RBTUR
Revista Brasileira de Pesquisa em Turismo

ANPTUR
ASSOCIAÇÃO NACIONAL DE PESQUISA E PÓS-GRADUAÇÃO EM TURISMO

ISSN 1982-6125

Articles - Tourism Management

Sustainability Assessment Matrix for Wine Tourism (SAMWT)

Matriz de Avaliação da Sustentabilidade do Enoturismo (SAMWT)

Matriz de Evaluación de la Sostenibilidad para el Enoturismo (SAMWT)

Joice Lavandoski[1], Hernanda Tonini[2], Gabriel Santos García[3], Marcelino de Souza[4], Jesús Enrique de las Heras Roger[5], David Padrón Marrero[5]

[1]Federal University of the State of Rio de Janeiro (UNIRIO), Rio de Janeiro, RJ, Brazil.
[2]Federal Institute of Rio Grande do Sul (IFRS), Bento Gonçalves, RS, Brazil.
[3]Canary Islands Chair of Agrotourism and Enotourism (ICCA/ULL), Santa Cruz de Tenerife, Spain.
[4]Federal University of Rio Grande do Sul (UFRGS), Porto Alegre, RS, Brazil.
[5]University of La Laguna (ULL), Santa Cruz de Tenerife, Spain.

Keywords:

Wine tourism;
Sustainability indicators;
Wineries;
Sustainable practices;
Evaluation matrix.

Abstract

Sustainability has become a permanent global priority in a competitive and dynamic market, requiring companies and governments to rethink their economic, social, environmental, territorial, and governance strategies. In the field of wine tourism, studies that assess sustainability in an objective and multidimensional manner are still in their infancy. The overall objective of this article is to propose an assessment matrix as a theoretical-practical tool to measure the sustainability of wine tourism at wineries. Based on an integrative literature review supported by the PRISMA protocol, it was possible to construct the Sustainability Assessment Matrix for Wine Tourism (SAMWT), which brings together 72 indicators across five dimensions of sustainability in wine tourism: economic, social, environmental, territorial, and institutional governance. The matrix offers a self-assessment of sustainable practices in wine tourism, allowing for the evaluation of wineries' performance toward sustainability. The application of this organizational checklist can encourage managers to design more sustainable, competitive, and inclusive wine tourism experiences and models.

Palavras-chave:

Enoturismo;
Indicadores de sustentabilidade;
Vinícolas;
Práticas sustentáveis;
Matriz de avaliação.

Resumo

A sustentabilidade tornou-se uma prioridade global permanente em um mercado competitivo e dinâmico, exigindo que empresas e governos repensem suas estratégias econômicas, sociais, ambientais, territoriais e de governança. No âmbito do enoturismo, os estudos que avaliam a sustentabilidade de forma objetiva e multidimensional ainda são incipientes. O presente artigo tem como objetivo geral propor uma matriz de avaliação, enquanto ferramenta teórico-prática, para mensurar a sustentabilidade do enoturismo em vinícolas. Com base em uma revisão integrativa da literatura apoiada no protocolo PRISMA, foi possível construir a Matriz de Avaliação da Sustentabilidade do Enoturismo (SAMWT) que reúne 72 indicadores em cinco dimensões da sustentabilidade no enoturismo: econômica, social, ambiental, territorial e governança-institucional. A matriz oferece uma autoavaliação de práticas sustentáveis no enoturismo, permitindo avaliar o desempenho das vinícolas em direção à sustentabilidade. A aplicação deste *checklist* organizacional pode estimular os gestores a conceber experiências e modelos de enoturismo mais sustentáveis, competitivos e inclusivos.

Palabras clave:

Enoturismo;
Indicadores de sostenibilidad;
Bodegas;
Prácticas sostenibles;
Matriz de evaluación.

Resumen

La sostenibilidad se ha convertido en una prioridad global permanente en un mercado competitivo y dinámico, lo que exige que las empresas y los gobiernos se replanteen sus estrategias económicas, sociales, medioambientales, territoriales y de gobernanza. En el ámbito del enoturismo, los estudios que evalúan la sostenibilidad de forma objetiva y multidimensional aún se encuentran en una fase incipiente. El objetivo general del presente artículo es proponer una matriz de evaluación, como herramienta teórico-práctica, para medir la sostenibilidad del enoturismo en las bodegas. A partir de una revisión integradora de la literatura basada en el protocolo PRISMA, se ha podido construir la Matriz de Evaluación de la Sostenibilidad del Enoturismo (SAMWT), que reúne 72 indicadores en cinco dimensiones de la sostenibilidad en el enoturismo: económica, social, ambiental, territorial y de gober-

Peer-reviewed.
Received: 10/04/2026
Approved: 26/08/2026
Editor: Glauber Eduardo de Oliveira Santos.

nanza-institucional. La matriz ofrece una autoevaluación de las prácticas sostenibles en el enoturismo, lo que permite evaluar el desempeño de las bodegas en materia de sostenibilidad. La aplicación de esta lista de verificación organizativa puede animar a los gestores a diseñar experiencias y modelos de enoturismo más sostenibles, competitivos e inclusivos.

How to Cite: Lavandoski, J. *et al*. (2026). Matriz de Avaliação da Sustentabilidade do Enoturismo (SAMWT). *Revista Brasileira de Pesquisa em Turismo, São Paulo,* 20, e-3539, 2026. https://doi.org/10.7784/rbtur.v20.3539

1 INTRODUCTION

In the twenty-first century, sustainability has become increasingly important in business and government, particularly as a result of the 2030 Agenda for Sustainable Development, which establishes 17 Sustainable Development Goals (SDGs) to be achieved by 2030 (UN, 2025). Sustainability has thus become a historical, legal and strategic framework for the contemporary world.

There is a consensus in global society that the principles of sustainability are not limited to economic growth and the preservation of natural resources. Sustainability must also encompass the valorisation and conservation of cultural resources and values, the provision of social benefits for people within the territory (the local community, tourists, business and government sectors, including employees, among others), and governance as a political and social mechanism (Sachs, 1995).

In the field of tourism, the multidimensional perspective of sustainability poses challenges due to the complexity of the phenomenon (Mendoza Jiménez & Hernández Martín, 2017; Torres-Delgado & López Palomeque, 2014). It is essential to encourage businesses and public bodies to adopt sustainability principles and to raise public awareness of the issue. Such actions generate mutual and integrated long-term benefits for the economy, the environment and society within a given territory.

In line with trends towards sustainability, the wine sector has increasingly sought alternatives to improve its practices with a view to developing a healthier relationship with nature and the territory. However, beyond aspects related to wine production, wineries must consider implementing sustainable practices in the context of wine tourism, taking into account the inherent characteristics of this type of tourism, which consists of experiences centred around grapes, wine and the producing region. In this regard, studies argue that sustainability in wine tourism is fundamental for wineries to achieve competitive advantage and promote regional development (Martínez-Falcó *et al.*, 2024a, 2024b, 2024c; Martínez-Falcó *et al.*, 2025; Nave *et al.*, 2021a, 2021b; Nave & do Paço, 2023; Trindade *et al.*, 2022).

Despite the growing number of studies published on sustainability in wine tourism (Trindade *et al.*, 2022), the scientific literature still lacks indicators capable of objectively assessing how sustainable wine tourism activity is across its different dimensions. Recent research has moved in this direction (ACEVIN, 2023; COVIAR, 2025; Duarte Alonso *et al.*, 2022; Juste Carrión & Aleixandre Mendizábal, 2022; Nave & do Paço, 2023). There are also studies applied to the wine sector that require adaptation to the tourism service context (Flores, 2015; Flores & Medeiros, 2016; Morandi & Zinno, 2025), as well as research that can contribute to further reflection on wine tourism (Mendoza Jiménez & Hernández Martín, 2017; Torres-Delgado & López Palomeque, 2014).

Against this background, the general objective of this article is to propose an assessment matrix, as a theoretical and practical tool, to measure the sustainability of wine tourism in wineries. The specific objectives are: (1) to develop a set of indicators that enable wine tourism sustainability to be measured from a multidimensional perspective; and (2) to correlate sustainable wine tourism practices with the United Nations Sustainable Development Goals (SDGs), in order to support business decision-making.

The methodology involves an Integrative Literature Review (ILR), conducted in accordance with the PRISMA (2020) protocol, to construct the Sustainability Assessment Matrix for Wine Tourism (SAMWT), which comprises 72 indicators analysing five dimensions of sustainability. The matrix provides the possibility of diagnosing the sustainability practices adopted in wine tourism. Sustainability measurement tools can be effective in decision-making processes relating to organisational planning and management and the management of wine tourism destinations (Torres-Delgado & López Palomeque, 2014), aimed at achieving sustainable, competitive and inclusive business models.

The originality of this study lies in providing scientific evidence derived from an ILR and in its alignment with the SDGs, thereby enabling the development of a multidimensional theoretical and practical tool for assessing sustainability in wineries operating in the wine tourism segment. This tool encompasses five dimensions: economic, social, territorial, environmental and institutional governance.

The following section presents the theoretical framework, divided into two parts: the first addresses sustainability in the context of wine tourism, while the second discusses studies on the multidimensional measurement of sustainability using indicators. The theoretical framework is followed by the methodology, results and discussion, final considerations, and references.

2 THEORETICAL FRAMEWORK

2.1 Sustainability in wine tourism

Wine tourism is a segment of cultural and gastronomic tourism in which motivations are linked to the world of wine and to the cultural and heritage elements of wine-growing territories (Tonini *et al.*, 2022). It encompasses visits to vineyards and wineries, participation in festivals and exhibitions, wine tasting, and the pursuit of knowledge about traditions associated with wine (Hall *et al.*, 2000). In addition to its experiential dimension, wine tourism serves as a marketing strategy for wineries, supporting sales, customer loyalty and brand reputation, as well as a driver of territorial development, with impacts on job creation, the valorisation of cultural heritage and the promotion of wine tourism destinations (Alant & Bruwer, 2004; Hall *et al.*, 2000).

Given the different implications of wine tourism development for the territory, considering its sustainability involves the planning and management of economic, sociocultural, environmental, territorial and governance strategies. Wine tourism sustainability in wineries is achieved through synergies between resource-efficiency practices and marketing and tourism service management strategies aimed at balancing economic growth, environmental preservation and social equity (Yildiz, 2004). Lockshin and Corsi (2020) highlight the need for more profitable and sustainable business models for wineries of different sizes, which requires the economic viability of tourism operations, the environmental management of resources, economic and social resilience, and the conservation and valorisation of *terroir*.

The adoption of these models requires joint and consistent action by public bodies, the private sector and society (Trindade *et al.*, 2022). Practices planned by wineries, in coordination with different stakeholders to develop public–private partnerships (Trindade *et al.*, 2022), can foster local job creation and help overcome limitations associated with small scale (Karagiannis & Metaxas, 2020; Yildiz, 2004).

Wine tourism can be regarded as a strategic resource for achieving winery sustainability and competitiveness (Martínez-Falcó *et al.*, 2024a, 2024b, 2024c; Martínez-Falcó *et al.*, 2025). Research shows that wine-related tourism activities promote green innovation —in products and organisational processes— and sustainable performance across the social, economic and environmental dimensions of Spanish wineries (Martínez-Falcó *et al.*, 2024a, 2024c). In this regard, wine tourism represents an opportunity to diversify the business, increase competitiveness, promote social wellbeing, facilitate environmental management, foster territorial development and encourage innovation.

Recent studies have analysed the benefits of and barriers to adopting sustainable practices in Portuguese wineries (Nave & do Paço, 2023; Nave *et al.*, 2021b). Adoption is driven by internal and external pressures, with the main identified benefits being stronger customer relationships and cost reductions. According to the authors, financial constraints do not constitute a barrier to implementing such practices. Baird *et al.* (2018) examine the challenges and motivations underlying the adoption of sustainable practices by New Zealand wine producers. Their findings indicate that wine tourism is one of the business strategies pursued by wine producers; however, there is a disconnect between wineries' sustainability practices and their engagement in tourism. Furthermore, wineries' sustainability practices are institutionally driven through the national export-oriented organisation, rather than by tourism or by the emphasis that wineries themselves might place on sustainability (Baird *et al.*, 2018).

There is no doubt that wine tourism has considerable potential to promote regional development (Nave *et al.*, 2021a, 2021b; Nave & do Paço, 2023). Research conducted in the Douro (Trigo & Silva, 2022) and Greece (Karagiannis & Metaxas, 2020) shows that wine tourism can help prevent tensions, friction and feelings of exclusion among residents when the growth of the activity generates negative impacts that outweigh the benefits perceived

by the community. These studies emphasise the need to consult residents, respect the territory's carrying capacity, create local employment opportunities and incorporate residents' needs into business planning.

Wineries seek social legitimacy through ethical and responsible business practices, and wine tourism can play an important role by fostering transparency regarding their mission, vision, values and organisational actions. By welcoming visitors to their premises, wineries establish a direct connection between visitors and the local community. This provides an opportunity to demonstrate their commitment to the efficient management of natural resources, appropriate working conditions and fair wages for employees, as well as to improvements in corporate image (Martínez-Falcó *et al.*, 2024c).

The adoption of sustainable wine tourism practices aligned with the SDGs provides an opportunity to integrate the different dimensions of sustainability into business models. Juste Carrión and Aleixandre Mendizábal (2022) discuss the increasing integration of environmental, economic and social sustainability into practices within the Spanish wine sector, in alignment with the SDGs, and the role of wine tourism as a factor in diversification and territorial valorisation. Karagiannis and Metaxas (2020), in turn, explore a range of organisational practices and innovative management tools aligned with the SDGs that can be adopted by Greek wineries (such as inclusive and equitable education during visits and through virtual materials, accessibility, etc.).

Sustainability in wine tourism should also focus on reducing the carbon footprint generated by wine production and the movement of goods, inputs and people (Sun & Drakeman, 2020); preserving native fauna and flora (Tafel *et al.*, 2024); using renewable energy in facilities; and adopting circular economy practices in waste management (Martínez-Falcó *et al.*, 2024b; Yildiz, 2004), among other aspects. In addition, carrying capacity must be taken into account to avoid potential environmental and cultural degradation caused by visitor flows in rural and urban wine regions (Duarte Alonso *et al.*, 2020; Yildiz, 2004).

Studies assessing visitors' and wine consumers' perceptions of sustainable practices reveal motivations for visiting and factors leading to brand loyalty (Gastaldello *et al.*, 2024; Vecchio, *et al.*, 2024). Vecchio *et al.* (2024), for example, found that young Italian and French adults are motivated by sustainability certifications and biodiversity preservation when choosing wine tourism products and experiences. These findings can inform the development of wineries' product and experience portfolios by offering products and experiences that address the interests of different wine tourism consumer profiles.

In light of the above, the following section presents studies on sustainability measurement from a multidimensional perspective, providing insights for its application in the context of wine tourism.

2.2. Measurement of sustainability in wine tourism

Indicator-based measurement studies consist of systematic approaches to quantifying and assessing the sustainable performance of businesses or destinations by integrating different dimensions of sustainability. These studies arise from the need to operationalise theoretical models such as the triple bottom line. They use tools such as indicator systems, checklists and indicator matrices, which make it possible to diagnose sustainability levels and establish performance rankings, while also providing an objective tool to support decision-making, monitor impacts and guide tourism planning and policies (ACEVIN, 2023; De Alencar *et al.*, 2025; Tasso & Nascimento, 2022).

With regard to tourism activity, there are several references in this field. These include the initiatives proposed by UN Tourism (UN Tourism 2026): *Measuring the Sustainability of Tourism* and *Achieving the Sustainable Development Goals through Tourism - Toolkit of Indicators for Projects* (UN Tourism, 2023). Another example is the European Tourism Indicator System for the sustainable management of tourism destinations developed by the European Commission (European Commission, 2016).

In Brazil, examples include the Tourism Sustainability Mandala (Tasso & Nascimento, 2022), as well as studies proposing a process for assessing sustainability in tourism activity (Dias e Cordeiro *et al.*, 2009; Dias e Cordeiro *et al.*, 2010) and literature review studies (De Alencar *et al.*, 2025; Sanches *et al.*, 2018).

Given the extensive literature on this subject in the field of tourism, the present study selected the main studies derived from the ILR conducted in the field of wine tourism sustainability, which is detailed in the Methodology section, together with other studies identified after the ILR. The studies presented in Chart 1 focus, in terms of both their objectives and the central emphasis of their analyses, on the multidimensional measurement/assessment of

sustainability, that is, on more than one dimension of sustainability. Chart 1 identifies the objective of each study, the sustainability dimensions analysed, methodological details and their correlation with the SDGs.

Chart 1 - Studies on the multidimensional measurement of sustainability in the context of wine tourism (continue)

Reference	Study objective	Sustainability dimensions analysed	Study setting	Data collection instrument and measurement scale	Relationship with the SDGs
ACEVIN (2023)	Presents sustainable wine tourism best practices implemented by the Wine Routes of Spain.	Economic, social and environmental	Wineries on the Wine Routes of Spain	Technical assessment form. Two-level scale: meets the criterion / does not meet the criterion.	Yes
Baird, Hall & Castka (2018)	Examines the attitudes and behaviours of New Zealand wine producers towards wine tourism and sustainable viticulture practices.	Dimensions not identified	New Zealand wineries	Online questionnaire. 5-point Likert scale.	No
COVIAR (2025)*	Assesses wine tourism performance using a set of sustainable tourism indicators.	Economic, social, cultural, environmental and governance	Argentine wineries	Instrument not specified. Three-level scale: basic, medium and high.	Yes
Duarte Alonso, Bressan, Kok & O'Brien (2021)	Examines sustainable practices among wineries offering wine tourism experiences.	Environmental, social, economic and cultural	Argentine and Chilean wineries	Interviews. Four-level scale: full glass, three-quarter-full glass, half-full glass and quarter-full glass.	No
Flores (2015)	Proposes a protocol for integrating sustainability principles into Brazilian viniculture, using a territorial approach.	Environmental, economic, social, political-institutional and territorial	Brazilian wineries	BaccuS protocol. Three-level scale: green, yellow and red.	No
Flores & Medeiros (2016)	Presents BaccuS, a framework for internalising sustainable development in the wine industry.	Environmental, economic, social, political-institutional and territorial	Brazilian wineries	BaccuS protocol. Three-level scale: green, yellow and red.	No
Karagiannis & Metaxas (2020)	Explores the development of sustainable wine tourism in the Greek region of the Peloponnese by analysing the practices of local wineries, focusing on their relationship with sustainability and innovation.	Economic, environmental and social	Wineries on the Peloponnese Wine Route (Greece)	Questionnaire. Scale not identified.	Yes
Martínez-Falcó, Marco-Lajara, Zaragoza-Sáez & Sánchez-García (2024a)	Analyses the impact of wine tourism on wineries' sustainable performance.	Economic, social and environmental	Spanish wineries	Online questionnaire. 7-point Likert scale.	No
Martínez-Falcó, Sánchez-García, Marco-Lajara & Millán-Tudela (2024c)	Explores how wine tourism in Spanish wineries enhances their sustainable performance, examining the mediating role of corporate social legitimacy and green innovation in this relationship.	Environmental, social and economic	Spanish wineries	Online questionnaire. 7-point Likert scale.	No
Nave & do Paço (2023)	Identifies barriers to the implementation of sustainable practices and the benefits achieved by wine tourism firms that implement these practices.	Environmental, economic and social	Portuguese wineries	Online questionnaire. 7-point Likert scale.	No
Nave, Laurett & do Paço (2021b)	Investigates the adoption of sustainable practices by Portuguese wine tourism firms, analysing the relationships between antecedents, barriers and consequences.	Environmental, economic and social	Portuguese wineries	Online questionnaire. 7-point Likert scale.	No

Chart 1 - Studies on the multidimensional measurement of sustainability in the context of wine tourism (continue)

Reference	Study objective	Sustainability dimensions analysed	Study setting	Data collection instrument and measurement scale	Relationship with the SDGs
ACEVIN (2023)	Presents sustainable wine tourism best practices implemented by the Wine Routes of Spain.	Economic, social and environmental	Wineries on the Wine Routes of Spain	Technical assessment form. Two-level scale: meets the criterion / does not meet the criterion.	Yes
Baird, Hall & Castka (2018)	Examines the attitudes and behaviours of New Zealand wine producers towards wine tourism and sustainable viticulture practices.	Dimensions not identified	New Zealand wineries	Online questionnaire. 5-point Likert scale.	No
COVIAR (2025)*	Assesses wine tourism performance using a set of sustainable tourism indicators.	Economic, social, cultural, environmental and governance	Argentine wineries	Instrument not specified. Three-level scale: basic, medium and high.	Yes
Duarte Alonso, Bressan, Kok & O'Brien (2021)	Examines sustainable practices among wineries offering wine tourism experiences.	Environmental, social, economic and cultural	Argentine and Chilean wineries	Interviews. Four-level scale: full glass, three-quarter-full glass, half-full glass and quarter-full glass.	No
Flores (2015)	Proposes a protocol for integrating sustainability principles into Brazilian viniculture, using a territorial approach.	Environmental, economic, social, political-institutional and territorial	Brazilian wineries	BaccuS protocol. Three-level scale: green, yellow and red.	No
Flores & Medeiros (2016)	Presents BaccuS, a framework for internalising sustainable development in the wine industry.	Environmental, economic, social, political-institutional and territorial	Brazilian wineries	BaccuS protocol. Three-level scale: green, yellow and red.	No
Karagiannis & Metaxas (2020)	Explores the development of sustainable wine tourism in the Greek region of the Peloponnese by analysing the practices of local wineries, focusing on their relationship with sustainability and innovation.	Economic, environmental and social	Wineries on the Peloponnese Wine Route (Greece)	Questionnaire. Scale not identified.	Yes
Martínez-Falcó, Marco-Lajara, Zaragoza-Sáez & Sánchez-García (2024a)	Analyses the impact of wine tourism on wineries' sustainable performance.	Economic, social and environmental	Spanish wineries	Online questionnaire. 7-point Likert scale.	No
Martínez-Falcó, Sánchez-García, Marco-Lajara & Millán-Tudela (2024c)	Explores how wine tourism in Spanish wineries enhances their sustainable performance, examining the mediating role of corporate social legitimacy and green innovation in this relationship.	Environmental, social and economic	Spanish wineries	Online questionnaire. 7-point Likert scale.	No
Nave & do Paço (2023)	Identifies barriers to the implementation of sustainable practices and the benefits achieved by wine tourism firms that implement these practices.	Environmental, economic and social	Portuguese wineries	Online questionnaire. 7-point Likert scale.	No
Nave, Laurett & do Paço (2021b)	Investigates the adoption of sustainable practices by Portuguese wine tourism firms, analysing the relationships between antecedents, barriers and consequences.	Environmental, economic and social	Portuguese wineries	Online questionnaire. 7-point Likert scale.	No

Chart 1 - Studies on the multidimensional measurement of sustainability in the context of wine tourism (conclusion)

Reference	Study objective	Sustainability dimensions analysed	Study setting	Data collection instrument and measurement scale	Relationship with the SDGs
Trigo & Silva (2022)	Analyses sustainable viticulture practices and the potential of tourism for regional development.	Dimensions not identified	Not applicable[1]	Qualitative research. Data collection method not detailed.	No
Szolnoki, Bail, Tafel, Feher & Veith (2022)	Identifies new sustainable initiatives and resilience strategies implemented to address the COVID-19 pandemic and analyses the future prospects of wine tourism.	Environmental, social and economic	Wineries in the United States, Australia, Germany, Hungary and Romania	Semi-structured interviews.	No
Vecchio, Annunziata & Bouzdine-Chameeva (2024)	Analyses young Italian and French adults' interest in sustainable wine tourism, investigating the factors influencing their intention to participate in this activity.	Dimensions not identified	Italian and French adults	Interview and online questionnaire. 7-point Likert scale.	No
Morandi & Zinno (2025)*	Examines wineries' views and actions regarding sustainability, including their perceptions of consumers' attention to winery responsibility in sustainability issues and the barriers to adopting sustainability practices.	Environmental, social and economic	Italian wineries	Questionnaire. 5-point Likert scale.	No

Note: Studies that were not derived from the ILR but are relevant to the context of the analysis.
Source: Authors' own elaboration (2025).

As highlighted above, the studies presented in Chart 1 measure sustainability multidimensionally, generally through three dimensions, sharing the economic, social and environmental pillars. Approaches addressing territorial, governance, cultural and political-institutional contexts are also identified.

Empirical applications to wineries are the most common; however, demand can also be identified as a target population (Vecchio *et al.*, 2024).

Regarding the nature of the studies, they encompass qualitative analyses (using interviews), quantitative analyses (using questionnaires) and mixed-methods analyses. With regard to measurement scales, the studies presented include dichotomous ordinal scales (e.g. ACEVIN, 2023); scales using three levels of intensity, such as basic, medium and high (COVIAR, 2025); and colour-based scales — green (indicator in place), yellow (being implemented) and red (not identified or incipient) (Flores, 2015; Flores & Medeiros, 2016). Duarte Alonso *et al.* (2022) propose a four-level intensity scale: a full glass, encompassing all four dimensions of sustainability; a three-quarter-full glass, encompassing three dimensions; a half-full glass, for two dimensions; and a quarter-full glass, for one dimension. Five- or seven-point Likert-type scales are also used, as in Martínez-Falcó *et al.* (2024a).

Among the studies analysed, few establish any form of linkage with the SDGs (ACEVIN, 2023; COVIAR, 2025; Karagiannis & Metaxas, 2020). Establishing this correlation can provide a distinguishing feature while also enhancing the currency and applicability of the proposed analysis. Karagiannis and Metaxas (2020) integrate the SDGs into a regional development model that links the primary sector (agriculture) with the tertiary sector (tourism) in Peloponnese wineries. According to the authors, a range of sustainable practices and management tools can be adopted to achieve sustainability, for example, wineries acting as educational centres through tours and information materials that promote appreciation of the landscape and agricultural work (directly associated with SDG 4, Quality Education, and SDG 12, Responsible Consumption and Production).

Regarding the objectives of the studies presented in Chart 1, two guides developed by representative bodies in the wine sector can be identified: the Argentine Wine Corporation (COVIAR, 2025) and the Spanish Association of Wine Cities (ACEVIN, 2023). These guides comprise a set of objective indicators of mutual interest to the scientific and business communities, as they provide a diagnosis and good practices from the wine sector that can be applied to

wine tourism. The scoring system presented by COVIAR (2025) enables each establishment to identify its current level of ethical commitment and plan continuous improvements to its processes.

The BaccuS protocol proposed by Flores (2015) and Flores and Medeiros (2016) establishes five dimensions, four guidelines and 257 indicators for integrating sustainability principles into viniculture. The protocol was developed on the basis of guidelines from the International Organisation of Vine and Wine (OIV), together with other primary and secondary data. The instrument was tested in two Brazilian regions, Campanha Gaúcha and Vale do São Francisco (Flores, 2015), and can be applied both to the winery and to the territory, providing an individual assessment and/or a collective perspective.

Also noteworthy are the studies by Martínez-Falcó *et al.* (2024a, 2024c), which analyse wineries' sustainable performance; those by Karagiannis and Metaxas (2020), Martínez-Falcó *et al.* (2024c), and Baird *et al.* (2018), which address innovation, with the latter study also combining biosecurity and climate change; and the study by Vecchio *et al.* (2024), which analyses environmental attitudes, intention and social norms from the demand perspective.

The following section presents the methodology used in the present study to achieve the proposed objectives.

3 METHODOLOGY

The research is exploratory and evaluative in nature (Veal, 2011), as well as theoretical and applied, since it involves the development of a theoretical and practical tool for assessing sustainability in the business context of wineries. The assessment provided by applying the tool can support decision-making in organisational planning and management processes, with a view to adopting sustainability practices for wine tourism in wineries.

The methodological process follows the deductive method (Veal, 2011) and comprises two stages:

a) an Integrative Literature Review (ILR), based on an adaptation of the PRISMA (2020) protocol (Page *et al.*, 2021), to develop the indicators that will comprise the Sustainability Assessment Matrix for Wine Tourism (SAMWT) and enable wine tourism sustainability to be measured from a multidimensional perspective (specific objective 1);

b) expert review and alignment of the SAMWT indicators with the United Nations Sustainable Development Goals (SDGs), in order to effectively support business decision-making aimed at sustainable, competitive and inclusive business models (specific objective 2).

3.1. Integrative Literature Review (ILR)

An ILR is a type of systematic literature review that includes previous studies, theoretical and empirical studies, and qualitative and quantitative studies that synthesise a research topic (Whittemore & Knafl, 2005). The process of identifying and selecting the studies is illustrated in Appendix 1 and detailed below.

The ILR involved the selection of scientific studies based on their thematic relevance to the development of sustainability indicators applied to wine tourism in wineries. Three studies were initially consulted: the studies by Flores (2015) and Flores and Medeiros (2016), which present the BaccuS protocol, and the Guía 50 buenas prácticas en enoturismo sostenible Rutas del Vino de España [Guide to 50 Good Practices in Sustainable Wine Tourism on the Wine Routes of Spain] (ACEVIN, 2023). These studies were selected because of the breadth of the dimensions and indicators they present.

The Web of Science (WoS Core Collection) database was searched on 20 January 2025 to identify scientific articles, using the following search string: "wine touris*" AND sustainab* (Topic). The research question guiding the ILR was: what factors contribute to the sustainability of wine tourism in wineries?

The search retrieved 145 records. After refining the search (languages: English, Portuguese and Spanish; document types: articles, review articles and early access), 120 scientific articles remained. The retrieved records were exported in .ris format and screened using the Rayyan platform (2025), followed by analysis using Excel.

Eligibility criteria were applied by reading the titles, abstracts and keywords, using five inclusion criteria related to the type of study and its relevance to the research question guiding the ILR: i) theoretical and empirical articles; ii) articles focusing on wine tourism demand and supply; iii) availability of an abstract; iv) explicit presentation of the

study objectives and results in the abstract; and v) addressing the interface between wine tourism and sustainability in the objectives and in the brief results presented in the abstracts. The exclusion criterion was failure to address the interface between wine tourism and sustainability.

Following the application of these inclusion criteria, 81 scientific articles remained. In a further round of selection, the following criterion was applied: articles providing insights into dimensions and indicators related to the sustainability of wine tourism in wineries. Following this final filter, 38 articles from the database were selected for full-text review. Taking into account the 38 articles retrieved from the database and the three previous studies, a total of 41 studies were included in the ILR and informed the construction of the matrix, including the establishment of its dimensions, subdimensions, indicators and measurement scale.

Based on the ILR, the SAMWT was proposed as a theoretical and practical tool for assessing sustainability, comprising five dimensions (environmental, economic, social, political-institutional and territorial). The definition of the five dimensions was based primarily on the BaccuS protocol proposed by Flores (2015) and Flores and Medeiros (2016). This protocol encompasses the multifaceted nature of sustainability. The proposed matrix also comprises 116 indicators focusing on wine tourism sustainability and a three-point measurement scale: 0, “does not meet the criterion”; 1, “at an initial/in-progress stage”; and 2, “at a consolidated stage”.

3.2 Expert review and mapping of sustainable wine tourism practices to the SDGs

The assessment tool was reviewed by two experts with training and experience in the fields of economics, sustainable development, wine-related services and wine tourism. The expert review process involved sending the tool by email in April 2026. At that stage, it comprised five dimensions, 116 indicators and a three-point measurement scale. The experts suggested reducing the number of indicators, changing the name of the “political-institutional” dimension to “institutional governance”, and making other adjustments aimed at increasing the objectivity of the assessment matrix. These changes were implemented. The resulting tool therefore comprised five sustainability dimensions, 72 indicators and a three-point measurement scale. The SAMWT (Appendix 1) is detailed in the Results and Discussion section.

The 72 indicators were then mapped against the goals and targets set out in the 17 SDGs (UN, 2025). The following correspondence was identified:

- 14 of the 17 SDGs are aligned with the indicators in the SAMWT;
- 36 of the 169 SDG targets are related to the proposed indicators.

As shown above, the proposed sustainability measurement approach is aligned with 82% of the SDGs and 21% of the global targets for the sustainability of products and territories. A significant correspondence was observed with the following SDGs: SDG 8, Decent Work and Economic Growth; SDG 11, Sustainable Cities and Communities; and SDG 12, Responsible Consumption and Production. The correspondence with these goals is consistent with the propositions of Karagiannis and Metaxas (2020), given the intrinsic nature of tourism activity. Accordingly, no correspondence between wine tourism and only three SDGs were identified: SDG 1, No Poverty; SDG 13, Climate Action; and SDG 14, Life Below Water.

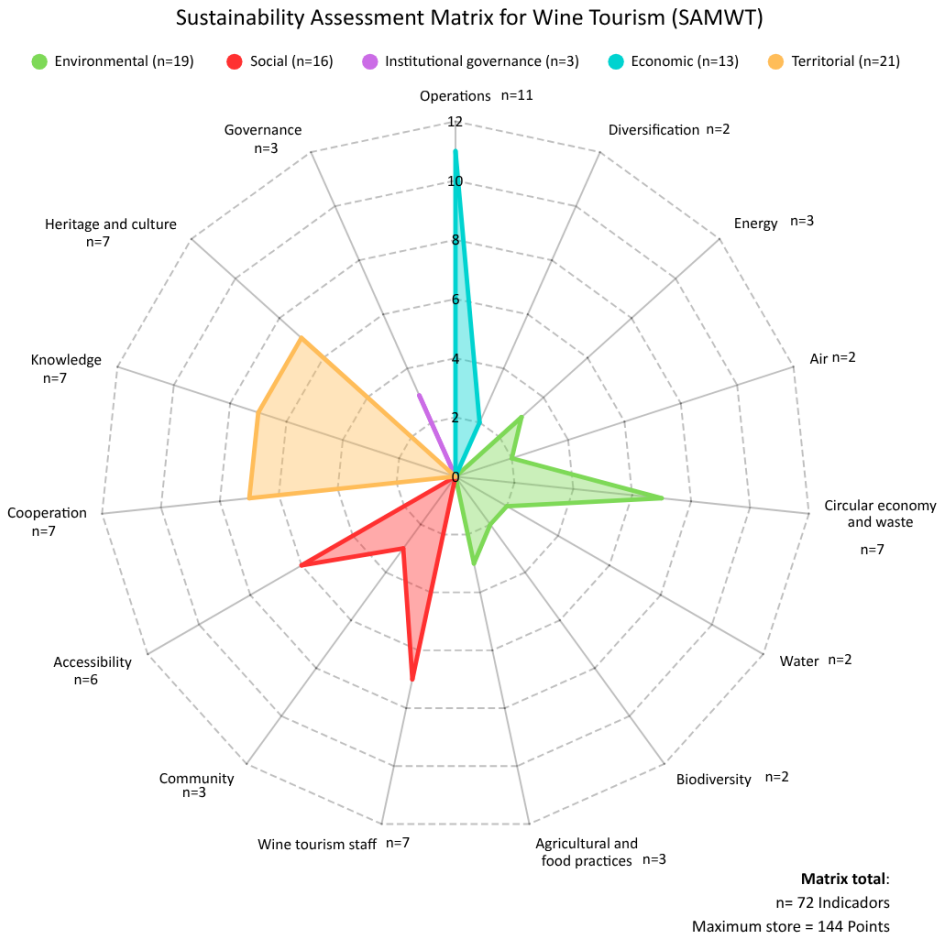
A detailed account of this correspondence is presented in Chart 2 in the Results and Discussion section.

In methodological terms, it is also important to note that the online tools Rayyan (2025) and DeepL Write (2026) (version 26.6.14916780) were used. Rayyan was used to systematise the studies included in the systematic literature review, while DeepL Write was used to improve spelling and grammar, with the aim of enhancing the clarity and precision of the text.

4 RESULTS AND DISCUSSION

The proposed theoretical and practical tool is the Sustainability Assessment Matrix for Wine Tourism (SAMWT), which measures five dimensions of sustainability and 72 indicators grouped into 15 subdimensions. Figure 1 illustrates the components of the matrix, which are detailed in Appendix 1. Different colours are used to represent each dimension, while polygons connect the subdimensions; the figure also shows the number of indicators distributed across the dimensions and subdimensions.

Figure 1 - Sustainability Assessment Matrix for Wine Tourism (SAMWT)



Source: Authors' own elaboration, based on the Integrative Literature Review (ILR).

Chart 2, presented below, shows the five dimensions, the 15 subdimensions comprising a total of 72 indicators, the mapping of the indicators to the SDGs, and the literature supporting each set of indicators, which was derived from the ILR.

Chart 2 - Sustainability Dimensions, Indicators and Mapping to the SDGs (continue)

Sustainability dimensions	Subdimensions	Number of indicators	SDGs (UN, 2025)	References
Economic	Operations	11	4, 8, 9, 11, 12, 16, 17	ACEVIN (2023); Duarte Alonso *et al.* (2022); Flores (2015); Flores & Medeiros (2016); Maracajá *et al.* (2023); Martínez-Falcó *et al.* (2024 c); Martínez-Falcó *et al.* (2025); Nave & Paço (2023); Trigo & Silva (2022); Szolnoki *et al.* (2022); Yildiz (2004).
	Diversification	2	8, 9	Baird *et al.* (2018); Duarte Alonso *et al.* (2020); Flores (2015); Flores & Medeiros (2016).
Environmental	Energy	3	7	Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 b); Nave & Paço (2023); Yildiz (2004).
	Air	2	11	Gastaldello, Rossetto, & Giampietri (2024); Yildiz (2004).

Chart 2 - Sustainability Dimensions, Indicators and Mapping to the SDGs (conclusion)

Sustainability dimensions	Subdimensions	Number of indicators	SDGs (UN, 2025)	References
Environmental	Circular economy and waste	7	6, 11, 12	Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 b); Nave & Paço (2023); Yildiz (2004).
	Water	2	6	Flores (2015); Flores & Medeiros (2016); Nave & Paço (2023); Yildiz (2004).
	Biodiversity	2	15	Flores (2015); Flores & Medeiros (2016); Juste Carrión, & Aleixandre Mendizábal (2022); Tafel *et al.* (2024).
	Agricultural and food practices	3	2, 11, 12, 15	Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 b); Nave & Paço (2023); Szolnoki & Tafel (2022); Tafel *et al.* (2024); Yildiz (2004).
Social	Wine tourism staff	7	4, 5, 8, 10	Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 b); Nave & Paço (2023).
	Community	3	8, 12	Flores (2015); Flores & Medeiros (2016); Duarte Alonso *et al.* (2022); Nave & Paço (2023); Szolnoki & Tafel (2022); Yildiz (2004).
	Accessibility	6	4, 9, 10	Duarte Alonso *et al.* (2022); Karagiannis & Metaxas (2020); Maracajá *et al.* (2023); Nave & Paço (2023)
Territorial	Cooperation	7	8, 11, 17	ACEVIN (2023); Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 c); Nave & Paço (2023).
	Knowledge	7	4, 9, 11, 12, 17	ACEVIN (2023); Flores (2015); Flores & Medeiros (2016); Martínez-Falcó *et al.* (2024 b); Martínez-Falcó *et al.* (2025); Nave & Paço (2023); Yildiz (2004).
	Heritage and culture	7	8, 9, 11, 12, 15	Duarte Alonso *et al.* (2022); Flores (2015); Flores & Medeiros (2016); Nave & Paço (2023); Vecchio *et al.* (2024); Yildiz (2004).
Institutional governance	Governance	3	3, 8, 12, 16	ACEVIN (2023); Flores (2015); Flores & Medeiros (2016); Lockshin & Corsi (2020); Nave & Paço (2023); Trindade *et al.* (2022).

Source: Authors' own elaboration, based on the Integrative Literature Review (ILR).

The economic dimension assesses operations, that is, the organisational processes involved in planning, implementing and controlling wine tourism activities, as addressed by Duarte Alonso *et al.* (2022), Flores (2015), Szolnoki *et al.* (2022) and Trigo and Silva (2022). In addition, this dimension considers the diversification of markets and products/experiences, which directly contributes to revenue distribution and the optimisation of infrastructure, as illustrated by Baird *et al.* (2018), Flores (2015) and Nave and Paço (2023). The economic dimension comprises 13 indicators.

The environmental dimension analyses wineries' environmental practices related to wine tourism, covering issues such as energy and water management; emissions control initiatives; circular economy and waste management; biodiversity; and agricultural and food practices, as addressed, for example, by Flores (2015), Flores and Medeiros (2016), Martínez-Falcó *et al.* (2024b), Nave and Paço (2023) and Yildiz (2004). It includes indicators relating to a firm's capacity to minimise its negative impact on the environment and contribute to the protection and conservation of the natural environment (Martínez-Falcó *et al.*, 2024a, 2024b). This dimension comprises 19 indicators in the matrix.

The social dimension assesses aspects related to wine tourism staff; relationships with visitors and impacts on the community; and the company's actions to integrate the local community. This dimension also includes accessibility indicators covering the four types of barriers that may limit access to wine tourism experiences: architectural barriers, related to the inadequacy of physical spaces for persons with disabilities and/or reduced mobility; attitudinal barriers, associated with a lack of staff training and awareness to accommodate the diversity of visitors; digital barriers, affecting people experiencing digital exclusion or without access to devices and an Internet connection; and communication barriers, encompassing difficulties in accessing information arising from linguistic or format-related limitations. Research by Duarte Alonso *et al.* (2022), Karagiannis and Metaxas (2020), Maracajá *et al.* (2023) and Nave and Paço (2023) informed the development of these indicators.

The social dimension also includes indicators that make it possible to analyse an organisation's impact and contributions in terms of its social responsibility and commitment, such as local job creation, equal pay, corporate social responsibility and inclusion (Martínez-Falcó *et al.*, 2024a). It therefore comprises a set of social indicators which, when adopted, should have an impact not only on people management within the company but also on its relationship with the territory, as addressed by ACEVIN (2023), Flores (2015), Karagiannis and Metaxas (2020) and Martínez-Falcó *et al.* (2024a). As demonstrated by Duarte Alonso *et al.* (2022), the benefits are not limited to winery employees but also extend to the local community through a range of positive externalities generated by the provision of tourism services. The proposal encompasses a total of 16 social indicators.

The territorial dimension assesses cooperation, coordination and promotion within the territory (ACEVIN, 2023; Martínez-Falcó *et al.*, 2024c); knowledge generation to improve processes and the knowledge conveyed to visitors during visits (Martínez-Falcó *et al.*, 2025); and aspects related to heritage and culture, as addressed in the studies by Flores (2015), Flores and Medeiros (2016) and Vecchio *et al.* (2024). Indicators in this dimension are sometimes also related to the social dimension and to cultural aspects; one example is territorial coordination aimed at fostering sustainability and cultural identity. This dimension comprises the largest number of indicators, with a total of 21.

Finally, the institutional governance dimension uses three indicators to identify how the company is organised within the territory in relation to other stakeholders and external contexts, addressing incentive practices, codes of conduct and the management of conflicts of interest. Relevant references in this regard include the studies by Flores (2015), Flores and Medeiros (2016), Lockshin and Corsi (2020) and Nave and Paço (2023).

Regarding the measurement scale, the Sustainability Assessment Matrix for Wine Tourism (SAMWT) (Figure 1 and Appendix 1) uses a three-category ordinal scale: 0, “does not meet the criterion”; 1, “at an initial/in-progress stage”; and 2, “at a consolidated stage”. This scale has relevant methodological implications for measuring sustainability in wine tourism. In terms of its advantages, the three-category scale differs from the more extensive scales reviewed in the literature (such as 5- or 7-point Likert scales) because of its operational simplicity, which facilitates data collection and reduces subjectivity in the classification of indicators. At the same time, by allowing intermediate stages of implementation to be identified (initial/in-progress stage), the scale captures nuances in the evolutionary process of adopting sustainable practices, overcoming the limitations of purely dichotomous scales (yes/no). The ordinal nature of the scale enables quantitative analyses using statistical techniques such as means, sums of scores, comparative analyses across sustainability dimensions and the construction of rankings.

With scores ranging from zero to 144 points, the matrix enables a gradual analysis of sustainability in wine tourism, describing and measuring the situation in specific areas in terms of objective parameters (Torres-Delgado & López-Palomeque, 2014). Regarding its limitations, it is acknowledged that the three-category scale may not capture more subtle gradations in sustainability performance, particularly in contexts where practices exhibit different intermediate levels of consolidation.

In this way, it becomes possible to classify not only sustainability indicators but also wineries that adopt sustainable wine tourism practices. This provides a diagnosis of best practices and a ranking of wineries with the strongest sustainability performance. However, methodological limitations must be adequately taken into account when interpreting the results.

The SAMWT's capacity to describe and measure sustainable practices adopted in wine tourism through multiple parameters provides concrete implications for the planning and management of wine-sector businesses and may generate competitive potential for individual businesses and for the region as a whole, as emphasised by recent research, including Martínez-Falcó *et al.* (2024a, 2024b, 2024c) and Martínez-Falcó *et al.* (2025).

5 FINAL CONSIDERATIONS

The study argues that wine tourism sustainability should be achieved through the integration of the economic, environmental, social, territorial and governance dimensions. The main objective of the study was to propose an assessment matrix, as a theoretical and practical tool, for measuring wine tourism sustainability in wineries. The Sustainability Assessment Matrix for Wine Tourism (SAMWT) (Figure 1 and Appendix 1) represents a scientific advance in understanding wine tourism from the perspective of business sustainability principles. The originality of the study lies in presenting scientific evidence derived from the ILR and alignment with the SDGs, enabling the development of a theoretical and practical tool based on a multidimensional perspective for assessing sustainability in wineries engaged in wine tourism.

Accordingly, wine tourism sustainability, as operationalised through the SAMWT, is understood as a multidimensional and integrated system comprising five fundamental dimensions: environmental, social, economic, territorial and institutional governance. This five-dimensional approach is quantified through 72 indicators organised into 15 subdimensions, resulting in a maximum score of 144 points. The identification of the indicators enables an analysis of the congruence between wineries' wine tourism operations and planning and the principles ofsustainability. In this way, wineries can integrate a sustainable strategic planning system, contributing to the promotion and management of the region and destination as a whole (COVIAR, 2025).

According to the SAMWT, wine tourism sustainability is defined as the capacity of wine tourism activities to simultaneously promote environmental preservation, equitable socioeconomic development, the valorisation of territorial and heritage assets, and institutional coordination. This capacity should be ensured from a long-term perspective in order to guarantee the viability of wineries as agents of sustainable territorial development.

The main theoretical contribution of the study is the proposal of a theoretical and practical tool embodied in the SAMWT, with its five dimensions and 72 measurement indicators. The present study overcomes existing limitations regarding the development of objective indicators for sustainability assessment identified by Lockshin and Corsi (2020) and Trindade *et al.* (2022). As highlighted by Torres-Delgado and López-Palomeque (2014), indicators are relevant to decision-making processes associated with planning and management.

The SAMWT can be applied to businesses with different profiles and in different wine tourism regions. The tool was designed to be administered through a questionnaire within the business context of wineries. However, its application to a group of wineries within the same region may reveal different levels of wine tourism sustainability among wineries associated, for example, with a particular wine route. The contribution of the matrix therefore extends beyond the business context and may have implications for the institutional management and governance of wine tourism destinations.

In practical terms, as a checklist, the SAMWT has the potential to:

a) identify which wineries are the most sustainable in terms of wine tourism and which sustainability indicators and dimensions may serve as a reference for future *benchmarking* within the sector;

b) provide a self-assessment tool that can support business decision-making for the planning and management of sustainable wine tourism practices;

c) support researchers, public- and private-sector managers, and other stakeholders involved in destination marketing management in their decision-making regarding the sustainable promotion and improvement of wine tourism;

d) provide guidance for the formulation of public policies for wine tourism aimed at sustainable development, contributing to the implementation of the SDGs within the business context of wineries and the governance of wine tourism destinations.

It should be noted that the present proposal is consistent with the guidelines of the *Plano Setorial de Turismo - Plano Clima Adaptação* (Brasil, 2025) in several respects, including concern for the quality of the tourist experience and the conservation of landscapes, biodiversity, and historical and natural heritage.

The evaluative character and applied nature of the SAMWT should also be highlighted. Future studies may use this practical tool to conduct diagnostic research and obtain information and data that enable progress towards business forecasting and forecasting related to the governance of wine tourism destinations.

One of the main limitations of the study derives from the development of the matrix, which required the selection of the most relevant indicators, leaving out others that could also yield relevant results in the context of wine tourism. Developing a business-oriented assessment matrix to be administered through a questionnaire requires particular care. This requirement stems from the cognitive capacity needed to respond to a large number of alternatives and the time required to complete the questionnaire. In this regard, one suggestion for future studies is to incorporate other participants and data collection methods, such as interviews, following the example of Vecchio *et al.* (2024).

The three-category ordinal scale used in the SAMWT proved functional in capturing gradations in the development of wine tourism practices, but its application without researcher mediation exposes the instrument to variability in interpretation among respondents. Future studies could develop explicit operational criteria for each level, with objective descriptors based on concrete evidence, in order to reduce subjectivity in classification and increase the reliability of the instrument in self-administered applications and international comparative contexts.

Another suggestion for future studies is to include examples or operational criteria for all indicators in order to reduce ambiguity and subjectivity in the analysis.

Finally, the SAMWT presented in this study shows an asymmetric distribution of indicators across the different dimensions, as a consequence of the distinct nature of each dimension assessed. Future studies could review this distribution in order to assess the appropriateness of equalising the number of indicators per dimension and/or assigning different weights to each dimension. This effort would contribute to the methodological refinement of the instrument, making it more robust for comparative applications across different wine tourism destinations and contexts.

REFERENCES

Alant, K., & Bruwer, J. (2004). Wine tourism behaviour in the context of a motivational framework for wine regions and cellar doors. Journal of Wine Research, 15(1), p. 27-37. https://doi.org/10.1080/0957126042000300308

Associación Española de Ciudades del Vino (ACEVIN). (2023). *50 Buenas prácticas en enoturismo sostenible: Rutas del Vino de España*. Retrieved from https://larutadelagarnacha.es/panel/archsubidos/20240403_c0ad_50BuenasPracticasEnoturismoSostenible-RVE.pdf

Baird, T., Hall, C. M., & Castka, P. (2018). New Zealand Winegrowers attitudes and behaviours towards wine tourism and sustainable winegrowing. *Sustainability*, *10*(797), 2–23. https://doi.org/10.3390/su10030797

Brasil. (2025). Ministério do Meio Ambiente e Mudança do Clima. *Plano Clima Adaptação* [electronic resource]: plano setorial de turismo. Brasília, DF: MMA; MCTI; MTur. Retrieved from https://www.gov.br/mma/pt-br/centrais-de-conteudo/publicacoes/mudanca-do-clima/planosetorial-turismo.pdf

Corporación Vitivinícola Argentina (COVIAR). (2025). *Guía de autoevaluación Sostenibilidad Enoturística Argentina*. Retrieved from https://pevi2030.com.ar/wp-content/uploads/2023/02/Guia-Enoturismo-Sostenibilidad.pdf

De Alencar, C. M. M., da Silva Braz, V., de Andrade, M. R. O., & Oliveira-Silva, I. (2025). O Panorama Atual dos Indicadores de Sustentabilidade Relacionados ao Turismo Sustentável: Uma Revisão Sistemática de Literatura. *Fronteira: Journal of Social, Technological and Environmental Science*, *14*(4), 56-79. https://doi.org/10.21664/2238-8869.2025v14i4.8222

Deepl Write. (2026). Retrieved from https://www.deepl.com/pt-BR/write

Dias e Cordeiro, I., Leite, N. K., & Partidário, M. R. (2010). Instrumentos de avaliação de sustentabilidade de destinos turísticos: uma revisão de literatura. *Caderno Virtual de Turismo*, *10*(2), 49-64. https://www.redalyc.org/pdf/1154/115415458005.pdf

Dias e Cordeiro, I., Partidário, M. R., & Leite, N. K. (2009). Considerações sobre o escopo de um processo de avaliação da sustentabilidade do turismo. *Revista Turismo em Análise*, *20*(3), 525-540. https://doi.org/10.11606/issn.1984-4867.v20i3p525-540

Duarte Alonso, A., Kok, S., & O'Brien, S. (2020). Sustainable wine tourism development through the lens of dynamic capabilities and entrepreneurial action: an exploratory four-region perspective. *Tourism Recreation Research*, *45*(3), 401–419. https://doi.org/10.1080/02508281.2020.1745000

Duarte Alonso, A., Bressan, A., Kiat Kok, S., & O'Brien, S. (2022). Filling up the sustainability glass: wineries' initiatives towards sustainable wine tourism. *Tourism Recreation Research*, 1–15. https://doi.org/10.1080/02508281.2021.1885801

European Commission (2016). *El Sistema Europeo de Indicadores Turísticos: Herramienta del ETIS para la gestión de destinos sostenibles*. Retrieved from https://www.google.com/url?sa=t&source=web&rct=j&opi=89978449&url=https://ec.europa.eu/docsroom/documents/21749/attachments/1/translations/es/renditions/native&ved=2ahUKEwiF-eiozYmTAxVwqZUCHbffBdgQFnoECBoQAQ&usg=AOvVaw2VwUdSJxeR0MWCdsN0fDpA

Flores, S. S. (2015). *Vitivinicultura sustentável no contexto do Brasil: uma proposta de abordagem* (Doctoral thesis, Universidade Federal do Rio Grande do Sul (UFRGS), Université de Bourgogne). Retrieved from https://lume.ufrgs.br/bitstream/handle/10183/128038/000975621.pdf?sequence=1&isAllowed=y

Flores, S. S., & Medeiros, R. M. V. (2016). BaccuS: A framework for sustainability in the wine industry / BaccuS: un framework pour le développement durable dans la vitiviniculture. *BIO Web of Conferences*, *7*, 03018. https://doi.org/10.1051/bioconf/20160703018

Gastaldello, G., Rossetto, L., & Giampietri, E. (2024). Consumer behavior toward virtual wine experiences as a technology-based sustainable transformation. *Frontiers in Sustainable Food Systems*, *8*(1384011), 01–14. https://doi.org/10.3389/fsufs.2024.1384011

Hall, M. C., Sharples, L., Cambourne, B., & Macionis, N. (2000). Wine tourism around the world: development, management and markets. Oxford: Butterworth-Heinemann. https://doi.org/10.4324/9780080521145

Juste Carrión, J. J., & Aleixandre Mendizábal, G. (2022). Clúster y sostenibilidad: una aproximación desde el sector español del vino y sus denominaciones de origen. *Revista de Estudios Empresariales. Segunda Época*, *2*, 116–156. https://doi.org/10.17561/ree.n2.2022.7070

Karagiannis, D., & Metaxas, T. (2020). Sustainable wine tourism development: Case studies from the Greek Region of Peloponnese. *Sustainability*, *12*(12), 1–15. https://doi.org/10.3390/su12125223

Lockshin, L., & Corsi, A. M. (2020). Key research topics likely to generate Australian and other wine producer countries' support during the period 2020-2030. *International Journal of Wine Business Research*, *32*(4), 493–502. https://doi.org/10.1108/IJWBR-01-2020-0004

Maracajá, K. F. B., Batista Schramm, V., Schramm, F., Valduga, V., & Trindade, J. R. (2023). Application of MCDM using PROMETHEE II for evaluation of wine tourism services. *International Journal of Wine Business Research*, 35(3), 427-444. https://doi.org/10.1108/IJWBR-07-2022-0025

Martínez-Falcó, J., Marco-Lajara, B., Zaragoza-Sáez, P., & Sánchez-García, E. (2024a). The effect of wine tourism on the sustainable performance of Spanish wineries: a structural equation model analysis. *International Journal of Wine Business Research*, 36(1), 61-84. https://doi.org/10.1108/IJWBR-02-2023-0006

Martínez-Falcó, J., Marco-Lajara, B., Zaragoza-Sáez, P. del C., & Millan-Tudela, L. A. (2024b). Do circular economy practices moderate the wine tourism–green performance relationship? A structural analysis applied to the Spanish wine industry. *British Food Journal*, *126*(1), 134–155. https://doi.org/10.1108/BFJ-10-2022-0833

Martínez-Falcó, J., Sánchez-García, E., Marco-Lajara, B., & Millán-Tudela, L. A. (2024c). Wine Tourism as a Catalyst for Sustainable Performance: The Mediating Role of Corporate Legitimacy and Green Innovation. *Agribusiness*, 1–22. https://doi.org/10.1002/agr.21982

Martínez-Falcó, J., Sánchez-García, E., Marco-Lajara, B., & Visser, G. (2025). Wine tourism as a catalyst for sustainable competitive advantage: unveiling the role of employee wellbeing and organizational commitment. *British Food Journal*, *127*(3), 1059–1079. https://doi.org/10.1108/BFJ-06-2024-0622

Mendoza Jiménez, J., & Hernández Martín, R. (2017). Una propuesta metodológica para la medición de la sostenibilidad del turismo a escala local. Cuadernos Económicos de ICE, 93, 69-90.

Morandi, S., & Zinno, I. (2025). Sustainable practices in the wine sector: firm perspectives and actions. *International Journal of Wine Business Research*, *37*(4), 640–676. https://doi.org/10.1108/IJWBR-01-2025-0005

Nave, A., do Paço, A., & Duarte, P. (2021a). A systematic literature review on sustainability in the wine tourism industry: insights and perspectives. *International Journal of Wine Business Research*, *33*(4), 457–480. https://doi.org/10.1108/IJWBR-09-2020-0046

Nave, A., Laurett, R., & do Paço, A. (2021b). Relation between antecedents, barriers and consequences of sustainable practices in the wine tourism sector. *Journal of Destination Marketing and Management*, *20, 1-10*. https://doi.org/10.1016/j.jdmm.2021.100584

Nave, A., & Paço, A. do. (2023). Barriers versus Benefits of Sustainable Practices: An Application to the Wine-Tourism Sector. *International Journal of Hospitality and Tourism Administration*, *24*(2), 240–259. https://doi.org/10.1080/15256480.2021.1981185

Organização das Nações Unidas. (2025). *Objetivos de Desenvolvimento Sustentável.* Retrieved from https://brasil.un.org/pt-br/sdgs

Page et al. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372, n71. https://doi.org/10.1136/bmj.n71

Rayyan. (2025). Retrieved from https://www.rayyan.ai

Sachs, I. (1995). Em busca de novas estratégias de desenvolvimento. *Estudos Avançados,* 25(9), 29-63. https://doi.org/10.1590/S0103-40141995000300004

Sanches, A. C., Sauer, L., Binotto, E., & Espejo, M. M. B. (2018). Análise dos Estudos sobre Indicadores de Sustentabilidade no Turismo: uma revisão integrativa. *Revista Turismo em Análise*, *29*(2), 292-311. https://doi.org/10.11606/issn.1984-4867.v29i2p292-311

Szolnoki, G., & Tafel, M. (2022). Environmental Sustainability and Tourism - The Importance of Organic Wine Production for Wine Tourism in Germany. *Sustainability*, 14, 11831, 1–12. https://doi.org/10.3390/su141911831

Szolnoki, G., Bail, S., Tafel, M., Feher, A., & Veith, C. (2022). A cross-cultural comparison of new implemented sustainable wine tourism strategies during the COVID-19 crisis. *Sustainability*, 14(8), 4688. https://doi.org/10.3390/su14084688

Sun, Y. Y., & Drakeman, D. (2020). Measuring the carbon footprint of wine tourism and cellar door sales. *Journal of Cleaner Production*, 266, 121937. https://doi.org/10.1016/j.jclepro.2020.121937

Tafel, M., Szolnoki, G., & Jedicke, E. (2024). Do German winegrowers see a connection between biodiversity and wine tourism? *Zeitschrift Für Tourismuswissenschaft*, 15(3), 321–333. https://doi.org/10.1515/tw-2023-2013

Tasso, J. P. F., & Nascimento, E. P. (2022). Mandala da sustentabilidade no turismo: um instrumento crítico e propositivo. *Turismo, sustentabilidade e COVID-19: entre incertezas e esperanças*, 309-335. Retrieved from https://lets.etc.br/content/files/2022/07/Mandala-da-sustentabilidade-no-turismo-um-instrumento-crtico-e-propositivo.pdf

Tonini, H., Lavandoski, J., Pereira, G. O., & Annoni, A. L. R. (2022). Avaliação de Websites de Regiões de Enoturismo: casos brasileiros e internacionais. *Revista Brasileira de Pesquisa em Turismo*, *16*(2684), 1-20. Retrieved from https://doi.org/10.7784/rbtur.v16.2684

Torres-Delgado, A., & López Palomeque, F. (2014). Measuring sustainable tourism at the municipal level. *Annals of Tourism Research*, 49, 122-137. https://doi.org/10.1016/j.annals.2014.09.003

Trigo, A., & Silva, P. (2022). Sustainable Development Directions for Wine Tourism in Douro Wine Region, Portugal. *Sustainability*, *14*(3949), 1–24. https://doi.org/10.3390/su14073949

Trindade, J. R., Maracajá, K. F. B., Cicciú, B., Filho, R. B. L., & Valduga, V. (2022). Theoretical discussion about the concepts of sustainability in wine tourism with the bibliometrix. *Revista Brasileira de Pesquisa Em Turismo*, 16, 1-21. https://doi.org/10.7784/rbtur.v16.2644

UN Tourism (2023). *Achieving the Sustainable Development Goals through Tourism – Toolkit of Indicators for Projects (TIPs)*. Retrieved from https://www.e-unwto.org/doi/book/10.18111/9789284424344

UN Tourism (2026). *Measuring the sustainability of tourism (MST).* Retrieved from https://www.untourism.int/tourism-statistics/measuring-sustainability-tourism

Veal, A. J. (2011). *Metodologia de Pesquisa em Lazer e Turismo*. São Paulo: Aleph.

Vecchio, R., Annunziata, A., & Bouzdine-Chameeva, T. (2024). How to promote sustainable wine tourism: Insights from Italian and French young adults. *Annals of Tourism Research Empirical Insights*, *5*(2), 1–11. https://doi.org/10.1016/j.annale.2024.100137

Whitemore, R., & Knafl, K. (2005). The integrative review: updated methodology. *Journal of Advanced Nursing*, 52(5), 546-553. https://doi.org/10.1111/j.1365-2648.2005.03621.x

Yildiz, Ö. E. (2004). Applications of Circular Economy and Wine Tourism in Viniculture: A Case Study. *International Journal of Contemporary Economics and Administrative Sciences*, 394–410. https://doi.org/10.5281/zenodo.13932186.

Data Availability Statement

The data should be requested from the author via email at joice.lavandoski@unirio.br

About the authors

Joice Lavandoski
Bacharel, Mestre e Doutora em Turismo. Pós-doutorado em sustentabilidade do enoturismo. Professora Adjunta no Departamento de Turismo e Patrimônio da Universidade Federal do Estado do Rio de Janeiro (UNIRIO). Professora permanente no Programa de Pós-Graduação em Turismo da Universidade Federal Fluminense (UFF). Coordenadora do Laboratório de Eventos em Turismo (LABETUR/UNIRIO). Pesquisas sobre Enoturismo, Gastronomia, Sustentabilidade, Planejamento e Gestão do turismo, Eventos, Acessibilidade.
Contribuições: Conceituação, Curadoria de dados, Análise formal, Obtenção de financiamento, Investigação, Metodologia, Administração do projeto, Recursos, Software, Supervisão, Validação, Visualização, Redação do manuscrito original, Redação - revisão e edição.
Email: joice.lavandoski@unirio.br
ORCID: https://orcid.org/0000-0002-7324-1134

Hernanda Tonini
Bacharel e Mestre em Turismo, Doutora em Desenvolvimento Rural. Professora do eixo Turismo, Hospitalidade e Lazer do IFRS Campus Bento Gonçalves, atuando no ensino médio, superior e pós-graduação. Coordenadora do curso Técnico em Eventos. Desenvolvimento de pesquisas ligadas aos temas: enoturismo, desenvolvimento territorial, hospitalidade, sustentabilidade, acessibilidade.
Contribuições: Conceituação, Curadoria de dados, Análise formal, Metodologia, Administração do projeto, Visualização, Redação do manuscrito original, Redação - revisão e edição.
Email: hernanda.tonini@bento.ifrs.edu.br
ORCID: https://orcid.org/0000-0002-2525-3325

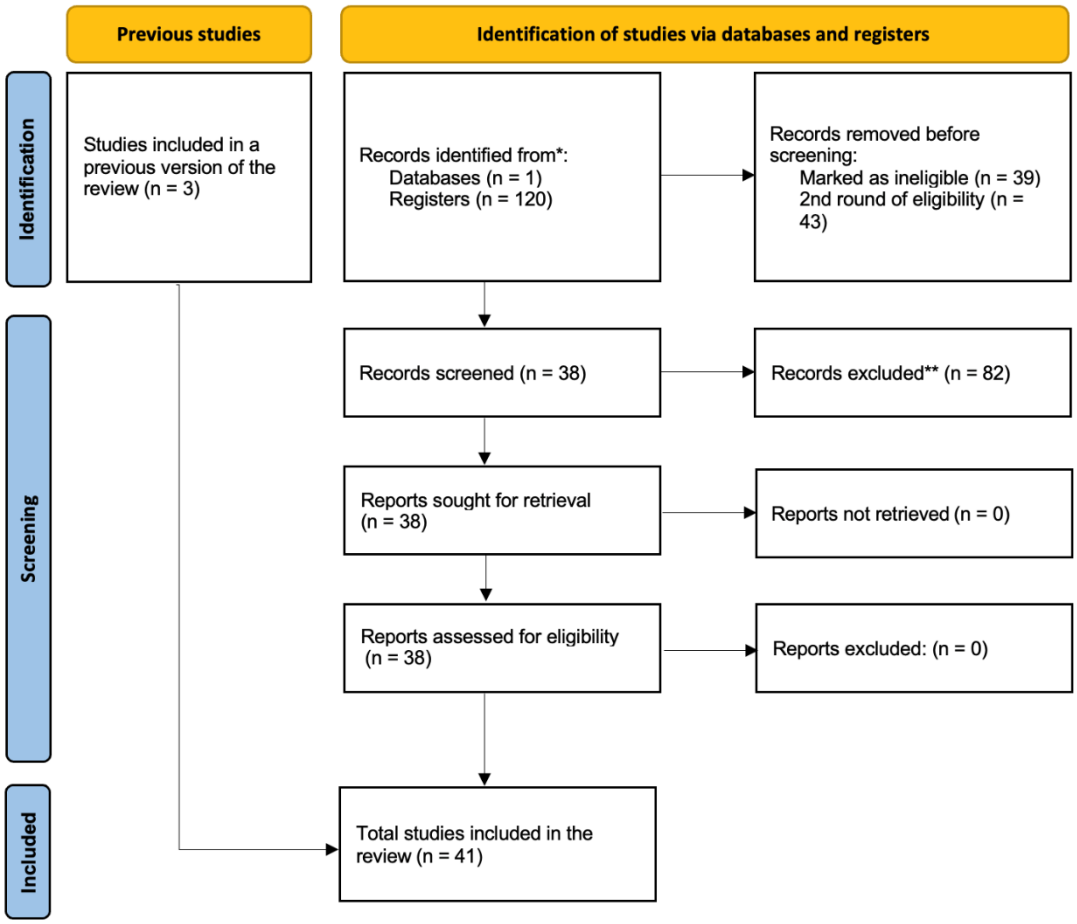
Gabriel Santos García
Cátedra de Agroturismo e Enoturismo do Instituto de Qualidade Agroalimentar das Ilhas Canárias e da Universidade de La Laguna.
Contributions: Data curation, Formal analysis, Validation, Writing – review and editing.
Email: aenogas@ull.edu.es
ORCID: https://orcid.org/0009-0000-6003-8172

Marcelino de Souza
Professor titular da Faculdade de Ciências Econômicas e do Programa de Pós-Graduação em Agronegócios da Universidade Federal do Rio Grande do Sul (UFGRS)
Contribuições: Conceituação, Curadoria de dados, Análise formal, Supervisão, Redação do manuscrito original.
Email: marcelino.souza@uol.com.br
ORCID: https://orcid.org/0000-0001-6044-6694

Jesús Enrique de las Heras Roger
Jesús de las Heras Roger é professor e investigador da Universidade de La Laguna e diretor da Cátedra de Agroturismo e Enoturismo das Canárias. Doutorado em Ciência e Tecnologia dos Alimentos, desenvolve investigação nas áreas da vitivinicultura, qualidade dos vinhos, enoturismo, sustentabilidade e valorização dos territórios vitivinícolas.
Contribuições: Curadoria de dados, Análise formal, Recursos, Supervisão, Validação, Redação - revisão e edição.
Email: jherasro@ull.edu.es
ORCID: https://orcid.org/0009-0004-4998-4351

David Padrón Marrero
Docente de Economia Aplicada na Universidade de La Laguna (Espanha) e pesquisador do Centro de Estudos sobre Desigualdade Social e Governança (CEDESOG). Suas principais áreas de pesquisa são economia regional, desenvolvimento sustentável, desigualdade, produtividade e análise da economia das Ilhas Canárias. É membro do Conselho Consultivo da Cátedra de Agroturismo e Enoturismo das Ilhas Canárias.
Contribuições: Curadoria de dados, Análise formal, Supervisão, Validação, Redação - revisão e edição.
E-mail: dpadron@ull.edu.es
ORCID: https://orcid.org/0009-0009-8963-4539

Appendix 1 - PRISMA Flow Diagram



Page MJ, McKenzie JE, Bossuyt PM, Boutros I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

Source: Adapted from the PRISMA (2020) protocol.

Appendix 1 - Sustainability Assessment Matrix for Wine Tourism (SAMWT)

Economic Dimension				
Operations		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
1	Existence of service quality programmes (with the participation of staff and visitors).			
2	Sustainability-related certifications, which may include environmental, quality and social responsibility aspects, etc.			
3	Partnerships for the development of wine tourism products and services.			
4	Awards for best practices in wine tourism.			
5	Internal processes and controls to record access and the number of visitors/wine tastings per day (e.g. customer relationship management).			
6	Internal processes and controls to record revenue from wine tourism activities.			
7	Marketing and customer loyalty strategies (e.g. reviews, digital booking management and customer service in other languages).			
8	Pursuit of excellence in customer and visitor service by providing channels for questions, complaints and suggestions (e.g. chatbots and customer contact forms).			
9	Access to external resources to implement/improve wine tourism (which may include funding, technology, technical support and advice, etc.).			

10	Specific wine tourism planning initiatives (services, activities and programmes) aimed at educational, interactive and sensory experiences, etc.			
11	Visitor satisfaction surveys aimed at improving internal processes related to wine tourism.			

Diversification		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
12	Sale of products related to the local area (e.g. cosmetics, handicrafts, gastronomy and clothing, etc.).			
13	Initiatives to explore new niches related to wine tourism (e.g. accessible wine tourism, cycle tourism and veganism, etc.).			

Social Dimension				
Wine tourism staff		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
14	Initiatives related to ergonomics, occupational health, quality of life and work–family balance for winery staff, including those involved in wine tourism.			
15	Equal pay for men and women in the same job.			
16	Initiatives for staff participation in company profits.			
17	Positions for apprentices and/or interns.			
18	Initiatives to raise the level of training of staff in the wine tourism sector.			
19	Specialist wine tourism training for staff involved in wine tourism.			
20	Recruitment of local labour for wine tourism (local job creation).			

Community		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
21	Monitoring and initiatives to minimise the impact of visitor flows on surrounding communities (e.g. noise, vehicle traffic and waste, etc.).			
22	Support for local professionals and/or inputs produced and marketed in the region.			
23	Adoption of Corporate Social Responsibility principles and policies (e.g. social or community programmes) and communication of these to visitors during the visit or through the website.			

Accessibility		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
24	Availability of staff to book and conduct visits and provide information about wine tourism experiences through non-automated means (including for people experiencing digital exclusion).			
25	Availability of trained staff to assist people with accessibility difficulties or limitations.			
26	Availability of accessible toilets for persons with disabilities and/or reduced mobility.			
27	Availability of accessible spaces for persons with disabilities and/or reduced mobility (e.g. lifts; directional and warning tactile paving; visual and tactile signage; furniture suitable for wheelchair users; ramps with handrails; designated parking, etc.).			
28	Free Wi-Fi Internet access for visitors and customers on the company premises.			
29	Winery website with a responsive mobile version and language options.			

Territorial Dimension				
Cooperation		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
30	Exchange of information and initiatives with other wineries on wine tourism.			
31	Exchange of information and initiatives with other stakeholders in the local area/territory in the field of wine tourism (e.g. the tourism sector, research institutions, etc.).			

32	Specific territorial coordination initiatives to promote sustainable wine tourism and regional identity.			
33	Collaboration in initiatives aimed at integrating stakeholders within the territory.			
34	Participation in actions (projects, programmes, policies and other activities) to promote wine tourism and territorial competitiveness (e.g. promotion of the Designation of Origin, support for and promotion of local initiatives, events, etc.).			
35	Participation in associations and decision-making bodies with an influence on tourism/wine tourism.			
36	Participation in events such as conferences, trade fairs and other wine tourism sector events.			

Knowledge		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
37	Coordination to promote research on territorial resources and improvements in internal wine tourism practices and processes.			
38	Research initiatives to improve understanding of the territory and its stakeholders.			
39	Participation in initiatives to promote wine tourism training in the region (e.g. supplementary training and extension courses).			
40	Initiatives to collect, analyse and systematise data and information on winery visitors.			
41	Participation in initiatives at territorial level to collect, analyse and systematise data and information and make them available to territorial stakeholders.			
42	Raising visitors' awareness of sustainability in the wine sector and/or the region's history and heritage.			
43	Conducting satisfaction surveys among the local population or using other mechanisms to receive complaints from the community.			

Heritage and culture		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
44	Valorisation of local heritage and culture in the company's architectural design.			
45	Valorisation of natural and cultural heritage and local culture in the winery's wine tourism activities (e.g. using photographs of the family matriarch on wine labels, photographic exhibitions and a differentiated approach to products with a Designation of Origin, etc.).			
46	Initiatives to use territorial assets to create and/or improve distinctive experiences.			
47	Initiatives to protect and enhance the landscape.			
48	Valorisation of landscape attributes in promotional materials and visitor services.			
49	Conservation of elements of the local vineyard cultural landscape (e.g. vine-growing techniques and other cultural elements of the landscape).			
50	Promotion and communication of the wines' Designation of Origin to visitors (e.g. through distinctive presentation in the shop and information provided during the visit).			

Institutional governance dimension				
Institutional governance		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
51	Supplier selection criteria for the wine tourism segment that are not based solely on price (e.g. suppliers that demonstrate social and environmental responsibility, etc.).			
52	Initiatives to participate in decision-making involving public and sectoral organizations (wine and tourism).			
53	Initiatives that emphasise ethical aspects of responsible consumption among staff, customers and/or visitors (e.g. safe driving and prevention of alcohol consumption).			

Environmental dimension				
Energy		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
54	Specific initiatives to rationalise energy use in wine tourism facilities (e.g. low-energy lighting and the maintenance or replacement of equipment to reduce energy consumption/improve energy efficiency, etc.).			
55	Wine tourism facilities designed to enhance energy efficiency (e.g. use of natural lighting; thermal insulation using specific materials, water features and vegetation; layouts that use gravity for the movement of materials; and lighting with motion sensors).			
56	Use of renewable energy sources in wine tourism facilities (e.g. solar or wind power generation; use of energy from renewable sources, such as electricity, ethanol or biodiesel, for the transport of wine tourism staff and visitors).			

Air		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
57	Specific initiatives to reduce emissions (e.g. maintenance of vehicles used by staff and visitors, vehicles using fuel from renewable sources, use of public/shared transport, and reduction of noise/noise pollution).			
58	Initiatives to reduce visitors' carbon footprint (e.g. planting trees, charging mobile phones using bicycles, encouraging the use of electric vehicles or public/shared transport, and holding virtual events that reduce the need to travel).			

Circular economy and waste		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
59	Composting of organic waste (e.g. restaurant waste and waste from wine tastings).			
60	Separation of different types of waste/selective waste collection.			
61	Waste management programme establishing objectives and monitoring indicators.			
62	Specific initiatives for the disposal of special waste (batteries, etc.) by wine tourism staff and visitors.			
63	Specific initiatives to reduce the generation and consumption of materials and waste associated with wine tourism (e.g. excessive packaging, use of lighter bottles, and adoption of recyclable or biodegradable packaging, etc.).			
64	Use of biodegradable materials in wine tourism activities (e.g. biodegradable detergent in the kitchen and visitor toilets).			
65	Wastewater treatment in wine tourism facilities (e.g. wastewater from kitchen sinks/washbasins and toilet waste).			

Water		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
66	Specific initiatives to reuse water in wine tourism activities in order to reduce consumption (e.g. reuse of water used for washing wine glasses and rainwater harvesting).			
67	Provision of free drinking water for visitors (e.g. from water galleries, wells or springs).			

Biodiversity		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
68	Attention to the protection of preservation and conservation areas on the property (e.g. maintaining water galleries, wells and native vegetation, etc.).			
69	Specific actions to promote biodiversity (maintenance of natural habitats) among staff and visitors (e.g. photographic exhibitions of fauna and flora species and other activities that encourage appreciation of the environment, fauna and flora).			

Agricultural and food practices		Measurement scale		
N.º	Indicators	Does not meet the criterion	At an initial stage	At a consolidated stage
70	Communication to visitors about the winery's sustainable practices (e.g. cultivation of cover crops, use of integrated and organic production techniques, sustainable viniculture and biodynamic wines, etc.).			
71	Preference for the use of organic culinary ingredients in products offered for tasting (e.g. use of organic vegetables and fruit in food served to visitors).			
72	Preference for the use of local food products and/or products from family-run agri-food businesses.			

Source: Prepared by the author (2025).