Ema	X		X		X		X		X		X		X	
Retiro Vikings		X		X	X			X		X		X		X
Cachoeira Fecho da Serra		X	X		X			X		X		X		X
Cachoeira Casca D'anta	X			X	X			X		X	X		X	
Cachoeira Capivara	X		X		X		X		X		X		X	
Mirante dos C6nions	X		X		X		X		X		X		X	

Source: Authors (2022).

In terms of what was analyzed, the anthropic actions foreseen in other studies with damages to the environment were verified (BARROS, 2013; COSTA, 2011; SILVA, 2010) as they have occurred in ecotourism, such as depredations, the irregular disposal of garbage that shows the negligence of people and governmental entities (PORTUGAL *et al.*, 2023), the dumping of human waste in the waters of the Furnas Lake without treatment, the removal of native plant seedlings and rocks.

This refers to the discussion about environmental education teaching in schools that, at all levels, is flawed and incipient (MASSA, 2015; LEAL FILHO *et al.*, 2018; VON BLOTTNIZ; CASE; FRASER, 2015) to make people aware of their responsibilities towards the environment so that its use as a mean of tourism generates social benefits (BARROS, 2013; McINTOSH *et al.*, 2000; GOMES; PENNA; ARROIO, 2020) with safety and preservation of the environment and preserving themselves from misinformation (JACOBI, 2003).

A quality environmental education will increase the respect for the environment and facilitate the work of tour guides that, as observed in this work, was not always respected when communicating with tourists to prevent the depredation of the environment and removal of native plant seedlings. The tour guide is an educator (RABOTIC, 2010) and an environmental inspector (REISINGER; STEINER, 2006) whose actions can prevent accidents, preserve the environment (LAYRARGUES, 2004) generate ecological awareness (BIANCHINI *et al.*, 2014), avoiding the pollution made by tourists (BARBOSA; ZAMBONI, 2000; TORRES, 2008).

In this sense, a quality environmental education will allow tourists to see with more respect the work of the guide and obey the indications with the purpose of preserving the environment. A quality general education is lacking in Brazil and the same, by inference, occurs with environmental education that is flawed even with governmental indications for it to be offered at the various levels of education (FARIA *et al.*, 2022; LEAL FILHO *et al.*, 2018; SANTOS *et al.*, 2012; VON BLOTTNITZ, CASE; FRASER, 2015).

Within the scope of environmental education, this work alerts to the need for an environmental education of the general population in order to preserve the environment, respect the tourist guide, and in a broader aspect, indicate that people, such as owners and lessees of tourist sites organize themselves to use the environment to generate resources

and social improvement, but without destroying it. Although some of the sites visited for the purpose of this study show regulations and aspects of respect for the environment, it is desirable that all sites do so, and this could be obtained from the public authorities.

It is concluded that the place studied offers leisure and rest to the population that visits it via ecotourism, but presents dangers derived from the region itself and from ecotourism in general, therefore, people and authorities are responsible for the adequate management of the place and the preservation of the environment. The hypothesis of the importance of the tour guides is answered when it is observed that they can be effective in the environmental educational action and preservation of accidents and, their necessity in ecotourism is essential to preserve the environment and take care of people, which can be facilitated by a better environmental education in the schools of the country.

Only the fields related to off road tours were studied in this work, however, the other spaces such as waterfront restaurants, tourism in boats and in private ranches should be studied in order to offer to the public power more information to take care of tourism in general, and, in particular, in Capitólio.

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