Construction and Empirical Validation of a Tourism Quality Certification Protocol for Urban Beaches (PCTP)

Construção e Validação Empírica de um Protocolo de Certificação da Qualidade Turística para Praias Urbanas (PCTP)

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ABSTRACT

Most certification protocols primarily focus on environmental and beach management aspects (such as infrastructure and service maintenance), while criteria relevant to tourism quality are rarely considered. In Brazil, the only existing beach certification—the Blue Flag—is applied to only a few beaches and serves as an ecological seal, which does not account for other essential dimensions in evaluating tourism quality. Therefore, this study aims to develop and empirically validate a Tourism Quality Certification Protocol for Urban Beaches (PCTP) by creating tourism-specific indicators to support a beach quality monitoring methodology. The study adopts a mixed-method, multi-methodological approach and was conducted in four stages: (1) Identification of the protocol's variables through a systematic literature review using the ProKnow-C method (Ensslin et al., 2010); (2) Application of the Delphi technique and a panel of industry experts; (3) Administration of questionnaires to beach visitors (both tourists and residents); and (4) Validation of the protocol through the calculation of the Tourism Quality Index (TQI) and interpretation of the results based on five levels of tourism quality. The protocol includes four dimensions, 17 subdimensions, and 75 indicators, and was tested on two beaches in João Pessoa, Paraíba, Brazil. The results indicated that the tourism quality of these two beaches was considered good (level 4), with scores exceeding 0.61. Thus, both beaches could be certified as four (4) stars on a five (5)-level scale. The most crucial factors influencing visitors' perceived quality

were cleanliness and safety, followed by infrastructure (both basic and tourism-related).

Keywords: urban beaches, certifications, tourism quality index.

RESUMO

A maioria dos protocolos de certificação abordam prioritariamente os aspectos ambientais e de gestão da praia (infraestrutura, manutenção de serviços, etc.), mas os critérios relevantes para a qualidade turística são pouco discutidos. No Brasil, a única certificação de praia existente (Bandeira Azul) é aplicada em poucas praias e consiste em um selo ecológico que não permite a avaliação de outras dimensões necessárias para se avaliar a qualidade turística das mesmas. Desta forma, esta pesquisa objetiva construir e validar empiricamente um Protocolo de Certificação da Qualidade Turística para Praias Urbanas (PCTP), considerando a criação de indicadores específicos para o turismo, a fim de contribuir com uma metodologia de monitoramento da qualidade das praias. O estudo possui abordagem qualiquantitativa e multimetodológica e contou com quatro etapas: 1) Identificação das variáveis do Protocolo através da revisão sistemática de literatura com o auxílio do método ProKnow-C (Ensslin et al., 2010); 2) Realização da técnica Delphi e Painel com especialistas da área; 3) Aplicação de questionários com os visitantes (turistas e residentes) das praias estudadas; 4) Validação do protocolo por meio do cálculo dos IQT das praias e interpretação dos resultados a partir de 5 níveis de qualidade turística. O protocolo foi composto por 4 dimensões, 17 subdimensões e 75 indicadores. O PCTP foi testado em duas praias da cidade de João Pessoa, PB – Brasil. Os resultados indicaram que a qualidade turística destas duas praias foi considerada boa (nível 4), com índices superiores a 0,61. Desta forma, as duas praias poderiam ser certificadas como 4 estrelas em uma escala de 5 níveis. Concluiu-se que os fatores mais importantes da qualidade percebida pelo visitante foram a limpeza e a segurança, seguido da infraestrutura (básica e turística).

Palavras-chave: praias Urbanas, certificações, índice de qualidade turística.

INTRODUCTION

Beaches remain one of the main attractions in coastal tourism destinations due to their environmental, socioeconomic, recreational, and leisure value (Dodds & Holmes, 2020; García-Morales et al., 2018; Schlacher et al., 2008; Zielinski & Díaz Cano, 2014). As such, they are considered strategic ecosystems for tourism and should be managed sustainably (da Silva at. al, 2024; García-

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Morales et al., 2018; Schlacher et al., 2008). However, pollution along coastal areas is one of the main factors contributing to the degradation of these environments, affecting beach water quality and highlighting the need for proper management and monitoring (da Silva et al., 2024).

Therefore, maintaining beach quality is viewed as an investment in the tourism economy since "the value of a beach will depend on its quality" (Saayman & Saayman, 2017, p. 1436). It is crucial to note that the tourism quality of a beach is not limited to environmental factors—it should also account for variables such as safety, transportation, potable water, and service quality, all of which significantly influence tourist satisfaction levels (Zielinski & Botero Saltarén, 2012).

Tourism quality at a beach extends beyond environmental factors, which include physical, sanitary, and ecological conditions. It also reflects the quality of the visitor experience, encompassing factors such as satisfaction and the fulfillment of tourists' expectations. Moreover, it is essential to assess the overall experience, which includes providing suitable conditions for tourism and leisure activities (Duvat, 2013).

In this context, quality indices and beach certifications have emerged as tools to ensure consistent quality standards for both managers and tourists. However, most existing models have focused primarily on environmental and management aspects, such as infrastructure and services, while tourism quality dimensions have received little attention. In Brazil, the only available certification—the Blue Flag—is an ecological seal that does not evaluate other essential variables needed for a comprehensive assessment of tourism quality at beaches.

Given this background, the following questions arise: What dimensions should be considered in beach quality certification protocols for tourism purposes? What indicators are important for certifying the tourism quality of beaches?

Therefore, this study aims to develop and empirically validate a Tourism Quality Certification Protocol for Urban Beaches (PCTP) by creating tourism-specific indicators to support a beach quality monitoring methodology.

Historically, beach quality has been assessed based on bacterial density in the water and bathing suitability criteria (Souza & Silva, 2015). However, in recent years, assessments have expanded to include additional variables that incorporate natural, social, and structural elements. More recent models consider aspects such as physical quality (Ariza et al., 2010; Botero et al., 2015; Cervantes & Espejel, 2008), visual quality (Ariza et al., 2010; Guneroglu et al., 2016; Peña-Alonso et al., 2018), infrastructure and services (Chen & Bau, 2016; González & Holtmann-Ahumada, 2017; Peña-Alonso et al., 2018; Semeoshenkova et al., 2017), and recreational opportunities (Ariza et al., 2010; Botero et al., 2015; Cervantes & Espejel, 2008; González & Holtmann-Ahumada, 2017; Peña-Alonso et al., 2018). Despite these advancements, key tangible and intangible factors critical to tourism, such as safety (González & Holtmann-Ahumada, 2017; Peña-Alonso et al., 2018; Semeoshenkova et al., 2017), accessibility (Peña-Alonso et al., 2018), and hospitality, remain underexplored in the literature. In this regard, Oliveira et al. (2024) and De Oliveira & Tricárico (2023) highlight that hospitality is just as essential as the attractions and infrastructure that support tourism.

From a theoretical perspective, this research seeks to fill a gap in the investigation of variables related to key tourism attributes that are not addressed in existing evaluation models. It also aims to contribute to the development of methodologies and indicators tailored to the Brazilian context, which differs significantly from the predominantly European models currently in use.

Accordingly, this paper first discusses the most relevant beach certifications and quality indices identified in the literature. It then outlines the methodological procedures adopted in this study, including its epistemological foundations, data collection, and analysis methods. Lastly, the paper details the steps taken to develop the final version of the Tourism Quality Certification

Protocol for Urban Beaches (PCTP), which was validated through testing at Cabo Branco and Tambaú beaches, both located in João Pessoa, Paraíba, Brazil.

LITERATURE REVIEW

To continuously improve the local conditions of natural tourist areas, the concepts of tourism certification and beach tourism certification have emerged (Zielinski & Díaz Cano, 2014). These certifications aim to assess beach conditions based on measurable criteria (Botero et al., 2013) and are relatively recent tools, typically applied to tourist beaches. Their implementation is voluntary, and the benefits range from environmental conservation to enhancing the beach's competitive edge as a tourism product (Zielinski & Díaz Cano, 2014).

In this context, Beach Certification Schemes (BCS) have emerged as a way to protect environmental resources and ensure high tourism quality (Zielinski & Díaz Cano, 2014). These schemes can be implemented through awards, eco-labels, or management systems, with voluntary participation and typically measurable criteria (Marchese et al., 2021). Such certifications indicate "the degree to which tourism beaches are operating in line with given standards and in return they are allowed commercial usage of a name and logo" that may certify their quality (Zielinski & Botero, 2019, p. 15). BCS are designed to recognize environmental management efforts, particularly in urban beaches, and aim to bridge the gap between beach recreation and conservation (Marchese et al., 2021).

Beach certifications serve as a quality seal for both managers and visitors, and they can also provide a competitive market advantage—becoming a differentiating factor for the beach as a tourism product—by meeting high-quality standards in management, environmental practices, services, safety, education, and other areas (Toselli & Godoy, 2011). This, in turn, contributes to

the sustainable management of beaches and the continuous improvement of coastal areas, even though participation remains voluntary.

The first beach tourism certification was introduced in France in 1985 under the Blue Flag program, which has certified 5,161 beaches, marinas, and tourism boats in 51 countries as of 2024 (Blue Flag, 2024). Subsequently, other certifications emerged in Europe, such as the Gold Quality Beach and Accessible Beach certifications. However, the Blue Flag remains the most widely recognized and applied beach certification worldwide, covering almost all European countries (Zielinski & Botero Saltarén, 2012).

In Latin America, beach certification schemes are a relatively recent development, beginning with the implementation of the Blue Ecological Flag in Costa Rica in 1996 and the Playa Natural program in Uruguay in 2003. Since then, other beach certifications have emerged across most Latin American countries, including the Bandera Azul Ecológica in Costa Rica and Panama; Ecoplaya in Peru; IRAM 41200 in Argentina; NMX-AA-120-SCFI in Mexico; NTS-TS-0012 in Colombia; Playa Ambiental in Cuba; Playa Natural in Uruguay; and INEN 2631:2012 in Ecuador (Zielinski & Botero, 2019).

However, only the Blue Flag program is certified in five Latin American countries (Brazil, Colombia, Mexico, Puerto Rico, and the Dominican Republic). The Ecological Flag is applied in two countries (Costa Rica and Panama), while the other certifications are used in only one country each (Marchese et al., 2021).

As a result, there is considerable variation among beach certification schemes since many countries have developed their own assessment methodologies and criteria. Brazil, the Dominican Republic, and Puerto Rico have opted to adopt the European Blue Flag program (Saltarén, Zielinski & Castro, 2012; Zielinski & Botero, 2019), which has certified only a small number of beaches along the Brazilian coast (a total of 37 beaches as of the 2024/2025 season). Notably, the first Blue Flag in South America was awarded in 2009 to Jurerê Internacional Beach in Florianópolis, Santa Catarina.

In addition to beach certifications based on international and national programs, some countries have adopted internationally recognized criteria from Quality Management Systems (QMS), such as ISO 9001, ISO 14001, and ISO 13009, which was specifically designed to certify the sustainable tourism management of beaches.

In response to criticism of many beach certification schemes, some studies have sought to create their own beach quality indices and indicators. These indices have shown both similarities and differences, with some becoming more specialized based on the type of beach being evaluated (e.g., rural or urban). Additionally, many indices have begun incorporating the opinions of beach experts and users into their evaluation methods, which can be seen as a response to criticism of most beach certification systems (Guneroglu et al., 2016).

Among the most widely used beach quality indices worldwide, the following are noteworthy: the Integrated Evaluation Index for Recreational Beaches (IBVI) by Cervantes and Espejel (2008); the Beach Quality Index (BQI) by Ariza et al. (2010); the Environmental Quality Index for Tourist Beaches (ICAPTU) by Botero et al. (2013); the Beach Evaluation Index (BEI) by Lucrezi et al. (2016); the Integrated Beach Quality Index (BQI) by Semeoshenkova et al. (2017); and the beach quality indices developed by Bombana and Ariza (2018), among others.

Research on beach quality indices points to a lack of consensus, although variables such as environmental quality, sanitation, and infrastructure are recurring, even if they are named differently across models. There is a growing effort to include systemic indicators tailored to local specificities. Methodologically, most studies have validated their indicators with experts through interviews, focus groups, or questionnaires, reinforcing the interdisciplinary nature and legitimacy of the research, since the complexity of the subject spans multiple scientific fields. However, the opinion of users or tourists was considered in only half of the indices analyzed, which may be a

limitation, given that perceived quality depends on visitor satisfaction and expectations.

Moreover, most beach quality indices are designed to support coastal management and, as such, prioritize technical and quantitative approaches. As a result, they have limited influence on tourists' choice of destinations, revealing a misalignment between managerial use and tourist expectations. While some indices present more accessible qualitative results, such as "moderate/high" classifications (Peña-Alonso et al., 2018) or "sufficient/excellent" (Semeoshenkova et al., 2017), there is no evidence that these methodologies generate comprehensive rankings or drive competition among tourism destinations, as awards and certifications do.

In Brazil, rankings of the best beaches are generally based on bathing suitability, which assesses water quality for recreational activities—a relevant criterion for both public health and tourism (de Freitas et al., 2022). Initiatives such as the Blue Flag program provide an environmental quality seal based on criteria established by the Foundation for Environmental Education (FEE), but participation is voluntary and funded by local municipalities. No free index with systemic and tourism-specific criteria covering the full range of Brazilian beaches has been identified. Thus, there is a need for research to develop broader methodologies capable of meeting the needs of both visitors and managers.

METHODOLOGY

This research adopts the hypothetico-deductive method, which involves identifying a knowledge gap, formulating hypotheses, and testing them through deductive inference (Lakatos & Marconi, 2019). It also employs a mixed-method approach, combining quantitative and qualitative methods within a single research design, thereby expanding the possibilities for data analysis and interpretation (Creswell & Clark, 2011; Paranhos et al., 2016).

The multi-method approach is justified by the need to apply qualitative techniques for beach observation and expert discussions, ensuring greater analytical depth (Richardson, 1985). At the same time, administering questionnaires to users requires a quantitative approach due to the substantial number of participants and the need for statistical analysis. Mixed methods are recommended for investigating complex problems that cannot be resolved through a single approach (Lozada & Nunes, 2018), as the two methodologies are complementary and widely accepted in the literature (Veal, 2011).

In terms of its purpose, this is an applied research project aimed at applying the acquired knowledge to solve a specific problem or situation (Gil, 2002; Veal, 2011) . Regarding its general objectives, the research is characterized as descriptive, as it describes characteristics and phenomena by establishing relationships between the studied variables (Gil, 2002), and exploratory, as it seeks to "discover, describe, or map behavior patterns in areas or activities that have not been previously studied" (Veal, 2011, p. 29).

The research strategies and methodological procedures for data collection and analysis were carried out in stages, beginning with a literature review, followed by the application of the Delphi technique with experts, and later field research, the theoretical construction of the evaluation model, and the validation of the proposed model.

In the first phase, a literature review was conducted through the Coordination for the Improvement of Higher Education Personnel (CAPES) Journal Portal using the ProKnow-C method (Ensslin et al., 2010) to identify potential variables for the Protocol through a systematic literature review and the creation of its dimensions and indicators. In phase 2, the Delphi technique was applied with three professors from graduate programs in tourism, hospitality, and hotel management in Brazil, who agreed to participate. This stage involved an open questionnaire designed to assess the degree of agreement among these experts regarding the four dimensions of the first version of the Protocol, following the literature review: Environmental Quality,

Tourism Infrastructure Quality, Basic Infrastructure Quality, and Experience Quality.

Subsequently, an expert panel was held with three additional professors from Rio Grande do Norte to refine the dimensions and indicators of the Protocol. The meeting was conducted remotely using the Google Meet platform and aimed to identify potential improvements to the initial proposed model, resulting in the second version of the PCTP.

In phase 3, an electronic questionnaire was administered using Google Forms to visitors at two tourist beaches in João Pessoa, Paraíba, Brazil: Cabo Branco and Tambaú. The questionnaire was necessary to validate the instrument and gather the data required to calculate the Tourism Quality Index (TQI) for each beach. The sample was determined using the sample size calculation for an infinite population (over 100,000 individuals), estimating a sample of 385 visitors and distributing 400 questionnaires. However, after validating the questionnaires, the sample was reduced to 395 participants. A simple random sampling method was used. The data collection process was conducted in person between February and April 2022.

Initially, a pre-test was conducted with 53 participants during the first week of February 2022. After adjustments were made, the final version of the questionnaire was administered to 395 participants (52.4% at Tambaú and 47.6% at Cabo Branco).

The questionnaire consisted of 33 questions divided into five sections. It was structured with closed-ended questions using a 5-point Likert scale and was based on the 75 indicators from the final proposed protocol to assess beach tourism quality. The instrument also included two open-ended questions: one about what the visitor expected from a beach they would consider visiting and another to identify their place of residence. In summary, the questionnaire was divided into five sections: (1) Information about the beach and visitor profile; (2) Evaluation of beach tourism quality; (3) Satisfaction with the beach; (4) Visitor loyalty; and (5) Sociodemographic data.

The results were analyzed using descriptive statistics (frequency calculation, mean, and percentage of responses). To this end, the IBM SPSS statistical package (version 22) and Microsoft Excel were used to create comparative pivot tables between the two evaluated beaches. The open-ended questions were analyzed qualitatively by generating word clouds using the online tool WordCounter.

The final phase of the research (phase 4) aimed to validate the Protocol by calculating the Tourism Quality Index (TQI) for each beach and interpreting the results based on five levels of tourism quality. After tabulating the data collected through the questionnaire with tourists and residents, the Tourism Quality Index (TQI) for each beach was developed.

To calculate this index, the following statistical measures were considered: frequency, mean, standard deviation, coefficient of variation, skewness, and kurtosis of the data. Each question was assigned a weight corresponding to the level of quality perceived by tourists and residents at each beach (on a scale from 1 to 5). The sum of the average scores of the indicators for each dimension generated an overall score, which, when divided by the total possible score, produced the index for each dimension: Environmental Quality (EQ), Tourism Infrastructure Quality (TIQ), Basic Infrastructure Quality (BIQ), and Experience Quality (XQ). The same procedure was applied to the total score obtained from the 75 indicators across the four dimensions. Dividing this score by the maximum possible score of 375 points (75 indicators x 5) generated the overall Tourism Quality Index (TQI) for the beach, as shown in Table 1.

Table 1

Calculation of the Tourism Quality Index (TQI) for each dimension of the Tourism Quality Certification Protocol for Urban Beaches (PCTP)

Dimensions/Scores	Environmental Quality (EQ)	Tourism Infrastructure Quality (TIQ)	Basic Infrastructure Quality (BIQ)	Experience Quality (XQ)
Number of indicators (NI)	6	18	28	23

Evaluation scale (ES)	1-5	1-5	1-5	1-5
Maximum score (MS)	30 (NI × ES)	90 (NI × ES)	140 (NI × ES)	115 (NI × ES)
Dimension index	∑ (Mean) ÷ 30	∑ (Mean) ÷ 90	∑ (Mean) ÷ 140	∑ (Mean) ÷ 115
Overall TQI	∑ (Mean) ÷ 375 (75x5)			

Source: Prepared by the authors (2022).
Note. NI = Number of indicators; ES = Evaluation scale; Mean = Average.

The TQI results were interpreted using an evaluation scale divided into five levels: Very Poor Tourism Quality, Poor Tourism Quality, Average Tourism Quality, Good Tourism Quality (expected), and Excellent Tourism Quality (Table 2).

Table 2
Interpretation of the tourism quality of an urban beach based on TQI results

Assessment of Beach Tourism Quality	Index Result (TQI)
Very Poor Tourism Quality	0 – 0.20
Poor Tourism Quality	0.21 – 0.40
Average Tourism Quality	0.41 – 0.60
Good Tourism Quality (Expected)	0.61 – 0.80
Excellent Tourism Quality	0.81– 1.00

Source: Prepared by the authors (2022).

On this TQI evaluation scale, each level represents a specific degree of beach tourism quality as perceived by visitors, significantly influencing their overall experience. The levels of tourism quality can be interpreted as follows:

Level 1 – Very Poor Tourism Quality: Indicates an urban beach with no environmental quality, characterized by high levels of pollution, litter, and a lack of environmental conservation measures, along with various environmental problems. Additionally, it offers little to no basic infrastructure and no tourist support infrastructure, resulting in a highly frustrating experience. Visitors leave the beach very dissatisfied.

Level 2 – Poor Tourism Quality: Indicates an urban beach with low environmental quality, high levels of pollution (in the water, sand, etc.), litter accumulation, and other environmental issues. While some basic infrastructure is available, such as public lighting, accessibility, and mobility, and there are limited tourism services like restaurants and accommodations, the availability is insufficient. This compromises the visitor experience, leaving them dissatisfied and unlikely to return.

Level 3 – Average Tourism Quality: Indicates an urban beach with moderate environmental quality, showing moderate levels of pollution, litter, and other environmental issues. It has basic infrastructure such as easy access, public lighting, potable water, and public transportation but lacks improvements in safety, urban cleanliness, and commercial services. Tourism infrastructure is limited, offering only food and/or accommodation, but with shortcomings in signage and other support services. The tourism experience is average, and visitors consider the beach quality to be neither good nor bad.

Level 4 – Good Tourism Quality (Expected): Indicates an urban beach with good environmental standards, including water quality, sand quality, and biodiversity preservation. Basic infrastructure meets visitor needs, including cleanliness, waste management, restrooms, showers, access, and safety. However, there is still room for improvement in less visible aspects such as accessibility and safety signage for swimmers. Tourism infrastructure is satisfactory, offering food, accommodation, signage, and support services, but without exceeding visitor expectations. This means that most visitors are satisfied with the beach's tourism quality, but their expectations are not surpassed.

Level 5 – Excellent Tourism Quality: Indicates an urban beach with exceptional environmental and structural quality. Basic infrastructure exceeds expectations, providing accessibility for people with disabilities, amphibious chairs, clean restrooms and showers, marked bike lanes, and efficient daily maintenance. Tourism infrastructure is equally impressive, with clear signage,

support services in multiple languages, high-quality services, and a wide range of leisure options. The visitor experience is marked by hospitality, environmental awareness, and fair prices. In this case, visitors are extremely satisfied and likely to return, becoming loyal to the beach since their expectations have been exceeded.

The empirical phase aimed to test the dimensions and indicators to refine the Protocol and assess visitors' understanding and perception of the proposed instrument.

This evaluation approach was based on Kano's quality model (1984) , which defines two aspects of quality: objective quality, which involves meeting specific attributes, and subjective quality, which reflects users' perceived satisfaction. The Kano model has been widely used in the management of goods and services and in improvement processes. The model defines five categories of quality elements (Kano, 1984; Prebez & Mikulic, 2016):

Attractive Quality: Elements that generate high customer satisfaction when present but do not cause dissatisfaction when absent, as they are not expected by the customer. This can serve as a competitive advantage.

One-Dimensional Quality: Elements that generate high satisfaction when performance is strong and high dissatisfaction when performance is weak.

"Must-Be" Quality: Elements that result in dissatisfaction when absent or when performance is poor. However, even when performance is strong, they do not generate satisfaction because they are considered basic expectations by customers.

Indifferent Quality: Elements that have no impact on satisfaction or dissatisfaction, regardless of their performance.

Reverse Quality: Elements that cause dissatisfaction when performance is strong and satisfaction when performance is weak (e.g., overly attentive or talkative waiters or salespeople, even when not requested).

An adaptation of this model was applied to explain the levels of tourism quality observed at the two beaches addressed herein. Therefore, the methodological design of this research can be described as following four phases (Figure 1).
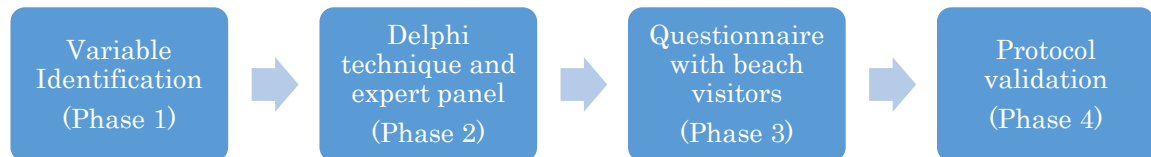
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┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐     ┌─────────────────┐
│    Variable     │     │     Delphi      │     │  Questionnaire  │     │    Protocol     │
│ Identification  │ ──▶ │ technique and   │ ──▶ │   with beach    │ ──▶ │   validation    │
│   (Phase 1)     │     │  expert panel   │     │    visitors     │     │   (Phase 4)     │
│                 │     │   (Phase 2)     │     │    (Phase 3)    │     │                 │
└─────────────────┘     └─────────────────┘     └─────────────────┘     └─────────────────┘
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Figure 1. Research design

Source: Prepared by the authors (2020).

RESULTS

Following the literature review, an initial model of the Protocol was developed to assess the tourism quality of urban beaches, divided into Environmental Quality (evaluating the beach's ecological and sanitary aspects), Tourism Infrastructure Quality (assessing the amenities and services offered to tourists), Basic Infrastructure Quality (evaluating the basic services available on the beach and in its surroundings), and Tourism Experience Quality (measuring the key non-structural factors that positively impact visitor satisfaction at an urban beach).

In this context, the main indicators of environmental quality and infrastructure quality (both tourism and basic) used in various evaluation models and beach certification schemes were considered. At this stage, new dimensions and indicators were proposed, such as tourism signage and mobility. The experience quality dimension was also introduced as a new category for assessing tourism quality, along with indicators for hospitality and satisfaction.

To refine this initial version of the Protocol, the Delphi technique and an expert panel were conducted to validate, add, or remove dimensions and indicators.

After the pre-test, some adjustments were made to the Protocol to improve clarity for visitors responding to the questionnaire. As a result, certain subdimensions and indicators were modified, leading to the final version of the Tourism Quality Certification Protocol for Urban Beaches (PCTP), as shown in Table 3.

Table 3
Final Version of the Tourism Quality Certification Protocol for Urban Beaches (PCTP)

Protocol Dimensions	Subdimensions	Indicators	References
Environmental Quality (EQ)	Ecological and sanitary aspects	Biodiversity preservation Sea water quality Sand quality Beach crowding Biosafety protocols (masks, 70% alcohol, etc.) Overall assessment of ecological and sanitary aspects	Ariza et al. (2010); Botero et al. (2015); Cervantes e Espejel (2008); Semeoshenkova et al. (2017); Botero et al. (2015); Lucrezi et al. (2016); Guneroglu et al. (2016); Semeoshenkova et al. (2017); Peña-Alonso et al. (2018); Instituto Ambientes em Rede (2019).
Tourism Infrastructure Quality (TIQ)	Accommodation	Availability and variety of lodging options (hotels, inns, etc.) Service quality Cleanliness and hygiene	Lucrezi et al. (2016); Chen & Bau (2016);

		Overall assessment of accommodation services	Peña-Alonso et al. (2018); ISO 13009(2015)
	Food services	Availability and variety of restaurants and kiosks	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); ISO 13009:2015.
		Service quality	
		Wait time at restaurants/kiosks	
		Cleanliness and hygiene of establishments	
		Overall assessment of food services	
	Tourism signage	Beach signage (traffic signs)	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); ISO 13009:2015.
		Tourist information maps/signs	
		Signage for tourist attractions	
		Overall assessment of beach signage	
	Support infrastructure	Availability of chairs and beach umbrellas	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); ISO 13009:2015.
		Tourist information centers	
		Craft markets	
		Parking availability	
		Overall assessment of support infrastructure	
Basic Infrastructure Quality (BIQ)	Cleanliness	Waste management	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); Instituto Ambientes em Rede (2019); ISO 13009:2015.
		Availability of recycling bins	
		Daily cleaning and maintenance of sidewalks and walkways	
		Overall assessment of beach cleanliness	
	Basic infrastructure	Availability of public restrooms	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); Instituto Ambientes
		Availability of public showers	
		Adequate public lighting	
		Ease of access to the beach	
		Overall assessment of basic infrastructure	

			em Rede (2019).
	Accessibility	Adapted sidewalks and tactile paving	Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); Instituto Ambientes em Rede (2019).
		Handrails and ramps for beach access	
		Amphibious chairs	
		Overall assessment of beach accessibility	
	Mobility	Availability of public transportation	Botero et al. (2015); Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018).
		Availability of taxis and rideshare services	
		Pedestrian crossings	
		Bike lanes	
		Overall assessment of beach mobility	
	Safety	Policing	Botero et al. (2015); Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018); Instituto Ambientes em Rede (2019); ISO 13009:2015; Semeoshen kova et al. (2017).
		Presence of lifeguards on duty	
		Warning signs for hazards (sharks, pollution, etc.)	
		Emergency and alert systems (e.g., public speaker announcements)	
		Feeling of safety on public roads	
		Overall assessment of beach safety	
	Commercial services	Banks	Cervantes e Espejel (2008); Lucrezi et al. (2016); Chen & Bau (2016); Peña-Alonso et al. (2018).
		Pharmacies	
		Retail shops	
		Overall assessment of commercial services	
		Scenic beauty of the beach	

Experience Quality (XQ)	Scenery/Landscape/Atmosphere	Air and water temperature	Duvat (2013); Ariza at al. (2010); Botero et al. (2015); Guneroglu et al. (2016); Peña-Alonso et al. (2018).
		Atmosphere ("vibe")	
		Overall assessment of the beach's scenery/landscape/atmosphere	
	Perception of social issues	Presence of homeless individuals	Lucrezi et al. (2016); Prepared by the authors (2022)
		Street peddlers	
		Prostitution	
		Overall perception of social issues	
	Environmental information and education	Environmental education initiatives	Duvat (2013); Ariza at al. (2010); Botero et al. (2015); Guneroglu et al. (2016); Instituto Ambientes em Rede (2019).
		Information on waste disposal sites	
		Overall assessment of environmental information and education initiatives	
	Recreation and entertainment	Availability of sports facilities (courts and other equipment)	Duvat (2013); Ariza at al. (2010); Botero et al. (2015); Guneroglu et al. (2016); Lucrezi et al. (2016).
		Availability of tourist excursions (catamarans, boats, etc.)	
		Availability of entertainment venues (music and other arts)	
		Overall assessment of recreation and entertainment	
	Hospitality	Commercial hospitality (service in bars, restaurants, hotels)	Duvat (2013); Ariza at al. (2010); Botero et al. (2015); Guneroglu et al. (2016)
		Social hospitality (friendliness of the local population toward tourists)	
		Overall assessment of hospitality at the beach	
	Pricing	Lodging prices	Cervantes e Espejel (2008); Lucrezi et al. (2016); Prepared by the
		Food and beverage prices	
		Prices for tours and other recreational services	
		Souvenir prices	
		Overall assessment of beach pricing	

			authors (2022).

Source: Research data (2022).

SAMPLE PROFILE

The sample consisted of visitors (both tourists and residents) from the most popular beaches in João Pessoa/PB, totaling 395 respondents—52.4% (207 questionnaires) from Tambaú Beach and 47.6% (188 questionnaires) from Cabo Branco Beach. Data collection took place between February and April 2022 in alternating shifts (morning, afternoon, and evening).

Of the total respondents, 47.1% were tourists from various Brazilian states, with the highest representation from São Paulo, Minas Gerais, and the Federal District. This aligns with findings from the Empresa Paraibana de Turismo (PBTUR, 2022), which identified São Paulo, Pernambuco, Minas Gerais, and Rio Grande do Norte as the leading sources of tourists to Paraíba. The study also noted that the Northeast (41.14%) and Southeast (35.35%) regions accounted for the highest tourist flow to Paraíba, based on data from the National Guest Registration Form (FNRH) (PBTUR, 2022).

A sizable proportion of tourists were from neighboring states such as Pernambuco and Rio Grande do Norte, as well as from cities within Paraíba, including Campina Grande, Areia, and Bayeux. The sample also included seven international tourists from Paraguay, Germany, Italy, and the Democratic Republic of the Congo.

Meanwhile, 52.4% of the sample consisted of local residents who frequented the beaches for leisure, sports, and relaxation. Notably, 0.5% (two respondents) declined to answer this question, as they were in transition from tourist to resident status.

In terms of gender, female respondents accounted for the majority at 59.5%, compared to 39.7% male respondents. Additionally, 0.5% (two respondents) chose not to disclose their gender. Regarding education, nearly half of the participants had completed or partially completed higher

education—34.2% had completed a university degree and 18.2% had not yet graduated. Meanwhile, 27.6% had a high school education, with 24.8% having completed high school and 2.8% reporting incomplete secondary education.

Most respondents fell into two age groups: 27.8% were between 21 and 30 years old, and 26.1% were between 31 and 40 years old, making up a combined 53.9% of the sample. These age groups generally represent individuals on vacation with a stable income and financial security.

In terms of household income, most beach visitors (29.9%) reported earning up to three times the minimum wage (between R$ 1,213 and R$ 3,636), followed by 28.6% earning up to five times the minimum wage (between R$ 3,637 and R$ 6,060).

COMPARATIVE ANALYSIS OF TOURISM QUALITY INDEXES FOR CABO BRANCO AND TAMBAÚ BEACHES

The comparison of results between Cabo Branco and Tambaú beaches revealed that the main factors influencing tourists' and residents' choices were similar: cleanliness and safety ranked as top priorities, followed by basic infrastructure and tourism infrastructure. This reflects the consensus in the literature that issues such as waste accumulation and the absence of essential services like electricity and water are highly undesirable for tourism (Tavares et al., 2024), particularly when tourism activity is poorly planned or managed.

Visitors to Cabo Branco Beach reported prominent levels of satisfaction, with 90.42% declaring themselves "very satisfied" or "satisfied." Similarly, 85.51% of visitors to Tambaú Beach expressed the same level of satisfaction. In terms of expectations, 50.53% of Cabo Branco visitors stated that the beach "fully met" their expectations, while 9.57% said their experience "exceeded" expectations. For Tambaú, the figures were similar, with 43% reporting that the beach "fully met" their expectations and 9.18% stating that it "exceeded"

them—results that, according to the model by Del Bosque and San Martín (2008), have a direct impact on satisfaction and positive emotions.

Regarding how closely the beaches matched the ideal urban beach, 43.62% of Cabo Branco visitors responded that the beach was "very close" to this ideal, while 22.87% stated it was "completely" aligned with the concept of an ideal urban beach. At Tambaú, 46.86% of visitors said the beach was "very close" to the ideal, a result comparable to Cabo Branco. However, only 9.66% of visitors considered Tambaú to be "completely" aligned with the ideal, suggesting a slightly less positive perception compared to Cabo Branco.

The prominent levels of satisfaction and positive perception of both beaches resulted in a strong likelihood of return visits, rated as "very high" or "high" by 81.91% of Cabo Branco visitors and 77.30% of Tambaú visitors. These results align with studies by Chen and Tsai (2007), Del Bosque and San Martín (2008), and Lee et al. (2011), which demonstrate the relationship between quality, satisfaction, and visitor loyalty. Therefore, the level of satisfaction with the beaches suggests a tendency toward visitor loyalty or, at the very least, a strong desire to return.

After analyzing visitor perceptions of the four proposed dimensions for assessing tourism quality—Environmental Quality (EQ), Tourism Infrastructure Quality (TIQ), Basic Infrastructure Quality (BIQ), and Experience Quality (XQ)—it was found that all Tourism Quality Indexes (TQI) for the evaluated beaches were classified as good (above 0.61). This result places the beaches at Level 4 on the TQI interpretation scale, indicating "Good (Expected) Tourism Quality." Thus, both beaches demonstrate good environmental standards and adequate basic and tourism infrastructure, delivering, overall, what visitors expect from an urban beach. However, there is still room for improvement in areas such as enhanced accessibility for people with disabilities, the installation of public restrooms, and the expansion of basic infrastructure.

Environmental education initiatives, accessibility improvements, and enhancements to basic infrastructure and safety should be prioritized, as these indicators received the lowest scores in the evaluation. Proposals such as

distributing trash bags, holding educational talks, and organizing sports events could help raise visitor awareness and engagement. Additionally, installing public restrooms and showers and increasing policing and lifeguard presence, especially on weekends, are essential. Expanding the "Acesso Cidadão" program—which provides amphibious chairs on weekends (Prefeitura de João Pessoa, 2021)—to operate daily at both beaches is also recommended to promote greater inclusion and accessibility.

The results also showed that the Tourism Quality Index (TQI) rated by tourists was higher than the score given by residents. This difference is likely because residents tend to have a more critical perspective when evaluating the indicators, possibly due to their greater familiarity with the local environment.

The highest Tourism Quality Index (TQI) was recorded at Tambaú Beach (0.695) when evaluated by tourists, while the lowest index (0.652) was reported by residents at Cabo Branco Beach. Overall, the results were very close, indicating that both beaches could receive a similar certification based on the adopted evaluation scale. This certification would be equivalent to a "4-star" rating, represented by the (*) symbol in Table 4.

Table 4
TQI Results by Beach and Visitor Type

TQI for Cabo Branco Beach	**Tourists**	**Residents**
Score	267.259	250.005
Index	0.712	0.667
Result/Certification	Good (****)	Good (****)
TQI for Tambaú Beach	**Tourists**	**Residents**
Score	268.188	254.689
Index	0.715	0.679
Result/Certification	Good (****)	Good (****)

Source: Research data, 2022.
Note.¹ Maximum possible score: 375 points.
Note.² TQI evaluation scale: 0.00 to 0.20 – Very poor tourism quality; 0.21 to 0.40 – Poor tourism quality; 0.41 to 0.60 – Average tourism quality; 0.61 to 0.80 – Good tourism quality; 0.81 to 1.00 – Excellent tourism quality.

The results highlighted the key factors influencing visitors' perception of beach quality, whether they were tourists or residents. Cleanliness and safety emerged as the most important aspects, followed by basic infrastructure and tourism infrastructure, consistent with previous studies by Lozoya et al. (2014), Lucrezi and Van der Merwe (2015), and Zielinski and Botero (2019).

The study also found that the Tourism Quality Index (TQI) was higher among tourists than residents, which may be attributed to residents' greater familiarity with the environment, leading to more critical evaluations. Despite this, both beaches showed equivalent results on the evaluation scale, being classified as 4-star beaches on a 5-level scale.

The study further confirmed the relationship between perceived quality, satisfaction, and visitor loyalty to the beaches. At Cabo Branco Beach, 90.42% of visitors reported being "very satisfied" or "satisfied," while at Tambaú Beach, this rate was 85.51%. Both beaches, classified at Level 4 (Good), showed elevated levels of satisfaction, which were linked to a strong likelihood of return: 81.91% of Cabo Branco visitors and 77.30% of Tambaú visitors stated they would "very likely" or "likely" return. These findings support the conclusions of Chen and Tsai (2007), Del Bosque and San Martín (2008), and Lee et al. (2011), which demonstrate a significant relationship between perceived quality, satisfaction, and visitor loyalty.

Although the prominent level of satisfaction suggests a tendency toward visitor loyalty, other factors—such as personal motivations and the desire to explore new destinations—can also influence the decision to return, even after a positive experience. Furthermore, the study confirmed that perceived quality significantly impacts satisfaction, although it does not fully determine it, as other variables, such as weather conditions and social interactions, also play a role (Žabkar et al., 2010).

In summary, this study assessed the tourism quality levels of Cabo Branco and Tambaú beaches using the Tourism Quality Index (TQI). The results showed that the tourism quality of both beaches was considered good, with indexes above 0.61. The TQI for Cabo Branco Beach was 0.712 for tourists and 0.667 for

residents, while for Tambaú Beach, it was 0.715 for tourists and 0.679 for residents.

These results indicate that both beaches reached Level 4 on the evaluation scale, classified as "Good (Expected) Tourism Quality." This reflects good environmental conditions and adequate basic and tourism infrastructure, offering a satisfying experience—although without exceeding most visitors' expectations.

CONCLUSION

The empirical application of the proposed protocol at two beaches in João Pessoa, Paraíba, Brazil, enabled the refinement of the indicators and the development of a methodology focused on visitor-perceived quality. Through the use of questionnaires, the study evaluated the Tourism Quality Index (TQI) for Cabo Branco and Tambaú beaches, which showed similar and positive results, with indexes above 0.61, leading to a 4-star rating on a 5-level scale.

The study made significant theoretical contributions to the field of urban beach evaluation and certification by introducing the new dimension of "Experience Quality," which includes indicators such as "Commercial Hospitality" and "Social Hospitality." New subdimensions were also proposed for "Infrastructure Quality," such as "Tourism Signage" and "Mobility." Additionally, the study defined innovative concepts, such as "beach tourism quality," understood as the set of elements necessary to meet visitors' needs and expectations and introduced a classification system with five levels of tourism quality: Very Poor, Poor, Average, Good (Expected), and Excellent.

On a practical level, the results highlighted the potential of the Tourism Quality Index (TQI), developed under the Urban Beach Tourism Quality Certification Protocol (PCTP), to support the implementation of a certification program for Brazilian beaches with a 1-to-5-star rating system. Such a program could be managed by certification bodies or public agencies, helping to

ensure continuous and comprehensive monitoring of urban beach quality, which is currently limited to water quality assessments.

It is recommended that this monitoring be conducted regularly, at least once a year, to identify strengths and weaknesses, guide investments in improvements, and ensure compliance with the proposed certification program. In this regard, an annual application of the PCTP is suggested to compare results and identify any improvements or setbacks in the evaluated indicators. Furthermore, the protocol should be applied to other Brazilian urban beaches to compare results and validate its effectiveness in different contexts.

Like any mixed-methods study, this research has limitations. First, the time frame will require future updates. The participation of invited expert professors in the Delphi and Expert Panel phases was limited due to lack of responses or scheduling conflicts. The geographical scope for protocol validation was restricted to two beaches in João Pessoa, which requires caution when generalizing the results to other urban beaches—or even to the studied beaches— since the results reflect the perception of quality within a specific temporal and geographic context.

Regarding the conceptual framework of the protocol, this type of methodology should remain in continuous development. Therefore, its dimensions and indicators should be periodically reviewed as discussions about beach tourism quality evolve in the literature. This implies the possibility of adding new dimensions or indicators in the future or adapting them to reflect changing local realities.

Despite these limitations, this study offers important theoretical and managerial contributions, advancing the discussion on evaluation indexes and certifications for urban beaches and proposing an innovative tool through the PCTP for assessing Brazilian urban beaches from the visitor's perspective.

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