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An Assessment Model of the Algarve as a Sustainable Tourism Destination: A Conceptual Framework

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ABSTRACT

Sustainable tourism assessment models emphasize the need for holistic, integrated evaluations of tourism destinations, particularly in mature and mass tourism areas. While best practices can be shared, each destination requires a tailored approach, considering its unique features like infrastructure and natural assets. Research shows that sustainable tourism should involve continuous evaluation rather than a one-time assessment. This article develops a model for the ongoing review of sustainable tourism in the Algarve, a famous sun, sea, and sand destination in Portugal. Using qualitative and quantitative methods, the model was designed by analyzing existing frameworks and their relevant dimensions. A questionnaire was then administered to local stakeholders to validate and refine the selected indicators, which were ultimately used to create a framework for monitoring sustainable tourism in the region.

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Evaluation of tourism destinations; sustainable tourism development; economic sustainability; sociocultural sustainability; environmental sustainability; destination management

1. Introduction

Sustainable tourism development, considering the sustainable development goals (Vázquez et al., 2021), is crucial to support the continuous management of resources in tourism destinations (Niavis et al., 2019). Sustainable development aims to protect all natural and cultural resources against exploitation and preserve them for future generations (Angelevska-Najdeska & Rakicevik, 2012). Traditionally, development was carried out with a focus on three areas: the social, economic, and environmental impacts of tourism on a destination (Streimikiene et al., 2021). Nevertheless, additional areas, such as governance and culture, gained more importance in recent years and are included in contemporary assessment frameworks (Asmelash & Kumar, 2019; Islam et al., 2021; Ivars-Baidal et al., 2023; Nash et al., 2018; Ólafsdóttir, 2021; Rasoolimanesh et al., 2020).

Despite acknowledging the importance of developing sustainable tourism practices, consensus on actionable guidelines has yet to be achieved (Jovicic, 2014). Several organizations (European Commission, 2016; Global Sustainable Tourism Council, 2019; UNWTO,

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2016) and scholars to be further recognized later in this article have developed criteria and frameworks to assess various tourism destinations. However, the dynamic and static sustainable indicators proposed in previous frameworks bring significant limitations and are not easily transferrable between destinations with varying needs and features (Blancas et al., 2018). Some indicators carry multiple interpretations or are included in different dimensions (Asmelash & Kumar, 2019; Cernat & Gourdon, 2012; Choi & Sirakaya, 2006), leading them to measure different goals. For a successful ongoing tourism development at a destination level, it is thus crucial to develop a framework considering a region's unique features.

Since the establishment of Faro Airport in 1965, the Algarve has evolved into a hub for mass tourism (Costa, 2005), emphasizing offerings centered around sun, sea, and sand experiences (Do Valle et al., 2012), thereby solidifying its position as one of the leading tourism destinations in Europe (Andraz & Rodrigues, 2016; Soler et al., 2019). The Algarve stands out as a significant player in the realm of golf, hosting 31 of Portugal's 70 golf courses. Recognized as a leading golfing destination, it has garnered prestigious awards such as the title of "Best Worldwide Golf Destination" by the International Association of Golf Tour Operators (IAGTO) on multiple occasions (Oliveira et al., 2019). Additionally, the Algarve has been awarded as the "Europe's Leading Beach Destination" ten times and the "World's Leading Beach Destination" two times by the World Travel Awards (2023). The primary markets driving tourism in the Algarve are domestic visitors and Europeans seeking beach or golf vacations (Oliveira et al., 2019). Given its substantial contribution to the Gross Domestic Product (GDP) of around 66.0%, the region heavily depends on tourism as a critical economic driver (Do Valle et al., 2012).

The status of the Algarve as a tourism destination of excellence and the growing importance of tourism activity in the region raised the need for an accurate and continued assessment of the impacts on the environment, economy, and local population. As mentioned above, tourism contributes positively to the local economy and generates employment opportunities. However, with increased visitor numbers, adverse effects started to unfold. Tourism in coastal areas can exploit resources such as water, leading to supply issues (Garcia & Servera, 2003). Another adverse effect includes the uncontrolled construction of accommodation along the coastline (Pintassilgo & Silva, 2007). Uncontrolled construction in natural areas that do not consider the biospheric environment's capacity can lead to degradation (Vaz et al., 2011). Coastal regions need to be especially protected due to the increased risk posed by the shortage of land suitable for urban development, which in turn leads to more dense urban areas with higher pollution and a gradual loss of biodiversity (Vaz et al., 2011).

Nonetheless, a scarcity of tailored assessment frameworks for coastal destinations becomes evident upon scrutinizing sustainable evaluation frameworks, with only a few scholars putting forth such frameworks (Garcia & Servera, 2003; Oliveira et al., 2019). Given the significance of sustainable tourism development for coastal regions like the Algarve in safeguarding against detrimental environmental effects, it is imperative to establish frameworks for ongoing evaluation. These frameworks would facilitate sustainable development and reinforce tourism decision-makers' commitment to incorporating sustainable tourism strategies into formulating public travel policies. A specialized framework dedicated to continuously assessing sustainable tourism development in the Algarve remains to be developed.

This article contributes significantly to the existing body of knowledge, addressing the limited literature on sustainable development in coastal tourism destinations. Firstly, it comprehensively analyzed assessment frameworks devised by scholars, tourism entities, and organizations. Explicitly focused on resources pertinent to the Algarve, the review identified frameworks featuring fewer yet broader dimensions, within which subdimensions and indicators are grouped. These are more easily comprehensible and, thus, more readily integrated into tourism policies and operations. Furthermore, this article proposes a conceptual framework to measure and monitor sustainable tourism development in the Algarve. This framework delineated four main dimensions: economic, sociocultural, environmental, and destination management. Within these dimensions, 17 subdimensions were outlined, encompassing 52 indicators. These indicators served to identify critical areas and variables for assessing tourism development in the Algarve from a holistic, comprehensive, and sustainable standpoint.

An online survey was conducted to ensure the accessibility and relevance of the assessment framework to tourism stakeholders in the Algarve. This survey engaged various stakeholders, including public authorities, private tourism businesses, foundations, associations, and governmental organizations. Through this survey, the assessment framework underwent further refinement, reducing indicators to 50. Additionally, some indicators were rephrased to enhance accuracy and clarity. Thus, the conceptual framework presented in this article may be used as a precedent and guidance for scholars or organizations aiming to develop a specialized basis for sustainable tourism development of another sun, sea, and sand destinations with similar tourism offerings.

2. Literature review

2.1. Sustainable tourism development

The focus on sustainability in tourism planning, management, and research has expanded significantly since 1990 (Bianchi, 2004; Bramwell & Lane, 1993). The World Tourism Organization (WTO) defines the term as "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNEP & WTO, 2005, p. 12). Even though sustainability has gained an increased focus on academic research, sustainable tourism has been criticized several times (Liu, 2003; Moscardo, 2012; Sharpley, 2009; Wheeller, 1993). Most critical authors pointed out that tourism cannot be sustainable since it is focused on growth rather than on the ecological and social limits of living (Higgins-Desbiolles, 2018). Thus, for the design of the assessment model for the Algarve, the term *sustainable tourism* is defined as considering the effects on all aspects of society, such as environmental, sociocultural, and economic principles (Butler, 1999, 2010). The following sections focus on sustainable tourism assessment frameworks, their setup, and their contribution to sustainable tourism development.

2.2. Sustainable tourism frameworks

As outlined by Vázquez et al. (2021), there are two main approaches to model sustainable tourism development. The *scientific approach* offers insights to the academic community,

involving thorough data sets and in-depth analysis. Conversely, the *policy-maker approach* is geared towards providing practical managerial directives for stakeholders within a particular region or destination. Each approach is further elucidated, with subsequent sections delving into studies and organizations adhering to these methodologies.

The *scientific approach* is evident in studies that develop models to assess the current state of sustainable development in various destinations. These models encompass a wide range of topics, such as gauging tourism stakeholders' perceptions of Cuban tourist destinations (Pérez et al., 2017), crafting sustainability indicators for Spanish urban systems (Rama et al., 2021), and formulating a sustainable tourism evaluation chart (Blancas et al., 2016). In Bangladesh's Boga Lake, Islam et al. (2021) devised a system of indicators for community-operated tourism sustainability, while Asmelash and Kumar (2019) crafted and tested a comprehensive set of indicators involving critical stakeholders in the tourism industry. Vázquez et al. (2021) introduced a hybrid impact-value model to measure tourism product sustainability and stakeholder actions' impact on generating tourist commodities. Furthermore, Ólafsdóttir (2021) highlighted the importance of public participation in designing a framework for Arctic tourism, while other studies have focused on niche segments such as smart cities (Ivars-Baidal et al., 2023) and green digital transformations in tourism destinations (Streimikiene, 2023). It is worth noting that the discussions in this article exclude studies evaluating sustainability in hotels or resorts, niche technological or smart destinations, or those with features irrelevant to the Algarve, as they do not provide valuable insights for designing an assessment model for this region.

The *policy-maker approach* is applied by organizations that implement and distribute an actionable framework. Organizations that support the development of such policy-focused approaches include the European Union (EU) and the United Nations World Tourism Organization (UNWTO), which aided the development of the following two frameworks: The European Tourism Indicator System for Sustainable Destinations (ETIS), designed by the EU, which aims to provide tourism stakeholders with an accessible toolkit to measure and monitor sustainability management processes and benchmark progress and performance in the future (Miller et al., 2013); and The International Network of Sustainable Tourism Observatories (INSTO), supported by UNWTO, which aims to "support the continuous improvement of sustainability and resilience in the tourism sector through systematic, timely, and regular monitoring of tourism performance and impact in order to understand destination-wide resource use better and foster the responsible management of tourism" (UNWTO, 2016, p. 1).

In recent years, combining static and dynamic components as part of sustainable assessment models has become a standard in tourism assessment frameworks. Blancas et al. (2016) applied static and dynamic features to assess the evolution of sustainable development. Vázquez et al. (2021) developed a model to measure tourism product sustainability by integrating static and dynamic approaches for a long-term vision. The interdisciplinary combination of dimensions allows for a more holistic approach to an accurate evaluation (Choi & Sirakaya, 2006; Kristjánsdóttir et al., 2018). Other authors applied synthetic indicators to evaluate sustainable tourism development locally from a multidimensional perspective (Yuedi et al., 2023). Future assessment models should consider the

varying indicator types and incorporate those applicable to the destination and its unique features.

When designing a framework, the diversity between destinations, their varying tourist segments, and environmental features must be given great attention (Blancas et al., 2018). Each tourism area should critically account for its distinct specifications and choose applicable dimensions and indicators (Ko, 2005). Furthermore, the longevity of the model needs to be considered. Holistic and continued sustainable development can only be achieved with regular monitoring over time rather than several static assessments applying different measurement criteria. The model designed in this article considers the factors above by devising a framework particular to the Algarve, considering its distinct features for an ongoing assessment of tourism sustainability.

2.3. Sustainable tourism dimensions & sub-dimensions

This section focuses on the dimensions of sustainable tourism frameworks while comparing their application procedures and suitability for the ongoing sustainable tourism assessment of the Algarve.

Effective sustainable tourism requires precisely measuring parameters using indicators and various monitoring tools (McCool, 2002). Before defining indicators, sustainable tourism frameworks determine several dimensions and possibly sub-dimensions. The indicators are selected and grouped under the previously described dimensions. The dimensions and sub-dimensions comprise broader sustainable assessment criteria translated into measurable items via the indicators. The most commonly applied dimensions used in frameworks are *social*, *economic*, and *environmental*, with *governance* gaining more importance in recent years (see Table 1). The dimension names applied in studies looking at destinations with various features are highlighted in the following table. It first lists the dimensions involved in different studies, followed by those used by tourism organizations and observatories.

A direct comparison between the dimensions of different assessment frameworks is challenging due to varying wordings with the same aim being applied. Examples of this practice are the use of a *political dimensio*n (Choi & Sirakaya, 2006) or *destination management* (European Commission, 2016), which are incorporated as *governance* in other models (CROSTO, 2021; Islam et al., 2021; Ivars-Baidal et al., 2023; Nash et al., 2018; Ólafsdóttir, 2021; Rasoolimanesh et al., 2020; UNWTO, 2016). Some authors also combine two dimensions under the same umbrella, such as *environmental and social sustainability* (Cernat & Gourdon, 2012), *sociocultural* (European Commission, 2016), *sociocultural sustainability* (Asmelash & Kumar, 2019) and *socioeconomic* (Global Sustainable Tourism Council, 2019). Furthermore, additional dimensions, such as *technological* (Choi & Sirakaya, 2006), are included when reviewing specific destinations with unique features.

When examining reports and proposals from INSTO Tourism Observatories, it becomes apparent that they feature the most significant number of subdimensions. This can be attributed to the eleven mandatory dimensions that observatories must incorporate (UNWTO, n.d.). Furthermore, each observatory can include additional dimensions from the INSTO dimensions pool if deemed relevant and advantageous for assessing the destination's distinct characteristics or challenges. Even though observatories must follow the mandatory dimensions, they may choose to class the mandatory areas under a

Table 1. An overview of sustainable dimensions is presented in the relevant literature.

	No. of Dimensions	Social	Economic Scientific Research	Environmental	Governance	Culture	Additional Dimensions
Choi and Sirakaya (2006)	6	X	X	X	X (Political)	X	Technological
Fennell (2007)	3	X	X	X			
Roberts and Tribe (2008)	4	X (combined under socio-cultural)	X	X		X (combined under socio-cultural)	Management/ Institutional
Fernández and Rivero (2009)	4	X	X	X			Institutional
Blancas et al. (2011)	3	X	X	X			
Cernat and Gourdon (2012)	6	X (combined with environmental under the same dimension)		X (combined with social under the same dimension)			Tourism assets Tourism activity Tourism-related linkages Tourism-related leakages Overall infrastructure Attractiveness
Blancas et al. (2016)	3	X	X	X			
Pérez et al. (2017)	3	X	X				Patrimonial
Nash et al. (2018)	6	X	X	X	X		Science & technology Human resource management
Guerreiro and Seguro (2018)	3	X	X	X			
Kristjánsdóttir et al. (2018)	3	X	X	X			
Modica et al. (2018)	4	X (combined under social & cultural)	X	X		X (combined under social & cultural)	Destination Management
Asmelash and Kumar (2019)	4	X (combined with culture)	X	X			Institutional
Rama et al. (2021)	3	X	X	X			
Rasoolimanesh et al. (2020)	4	X	X	X	X		
Ólafsdóttir (2021)	4	X (and wellbeing)	X	X	X		
Islam et al. (2021)	5	X	X	X (Nature & Ecological)	X	X	
Ivars-Baidal et al. (2023)	4	X	X	X	X		
Lee et al. (2021)	6	X (combined under socio-cultural)	X	X	X (Government policy)	X (combined under socio-cultural)	Science & technology Human Resource Management

Vázquez et al. (2021)	4	X (combined under socio-cultural)	X	X		X (combined under socio-cultural)	Institutional
Crotts et al. (2022)	4			X			Visitor Experience Economy Residents' attitude towards tourism Hospitality Workforce Satisfaction
	No. of Dimensions	**Social**	**Economic**	**Environmental**	**Governance**	**Culture**	**Additional Dimensions**
Frameworks Developed by Organizations & Tourism Observatories							
ETIS Toolkit (European Commission, 2016)	4	X (combined under socio-cultural)	X	X		X (combined under socio-cultural)	Destination Management
INSTO Framework, Mandatory Dimensions (UNWTO, 2016)	11 Core Issue Areas		Destination Economic Benefits Employment Tourism seasonality	Energy management Water management Wastewater (sewage) management Solid waste management Climate action	X		Accessibility Local Satisfaction
GSTC Plan (Global Sustainable Tourism Council, 2019)	4	X (combined under socioeconomic)	X (combined under socioeconomic)	X		X	Sustainable management
Croatian Sustainable Tourism Observatory (CROSTO, 2021)	5	X (combined under social & cultural)	X	X	X	X (combined under social & cultural)	Destination management
Sustainable Tourism Observatory of South Tyrol (STOST, 2021)	3	X (Society)	X	X			
Sustainable Tourism Observatory Mallorca (STO Mallorca, 2022)	4	X (combined under sociocultural)	X	X			Destination management
Sustainable Tourism Observatory Barcelona (OTB, 2022)	3	X (combined under sociocultural)	X	X		X (combined under sociocultural)	

smaller set of overall dimensions to build a framework applicable to the region and its stakeholders and enable a more accessible framework application. An example is the Croatia Sustainable Tourism Observatory (CROSTO), which includes the mandatory areas under five main dimensions, matching those most used in literature: *sociocultural*, *economic*, *environmental*, *governance*, and *destination management* (CROSTO, 2021). Furthermore, the Sustainable Tourism Observatory of South Tyrol (STOST, 2021) and the Sustainable Tourism Observatory of Barcelona (OTB, 2022) define three dimensions: *sociocultural*, *economic,* and *environmental* (Table 1). The Sustainable Tourism Observatory of Mallorca (STO Mallorca, 2022) groups the mandatory dimensions under four dimensions: *sociocultural*, *economic*, *environmental,* and *destination management* (Table 1). Organizing a framework with dimensions and subdimensions enables various stakeholders to comprehend and act more efficiently, which should be considered in the design of future frameworks.

Difficulties often found in literature, such as inconsistent titles and descriptions of dimensions collecting similar features, are reduced for organizations applying the INSTO framework. The framework includes mandatory dimensions (*socio-cultural*, *economic*, *environmental,* and *destination management*) and optional dimensions, further split into measurable indicators that destinations can measure over time. The flexibility to categorize indicators into mandatory and optional dimensions allows for customization based on the destination, its stakeholders, and data availability. Consolidating key dimensions for assessing a destination's sustainable tourism development could enhance adaptability and comparability. Insights and benefits from different sorting criteria and dimensions utilized by other observatories may inform the development of a sustainability framework tailored for the Algarve region. Essentially, sustainable dimensions are the foundation for constructing assessment frameworks and establishing the basis for developing indicators. Selecting these dimensions requires meticulous examination, considering the distinct features and needs of the assessed destination.

2.4. Sustainable tourism indicators

Sustainable tourism indicators encompass quantitative metrics that assess various dimensions or sub-dimensions of sustainability (Vázquez et al., 2021). They transcend mere statistical data by compiling and integrating relevant information into frameworks to evaluate the impacts of tourism on a destination (Blancas et al., 2018). Quantitative indicators are more commonly utilized than qualitative ones, often considered more "subjective" (Kristjánsdóttir et al., 2018). While many frameworks concentrate solely on one type of indicator, a balanced consideration of both quantitative and qualitative indicators is believed to offer more comprehensive insights into sustainable tourism development (Rasoolimanesh et al., 2020). Existing assessment frameworks can serve as a basis for evaluating destination sustainability, yet detailed additional analysis is necessary before building a framework tailored to a specific destination (Rama et al., 2021).

The selection of indicators varies significantly across studies and frameworks, influenced by factors such as the specific goals of measurement (Blancas et al., 2016), the entity being evaluated (Lee et al., 2021), or the unique characteristics and challenges of the destination in focus (Choi & Sirakaya, 2006). Consequently, indicators cannot be easily compared or transferred between frameworks. For instance, an indicator like

"uses hybrid vehicles as shuttle buses" may be too specific to one context and not applicable elsewhere (Lee et al., 2021). Comparing indicators across studies is further complicated by authors grouping measurements under different dimensions, each aligned with distinct measurement objectives. This diversity is illustrated by the following example related to infrastructure assessments: "perceptions of the improved infrastructure of public services" (Pérez et al., 2017) grouped under the social dimension. In contrast, other authors incorporate the "quantity of infrastructure and public service" under the economic dimension in their model (Blancas et al., 2016). Both indicators evaluate infrastructure levels but target specific attributes aligned with the dimensions they are categorized within, and these dimensions can vary significantly.

The amount of data and detail per indicator also differs between studies. The indicator "waste management" (STOST, 2021) can be mentioned as a standalone or further divided into "volume of waste generated" (Blancas et al., 2016), "volume of waste treated" (Blancas et al., 2016; European Commission, 2016; Ólafsdóttir, 2021), "solid waste management" (STO Mallorca, 2022; STOST, 2021; UNWTO, 2016), or "volume of recycled packaging waste" (Blancas et al., 2016; Choi & Sirakaya, 2006; European Commission, 2016; Lee et al., 2021; Ólafsdóttir, 2021). Water consumption and wastewater management are essential indicators included in several frameworks as "number of wastewater plants" (Blancas et al., 2016; Ivars-Baidal et al., 2023; Rama et al., 2021; UNWTO, 2016), "protecting the local water quality" (Asmelash & Kumar, 2019; Choi & Sirakaya, 2006; Lee et al., 2021), or "number of establishments participating in water conservation and recycling" (European Commission, 2016; Lee et al., 2021). Additionally, some frameworks only measure the water consumption attributed to tourism (Asmelash & Kumar, 2019; Blancas et al., 2016; Rama et al., 2021). While this segmentation may appear essential for evaluating tourism impacts, it presents the obstacle of generating precise data. Therefore, selecting indicators requires careful consideration, considering the feasibility of collecting and assessing data accurately.

Another illustration of the diverse metrics across frameworks can be exemplified through employment indicators. Some researchers emphasize the benefits of the tourism industry, specifically for residents. For instance, Asmelash and Kumar (2019) incorporate the "number of job opportunities for residents" as an economic indicator, while others utilize metrics like the "percentage of employees in the tourism sector" (Blancas et al., 2016; Cernat & Gourdon, 2012) or "seasonal versus year-round employees" (European Commission, 2016; Ivars-Baidal et al., 2023; UNWTO, 2016). Assessing the impact of employment on the local population presents additional challenges as it necessitates a precise definition. Given the ease of movement within a country or among affiliated zones such as the EU, workers may opt to relocate for tourism-related jobs. It becomes crucial to differentiate whether individuals of the same nationality or those authorized to work without a visa are encompassed in indicators assessing the impact on residents. Failure to accurately define each indicator may result in flawed data collection and inaccurate measurement of this aspect over time.

Another aspect to consider when contrasting different frameworks is the unequal distribution of dimensions. Specific dimensions receive more emphasis and consequently have more associated indicators. A systematic analysis of sustainable tourism indicators revealed that the social dimension consistently has the fewest indicators across studies (Rasoolimanesh et al., 2020). Similarly, there is a suggestion that evenly distributing the

number of indicators across dimensions could promote more comprehensive sustainable development (Kristjánsdóttir et al., 2018). However, many frameworks do not adhere to such proportional distribution, indicating feasibility challenges.

Finally, the stakeholders involved and evaluated are pivotal in the indicator development process. It is imperative to grasp the experiences and requirements of destination stakeholders rather than relying on assumptions that can be more readily translated into indicators (Kristjánsdóttir et al., 2018). For instance, Rasoolimanesh et al. (2020) uncovered an unequal appointment of indicators per stakeholder by conducting a systematic literature review of sustainable frameworks. As mentioned earlier, ensuring accuracy and appropriately assigning indicators in stakeholder assessments leads to more effective data collection and a more precise evaluation of sustainable tourism development. Various studies and cases have presented a range of dimensions and indicators with different levels of depth and measurement objectives. While theoretical and empirical studies often offer detailed descriptions and frameworks that may not be easily implementable in practice, empirical articles and tourism organizations like INSTO tourism observatories take a more practical approach, providing dimensions and indicators that can be applied to different destinations. Therefore, the INSTO framework stands out for its detailed descriptions of each dimension and indicator's measurement objectives and flexibility to incorporate functional areas. This makes it a valuable foundation for developing an ongoing framework for destination assessment.

3. Materials and methods

Numerous frameworks to evaluate the sustainable development of tourism destinations were reviewed, alongside a literature review highlighting the complexities in selecting dimensions and indicators. It emerged that comparisons between frameworks were challenging due to their tailored designs to specific destinations. Consequently, adopting a pre-existing framework without customization to the unique characteristics of the Algarve was considered unsuitable.

The INSTO framework, comprising eleven mandatory dimensions and optional areas to assess the sustainable tourism development of a destination, promised improved usability for various stakeholders and was thus considered most suitable for the continued sustainable tourism assessment of the Algarve. The following dimensions were chosen: *Economic Dimension*, *Sociocultural Dimension*, *Environmental Dimension*, and *Destination Management*. The literature review showed that a small number of broader dimensions under which subdimensions and indicators are grouped makes frameworks easier to comprehend and thus incorporable into tourism policies and operations. As the framework developed for this research aims to be accessible to academics and stakeholders, the division of the framework into *dimensions* and *areas* (sub-dimensions) was chosen. The identified 17 areas (Figure 1) were grouped under the four dimensions, further discussed in section 4.2.

The indicators to observe and monitor the level of sustainable tourism development in the Algarve were chosen as the second step. A comprehensive list of indicators utilized in assessment frameworks was gathered by reviewing studies on sustainable indicators. Furthermore, the indicators used by European projects and tourism observatories, such as STOST (2021), STO Mallorca (2022), and CROSTO (2021), were consulted. The complete list of indicators was reviewed, and those not applicable to measure sustainable

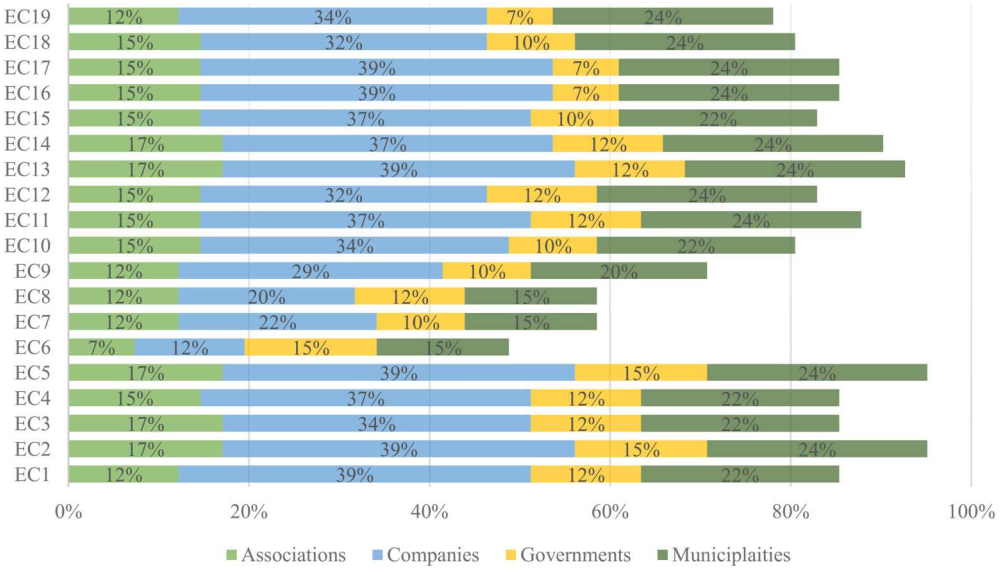

Figure 1. Conceptual framework assessing the sustainable tourism development of the Algarve.

tourism development in the Algarve were excluded. Furthermore, indicators with unclear goals and definitions were eliminated. Then, duplicate indicators and those measuring similar items were grouped and, where applicable, given a more appropriate name, highlighting the details of the revised classification.

The exclusion and regrouping yielded a more concise list of indicators that were probed further by applying the criteria: relevance, clarity, feasibility, complementarity, comprehensiveness, credibility, comparability, and role in measuring the sustainable development of the Algarve. Best practices and learning from INSTO, ETIS, and tourism observatories were also considered when adjusting the number of indicators. The outlined careful selection procedure produced a list of 52 indicators grouped under 17 areas and four dimensions.

As the third step, an online survey was applied to stakeholders in the Algarve in the fall of 2021 to purify the identified 52 indicators. The indicators divided into four dimensions are included in Appendix Table A. Public authorities and private tourism businesses, such as accommodation providers, tour operators, transfer providers, attractions, vehicle rental providers, DMOs (Destination Management Organizations), foundations, associations, and governmental organizations, were the population targeted to validate the indicators. The sample was chosen based on an existing dataset from a prior project financed by the European Regional Development Fund that identified the tourism stakeholders in the Algarve region. Consequently, all stakeholders with accessible email addresses in the dataset were invited to participate ($N = 701$).

Before starting the survey to 701 stakeholders in the Algarve, the questionnaire was reviewed by the Algarve Tourism Board assembly members. As Scuttari et al. (2023) mentioned, the regional Tourism Board, owing to its close ties with local stakeholders, possesses a heightened awareness of the industry's requirements. This proximity enables them to offer valuable insights regarding pertinent areas and potential indicators. The link to the

online survey was sent via email. The invitation to the survey included an explanation of the research purpose and information related with the confidentiality of responses. Participants were asked to determine their stakeholder group (municipality, association/ foundation, government organization, institution of a cultural or educational nature, or company). All stakeholders were informed about evaluating and validating each indicator's suitability for assessing sustainable tourism development in the Algarve. The questionnaire asked respondents to rate each indicator's suitability in assessing the sustainable tourism development of the Algarve on a 5-point Likert scale, ranging from (1) "not important" to (5) "extremely important." The questionnaire included an open-ended question under each area to allow space for respondents to add essential indicators not yet included.

4. Results

4.1. Results of the survey

This section discusses the weightings attributed to each indicator in the stakeholders' survey. The first part highlights the overall results per dimension, followed by an analysis per stakeholder group. A total of 42 survey responses were received, of which 18 belong to companies, seven to associations and foundations, 10 to municipalities, and six to government bodies. The survey's results of the 5-point Likert scale answer choices are presented in percentages in a range from 0% to 100%. The results per indicator and stakeholder group are analyzed by assigning one of three categories, "high importance" (over 75%), "medium importance" (between 50% and 75%), and "low importance" (under 50%).

The first section of the results focuses on the accumulated scores across all stakeholder groups. The results show that almost all indicators score in the "high importance" (29) and "medium importance" (20) categories. Only three indicators receive low-importance scores. Two of these indicators belong to the mobility area, "EV14 – number of passengers embarked and disembarked from cruise ships" (47.5%) and "EV13 – movement of passengers on Inland waterways" (38.5%); and one to the gender equality area "S7 – percentage of men and women employed in the tourism sector" (48.8%). The lower support for these indicators could be explained by the tourism organizations or bodies not having direct touchpoints with cruise tourism or passengers from inland waterways. The reduced interest in gender-specific factors should be further analyzed in follow-up studies.

In feedback gathered from municipalities, "high importance" ratings were consistently assigned to nearly all indicators, with only two indicators receiving "low importance" scores, mirroring the overall findings (EV13 and EV14). This suggests a broad consensus within this stakeholder group regarding the relevance of the proposed indicators. Conversely, responses from governmental bodies indicated the lowest ratings across all indicators. Only 11 indicators within the economic dimension received "high importance" ratings, while 28 were rated as "low importance." Figure 2 provides an overview of the overall importance scores of the Economic indicators split by stakeholder group. The full description of each indicator is included in Appendix Table A.

Among all dimensions, the economic indicators demonstrate the strongest validation scores, with the leading indicators "relative contribution of tourism in the region to the regional and national economy" (EC2) and "average daily expenditure per tourist" (EC5)

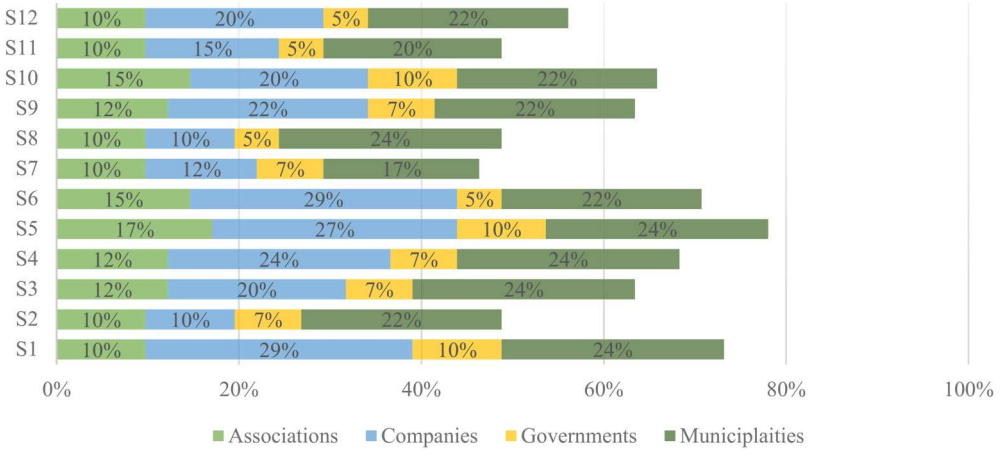

Figure 2. Importance of economic indicators by stakeholder group.

achieving a level of importance of 95.2%. The notable success of these indicators can be attributed to the scores given by three out of four survey subgroups (associations, municipalities, and governmental organizations). Conversely, the stakeholder segment representing government bodies offers the fewest validations, focusing solely on assigning "high-importance" ratings to economic indicators.

Figure 3 shows that the sociocultual indicator that received the highest level of importance was "S5-Percentage of residents that are satisfied with the impacts of tourism on the destination's identity". Sociocultural indicators did not receive "high importance" ratings from companies. Moreover, among the lowest-scoring indicators in company responses, six belonged to the sociocultural dimension. These findings suggest that tourism companies in the Algarve prioritize economic factors over social

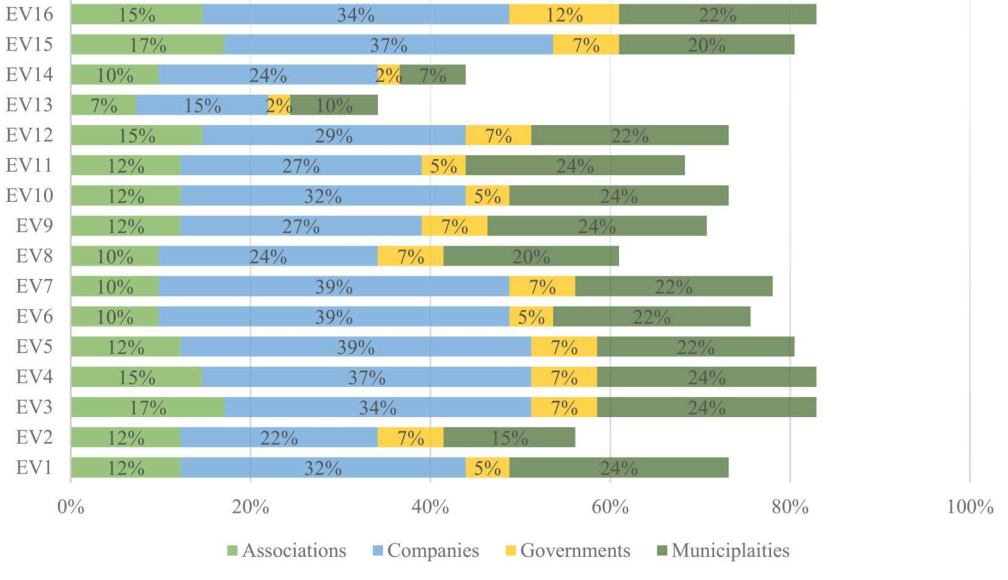

Figure 3. Importance of sociocultural indicators by stakeholder group.

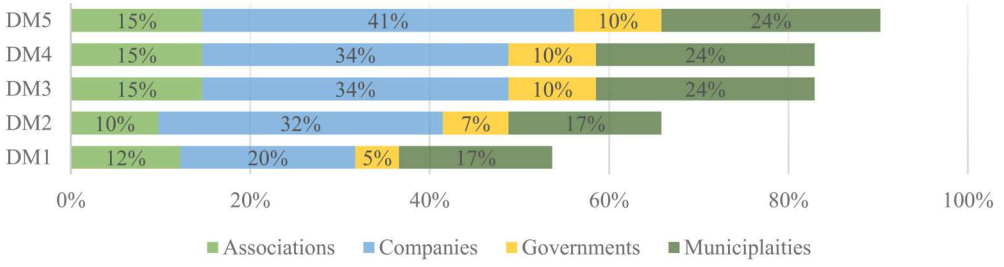

Figure 4. Importance of environmental indicators by stakeholder group.

ones. Interestingly, municipalities emerge as the sole stakeholder segment to validate all sociocultural indicators, rating eleven as "high important" and one as "mendium important".

Figure 4 shows that the three environmental indicators that received the highest level of importance were "EV3- Percentage of energy consumption produced by renewable sources in relation to total energy consumption", "EV4- Percentage of companies adopting energy efficiency measures" and "EV16- Air quality index". Governmental bodies give the environmental dimension indicators the lowest overall scores, rating only two (EV1 and EV8) as "medium important," while the other 14 are deemed "low-importance." Conversely, municipalities exhibiting the highest validation scores among all groups assign "high importance" ratings to 14 of 16 indicators. As mentioned, the two indicators receiving "low importance" scores align with the overall results (EV13 and EV14).

The dimension of destination management features a limited number of indicators, with two notable indicators receiving low-importance ratings (Figure 5). Firstly, companies and governmental bodies rated DM1 as the "percentage of companies and tourist establishments using voluntary certification of environmental sustainability or corporate social responsibility" poorly. It is worth noting that for both stakeholder groups, only a minority ranked this indicator with an importance score exceeding 50%, with eight out of 18 companies and two out of six governmental body respondents doing so. Similarly, DM2, the "percentage of establishments providing training on sustainable practices," fell into the low-importance segment for governmental bodies, rated higher than 50% by only three out of the six respondents.

To summarise, the overall validation results per indicator demonstrate a high level of importance. However, a closer examination of the assessment of each indicator per stakeholder segment reveals distinct patterns. Tourism companies in the Algarve prioritize economic indicators, while this group considers sociocultural indicators the least important. In contrast, municipalities assign high importance scores across all indicators, comprehensively considering all sustainability dimensions. It is essential to note the relatively small sample size, with 42 responses, including only seven from associations and foundations and six from government bodies. Therefore, scrutiny of the validation results for each indicator per stakeholder group is necessary. Considering the overall validation scores, segment-specific assessments, and the number of respondents, the initial indicator list appears suitable for application in the proposed framework for continuous tourism assessment in the Algarve.

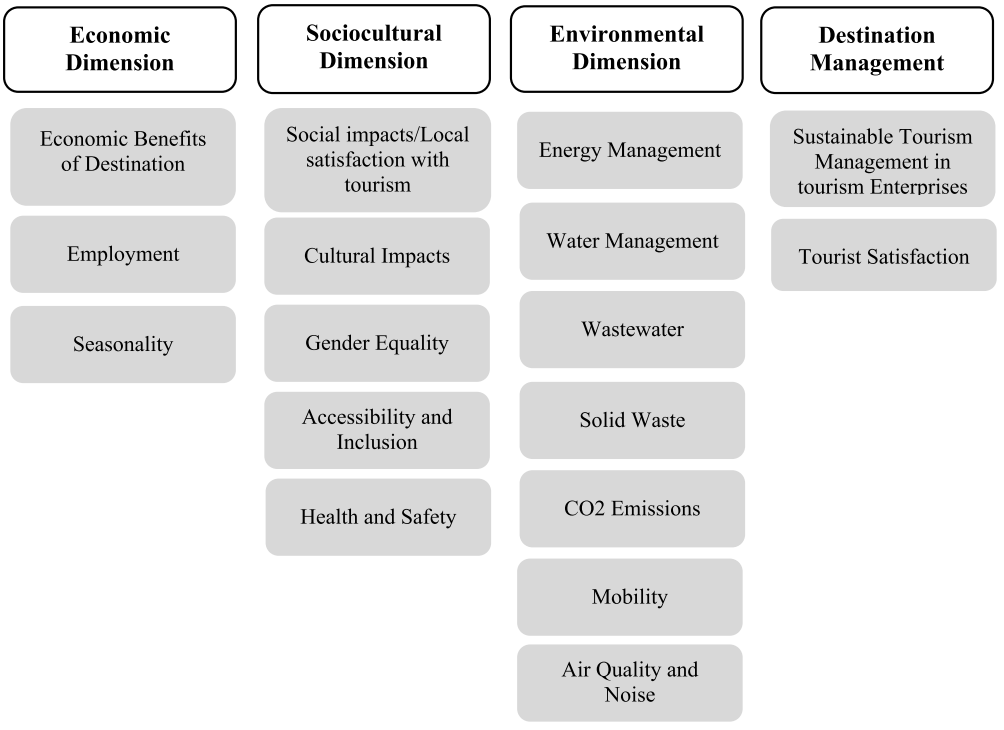

Figure 5. Importance of destination management indicators by stakeholder group.

4.2. Framework for sustainable tourism assessment of the algarve

This section presents the framework developed to assess the sustainability of the sun, sea, and sand destination, the Algarve. As already discussed in the methodology section, findings from literature and organizational guidelines were considered during composition. The following part will highlight the final changes made to the indicators based on the survey results discussed in previous sections.

The framework comprises four sustainable dimensions, 17 *mandatory areas*, and 50 indicators. Two indicators, "percentage of companies adopting energy efficiency measures" (EV4) (energy management) and "percentage of companies promoting the efficient use of water in their operations" (EV7) (water management), were excluded from the final list due to their vague definition and thus inability to produce appropriate data. The indicators EV1, EV5, EV10, and EV12 underwent slight adjustments and name changes to reflect their measurement objectives better and enhance users' clarity. It is important to emphasize that the framework is not rigid but adaptable and open to modification and refinement as needed. Serving as the inaugural tool, this framework enables continuous assessment of the Algarve as a tourism destination.

5. Discussion

This article thoroughly examined sustainable tourism dimensions and indicators to craft a framework for assessing sustainable tourism development in the Algarve. Literature and

European framework analysis revealed various indicators and dimensions utilized in destination assessments. A robust model is created, drawing upon insights and best practices from scholars and organizations while considering the unique characteristics of the Algarve and available data collection opportunities.

Crucial elements highlighted in the development of sustainable assessment frameworks, such as destination tourist segments and environmental characteristics (Blancas et al., 2018), were carefully considered in this study. Additionally, incorporating dynamic and static indicators (Blancas et al., 2018) and an interdisciplinary approach (Sharia & Sitchinava, 2023) were considered in shaping the framework's dimensions and indicators.

A list of indicators utilized to assess sustainable tourism development was created and reduced by the following selection criteria: relevance, clarity, feasibility, complementarity, comprehensiveness, credibility, and comparability. Several studies from tourism scholars (Asmelash & Kumar, 2019; Blancas et al., 2011, 2016; Cernat & Gourdon, 2012; Choi & Sirakaya, 2006; Crotts et al., 2022; Fennell, 2007; Fernández & Rivero, 2009; Guerreiro & Seguro, 2018; Islam et al., 2021; Ivars-Baidal et al., 2023; Kristjánsdóttir et al., 2018; Lee et al., 2021; Modica et al., 2018; Nash et al., 2018; Ólafsdóttir, 2021; Pérez et al., 2017; Rama et al., 2021; Rasoolimanesh et al., 2020; Roberts & Tribe, 2008; Vázquez et al., 2021), Tourism Observatories (CROSTO, 2021; OTB, 2022; STO Mallorca, 2022; STOST, 2021) and organizations (European Commission, 2016; Global Sustainable Tourism Council, 2019; UNWTO, 2016) have been reviewed to create a robust list of indicators applicable to the Algarve. The developed list of 52 indicators, among four dimensions, economic, sociocultural, environmental, and destination management, was further probed for validity by a survey of stakeholders in the Algarve. The survey showed that stakeholders apply varying importance to the sustainability dimensions, as concluded by previous scholars (Rasoolimanesh et al., 2020). While companies viewed the sociocultural dimension as less critical, municipalities significantly emphasized all its indicators. In light of survey findings and to enhance precision in data collection, the indicator list was trimmed down to 50. Additionally, some indicator names underwent revisions to ensure accuracy and clarity. This framework represents a crucial initial advance towards the ongoing assessment of sustainable tourism in the Algarve. It marks a significant advancement in theoretical understanding, serving as the inaugural model tailored specifically to this region. Notably, it offers practical utility for tourism authorities and organizations operating within the area, facilitating their efforts in sustainable tourism management.

However, an inherent limitation of the framework is its lack of adaptability to other destinations without necessary modifications. As Blancas et al. (2018) highlighted, customizing an assessment framework to suit a specific destination is imperative. Hence, every aspect of the framework discussed in this article has been tailored to align with the distinct characteristics of the Algarve and its sustainable tourism development. Future research recommendations encompass the practical implementation of the framework in assessing sustainable tourism development in the Algarve. Moreover, creating and disseminating a decision support system tailored for regional stakeholders will further bolster its practical application. It is essential to highlight that this model can be adapted for other tourism destinations that share characteristics with the Algarve, such as sun, sea, and sand destinations. However, evaluating each indicator separately is

essential to ensure its relevance to the specific destination in question. As mentioned earlier, developing an assessment model for sustainable tourism requires customized efforts tailored to the unique attributes of each destination.

6. Conclusion

This article has comprehensively explored sustainable tourism dimensions and indicators, culminating in developing a robust framework for assessing sustainable tourism development in the Algarve region. Through a meticulous analysis of literature and European frameworks, a rich array of dimensions and indicators for destination assessments were uncovered and incorporated into the model.

Leveraging insights from various studies and organizations, a comprehensive list of 52 indicators spanning economic, sociocultural, environmental, and destination management dimensions was curated. Validation through stakeholder surveys highlighted varying perceptions of sustainability dimensions, leading to refining the indicator list to 50 items. This framework represents a significant stride in understanding and managing sustainable tourism in the Algarve, offering practical utility for local authorities and organizations. Nevertheless, the framework's lack of adaptability to other destinations without necessary modifications poses a limitation. As emphasized in prior research, customization to suit specific destinations is paramount. Hence, the framework's design is intricately tailored to the distinctive attributes of the Algarve and its sustainable tourism development.

Future research endeavors should focus on the practical implementation of the framework in assessing sustainable tourism in the Algarve, including creating and disseminating a decision support system tailored for regional stakeholders. Additionally, studies should focus on stakeholder engagement, long-term impact assessment, and comparative analyses with similar destinations. Recommendations for practical application include training and capacity building, establishing monitoring and evaluation systems, fostering knowledge-sharing platforms, and ensuring adaptation and flexibility. Integrating technological solutions like digital tools and decision support systems can enhance the framework's effectiveness. By heeding these implications and recommendations, stakeholders can maximize the framework's utility in achieving sustainable tourism goals while safeguarding the Algarve's economic, natural, and sociocultural features.

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