ANALYSIS OF THE TOURIST TERRITORIES OF THE PIAUÍ COAST USING THE ANALYTICAL HIERARCHY PROCESS

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Abstract

The article applies the Analytic Hierarchy Process (AHP) to evaluate tourism development on the coast of Piauí, Brazil. The assessment of the tourism territories identified on the coast of Piauí was viable due to a quantitative analysis of the region's tourism activity. By quantifying the importance of the variables "means of accommodation," "food services," "tourist attractions," and "access routes" related to the criteria of "cost," "availability," and "quality," it was possible to evaluate each territory. The negative impacts caused by problems related to infrastructure were evident, especially the difficulty of access. AHP proves to be a methodology with the potential to be incorporated into the planning and management process for tourism, as it is effective in characterizing and evaluating territories used by tourism. This study is expected to support the decision-making of municipal and state public authorities concerning the social and environmental impacts of tourism activity on the coast of Piauí, mainly in fragmented territories.

Keywords: Analytic Hierarchy Process, Tourism, Piauí, Coast.

Resumo / Resumen

ANÁLISE DOS TERRITÓRIOS TURÍSTICOS DO LITORAL PIAUIENSE POR MEIO DE ANALYTIC HIERARCHY PROCESS

O artigo tem como objetivo aplicar a Analytic Hierarchy Process (AHP) para avaliar o desenvolvimento do turismo no litoral do Piauí. A avaliação dos territórios turísticos identificados no litoral piauiense foi possível com a realização de uma análise quantitativa da atividade turística nessa região. Por meio da quantificação da importância das variáveis "meios de hospedagem", "serviços de alimentação", "atrativos turísticos" e "vias de acesso" relacionados com os critérios de "custo", "disponibilidade" e "qualidade" foi possível avaliar cada território. Ficaram evidentes os impactos negativos provocados pelos problemas relacionados à infraestrutura, especialmente a dificuldade de acesso. A AHP demonstrou ser uma metodologia com potencial para ser incorporada no processo de planejamento e gestão para o turismo, pois se mostrou eficaz para a caracterização e a avaliação de territórios usados pelo turismo. Espera-se que este estudo possa subsidiar a tomada de decisão dos poderes públicos municipais e estadual em relação aos impactos sociais e ambientais da atividade turística que ocorre no litoral piauiense majoritariamente em territórios fragmentados.

Palavras-chave: Analytic Hierarchy Process, Turismo, Piauí, Litoral.

ANÁLISIS DE LOS TERRITORIOS TURÍSTICOS DE LA COSTA PIAUIENSE A TRAVÉS DEL PROCESO DE JERARQUÍA ANALÍTICA

Realizando el Proceso de Jerarquía Analítica (AHP) de los nueve territorios turísticos identificados en la costa de Piauí, que son Ilha Grande, Pedra do Sal, Parnaíba, Luís Correia, Coqueiro, Macapá y Maramar, Barra Grande, Barrinha y Cajueiro da Praia , fue posible hacer un análisis de la actividad turística en los territorios a través de la cuantificación de la importancia de las variables "alojamiento", "servicios de alimentación", "atractivos turísticos" y "vías de acceso" a través del criterio de "costo", "disponibilidad" y "calidad". Los impactos negativos ocasionados por problemas relacionados con la infraestructura fueron evidentes, especialmente la dificultad de acceso. Se espera que este estudio pueda apoyar la toma de decisiones de las autoridades públicas municipales y estatales en relación a los impactos sociales y ambientales de la actividad turística que se desarrolla en la costa de Piauí, mayoritariamente en territorios fragmentados a lo largo de la costa. El AHP puede y debe incorporarse al proceso de planificación y gestión del turismo, ya que ha demostrado su eficacia en la caracterización y evaluación de los territorios utilizados por el turismo.

Palabras-clave: Analytic Hierarchy Process, Turismo, Piauí, Costa.

INTRODUCTION

Tourism is a central global and national economic activity, representing 10.4% of the world's gross domestic product (GDP). In 2018, the sector accounted for 8.1% of the Brazilian GDP (UNWTO, 2019) and 3.5% of Brazil's economically active population's total jobs (MARTORELL, 2020). The activity's economic strength generates several intense and, at times, sudden transformations in different forms in the receptive nuclei, including cultural, social, environmental, and economic impacts. In the Northeast region of Brazil, tourism has emerged as one of the main economic activities in various of the nine states.

In the state of Piauí, the activity is still embryonic; tourism visitation and promotion occupies a peripheral position when considering the context of tourism in the Northeast region of Brazil. The state "is the second in the Northeast region with the lowest number of tourists, only in front of Sergipe" (PUTRICK, 2019, p.87). On a national scale, the state has a negligible 0.7% of the trips made in Brazil, occupying the position of the seventh smallest national emitter of tourists in terms of tourist revenue generation; Piauí's participation is 0.8% of the country's total (PUTRICK, 2019). Planning actions are still timid, discontinuous, and ineffective (BRAGA & GUZZI, 2021). This picture is evident when compared to the neighboring states of Ceará and Maranhão, where planning, management, and dissemination activities focused on tourism have been taking place for decades (ARAÚJO & DANTAS, 2015).

Tourism was approached as an economic activity in the coastal region of Piauí capable of causing both positive and negative impacts in various scales and spheres. Among other benefits, as a development promoter in the receiving regions, tourism can contribute to new sources of foreign exchange, the increase of economic and productive activities in a set of enterprises, diversification of the local economy, job generation, an increase of the average family income, and the increase of municipal and state revenues (EUSEBIO & CARNEIRO, 2012). This activity is noteworthy in regions with little industrialization and a lower development index, as contemplated by Putrick (2016) and Malta et al. (2019). Although they recognize tourism's potential for job creation and its contribution to economic growth, they add that it is not an automatic solution to reduce poverty.

The methodology and the evaluation herein may subsidize future actions of governments and local entrepreneurs to reduce the negative impacts generated by tourism and enhance the positive aspects in social, environmental, cultural, and economic spheres. By understanding the specificities and considering the existence of nine distinct territories in the 66 km coastal strip of Piauí state, the Analytic Hierarchy Process (AHP) describes, evaluates, and quantifies the complex phenomena based reliably on mathematical models applied to each location (SAATY, 2001). The AHP also supports classifying and hierarchizing attractiveness and tourist services comprising hospitality, food and beverage equipment (F&B), access routes, and tourist flow.

PLANNING TOURIST ACTIVITY

Research related to the evaluation models of tourist destinations has been conducted since 1960, such as the studies of "Butler, 1980; Christaller, 1963; Cohen, 1972; Getz, 1986; Leiper, 1979; Plog, 1973; Stansfield, 1978" (ALVARES et al., 2019, p. 2). Although we are aware of these models in Brazil, the examples of evaluation and planning actions of medium and long-term actions in tourism are still poorly applied. In addition, the knowledge produced by Brazilian researchers does not materialize in public tourism policies (SILVEIRA et al., 2017).

Given the above, it is evident that lack of planning, inefficient management (including evaluation actions), and discontinuity in the behaviors aimed at structuring and monitoring tourism activity are among Brazil's most significant obstacles to tourism development. The actions follow the four-year cycles of municipal, state, and national elections; there are few or no medium or long-term actions. The absence of a ministry dedicated exclusively to tourism (on a national scale, the Ministry of Tourism absorbed other portfolios and found itself almost inoperative in the previous government)[1] and specific state and municipal secretariats for tourism is aggravated by the fact that when they exist, these portfolios usually have the smallest budgets.

This research starts from a complex view of tourist activity (GONTIJO, 2003; BENI & Moesch, 2017); however, a geographical view predominates over fixed and flows (SANTOS, 2002) existing in tourist territories to characterize and evaluate tourist activity. Along with Pearce (2003), Castro (2006), and Alvares et al. (2019) by listing the variables, the "means of accommodation," "F&B equipment," "accesses," "attractions," and "tourist flow" we considered "two main components" for analysis and evaluation of the development of tourism in certain areas. Namely, tourist offer (attractions, accommodation, transport, infrastructure) and existing and potential markets (flow of tourists).

METHODOLOGY

The Analytic Hierarchy Process (AHP) methodology was applied to the inventory of the coast of Piauí's tourist supply collected between 2019 and 2020. The AHP combines quantitative methods to analyze the spatial action of tourism in the network/region studied, such as the density and distribution of attractions, inns, restaurants, and access roads, delimiting and identifying the potential of attractions and impacts generated by tourism activity.

The outline of this study is as follows: a description of the study area, the AHP method, the variables selected to compose the analysis matrix, and the results for each of the territories used by tourism on the coast of Piauí. The literature review accompanies the description of the methodological procedures used.

STUDY AREA

The study area corresponds to the coastline of Piauí with natural contours to the north, delimited by the Atlantic Ocean; by the Parnaíba River (border of Piauí and Maranhão) to the west; and to the east by the mouth of the Camurupim River (border of Piauí and Ceará). The region has four municipalities and extends along the coast for approximately sixty-six kilometers, involving Ilha Grande de Santa Isabel, Parnaíba, Luís Correia, and Cajueiro da Praia, located in the northern portion of Piauí. The criterion for defining the region was based on Piauí's state limits and the representativeness of the coastline in the state's tourist scenario.
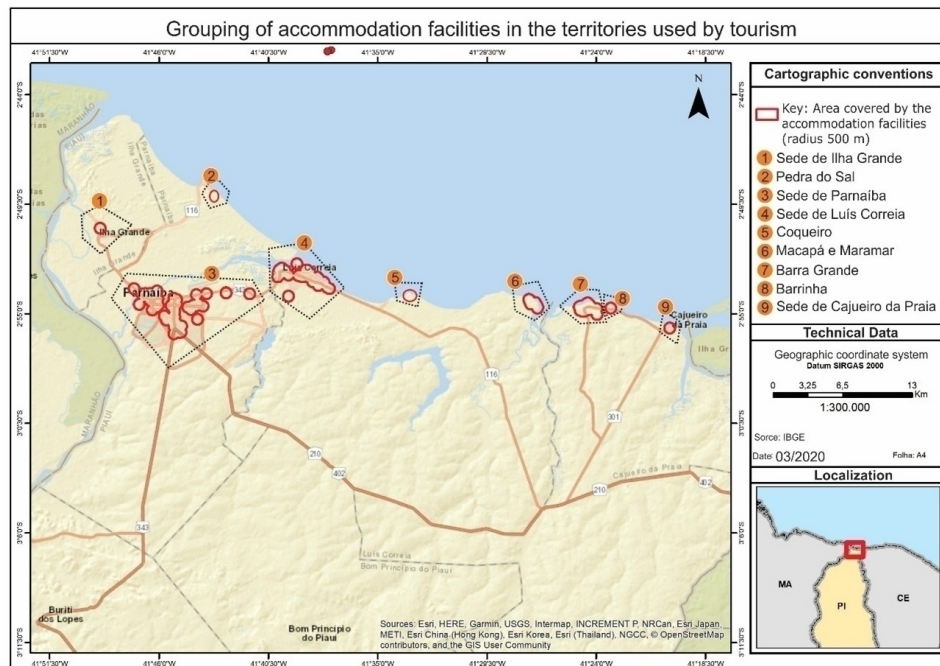

Figure 1 - Tourist territories of the coast of Piauí based on the concentration of accommodation facilities. Source: Braga and Guzzi (2021).

Similar spatial cuts based on the location and/or concentration of tourist services have already been applied in the studies of Lima (2015), Cordeiro (2008), Matellán et al. (2013), and Araújo & Ros (2014). The mapping was carried out from the Tourist Offer Inventory (TOI), and then the geographical coordinates and information about the collected infrastructures were organized in Excel spreadsheets and converted to the shapefile format. The maps were created using the ArcGIS 10.1 Geographic Information System software. The cartography of these maps applied the Universal Transverse Mercator (UTM) projection and the SIRGAS 2000 UTM Zone 23s datum. Subsequently, the interpolation of the points and the delimitation of the tourist territories were carried out, as shown in the map below (Figure 1).

The map above was created by applying the TOI on a municipal scale. The coastline is highlighted because this is where the means of accommodation and most of the F&B equipment are located. No hotels and inns are outside this territorial strip, and there are only a few motels[2] along the main access roads (BRAGA, 2021). Restaurants, snack bars, and bakeries are found in other areas of the municipalities, but not in sufficient numbers and concentration to form territories, unlike on the coast. Although tourism should not be limited to the coastal strip, activities occur and materialize in this restricted portion of the municipalities through basic and tourist infrastructure. Tourist attractions are dispersed in larger municipal areas that are not concentrated and densified to the same extent as the tourist infrastructure.

The nine tourist territories identified and described by Braga & Guzzi (2021) in the four municipalities were delimited based on the concentration of accommodation and F&B equipment, such as bars, restaurants, and snack bars. These are the municipal seat of Ilha Grande (IG); the beach of Pedra do Sal (PeS); the municipal seat of Parnaíba (PHB); the municipal seat of Luís Correia (LC); the Bairro and Coqueiro Beach (Coq); the territory of Macapá and Maramar (MaM); the beach and the district of Barra Grande (BG); the village of Barrinha (Bar) and the municipal seat of Cajueiro da Praia (CaP).

ANALYTIC HIERARCHY PROCESS (AHP)

Following the survey of the basic and tourist infrastructures in the tourist territories, the AHP method was selected as the most appropriate, as it enables the analysis of the various variables that compose the tourist offer. The process operationalizes qualitative and subjective analyses through numerical characteristics (BEN, 2006). Furthermore, it permits "the hierarchy of subjective opinions on categories of value drivers, allowing a quantitative treatment that leads to a numerical estimate of the relative importance of each driver" (BEN, 2006, p. 2). The drivers or variables chosen for this research were the "accommodation facilities," the "F&B equipment, " the "accesses," the "attractions," and the "tourist flow" (Figure 2).
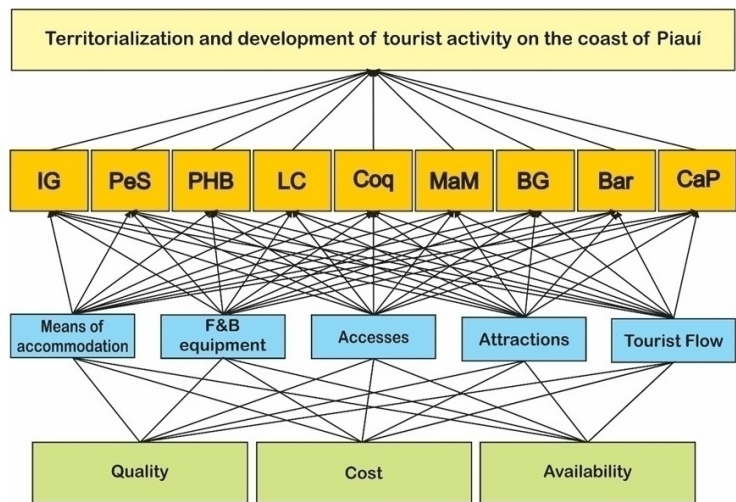

Figure 2 - Hierarchical structure of variables for the decision process. Source: By the author (2020).

This selection was based on fieldwork carried out between 2020 and 2021 on TOI data and the territories' characteristics. The TOI data and those collected during the field research supported the definition of the categories for the "evaluation and characterization of the tourist territories of the coast of Piauí," establishing weights, considering the quality, cost, and availability via AHP.

AHP is clearly in line with the definition of used and neglected territories proposed by Cruz (2005) and the concepts of Santos and Silveira (1994), as well as the complex approach proposed by Morin (2001), applied in studies on tourism activity. The proposed methodology is based on theorists who applied AHP to analyze issues related to tourism, such as Peral et al. (2009), Moutinho & Curry (1994), and Malpartida & Lavanderos (2000). The methodological steps were described and applied directly to treat the information obtained through data collection between 2019 and 2020.

Although AHP stands out from other multicriteria analysis techniques and is one of the most used methods in the world, it is necessary to recognize the methodology's subjective character (SANTOS et al., 2017). Nevertheless, this subjectivity offers the mechanisms to aggregate the characteristics considered most relevant, including non-quantitative variables, to provide greater clarity in the decision-making procedures and stages (SANTOS et al., 2017).

Another positive aspect of the AHP is the opportunity to validate the coherence of the evaluation criteria, the reduction of possible inconsistencies in the logic of weights assigned to the variables, and the calculations performed. The need to perform mathematical operations of the maximum eigenvalue (λmax), consistency index (CI), and consistency ratio (CR) is fundamental to validate the matrix (SANTOS et al., 2017). The maximum eigenvalue (λmax) calculation demonstrates whether the matrix data are logically linked. For Santos et al. (2017), reaching λmax is one of the AHP's primary objectives and can be calculated in three stages. First, the AHP matrix is multiplied by the priority vector of the central objective, and then the multiplication product is divided by the priority vector of the analyzed object (SANTOS et al., 2017; WANGAN, 2016). In the next step, the λmax is found by the arithmetic mean of the auxiliary priorities, corresponding to the value of the arithmetic mean of the previously performed division (SANTOS et al., 2017; COSTA, 2002). In the third step, the matrix can only be considered consistent if the λmax is equal to the matrix's number of rows and columns: λmax = average of the vector Aw/w (SAATY, 1990).

To calculate the consistency index (CI), Saaty (1991) determines that to be considered consistent, the maximum eigenvalue of a matrix must be equal to "n" (dimension of the matrix). In this case, obtaining the value n -1 in the parity comparisons is necessary. Santos et al. (2010) state that this step "must be performed if the matrix is considered consistent, through the following equation IC = (λmax-n) / (n-1), where n is the number of rows and columns of the matrix" (SANTOS et al., 2010, p. 7).

On the other hand, the consistency ratio (CR) calculation demonstrates whether there was coherence in assigning the values present in the matrix and the pairwise comparisons. We used the formula proposed by Pamplona (1999) and applied by Saaty (2001), in which the index is calculated using the formula RC=IC/CA. In this case, the acronym CA refers to the random consistency index (PAMPLONA, 1999). Santos et al. (2017) complement the information about the CR, affirming that these values should be the lowest possible: "this requires a value less than 0.1, if the result meets the standard, the calculation is accepted; otherwise it is necessary to improve consistency, through the reassessment of paired comparisons" (SANTOS et al., 2017, p. 7). As an example, the following respective values relate the number of variables and the Consistency Ratio: $1 \leq 0$; $2 \leq 0$; $3 \leq 0.58$; $4 \leq 0.90$; $5 \leq 1.12$; $6 \leq 1.24$; $7 \leq 1.32$; $8 \leq 1.41$; $9 \leq 1.45$, $10 \leq 1.49$ (SAATY, 1991).

Along with the discussion on CR, Marins et al. (2009) consider that in an AHP, the CR of any comparison matrix should be less than or equal to 0.10. For the authors, a higher number of variables should not necessarily be associated with a higher CR value. The RC oscillated within this parameter for the nine matrices constructed for the present study. As the proposed matrix is composed of five variables ("means of accommodation," "F&B equipment," "accesses," "attractions," and "flow of tourists"), the CI must present, at most, a value of 1.12. However, in all the matrices, the value was much lower than the limit, demonstrating that the evaluations met the logical criteria proposed for this method.

Table 1 - Example of a pairwise comparison matrix (the table appears in the database and refers to the territory of Ilha Grande, first in the database). Source: By the authors.

When the AHP methodology was applied in other studies, the same pattern of organization in stages was observed. The first stage includes the definition and decomposition of the problem, followed by constructing a set of matched comparison matrices, applying the AHP mathematical modeling, and, finally, evaluating the results (SANTOS et al., 2017; KOU et al., 2013).

Once the hierarchical structure had been established, the second stage was the evaluation with the equal comparison (pair by pair) between the components of the tourist territories analyzed, namely the "means of accommodation," the "F&B equipment," the "accesses," and the "flow of tourists." In this step, the pairwise comparison followed a scale composed of values below one (1) for less important defined variables: 1/9 (extremely), 1/7 (quite), 1/5 (very), and 1/3 (little). The variables with higher weights have the reference values: 3 (little), 5 (a lot), 7 (very), and 9 (extremely) (FIGURE 2) (SAATY, 2008). Although widely cited in more current studies, such as Marins et al. (2009) and Islam et al. (2020), this model is the same used by Saaty (1990 and 2008).
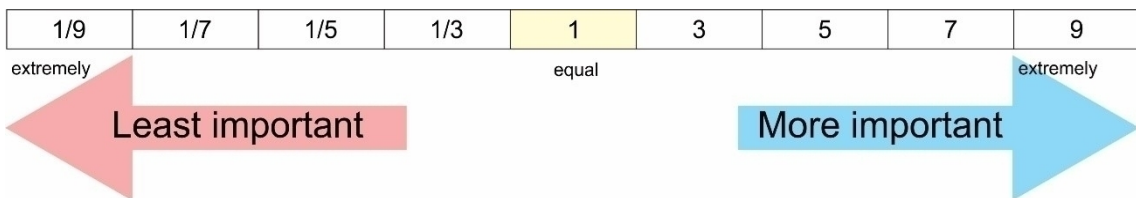

Figure 3 - Values applied in the pairwise comparison matrix. Source: SAATY (1990), adapted and translated by the author.

The classification within the scale between "least important" and "most important" used the criteria of quality (state of conservation, cleanliness, and quality of service), cost (if the amounts charged are relatively higher or lower in relation to the other enterprises in the same sector), and availability (the quantity, the period of operation and/or whether or not the service exists in the evaluated territory) of each variable. For the criterion of cost, classifications available on platforms such as Google and TripAdvisor were consulted as sources of complementary information, as they group the equipment according to the same logic adopted here: services identified with $ and $$ have a low cost; $$$ have an intermediate value; and $$$ $ and $$$$ are expensive. The means of accommodation were classified considering the service's quality, prices, and availability. Therefore, scenarios exist where there are few hotels, but the service has a high cost and low quality. In this case, this variable is less relevant than the others in the pairwise comparison with values between 1/9 and 1/7 (Figure 4) in relation to the other variables.
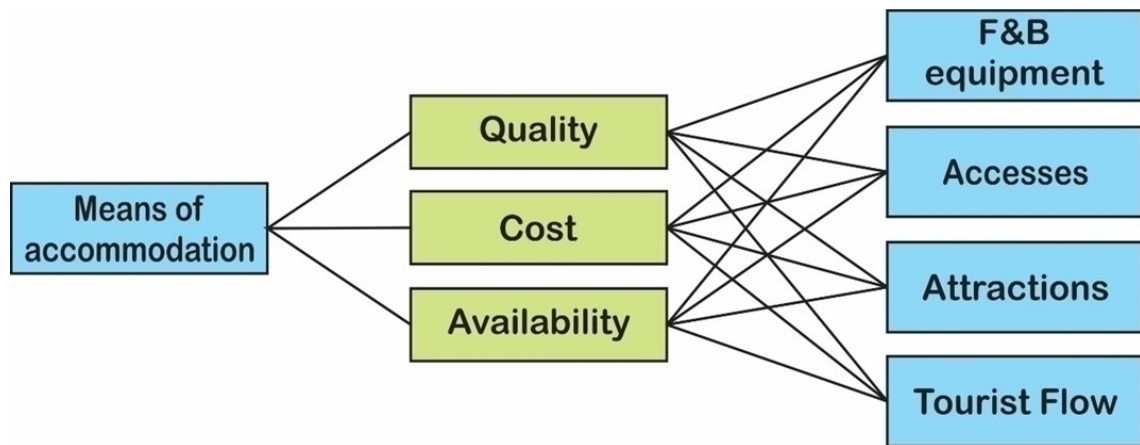
Figure 4 - Values applied in the pairwise comparison matrix. Source: Prepared by the authors.

Subsequently, the relative values assigned to each criterion were normalized. Each of the nine tourist territories identified in the municipalities of Ilha Grande, Parnaíba, Luís Correia, and Cajueiro da Praia was analyzed. In the tables showing the analysis of the territories, the gray shading highlights each time the criterion is compared with itself, and the result is "1". The mirror of the evaluations between the variables is also highlighted since, for example, the relative values when comparing "A to B" are mirrored by the value of "B to A." The territories' individual results are shown in the table in the section "Evaluation and characterization of the tourist territories of the coast of Piauí" below.

The assignment of weights for each criterion is performed by dividing each column's elements by the sum of that same column (normalization) and, subsequently, adding the elements in each resulting row and dividing this sum by the number of elements in the row (SAATY, 1991). The value obtained is the one used as a reference.

ELEMENTS FOR ANALYTIC HIERARCHY PROCESS (AHP) IN TOURIST TERRITORIES

Notably, our intention is not to propose a universal model for evaluating tourist territories, as the variables can (and should) change. Furthermore, depending on the reality analyzed, the comparison matrix can include or exclude different components. The variables are described below for constructing each territory's AHP matrix, interpreting the results, and ending with a synthesis.

ACCOMMODATION FACILITIES AND F&B EQUIPMENT

Lima's (2015) work "Modeling of the geotourism potential of the districts of the municipality of Ouro Preto - MG" characterized the tourist infrastructure using the following elements to characterize the means of accommodation (hostels, hotels, inns, bed and breakfast services, campsites, and boarding houses) and food segments (restaurants, snack bars, bakeries, grocery stores, ice cream shops). The author also stressed aspects of the influence of accommodation facilities on the territories where they are located. When describing the social and territorial context of Lavras Novas, district of Ouro Preto, in Minas Gerais, where tourism is the primary source of income, the author points out that "the holders of the means of accommodation represent a strong power of influence in the district's decisions, in addition to having obtained more attention from the rulers in order to expand tourism development" (LIMA, 2015, p. 07). The method also resembles that used by Matellán et al. (2013) in the " Caracterización y análisis de la oferta de los Servicios Complementarios en la red extra hotelera en destinos turísticos " and Araújo & Ros (2014) in the study "Possibilities for adventure tourism on the coast of Piauí."

The F&B establishments and lodging facilities were mainly visited between 2019 and 2020, and the information was collected through the standard Tourist Inventory form (INVTUR) proposed by the Ministry of Tourism in Brazil to survey the Tourist Offer Inventory (TOI). The field visits and data

collected allowed the evaluation of each territory and scores to be assigned for these two variables of the AHP matrix.

Santana et al. (2020) argue that there is little research on the quality of tourist services and that most studies are related to customer perceptions. The authors also considered that the "evaluation of quality in tourist services is multifaceted, variable, specific and allows many variables to be analyzed, as long as they are linked to the type of service in question" (SANTANA et al., 2020, p. 508). The assignment of weights for F&B services and lodging facilities partly followed the model described by Butnaru et al. (2018) and was based on documental research, field research, and quantitative analysis of quality and price variables (SANTANA et al., 2020, p. 508). Thus, the fieldwork enabled the evaluation of the quality of the service on a territorial scale and compared it with the other variables, namely: accesses, F&B equipment, tourist attractions, and tourist flows.

ACCESSES

The transportation and displacement system, here called "accesses," is a weighty variable when evaluating tourism potential (PIRSELIMOĞLU BATMAN & DEMIREL, 2015) and, therefore, is one of the elements of the analysis matrix of tourist territories. In Piauí, the main tourist corridor (BOULLÓN, 2002; BRASIL, 2009; RAMOS & LOPES, 2013) is the BR 343 highway, linking the capital Teresina and the municipality of Parnaíba. As described by Ramos & Lopes (2013), most of the tourist movements in the state occur along this highway, mainly involving local residents traveling towards the coast.

Until 2017, this was also the main corridor taken by national and international tourists who disembarked at Senador Petrônio Portella Airport in Teresina and headed for the Parnaíba Delta and Piauí's beaches. With a weekly flight to the airport of Parnaíba (on Saturdays from Campinas, in the state of São Paulo) and dozens in Cruz (which serves Jericoacoara and receives ten weekly flights. Belo Horizonte – five flights, São Paulo – four flights, and Recife – one flight) many Brazilian and foreign tourists have arrived in the region without passing through the state capital[3] (INFRAERO, 2019). In March 2023, the state government announced two more regular flights from Belo Horizonte to Parnaíba on Thursdays and Sundays.

The coast of Piauí was and still is an "isolated" region (SILVA, 2013; SANTOS et al., 2001). This issue is historical, as the "region was always marginal, distant from the economic and political centers of their respective provinces" (SILVA, 2013, p. 79). Under the same regional focus, Martins Filho (2014) emphasizes that isolation hinders tourism development of tourism in the Delta Coast Pole by stating that "the precariousness of investments in transport infrastructure, basic services and the lack of a network of tourist establishments have deprived the region of greater development" (MARTINS FILHO, 2014, p. 180). Parnaíba was defined as a destination with "severe access limitations" in a study by Santos et al. (2017), also pointing out the difficulty of the municipality being a "conveyor" of tourists to neighboring municipalities.

Regarding tourists' movements to the coast, Borges (2018) also recognizes the difficulties of access as a limiting factor, especially in the case of Parnaíba, an inducing destination for regional tourism. For the author, among the obstacles to tourism development, "the difficult access stands out because national flights only returned to the city airport in 2016; until then, road travel was the main form of long-distance travel" (BORGES, 2018, p. 192).

With the land access difficulties described above, local municipalities still expect to implement projects such as re-establishing the railway line between Luís Correia, Parnaíba, and Piracuruca to transport residents and tourists. In 2020, the municipal election year, the beginning of the railroad works, and purchasing of a passenger train was announced. With the elections over, little is known about the costs and schedule of the work. Azul Linhas Aéreas Brasileiras underuse the International Airport of Parnaíba Mayor Dr. João Silva Filho with a single Saturday flight. There was a forecast of expansion for 2020 to five weekly flights, but in fact, the increase was from one to two weekly flights.

In addition to the secondary data on the routes and forms of tourist access to the coast of Piauí, fieldwork was carried out in all the main modes, namely the airport and bus stations. The sections between the municipalities were traveled several times between 2019 and 2020, and there were transfers

through the airports of Cruz (Ceará) and Parnaíba (Piauí). The trips to Barreirinhas (Maranhão) and Jericoacoara (Ceará) were also part of the fieldwork to evaluate the connectivity between the municipalities of Piauí and the other destinations of the Route of Emotions[4]. The pairwise comparison conformed to the comparative diagram between the degree of relevance of the variable accesses for each territory with the means of accommodation, F&B equipment, tourist attractions, and tourist flow.

TOURIST ATTRACTIONS

The evaluation of tourist attractions in the AHP followed the parameters of the Ministry of Tourism (BRAZIL, 2007), adapted from the World Tourism Organization (UNWTO) and the Inter-American Center for Tourism Training (CICATUR). The same procedure was applied during the realization of the Integrated Plan for the Integrated Development of Costa do Delta Sustainable Tourism Pole in 2010 (PDITS Costa do Delta, 2010) and by Dantas & Melo (2011). The same criteria were used in technical visits during 2019 and 2020 to evaluate natural and cultural attractions: the Potential of attractiveness; the Degree of current use; Representativeness; Local and community support; the State of Conservation of the surrounding landscape; Infrastructure, and Access. A detailed evaluation was presented by Braga et al., (2022) in the study "Analysis of Tourist Attractiveness of the Piaui Coast: updating the evaluation of tourist attractions between 2010 and 2020," this data supported the pair-by-pair comparison presented.

FLOW OF TOURISTS

Tourism was approached as a provocative and/or materialized economic activity through a series of spatial transformations (FRATUCCI and MORAES, 2020). In this regard, Borges (2014) understands tourism as a "dynamizing" factor of the economy in many communities. However, it also produces deterritorialization and reterritorialization processes, generating new spatial configurations that sometimes become permanent, and the emergence of territorialities (BORGES, 2014; HAESBAERT, 2010).

When adopting geographical space as a fundamental concept, we considered its composition by fixed elements and flows (SANTOS, 2002) and the fact that human relations happen and produce the tourist territories in this same space. Santos (2002) proposes that fixed structures and flows compose an inseparable, solidary, and contradictory set of systems of objects and actions responsible for the forms and dynamics forming geographical space (BRAGA & GONTIJO, 2011). Space is not an object, a commodity, or even an instrument (PUTRICK, 2019). Space is not only the place where things are produced; it is also the area of the reproduction of social relations. This reproduction of social relations includes urban spaces, leisure spaces, educational spaces, spaces of daily life, and tourism (LEFÉBVRE, 2006).

Thus, the characteristics and intensity of the tourist flow are fundamental elements for characterizing tourist territories. In the report on the strategic environmental assessment of the Regional Tourism Development Program (PRODETUR) in the state of Piauí – Polo Costa do Delta, the issue of tourism massification had already been mentioned: "The profile of the tourist who consumes the tourist product of the Polo is, for the most part, composed of the mass visitor who seeks sun and beach tourism as a leisure activity" (BRASIL, 2010, p. 107). As well as reflecting the audience in the study area, the model prevents research from being lost in the plethora of possible segmentations and subdivisions. Another aspect is understanding mass and seasonal tourism as an unsustainable activity out of step with the local environment. Piauí, especially its coastline, needs to develop tourism respecting its cultural, social, and environmental fragilities. The values used to evaluate the flow of visitors are described in Braga (2020) and were validated by fieldwork in the region.

EVALUATION AND CHARACTERIZATION OF THE TOURIST TERRITORIES OF THE COAST OF PIAUÍ

Based on the methodology described, each territory was analyzed through AHP. From this approach, it was evident that, in most territories, the results are consistent with other studies carried out

in the same areas where tourist activity was evaluated. The Summary Table shows the variables with the highest and lowest representativeness highlighted by territory. The grouped data makes the idea of a regional set feasible. When comparing the territories, the values attributed to "Means of accommodation," "F&B," "Accesses," "Attractions," and "Tourist flow" are some elements that support the identification of positive and negative points on a regional scale. The highest scores, in green, show the variables with the best performance, and those in red show the sectors with the most significant weaknesses in each territory. This factor explains the adoption of AHP for territorial analysis and decision-making. Managers can define actions to remedy the problems of the worst-performing sectors and/or to enhance the best-evaluated areas.

Territory	Means of Accommodation	F&B	Accesses	Attractions	Tourist Flow
IG	0.13447	0.17990	0.08768	52847	0.06948
PeS	0.09208	0.21703	0.13204	0.32896	0.22989
PHB	0.16033	42851	0.12076	0.10971	18069
LC	0.28619	0.41825	10047	0.09003	0.10506
Coq	39493	0.26055	0.09937	16790	0.07726
MaM	0.36371	0.26023	0.12683	15831	0.09093
BG	20117	20117	0.04622	0.35902	20117
Bar	0.55223	0.12838	0.05077	0.35026	0.04024
CaP	0.23065	0.44117	0.10548	0.12669	0.09601

Table 2 - AHP synthesis of tourist territories. Source: Author's compilation (2020). Caption: Ilha Grande (IG); Pedra do Sal beach (PeS); the municipal seat of Parnaíba (PHB); the municipal seat of Luís Correia (LC); the Neighborhood and Coqueiro Beach (Coq); the territory of Macapá and Maramar (MaM); The beach and the district of Barra Grande (BG); the village of Barrinha (Bar) and the municipal seat of Cajueiro da Praia (CaP). Green: variable of the territory with the highest score; red: variable of the territory with the lowest score.

Even in an initial analysis, it is evident how the tourist flow and forms of access scored lowest in most territories. The aspects related to the tourist offer "Means of accommodation," "F&B," and "Attractions" received the highest marks in all nine territories. For example, the scores for "F&B" were the highest in the municipal seats of Parnaíba (PHB), Luís Correia (LC), and Cajueiro da Praia (CaP).

The combined analysis of the territories is consistent when comparing individual descriptions and AHP matrices. For example, neighboring territories such as Ilha Grande (IG) vs. Pedra do Sal (PeS) and Barra Grande (BG) vs. Barrinha (Bar), where the "Tourist attractions" variable had the highest relative evaluation among the study areas. In the former, in addition to the proximity of attractions such as access to the Parnaíba Delta and Pedra do Sal beach, the tourist infrastructure in Ilha Grande vs. Pedra do Sal is notably precarious. Thus, it was natural that the tourist attractions had high importance, whereas services had a relatively lower score. Services in both territories are considered low-cost when compared to other territories. The attractions stood out in Barra Grande and Barrinha, but with grades not far from those attributed to accommodation and F&B services, which have a medium to high cost.

Taken together, the values attributed to the means of accommodation in Ilha Grande and Pedra do Sal were the lowest in the nine territories. The two territories have scarce, low-cost, and low-quality accommodation equipment compared to the other coastal territories. In this item, Macapá and Maramar (MaM), Coqueiro (Coq), and Barrinha (Bar) had the highest values. In the three territories, the services are of higher quality, and the prices charged are also higher than in the other study areas. The descriptions of the territories and amounts of these structures in each are very coherent.

Geographical proximity could explain, in part, the assessments about the means of accommodation and tourist flow of Ilha Grande and Pedra do Sal being the least important. In both territories, the flow of visitors passing through the area does not revert to economic development. The transit of excursionists carrying out mass activities in Ilha Grande and Pedra do Sal proved to be much less advantageous for the tourist destination and much more socially and economically impactful than the realities of the other territories. Tourism in Ilha Grande and Pedra do Sal has negative impacts, such as garbage and pressure on basic infrastructure (water, sewage, garbage collection, public safety, health services), without positive effects, like job generation in the hotel network and the F&B and tourism

animation sectors. This is corroborated in studies carried out in the same region by Silva (2013), Borges (2018), Rocha (2017), Putrick (2019), and Braga (2021). In Coqueiro and the neighboring territory formed by the beaches of Macapá and Maramar, tourist flow was also the least relevant, but for other reasons. Despite several tourist enterprises in these two locations, most visitors have a second home there; thus, the flow remains constant and has different characteristics from conventional tourism. For example, during the CODIV-19 pandemic in 2020, the flow of people increased in the two territories as several of the homeowners (a group formed mainly by Teresinenses) decided to pass the quarantine period in Luís Correia.

Peral et al. (2009) consider "basic tourist services" (accommodation and F&B) the most important elements in carrying out actions and planning. The same authors defined tourist attractions and leisure activities as secondary or complementary tourist offers. In most cases, the matrices produced here agreed with Peral et al. (2009). Only in "Pedra do Sal" were the means of accommodation and F&B not among the two most relevant criteria since its tourist activity is still poorly developed. The area received visits from excursionists, mainly residents of Parnaíba; however, F&B beverage services are still precarious, and the means of accommodation are incipient. It is possible to consider that the quantity and quality of accommodation and F&B in the territory is a positive tourism impact, reflected in the generation of jobs for local residents.

CONCLUSION

The AHP method proved efficient for evaluating the development of tourism activity in the territories of the coast of Piauí. Although underused in Brazil, it is a consistent method to cover the complexity of territories used by tourism in the four coastal municipalities of Ilha Grande, Parnaíba, Luís Correia, and Cajueiro da Praia. This study is one of the few applying AHP for the territorial analysis of tourism activity. Thus, we hope to introduce research methods on the impact of tourism using less subjective methodologies. When reconciled with cartographic analysis, inventory data of the tourist offer, and an evaluation of attractions, the AHP provides consistent elements for diagnosing tourist activity on a local and regional scale.

Through the description of the territories, dialogical relations were observed between each fragment's characteristics and the regional "whole" that forms the coast of Piauí. The lack of planning, management, and structuring actions for territorial features of each portion of the coast catalyzes pre-existing local inequalities reflected in the spatial organization of each tourist territory. The poorest territories with the most difficult access are shown to be areas in which tourism is a mass activity with a low economic performance, such as |Pedra do Sal and Ilha Grande. This scenario contrasts with the territories used by residents and middle-class tourists, such as Barrinha, Barra Grande, Coqueiro, Macapá, and Maramar. Their spatial and aesthetic planning is characteristic of better-structured and more economically developed tourist spaces. Therefore, measures should be adopted to improve the primary and tourist infrastructure of the territories used by tourism, especially the lower-performing ones.

The study highlights the problems with basic infrastructure, such as access roads, security, and basic sanitation in the territories. In contrast, it is also clear that there are tourist attractions and services with the potential to make the coast of Piauí a competitive tourist destination. The use of AHP verifies that one of the reasons that the tourist potential of Piauí's natural and cultural attractions has not been used as a mechanism to boost the local economy and foster development involves problems related to the lack or precariousness of basic infrastructure. The most evident negative aspects were problems related to the transport system and access routes, making it difficult and expensive to move to and along the beaches and natural attractions of the Piauí coast.

The data provided emphasizes the need for future public tourism policies in municipalities to be more individualized for each territory. Generic actions for the region, such as the "Delta Coast Pole" end up considering the coast of Piauí as a homogeneous space, ignoring the latent conflicts and inequalities existing between the territories used by tourism. While the political conception guiding the activity at the local and regional levels considers tourism as the "saving" economic activity and development provider, the territories neglected by tourism must be incorporated into public tourism policies. Given

that the tourist attractions and areas with the greatest potential are mostly overlooked, increased investment in these areas may bring new perspectives for tourism on the coast of Piauí. Despite the problems presented, tourism cannot be considered harmful to the study region. After the processing of the analysis data, what stood out was the huge potential of the natural and cultural attractions and their numerous possibilities for tourism. This potential justifies the feeling of "backwardness" in the region concerning tourism, as the latency of the potentialities for developing tourism "awaiting" use is evident.

NOTES

1 - Regarding the past management of Brazilian tourism (2019 - 2022), professor and researcher Rita de Cássia Ariza da Cruz gives an overview of the scenario in 2020 in an interview for the Le Monde newspaper (10/14/2020): https://diplomatique.org.br/para-que-e-a-quem-serve-o-ministerio-do-turismo/.

2 - The term motel is used differently in Brazil from English speaking countries. "Brazilian motels offer a private place to have sex where discretion is taken very seriously.

3 - Flight schedule in the year 2020 and 2023.

4 - The Route of Emotions is considered one of the five pioneering tourist itineraries in the planning of Tourism Routing in Brazil, coordinated by the Ministry of Tourism. Fourteen municipalities are part of the Route of Emotions, five in the state of Ceará (Barroquinha, Camocim, Chaval, Cruz and Jijoca de Jericoacoara), five in Maranhão (Barreirinhas, Paulino Neves, Araioses, Tutóia and Santo Amaro) and four in Piauí (Parnaíba, Luís Correia, Cajueiro da Praia and Ilha Grande) (PUTRICK, 2019).

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