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Article

# The Relationship between Industrial Heritage, Wine Tourism, and Sustainability: A Case of Local Community Perspective

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**Abstract:** Our research addresses wine tourism as a means of enhancing the heritage and industrial memory of wine. Specifically, it considers winery tours as a form of industrial tourism capable of boosting the sustainable development of winemaking territories. This article explores the significance and perception of wine tourism from the perspective of the local community by examining a specific case: The Port Wine Cellars in Vila Nova de Gaia (Portugal), where tourism and the wine industry are undergoing a greening process, sharing both cultural and commercial ties. The originality of this article lies in the empirical part of the research, which, using quantitative methods based on questionnaires, provides primary data regarding the relationship between sustainability and industrial wine tourism from the perspective of local residents, key agents in the promotion and success of the destination. In general terms, the results statistics obtained through a cluster analysis show that local perception of the impact of wine tourism in Gaia is favorable, and it is considered an element with the capacity to revitalize the economy and also enhance the city's image. It is also seen as a sustainable option, attributable mainly to economic, cultural, and governance considerations.

**Keywords:** wine tourism; industrial heritage; industrial tourism; sustainable tourism; local community

## 1. Introduction

The relationship between tourism and the wine industry reveals a number of positive synergies [1–3]. In this sense, Hall and Mitchell [4] (p.447) define wine tourism as visits to vineyards, wineries, wine festivals, and events in which tasting and/or experiencing the characteristics of winemaking regions are the principal pull factors for visitors. It can therefore be included in the subsectors of agricultural, rural, cultural, special interest, and, of course, industrial tourism [5–8].

At first, industrial tourism has been related exclusively to visits to one's own industrial historical heritage. However, today there is greater recognition of current or active industrial heritage for its tourist use [1,9]. For this reason, industrial tourism is made up of three different types of resources (pre-industrial heritage; heritage of the industrial revolution; living industry) that are included in two groups: industrial archaeological heritage and living industry.

Wine tourism, as a form of industrial tourism, can be seen as a tool for regional development that favors the integration of the primary (agriculture), secondary (wine industry), and tertiary (tourism) sectors. Furthermore, the landscapes of winemaking regions are of particular value, due to the unique nature of the regional "tourist terroir" [10]. Indeed, winemaking has endowed many regions with a rich cultural heritage, made up essentially of traditional wineries and vineyards which today comprise one of the emerging tourist trends with the greatest appeal and potential for growth [11,12]. Wine culture is



the essential component of wine tourism activity and, therefore, is directly related to the environmental, economic, and social sustainability.

As Getz [13] indicates, wine tourism has the potential to provide competitive advantage for regions with a wine industry. International examples include Piamonte (Italy), Mendoza (Argentina), La Rioja (Spain), Bordeaux (France), Napa Valley (USA), and of course, Porto (Portugal). Indeed, for several decades, tourism in Vila Nova de Gaia, home to the Port Wine Cellars, has experienced steady growth thanks to the appeal of its wineries, which, according to the Portuguese Port Wine Business Association (AEVP in its Portuguese initials), received more than 1.5 million visitors in 2019.

In line with the development of wine tourism, scientific research has also grown significantly in recent decades [11,14–17]. Most of the studies have focused on the question of demand, considering, for instance, winery visitors' motivations or socio-demographic characteristics. However, despite the fact that there is evidence to link wine tourism with the environment and sustainable development, much ground remains to be covered in terms of the wine industry supply [18], as well as aspects associated with sustainability [2,19].

At all events, it is clear that exploiting the culture of wine through wine tourism experiences has allowed for the renewed appreciation and revaluation of many areas, thereby boosting regional social and economic development [10,13,17,20,21], as well as providing local wineries with diversified business opportunities [14,22].

Wine tourism allows visitors to experience a distinctive product and a central theme in many studies has been the various socioeconomic benefits that could be achieved through the development of wine tourism [10,13,17,20,23].

It must also be stressed that the European Charter of Wine Tourism recognizes it as a multidimensional system resulting from the interaction of the subsystems Territory, Tourism, and Wine Culture. Likewise, it states that “winemaking territories should undertake to give maximum priority to the principles of sustainable development”. In this sense and given the impact of wine tourism and its contribution to local development, interest in wine-related sustainability is assured [24]. However, the review of scientific literature reveals only scant contributions in terms of local residents' opinions regarding this option as a means for the sustainable tourist development of their environment [25,26].

It must therefore be stressed that the sustainability of a tourism destination is a key element in improving competitiveness and contributing to the enhancement of the value of existing resources by boosting a region's economic and social evolution. In this sense, adopting sustainable practices as a form of differentiation in the market is a growing trend [27,28], but it is also growing as a need for business innovation [2,8,29], including the tourist area, among wineries.

Wine tourism is emerging at international level as a new product with significant economic potential and characteristics that allow it to be placed in the paradigm of sustainable development [30]. This involves the conservation and enhancement of both historical and current industrial heritage for the enjoyment and use of all generations, contributing therefore to a social and economic improvement of the environment [26].

Literature also shows that sustainable wine tourism is strongly linked to the culture and distinctive features of the local community and place [24]. In fact, it is shown that both the participation and the support of the local community in tourism is essential for the sustainable development of tourism [25]. In this sense, the search for sustainability has triggered a renewed interest in the study of residents' general perceptions about tourism developments [26] and about wine tourism in particular.

Within this context, wine tourism in Portugal, a country with a long-standing winemaking tradition, is one of the principal examples of how this activity can improve sustainable local development [31–33]. In the particular case of Vila Nova de Gaia, wine as a cultural product has become the main driving force for the tourist development of a city that is home to the producers of port wine, the most widely exported Portuguese wine and a hallmark of the country's identity.

In this regard, the novel nature of this work is highlighted in line with the most recent approaches, since the literature review reveals the limited availability of conceptual and analytical frameworks to



facilitate the understanding of the various aspects surrounding the issue of sustainability in relation to wine tourism [2,29], according to the residents' perspective [28,34,35]. The intention is thus to provide a reference to fill the gap in knowledge regarding industrial tourism by analyzing the relationship with sustainable tourism from the perspective of local residents. In addition, on a practical level, the study is interesting considering also the proliferation of wine routes around the world today and their suggestive potential to promote social and economic development. Indeed, a better understanding of the attributes that influence residents' perceptions of wine tourism is also desirable from a management perspective to promote, in this way, the sustainable development of local communities [26].

Specifically, it applies a quantitative methodology based on written questionnaires targeting the residents of Vila Nova de Gaia in order to determine their perception of its industrial heritage and the tourist exploitation of the city's wineries as a framework for sustainable tourism development.

For this purpose, a series of variables are proposed. They are grouped into a set of five sustainability indicators or components (governance, economic, social, cultural, and environmental). Among the statistical procedures carried out with the SPSS programme, the calculation of the mean for each of the dimensions, the deduction of the synthetic index of sustainable tourism development, and the application of a cluster analysis in search of a homogeneous group structure related to the perception of sustainability in the destination can be pointed out.

## 2. Theoretical Framework

Wine tourism has been defined and conceptualized from various perspectives. Whilst some authors adopt a more commercial, business, and/or economic approach [36], others have focused on tourists' motivations and experiences [21,37]. In this sense, wine tourism holds a threefold definition as a pull factor for tourists, as a strategy enabling destinations to build and sell an image and amenities related to the world of wine, and finally as an opportunity for wineries to sell their products to consumers via a direct channel [38] (p.98). As a result, the product itself is not only related to the winery, its staff, its surroundings, etc., it is also related to the broader context of the wine region [3].

Although wine tourism is a relatively recent phenomenon [39], today it is positioned as a new tourist market niche that has experienced major growth [40]. In countries such as Australia (Tamar Valley Wine Route), New Zealand (Marlborough), Mendoza (Argentina), the USA (Napa Valley), South Africa (Stellenbosch Wine Routes), and Europe (Toscana and Piemonte (Italy); Alsace, Burgundy and Champagne (France); Rhine Valley (Germany); La Rioja (Spain); Douro (Portugal)), wine tourism has evolved largely thanks to the touristification of wineries, wine routes, exhibition, and festivals, etc., that are increasingly forming part of regional and national tourism strategies [18,34].

Wine tourism, a merger of the tourism and winemaking industries [33], inevitably requires an industry with wineries that are open to the public [18,21]. In this sense, the major designations of origin and the world's most famous wineries offer a range of services for wine, such as the creation of their own wine routes, among other viticultural, gastronomic, and/or cultural activities. It must be stressed that although wine tourism was initially associated exclusively with historical industrial heritage tours [41], there is currently a growing awareness of the tourism potential of working industrial heritage assets [16,42,43]. As a result, certain authors, such as Mitchell [44], propose differentiating between wine tourism in its widest sense and winery tours.

Visiting working companies naturally requires the touristification of certain spaces and objects that were not initially intended for tourism and form part of the productive process [45]. Wineries and vineyards fall within the realms of environmental, cultural, and industrial heritage [11], as this form of tourism includes not only the infrastructures of the wineries themselves, but also the landscape, gastronomy, artisanship, and the region's social and cultural components [10].

The review of scientific literature reveals that one of the most outstanding aspects of wine tourism is that winery tours are not only an efficient form of wine product promotion [46], but also a profitable business in themselves [40,47]. Consequently, wine tourism also emerges as a valuable diversifying element that promotes sustainable local and regional development [11,27,48–51].



In this sense, sustainable wine tourism as a form of tourism intended to guarantee the use and conservation of this heritage as a cultural resource, should aim to minimize any possible cultural and environmental damage, whilst optimizing visitor satisfaction and maximizing long-term regional social and economic growth with the support and involvement of the local community [2,26,52].

Sustainable practices are clearly on the rise and represent a differentiation factor among wineries and winemaking regions [2,4]. In essence, they represent a commitment to quality in tourist destinations offering industrial heritage attractions [26,53].

Nevertheless, whilst the interest in wine tourism has grown, the sustainability of this activity has received little scientific attention [2] and, albeit with a few exceptions, there is only a limited number of theoretical frameworks that shed light on the various aspects surrounding this issue (examples include [15,27,53]).

At this point it should be stated that in relation to tourism, sustainability is perceived as a complex and somewhat confusing concept [54,55] characterized by its multi-sectorial (including hotels, restaurants, and carriers) and multi-disciplinary nature (economic, social, environmental, etc.) [56]. Therefore, all efforts to measure its impacts have been hindered mainly due to the lack of consensus and ambiguity surrounding the selection and application of the various indicators [57]. The generally adopted solution has been to group impacts, profit, and costs into the categories included in the economic, social, cultural, environmental, and political framework [58–61].

In this sense, it must be stressed that the Sustainable Development Goals (SDGs), the core element of the UN 2030 Agenda, have become key focal points for the study of the way tourism can contribute to sustainable development [62]. In this regard, identifying the right indicators and monitoring strategies is considered essential in order to assess progress towards achieving SDGs, as well evaluating the overall sustainability of tourism.

Following González [63], wine tourism is directly linked to economic and social sustainability because it is a means of contributing to the generation of wealth and its distribution amongst all wine industry stakeholders. The relationship between wine tourism and environmental sustainability stems directly from the links between winemaking and oenological practices and the natural environment. It is therefore related to all aspects arising from the sustainable use of the land, as well as sustainable wine production. At all events, although environmental sustainability would appear to lie at the heart of the wine industry, it should not be limited solely to environmental issues [64].

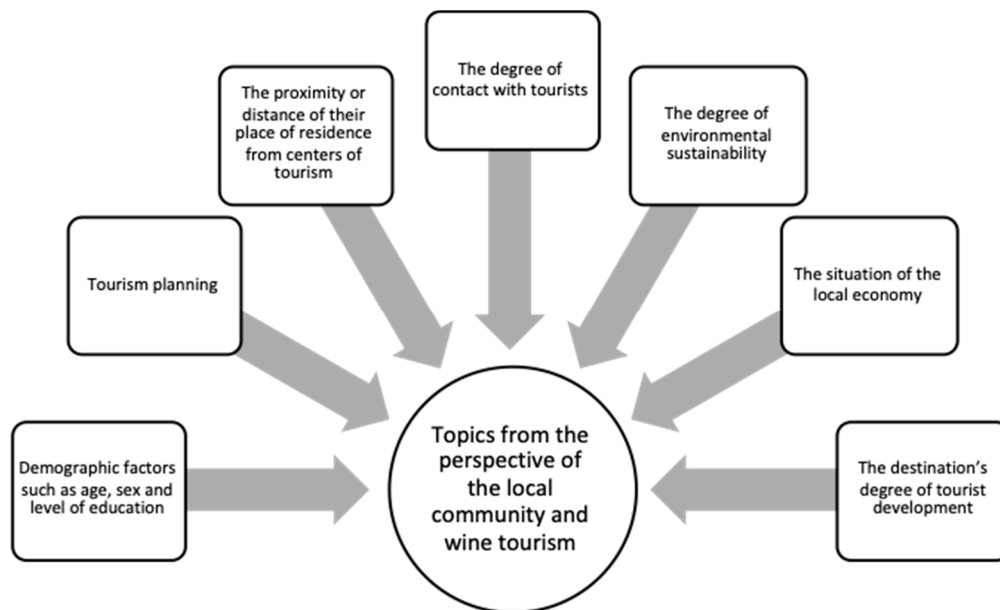
On the other hand, numerous authors have focused on studying the perceptions and attitudes towards tourism displayed by residents of the destinations as a key element for tourism success and sustainability [65,66]. The aim of most of these studies is to analyze the factors that influence these perceptions [66]. However, it is clear that the connections between the attributes that influence these perceptions are still not conclusive, as there are many cases of contradictory results [25].

Within this context, social exchange theory has provided one of the most appropriate frameworks for assessing residents' perceptions of tourist development [25], as it addresses the complex and dynamic considerations underlying individual decisions that seek to maximize the value of experiences [67]. The principal hypothesis posits that residents are prone to supporting development, provided that they believe that the expected benefits will exceed the costs [59]. Therefore, and within a context of exchange, those who perceive the greatest benefit from tourism will offer their support, whilst those who find it damaging will choose not to lend this support [58,67,68]. Specifically, many authors believe that negative perceptions may affect the sustainability of a destination [54,65,67,69,70], as well as the relations between residents and tourists [58], or the destination's capacity for entrepreneurship [65].

Successful tourism therefore requires a balance in relations between tourists, residents, places, organizations, and companies that provide tourist services [24].

In short, residents' perceptions of the impacts of tourism are a key issue that has attracted considerable attention in tourism literature [24,35,68,71]. It must be noted that earlier studies have determined that the perceptions of the local community may be influenced by demographic factors such as age, sex, and level of education [38], tourism planning [72], the proximity or distance of their

place of residence from centers of tourism [67], the degree of contact with tourists [60], the degree of environmental sustainability [72], the situation of the local economy [58,65], and/or the destination’s degree of tourist development [58,69,73] (see Figure 1).



**Figure 1.** Topics from the perspective of the local community and wine tourism. Source: [24,35,38,58, 65,68,69,71–73].

Sustainable destinations therefore require a deep insight into the preferences of all stakeholders, which naturally include those of the host population [58], whose attitudes and support are considered to be increasingly crucial for tourist development [74–76].

### 3. Methodology

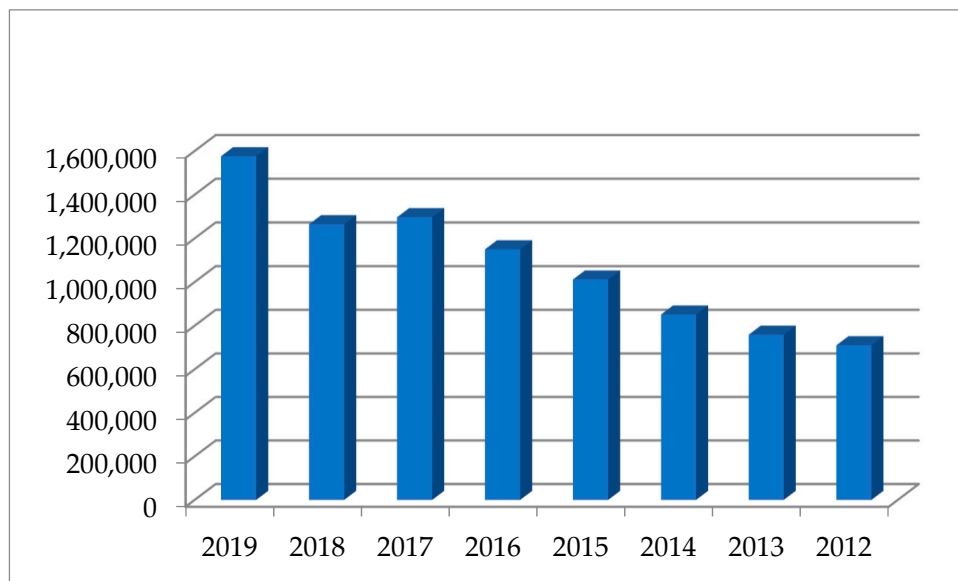
The aim of this research was to analyze local residents’ perceptions of wine tourism in Vila Nova de Gaia. Specifically, it focused on assessing the local community’s perceptions of the industrial heritage associated with the wineries located in this area as a framework for sustainable tourism. It also established and identified segments of residents displaying homogenous reactions to tourism.

#### 3.1. Contextual Setting

The city chosen for the study was the city of Vila Nova de Gaia in Portugal, as it lies at the heart of the port wine-making sector and is the finest example of Portuguese wine tourism. It is home to the warehouses where the port wine is stored prior to distribution.

The production and sale of port wine is based on a triangular system with a hub located at each point of the triangle. The three angles are based on a production-storage and authentication process that follows the course of the river [77]; namely Porto (the administrative center), Regua-Douro (the production center), and Vila Nova de Gaia (the sales center).

According to data released by the Secretary of State for Tourism, in 2018 Portugal welcomed 2.5 million tourists traveling for reasons related to wine tourism. The Portuguese wine industry has grown 50% thanks to direct sales on the estates and in the wineries. Gastronomy and wine are therefore considered strategic priority assets for the destination, as reported in the 2027 Strategic Plan for Tourism. Likewise, Figure 2 shows the evolution in the number of visitors to wineries, which makes it possible to confirm that it has increased during the years 2012–2019.



**Figure 2.** Evolution in the number of visitors to wine cellars (2012–2019). Source: Portuguese Port Wine Business Association (AEVP).

The vineyards where port wine is made are located in the Alto Douro Vinhateiro region, which in 1756 became the world’s first demarcated and regulated region and since 2001 has been listed as a UNESCO World Heritage Site. Once the grapes have been selected and harvested, they are taken to Vila Nova de Gaia, situated in the Porto Metropolitan Area and the most densely populated municipality in Portugal’s North Region.

Since the 1990s, the wineries have been one of the tourist attractions of Vila Nova de Gaia, separated from Porto’s historic quarter by the River Douro, welcoming some 1.5 million visitors a year [78]. The most famous wineries include Calém, Porto Ramos Pinto, Burmester, Churchill’s, Cockburn’s Port, Ferreira, Offley Forrester, Real Ca. Velha, Rozés, Sandeman, W & J. Graham, and C.N. Kopke Taylor’s (Fladgate & Yeatman). Most offer guided tours to the wine making areas *vino* (Figure 3), combined with wine tasting sessions. The range of tourist activities include river trips on board *rabelos* (Figure 4), the vessels that used to transport the wine from the Alto Douro Wine Region to Porto, enabling visitors to discover the local built and environmental heritage, as well as exhibitions and museums such as the Museu do Vinho, themed hotels, wine routes, wine bars, and events. This complex, known as the Port Wine Cellars (Caves do Vinho do Porto), forms one of the principal testimonies of Portuguese culture, occupying practically the entire historic quarter, which has grown steadily since the mid-18th century.



Figure 3. Guided winery tour (photo: Author's own).



Figure 4. Rabelos on the River Douro (photo: Author's own).





### 3.2. Research Instrument and Data Collection

What follows is a detailed description of the methodology employed.

The design of a questionnaire was chosen as a research instrument, with the aim that the various questions included in it allow to meet the general objective and the specific objectives established for the present empirical work.

Although the indicators used to measure tourism sustainability have been previously assessed [79], research is still in its early stages [80] as no consensus has yet been reached regarding a universal list of suitable indicators [81]. Furthermore, studies have pointed to the need to analyze impacts not just through objective indicators but also subjective ones by the analysis of residents' perceptions of the destinations [66,82].

Both types of indicators are of use in measuring sustainable tourism. In the case of our research, we opted for subjective indicators in the design of a structured questionnaire targeting the local population of Vila Nova de Gaia.

In this sense, and for explanatory purposes, limited primary research was conducted based on a quantitative trial and error methodology [83]. The data were collected by means of 100 valid surveys in September 2018 using a random sample of residents through a written questionnaire.

The study sample comprised 100 residents of Vila Nova de Gaia. The sample type was an intentional questionnaire. The results reveal a sample profile made up of 41 men (41%) and 59 women (59%). Participants' ages ranged from 18 to 50 (64.6%). The largest age group was 36 to 50 years (39%), followed by those aged between 18 and 35 (25%). Furthermore, 34.8% of them worked in hospitality and tourism, followed by commerce (22.8%). They were mainly employed by others (54.4%), followed by self-employed (14.4%) and retired (13.3%). As for their studies, the distribution was the following: no studies (4.1%), primary (33.7%), secondary (31.6%), and university (30.6%). In relation to monthly personal income, 52.9% earned less than €600 and 42.4% earned between €600 and €1000.

Based on the results obtained from the bibliographical review and the contrastive process based on semi-structured interviews with territorial agents and experts, the most relevant variables were selected and the questions for inclusion in the questionnaire were formulated. A block relating to socio-demographic characteristics was also included, bringing the total to 25 items that sought to determine the subjective perception of the local population regarding the sustainability of wine tourism. In short, five components were identified: economic, social, cultural, environmental, and governance components, each with five items. The responses linked to each dimension of sustainability were measured on a five-point Likert scale that ranged from a score of one, corresponding to "strongly disagree", to a score of five for "strongly agree". Additional variables were also included in reference to residents' support for tourism and their opinion on the positive or negative impacts on the territory generated by this type of tourism.

Once the collection process was complete, and prior to the statistical processing, the data were coded and tabulated by creating a file using version 21.0 of the SPSS for Windows program (Statistical Package for Social Sciences).

The statistical procedures included the mean calculation for each dimension, the deduction of the synthetic index for sustainable tourist development with a mean value for the value of all five components [26,52]. A cluster analysis was also conducted to identify a homogenous group structure for the perception of destination sustainability, and an ANOVA test was applied in order to obtain a comparative analysis of group agreement levels and identify the principal differences.

## 4. Results and Discussion

Securing an insight into local residents' support for tourist development is crucial, as it indicates that the success and sustainability of this activity is largely dependent on the active support of the local population [76,84]. Residents were therefore asked to give their opinion regarding the extent to which tourism is supported. The results obtained reveal that that the assertion (Figure 5), "I like the fact that tourist promotion in Vila Nova de Gaia is based on the industrial heritage represented by

the wineries”, obtained a high score (a mean of 4.18 out of 5), or in other words, 48.5% of the survey respondents strongly agreed with this statement, compared with just 1% who strongly disagreed. The culture of wine and its use through wine tourism experiences in Gaia therefore offer growing potential for tourism, thanks to the strong support shown by the local community.

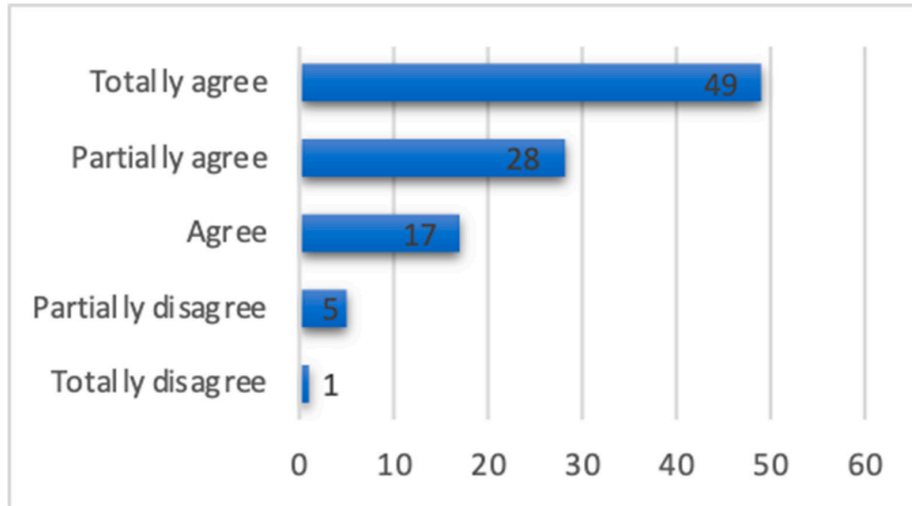


Figure 5. Tourism promotion and industrial heritage based. Source: author’s own.

As mentioned earlier, the impact of tourism on local development also depends to a large extent on the local community’s perceptions, assessment, and expectations [85] regarding the value and recognition conferred on heritage and its potential for tourism. In this sense, 48% of the residents polled considered that tourism contributes essentially positive benefits, whilst a mere 4% considered that tourism only brings negative consequences (Figure 6). The benefits produced by the industrial tourism linked to the Wineries in Vila Nova de Gaia are, therefore, greater than the costs. Our results also corroborate the hypotheses posed by a number of earlier studies based on the theory of social exchange, which indicated that the more positive the economic, socio-cultural, and environmental consequences for local residents, the greater their readiness to support tourism development, since they consider that this tourist activity will contribute, in general, to improving their community. Conversely, a greater perception of the negative impacts of tourism leads to lower levels of support [69,86].

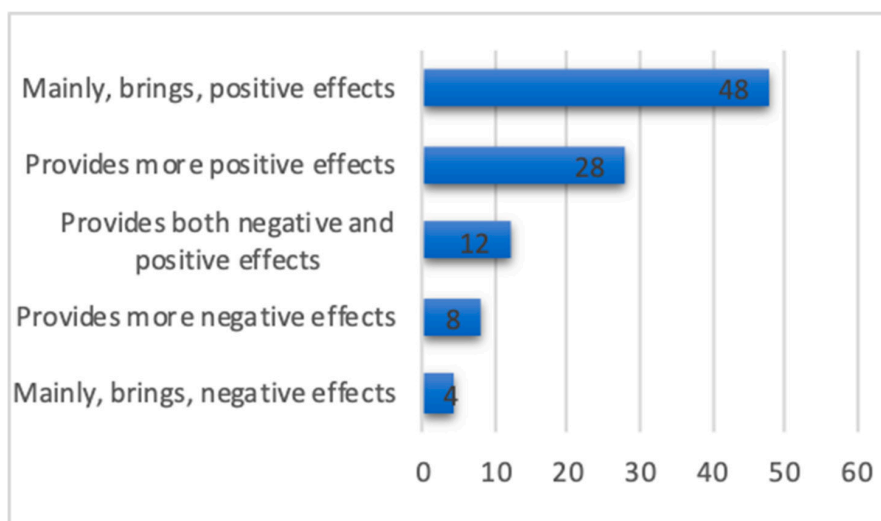


Figure 6. Tourism consequences. Source: author’s own



Regarding the subjective dimensions of sustainability included in the analysis model, Table 1 shows the mean scores obtained and the standard deviation of the responses, as well as the synthetic index for sustainable tourism development (SISTD), calculated as a mean value for all five components [26,52].

**Table 1.** Descriptive analysis of the perception of wine tourism as a sustainable activity.

| Components and indicators  | MS   | SD   | SISTD       |
|--|------|------|-------------|
| <b>GOVERNANCE COMPONENT</b>  | 3.75 | 0.83 |             |
| Tourism improves the provision of public services and infrastructures  | 3.98 | 1.18 |             |
| Tourism contributes to an increase in the availability of leisure amenities  | 3.94 | 1.27 |             |
| Money invested by institutions in order to attract a greater number of tourists has resulted in new facilities, infrastructures, and events tailored to tourism activity | 3.71 | 1.22 |             |
| Tourism contributes to improving the standard of the area’s catering services and outlets  | 3.52 | 1.12 |             |
| Tourism boosts the offer of cultural and recreational activities   | 3.61 | 0.96 |             |
| <b>ECONOMIC COMPONENT</b>  | 3.96 | 0.64 |             |
| Tourism is one of the principal sources of income for the city’s economic development  | 4.37 | 0.88 |             |
| Profit from tourism activity is reinvested in people and businesses outside the city   | 3.51 | 1.30 |             |
| Tourism attracts greater investment to the area  | 4.55 | 0.67 | 3.45 (0.58) |
| The local population is motivated in order to launch business initiatives in the tourism sector  | 3.72 | 1.12 |             |
| Tourism favors the generation of employment for the local population   | 3.67 | 1.28 |             |
| <b>SOCIAL COMPONENT</b>  | 3.13 | 0.58 |             |
| Tourism contributes to enhancing quality of life   | 3.52 | 1.59 |             |
| Tourism contributes to boosting collaboration among the city’s individuals, companies, or institutions in order to carry out tourism-related activities                  | 3.80 | 1.00 |             |
| People employed in the city’s tourism sector are highly skilled  | 4.08 | 1.10 |             |
| Tourism causes coexistence problems between tourists and residents   | 1.50 | 0.93 |             |
| Tourism only benefits a limited number of residents  | 2.78 | 1.06 |             |
| <b>CULTURAL COMPONENT</b>  | 3.81 | 0.55 |             |
| Tourism favors greater cultural exchange   | 4.21 | 0.98 |             |
| Tourism contributes to improving and enhancing the value of the city’s image   | 4.36 | 1.02 |             |
| Tourism disseminates the territory’s history and culture   | 4.03 | 1.08 |             |
| Tourism generates a greater sense of pride and belonging among the city’s residents  | 3.80 | 1.13 |             |
| Tourism disseminates the territory’s history and culture   | 2.63 | 1.30 |             |
| <b>ENVIRONMENTAL COMPONENT</b>   | 2.58 | 0.63 |             |
| Tourism contributes to the destruction or deterioration of natural resources and the local ecosystem   | 2.54 | 1.27 |             |
| Tourism leads to increased levels of rubbish, noise, and pollution   | 1.78 | 1.04 |             |
| Tourism negatively affects the municipality’s tranquility and increases massification at certain points within the municipality  | 1.77 | 1.06 |             |
| Tourism promotes the upkeep and restoration of the historic and cultural heritage, linking it with its environment   | 3.46 | 1.46 |             |
| The population takes an interest in activities related to the environmental recovery and revitalization of the industrial heritage and its setting for tourism usage     | 3.38 | 1.00 |             |

Source: author’s own.

The internal consistency of the scale, measured using Cronbach’s alpha, produced values of 0.77 for the impact scale, thereby exceeding the recommended value of 0.7 and complying with the parameters necessary for its application to our research.



What follows is a discussion of the key issues. Of the 25 items analyzed, “Tourism attracts more investment to the area” obtained the highest mean score ( $M = 4.55$ ,  $SD = 0.67$ ). This was followed by “Tourism is one of the principal sources of income for the city’s economic development” ( $M = 4.37$ ,  $SD = 0.88$ ) and “Tourism contributes to improving and enhancing the value of the city’s image” ( $M = 4.36$ ,  $DT = 1.02$ ). Conversely, the variables obtaining the lowest scores were “Tourism causes coexistence problems between tourists and residents” ( $M = 1.50$ ,  $SD = 0.83$ ), “Tourism negatively affects the municipality’s tranquility and increases massification at certain points within the municipality” ( $M = 1.77$ ,  $SD = 1.06$ ), and “Tourism leads to increased levels of rubbish, noise, and pollution” ( $M = 1.78$ ,  $SD = 1.06$ ).

The synthetic index for sustainable tourism development (SISTD), calculated as a mean for all five components [26,52], produced a score of 3.45 out of 5 with an SD of 0.58. Overall, this can be considered to be a positive result and a competitive advantage for the destination. It would appear to support the argument that wine tourism is a driving force for the integral and sustainable socioeconomic development of the area, generating employment and wealth, as well as improving the local population’s quality of life [16].

Furthermore, it was found that three of the dimensions of destination sustainability exceeded the mean value; namely, and listed in order of importance, the economic, cultural, and governance components. Dimensions relating to the social and environmental components obtained a lower score. In other words, local residents perceive wine-related industrial tourism in Gaia as a sustainable model, defined mainly by aspects related to the economy, culture, and governance.

In general terms, the economic impact of tourism was perceived extremely favorably, obtaining a mean score of 3.96 out of 5. “Tourism is one of the principal sources of income for the development of the city’s economy” and “Tourism attracts greater investment to the area” were the highest scoring perceived impacts. It is also necessary to comment that “Tourism favors the generation of employment for the local population” obtained a score lower than the average of the items in the set (3.6 out of 5). Therefore, residents are aware that wine tourism can promote the economic development of the region, although they perceive that this objective is not achieved because the jobs generated are not enough and for the most part are not of quality.

As for the cultural component of sustainability, opinion was also highly optimistic (obtaining a mean score of 3.81 out of 5). Particularly worthy of mention in this respect are the assertions that “Tourism contributes to improving and enhancing the value of the city’s image” ( $M = 4.36$ ,  $SD = 1.02$ ) and “Tourism favors greater cultural exchange” ( $M = 4.21$ ,  $SD = 0.98$ ). It is also significant that the negative cultural impacts of tourism also obtained relatively high mean scores. Notable examples in this sense include “Tourism leads to changes in or a loss of the area’s traditional culture”, with a mean score of 2.63 out of 5. This could imply that although residents perceive that tourism will have a considerable impact on the city in cultural terms, they also consider that some of those consequences will also be of a more negative nature.

Regarding the third-highest ranking component, governance (3.75 out of 5), the perceived positive effects that can be included among the strengths are “Tourism improves the provision of public services and infrastructures” ( $M = 3.98$ ,  $SD = 1.18$ ) and “Tourism contributes to an increase in the availability of leisure amenities” ( $M = 3.94$ ,  $SD = 1.27$ ). However, the most critical point, which thus represents a weakness in this dimension, refers to the fact that “Tourism contributes to improving the standard of the area’s catering services and outlets” (3.52 out of 5).

Likewise, residents’ perception of the social component of sustainability, closely related to the quality of life of the residents, which scored below the SISTD, can be considered fairly favorable (obtaining a mean score of 3.13 points). Specifically, the principal social impact is “People employed in the city’s tourism sector are highly skilled” ( $M = 4.08$ ,  $SD = 1.10$ ). In turn, although one of the most negative impacts obtained a low score, as in the case of “Tourism leads to coexistence problems between tourists and residents” ( $M = 1.50$ ,  $SD = 0.93$ ), it must be stressed that in all events the fact that



“Tourism only benefits a reduced number of residents” obtained a relatively high mean score of (2.78), indicating the need for further study in order to determine the reasons for this.

Finally, in the case of the environmental component, host population opinion was fairly optimistic (a mean of 2.58 points out of 5), particularly if we consider that three of the five assertions were formulated in a negative mode. It can therefore be concluded that “Tourism promotes the upkeep and restoration of the historic and cultural heritage, linking it with its environment” ( $M = 3.46$ ,  $SD = 1.46$ ) and “The population take an interest in activities related to the environmental recovery and revitalization of the industrial heritage and its setting for tourism usage” ( $M = 3.48$ ,  $SD = 1$ ) obtained a relatively positive score. On the other hand, “Tourism leads to increased levels of rubbish, noise, and pollution” ( $M = 1.78$ ,  $DT = 1.04$ ) and “Tourism negatively affects the municipality’s tranquility and increases massification at certain points within the municipality” ( $M = 1.77$ ,  $DT = 1.06$ ) may also be considered convenient. However, the result obtained from the item “Tourism contributes to the destruction or worsening of natural resources and the local ecosystem”, with a mean score of 2.58 and an  $SD = 1.27$ , should be considered with caution.

Phase two of the research included an exploratory factor analysis of the 25 variables to confirm the structure of the five-component sustainability model preestablished by the researcher. However, although the adjustment was optimum and the model explained 62% of the variance, the relatively small size of the sample led to the conclusion that this statistical procedure would imply a loss of information. The decision was therefore taken to apply a cluster analysis using the original variables in order to establish a structure comprising homogenous groups in relation to the perception of sustainability in the destination, in order to meet the second objective. In other words, when several impacts grouped into dimensions converge, impacts can be observed in each dimension more or less relevant with different intensity according to groups or segments. This is because the interests of each group of residents, due to the existing heterogeneity, will be different in their predisposition towards wine tourism as they are affected by the different dimensions.

In order to identify the segments of residents with homogeneous reaction patterns concerning wine tourism and within the hierarchical cluster analysis—as the most suitable technique for the classification of individuals—the choice of the criterion for grouping individuals into conglomerates, together with its pertinent execution of the algorithm by means of the Minimum variance method or WARD method, was made. There was no single criterion to select the best algorithm, but since it is important to minimize intragroup variance and maximize homogeneity within groups, the conglomeration method of the squared Euclidean distance using the WARD technique was chosen.

Ward’s method under the squared Euclidean distance was applied, where the selected variables segmenting respondents were the five preestablished dimensions, resulting in a hierarchical segmentation that allowed for four clusters displaying an optimum grouping of residents based on the perceived impacts (see Table 3). The subjects included in each cluster shared common and homogeneous features yet were differentiated and heterogenous from the others. Figure 7 allows us to visualize the groups and understand these differences, even though certain subjects are not correctly classified as they may fall into more than one group.

The convergence of various impacts grouped in the dimensions reveals a series of impacts-dimensions of varying relevance in accordance with their groups or segments.

A discriminant analysis of the segment configuration was conducted, based on the prior definition of the clusters. The aim was to determine the behavior patterns of each group based on the impact perceptions. The predictive power of the discriminant analysis was 93% and 92% for the correctly classified cross validated groups, indicating an appropriate group discrimination in the resulting segmentation. Group 1 obtained a 90.9% correct classification; Group 2 97.3%; Group 3 86.7%; and Group 4 93.3%. The descriptive analysis of each mean comparison (conducted using the Wilks’ lambda test) according to their group also revealed mean differences in the dimension/impact assessment.

A mean contrast (ANOVAS) for each variable and DIMENSION was used in order to contrast the profiles between segments and establish the differences between them. A further aim was to determine the internally homogenous profiles and the heterogeneity between groups.

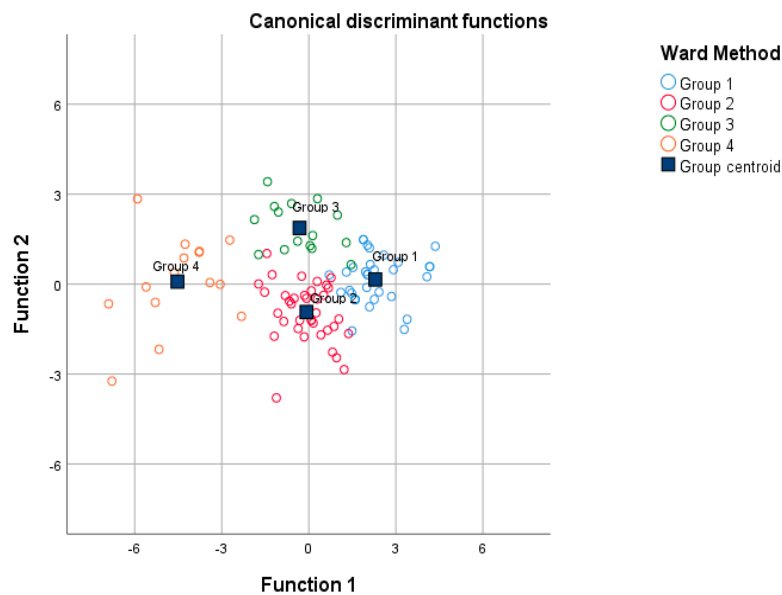


Figure 7. Canonical discriminant functions. Source: author’s own

With the exception of the environmental component (DIMENSION 5), the inter-group variability comparison revealed significant differences, indicating that the mean assessment for the various assertions included in the dimensions varied in accordance with the group, thereby allowing for clearly differentiated profiles. It was found that all groups showed significant differences in accordance with the mean scores obtained for the Governance component. In the case of the Economic component, it can be claimed that groups 4 and 2, and groups 1 and 3 were perceived in a similar manner. As for the Social component, groups 1 and 3 were the only ones that displayed differentiation, as the others recorded fairly heterogenous results. Finally, only groups 4 and 3 showed no differentiation in the Cultural component, as well as groups 2 and 1.

In short, there would appear to be greater similarities between the scores obtained by groups 1 and in the case of the first 3 dimensions (Governance, Economic Impact, and Social Impact). In the case of DIMENSION 4 (Cultural Impact), a greater similarity was observed between groups 1 and 3 (See Tables 2 and 3).

Table 2. ANOVA Test.

| DIMENSIONS                           | Group1 | Group2 | Group3 | Group4 | p-value |
|--------------------------------------|--------|--------|--------|--------|---------|
| DIMENSION 1: GOVERNANCE COMPONENT    | 3.8886 | 3.0000 | 1.9000 | 1.8000 | 0.0000  |
| DIMENSION 2: ECONOMIC COMPONENT      | 4.0506 | 4.4000 | 2.5000 | 3.8000 | 0.0040  |
| DIMENSION 3: SOCIAL COMPONENT        | 3.1873 | 3.8000 | 2.5000 | 1.8000 | 0.0080  |
| DIMENSION 4: CULTURAL COMPONENT      | 3.8709 | 2.6000 | 2.5000 | 3.6000 | 0.0000  |
| DIMENSION 5: ENVIRONMENTAL COMPONENT | 2.5722 | 4.0000 | 2.6000 | 2.2000 | 0.1250  |

Source: author’s own.



Table 3. Ward Method.

| WARD METHOD   | Group1 | Group2 | Group3 | Group4 |
|---|--------|--------|--------|--------|
| Tourism attracts greater investment to the area   | 4.82   | 4.32   | 4.93   | 4.13   |
| Tourism contributes to improving and enhancing the value of the city's image  | 4.76   | 4.59   | 3.27   | 4.00   |
| Tourism is one of the principal sources of income for the city's economic development   | 4.70   | 4.24   | 4.47   | 3.87   |
| Tourism improves the provision of public services and infrastructures   | 4.70   | 3.97   | 4.13   | 2.27   |
| Tourism contributes to an increase in the availability of leisure amenities   | 4.64   | 4.35   | 3.47   | 1.87   |
| Tourism promotes the upkeep and restoration of the historic and cultural heritage, linking it with its environment  | 4.55   | 3.17   | 3.00   | 2.20   |
| Tourism disseminates the territory's history and culture  | 4.52   | 4.11   | 4.00   | 2.80   |
| Money invested by institutions in order to attract a greater number of tourists has resulted in new facilities, infrastructures and events tailored to tourism activity | 4.50   | 3.89   | 3.53   | 1.80   |
| Tourism favors the generation of employment for the local population  | 4.48   | 2.92   | 4.20   | 3.14   |
| Tourism contributes to enhancing quality of life  | 4.44   | 2.92   | 4.07   | 2.47   |
| Tourism generates a greater sense of pride and belonging among the city's residents   | 4.33   | 4.03   | 3.13   | 2.73   |
| Tourism contributes to improving the standard of the area's catering services and outlets   | 4.30   | 3.70   | 2.20   | 2.67   |
| Tourism contributes to boosting collaboration among the city's individuals, companies, or institutions in order to carry out tourism-related activities                 | 4.30   | 3.73   | 3.67   | 3.00   |
| Tourism boosts the offer of cultural and recreational activities  | 4.30   | 3.46   | 3.53   | 2.53   |
| Tourism favors greater cultural exchange  | 4.27   | 4.24   | 3.87   | 4.33   |
| The local population are motivated in order to launch business initiatives in the tourism sector  | 4.24   | 3.42   | 4.00   | 3.00   |
| People employed in the city's tourism sector are highly skilled   | 4.24   | 3.84   | 4.67   | 3.71   |
| The population take an interest in activities related to the environmental recovery and revitalization of the industrial heritage and its setting for tourism usage     | 3.72   | 3.57   | 2.53   | 3.00   |
| Profit from the tourism activity is reinvested in people and businesses outside the city  | 3.48   | 3.22   | 4.60   | 3.13   |
| Tourism only benefits a limited number of residents   | 3.06   | 2.78   | 2.87   | 2.00   |
| Tourism contributes to the destruction or deterioration of natural resources and the local ecosystem  | 2.76   | 2.00   | 3.53   | 2.40   |
| Tourism leads to changes in or a loss of the area's traditional culture   | 2.72   | 2.46   | 2.57   | 2.93   |
| Tourism negatively affects the municipality's tranquility and increases massification at certain points within the municipality   | 2.09   | 1.64   | 1.93   | 1.21   |
| Tourism leads to increased levels of rubbish, noise, and pollution  | 1.91   | 1.68   | 2.20   | 1.33   |
| Tourism causes coexistence problems between tourists and residents  | 1.30   | 1.24   | 2.80   | 1.27   |

Source: author's own. Note: the maximum data is highlighted in red and the minimum data in yellow.

Once the clustering was defined, confirmed, and adapted to the four segments, the mean scores were obtained and analyzed for each of the 25 items in accordance with their group. However, due to the limited sample size, the mean equality test failed to provide sufficient significance to determine the principal sociodemographic characteristics of each.



Group 1, comprising 33% of the sample, was found to be the most favorable in positive opinions; in other words, it displayed a higher degree of agreement with the assertions regarding the various positive impacts of tourism: “Tourism contributes to improving and enhancing the value of the city’s image”; “Tourism is one of the principal sources of income for the city’s economic development”; and “Tourism improves the provision of public services and infrastructures”. Disagreement was observed (albeit to a similar degree as the mean) only in those items that refer to the worsening of tourism. Examples in this sense include “Tourism leads to increased levels of rubbish, noise, and pollution”. However, Group 1 was the most critical in terms of the item “Tourism negatively affects the municipality’s tranquility and increases massification at certain points within the municipality”. Consequently, this segment, which in overall terms considers wine tourism to be a driving force for the city’s sustainable development, in particular in relation to the governance, cultural, and environmental components, has been tagged as “Favorable to wine tourism and convinced of its contribution to sustainable development”.

Group 2 was the largest, accounting for 37% of the sample. Its middle scores for those variables related to the positive characteristics of tourism reveal a relative indifference. Nevertheless, this group showed stronger agreement with negative assertions such as “Tourism contributes to the destruction or deterioration of natural resources and the local ecosystem”; “Tourism leads to changes in or a loss of the area’s traditional culture”; or “Tourism causes coexistence problems between tourists and residents”. However, among this segment, defense of the assertion “Tourism favors the generation of employment for the local population” was lowest. In this sense, the decision was taken to tag this group as “Neutral regarding the connections between wine tourism and sustainability”, as in general terms it comprises persons with a neutral opinion regarding the majority of the problems specifically linked to the tourist exploitation of the city’s wineries as a framework for sustainable development.

Group 3 was made up of 15% of the survey population; residents of Gaia who displayed a favorable attitude to the majority of items, particularly those associated with the economic and social components. For instance, they strongly agreed with items such as “Tourism attracts greater investment to the area”; and “People employed in the city’s tourism sector are highly skilled”. However, they also strongly agreed with items that are crucial for wine tourism and sustainability in the city, such as “Profit from tourism activity is reinvested in people and businesses outside the city”; “Tourism contributes to the destruction or deterioration of natural resources and the local ecosystem”; “Tourism causes coexistence problems between tourists and residents”; and also “Tourism leads to increased levels of rubbish, noise, and pollution”. For these reasons, this segment was tagged as “Skeptical regarding the impacts of wine tourism on sustainability”.

Group 4, which also comprised 15% of the sample, displayed a less optimistic opinion of wine tourism’s potential to contribute to sustainability, awarding the lowest scores to the majority of favorable assertions, with the exception of “Tourism favors greater cultural exchange”. However, although their responses were generally above average in terms of the negative impacts, it is also true that they gave a high score to the notion that “Tourism leads to changes in or a loss of the area’s traditional culture”. This group was therefore identified as “Critical of the interrelation between wine tourism and sustainability”.

It should be noted that we examined whether the sociodemographic characteristics of the sample were associated with the perceptions of residents concerning the development of local wine tourism. In this sense, we have to indicate that the performance of the comparison analysis of means (one-factor ANOVA) when the normality and homogeneity of the variances were fulfilled revealed that the result of the F statistic accompanied by its level of significance ( $p$ -value) was higher than 0.05 in all cases and, therefore, it is concluded that the sample defined by the sociodemographic variables (sex, age, educational level, occupation, etc.) has the same criteria or responses in principle.

The results obtained further confirm the need to obtain and understand local community opinion [72] in order to draw up strategic and operational lines of action for training and/or information, tailored to the perceptions of homogenous groups. Furthermore, a greater insight into the factors





that influence residents' perceptions would also facilitate planning and management actions for the sustainable development of local communities [25,35,47].

## 5. Conclusions

As discussed previously, a winemaking industry with visitable wineries and the amenities necessary to support tourism activities is a requisite for the development of wine tourism [12]. In light of this premise, it is clear that in addition to the archaeological or historical-industrial heritage, living heritage or active industries can also be considered tourism resources [45,87]. In this sense, wine tourism can be considered a highly complex tourism product in terms of its structure, management, promotion, and sale, due largely to the intervention of two traditionally unrelated key strategic sectors, namely tourism and the winemaking sector.

Wine tourism has emerged as a form of sustainable tourism with the capacity to improve the integral social and economic development of a territory [3,16,63], thereby contributing a competitive advantage to winemaking regions [13]. Indeed, in most of the areas that are home to leading wineries, wine is a major hallmark of their regional identity [88]. In turn, the wineries comprise a key tourism asset for the majority of wine producing countries [89].

Sustainability also plays an increasingly important role in the wine tourism sector [15]. However, although sustainable practices now form a part of wine production, they must also be extended to wine tourism [3]. To date, efforts in this sense have centered more on the wine industry than the tourism sector [2].

In accordance with the results obtained, and following López-Guzmán and Sánchez [90] (p. 160), "wine tourism, as a model for sustainable economic development and an integrating elements for certain areas, is capable of boosting a region's level of competitiveness and increasing and improving wine production, whilst at the same time caring for the environment and enhancing citizens' living conditions." In short, wine tourism can generate positive impacts when managed and applied sustainably through policies that allow for the regular identification and assessment of the environmental, economic, social, and cultural impacts, as well as monitoring and applying actions designed to reduce or offset the negative consequences [38,61].

In this context, measuring the impact of tourism is an essential tool in preventing conflict between tourism and sustainability [66,91]. In the present study, we tried to develop and validate a proposal for subjective sustainability indicators capable of monitoring the impact of wine tourism activity in Gaia. This allowed for the identification of the most vulnerable areas as well as those considered that fit best within this paradigm. The population's overall perception of the impact of wine tourism in Gaia is fairly favorable: it is seen as a driving force for the economy that also contributes positively to the city's image. It is also seen as a sustainable model, mainly due to economic, cultural, and governance considerations. Furthermore, resident segments were identified that displayed homogenous reactions to wine tourism.

In essence, wine as a cultural product has emerged as the key factor for tourism development in Gaia through the interrelation of changing demands for cultural tourism and the wineries' promotional and economic diversification strategies [11,36,92]. In line with literature, it can therefore be concluded that the culture and use of wine based on wine tourism experiences bears a clear connection with territorial sustainability [64].

At all events, it must be stressed that successful sustainable development of winemaking regions through tourism requires the commitment and coordination of stakeholder objectives in line with the territories' development needs. This can be achieved through the application of strategies designed to generate value in the cooperation networks [33].

Sustainable wine tourism therefore requires meticulous planning and effective management that involves all stakeholders on an institutional level, as well as tour operators, winemakers, local trade, tourists, and above all the residents [93].



This said, the interpretation and implications of the results of the study must be considered with caution, due in part to the intrinsic characteristics of the territory, as the sample size prevented more sophisticated statistical analyses. Future lines of research should therefore include qualitative methodologies such as in-depth interviews and participant observation in order to complement these results. Finally, and considering that residents' perceptions are varied and change as they move from one stage of the life cycle to another [94], this aspect should also be considered by means of a longitudinal research approach [15] in order to compare and contrast the resulting differences.

The research findings also suggest a number of future study priorities that can be identified as a starting point, for example the analysis of sustainability from stakeholder perspectives, the importance of sustainability to wineries, and potential benefits of sustainability practices. On the other hand, the motivations and profile of wine tourists, as well as their preferences, attitudes, needs, and expectations in relation to ecological issues and sustainability in general, should also be thoroughly investigated.

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