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LODGING FACILITIES IN LOCAL PRODUCTIVE ARRANGEMENTS IN THE CONTEXT OF BOOKING PLATFORMS IN CEARÁ, BRAZIL (2024)

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Abstract

Local Productive Arrangements (LPA) are local economic systems that generate learning, productive, and innovative capacities. The objective of this study was to analyze the innovative characteristics adopted by lodging facilities within the Local Productive Arrangements (LPA) of the municipalities of Icaraizinho de Amontada (Amontada) and Icapuí in the state of Ceará, as showcased on digital lodging search platforms. For this purpose, an exploratory factor analysis was applied to fourteen innovative variables from lodging facilities listed on the Booking.com and AirBnb platforms in 2024. The results highlighted differences in the adoption of innovative elements by the lodging units in both LPA revealing a process of market homogenization in Icaraizinho de Amontada, while the establishments in the Icapuí beaches maintained competitive advantages.

Keywords: Productive Arrangements; Tourism; Innovation; Ceará; Factor Analysis.

Resumo / Resumen

MÍDIAS DE HOSPEDAGEM EM ARRANJOS PRODUTIVOS LOCAIS NO CONTEXTO DE PLATAFORMAS DE RESERVAS NO CEARÁ, BRASIL (2024)

Os Arranjos Produtivos Locais (APLs) são sistemas territoriais complexos que promovem aprendizado, capacidades produtivas e inovação. Nesse sentido, o objetivo deste trabalho é analisar os aspectos característicos adotados pelos meios de hospedagem integrantes dos APLs de turismo nos municípios de Amontada e Icapuí, no estado do Ceará, conforme expostos em plataformas digitais de busca por hospedagem. Para isso, optou-se pela aplicação do método de análise fatorial exploratória em quatorze variáveis inovadoras dos meios de hospedagem presentes nas plataformas Booking.com e Airbnb no ano de 2024. Os resultados evidenciaram diferenças na adoção de elementos inovadores pelos meios de hospedagem nos dois APLs, com a presença de um processo de homogeneização do mercado em Icaraí de Amontada e a preservação de vantagens competitivas dos e tabelecimentos localizados nas praias de Icapuí.

Palavras-chave: Arranjo Produtivo; Turismo; Inovação; Ceará; Análise Fatorial.

MEDIOS DE HOSPEDAJE EN ARREGLOS PRODUCTIVOS LOCALES EN EL CONTEXTO DE LAS PLATAFORMAS DE RESERVAS EN CEARÁ, BRASIL (2024)

Los Arreglos Productivos Locales (LPA) son sistemas económicos locales que generan aprendizaje y capacidades productivas e innovadoras. De esta manera, el objetivo de este trabajo es analizar los aspectos característicos adoptados por los alojamientos de los Arreglos Productivos Locales (LPA) de turismo de los municipios de Amontada e Icapuí, en el Estado de Ceará, expuestos en plataformas digitales de búsqueda de hospedaje. Para esta finalidad, se optó por la aplicación del método de análisis factorial exploratorio de catorce variables innovadoras de alojamientos en las plataformas Booking.com y AirBnb en 2024. Los resultados evidenciaron diferencias en la adopción de elementos innovadores por parte de los alojamientos en ambos LPA, con la presencia de un proceso de homogeneización del mercado en Icaraí de Amontada y la conservación de ventajas competitivas de los establecimientos en las playas de Icapuí.

Palabras-clave: Arreglos Productivos; Turismo; Innovación; Ceará; Análisis Factorial.

INTRODUCTION

In the 1990s, the Local Productive and Innovative Arrangements Research Network (Redesist) recognized Local Productive Arrangements (LPAs) as a complex system of interaction among local agents, involving economic and social processes within a given territory that consequently generate learning and productive and innovative capacities (MATOS et al., 2017).

Economic activities — through productive agglomerations — are spatially concentrated in regions, leveraging this situation to access labor, capital, and local expertise, thereby achieving more favorable economic conditions than other regions (ŠABIĆ; VUJADINOVIĆ, 2017). As presented by Tahim and Araújo Júnior (2015), the geographic proximity of productive agglomerations creates opportunities for companies to grow and benefit from local externalities, ultimately reflecting in their competitive advantages. From this perspective, the ability of these productive agents to cooperate and interact is fundamental to the effectiveness of the adopted strategic process (SILVA; PASCUCI, 2020).

Within this context, tourism — a strategic factor used to promote economic development (Feo, 2020) — gains prominence in reflections, political debates (federal, state, and municipal), and international and national scientific literature due to its potential for generating employment and income (BRASILEIRO, 2012). The transformation induced by tourism in geographic space shifts attention to those agglomerations of productive economic activities that stimulate local development through job creation, income generation, competitiveness, and innovation (CERQUEIRA NETO; SILVA, 2015). In this case, the touristification of the territory occurs as a result of the transformation of a place and its customs based on a new model of territorial dynamization and spatial structuring (EGLER et al., 2015; BAPTISTA et al., 2018).

Innovation, in particular, emerges as a key variable in enhancing productivity, competitiveness, and transformation within companies across all economic sectors, especially in service-oriented businesses such as lodging establishments. Among innovative strategies, the incorporation of new elements in products/services, management, and sensory marketing can add value to the services offered and create new tourist experiences, thus becoming a competitive advantage (FRAJ et al., 2015; AIRES, 2017; GIL et al., 2023). Currently, within this economic segment, sensory marketing—related to people's senses and emotions—is a relatively recent type of marketing and has emerged as an important strategy for providing personalized, unique, and specific experiences to tourists. By enhancing sensory stimulation, it increases the attractiveness of destinations (SCHMITT, 2002; AZEVEDO et al., 2010; MATEIRO, 2018; GIL et al., 2023).

Thus, locations with a higher concentration of productive agglomerations within the same tourism segment — such as LPAs — encourage the introduction of innovative elements that boost tourist inflows. Regarding the LPA theme in the context of Ceará, in 2022, the state government mapped 36 LPAs across 48 municipalities (INSTITUTO CENTEC, 2022; TAHIM et al., 2024). Among these LPAs, three are related to "sun and beach" tourism: one located on the eastern coast (Beberibe, Aracati, and Icapuí) and two on the western coast (Icaraizinho de Amontada and Jijoca de Jericoacoara) (INSTITUTO CENTEC, 2022). According to official data, in 2021 — a period still influenced by the COVID-19 pandemic — there were 35 lodging establishments registered with the Ministry of Labor and Employment (MTE) in the municipalities of Amontada and Icapuí, representing a 52.17% increase compared to 2019 (BRASIL, 2024).

Within this discourse, the guiding question of this research arises: What aspects adopted in lodging services characterize the establishments in the municipalities of Amontada and Icapuí, which belong to the Local Productive Arrangements (LPAs) of the western and eastern regions of Ceará, respectively? The hypothesis is that differences exist in the adoption of attractive elements in lodging units across both LPAs, with an advantage for the Icaraí de Amontada LPA, given its greater development compared to the Icapuí LPA.

Therefore, this study aims to analyze the characteristic aspects adopted by lodging establishments within the Local Productive Arrangements (LPAs) of tourism in the municipalities of Amontada and Icapuí, Ceará, as presented on digital lodging search platforms. To achieve this, the Exploratory Factor Analysis (EFA) method was chosen to define representative factors of the complex relationships among the selected variables.

The importance of addressing LPAs lies in the possibility of understanding the strategies adopted by lodging establishments within the local hotel network, which operate in highly competitive environments with strong market power. This is particularly relevant in the post-COVID-19 pandemic period, which forced the hospitality industry to seek new, comfortable, attractive spaces that offer unique experiences (GIL et al., 2023). The competition among companies within these arrangements increases the need to attract a larger flow of consumers by implementing innovative marketing concepts to enhance quality and profitability (ĆURLIN et al., 2022; BOIKO et al., 2023).

In this scenario, new technologies emerge as drivers of tourism growth and development, as tourists are becoming increasingly demanding when searching for websites and messages that assist in their decision-making process regarding which accommodation to book (VUKASOVIĆ; MIHAČ, 2021). Within this context, marketing techniques are used to provide distinct attributes to destinations compared to their competitors (FEO, 2020).

Another reason for developing this study is the scarcity of theoretical and empirical research linking innovation in lodging businesses within LPAs, particularly in the context of Ceará. This highlights a research gap, especially concerning innovation (AIRES; BRANDÃO, 2022). Thus, gaining deeper knowledge about the innovative landscape — especially in lodging establishments within the two LPAs on the Ceará coast — paves the way for formulating interventionist public policies in these productive arrangements.

METHODOLOGY

This research is quantitative in nature, with an exploratory-descriptive approach (CRESWELL, 2010), based on the collection of numerical data that contribute to the analysis of the characteristic factors of the hotel network in the municipalities of Amontada and Icapuí, in the state of Ceará (Figure 1). It is a case study, as it seeks to understand specific strategies related to lodging establishments on the beaches of these municipalities (YIN, 2010).

Figure 1 – Location of the coastal municipalities of Amontada and Icapuí (Ceará). Source: Prepared by the authors, 2024.

The selection of these coastal destinations in Ceará was driven by the increase in media visibility, between 2019 and 2024, as well as the development of activities related to both traditional tourism and community-based tourism (CARACRISTI; ALBUQUERQUE, 2015; LOUREIRO; GORAYEB, 2017; CORIOLANO; PEREIRA, 2018). Tourism on the western coast, represented by Amontada (Icaraí de Amontada), is undergoing a phase of growth in traditional tourism, allowing it to reach the second position in the ranking of the most sought-after tourist destinations by visitors on the Airbnb platform (CEARÁ, 2023). On the eastern coast of the state, Icapuí exhibited a relative specialization in tourism in 2019, following the trend of other coastal destinations in this region of Ceará, as it recorded an increase in the number of establishments and formal employment ties between 2010 and 2019 (BRAGA; DE PAULA, 2024).

Additionally, both destinations are classified as Local Productive Arrangements (LPAs) on the Ceará coast, with Icapuí belonging to the Eastern Coastal LPA, alongside Beberibe, Fortim, and Aracati, while Icaraí de Amontada is part of the Western Coastal LPA (INSTITUTO CENTEC, 2022). These characteristics grant the destinations a strategic role in regional tourism development, especially given the coexistence of mass tourism with community-based tourism initiatives as an alternative for sustainable tourism activities.

For the secondary database, information was collected from specialized websites—Booking.com and Airbnb—dedicated to the promotion and booking of accommodations in the hospitality sector (Figure 2). In the municipality of Amontada, 83 lodging establishments (inns, hotels, chalets, apartments, and houses) were mapped and selected, while 43 were identified in Icapuí. In total, information was collected from 126 establishments, with 53% sourced from Booking.com and 47% from Airbnb.

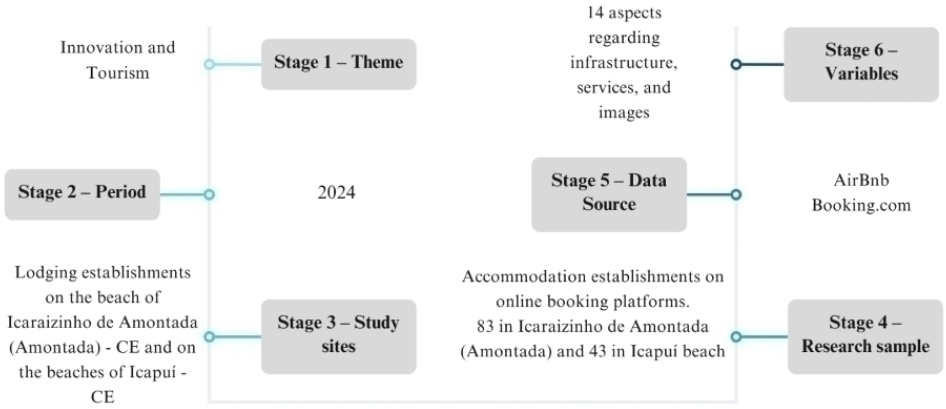

Figure 2 – Research design; Source: Prepared by the authors, 2024.

From the total number of establishments, 14 variables were selected, extracted from accommodation booking platforms during the first half of 2024 (Table 1). These variables are directly or indirectly related to the adoption of innovations—or the lack thereof—in the lodging units of the municipalities (Table 1). According to Fraj et al. (2015), actions aimed at creating value for the service or product offered can be considered innovations. Aires (2017) expands this understanding by highlighting that the innovation process in the tourism sector can be analyzed from different perspectives, such as: i) product or service; ii) process; iii) management; iv) marketing; and v) institutions. However, it is common to observe that innovations in tourism are more frequently associated with products or services (PANOSSO NETTO; MAZARO, 2012), as well as digital marketing, which explores consumers' sensory perception.

Code (Wi)	Variables	Unit of Measurement	**Innovation Prism**
QUART	Number of rooms offered by lodging units	Scalar variable	Product/service
LOJAS	Range of services offered by lodging units		
LANGUAGE	Number of languages spoken		Management
PAGAM	Available payment methods		
CAF.	Breakfast service available	Ordinal variable: No (1) and Yes (2)	Product/service
FRIGOB	Presence of minibar		
WIFI	Free internet for guests		
PETs	Pets allowed		
ARCOND	Air conditioning		
LUZ	Photos showing lighting features on platforms		Marketing
TERRAC	Photos showing terraces with views of nature/ocean		
REDESOC	Presence on social media		
NAT	Photos of green areas		
COR	Photos with colorful/attractive environments		

Table 1 – Selected characteristics of lodging units used for the study. Source: Prepared by the authors, 2024.

Initially, the internal consistency of the set of variables forming the research instrument was verified using Cronbach's Alpha (α), which assesses the extent to which the instrument's items are correlated (DOS ANJOS et al., 2020). The coefficient value ranges between 0 and 1, where values above 0.90 indicate redundancy or duplication of items, while values below 0.60 indicate low instrument consistency. The study adopted the classification scale suggested by Freitas and Rodrigues (2005).

After verifying consistency, the variables were analyzed through Exploratory Factor Analysis (EFA). This statistical multivariate technique describes and analyzes a set of variables and their complex relationships, reducing the initial number of observed variables into a smaller number of extracted factors, ordered from the most to the least explanatory (MINGOTI, 2005).

According to Fávero et al. (2009), the Exploratory Factor Analysis (EFA) method can be represented by the following general equation:

$$w_1 = \alpha_{11}f_1 + \alpha_{12}f_2 + \alpha_{13}f_3 + \ldots + \alpha_{1m}f_m + \varepsilon_1$$
$$w_2 = \alpha_{21}f_1 + \alpha_{22}f_2 + \alpha_{23}f_3 + \ldots + \alpha_{2m}f_m + \varepsilon_2$$
$$w_3 = \alpha_{31}f_1 + \alpha_{32}f_2 + \alpha_{33}f_3 + \ldots + \alpha_{3m}f_m + \varepsilon_3$$
$$\ldots$$
$$w_m = \alpha_{m1}f_1 + \alpha_{m2}f_2 + \alpha_{m3}f_3 + \ldots + \alpha_{mm}f_m + \varepsilon_m$$

(Equation 1).

Equation 1 refers to a generalized model of Exploratory Factor Analysis (EFA), highlighting a linear combination between the observed variables (w) and the extracted common factors (f). This demonstrates the existence of a correlation resulting from the linear combination of factors and observed variables, generating an interdependence between w_1, w_2, w_3 e w_m.

Following this approach, factor scores must be estimated for each factor category obtained after orthogonal rotation, expressed by the following equation (FÁVERO et al., 2009):

$$F_1 = d_{11}w_1 + d_{12}w_2 + d_{13}w_3 + \ldots + d_{1p}w_k$$

$$F_2 = d_{21}w_1 + d_{22}w_2 + d_{23}w_3 + \ldots + d_{2p}w_k$$

$$F_3 = d_{31}w_1 + d_{32}w_2 + d_{33}w_3 + \ldots + d_{3p}w_k$$

$$\ldots$$

$$F_{jk} = d_{j1}w_{1k} + d_{j2}w_{2k} + d_{j3}w_{3k} + \ldots + d_{jp}w_{pk}$$

(Equation 2).

Where: k represents the sample elements; Fj are the common factors; Wi are the original variables, and Djk are the factor score coefficients.

In the Exploratory Factor Analysis (EFA) technique, the Kaiser-Meyer-Olkin (KMO) criterion was used as a sample adequacy index. This index evaluates the proportion of variance most suitable for analysis, indicating whether the sample is appropriate for EFA (TIMMERMAN; LORENZO-SEVA, 2011). According to Braga; Campos (2022), the closer this indicator is to zero, the less appropriate the EFA is, whereas values above 0.70 indicate a more appropriate analysis. Additionally, Bartlett's test of sphericity was applied to verify the similarity between the correlation matrix of observed variables and the identity matrix, where p

The number of factors was determined using Optimized Parallel Analysis (PA), a Monte Carlo simulation procedure that includes the random permutation of observed data, bootstrapping, and the analysis of variance explained by the factors (TIMMERMAN; LORENZO-SEVA, 2011). Furthermore, the oblimin rotation was chosen as it is one of the most commonly used, allowing for correlations between factors (IZQUIERDO et al., 2014; LORENZO-SEVA; FERRANDO, 2020).

Finally, the quality of the identified model was assessed based on the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) (Brown, 2006). For CFI and TLI, values should be above 0.90 or, preferably, 0.95, with the TLI potentially exceeding 1.00 (BENTLER, 1990; HU; BENTLER, 1999).

RESULTS

Data collected from the 126 lodging establishments in Amontada and Icapuí reveals a figure 3.6 times higher than the number of formal establishments registered in the Ministry of Labor and Employment system (BRAZIL, 2024), indicating the possibility that some lodging units may be operating informally (such as those offering their homes as accommodation for tourists). A comparative description of the main innovative aspects adopted by these establishments allowed for important distinctions to be made about them in 2024. Of the strategies adopted by the establishments, more than 95% offer free internet access to guests in both locations. The second variable, breakfast, is provided by 59% of the establishments in Icaraí de Amontada, compared to only 6.97% of those in Icapuí (Table 2). This low percentage is due to the fact that many of the selected establishments in both municipalities belong to the Airbnb platform, where entire homes are rented for short stays, thus eliminating the need to offer breakfast.

Three other strategies adopted by the establishments concern the presence or absence of air conditioning, minibar, and allowance for pets. In this regard, air conditioning is available in 90% of the establishments in Icaraí, compared to less than half of the establishments (48.83%) in Icapuí. The presence of a minibar is a convenience offered by 57.83% of the establishments in Icaraí de Amontada, compared to only 6.97% of the establishments in Icapuí. This disparity occurs because the establishments in the latter municipality — available on platforms — are entire homes of residents, already equipped with refrigerators, thus negating the need for a minibar. The last variable analyzed concerns the allowance for pets. This is a recent strategy to attract guests traveling with pets (pet-friendly establishments). In this context, it was observed that 53% of the establishments in Icaraí and 72% of those in Icapuí allow pets (Table 2).

The diversification of services offered at the lodging establishments was observed in both coastal municipalities. However, in absolute and percentage terms, Icaraí de Amontada has 27 establishments (32.53%) offering other services on-site, such as restaurants, bars, and cafeterias (Table 2).

Aspects	Icaraí de Amontada (Amontada)			Icapuí		
WIFI	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	2	2.41	2.40	2	4.65	4.65
Yes	81	97.59	100.00	41	95.34	100.00
Total	**83**	**100.00**		**43**	**100.00**	
CAF.	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	34	40.96	40.96	40	93.02	93.02
Yes	49	59.04	100.00	3	6.97	100.00
Total	**83**	**100.00**		**43**	**100.00**	
LOJAS	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	56	67.47	67.46	40	93.02	93.02
Yes	27	32.53	100.00	3	6.97	100.00
Total	**83**	**100.00**		**43**	**100.00**	
ARCOND	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	8	9.64	9.63	22	51.16	51.16
Yes	75	90.36	100.00	21	48.83	100.00
Total	**83**	**100.00**		**43**	**100.00**	
FRIGOB	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	35	42.17	42.16	40	93.02	93.02
Yes	48	57.83	100,00	3	6.97	100.00
Total	**83**	**100.00**		**43**	**100.00**	
PETS	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	39	46.99	46.98	12	27.90	27.90
Yes	44	53.01	100.00	31	72.09	100.00
Total	**83**	**100.00**		**43**	**100.00**	

Table 2 – Icaraí de Amontada and Icapuí: characterization of product/service variables, with CAF indicating breakfast, LOJAS indicating stores, ARCON indicationa A/C, FRIGOB indicating a minifridge. Source: Prepared by the authors, 2024.

Regarding marketing strategies, particularly sensory ones, it was observed that 57.83% of the units in Icaraí and 34.88% in Icapuí displayed images highlighting the lighting of the location, revealing well-lit environments at night with a welcoming atmosphere for guests' rest (Table 3).

Aspects	Icaraí de Amontada (Amontada)			Icapuí		
LUZ	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	35	42.17	42.16	28	65.11	65.11
Yes	48	57.83	100.00	15	34.88	100.00
Total	**83**	**100.00**		**43**	**100.00**	
NAT	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	19	22.89	22.89	11	25.58	25.58
Yes	64	77.11	100.00	32	74.41	100.00
Total	**83**	**100.00**		**43**	**100.00**	
COR	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	47	56.63	56.62	27	62.79	62.79
Yes	36	43.37	100.00	16	37.20	100.00
Total	**83**	**100.00**		**43**	**100.00**	
TERRAC.	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	31	37.35	37.34	29	67.44	67.44
Yes	52	62.65	100.00	14	32.55	100.00
Total	**83**	**100.00**		**43**	**100.0**	
REDESOC	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
No	12	14.45	14.45	27	62.79	62,79
Yes	47	56.62	100.00	16	37.20	100.00
Total	**83**	**100.00**		**43**		

Table 3 – Icaraí de Amontada and Icapuí: characterization of marketing variables, with LUZ indicating light, NATUR indicating nature, COR indicating color use, TERRAC indicating a terrace with a scenic view, and REDESOC indicating listing on social media. Source: Prepared by the authors, 2024.

The use of bright and cheerful colors is adopted by fewer than 50% of the establishments mapped in both locations, indicating that most of them still prefer more formal tones (such as gray, black, and white) to present their units to consumers (Figure 3). In Icapuí, the houses reflect the architecture and landscaping of the former fishermen's residences, typically with white facades and doors and windows in shades of blue.

Figure 3 – Amontada and Icapuí: lighting (LUZ) design element. Source: Extracted from the Airbnb platform, 2024.

The presence of green areas (NAT) was also observed in the images of the establishments on the platforms, which allowed the identification of more than 70% of the establishments in both municipalities with this feature, as the images of green areas and gardens were prominent points in the units on the booking platforms (Figure 4).

Figure 4 – Amontada and Icapuí: examples of a green space element in the listings (NAT). Source: Extracted from the Airbnb platform, 2024.

Regarding the terrace variable (view of nature and/or ocean) on the property, differentiated structures were noted in both locations (Table 3). 62.65% (52) of the establishments in Icaraí de Amontada feature this attractive and higher-value element in terms of differentiated experience, while only 32.55% (14) of the units in Icapuí possess this characteristic (Figure 5).

Figure 5 – Amontada and Icapuí: terrace (TERRAC) element of lodging units. Source: Extracted from the Airbnb platform, 2024.

The adoption of innovative actions in management was represented by two variables, namely: i) the number of daily payment methods (PAGAM) and the number of languages spoken at the establishments. In these cases, 62.65% and 93% of the establishments in Icaraí and Icapuí, respectively, accept only one payment method (credit card). However, in the first tourist location, 31 establishments (37.34%) accept more than one payment method for the daily rates (Table 4).

Aspects	Icaraí de Amontada (Amontada)			Icapuí		
PAGAM	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
Only 1	52	62.65	62.65	40	93.02	93.02
More than 1	31	37.34	100.00	3	6.97	100.00
Total	**83**	**100.00**		**43**	**100.00**	
LANGUAGE	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**	**Absolute frequency**	**Relative frequency (%)**	**Cumulative frequency**
Only 1	33	39.75	39.75	26	60.46	60.46
More than 1	50	60.24	100.00	17	39.53	100.00
Total	**83**	**100.00**		**43**	**100.00**	

Table 4 – Icaraí de Amontada and Icapuí: characterization of process variables. Source: Prepared by the authors, 2024.

The 'LANGUAGE' variable, the last one in the research instrument, demonstrates the establishments' efforts to offer more than one type of verbal communication, in addition to Portuguese, to consumers. The establishments in Icaraí de Amontada are at an advantage compared to those in Icapuí, as 60.24% of the units have staff who speak more than one language, while more than half of the units in Icapuí (60.46%) offer only one means of communication with consumers (Portuguese). However, it is not possible to determine whether this difference is due to training provided to the staff or the owners' origin, as in tourist hotspots, it is common to find foreign investors in the accommodation sector.

The application of the Exploratory Factor Analysis (EFA) with the 14 initial variables initially allowed the exclusion of 3, as they were deemed unsuitable for the chosen method: WIFI, REDESOC, and PETs. After excluding the variables, the Cronbach's Alpha coefficient was measured, yielding a value of 0.618, which is within the moderate range (FREITAS; RODRIGUES, 2005), allowing the continuation of the analyses.

In the second application of the EFA, using all the variables, only COR had an individual KMO value below 0.50. Considering COR as an important sensory element in presentation on digital platforms, it was decided to keep it in the analysis. Regarding the multivariate normality analysis of the collected data, although it was not accepted, this does not pose a problem, as the choice of the factor retention technique – Parallel Analysis (PA) – is suitable for this special situation.

The results obtained from the EFA (Table 5) resulted in a satisfactory KMO value (Kaiser-Meyer-Olkin) of 0.790, confirming the consistency of the original data sample (FAVERO et al., 2009; BRAGA; CAMPOS, 2022). Bartlett's Test of Sphericity – BTS registered a value of 318.268 ($p < 0.001$), allowing the rejection of the hypothesis that the correlation matrix is the identity matrix (LORENZO-SEVA; FERRANDO, 2021). These results enabled the continuation of the EFA to determine the number of factors and their respective explanatory variances. Thus, the EFA allowed the extraction of two dimensional factors that together explained 34.2% of the total variance of the model, with factor 1 explaining 25.2% of the data variance and factor 2 accounting for 9.41% of the explained variance (Table 5).

Factor	Actual variance (%)	Test	Valor	CFI	TLI
1	25,20	**Kaiser-Meyer-Olkin Test**	0,790	0,963	0,940
2	9,41	**Bartlett's Test**	318.268 (p<0,001)		

Table 5 – Percentage of total variance explained by the factors and KMO and Bartlett tests. Source: Prepared by the authors, 2024.

To evaluate the quality of the model, the CFI and TLI indices were measured, with values closer to one indicating a better model, while values closer to zero indicating a poorer model (Brown, 2006). For the data of this research, the CFI and TLI values were around 0.95 (preferred value). Thus, the factorial model found meets the plausibility criteria, indicating model adequacy (BENTLER, 1990; HU; BENTLER, 1999).The first factor – Factor 1 (25.2%) – represents the dimension of attractive elements of products/services, as it mainly gathered variables related to accommodation strategies, albeit replicated from other locations, which include: Breakfast (CAF), Minibar in the unit (FRIGOB), number of rooms (QUART.), extra services offered at the accommodation (LOJAS), and presence of air conditioning (ARCOND). Additionally, it was observed that the factor also consists of a management-related variable (PAGAM) and a sensory marketing dimension variable (TERRACE) (Table 6).

Final variables	Factor 1	Factor 2	Uniqueness
CAF	0.767		0.381
PAGAM	0.708		0.542
FRIGOB	0.701		0.509
QUART	0.571		0.675
LOJAS	0.529		0.541
ARCOND	0.467		0.778
TERRAÇO	0.355		0.878
LUZ		0.536	0.465
NATUR		0.484	0.787
COR		0.412	0.835
LANGUAGE		0.407	0.842

Table 6 – Factor loadings after rotation and communalities. Source: Pesquisa results, 2024. Note: Application of the oblimin rotation method.

Of all the analyzed variables, two have a lower explanatory power in factor 1 – TERRACE (0.355) and ARCOND (0.467) – while all other variables had values above 0.50. In the case of the 'terrace' variable, which represents factor 1, it is simultaneously a structural variable that adds value to the accommodation service and a visual element designed to attract more customers to enjoy this experience.

Factor 2 (9.41%), in turn, was formed by innovative elements related to marketing, as it aggregated the variables light (LUZ), colors (COR), and the presence of green areas in the establishment images on accommodation booking platforms (NATUR). The number of languages (LANGUAGE) was added to this factor to explain the behavior of these accommodations. Therefore, of all the variables in this factor, only LUZ had an explanatory power above 0.50.

The values shown in singularities indicate the portion of individual variance that cannot be explained by the factor; thus, the higher its value, the less importance the variable has in the explanatory power of the factor (Table 6). According to Mingoti (2005), values equal to or less than 60% should be considered in the model analysis, while others require additional explanations justifying their high behavior. Therefore, the results showed that, despite the plausibility of the EFA model, only 5 variables can explain their respective factors, namely: CAF, FRIGOB, and LOJAS, related to product/service characteristics, PAGAM (management), and LUZ (sensory marketing).

DISCUSSION

The search for increasing current and future participation and competitiveness in the market, including in the economic activities of the tourism sector, encourages companies to incorporate innovative aspects – fundamental for all businesses, organizations, and countries – while simultaneously offering attractive features to consumers seeking high-quality products and services (SCHUMPETER, 1982; MAZARO, 2017). In this regard, Schumpeter is considered a pioneer in the study and conceptualization of innovation within the context of economic science (SCHUMPETER, 1982; BRANDÃO; COSTA, 2014). In this context, Aires and Brandão (2022) emphasize that innovation in the tourism sector is not a recent topic in the literature, as it is directly related to its own history, from the creation of productive practices to scientific knowledge.

In line with this, Ceará has been emerging as one of the most sought-after tourist destinations, both nationally and internationally (CEARÁ, 2024), with emphasis on coastal municipalities along the eastern coast (Fortim, Beberibe, Aracati, and Icapuí) and the western coast (Camocim, Jijoca de Jericoacoara, and Amontada). This recognition of Ceará as a tourism destination has led the state to achieve eighth place in the national ranking of states receiving the most tourists (BRAZIL, 2021).

The visibility and attractiveness of Ceará's coastal regions reflect not only their natural features (sun, beach, wind, sea, cliffs, and dunes) but also the strategic development choices made for the region. Among these choices, the formation of Local Productive Arrangements (LPAs) for Tourism within the same geographical area stands out, as noted by Amaral Filho (2002) and Allen and Arkolakis (2023). It is important to highlight that many Brazilian tourist destinations are at different stages of development (LOHMANN; PANOSSO NETTO, 2012). This is the case for the two Ceará destinations analyzed: Amontada, which is more established and presents greater development opportunities, and Icapuí, which is smaller, less known, and still has untapped tourism activities.

Recent literature on LPAs in Ceará underscores the existence of three arrangements related to the "sun, sea, and wind" tourism model: one on the eastern coast and two on the western coast of Ceará. The first arrangement connects the municipalities of Fortim, Beberibe, Aracati, and Icapuí, while on the western coast, there is the Jericoacoara LPA and another in Icaraí de Amontada (Centec, 2022). Therefore, linking this theme (LPA) with innovation in hospitality establishments – which operate in a competitive environment – allows for an understanding of the strategies adopted to attract consumers, thereby improving quality and productivity (ĆURLIN et al., 2022; BOIKO et al., 2023).

In this regard, it was found that the use of lights and colors is part of the strategy adopted by establishments to create positive effects on consumers, extending beyond simple visual perception of the space. This strategy aims to provide a sense of individuality and specific personalization, which reflects the guest's physical and mental state. Furthermore, the unique design and décor of the accommodation

units also serve as strategies for sensory marketing in this hotel network, where attractive colors are used to create an image of service structures that meet consumer expectations and encourage them to reuse the service (MANÉ et al., 2021). This demonstrates strategies being adopted within the marketing perspective to attract consumers and address long-standing demands in the sector, which involves a complex area of knowledge to be explored in the hotel industry (GIL et al., 2023).

Although physical, structural, and renovation elements of spaces are not typically considered innovations in the literature, when they are associated with sustainability (greater engagement with nature), they can be regarded as innovative actions/practices within hospitality establishments (CAJAZEIRA, 2012; CARDOSO; FIGUEIREDO, 2016; BARBIERI; CAJAZEIRA, 2021). Thus, this element in the hotel network is seen as a structural and physical strategy to counter the competition, providing greater value due to the view of nature and the sea (PEREIRA et al., 2018). These physical and structural elements of the establishments, therefore, engage at least three consumer senses (sight, hearing, and smell), as the natural scenic beauty of the location, showcased in the images of the establishments, provokes unique and intense sensory stimuli (MATEIRO, 2018).

In this context, the use of marketing – specifically sensory marketing – is directed toward combining lights, colors, nature, and social media as a mechanism to present the establishments to consumers, stimulating the nervous system to create needs and preferences for the products and services offered by these hospitality establishments (OLIVEIRA et al., 2020). Moreover, generally, the image of the tourist destination is crafted through simultaneous sensory stimuli, creating a unique experience for the visitor (MATEIRO, 2018).

Given these aspects, the adoption options of these elements in tourism accommodation businesses – which contribute to enhancing a destination's competitiveness – emerge as opportunities to maintain a position in the market and capture new segments of this competitive and dynamic sector, represented by attracting new customer profiles in the local, regional, national, or international markets (ALVARES; LOURENÇO, 2011; BOOYENS; ROGERSON, 2016).

The results of the attractive elements adopted by accommodation establishments, through the AFE technique, are related to the product/service offered (directly observed by the customer); or related to business management, which involves changes in communication, relationships, and organization; or in product/service marketing strategies for promoting and sustaining the tourism market, ensuring the tourism differentiation in the face of sector competition (HJALAGER, 2010; MAZARO, 2017; AIRES, 2017; OLIVEIRA et al., 2020).

However, it was noted that most tourist destinations prefer adopting follower or imitative actions, which may be new to the locality or new for the company (but adopted by other competitors). In this case, the accommodation establishments in the APLs of these beaches prefer low-road strategies based on local factors and comparative advantages (location, land, capital, among others), as presented by Ritche and Crouch (2003).

The adoption of low-road and imitative aspects by the accommodation establishments of the APLs allows for the exploitation of regional vocational opportunities (labor, financial and natural capital), enabling a favorable environment for the regional and territorial dynamization. This environment, therefore, demands the maintenance of cooperation relations – even when competing among themselves – to seek growth and competitive advantages jointly (TAHIM; ARÁUJO JÚNIOR, 2015; ŠABIĆ; VUJADINOVIĆ, 2017; SILVA; PASCUCI, 2020; TAHIM et al., 2024). Thus, all the attractive elements adopted by the accommodation establishments of the APLs of Amontada and Icapuí — related to products/services, management, and marketing — were implemented with the goal of attracting a larger number of consumers and, consequently, increasing competitiveness in this environment.

The research findings are important for understanding the behavior of accommodation establishments and the possible stage they are in, which provides pathways for the development of public policies directed toward these APLs. In this context, tourism in Icaraí de Amontada is in a more advanced stage than observed in Icapuí, which still relies on artisanal fishing, mainly lobster, community tourism, and, more recently, traditional tourism has gained prominence in the municipality, as evidenced by the increase in the number of establishments and formal labor connections (BRAZIL, 2024; BRAGA; DE PAULA, 2024b). On the other hand, it has been observed that the aspects of

services offered by Icaraí establishments are transforming the local market into a more homogeneous one – less differentiated and more specialized – thus raising competition among these accommodation establishments.

Innovations in the tourism sector – from a more state policy perspective – may be represented by various forms and actions to enhance natural and/or cultural attractions in tourist locations, adding value to the offered services; or by the inclusion of these locations in event circuits of national visibility or in tourist routes that provide greater visibility and visitation (ALVARES; LOURENÇO, 2011). In the case of this research, it is noticeable that the beaches of Amontada and Icapuí are part of tourism routes in the State of Ceará, namely: the "Rota das Emoções" (western coast), created in 2005, connecting Ceará, Piauí, and Maranhão; and the "Rota do Sol Nascente," which connects the beaches of the eastern coast of Ceará.

This interaction environment between the local productive arrangements of the two analyzed municipalities and the tourism routes and circuits reinforces the movement toward local development, as it connects the increasingly specific demands of tourists with the peculiarities of the economic, social, and ecological dimensions. It also fosters the formation of regional circulation networks that seek the organization of spaces, the dynamization of activities in these spaces, and the incorporation of innovative elements into local production systems (CORIOLANO, 2009; RESENDE, 2009; BRAGA; DE PAULA, 2024).According to Mazaro (2017), these strategies, such as marketing, ensure greater media attention – a positive aspect – and project their image in a unique and personalized way (FEO, 2020). However, this may lead to the process of market homogenization, making the offer undifferentiated with the same innovative actions of reproduction, which is, at the same time, a disadvantage. Furthermore, the imitative process of implemented services reduces the competitive advantage of the place, causing a loss of local originality and the failure to explore local characteristics and vocations. For this reason, strategies for diversifying the tourism offer should be sought, in order to provide competitiveness to the destination with differentiated services and higher added value (SÁNCHEZ; GARCÍA, 2003).

It is in this context that public policies should be developed and implemented, considering the economic, social, and cultural environment that involves each representative sector of the specific region. From the perspective of the tourism sector of the municipalities of Amontada and Icapuí, policies need to be directed toward boosting the development of tourism in the region, offering local actors – accommodation establishments – assistance plans for implementing innovations and sharing them. Thus, the innovations encouraged should distance themselves from mass reproduction, which leads to a loss of the specific characteristics of the locations in question.

CONCLUSION

The objective of the study was achieved by analyzing the innovative aspects adopted by the accommodation establishments within the Local Productive Arrangements (LPAs) of the municipalities of Icaraí de Amontada (Amontada) and Icapuí, located in the State of Ceará, as presented on the two main online accommodation search platforms.

The results of the comparative and descriptive analyses provided insights into the innovative elements, whether related to products/services or marketing and management, adopted by the accommodation establishments in Icaraí de Amontada and Icapuí, primarily based on digital platform information. These results initially highlighted the use of innovative elements that were new to the establishments and localities, but which were imitative of other tourist destinations.

The application of the AFE method led to the extraction of only two dimensional factors capable of explaining the total variance of the model. The first factor relates to innovative elements of products and services, while the second factor consists mainly of innovative elements related to digital marketing.

The process of homogenization — with little differentiation — in the local market of Icaraí de Amontada is more advanced than in the beaches of Icapuí, which have adopted some of these innovative elements but still manage to retain the original aspects of the location in their services, providing them with a competitive advantage. Thus, the results corroborated the hypothesis of this study, namely, that

there are differences in the adoption of innovative elements among the accommodation units in both LPAs.

The limitations of the study are related to the methodological aspects adopted in the mapping and selection of the analyzed establishments. First, some establishments did not present all the variables selected for the study, as they were new to the platform and lacked important information for the research. Additionally, the search covered reservations from the first semester of 2024, which may have excluded accommodation establishments that were already booked.

The fact is that innovation is a current and future competitive challenge for the tourism sector — especially in accommodation — in both tourist destinations on the Ceará coast. It is at this point that public policies must be developed and implemented to equip tourist destinations with innovative elements that avoid mere reproduction, but also take into account and preserve the social and cultural aspects of the localities within the innovative elements adopted.

As a suggestion for future studies, there is the possibility of filling important gaps left by this study. One such gap is the need to observe on-site, through field research, the innovative aspects (products/services, management, process, marketing) adopted by the accommodation establishments in the LPAs of the two selected locations, aiming to identify innovative elements not covered by the information available on the online booking platforms, such as technological and sustainability aspects.

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