Célia M.Q. Ramos / Adolfo Vanti / Pedro Solana-González

Multicriteria Decision-Making for Selecting Tourist Destinations and Increasing Their Competitiveness

Abstract

The competitiveness of a tourist destination is related to its capacity to present products and services better than others, providing tourist experiences that meet the preferences of those who demand them. However, how tourists decide which destination to visit is a question that needs to be answered to support all destination stakeholders, and this is the aim of this research. This paper uses the Multi-Criteria Decision-Making approach to prioritise the types of tourism. The method applied is the Analytic Hierarchy Process, and the results showed the greater importance of the criteria of rest/simplicity and cultural difference. As for the tourist destinations, the most relevant in order of priority were Cruise tourism followed by Art/culture tourism, showing that these two types of tourism must be combined in a co-competition.

Keywords: tourism destination, decision support system, multiple criteria decision-making, analytic hierarchy process (AHP), tourism competitiveness

1. Introduction

The tourism sector is one of the most relevant in global terms from an economic, cultural, social, and even environmental point of view, factors that are considered in the principles associated with the sustainability of destinations (Armenski et al., 2018; Dwyer & Kim, 2003) and the development of an associated focus that generates competitiveness (Porter, 1990). It is related to criteria that lead to the choice of the tourist destination as a place of leisure and to its ability to present products and services (Dwyer & Kim, 2003) that enrich the tourist experience and their preferences, including the existing differentials in prices (Dwyer et al., 2009) with a superior quality that contribute to the well-being of the resident population (Ritchie & Crouch, 2003).

Similarly to the consumption of other products, it is essential that the tourist destination, by its characteristics, convinces its customers with a combination of products, services, and benefits that no other offers (Crouch, 2011). On the other hand, the image of a tourist destination also induces tourists' decision-making and behaviour (Bigné et al., 2009; Carvalho et al., 2020), as well as destination awareness (Carvalho, 2022; Goffi et al., 2019) through marketing activities to make it known (March 2004), and at last, but not least important, the tourists' preferences (Chen & Gursoy, 2001) are the main factors that condition tourism demand and contribute to its competitiveness (Dwyer & Kim, 2003; Fernández et al., 2022; Porter, 1990).

For the competitiveness of a destination, as well as to identify the attributes that motivate its choice by travellers, the development of a model/study (Crouch & Ritchie, 2005; Dwyer & Kim, 2003; Koo et al., 2016; Luštický & Štumpf, 2021; Perna et al., 2018; Sánchez & López, 2015) that identifies the main characteristics that enhance or drive away tourists' choice is relevant. These in this work are modelled in the hierarchical design as

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criteria that enhance opportunities to ward off potential threats and lead to increased competitiveness, which allows for meeting the Sustainable Development Goals (SDGs) of the United Nations (UNWTO, 2021).

The (SDGs) of the United Nations Tourism (UNWTO, 2021) are the reference where the pillars of economic, environmental, social, and cultural sustainability are evidenced, such as decent work from economic growth (SDG8), industry, innovation, and infrastructure (SDG9), sustainable cities and communities (SDG11), sustainable promotion and consumption (SDG12) and partnerships for the goals' implementation (SDG17).

The analysis of the attributes that lead to the choice of a tourist destination considers its competitiveness, sustainability, perception, and own tourist characteristics, thus leading to the need to refer to a model that involves multiple objectives and resources so that this work is referenced in the form of a model, through a multicriteria approach, to the Analytic Hierarchy Process (AHP). The AHP is a classic tool of Multi-Criteria decision-making (MCDM) as referred to by Zhou et al. (2015), Crouch (2011) and Luštický and Štumpf (2021) that here is analysed from a management perspective so that it is possible to enhance the decision-making process as classically was studied by Simon (1961).

To create value and achieve competitive advantages for a tourist destination, it is necessary to implement strategies and make decisions that involve multiple criteria, so the AHP method (Jabeen et al., 2022; Saaty, 1980) is considered to achieve the objective of this research. The method is robust for a multi-criteria evaluation in which subjective and even somewhat abstract or difficult-to-quantify criteria (Luštický & Štumpf, 2021) can be compared to each other, also enabling easy detection of inconsistencies in responses and greater reliability of measurement (Czaja et al., 2003).

In this way, this research aims to determine through the AHP method the destination characteristics that most contribute to its choice as a holiday destination and, consequently, to the competitiveness of the place, taking into consideration the social, cultural, economic and sustainability dimensions together with the traveller's preferences.

After this introduction, the article is divided into three sections. The first section presents the literature review on the reasons that lead to the choice of a tourist destination, its competitiveness and the theoretical foundation of the AHP method. The second section presents the research methodology and the practical case study. The third section presents an analysis of the results with practical implications at managerial and academic levels. Finally, the conclusions, limitations, and future lines of work that may be developed.

2. Literature review

2.1. Tourism destinations

Tourism activity is one of the most important globally, both in economic, social, cultural, and even environmental terms, which, according to World Travel & Tourism Council (WTTC), contributes 10.3% of GDP globally, generating 33 million jobs (WTTC, 2021). It presents a high potential to contribute to the sustainability of destinations, considering the SDGs (UNWTO, 2021), as it contributes to decent work, economic growth, industry, innovation and sustainable infrastructure of cities and communities.

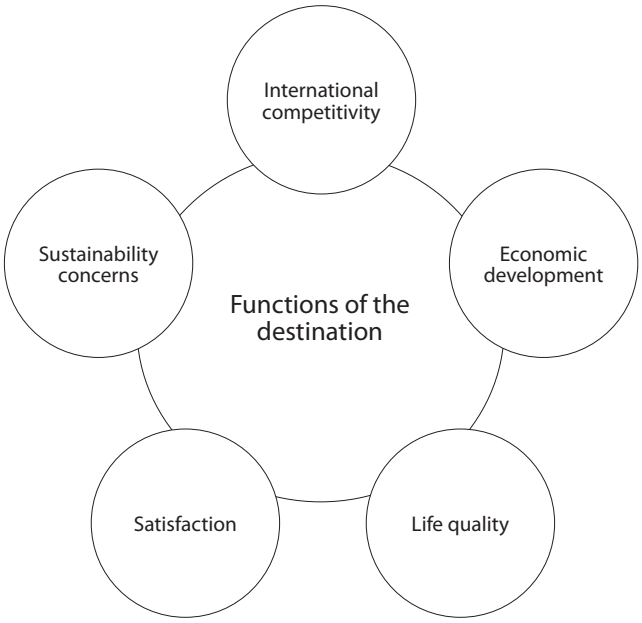
Tourism is one of the most significant economic activities with the highest growth rate worldwide (Ivanov & Webster, 2007). In a global world where travel is increasingly more straightforward and more accessible, tourist destinations are increasingly competitive to attract tourists, businesses, and investments (Ndubisi & Nair, 2023). It is increasingly sought to segment the demand and satisfaction of tourism consumers' needs (Jiang et al., 2022).

The satisfaction of tourists and residents depends on the quality of the experiences provided by the destination, where Information and Communication Technologies (ICT) contribute to enhancing the expertise (Bowen

& Sotomayor, 2022) through the level of involvement of tourists and residents both in seeking and sharing information about the tourist destination.

A tourist destination should attract tourists on an international scale to obtain economic development, improve the residents' quality of life and meet the satisfaction of visitors (Xiong et al., 2021). A tourist destination includes urbanistic, social, and cultural structures, among others, that aim to achieve the best quality of residents and attract tourists to obtain an economic development higher than it would reach through the combination of the other factors of production (Valls, 2006), as presented in Figure 1.

Figure 1
Functions of tourist destinations



Source: Adapted from Valls (2006).

A tourist destination must acquire centrality, a territory that travellers aim to visit (Ramos et al., 2020); it must meet customer satisfaction through a structured offer of services and the provision and sharing of resources and attractions so that the visitor can experience and taste the visit, and make combinations according to his preferences (Macchiavelli, 2001); it must have a brand that attractively translates the offer and facilitates its identification, and create an idea of interaction of affections and feelings; and it must adopt a form of joint promotion, with vertical cooperation in terms of marketing for the whole space that defines the tourist destination (March 2004; Zhao et al., 2022).

For Maslow (1943), people have three types of needs: functional (basic), symbolic (social) and experiential (personal). In the tourist, the three needs are interconnected to a level where the concept of need is diluted in the idea of satisfaction, which is part of the decision-making process when selecting a travel destination. Needs are related to factors considered relevant for analysing the choice of a destination and consequently contribute to its competitiveness (Crouch & Ritchie, 2005). However, destinations belong to well-defined geographical areas with climatic and cultural characteristics and contain features for resting or spending time in nature, among others, which contribute to attracting visitors and satisfying their needs, so a destination should be evaluated by its tourist attractiveness (Seyidov & Adomaitienė, 2016), associated with its image and tourists preferences (Bignée et al., 2009; Carvalho et al., 2020; Chen, & Gursoy, 2001; Goffi et al., 2019).

Decision-making for choosing a tourist destination as the preferred one for the next trip can be related to several factors, taking into consideration the attractiveness and preferences of tourists, such as cost standard of living (Crisostomo & Gustilo, 2019); adventure (Sato et al., 2018); quality of life in the destination (Andereck & Jurowski, 2006; Woo et al., 2018); rest and/or simplicity (Dellaert et al., 2013; Seabra et al., 2020); human relations (Baum, 2018; Seyidov & Adomaitienė, 2016); economic status (Luka, 2012); culture (Correia et al., 2011; Lee et al., 2020); gastronomy (Kivela & Crotts, 2006; Seyitoğlu & Ivanov, 2020); climate (Rutty et al., 2020); security (Ma et al., 2020); technological development (Benckendorff et al., 2019; Stylos, 2019); and sustainability (He et al., 2018), among others.

Each of these factors contributes to the choice of a tourist destination associated with a tourism product, which can be cultural, of nature, sun and beach, rural, spa and wellness, business, sportive, cruises, religious (Seabra et al., 2020), combining the type of tourism with the perceptions that tourists have of the image of a destination (Kladou et al., 2014) and their motivations, lead to the identification of the factors that are most prevalent in the choice of a particular type of tourism.

It can be evidenced that the referenced authors converge on criteria and alternatives that are grouped here in this way, in which the natural alternative is inserted in sun, beach, and rural destinations. At the same time, the spa and wellness alternative is in rest/simplicity, and finally, religious tourism is included in art/culture tourist destinations. Considering the criteria, it could be grouped as follows: sustainability and climate together with rest/simplicity, gastronomy with cultural difference, and quality of life in status. Therefore, the criteria and alternatives were classified into:

1 – Criteria: Rest/simplicity, Cultural difference, Leisure/sports activities, Adventure, Human relations/ learning, and Status.

2 – Alternatives: Sun and beach tourism, Rural tourism, Sports tourism, Cruise tourism, Art/culture tourism and Business/events tourism.

These criteria become more operational and convergent as the work progresses in such a way that defines the hierarchical design and then the AHP structuring with the generation of matrices that will collect data in "pairwise" comparisons answered by a tourism professional. Finally, a ranking for the best tourist destinations is generated.

In terms of the alternatives, “Sun and beach tourism” can be considered as a specific market with the presumption that all tourists look for sunny climates and scenic beaches anywhere (Croes & Vanegas, 2005), “Rural tourism” is defined by UNWTO (2008) as the trip where visitor’s experience is related to a wide range of products usually associated with nature-based activities, agriculture, rural lifestyle/culture” also define “Sports Tourism “as an activity where tourist observes as a spectator or actively participates in a sporting event generally involving a competitive nature. In terms of “Cruise tourism” can be defined “as a form of travelling involving an all-inclusive holiday on a cruise ship of at least 48 h with a set and specific itinerary in which the cruise ship calls at several ports or cities” (Zhang et al., 2022, p. 106321). The “Art/culture tourism” is conjugated once “the majority of tourism studies consider art as a form of cultural tourism” (Slak Valek, 2022, p. 100) and “Cultural tourism” as considered by UNWTO (2008) is an activity “in which the visitor’s essential motivation is to learn, discover, experience and consume the tangible and intangible cultural attractions/products in a tourism destination” where the spiritual features are included as religious tourism. The last alternative type is “Business/events tourism”, in which “visitors travel for a specific professional and/or business purpose to a place outside their workplace and residence intending to attend a meeting, an activity or an event”, as defined by the UNWTO (2008).

For this, the next issue theoretically reviewed refers to the multicriteria decision. In this way, it is possible to understand better the systematic of multicriteria decision-making, which broadens the simple manner of deciding in a very subjective way.

2.2. Analytical hierarchical process of decision-making

The Analytic Hierarchy Process (AHP) (Saaty, 1980; 2008) extends the intuitive/simplified decision-making process and can be used to solve problems of diverse evaluations by applying a rigorous and systematic method. It uses pairwise comparisons of one element concerning another, considering expert judgments.

AHP is structured in the context of Decision Support System (DSS) outreach that references mainly the classics of the '70s and 80's (Hogue, 1987; Keen, Scott-Morton, 1978) and its terminology refers to the Multi-Criteria Decision-Making (MCDM) approach (Gupta et al., 2017). The centrality is in DSS achieving a significant interface with Artificial Intelligence (AI) and Operations Research (OR), as researched in the work of Gupta et al. (2021).

With a variety of applications, AHP ranges from simple and practical to combined (hybrid) and more complex applications such as TOPSIS and other techniques in fuzzy environment and sensitivity analysis aimed at autonomous vehicles, seeking a more sustainable transport in which inaccuracies in the decision-making process involving risk prioritization and conflicting alternatives (Bakioglu & Atahan, 2021).

This methodology can also be used to define weights in the evaluation of sustainable urban mobility services in which the study of Gompf, Traverso and Hetterich (2021) involved weightings of almost five hundred experts aiming at a more social approach to this type of service. There are many applications, and it is highlighted only as references those found in Bianchini (2018), Nazari et al. (2018), Gu et al. (2018), Ishijaza and Siraj (2018) and even considering the classic SWOT in the definition of strategies for the growth of the satellite industry (Lee et al., 2021).

The AHP models well the intangible variables that are typical of the corporate management environment, quantitatively converting them to analyse the results found in a less intangible way. Furthermore, utilizing data matrices, one can easily verify to what extent respondents differ in their replies, possibly due to a different organizational or cultural approach (Morgan, 1996). These variations range between seven (7) points of difference and two (2) points of variability between the intervals when comparisons between alternatives and criteria hierarchically are made.

With this type of positioning, one can, in an epistemological approach of occidental philosophy (Nonaka & Takeuchi, 1995), increase the prior knowledge of mental constructs such as concepts, laws and theories by deducing truth from rational arguments. Thus, empiricism, which hardly considers a priori knowledge and that its only source would be significantly based on the induction of sensory experience is reduced. In this way, companies based on knowledge and innovation are distanced from those traditional autocratic companies based on command and control, overly reliant on performance indicators.

The hierarchical analytic process comprises several stages such as problem/objective definition, decomposition into a hierarchical structure with attributes, converted into criteria, sub-criteria (if any) and alternatives, comparisons between them, data validations such as the consistency levels of quantitative answers of respondents, generation of the weight of each element, and final evaluation of the importance of alternatives, based on the weights calculated to meet the proposed objective.

3. Method

The AHP method presents several steps that are introduced here in the structuring of the case to be modelled in tourist destination selection:

1 – Define the problem (which is the best tourist destination?) or general objective related to selecting the best destination (ranking of destinations).

2 – Decompose the problem/objective into a hierarchical structure, defining a set of criteria or attributes related to:

- Rest/simplicity
- Cultural difference
- Leisure/sports activities
- Adventure
- Human relations/learning
- Status

3 – Finally, in this hierarchical structure, define the respective alternatives that for this work were considered according to the following types of tourism:

- Sun and beach tourism
- Rural tourism
- Sport tourism
- Cruise tourism
- Art/culture tourism
- Business/events tourism

The AHP scale of defining weights for completing the matrices ranges from 1 to 9, as illustrated below in Table 1.

Table 1
AHP scale of weight definition

1	Factor i has the same importance as factor j
3	Factor i is moderately more important than factor j
5	Factor i is significantly more important than factor j
7	Factor i is much more important than factor j
9	Factor i is extremely more important than factor j
2,4,6,8	Intermediate values

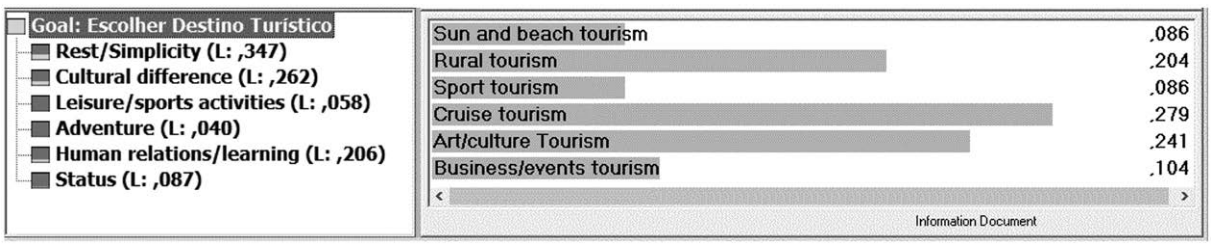
Source: Saaty (1980).

The implementation of the design was considered as the main objective of this research, which is to determine through the AHP method, the characteristics of the destination that most contribute to the selection as a holiday destination and, consequently, for the local competitiveness, considering the social, cultural, economic and sustainability dimensions along with the preferences of the traveller. Therefore, the hierarchical design is presented below with criteria and respective alternatives that increase the understanding of the dimension of work.

3.1. Hierarchical design for decision-making

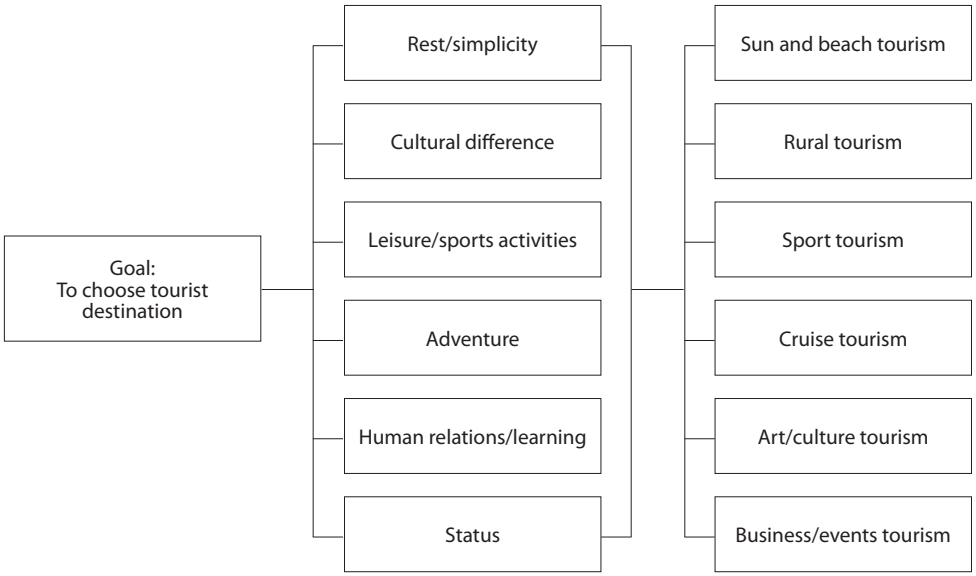
The hierarchical design for tourist destination selection decision-making involving criteria and alternatives is according to Figure 2.

Figure 2
Definition of criteria and alternatives for selecting tourist destination



The hierarchical design (Figure 3) for selecting a tourist destination can be generated through an academic version of the decision support software to achieve this structuring. Thus, it was possible to create different matrices which respondents could quantitatively complete based on their knowledge. This structuring and its results can also be realised by setting up the decision-making model in an electronic spreadsheet.

Figure 3
Hierarchical design for tourism destination selection



This hierarchical structure presented with the theoretical foundation and the implementation via AHP Expert Choice software, academic version, allows us to confirm the objective design of this work and to detail the data collection.

3.2. Data collection

The corresponding matrices of the methodological instrument for data collection are listed below, although not all of them are presented so as not to make this step needlessly detailed. However, the systematic was maintained because it is required to generate the final classification of the best tourist destinations.

The Delphi method was considered to construct the comparison matrices between the decision elements in the AHP model since it considers the experiences and knowledge of expert panellists on an issue under study, whose opinions are collected in an interactive process, generally by interview. The Delphi method was applied (Heiko, 2012), with the participation of five tourism experts as external consultants, which were selected due to the functions performed in government entities that manage the tourist destination, decision makers of tourism and tourism board representatives associated with the tourist destination, which allowed a high degree of agreement to be reached, validating the judgements in a rigorous and systematic process of pairwise comparison of criteria and alternatives for the selection of tourist destinations. The methodological procedure followed consisted of three anonymous rounds of assessment between the decision elements of the matrices, providing feedback to the consultants after each iteration, resulting in a dynamic process of discussion and consensus.

Initially, it is presented in Table 2, the central matrix with the data collection/expert judgements related to the objective of choosing the best tourist destination.

Table 2
Main matrix

Goal: To choose a tourist destination	C1	C2	C3	C4	C5	C6
C1 – Rest/simplicity		3.0	3.0	5.0	2.0	4.0
C2 – Cultural difference			5.0	5.0	2.0	5.0
C3 – Leisure/sports activities				2.0	**5.0**	**3.0**
C4 – Adventure					**5.0**	**3.0**
C5 – Human relations/learning						4.0
C6 – Status						

Note. Inconsistency index = 0.09.

The main matrix crosses the main criteria with each other, and the AHP logic applied to the data informs us that there is a low inconsistency in the responses, at 0.09, which is very appropriate for this type of methodological and conceptual approach.

In the following, some implementation results illustrate this work's development, as shown in Table 3, the Rest/simplicity matrix.

Table 3
Matrix rest/simplicity

Criterion: Rest/simplicity	Cds1	Cds2	Cds3	Cds4	Cds5	Cds6
Cds1 – Sun and beach tourism		**4.0**	5.0	**2.0**	1.0	5.0
Cds2 – Rural tourism			6.0	2.0	4.0	6.0
Cds3 – Sport tourism				**5.0**	**5.0**	1.0
Cds4 – Cruise tourism					4.0	6.0
Cds5 – Art/culture tourism						5.0
Cds6 – Business/events tourism						

Note. Inconsistency index = 0.05.

Table 3 presents the data collection matrix for the criterion Rest/simplicity, where values in light black represent the higher importance of the criterion on the left and bold values indicate a higher criterion weight in the top row (the inverse values of the matrix). This systematics occurs in the different selection matrices, as presented in Table 4 for the matrix related to the criterion of Cultural difference.

Table 4
Matrix cultural difference

Criterion: Cultural difference	Cdc1	Cdc2	Cdc3	Cdc4	Cdc5	Cdc6
Cdc1 – Sun and beach tourism		**3.0**	2.0	**5.0**	**7.0**	**3.0**
Cdc2 – Rural tourism			4.0	**5.0**	**5.0**	**3.0**
Cdc3 – Sport tourism				**5.0**	**7.0**	**5.0**
Cdc4 – Cruise tourism					1.0	1.0
Cdc5 – Art/culture tourism						4.0
Cdc6 – Business/events tourism						

Note. Inconsistency index = 0.06.

Table 4, corresponding to the pairwise comparison matrix of the Cultural Difference criterion, followed the same systematic filling in as the others, maintaining an inconsistency level below 0.1, which is adequate for this methodology. Thus, matrix by matrix, data were accumulated for the different criteria and then processed to generate results and ranking alternatives for tourist destinations.

Having presented the scope of the work in terms of the introduction of the topic, its objective and justification, as well as the definition of the theoretical framework, this part of the work sought to give a vision of the methodological procedures in an applied way to solve the research problem, being directed to cases with tourists who will choose a destination to spend their holidays.

4. Results

As an example of the results of the generated design are presented some graphs grouped, in which after the interview conducted for data collection, different priorities could be analysed by processing the matrices structured with the pairings and rotating views by different tributes and alternatives, even building sensitivity analysis that allows performing an If-Then. This representation is made in a didactic manner using bar and line graphs using the Expert Choice software. Considering the defined objective, the principal results correspond to the performance presented in Figure 4.

Figure 4
Ranking of tourist destinations alternatives

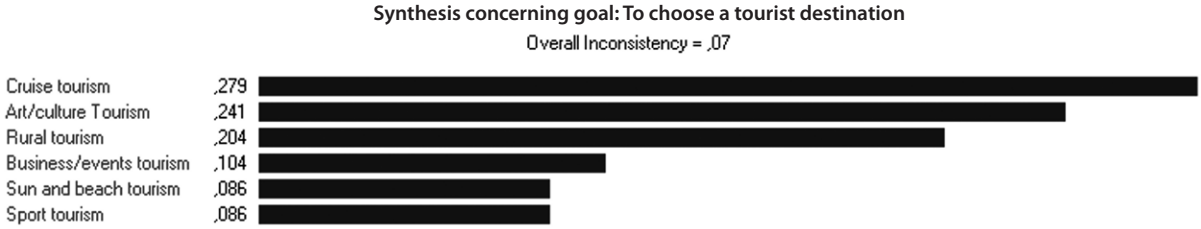


Figure 5, corresponding to the ranking of alternatives of tourist destinations that this work aimed and that assists in organising the decision-making process, points with particular attention to Cruise tourism, followed by Tourism of art/culture and then, with significative importance of rural tourism, the others. Considering the results by criteria, we find that the cultural difference followed by rest/simplicity (Figure 5) is the most important in the view of the professional respondents of the tourism sector.

Figure 5
Results of criteria and alternatives

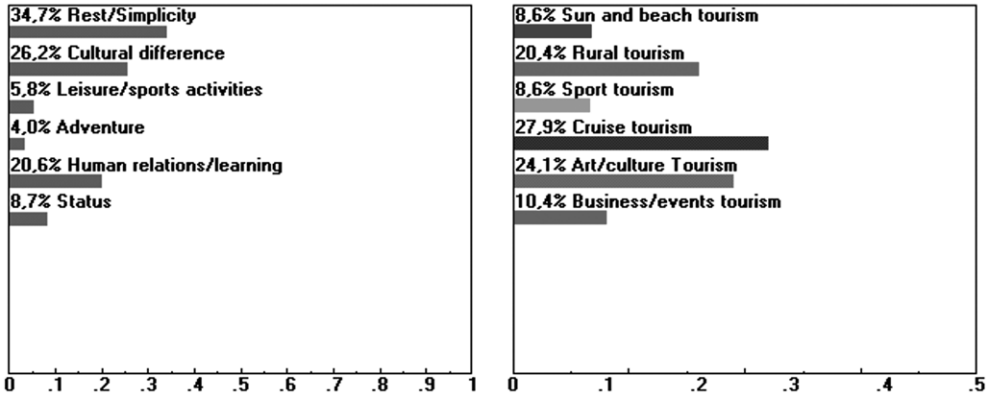


Figure 5 corresponds to the grouping of criteria and alternatives in which the highlight was given to the Rest/simplicity followed by Cultural difference criteria provided by the DSS, which shows the performance of the variables and supports the managers working in the tourism area who can extend with different views the information through the sensitivity analysis resource.

Although specialists prefer the criteria of simplicity and cultural differences, cruise tourism arouses interest due to its characteristics that combine rest and contemplate visits to points of tourist interest previously defined through itineraries, which allow tourists to know what they have the possibility of visiting concerning the cultural heritage of the places, while during the boat crossing they can rest, without worrying about the journey between points and without the need to cook meals, which allows them to relax (Dai et al., 2019).

After cruise tourism, "Art/culture tourism" ranks second in terms of alternatives, as it is motivated by the desire to learn, discover, experience, and consume the tangible and intangible cultural attractions/products, which includes the traditions and customs of the locals, as well as the entire component associated with travel motivated by religion (Lak et al., 2020).

Thus, the conclusions and future studies that can be addressed and the bibliographical references used are presented below. Therefore, the management approach and the possibility of increasing the tourism sector's competitiveness utilizing a multi-criteria decision-making approach are prioritised.

In terms of the implications and contributions of this investigation, we can reflect on the importance of combining activities inherent to cruise tourism with cultural activities that promote the intangible heritage of the destination, enabling the academy to develop a new research track that creates models that combine this s two types of tourism, both in terms of promoting the image of the destination and in terms of identifying the cultural aspects that could be complementary to these two types of tourism.

For the industry and the governance aspects of destinations, strategies should be considered in promoting and developing tourism products and services that combine these two types. This environment provided by the combination makes it possible to reduce seasonality in the sun and beach destination through the mix of activities related to the cultural aspects of the tourism destination and related to the product, including boat trips, increasing their competitiveness in terms of their competitive set.

5. Conclusions

The competitiveness of a tourist destination is related to its capacity to present products and services with differentials that satisfy the preferences of the demanders, and that in this work were analysed through the multi-criteria decision-making process MCDM based on the AHP concept that involves comparisons between pairs of criteria. The criteria Rest/simplicity and Cultural difference were found to be the most important, and as alternatives, Cruise tourism followed by Art/culture tourism was highlighted as preferred.

The tourism sector is one of the most relevant in the economy, generating a very significant global GDP and associated with factors such as sustainability, among others, that characterise superior quality and contribute to the well-being of the resident population. With this consideration and the contributions of this work, it is possible to better combine the aspects of markets and pricing for the allocation of tourist destinations preferred by travellers and which are aligned with the improvement of competitiveness and with the SDGs of the United Nations related to economic, environmental, social, and cultural sustainability.

With this study, it was possible to define criteria and alternatives in the light of the theoretical references and whose application to systematic decision-making processes can be extended in future studies with techniques such as Analytic Network Process (ANP) or fuzzy logic. This provides the foundations for creating decision support systems that generate competitive advantages for tour operators, implementing strategies through a decision-making process that involves multiple criteria that are sometimes abstract or difficult to quantify, as is the case in business management. This research constitutes a knowledge base for developing future studies of a tourist destination recommendation system based on the results generated by the expert system.

In this work, the AHP method was used to identify the characteristics of the destination that most contribute to its choice as a holiday destination. The results also relate to the destination marketing function as they provide valuable information for agencies, tour operators, and destination managers and contribute to meeting tourists' needs.

In the development of the present study, one of the limitations is the number of experts, which was five, due to their availability to answer the questions, and secondly, the fact that only six tourism alternatives were

considered when more and more types are emerging, such as "Dark tourism", "Health and wellness tourism", "Literary tourism", "Food tourism", "Wildlife tourism", among others to be considered in future work.

In addition to overcoming the presented limitations, as a future work, we intend to investigate how tourists decide which destination to visit and how they know which one suits their desires, which is one of the critical questions for marketers in the tourism industry and it has been intensively studied in tourism marketing research over the past 40 years (Clarke & Hassanien, 2020; Crompton, 1979).

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