



**Universidade de Évora - Escola de Ciências Sociais**

**Mestrado em Gestão**

Área de especialização | Marketing

Dissertação

**Wine Sustainability and Customer Buying Decision**

**Diogo Vargas Mendonça**

Orientador(es) | Maria Raquel Lucas  
Andreia Teixeira Basílio

Évora 2024

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A dissertação foi objeto de apreciação e discussão pública pelo seguinte júri nomeado pelo Diretor da Escola de Ciências Sociais:

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## **Abstract**

The proposed work presents exploratory research related to the main theme, wine sustainability and customer buying decision. This research allows to justify the choice of the theme and prove the need for further research. Once the exploratory research has been carried out and the main concepts related to the specific objectives of the work have been defined, a survey related to the consumer's willingness to pay a premium price for wines with sustainable production certification was applied. The answers and statistical analyses made to them will be presented, as well as the conclusions obtained through this analysis. Finally, the results of the questionnaire and the conclusions drawn from the initial exploratory research will be crossed, in order to draw conclusions that answer the question of investigation of the work.

## **Keywords:**

Sustainability, Sustainability Label, Winemaker, Sustainable Production, Customer Willingness to Pay.

## **Resumo**

# ***A sustentabilidade do vinho e a decisão de compra do consumidor***

*O trabalho proposto apresenta uma pesquisa exploratória relacionada com o tema principal, sustentabilidade do vinho e decisão de compra do cliente. Esta pesquisa permite justificar a escolha do tema e comprovar a necessidade de desenvolver investigação. Uma vez realizada a pesquisa exploratória e definidos os principais conceitos relacionados com os objetivos específicos do trabalho, foi aplicado um questionário relacionado com a disponibilidade do consumidor para pagar um preço premium por vinhos com certificação de produção sustentável. Serão apresentadas as respostas a este questionário e as respetivas análises estatísticas, bem como as conclusões obtidas através desta análise. Por fim, serão cruzados os resultados do questionário e as conclusões retiradas da pesquisa exploratória inicial, a fim de tirar conclusões que respondam à questão da investigação do trabalho.*

**Keyword:** Sustainability, Sustainability Label, Winemaker, Sustainable Production, Customer Willingness to Pay.

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## **LIST OF ACRONYMS**

WTP – Willingness to pay

PSA – Set of questions titled “Preocupações socioambientais” (Socio-environmental concerns)

AMEV – Set of questions titled “Atenção dos consumidores à comunicação de marketing das empresas de vinho” (Consumers' attention to the marketing communication of wine companies)

CPS – Set of questions titled “Certificação de produto sustentável no setor vitivinícola” (Sustainable Product Certification in the Wine Sector)

DP – Set of questions titled “Disposição a pagar por certificação de produção sustentável em vinho” (Willingness to pay for certification of sustainable wine production)

## 1. Introduction

The emerging concern for the environmental issues has stimulated the attention given by wine producers to the theme of sustainability (Santini et al., 2013). The relevance of this topic in the current scenario has been forcing companies to implement sustainable production and management measures. Currently, it can be said that sustainability has a significant impact on the most varied industries and that in this specific case of the wine sector, the investment made by companies in the protection of the environment is visibly increasing, as noted by Borsellino et al. (2016): "we witness a proliferation of initiatives to develop the sustainable production of wine at the international level since the early 1990. (Borsellino et al, 2016, p.6)". The increasing global concern regarding the topic of sustainability has led companies around the world to adopt an "environment-friendly" positioning. The theme has been gaining an increasingly relevance nowadays, especially in its environmental aspect, which is of interest to producers and consumers, due to the impact it has on the daily lives of both. Younger generations are increasingly concerned about the climate emergency and it's easy to see how urgent the topic is. Still, it is imperative to note that sustainability extends beyond the theme "environment", as highlighted by Purvis et al. (2020): "The three-pillar conception of (social, economic and environmental) sustainability, commonly represented by three intersecting circles with overall sustainability at the centre, has become ubiquitous." (Purvis et al, 2020, p1). Subsequently, it can be admitted that even the term sustainability being often associated as almost a synonym of the protection of the environment, the other two fundamental pillars – social and economic – should also be considered when approaching this concept.

That said, it is nowadays necessary to promote not only a sustainable attitude in the business environment, but also a positioning that reveals concern by the company to contribute to the preservation of the planet, in the environmental, social, and economic facet, with the aim of meeting consumers' beliefs regarding the theme of sustainability. The study by Sogari et al. (2016), concludes that sustainable certification can be useful to get consumer attention, but might not be enough to turn this attention into a real purchase. In addition, the authors of this same study suggest that companies focus their campaigns on raising consumer awareness of environmental issues in the wine sector and on the importance that sustainability labels should have (Sogari et al, 2016). As Marques e Teixeira (2023) highlight, this awareness is increasing and consumers nowadays are aware of the need to be more sustainable, so producers should find a way to "implement sustainable practices in order to stand out in the market" (Marques & Teixeira, 2023, p.2). The potential of sustainable

positioning is high, and it is important to understand how companies can differentiate themselves from the competition by investing in sustainable production and labelling and captivate the attention of specific target customers “who might be interested to buy and value sustainable wine” (Sogari et al., 2016, p.63). The same authors also state that finding this clusters of customers “might become one of the major issues in the marketing strategies and consumer communication in the forthcoming years” (Sogari et al, 2016, p.63). It will also be relevant to understand to what extent this certification of sustainable production in the wine sector can be decisive for the consumer when evaluating purchasing alternatives. The previous mentioned study by Schaufele and Hamm (2017) about the perceptions, preferences and willingness-to-pay for wine with sustainability characteristics, also revealed that the consumer sees organic wine as higher quality product. It is also stated in this same study by Schaufele and Hamm that there can be found various groups of consumers in different countries that show willingness to pay an extra price for wine, and that this consumer is mostly female, with higher incomes and living in urban areas.

The present work is conceived with the main purpose of identifying the importance given by the wine consumer to a sustainable attitude from wine producing companies. A fundamental aspect to be investigated in this context is the importance of the certification labelling for sustainable wine production. Understanding whether these certification labels have meaning in the consumer's evaluation of purchasing alternatives is essential. Specifically, the study's main goal is to investigate whether the presence of certification labels that guarantee sustainable production practices hold a decisive role, motivating consumers to choose wines that are clearly recognized as sustainably produced. Hopefully, this research can contribute with valuable conclusions for both the winemaking industry in means of understanding the value of a sustainable approach and the academics that might want to extend this subject into further research.

### **1.1. Theme framework and Justifications of the Choice**

Primarily, it was necessary to understand if the research proposed for this report was significant and necessary, by consulting existing work and clarifying on whether there is room for further research on the subject. The work of Li and Kallas (2021) on this topic helps to support the thesis that research within this topic is necessary, having in consideration the conclusions that the authors presented in defence of this idea. Santini et al. (2013) was also a

highly significant article to confirm that further academic research under this theme can have multiple benefits. Its main focus is to understand the status of investigation and the current trends of research in sustainability when related to the wine industry. This work highlights the importance of further academic research to disseminate the focus in sustainability into the wine industry. Santini et al. (2013) also highlight “how a tight relationship between academic and industry can provide benefits to the wine industry and can improve its overall orientation toward sustainability” (Santini et al., 2013, p.10), leaving as a note that deeper research can be something to look at to “provide answers for some managerial issues” (Santini et al., 2013, p.11). Since the present work focuses on wine consumer willingness to pay a premium price for wine certified as sustainable, the article by Sogari et al. (2016b) also proves to be an important starting point, as its main focus is on the determining factors for a decision to purchase a sustainable product, with emphasis on wine. The authors even say that “further research is required to determine whether and how current certification and labelling systems influence consumers' buying decisions” (Sogari et al., 2016b, p.643). The same was highlighted by Pomarici et al. (2016), which in conclusions of their research on the Italian wine consumers' interest in sustainable wines also underlined the hypothetical scenario as a limitation to their study and suggested that real-choice experiments could be more accurate to understand consumer's actual purchase behaviour.

The bibliography inherent to the topic of sustainability and its relationship with the area of marketing and consumer behaviour leads to the urgent need for research on it, as stated in a 2021 study which concludes that “it is necessary to find systematic evidence on consumers' willingness to pay (WTP) for sustainable food products” (Li & Kallas, 2021, p.7). Social evolution, especially in terms of changing mindsets and attitudes, has promoted the awareness of the population in the most impactful areas for society, in which sustainability, the central theme of this work, is inevitably included, as Schaufele and Hamm (2017) point out, in conclusions drawn from their research on consumer perceptions, preferences and willingness to pay for wine with sustainable characteristics. As the research outcomes from the work of Schaufele and Hamm (2017) underline, the act of purchasing wines considered sustainable will strongly be influenced by the values and beliefs of the consumers. That said, it can be concluded that it is crucial to point communication in the way that aligns with consumer's values and beliefs, thus leading the consumer to perceive the winemaking company's sustainable positioning as something that differentiates it from its competitors and that makes it a better option. As stated by Sogari et al (2016) in their research on

sustainable wine producer certification, understanding consumer perceptions can assist in developing marketing strategies for sustainable certified wines.

## **1.2. Formulation of the Problem and Objectives**

The main goal of this work is to define the importance of the certification of "sustainable production" for the wine consumer. It is relevant to understand if it is important for the wine consumer, if it's valued and can be a decisive determinant to buy a wine. To attain that goal, four other specific objectives were predetermined. 1) Analyse the consumer's perception of sustainable production in the wine sector, i.e., understanding consumer's awareness in what regards sustainable approaches in the winemaking industry. This involves exploring the consumer's consciousness about environmental, social, and economic practices associated with sustainability, as well as the importance given to these practices; 2) Assess consumer commitment to sustainability and environmental protection, by analysing consumer behaviours that show commitment to sustainability and to what extent the consumer is willing to change their practices in favour of sustainable habits; 3) Understand to what extent the consumer of wines is willing to pay a premium price for the product that is certified as sustainable, namely, understanding how sensitive the consumer is to a price increase and if they understand some added value on a sustainability recognition. This includes clarifying whether consumers prioritise sustainability over price or if there are limits to their willingness to pay a premium price; 4) Identify the profile of the wine consumer who is willing to pay a premium price for a product with sustainable production certification, in what regards demographic characteristics, such as gender, age, geographic location, studies and income level.

## **1.3. Research Methodology**

The work presents exploratory research related to the main theme. The search for articles, with a publication date at least from 2010 onwards, mostly in the google academic search engine, with the access to the articles being guaranteed by the online catalogue of the library of the University of Évora. The scientific articles that proved to be relevant to this research were submitted to the software Mendeley, which currently functions as a database of scientific information and a tool for citation and referencing. The keywords Sustainability, Sustainability Label, Winemaker, Sustainable Production, Customer Willingness to Pay were



determined, which when combined provided an interesting range of results related to the theme. To try to restrict the search to recognized articles and authors of proven quality, the SC Imago Journal Rank and the Web of Science were consulted. This preliminary research serves a dual purpose: to justify the choice of the topic and to evidence the need for research within this domain. Having this exploratory research concluded and the fundamental concepts related to the main subject of this work defined, a survey was carried out with the aiming of understanding wine consumer's willingness to pay (WTP) a premium price for wines with sustainable production labelling and certification and to understand some other relevant details for answering the objectives of this work, being it consumers attention to marketing campaigns of winemaking companies, attitudes in relation to sustainability and socioenvironmental concerns and beliefs towards sustainability labels. This survey is mainly inspired by the one used by Sogari et al (2016b) in their work about the factors that drive to a sustainable choice of wine. The choice of this procedure for data collection is due to the high capacity that the questionnaire has for an initial confirmatory analysis, providing closed answers, which are inevitably clear and precise, or open answers, which allow more detailed data to be obtained. It is also important to note that the questionnaire is an inexpensive data collection method that allows for a longer response time and the guarantee of anonymity allows for honest answers. The sampling technique to be used will be the snowball technique, which is very advantageous due to the incentive given to the respondents themselves to disseminate the survey, thus allowing the sample to become wide and varied. The main purpose of this survey is to allow the author to answer the specific objectives that were defined for this work. The answers and statistical analyses made to the survey will be presented, as well as the conclusions obtained from them. Finally, the results of the questionnaire and the conclusions drawn from the initial exploratory research will be crossed, to draw conclusions that answer the research main question: Is the customer willing to pay a price premium for sustainable wine? The absence of a response tendency will not be a less valuable result, as it will make it possible to admit a non-generalisation of this consumer interest. To understand which group of consumers, show the most interest and willingness to pay for wine labelled as sustainable, a hierarchical clustering analysis will be carried out, with the main goal being to find a specific group of consumers with similar demographic characteristic that state to have the same opinion about the mentioned product. Through this research, the study aims to contribute with valuable outcomes to the ongoing discourse concerning sustainability and consumer preferences, crossing it with the wine-making industry.

## **1.4. Structure of the Work**

The present work starts with the introduction in which this topic 1.4. is included. This introduction is split into subtopics to explain the general goals of the research and how the work will be conducted. It shows a theme framework and the justification of its choice, followed by the formulation of the problem and the general and specific objectives. Then, it will be briefly explained the methodology used and in the present point is shown the structure of the work.

The second main chapter of this work is the literature review, which sheds light on the main concepts that will be mentioned along the research. The first sub chapter of the literature review focuses on the three fundamental pillars of sustainability and their relevance to the research and is followed by a topic focused on the current status of investment in sustainability. The work proceeds with an overview on how other authors previously identified to be possible to gain competitive advantage through sustainability and then skips to an introductory summary of other works that mentioned the willingness to pay for sustainable wine. After this, will be reviewed the factors that can influence the buying decision and the first approach to sustainable labels in the winemaking industry will be presented. Last in the literature review chapter, some past works, which focused on specific targets, will also be reviewed and put together to understand how this different group of consumers react to sustainable winemaking approaches.

The third main chapter is the methodology, in which it is described with more detail the methods used to collect data and analyse it to conduct the study. It includes an explanation of how the literature review was carried out and how the articles to put it together were found and accessed, followed by an explanation of how the general and specific objectives were defined. Then it is shown where the survey used was based and how the different groups of the survey are needed to answer the objectives of this work, followed by an explanation of the sample procedure and how the data collected was handled.

The subsequent chapter is the analysis of the results obtained from the questionnaire and after showing the demographic data collected, it offers two subgroups, one focused on the descriptive analysis of the questions and the second one focusing on the hierarchical clustering analysis.

Finally, the conclusions drawn from this research are presented in the fifth chapter as well as its relation to the objectives of the work, allowing the reader to find the answers to the proposed questions in the beginning of the work. It will also be mentioned the limitations and

challenges that this study faced and the suggestions for future research under similar concepts and theme.

The work ends with references to the bibliography mentioned and used as basis and provides an appendix and an annex section divided into some subgroups, including relevant figures and tables left out of the main work but that revealed to be of significance to it.

## **2. LITERATURE REVIEW**

Considering the basis of this research are both sustainability and the winemaking industry, it is essential to begin with a review the main concepts of sustainability and the work already produced that relates to this main themes. The three fundamental pillars of sustainability will be presented for reference and following this, the current status of investment in sustainability will be analysed. Successively, it will be reviewed how far have past works reached in what concerns consumers willing to pay for sustainable wines and how a winemaking company can gain competitive advantage through sustainable practices. Additionally, this review will identify the key factors considered by other authors as the most determining for wine purchasing and what constitutes a sustainability label for wines. Finally, will be presented and discussed the findings of other authors that focused on specific groups of consumers, different than the ones that participated in the present work, thus allowing for comparisons and conclusions.

### **2.1. The three fundamental pillars of sustainability**

To start investigating a topic related to sustainability, it is essential to understand the concept of the theme and define its 3 fundamental pillars – social, economic, and environmental sustainability. For this purpose, the article by Purvis et al. (2020) is essential, as it allows the reader to further acknowledge on the historical evolution of the sustainability theme and clarifies how these three pillars were conceived, by reviewing relevant historical sustainability literature. The paper concludes that it is not possible to confirm one single point of origin, however, the intention of reconcile economic growth with social and ecological issues might have been a starting point for the definition of the three fundamental pillars of sustainability (Purvis et al., 2020).

### **2.2. Status of investment in sustainability**

The article authored by Gilinsky et al. (2016) presents a valued case study, offering the reader valuable insights about the status of investment in sustainability across various countries in different continents as well as the opportunities in the market for competitive advantage gaining via a sustainable strategy. Through this investigation, readers can find extended information of some of the approaches and practices carried out in different global

regions that serve the main purpose of promoting and integrating sustainable habits. According to the authors of the mentioned case study, the general way of adopting a sustainable approach for business includes “using business practices that are environmentally friendly, socially equitable in terms of treating employee and community fairly, and economically viable” (Gilinsky et., 2016, p.38). Specifically, some of the practices in favour of sustainability implemented by winemaking companies that were identified by Gilinsky et al (2016) are, for example, an attempt to use organic products by sustainable vineyards and “reducing the use of water and energy in both vineyard and cellar” (Gilinsky et., 2016, p.38). Still the authors don’t miss to note that vineyards considered sustainable “will resort to agro chemicals to protect the crop” (Gilinsky et., 2016, p.38) if they find it needed. Another highly valued insight that can be taken from this case study is that, in general, “wine consumers do not seem to be demanding eco-labelled wines” (Gilinsky et., 2016, pp.38-39). Nevertheless, “many members of the global wine industry have decided to be proactive in pursuing sustainability strategies, anyway” (Gilinsky et., 2016, p.39). The authors state that this proactive approach is related to “philosophical beliefs in preserving the environment and gifting the business to future generations, whereas others focus on wine quality and business benefits.” (Gilinsky et., 2016, p.39). In short, the authors of this case study testify that by crossing sustainability and the wine industry, they were able to “recognize that for practitioners in the wine industry, priority number one is leaving the land in better shape for the next generation.” (Gilinsky et al., 2016, p.38).

### **2.3. Gaining competitive advantage through sustainability**

It is fair to admit that for winemaking companies, it might be of great value to understand how the adoption of an environment-preserving attitude might lead to competitive advantage and how including sustainability habits in the winemaking sector might benefit future generations and allow long-term profitability (Gilinsky et al., 2016). “Producing and marketing wine with sustainability characteristics is a promising strategy for quality differentiation” (Schäufele and Hamm, 2017, p.379). Focusing on a sustainable plan can be a great strategy for companies to create a unique product and a marketing campaign that can differentiate from competition and this way surpass it (Hill and Jones, 2010, as cited in Gilinsky et.al, 2016), “one which customers perceive as innovative or of higher quality (...) and which in turn allows the company to charge a premium price” (Hill and Jones, 2010, as cited in Gilinsky et.al, 2016,

p.44). As stated by Sogari et al. (2016b), consumer often face various alternative options of wine and normally make their decisions quickly. That has been said, can be assumed that sustainability has a potential to emerge as a meaningful marketing tool in such a decision-making type of market. “As the scope and intractability of an environmental problem rise, so do opportunities for innovation of sustainable processes and products in the pursuit of a sustainable competitive advantage” (Porter and Van Der Linde, 1995, as cited in Gilinsky et al., 2016, p.37). This advantage, in this case, consists of turning the winemaking company offer into a stand-out product in the market, by adopting environmentally friendly practices that can distinguish the company from its competitors. “Proactive environmental management can provide wineries with a competitive advantage via differentiation of their products” (Gilinsky et al., 2016, p.44), what reinforces the idea that a sustainable strategy can have great value for wine-producing companies that want to value themselves through product differentiation and gain consumers’ loyalty (Martínez-Falcó et al., 2024). The same was shown by Pomarici et al (2016) article. This work revealed that winemakers can strengthen their marketing campaigns success using appropriate programs and marketing tools, in this specific case due to the fact that a group of Italian wine consumers (experts and high spenders in wine) showed interest to these kinds of positioning. On the other hand, the authors also suggest that this renewed marketing strategies need to focus on gaining attention from consumers that have low involvement in sustainability issues in the wine industry. (Pomarici et al., 2016). This “new shape of competition is pushing wine firms to invest into new technologies” (Stasi et al., 2016, p.290). Stasi et al. (2016) is an article that concerns the new technologies being used in the wine sector in Italy and its relationship with sustainability. Nowadays, “consumers’ awareness towards food safety issues, environment and ethical implications of production has increased” (Stasi et al., 2016, p.290), which can be a sign for a growing need for a sustainable approach by winemaking companies. The already mentioned article by Martínez-Falcó et al. (2024) is also a highly valuable and up to date article that focuses on this gaining of competitive advantage, with the authors highlighting that “sustainability facilitates access to new markets and customer segments, especially those that value environmental and social responsibility” (Martínez-Falcó et al., 2024). The increasingly perception by the consumer about environmental implications might result in extra efforts for the winemaking companies that intend to achieve market advantage, as the customer might demand eco-friendly policies. A sustainable approach might be needed to meet this new consumer expectations.

## **2.4. Sustainability in the wine industry and the willingness to pay for sustainable wine**

A quantitative study carried out by Pomarici and Vecchio (2014) on the attitude of the *millennial* generation towards sustainability in the wine sector revealed that 74.8% of the sample said they were interested in buying sustainable wine. In this case, it can be assumed that interest in sustainable wines is high in the sample selected by the authors for the study. Even so, and although the conclusions reported by Pomarici and Vecchio (2014) suggest a high interest in sustainable wines among the millennial generation, it is crucial to admit a potential discrepancy between hypothetical purchase intentions and actual consumer behaviour. While 74.8% of the millennial respondents of this study from Pomarici and Vecchio (2014) expressed interest in buying sustainable wine, it is essential to consider the factors that influence them in a real market scenario. Having that acknowledged, Pomarici and Vecchio (2014) do not fail to note that this study is based on hypothetical purchase intentions and that, in practice, the results could be less expressive. This study can then be very helpful in a hypothetical purchase evaluation, but it still leaves an open spot for further investigation on whether the millennial generation is only motivated to purchase sustainable wines or if otherwise that can be seen in a real-world scenario. Also, it is important to consider that this interest in buying sustainable wine might suffer an increase if a premium price is added to this product. The article by Baiano (2021) provides an overview of the topic of sustainability in the wine industry and the consumer's willingness to pay a premium price for wines with sustainable characteristics. The authors state that following the growing interest in sustainable practices and in preserving the environment “there has been an increase in vineyards conducted with sustainable (mainly organic and biodynamic) methods” (Baiano, 2021, p.1), with sustainable wines turning into a trend in both traditional and emerging countries (Baiano, 2021). Still, it is difficult to admit a concrete concept of sustainable wine, what can end up causing confusing in both the winemaking companies and the consumer (Baiano, 2021). The International Organisation of Vine and Wine (OIV) defined sustainable viticulture as a

Global strategy on the scale of the grape production and processing systems, incorporating at the same time the economic sustainability of structures and territories, producing quality products, considering requirements of precision in sustainable viticulture,

risks to the environment, products safety and consumer health and valuing of heritage, historical, cultural, ecological, and landscape aspects.

(The International Organisation of Vine and Wine, 2008, as cited in Baiano, 2021, p.2)

That is to say, sustainable viticulture goes far beyond a simple environmentally friendly strategy, as it aims to create a balance between various concerns involving sustainability in its three pillars – social, economic, and environmental. There was no evidence found by Baiano (2021) that can prove a higher quality in sustainable wines when compared to traditional wines, however, it was possible to conclude that “consumers are willing to pay a premium for sustainably produced wines” (Baiano, 2021, p.1), still it is important to underline that, as stated by Baiano (2021), the positive attitude towards the environmental protection might not be enough to lead the consumer into paying a premium price for the wine that is considered sustainable. Sogari et al. (2016b) found that consumers who show an attitude in favour toward sustainable wine and hold stronger beliefs in environmental protection are also more inclined to pay higher premium prices for wines labelled as sustainable. Ricardo Sellers (2016), in his study on the willingness to pay a premium price for a wine considered sustainable, presents results in favour of the sustainable wine market. The study, based on a survey conducted by the author, aimed to evaluate Spanish customer’s WTP for sustainable wine and analyse to what extent customer is willing to pay an extra value for this sort of product. The conclusions extracted from Seller’s work not only contribute with valued information on the WTP for sustainable wine, as it also underscores how consumers nowadays are inclined to invest on sustainable products, in this case, wine, making it fair to say that consumer is willing to spend an extra amount of money if that means buying a conscious and socially responsible product. From this work, academics might have a good starting point on the WTP for sustainable wine at the same time that winemaking companies may extract some valuable insights on whether investing in a sustainable approach might be worth it or not. The survey stated that 82.4% of wine consumers would be willing to pay a predefined amount of €5 for a sustainable wine. The percentage of the sample that is willing to pay a premium price decrease along with the increase in price to €10 or €15, to 76.5% and 75%, respectively. Sellers (2016) states in the conclusions of the same study that the results obtained demonstrate how the sustainable wine market can be a great opportunity for wine producing companies, given the high interest of consumers in the product considered sustainable.

It should be noted that the studies mentioned above are intended for specific sampled respondents. In the case of Pomarici and Vecchio's study, the target of the survey is Italian



wine consumers, while Sellers' study focuses on Spanish consumers. The present study aims to clarify whether the trend of interest in buying sustainably produced wines is replicated in the Portuguese consumer. Will then be analysed the case of the Portuguese wine consumer, with the indirect support of the Alentejo Regional Winegrowing Commission (Comissão Vitivinícola Regional Alentejana – CVRA), which carried out the elaboration of a sustainable production label in its wines of Alentejo sustainability program (Programa de Sustentabilidade dos Vinhos do Alentejo – PSVA), in order to understand what is the real impact that this kinds of labels can have on the decision to buy wines and attract new customers. CVRA's sustainable label initiative developed a further interest in acknowledging the extent to which consumers would value it.

Schäufele and Hamm (2017) is a very valuable review article for this research, as it presents an analysis of 34 scientific documents focusing on the issue of willingness to pay a premium price for sustainable wines. Some of the conclusions taken from this study are in clear agreement with what has already been mentioned above when analysing studies carried out by different authors. Schäufele and Hamm mention, for example, that “values and beliefs regarding environmentalism were given most often as motivators for the purchase of wine with sustainability characteristics.” (Schäufele and Hamm, 2017, p.388), which was already mentioned in the present research. The authors also noted that “certain consumer groups were willing to pay price premiums for sustainable and organic wines.” (Schäufele and Hamm, 2017, p.388), but there were many different variables that might influence this purchasing attitude. The main segment of consumers that is interested in sustainable production methods and willing to pay an extra price for it are defined by Schäufele and Hamm (2017) as “typically female with higher incomes, and people living in urban areas”. Schäufele and Hamm (2017) also concluded that there are indeed a reasonable number of articles concerning WTP for sustainable wines, however, it is difficult to find a study applied in a real market scenario that would allow academics to understand if there is a gap between willingness and behaviour. The authors suggest that it would be very useful to conduct research with the aim of analysing purchase data combined with survey data and clarify on what extent customer attitudes are translated into purchase behaviour (Schäufele and Hamm, 2017).

## **2.5. Determining factors in the decision to purchase wine**

As mentioned earlier in this study, through the analysis of various studies and research, it is possible to conclude that there is a group of consumers who claim to be willing to pay a premium price for sustainable wine (Schäufele and Hamm, 2017) (Sellers, 2016) (Baiano, 2021). Nevertheless, almost every author mentions the fact that to understand to what extent consumer is willing to pay this price premium, it is important to evaluate the other determining factors in the buying decision. “Depending on the strength of consumers’ attitudes towards sustainability issues, various wine characteristics (context) like origin, taste and wine style influence the decision-making process.” (Schäufele and Hamm, 2017, p.388). The same authors underlined that “for organic wine, attitudes towards health and taste were presented as further determining factors.” (Schäufele and Hamm, 2017, p.388), which suggests that in the context of organic wine, consumer might be considering some determinants that are not considered in a regular wine purchasing alternatives evaluation, such as the absence of pesticides and fertilizers in production, what might lead the consumer to find this type of product – organic wine – as a healthier and more natural option. Still, taste has an important role while evaluating wine options. Following the affirmations by Schäufele and Hamm (2017) on the importance of this factor, it is fair to say that consumer satisfaction towards the product may highly depend on how much they enjoy the taste. Still, “trust in the winery was, besides taste, the main factor influencing consumers’ behavioural intentions to purchase organic wine” (Kim and Bonn, 2015, as cited in Schäufele and Hamm, 2017, p.384), which may change the approach of a marketing strategy for an organic wine, making it necessary to develop a feeling of trust between the consumer and the overall credibility of the winemaking company. Clearly, when evaluating purchasing options, price appears as one of the main determinants, and just like Schäufele and Hamm point out, “price itself can influence the quality perception of sustainable wine, e.g., low price could imply low quality and vice versa.” Schäufele and Hamm (2017, p.388), which is an assumption that might be connected to the common perception that a low-price product might be associated with lower quality ingredients and less investment in higher quality production standards. At the same time, Schäufele and Hamm (2017) identified that “the variable ‘price’ was found to be one of the most important product attributes that could prevent the purchase of organic and sustainable wine” (Schäufele and Hamm, 2017, p.388), being that there is normally an extra price associated with this type of product. Nonetheless, organic wine is commonly understood as an expensive product due to the extra requirements that are needed for its production, which

makes a “slightly higher price for organic wine not a purchase obstacle for people who are very committed to these products” (Stern, 2000, as cited in Schäufole and Hamm (2017, p.385). As noted by Schäufole and Hamm (2017), in general, sustainable wine is perceived as a product with higher quality. Therefore, the extra price associated with the techniques needed to produce a wine with sustainable characteristics leads the consumer to perceive the product as also of higher quality. Another very important factor in the decision making of purchasing a wine is related to the context for which the decision is being made, being that "social desirability is an important issue for purchasing wine, especially when hosting friends or buying wine as a gift" (Orth, 2005, as cited in Schäufole and Hamm, 2017, p.388). This means that consumer may choose wines not only based on personal preferences, but also considering how that choice will be viewed by others, with the purpose of selecting the option that can develop their social image or reputation. As wine is often associated with social gatherings and gift occasions, the desire to make socially acceptable choices can influence buying decisions, leading individuals to select wines that they believe will be well-received or admired by others. It should also be noted that the grape variety or wine variety was not considered a determining factor, as Schäufole and Hamm were not able to identify a trend regarding this factor. The same authors conclude that "little is known about variables like grape variety or wine style" (Schäufole and Hamm, 2017, p.388). This same study also revealed that “no results were found on package design and the reputation of wineries or brands” (Schäufole and Hamm, 2017, p.388), so the reader might conclude that the absence of wineries or brands when making decisions about sustainable wine purchases evidence regarding the impact of these two factors implies that consumers may not prioritize package design or the reputation. Another study, authored by Sogari et al. (2016b), with the main objective of identifying the decisive factors in the purchase of a sustainable wine, carried out through a questionnaire and the afterwards statistical analysis of the responses to it, presents the following options as the main decision factors (randomly presented): Price; Sensory characteristics; Colour; Brand; Geographical indication mark; Territory; Retailer’ recommendation; Consumption occasion; Grapes’ variety; Environmental certification; Organic certification; Ethical certification; Previous experience; The authors were also able to conclude that the most relevant determinants in the purchase of sustainable wine were the sensory characteristics and the previous experience (Sogari et al., 2016b, p.641).

Finally, while some determinants can be identified as highly influential in the decision-making process of purchasing sustainable wine, others have been marked as of less impact. Still, it’s important to note that the absence of proof that some factors are in fact significant

doesn't state that they level of influence is low. In other words, and as stated before in the present work, significant factors may not necessarily translate into important decision factors at the time of purchase. The consumer may be influenced by certain determinants, but not be enough to convert that influence into a real purchase. That said, further research might be helpful to clarify to what extent some of these factors contribute in fact to consumers' choices in the sustainable wine market in a real purchase scenario.

## **2.6. Sustainable wine labels**

Nowadays, the market offers various types of environmentally friendly wines, such as natural, organic, biodynamic, and sustainable wines (Baiano, 2021). However, the many country-specific regulations, certification standards, and logos associated with these categories has led to confusion among consumers, influencing their buying decisions (Baiano, 2021). There is a noted divergency in what concerns consumer preferences for sustainability labelling, what may be linked to the various certifications that exist and their meanings (Piracci et al., 2022). These certifications can be a tool for winemaking companies to present their sustainability efforts to their customers, leading to a marketing campaign with focus on this emerging issue, especially in what concerns water footprint labelling (Pomarici et al., 2016). It is from the label that consumers can extract information regarding the characteristics of the products they are purchasing, what gives labelling an important role as it provides the consumers with information concerning the characteristics of food products (Baiano, 2021). When it comes to sustainability in the wine market, "a certification system can be useful to avoid the risk of "green washing" (Barber, 2010, as cited in Sogari et al., 2016b), although the term can be very difficult to define due to its complexity (de Freitas Netto et al., 2020). Labelling a wine as produced sustainably can also allow the winemaking companies to justify a premium price in the product (Pomarici et al., 2016). There is also a belief amongst consumers that certification means that the product is of high-quality standards, a perception that can influence consumer's buying decisions, as they may identify certified products as more reliable and trustworthy options (Sogari et al., 2016b), being that a possible reason for eco-labelled and organic wines to have better ratings by wine critics (Delmas and Gergaud, 2014, as cited in Pomarici and Vecchio, 2014). Piracci et al. (2022) were able to identify in their research about wine consumers' demand for social sustainability labelling that the most well-known sustainability label is the organic certification and that "the organic attribute was the

most preferred among the sustainability labels on wine bottles” (Piracci et al., 2022, p.1751). The same study also revealed that afterwards the organic attribute comes the certification of fair labour practices, and the respondents were willing to pay an average of extra 7.42€ for a wine that is certified as produced in accordance with fair labour conditions when compared to the same wine, but without this fair labour conditions guaranteed (Piracci et al., 2022). When it comes to a sustainability label’s relation to greater support for local producers, the work from Sgroi et al. (2023) shows that the wine consumer is not very confident in such a connection, not that these labels grant a higher quality product, however, the highest homogeneity in opinions seen in the work from Sgroi et al. (2023) is that a sustainable wine label is a guarantee of the origin of the raw materials.

Hence, it is fair to assume that achieving the necessary standards to certify a wine as sustainable can be a promising marketing strategy for the wine market. The present study seeks to add information in relation to this theme, understanding the opinion of the respondents in was regards this type of certification.

## **2.7. Specific targets**

Finally, and in order to better understand the current status of research on the WTP and consumer interest in wine certified as sustainable, it is interesting to look at work already developed by other researchers in the area. Some already mentioned before in the presented work have shared valuable insights for this theoretical background and some other are still to be reviewed. It is the case of Valenzuela et al. (2022), an article that investigates the extent to which the wine consumer values an eco-labelled product and a sustainability certification, whit the main focus being Chile. Firstly, it’s important to highlight that the authors of the previously mentioned work found out that “there are many wine-related eco-certifications that incorporate sustainability concepts” (Valenzuela et al., 2022, p.14), which can lead to a need to clarify the meaning of each eco-certifications. Throughout their research, Valenzuela et al. aimed to understand and explain the Chilean wine consumer’s perceptions and preferences in what concerns this sort of certifications. To attain that goal, an online survey was conducted with the purpose of obtaining primary data directly from the consumer, from which it was concluded that approximately 3 out of every 4 respondents had already bought eco-labelled wine in the past. In what regards WTP for sustainable wine, this paper showed that 22% of the respondents claimed they would be in favour of paying a price premium for

wines certified as organic, more specifically in a range between 5 and 16 USD. This highlights a considerable segment of the market that values organic certification and is willing to invest in this kind of environmentally sustainable wine option. As mentioned before, Sellers (2016) is also a work that focused on a specific target, being it the Spanish wine consumers. The author showed that 77.9% of his sample stated they would be willing to pay a premium price for a sustainable wine. Equally important is the already mentioned work from Pomarici e Vecchio (2014), which had as its main focus the Italian consumer, more specifically the Millennials (individuals aged between 18 and 35). This work revealed that Millennial females in the older age cohort (27-35) are more likely to purchase sustainable wine and as showed before, the authors acknowledged that there is a high interest from this target in buying sustainable wine (Pomarici e Vecchio, 2014). Furthermore, it is worth noting the work conducted by Pomarici et al. (2016), also focused on the Italian wine consumer, but this way being using a sample of 301 Italian wine drinkers with age over 18 years old and that consume wine at least once a month. Pomarici et al. revealed that 68% of the sample revealed little interest in environmentally friendly wines, however, there is a minority of high spenders and wine experts that might be a target opportunity, suggesting that it may be worthy to address marketing campaigns to this specific target of Italian consumers. It was also revealed in the same article that the participants to this research shown to have an increased awareness towards carbon footprint when compared to the water footprint in food production (Pomarici et al, 2016).

### **3. METHODOLOGY**

The main focus of this work is to explore wine consumer's interest and willingness to pay a premium price for wines labelled as sustainably produced, with the main objective being, as stated before, to identify the importance of sustainability certification labels for the wine consumer. The specific objectives were also mentioned before, being it to analyse the consumer's perception of sustainable production in the wine sector, to assess consumer commitment to sustainability and environmental protection, to understand to what extent the consumer of wines is willing to pay a premium price for the product that is certified as sustainable and to identify the profile of the wine consumer who is willing to pay a premium price for a product with sustainable production certification.

This research aims to identify whether a sustainability label in a bottle of wine can be a determining factor in the buying decision and also the extent to which the consumer would be in favour of being charged an extra price for this sort of product. It is also this study's goal to determine the profile of the consumer that would be interested in buying such a product. To attain this goal, a literature review was conducted and was then collected primary data via survey. This methodology was chosen with the main goal of creating some enlightening about the main theme of the research to be then crossed with the primary data collected from the survey, which will allow to understand whether there is a connection between what was found in past works by other authors and the conclusions drawn from this study or in alternative if this study challenges what was found before and provides further information and new paths for forthcoming research.

#### **3.1. Justification of the structure of the work**

Given the nature of this research, it was defined that collecting primary data through a questionnaire would be the best way to have a good starting point to answer the objectives defined for this work. A survey is not only an efficient and direct method for collecting a large amount of statistical data for analysis, as it is also a costless way to gather data.

The survey was carefully designed to ensure that all the specific objectives would be connected to at least one of the set of questions. Different sections were created to split the questions into specific groups, with each one focusing on a singular them. The first group of questions, called "Preocupações socioambientais (PSA)" (Socio-environmental concerns) is more directed towards the specific objective of assessing consumer commitment to

sustainability and environmental protection. This group will work along the following one, “Atenção dos consumidores à comunicação de marketing das empresas de vinho (AMEV)” (Consumers' attention to the marketing communication of wine companies) to answer the already mentioned specific objective. When it comes to the group “Certificação de produto sustentável no setor vitivinícola (CPS)” (Sustainable Product Certification in the Wine Sector), the main reason for its creation was to analyse the consumer's perception of sustainable production in the wine sector, the first specific objective of this work. The group named “Disposição a pagar por certificação de produção sustentável em vinho” (DP) (Willingness to pay for certification of sustainable wine production) is considerably smaller than the previous mentioned sections, however, the three questions that it includes are highly valuable to attain the goal of understanding to what extent the consumer of wines is willing to pay a premium price for the product that is certified as sustainable

Finally, the last section of the survey was focused on demographic data and was used to segment the sample by gender, age, income and other relevant characteristics, this way allowing to have the needed information for trying to identify the profile of the wine consumer who is willing to pay a premium price for a product with sustainable production certification, the fourth and last specific objective of this research.

The chosen analytical methods provide a strong framework to attain the goals mentioned before, with the descriptive analysis being used to draw the characteristics of the dataset and also allowing to clearly see trends and distributions among the respondents. Before conducting the analysis, the data was prepared to ensure that all the answers would be considered. The hierarchical clustering analysis and contingency tables serve the purpose of identifying distinct consumer segments based on their answers and demographic characteristics.

Based on the objectives defined and the literature review, the hypothesis that consumers are willing to pay a premium price for wine labelled as sustainable was formulated, with the results and conclusion being shown in the later chapters of the study.

### **3.2. Data collection method and survey elaboration**

The survey conducted in this work was mainly inspired by the one used by Sogari et al. (2016b) in their research titled “Factors driving sustainable choice: the case of wine”. This survey served as the primary data collection instrument and was divided into different groups



focused on different themes. The first group focused on socioenvironmental concerns while the second group on the attention given to marketing campaigns from winemakers. The third group asked consumer about their opinions on sustainability certifications and labels in the wine sector and the last group aimed to acknowledge the willingness to pay a premium price for these types of wines. Finally, demographic data was collected to identify the profile of the consumers. This survey was placed online and was accepting answers via Google Forms between February 25<sup>th</sup> of 2024 and March 31<sup>st</sup> of 2024. The platforms used to share the hyperlink for accessing the survey was the e-mail distribution lists for both the University of Évora's students and teachers and the social media websites of the author of this work.

To ensure the reliability of this survey, a pre-test was conducted with a small group of respondents. This pilot testing was a crucial step in the survey design process for different reasons. Firstly, it helped to identify ambiguous or confusing questions and define the proper scale to be used. Testing the survey before placing it online allowed to refine the writing, ensure clarity and avoid any sort of misunderstanding that respondents might face. It was also valuable to detect potential irrelevant questions that could be of no importance to collect the needed information for analysis and also to evaluate the flow of the structure chosen and see if it would allow for a smooth answering. The pre-test was also a way of understanding and defining the optimal length of the survey to attain the maximum engagement from the participants and to have a first view of the data collection method with the goal understanding whether the questions made would provide the needed answers to take conclusions. Finally, considering that the survey was placed in an online platform, the pilot test was also used to check for eventual technical issues or formatting problems. In summary, the pilot test conducted allowed to create a well-designed survey and ensure that all potential issues were checked in advance to ensure maximum accuracy and effectiveness in collecting the necessary data for this study.

### **3.3. Sample procedure**

The method used to collect the needed data was the snowball sampling. This way, this survey would allow participants to reference others and would be available to a vast amount of people, reaching a diverse and random group of respondents. The snowball sampling started with an online distribution of the survey not only in social media but also by using the general communication e-mails of the University of Évora, which proved to be very efficient

ways of obtaining answers. This method allows a costless method of data collection, when compared to other traditional methods and guarantees an easy access to everyone who want to participate in the research. The answers to the survey were anonymous, which was one more advantage of this data-collection method, considering it encourages for more honest responses.

### **3.4. Data analysis and treatment**

The data collected was then analysed to understand which findings could be highlighted and the extent to which the objectives could be answered. To analyse this data, statistical methods were used, such as descriptive statistics and hierarchical clustering analysis. The descriptive statistical analysis allowed to identify the demographics collected and the profile of the consumers that participated in this survey. At the same time, the groups of questions were analysed by using a descriptive approach, revealing the general beliefs towards sustainability and environmental concerns from the perspective of wine consumers. Cluster analysis focused on examining the relationship between the answers given in regard to socioenvironmental concerns and willingness to pay for sustainable wine and the demographic characteristics like age, gender, zone of residence, job, income and education. The hierarchical clustering technique used was complemented with k-means clustering, with the goal of finding groups of consumers without overlapping subgroups. Different attempts of cluster options were tried, and the results were evaluated using metrics like the  $R^2$  to identify the variability of the data and the silhouette score to analyse the consistency of the data within clusters (Hair et al., 2010). The T-SNE cluster plot also allowed to reveal the distribution between the different segments of consumer and indicators such as the explained proportion within-cluster heterogeneity were also evaluated to each clustering attempt.

## **4. ANALYSIS OF THE RESULTS**

This chapter consists of a detailed analysis of the results obtained from the survey entitled "Vinhos sustentáveis - sustentabilidade no setor vitivinícola". The primary goal of this section is to provide an overview of the answers obtained, as well as the analysis made based on those answers.

The survey obtained a total of 278 responses, however, of which 204 were valid for analysis. This happens because the participants were asked to reveal if they are wine consumers or not. Respondents who stated that they were not wine consumers were excluded, thus ensuring the relevance and accuracy of the results obtained.

This analysis is structured into three main sections. The first one is focused on the demographic data collected and provides an overview of the characteristics that define the surveyed sample, in concern to gender, age, region of residence, professional situation, net income and education. This characterization is crucial to conduct the research and to attain the objectives of this study, specially to answer the specific objective focused on the characteristics of the wine consumer that might be interested in sustainable wine.

The subsequent section is the analysis of the answers, examining each question of each group and the trends that can be seen among respondents. The data will be presented in a way that allows to reader to compare the answers and understand the general attitudes and behaviours towards sustainability in wine production and in the wine market.

The final section of this chapter consists of the clustering techniques that were used to identify singular groups of respondents based on their responses and on their demographics. Grouping the respondents allows to understand if there is a connection between the demographic characteristics and the answers given that cannot be seen by looking at the descriptive analysis.

The findings shown in this chapter will allow to conclude in favour or against the hypothesis that consumers are willing to pay a premium price for wine labelled as sustainable, previously defined and to draw conclusions to meet the objectives of the research.

### **4.1. Sample characteristics**

Regarding the sample that responded to the survey, it is important to note that 100% of the respondents are over 18 years old, which restricts the sample to only adults. This would be expected, since the questionnaire concerns alcoholic beverages, thus making the sample

under analysis necessarily of legal age. The Figure 1, which can be seen below, shows the data concerning the age groups of the respondents. The one that verified the most responses is between 18 and 25 years old, representing 47.1% of the total sample, with respondents over 55 years old being the ones who were least represented, with a total of 14 responses and a representativeness of 4.3%. The 26-30 age group registered a total of 29 responses, with a weight of 10.4%, while 39 respondents were in the 31-40 age group. Finally, 43 responses were recorded from individuals aged between 41 and 50 years, i.e. 15.5% of the respondents are in this age group, and there are 24 individuals aged between 51 and 55 years, representing 8.6% of the sample.

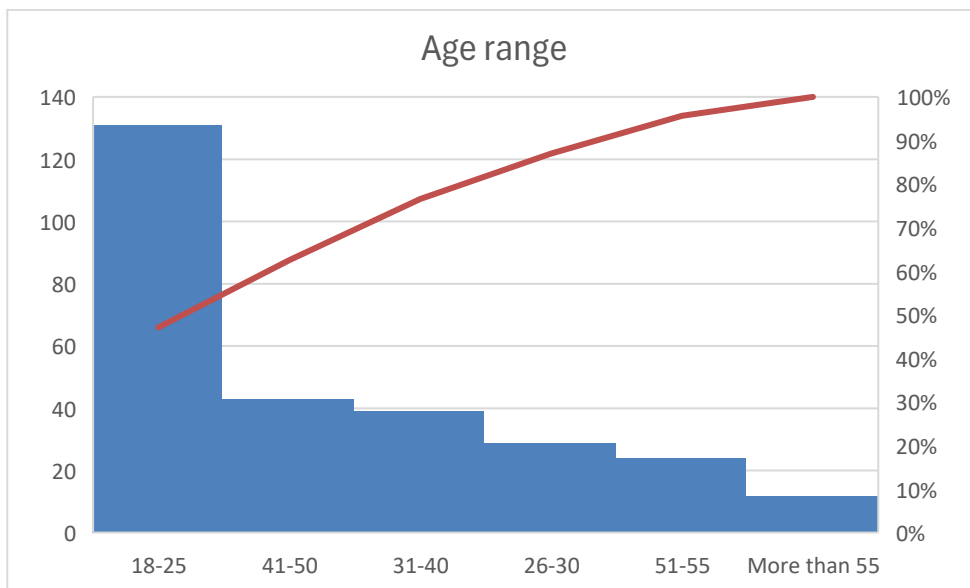


Figure 1 - Age range of the respondents

In terms of the gender among the respondents, there are 175 women and 99 men participating in this study. Additionally, 4 people chose not to reveal their gender. As it is visible on the Figure 2, this result in a predominance of female respondents, more precisely approximately 63%, while males account 36% of the sample. The remaining 1% of the sample concern the 4 individuals that decide not to choose either of the genders.

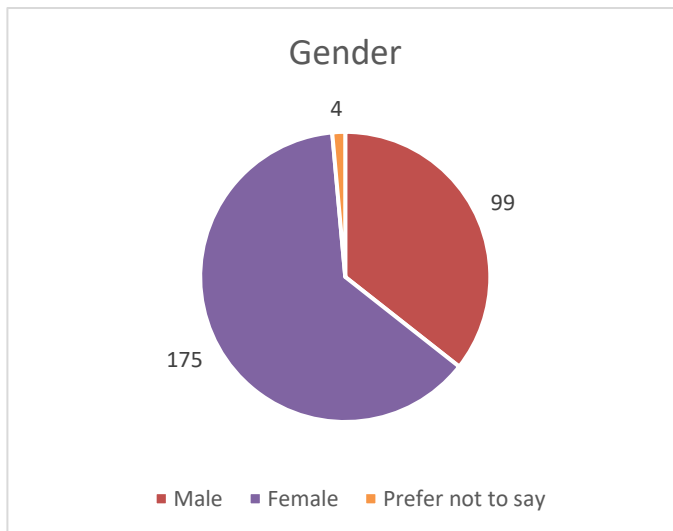


Figure 2 - Gender of the respondents

Considering the region of residence of the respondents, presented in the Figure 3, it is possible to see a vast majority of respondents from the Alentejo region, with 64.7% of the answers belonging to this group, the same as saying 180 respondents. It should be noted that there was a very similar distribution between individuals from the Lisbon Metropolitan Area and those from the Central region, with an incidence of 14.4% and 11.5% respectively, i.e., 40 people selected the answer "Lisbon metropolitan area", while 32 chose "Centre". Subsequently, 13 responses were received from individuals from the "Algarve" region, with an incidence of 4.7% in the total number of respondents and 10 responses from respondents from the "North" region, comprising 3.6% of the total answers. Finally, 1.1% of the respondents, i.e, 3 respondents revealed that they lived in the autonomous regions, Azores and Madeira.

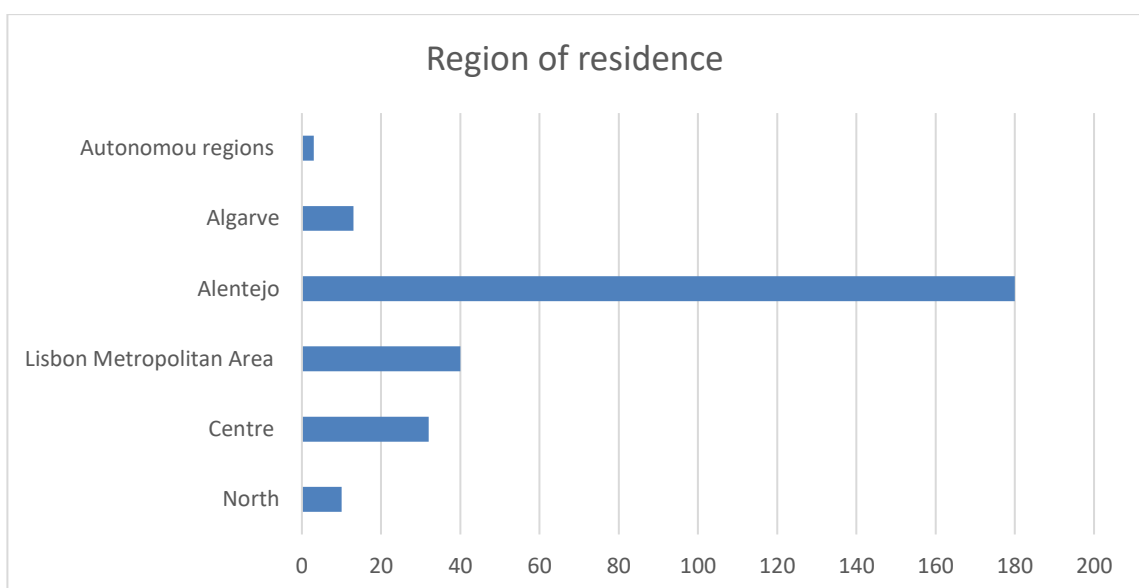


Figure 3 - Region of residence of the respondents

The Figure 4 shows the data collected in regard to the professional situation of the respondents to this questionnaire, with the highest incidence being observed in the answer "Student", with 124 of the 278 answers belonging to this group, with a percentage of 44.6% in the total number of responses. There are also 64 respondents, 23% of the total, who reveal themselves to be working students. Therefore, it can be concluded that a total of 67.6% of the respondents are currently studying, which gives students a great representation in this questionnaire. 27.3% of respondents, more specifically 76 individuals, are currently working as employees, while 10 said they are self-employed, meaning 3.6% in the total responses. Remarkably, none of the respondents revealed to be unemployed. Finally, resulting in only 1.4% of the selections, 4 people chose the option "Other" professional status.

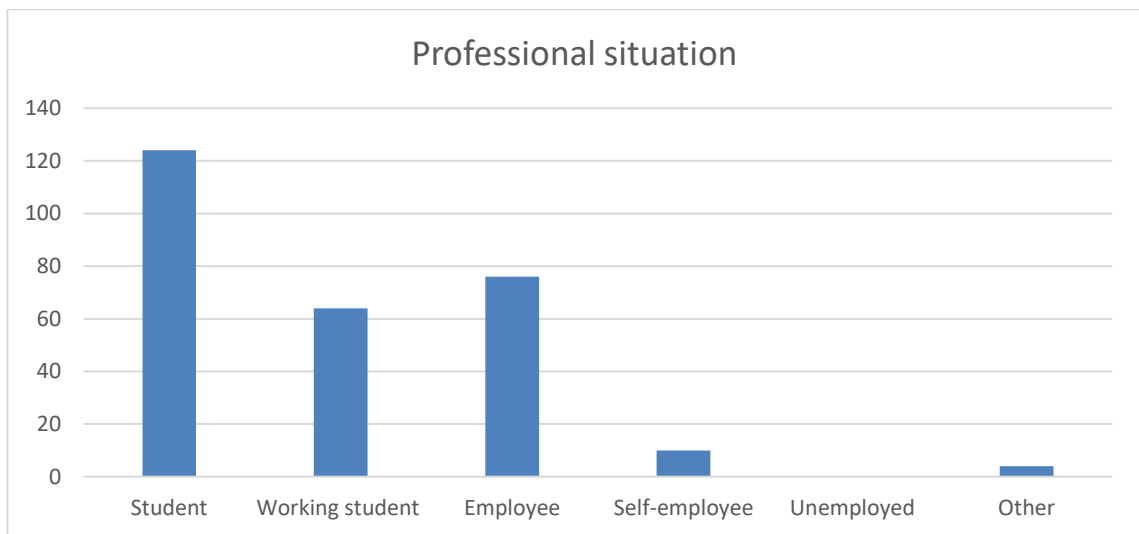


Figure 4 – Professional situation of the respondents

With regard to the net monthly income of the respondents, which can be seen in the Figure 5, it is noted very heterogeneous distribution, with the highest representation being based on 38.5%. This value corresponds to the 107 respondents who stated that they did not have any monthly income. This was followed by 56 respondents, 20.1% of the total responses, who revealed that they obtained a net monthly income between €1101 and €1500. This range of values is the one in which the majority of respondents to this questionnaire who obtain a monthly income are located. The next group in terms of representation is from €851 to €1100, with a total of 15.1%, consisting of 42 responses. The subsequent group is the income range from €1501 to €2500, with a total of 34 respondents selecting this option, constituting 12.2% of the total responses. There are 18 answers in the "up to €500" field, worth 6.5% of the answers, and 13 answers in the €501 to €850 group, 4.7% of the total. Finally, the group with

the least representation was that of respondents who earn more than €2500 net per month, with only 8 of the 278 responses, 2.9% of the total.

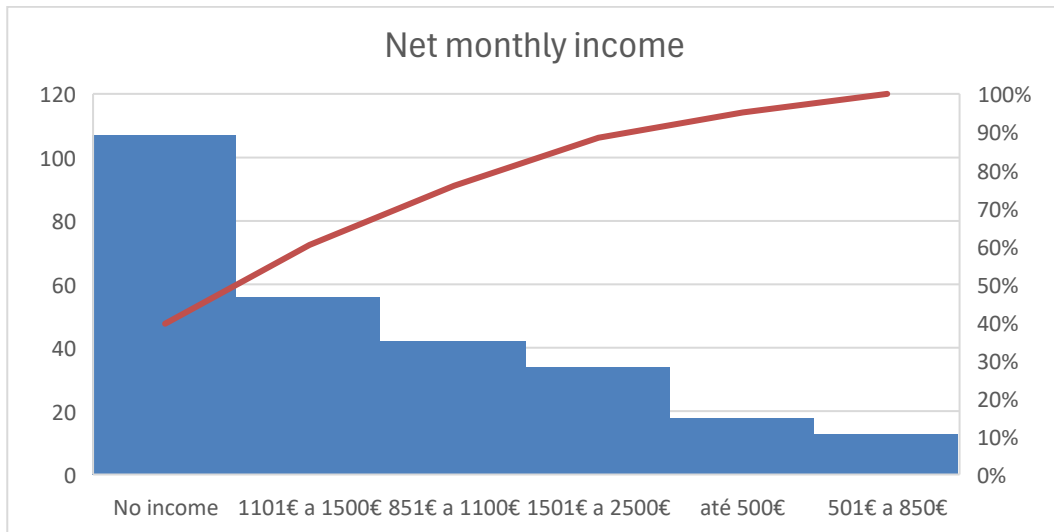


Figure 5 - Net monthly income of the respondents-

Finally, respondents were also asked to reveal their level of education (Figure 6). It was observed a very similar split between respondents with secondary education and respondents with a bachelor's degree. 102 individuals, i.e., 36,7% of participants have a bachelor's degree, while there is only 1 less participant in the group of people with secondary education, meaning 36,3% of the total answers, only 0,01% of difference between these two groups. There is also a considerable portion of the sample that answered the questionnaire that has already completed their studies at the master's level, more specifically, 68 people, or 24.5% of the total. The remaining options registered very few selections, with only 6 stating to have a PhD degree, which corresponds to 2.2% of the total responses and only 1 selection of primary education (0,4% of the total). Finally, there was no respondent revealing to have finished studying after the 3rd cycle.

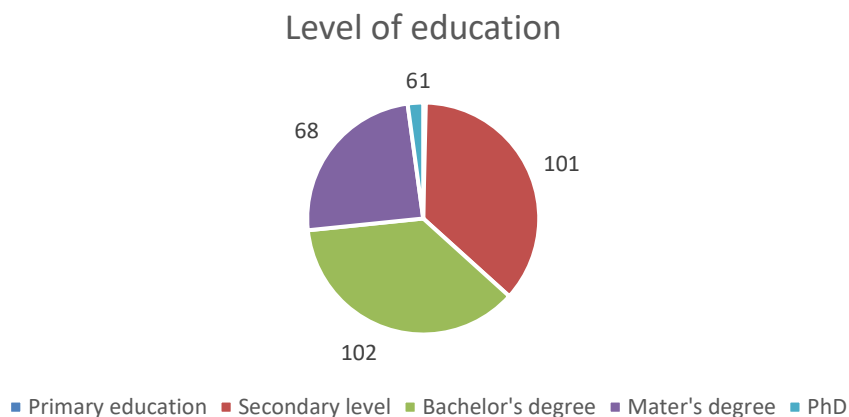


Figure 6 - Level of education of the respondents

## 4.2. Questions analysis

In the first instance, participants were asked to answer 7 questions to identify their socio-environmental concerns. This group was given the name “Preocupações socioambientais (PSA)” (Socio-environmental concerns). For each question of this group, respondents were asked to indicate their level of agreement with the statements presented, considering those that best apply to them. To this end, the following scale was used: "completely disagree", "moderately disagree", "neither agree nor disagree", "moderately agree" and "completely agree".

The Figure 7, seen below, shows a bar chart with the split between agreement, disagreement and neutrality to each of the question to the group PSA, which focused on the participants' socioenvironmental concerns, such as the overuse of land and water and other natural resources and they willingness to adapt behaviours for the sake of the environment. A more detailed picture of each question is available in the Appendix section A of this work. For this chart, agreement was considered the sum of “completely agree” and “moderately agree” selections, whilst on the other hand disagreement is the sum of the “completely disagree” and “moderately disagree” selections. This graph excludes the question PSA4, as it worked more to assess respondent's commitment to the survey with the question being the opposite of the question PSA4. As seen in Figure A.4., available in the section A of the Appendix to this work, this question confirmed not only the commitment to the survey, considering the opposite trend of responses, but also the socioenvironmental concerns.

Apart from this question, all the statements in the group PSA presented a different concern or suggested a willingness to adapt the behaviour to protect the environment. That being said, a first look at the chart shows the huge consensus that the participants revealed when it comes to their socioenvironmental concerns and their willingness to change behaviour.



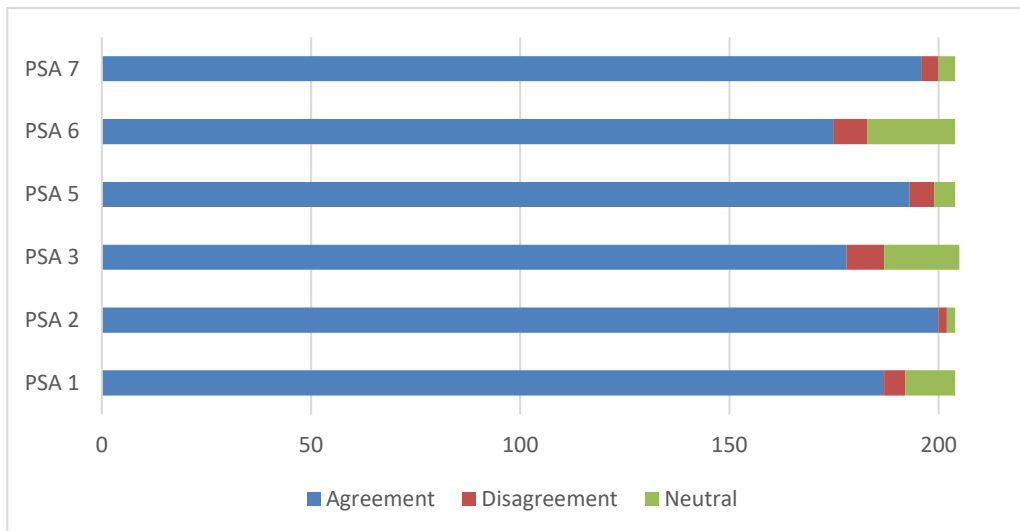


Figure 7 - Agreement VS Disagreement VS Neutrality in the group PSA

It is notable by looking at the Figure 7 that there is a huge willingness to adapt for the sake of the environment, considering the significant majority of respondents that agreed with the statement “I am willing to make personal sacrifices for the sake of the environment” (PSA1) (Figure A.1.), with an impressive total of 187 answer in the two selections in agreement. As shown by the question PSA2, which only obtained as little as 2 answers in disagreement, behaviour change is also highly approved by the vast majority of the respondents (Figure A.2), which provides a promising view of readiness to adapt for environmental reasons.

There is also a shared belief that buying sustainable products helps protect the environment, revealed by looking at the answers to the question PSA3, available in Figure A.3. and not to forget the question PSA5 (Figure A.5.), that confirmed a mutual concern among respondents for the damage caused by humans in the use of land and water and the question PSA6 (Figure A.6.), which revealed preoccupation about the overuse of natural resources in the food production sector. As seen in the Figure 7, the question PSA6 was the one that had the lower agreement in the group, however, the overuse of natural resources is seen as a concern by 175 of the 204 respondents.

Finally, the question that obtained the highest number of “completely agree” selections in the group, 156 (Figure A.7.), PSA7 asked the respondents to evaluate whether it is important to preserve the environmental for future generations, underscoring a dominant sense of commitment to environmental preservation. This widespread recognition of the importance of environmental conservation for future generations can also be seen in Figure 7, by looking at the low representativeness that answers in the neutral and disagreement fields have in the chart.

The second group of answers was given the name of “Atenção dos consumidores à comunicação de marketing das empresas de vinho (AMEV)” (Consumers' attention to the marketing communication of wine companies). Once again, the same scale was used, and the respondents were asked to indicate their level of agreement with the statements. The picture of the representativeness of the answers in agreement, disagreement or neutral can be seen in the Figure 8 below. Again, the answers in agreement and disagreement will include both the “moderately” and “completely” fields. In the appendix section of this work is shown a detailed description of the number of selections of each of the five options.

The answers to this group were slightly more heterogeneous when compared to the previous ones, with some questions revealing an increase in the number of neutral and disagreement answers. Nevertheless, it can be easily noted by looking at the Figure 8 below that almost all answers obtained accordance from the vast majority of the participants.

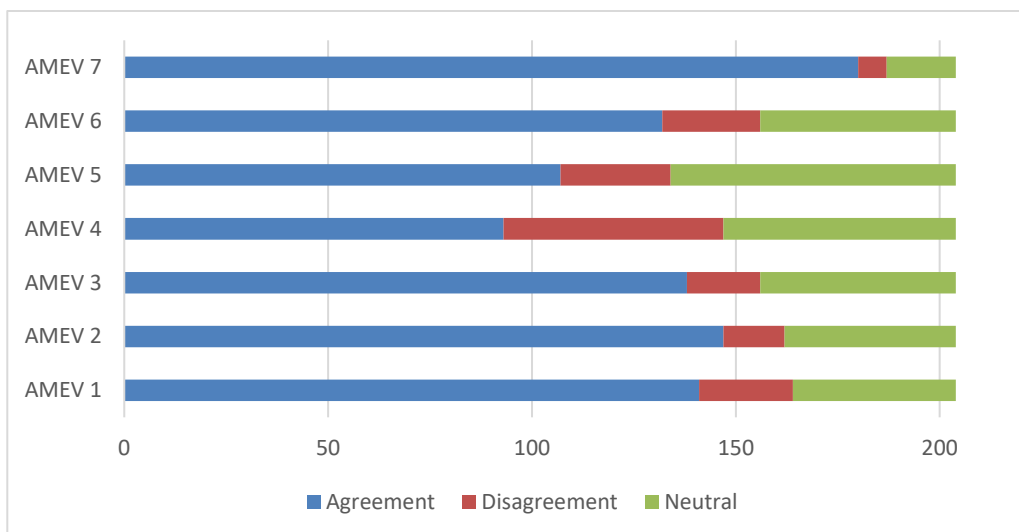


Figure 8 - Agreement VS Disagreement VS Neutrality in the group AMEV

This group provides valuable insights on the attention given to the marketing campaigns of winemaking companies, such as it allows the conclusion that most respondents pay close attention to advertising messages related to sustainability, considering the 69,12% of answers in agreement with the question AMEV1 (Figure B.1.) and that an even bigger number of consumers appreciate winemaking companies that have environmental certifications and labels, 72,06%, as seen in Figure B.2. When looking at the question AMEV3, shown in Figure B.3. in the Appendix of this work, it is possible to note once again a prevalence of positive answers towards the statement. The 138 answers in agreement with this statement prove that the majority of the wine consumers that participated in this work respond favourably to brands that use environmental protection messages in their advertising campaigns. In contrast, AMEV4 (Figure B.4.) was the only question in this group that didn't

register a majority of responses in favour of the statement, suggesting that the respondents are uncertain on whether they pay close attention to the labels and tags of wines with all the information about their environmental impacts. This can represent a challenge for winemaking companies to reimagine their labels and the way that the environmental impacts are shown to the public.

The question “When buying, I prefer wines from companies that adopt a responsible attitude towards the environment, to the detriment of others” (Figure B.5.) was the one that saw the "neither agree nor disagree" field revealing its highest incidence among the seven responses in the group, with 70 selections. Although some participants shown to be uncertain about this question, the prevalence of the answers in agreement was still noted, with 52,45% of the participants selecting either “moderately agree” or “completely agree”. This can suggest that consumers may not have enough information about responsible environmental practices in the winemaking market, leading to some hesitation when asked about a clear preference. It is also fair to assume that some other factors surely have influence in consumers’ decision and to define which factor is more determining can be a challenging yet very valuable work. The following question saw a quite similar level of disagreement, but it is noticed a decrease in the neutral field to the detriment of the agreement selections. This question, seen in Figure B.6., revealed that the majority of the respondents support ways of eco promotion, such as advertising campaigns that avoid to use of plastics and paper waste.

Finally, question AMEV7 was the one that obtained the highest level of agreement in the group, with an impressive 107 selections of the option “completely agree” and 73 selections of the hypothesis “moderately agree”. This means that 88,4% of the participants stated they agreed with the statement, either completely or moderately. The very small number of participants in disagreement (7) with this statement, which focused on the demand for clear information about the environmental characteristics of wines and the production methods, confirms that the consumers are demanding transparency regarding the environmental practices of winemaking companies. This transparency may be a key determinant for the decision of buying a wine labelled as sustainable to the detriment of others.

The third group of questions was named “Certificação de produto sustentável no setor vitivinícola (CPS)” (Sustainable Product Certification in the Wine Sector) and followed the same format as the previous two groups, with participant being asked to indicate their level of agreement with the twelve statements presented, using the same scale as before. (CPS1) and (CPS3)

As seen in the Figure 9 below, there was a general agreement among consumers with the statements presented, however, there were also four questions that did not obtain majority agreement. It can be said that the individuals that participated in the survey recognize sustainable wine production labels as a guarantee of a product of higher quality and high hygiene standards, considering the 56,86% answers in agreement with CPS1 and the 54,41% in agreement with CPS2, seen in Figure C.1. and Figure C.2., respectively, both available in the appendix section C of this work.

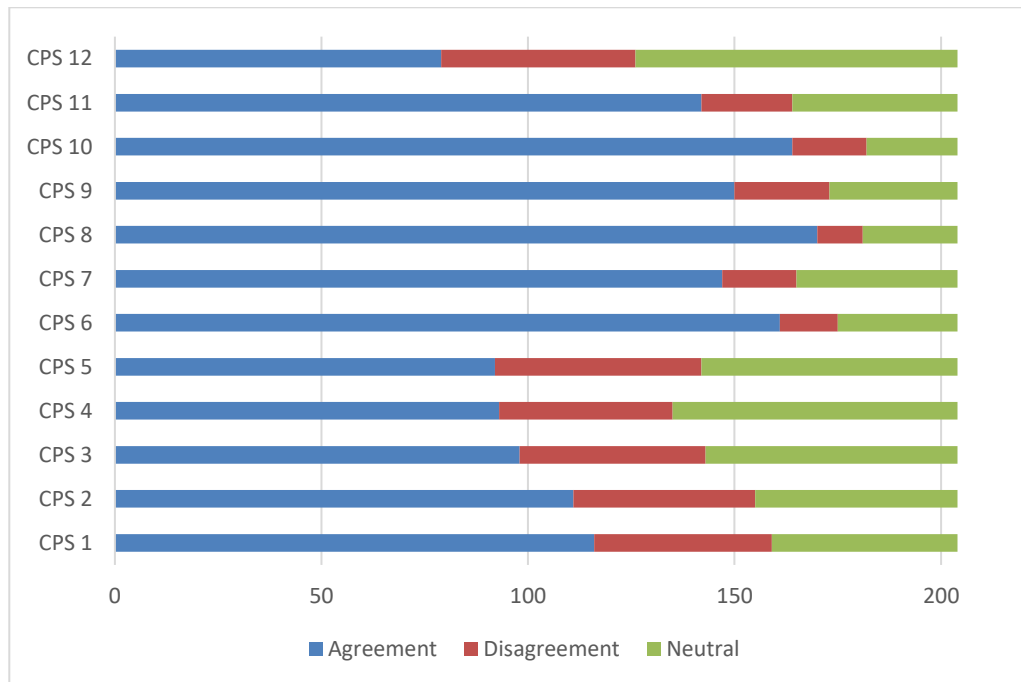


Figure 9 - Agreement VS Disagreement VS Neutrality in the group CPS

The participants revealed to have some doubts when it comes to the relationship between sustainable wine labels and economic and social impacts. There was a considerable increase in the neutral opinions in the questions related to these impacts, with the questions CPS3, CPS4 and CPS5 registering 61, 69 and 62 selections of the “neither agree nor disagree” option respectively. As seen in the Figure 9, the disagreement zone was quite similar in the first five questions, with the neutral zone being the one that registered a significant growth. That being said, it’s fair to assume that there is a shared doubt that sustainable wine labels are connected to benefits for local producers, employability and working conditions.

Looking at the next questions, it is easily noted that the opinions in favour saw an increase among respondents, with the question CPS6 registering a total 161 answers in agreement, revealing that the vast majority of respondents agree that sustainable wine certification focuses on achieving sustainable development goals. The growth of the Alentejo wine market is also seen by the participants as something that can be a result of this kinds of

labels, with 147 respondents stating they agree with this idea (question CPS7, seen in Figure C.7.).

The highest agreement in this group (83,34%) was observed in the question CPS8, which leads to the conclusion that wine consumers agree that sustainable wine labels are a tool to notice the importance of sustainability challenges. The respondents also agreed that sustainability sustainable wine labels are focused on social, environmental and economic well-being, which can be confirmed when looking at the answers to the question CPS9 (Figure C.9.).

The final three questions of the group CPS focused on operational challenges and ask participants to think about the relationship between sustainable wine labels and operational efficiency. In general, there is a significant agreement that these certifications lead to a more efficient use of resources, but some hesitancy was seen in the last question, CPS12, when it comes to the relationship between the mentioned labels and the reduce of internal operating costs, with only 38,73% of the participants stating to agree with this statement. Nevertheless, it is important to mention that 80,39% believe that certification of sustainable wine production is a guarantee of more efficient use of resources/eco-efficiency (CPS10) and 69,61% consider that it encourages the reduction and reuse of co-products by reducing internal operating costs (CPS11).

The final group of this questionnaire was named “Disposição a pagar por certificação de produção sustentável em vinho” (DP) (Willingness to pay for certification of sustainable wine production). The first question revealed a high willingness to buy wine with a certification label of sustainable production. This is a decisive question for the main objective of the present study, as the answers verified are a satisfactory starting point to draw conclusions in favour of sustainable production in the wine market. This high agreement to buying sustainable wine can be confirmed when looking at the Figure 10 below, with 179 individuals (87,75%) responding in favour of this idea.

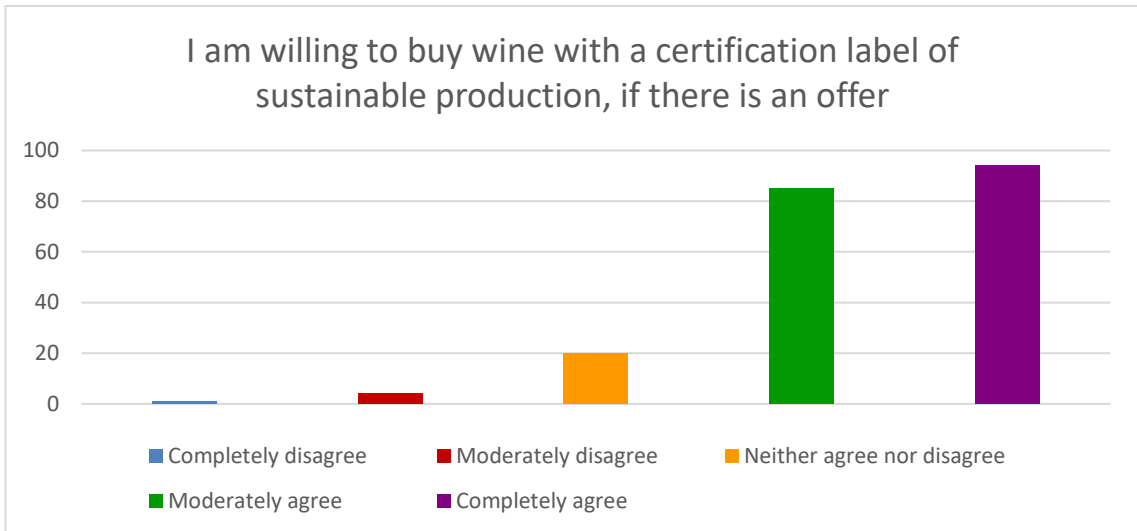


Figure 10 - Group DP Question 1

The second question from this group asked respondents to reveal to what extent they would agree to pay more for wine with a sustainable production certification label. While the previous statement suggested a willingness to pay from the respondents, this second question referred to an extra cost for this type of product, which generated a bigger division among the participants. This can be seen below in the Figure 11. There was an increase in both neutral and negative responses, with the total agreement reducing to 63,73%. That being said, this question suggests that the willingness to buy wine labelled as sustainable may reduce significantly when a premium value is associated to this type of product.

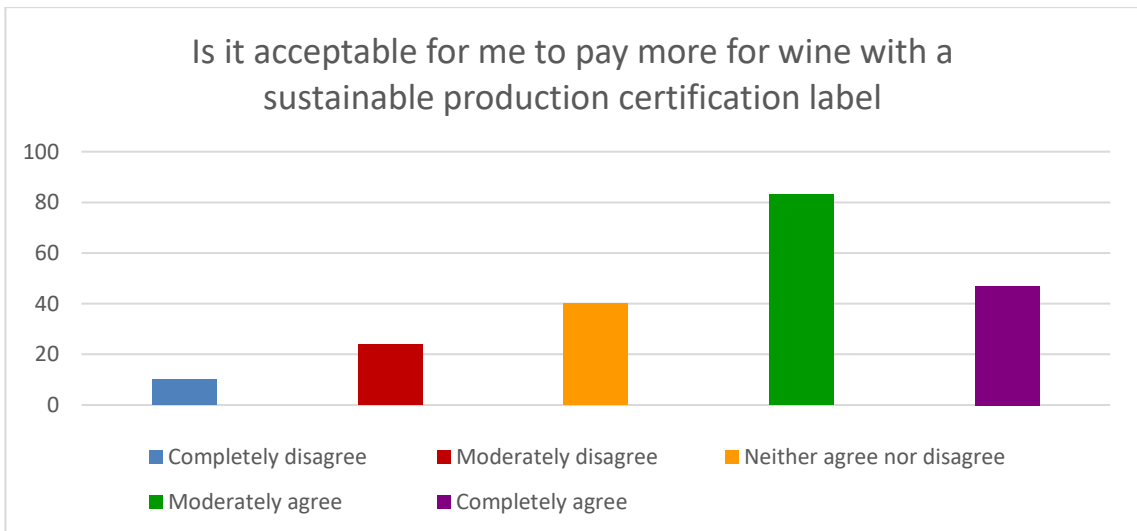


Figure 11 - Group DP Question 2

To conclude the survey, respondents were asked to select from multiple options the additional amount of price they would be willing to pay for a bottle of wine with a sustainability label. The answers can be seen below in the Figure 12 below. The descriptive analysis of this data does not allow to highlight a trend among respondents, with the range of

values €2.01 to €3 being the most selected with only 21.08% of selections, consisting of 43 respondents, followed closely by €1.01 to €2, chosen by 41 respondents (20,1%) and 20.10% and "more than €5", selected by 39 respondents, 19.12% of the total. Although the selections are divided in a very similar way, the majority of respondents were willing to pay no more than €3 (55,39%), indicating that while there consumers approve the idea of buying wine certified as sustainable, most prefer a relatively modest extra price.

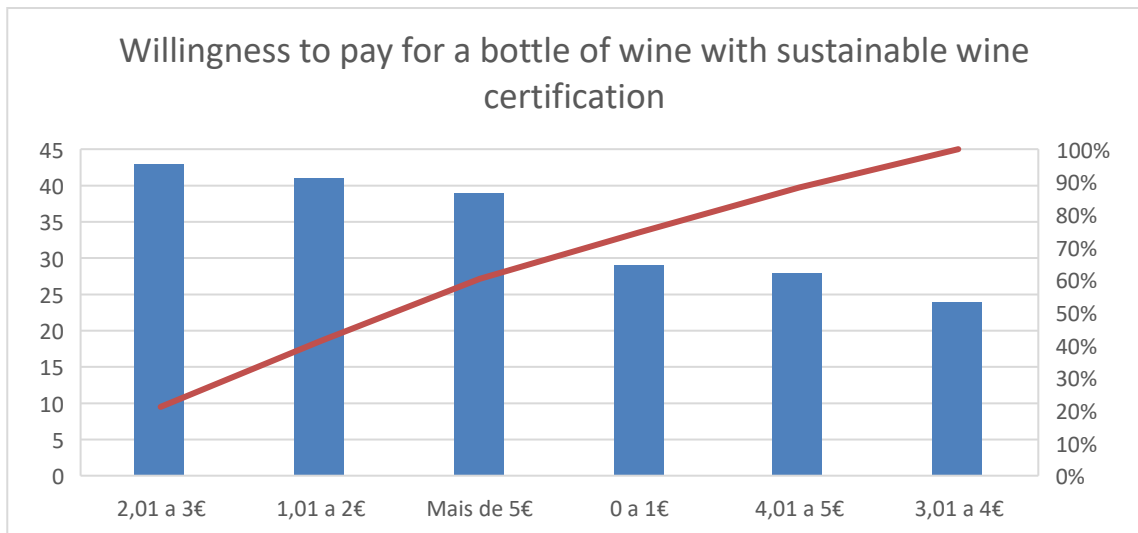


Figure 12 - Willingness to pay for a bottle of wine with sustainable wine certification (Group DP Question 3)

### 4.3. Cluster analysis

The hierarchical clustering analysis was carried out with several different configurations in order to define the best fit, if any, for the present work objectives. The first attempt, visible in the Table 1 and Table 2 divided the data into 2 clusters, offering a cluster with 145 individuals and a second cluster with 59 individuals. As seen in the Table 1, the first cluster includes a proportion within-cluster heterogeneity of 63,6%, which is a significantly higher portion when compared to the second cluster, that accounts 36,4%. The  $R^2$  value, which can be seen in the Table 2, was 0,341, which is to say that 34,1% of the variability of the data is explained by the clustering model. In this case, the variance is not satisfyingly explained by the clustering model.

Cluster	1	2
Size	145	59
Explained proportion within-cluster heterogeneity	0.636	0.364
Within sum of squares	255.239	146.211

Table 1 - Hierarchical clustering with 2 cluster - Cluster Information

Clusters	N	R <sup>2</sup>	AIC	BIC	Silhouette
2	204	0.341	413.450	433.360	0.350

Table 2 - Hierarchical Clustering with 2 clusters

The Figure 13 presented below shows the T-SNE cluster plot for this clustering attempt, which when analysed reveals a reasonable distribution between the two segments of customer, however, it can be noticed some dots are really close, suggesting potential overlapping.

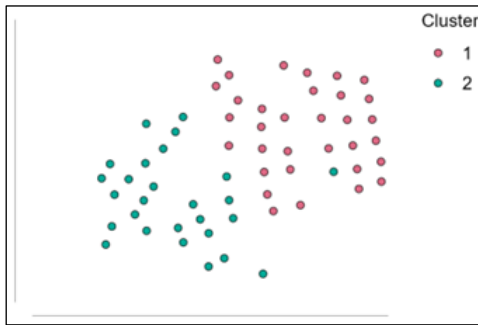


Figure 13 - t-SNE Cluster Plot for the 2-Clusters attempt

Some more options were tested and a scenario with 3 clusters offered an R<sup>2</sup> value of 0,500, indicating a moderate explanation of the data's variance (50%). Further details about this attempt can be seen in the appendix section D of this work, Table A.1. However, the silhouette score of 0,290, shown in the same Table A.1., highlights that the clusters are not very well separated and it is fair to assume that there might be some overlapping between different clusters. This can be confirmed when looking at the T-SNE cluster plot for this clustering attempt, shown in the Figure D.1. in the appendix section D of this work, which offers a different point of view of this grouping distribution. For the 3-cluster option, the division consists of 76, 59 and 69 individuals (Table A.2.), respectively, a balanced size between the different clusters.

Next attempt was for an option with 4 cluster, which resulted in a cluster size of 76, 59,, 34 and 35 individuals (Table A.3.), with an R<sup>2</sup> of 0,551 or 55,1% of the explanation of the data's variance (Table A.4.). Despite the higher R<sup>2</sup> value, the lower silhouette score of 0,250 indicates that the clusters are poorly separated and with a low explained proportion within-cluster heterogeneity is very low, specially for 2 of the clusters. what led to the rejection of this clustering model. The t-SNE cluster plot for this attempt can be seen in the Figure D.2. in appendix D.

A 5 clusters option was also tested, offering an R<sup>2</sup> value of 0,621 and a slightly improved clusters separation (Table A.5.). However, the silhouette score of 0,300 is still unsatisfactory. Plus, when looking at the explained proportion within-cluster heterogeneity (Table A.6.),



cluster 3 explains the largest proportion of its variance, with 63,3%, nevertheless, the remaining clusters have a very low explained variance, with the cluster 1 value being 16,9% and no other cluster registering a value higher than 10%.

The final option tried was the 6-clusters model, seen in Table 3, with an  $R^2$  of 0,712, which is to say that 71,2% of the total variance is explained by this clustering model, a significantly higher result over previous attempts.

Clusters	N	$R^2$	AIC	BIC	Silhouette
6	204	0.712	211.510	271.240	0.350

Table 3 - Hierarchical clustering with 6 cluster

The silhouette score was 0,350, the same as the 2-clusters model, which although reasonable is not fully satisfactory, The clusters size were also reasonably balanced, with the lower-sized cluster including 25 individuals and the largest accounting 46. Despite the improvements seen in this attempt, the rejection of this option is confirmed when looking at the explained proportion within-cluster heterogeneity, as shown in the Table 4, and the t-SNE cluster plot, in Figure 14, which shows a split that cannot be easily noticed, revealing some overlapping between the different cluster options.

Cluster	1	2	3	4	5	6
Size	30	46	34	34	25	35
Explained proportion within-cluster heterogeneity	0.223	0.115	0.168	0.070	0.349	0.076
Within sum of squares	39.093	20.192	29.476	12.287	61.168	13.293

Table 4 - Hierarchical clustering with 6 cluster - Cluster Information

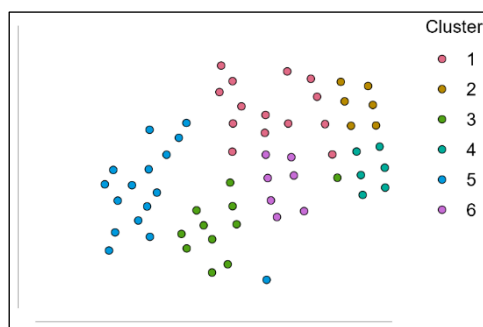


Figure 14 - t-SNE Cluster Plot for the 6-Clusters attempt

In summary, although the typical trade-off of increased within-clusters heterogeneity when increasing the number of clusters was expected, in this case the increased amount of clusters came with a significant decrease in the within-cluster heterogeneity, suggesting that the clusters might be overlapping each other. Cluster 5 is the one that registers the highest value of 34,9%, while clusters 1 to 3 ranged from 11% to 23% and finally clusters 4 and 6 had around 7% each.

In conclusion, the hierarchical cluster was conducted in hopes to find the best possible fit to answer the specific objective predefined that aimed to identify the profile of the consumer that is willing to pay for wine labelled as sustainable. Each attempt sought to identify the best possible trade-off between cluster explanation and separation between clusters. However, as seen above, it became evident that none of the attempts has shown to be of enough quality or validity to ensure a consistent discrimination of the groups. Although the increase in the number of clusters provided a reasonable improvement in the  $R^2$  value, it also resulted in an increased reduction in the within-cluster heterogeneity, suggesting potential overlapping between groups.

Based on the results obtained, it can be concluded that the variables used do not provide a feasible segmentation of the respondents, as the quality of the groups tried is not sufficient to grant a robust segmentation within cluster, which is to say that the divisions of the groups would not reflect the characteristics of the data with the accuracy wanted. Consequently, none of the cluster tentative was accepted as the best segmentation for this work.

#### **4.4. Discussion of results**

It can be said that the majority of the consumers understand a sustainability label as a guarantee of a product with high quality and as a guarantee of strict hygiene standards, as seen in the study from Sogari et al. (2015). On the other hand, and although it wasn't verified any valuable lack of trust in sustainability certification, some answers seem to have caused a slight confusion among respondents, what can be due to lack of information on the subject. Specifically, the relationship between sustainability labels and economic support for local producers, employability in the region, respect for working conditions and reduction and reuse of co-products by reducing internal operating costs. In this case, the high number of neutral responses lead to the conclusion that the individuals that participated in this survey do not have a cemented opinion on this connection, which aligns with the already mentioned article by Sgroi et al. (2023), which also seen a limited number of consumers (29%) that identified a sustainable label as a guarantee of greater economic support for local producers. It's as well noteworthy that the respondents perceive the main focus of sustainable wine certification as the achievement of the sustainable development goals and the focus of sustainable production as a social, environmental, and economic well-being, which connects to what was found by Li and Kallas (2021), as this awareness on the focus of sustainable

practices may indicate high alertness towards the issues that unsustainable practices provoke towards the three fundamental pillars of sustainability, as discussed by Li and Kallas (2021). When it comes to the opinion of the participants about how the sustainable wine production can be a tool for the growth of the Alentejo wine market, which was a more specific question, the answers also shown to be very in favour to this idea. From a general point of view, the present work highlights how the surveyed sample of wine consumers is in favour of sustainable practices in the wine making industry and perceives these practices as an added value for the sector, confirming what was highlighted by Baiano (2021), previously mentioned in this research. This also aligns with what was previously mentioned in the introduction of this work with connection to the work from Sogari et al. (2016), that the potential of sustainable positioning is high, and that it is important that companies acknowledge the best way to gain competitive advantage towards sustainable production and labelling. From a marketing perspective, it is indeed relevant to understand who the specific consumers are and how their interest can be attracted.

The group of questions named “Socio-environmental concerns (PSA)” revealed that a considerable number of respondents are in favour of sustainable practices and even willing to adapt their attitude for the sake of the environment. Almost all the individuals agreed that it is important to preserve the environment for future generations, which reveals a high commitment to this cause, reinforcing what was found by Sogari et al (2016b) in their work about the factors driving sustainable choice in the case of wine, mentioned before as the survey conducted in the investigation by Sogari et al was the one that inspired the survey for the present work. It is also possible to conclude that the wine consumer that participated in this study is willing to adapt and even make personal sacrifices for the sake of the environment, again in accordance with what was found by Sogari et al (2016b). There is also the belief that buying sustainable products help protect the environment and that the environmental damage caused by humans in the use of land and water and the overuse of natural resources in the world for food production is a shared concern. The same was found by Pomarici et al. (2016), although the research was more specific and was able to distinguish the concern between water footprint and carbon footprint. Pomarici et al. (2016) revealed that their sample was not concerned about the water footprint, addressing their concerns to the carbon footprint. In the present study, however, the overuse of natural resources related to land and water was posed to participants as one single concern, which in fact was seen as a collective concern.

When it comes to the attention given to marketing campaigns from winemaking companies, it's notable that consumer tends to pay attention to advertising messages that talk about environmental protection, that wine brands/companies that have environmental certifications and labels are appreciated and that brands that use environmental protection messages in their advertising have a favourable response among consumer, however, it's also worth noting that more than one third of the participants to the survey conducted for this research stated that they are neutral to the preference of wines from companies that adopt a responsible attitude towards the environment, to the detriment of others, which can raise the assumption that in a real purchase scenario, consumer's attitudes towards sustainable winemaking practices might not be enough to lead them to buy this product and some other factor(s) may have high importance in this decision, as also shown by Pomarici et al. (2016), "even if most consumers claim to consider sustainability issues generally important and desirable, this does not necessarily translate into manifest sustainable consumption" (Pomarici et al., 2016, p.539).

The group named "DP" was made with the focus of understanding the willingness to pay for wine labelled as sustainable. It is possible to assume that the wine consumer that participated in this survey as a significant willingness to buy wine with a certification label of sustainable production, if there is an offer, as highlighted by Pomarici et al. (2016). However, and although consumers had shown a high accordance to the idea of buying wine certified as of sustainability produced, the number of opinions in favour of paying more for this product was slightly lower. That is to say that consumer still might need to review the price difference and understand the value of this type of product before saying they do want to pay for it. Again, this is in accordance with what was previously mentioned in the introduction to this work based on the research by Pomarici and Vecchio (2014), that an extra value might be a factor to push away consumers from sustainable wine options. That has been said, consumers do agree they would be willing to buy sustainable wine, however, when it comes to pay a premium price for this type of wine, the willingness decreases a bit, which leads again to the assumption that a sustainable product is appreciated and consumer is indeed willing to buy it, however, the extra cost might not be accepted and other determinants need to be evaluated before deciding if the sustainable wine is valuable enough. To have an even more clear understating of this willingness to pay, the third question of the group DP asked consumer about concrete extra cost that they would accept in exchange of a wine certified as sustainably produced. The answers were very heterogeneous, and it was not possible to underline a trending value among respondents. The most selected possibility was the extra

cost between 2,01€ and 3€ and the least selected was 3,01€ to 4€, making it very difficult to highlight the extra cost that consumer would be willing to pay for wine with sustainable wine certification. Still, it is possible to conclude that the majority of the individuals revealed a willingness to pay no more than 3€ for the suggested product, with 55,4% of the selections being below the 3,01€ value. The intermediate values were the least selected by the participants, with only 25.5% of the total responses being between 3.01€ and 5€. This goes in a different direction from what was found by Sellers (2016), where the author revealed an impressive 82.4% of wine consumers stating to be willing to pay an extra 5€. This may perhaps be related to the demographic characteristics of the samples that participated in both the work from Sellers (2016) and the present research, which may differ in some indicators. The awareness and price sensitivity can also be an influencing factor, and it is also important to note that the range used by Sellers was considerably wider than the one used in this work, leaving space to different answers.

Finally, as mentioned before, it was tried to identify a group of consumers with a similar profile that is willing to pay a premium price for a product with sustainable production certification, in what concerns demographic data. Although the cluster analysis was carried out with different options, it was not possible to identify a significative group with similar characteristics that shared the same visions towards paying a premium price for the mentioned product. In conclusion, there was not an option that was satisfying enough to be assumed as the best clusters division, with all attempts leaving some open questions, which actually reminds what was advised by Sogari et al in their study from 2016, in which the authors mentioned that finding the proper clusters of consumers “might become one of the major issues in the marketing strategies and consumer communication in the forthcoming years” (Sogari et al, 2016, p.63).

When asked if they pay close attention to the labels and tags of wines with all the information about their environmental impacts, consumer showed the biggest diversity of opinions. This could indicate that some consumers that answered the survey are not very much concerned with the consequences of the production of their wines for the environment in general, however, this would be an opposition of what was beforehand stated by this consumers, that highly affirmed their concerns towards sustainability issues previously and further in the same survey. That has been said, the lack of attention that some consumers show to this kinds of labels can represent a challenge for winemaking companies, that may want to either adjust their marketing campaigns in a way that captivates consumer’s attention towards the environmental concerns that the company itself takes into account to carry out

its activity or even try a renewed way of highlighting this concerns in the labelling of the wine, as also suggested by Martínez-Falcó et al. (2024) as a benefit for winemaking companies, highlighted before in the present work.

It is also valuable to remember what was stated by Schäufole and Hamm (2017), that marketing wine with sustainability characteristics can lead to differentiation and even result in competitive advantage for winemaking companies. Being that the conclusions presented above in this work also shown an interest from the consumer to this kind of product, it can be stated that indeed sustainable certification can be an opportunity for a better marketing strategy that can surpass the competitors'. Still, this leaves the question open: to what extent can this competitive advantage be in fact turned into practice in a real market scenario? Will this be only an interest from consumers or otherwise will they prefer the sustainable option and purchase it even if it is subject to a premium price? It is also a good note to make that in this work the consumers also shown the same mindset that Hill and Jones (2010) observed in their work, cited in Gilinsky et. al (2016), in which the authors understood that a wine certified as sustainable will be seen as of higher quality, with the same being highlighted by Sogari et al. (2016b). It is then fair to assume that sustainable wine is seen by consumers as a higher quality wine when compared to others. It is pertinent to underscore that consumers awareness towards sustainable issues is as well a reality nowadays, as shown by the surveys participants when asked about their socio environmental concerns, which confirms what was already stated by Marques and Teixeira (2023). This comes as a confirmation of what was previously suggested by Stasi et al. (2016), that a sustainable approach to the market by winemaking companies might be a valuable initiative to gain consumers attention, being that consumers is nowadays very aware and involved in concerns about food safety issues, environment, and ethical implications of production.

When it comes to consumers WTP, it is important to remember Pomarici and Vecchio's (2014) work on the attitude of the *millennial* generation towards sustainability in the wine sector. As previously mentioned, the authors found out that 74.8% of their sample would be interested in buying sustainable wine. The present work also evaluated this interest from the wine consumer, revealing an 87.75% of interested consumers that agree they would be willing to buy wine certified as of sustainable production, if there was an offer, which confirms a high number of consumers that shown this interest just like in Pomarici and Vecchio's article. Baiano (2021) also concluded in favour of this WTP, serving as another study in concordance with what was observed in the present work. It is also worth to bring back again the results drawn from Ricardo Sellers' (2016) work, which also collected data via a survey. As already

mentioned, Sellers revealed an 82.4% of wine consumers that shown WTP extra 5€ for a sustainable wine. In this case, it is not possible to compare directly, as the prices suggested to the survey participants in Sellers' study was beforehand higher than the options given to the individuals that participated in the present work. Still, it might be worth noting that only 19,1% of this work's participants stated to be in accordance with paying extra 5€ or plus for a wine labelled as sustainable, showing a significant gap between this individuals and the ones that were part of Sellers' sample, which suggests that there is a difference in the willingness to pay extra price for sustainable wine between Spanish and Portuguese consumers, what can be linked to some sociodemographic and other factors. Not to forget what was revealed by Piracci et al. (2022), a willingness to pay an average extra price of €7.42 for a wine that is certified as produced in accordance with fair labour conditions. Pomarici et al. (2016), as mentioned before, also focused on a specific target – the Italian wine consumers. The authors were able to find a target that would be interested in buying sustainable wine – higher spenders in wine and experts in winemaking, contrasting with the present work, in which it was not possible to define a specific group of consumers that would be willing to pay a premium price for wine labelled as sustainable. Pomarici et al. (2016) also showed that a 68% of their sample of consumers have low interest in sustainable wines, which distinguishes from the results obtained in the present work, considering the 67,6% of consumers that stated that they respond favourably to brands that use environmental protection messages in their advertising and the 72,06 % that appreciate wine brands/companies that have environmental certifications and labels. Again, the 87.75% of individuals that revealed an interest in purchasing sustainable wine underlining underline a difference between Portuguese and Italian wine consumers.

## 5. CONCLUSIONS

The conclusions of the present work not only show an alignment between consumer perceptions and interests towards sustainability in the wine industry and what was previously found by other authors, but also provided valuable data concerning the four specific objectives that were predetermined. This chapter delves into these new findings and aims to provide an answer to the main objective of the work as well as respond to the four specific objectives.

The data collected allows to draw conclusions in favour of the sustainable wine market, as it was noticed a shared interest among consumer towards this sort of product. Nevertheless, there is still a huge space for improvement and innovation in what concerns marketing campaigns that aim to promote such products, and the wine industry must work to find a way of promoting sustainable wine and ensure that the consumer is able to distinguish this product on the shelves (Pomarici and Vecchio, 2014).

When it comes to the first specific objective, to analyse the consumer's perception of sustainable production in the wine sector, the results of this study showed a general positive attitude towards sustainable practices and a shared interest in protecting the environment for the generations to come. When the questions connect to the wine market, the majority of the respondents of the survey agreed that sustainable wine is a product of both higher quality and strict hygiene standards. The biggest confusion among the participants was seen in the answers that suggested a link between sustainable practices in wine production and economic benefits for local producers, regional employability and reuse of products, which is to say that although the wine consumer shows interest in sustainable wine production, there is still a path to run until all the benefits from this sort of production can be clear for them. It is then important that wine companies that are focused on sustainable production and labelling find the proper way of making it clear which are the benefits that can be taken from such practices.

The second objective was to assess consumer commitment to sustainability and environmental protection. The idea of environmental protections seems to be very present in the participants day-to-day, considering the more than 96% that agreed that it is important to preserve the environment for future generations. Additionally, there was a vast number of consumers that revealed to be willing to adjust their behaviour and adapt their attitudes for the sake of the environment, showing a strong sense of responsibility. This high commitment to sustainable practices shows how there is a growing attention from consumers nowadays to



sustainability issues and how a marketing campaign that addresses the sustainability issues that are being taken into consideration in wine production can be a key factor on the decision-making process. As mentioned before, there was a general favourable opinion among respondents towards winemaking companies that have environmental certifications and highlight their environmental care initiatives in their advertising campaigns, which for winemaking companies can be a significant sign that directing marketing in a way that aligns with consumer's beliefs in what concerns sustainability can be a benefit. Finally, to properly answer the question posed by this second objective specific, it is fair to admit that there is a shared commitment to sustainability and environmental protection by the wine consumer.

The third specific objective was to understand to what extent the consumer of wines is willing to pay a premium price for the product that is certified as sustainable. The group of answers named DP was made with the main purpose of answering this question and provided valuable insights on this WTP for sustainable wine. The 3 questions of the group have also a great importance for the main goal of the whole work. The willingness to purchase sustainable wine was clear, having in count the more than 87% of consumers that expressed this disposition, nevertheless, the premium price might be something that still lacks further investigation, as the number of consumers significantly decreased when this idea was brought to their attention. Paying a price premium, which is to say paying an extra amount when compared to a regular bottle of wine was approved, however, by only around 63% of the participants to this work. That is to say that a sustainable wine bottle is indeed a product of interest for the wine consumer, but winemaking companies need to be cautious and evaluate what is the ideal extra amount to this way ensure that the interest shown by the wine consumer in the sustainable wine is not surpassed by other key decision-making factors. Most consumers indicated they would be willing to pay no more than 3€ of added price, with only a few accepting to pay more than 5€. In conclusion, the wine consumer is in general very interested in purchasing sustainable wine if they have that option, however, they remain sensitive to the price as a key factor in the buying decision, which is to say that a premium price can be a limiting factor and direct consumers to a regular wine not labelled as of sustainable production.

The last specific objective defined was to identify the profile of the wine consumer who is willing to pay a premium price for a product with sustainable production certification. Despite multiple attempts to identify a clustering option that could provide a group of consumers with similar demographic characteristics and WTP, the results were inconclusive. Still, this scenario does not indicate that there is an absence of a group of people with similar

demographic details that are in fact willing and interested in purchasing this product even under a higher price. The low number of respondents might be the main cause for the lack of significantly similar groups of consumers. An analysis with a bigger sample could be interesting to provide a more significant overview to identify this missing information.

In conclusion, to answer the main objective of the whole work, which was to identify the importance of sustainability certification labels for the wine consumer, this work revealed that there is in fact a high commitment from consumers to sustainability and environmental protection and that there is a shared interest in purchasing wine certified as being of sustainable production, however, these beliefs may not be enough to lead the consumer to opt for this wine type if this certification imposes an extra price, with other factors determining consumer's buying decision.

### **5.1. Limitations of the study**

It's important to highlight once again that this work doesn't observe consumers decisions in a real market scenario, which infers the assumption that in a real market scenario consumers might act different from what they state as their willingness via the questionnaire. Also, the limited number of respondents to the survey (204 valid answers) made it not possible to find a relationship between demographic characteristics and the answers given and to find clusters among the individuals that taken part in the survey, with this being the main limitations and difficulties to this work.

### **5.2. Future work**

As said before, a significant number of consumers revealed to be uncertain on whether they would be willing to choose a wine labelled as environmentally friendly or sustainably produced to the detriment of other that is not similarly labelled. Therefore, it would be interesting to have a work conducted with the main goal of understanding which factors can make the consumer put their convictions towards sustainability in the winemaking industry apart and opt for a regular wine. This work could help the winemaking industry in order to understand which factors are more important for the consumer in the choice of wines and which may be even more relevant than the beliefs themselves, in this case, in the field of sustainability, thus allowing marketing campaigns more targeted to what the consumer is

looking for in reality and on the other hand it can be helpful for academics that would like to develop this subject deeper and with more detail. Furthermore, it could be of high interest to connect the present study with some others mentioned in the theoretical background to understand what distinguishes the consumers from different in what concerns the price that they are willing to pay for a sustainable wine. As mentioned above, the survey contributors of the present work showed a lower amount of extra price that they would agree to pay, while for example Seller's participants (Spanish consumers) were more receptive to pay a considerably higher price and Pomarici et al. (2016) revealed only a very specific target that was interested in buying this type of product. That is to say, not only is it important to confirm consumers' willingness to pay for wine labelled as sustainable, which seems now in an advanced stage of acceptance, as it would also be very valuable to conduct a study in a higher scale on the concrete extra price that consumers from different countries would be willing to pay and which factors influence this eventual discrepancy.

Finally, and although the survey conducted in the present work does not focus on the determining factors in the decision to purchase wine, it is always interesting from a marketing perspective to develop further research in consumer behaviour, so it would be valuable to reach deeper into the decisive factors that make wine consumer choose a wine in detriment of others and which factor can have more strength in this decision. As mentioned before, works like Schäufele and Hamm (2017), Sellers (2016), Baiano (2021) and Sogari et al. (2016b) focused on this subject, which makes these a great starting point for a rich background to conduct the work here suggested.

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## APPENDICES

### Appendix A

This appendix contains the graphics related to the answers to the groups of questions PSA from the survey that was applied to collect data for this research.

Figure A.1. – Group PSA Question 1

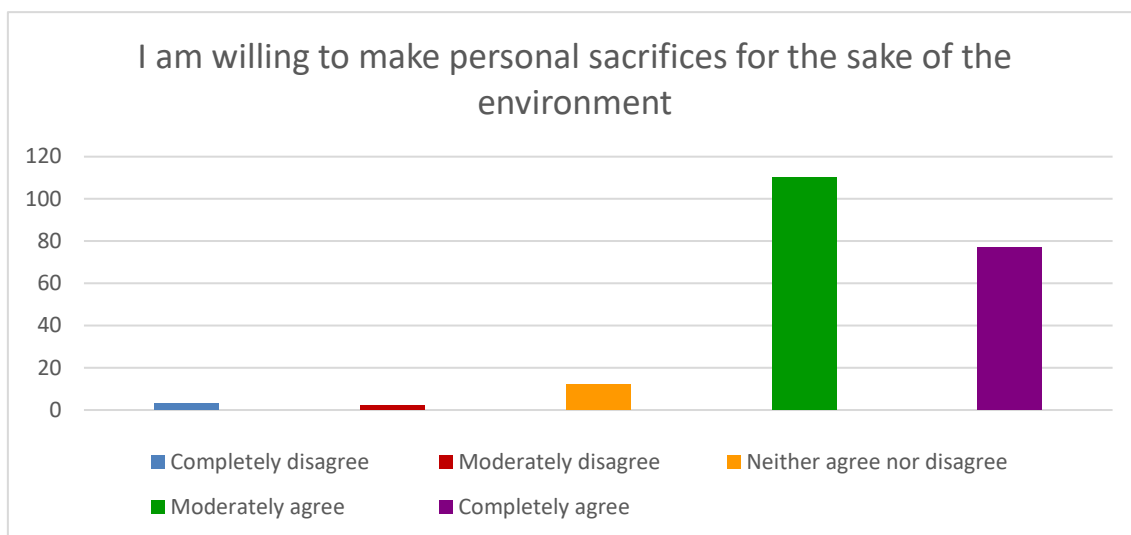


Figure A.2. – Group PSA Question 2

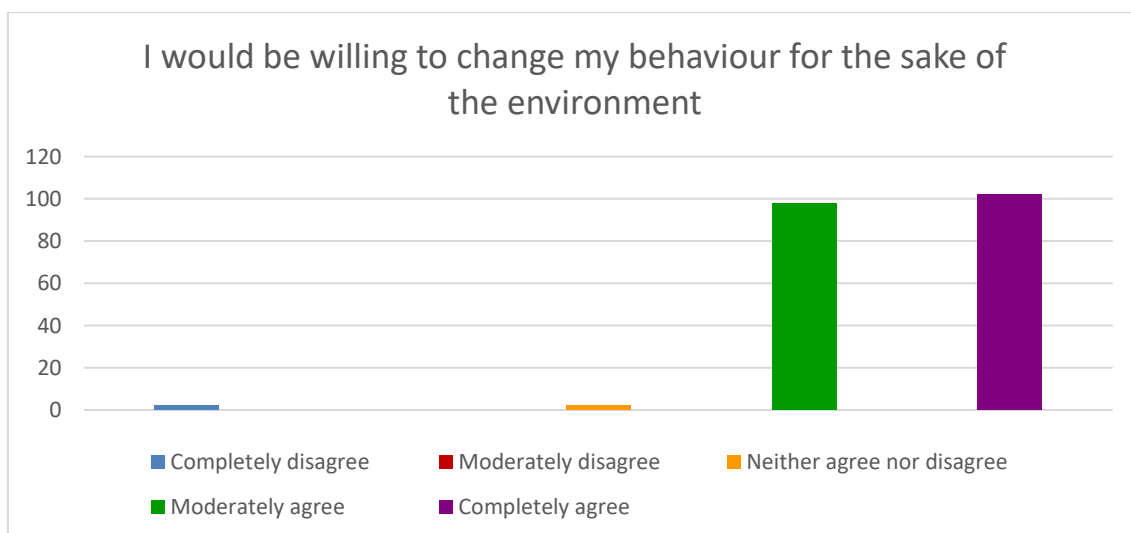


Figure A.3. – Group PSA Question 3

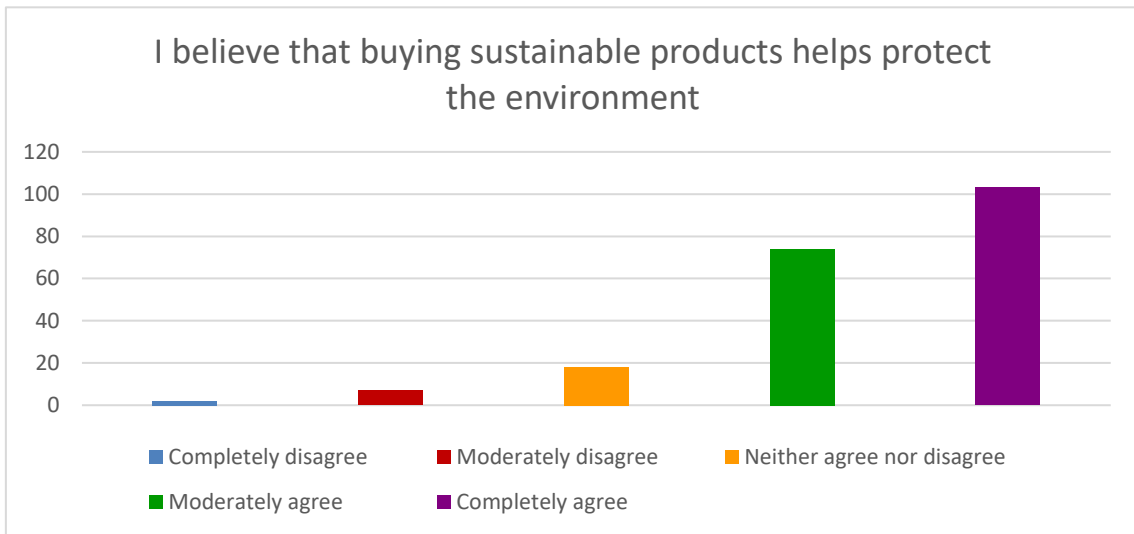


Figure A.4. – Group PSA Question 4

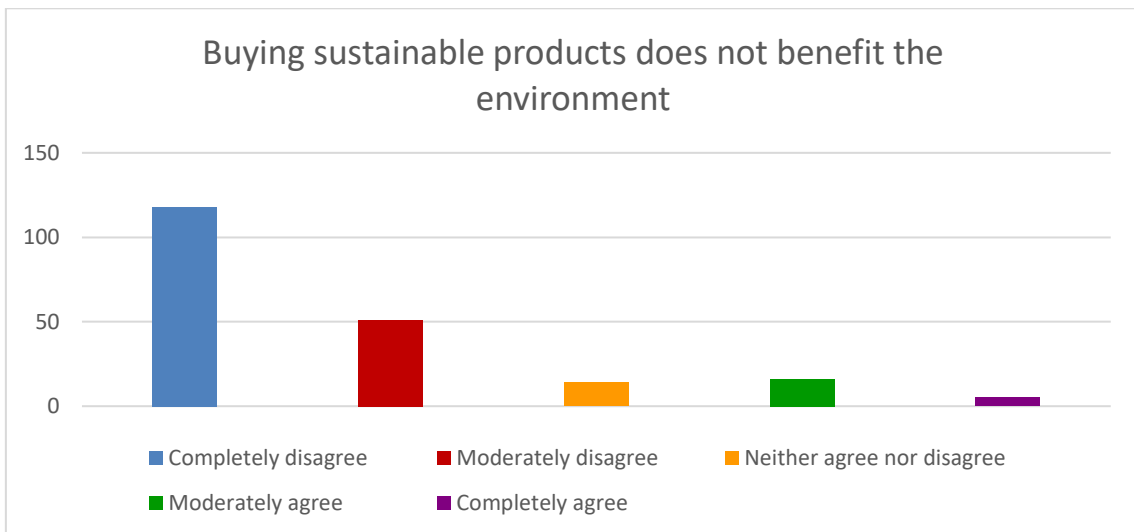


Figure A.5. – Group PSA Question 5

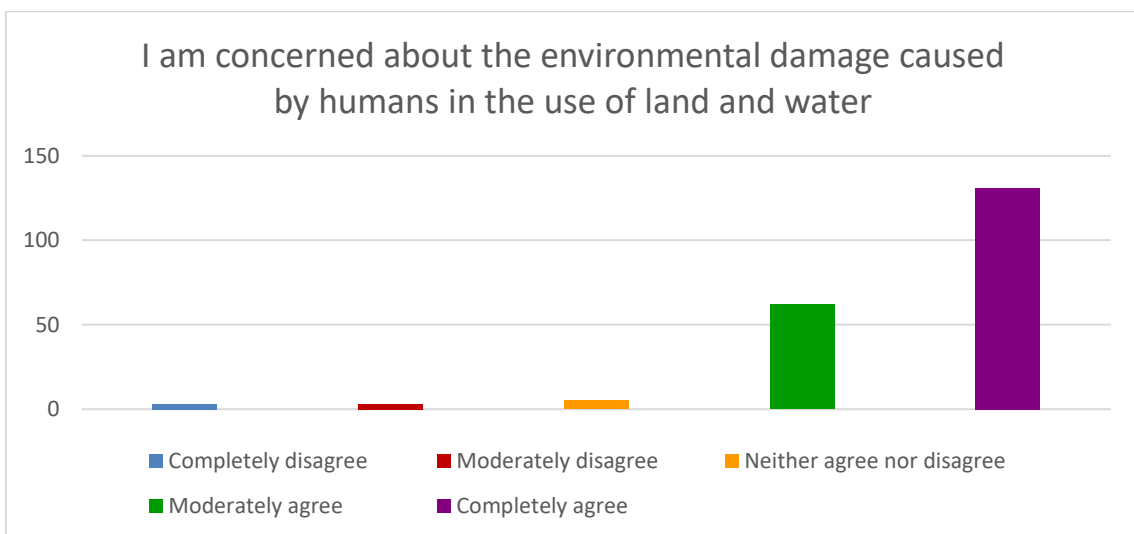




Figure A.6. – Group PSA Question 6

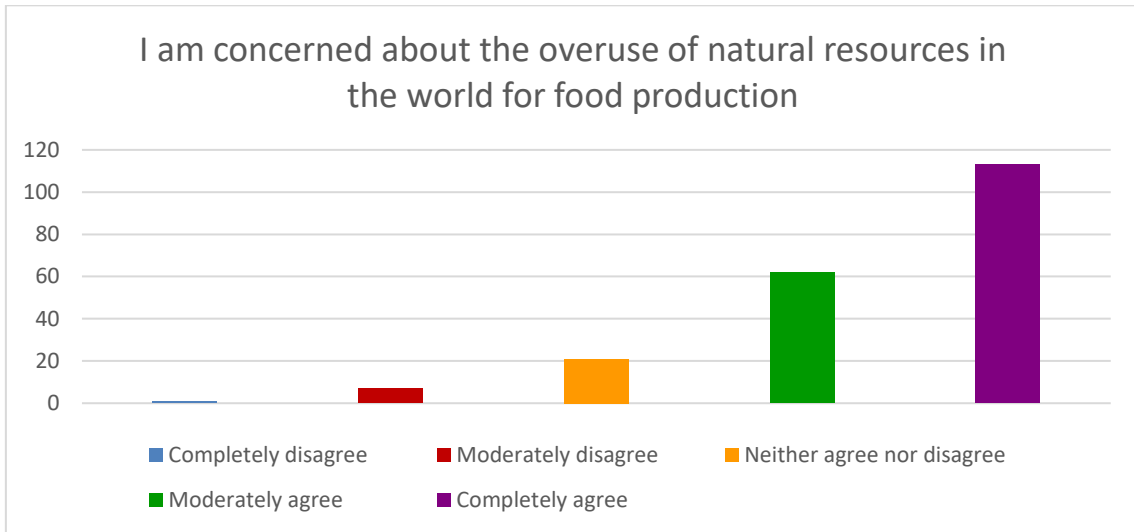
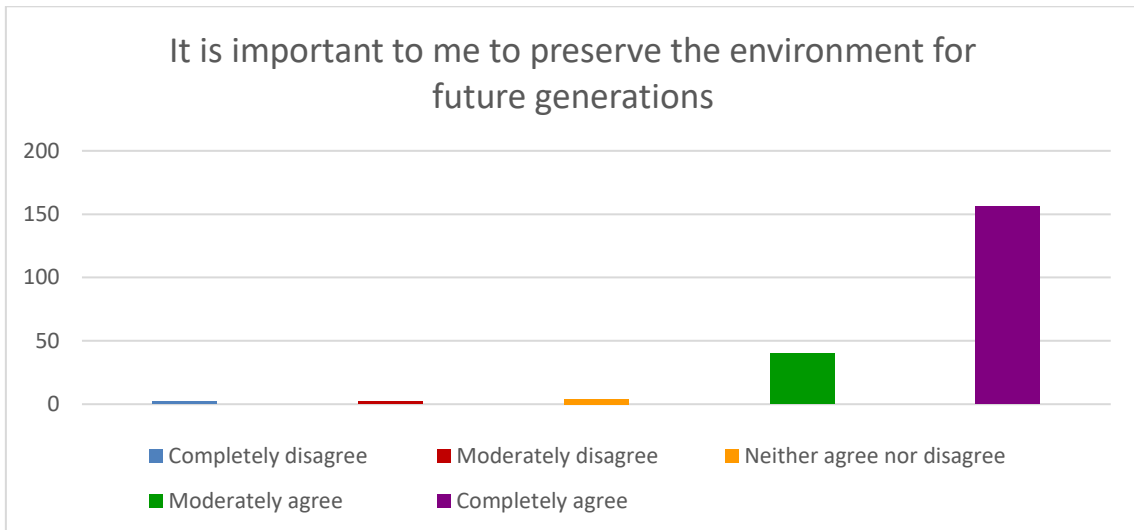


Figure A.7. – Group PSA Question 7



## Appendix B

This appendix contains the graphics related to the answers to the groups of questions AMEV from the survey that was applied to collect data for this research.

Figure B.1. – Group AMEV Question 1

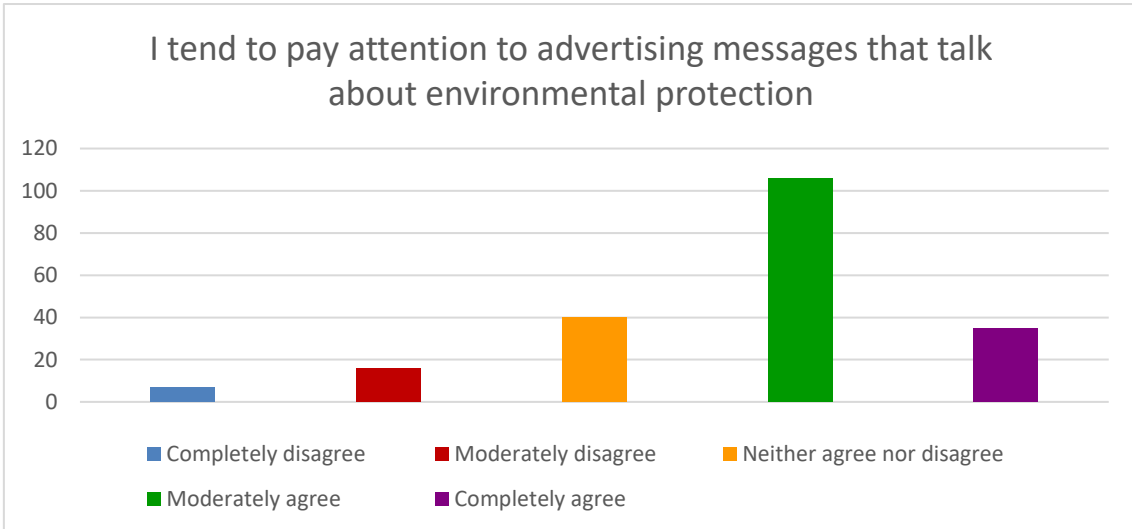


Figure B.2. – Group AMEV Question 2

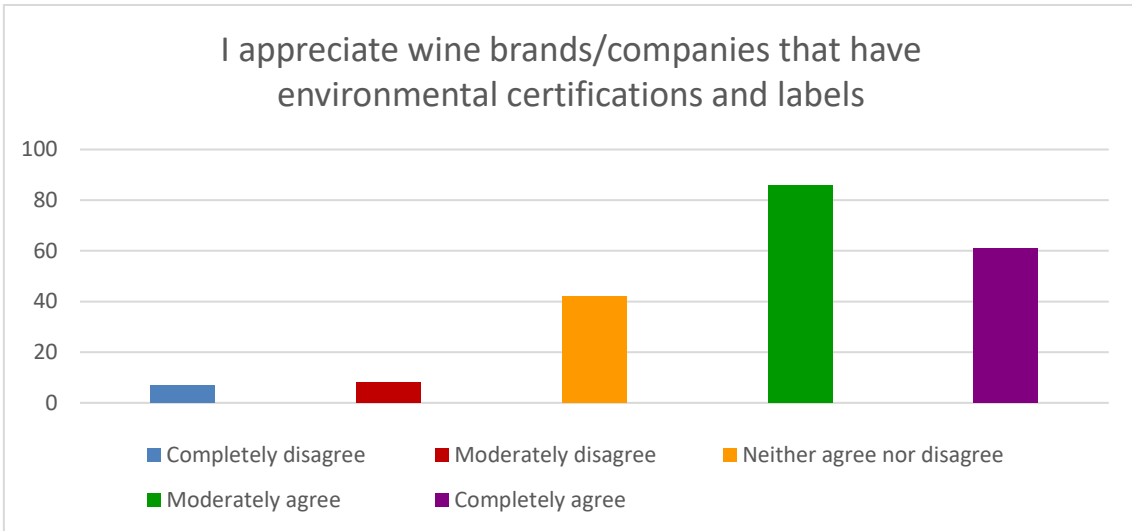


Figure B.3. – Group AMEV Question 3

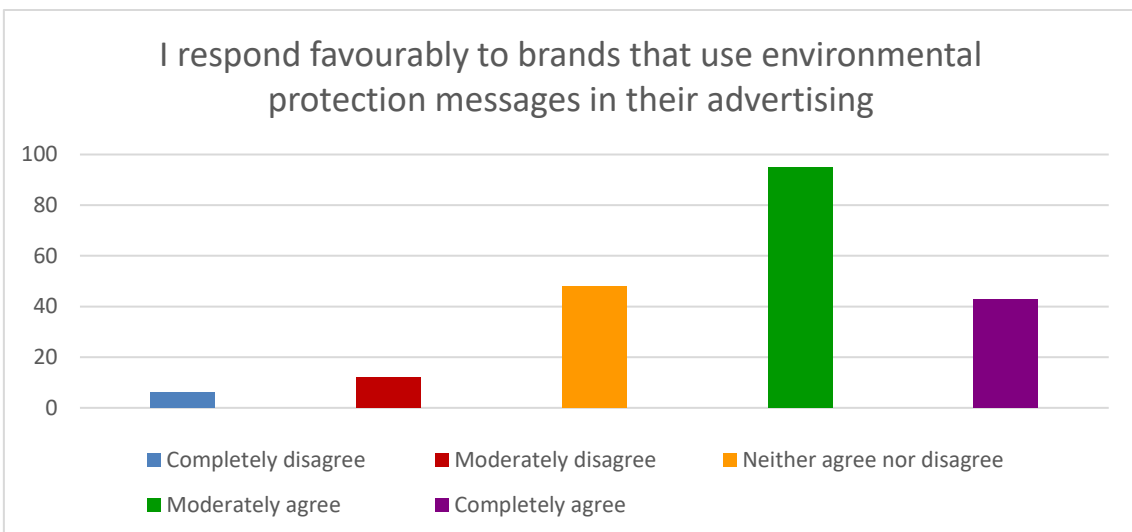


Figure B.4. – Group AMEV Question 4

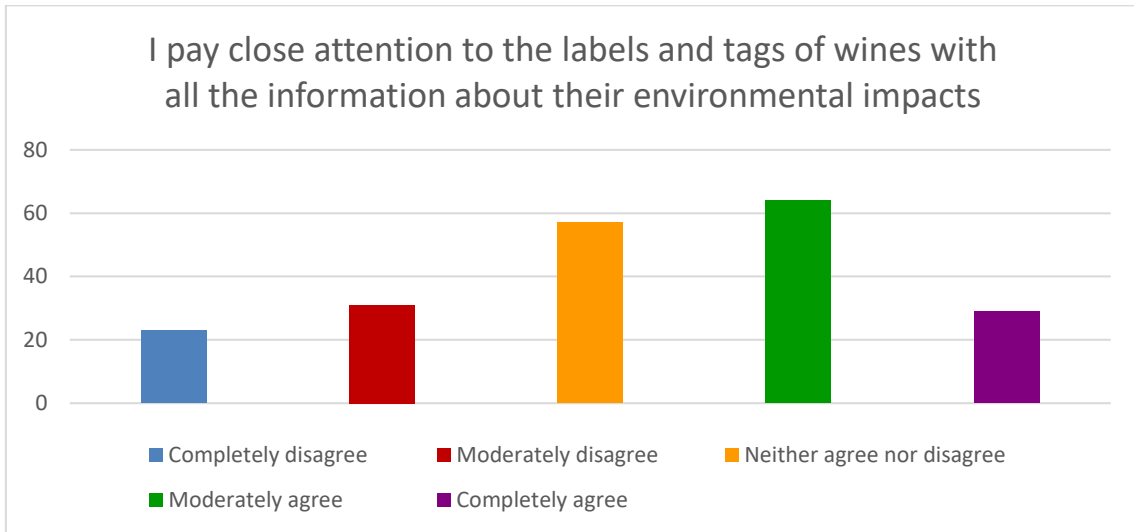


Figure B.5 – Group AMEV Question 5

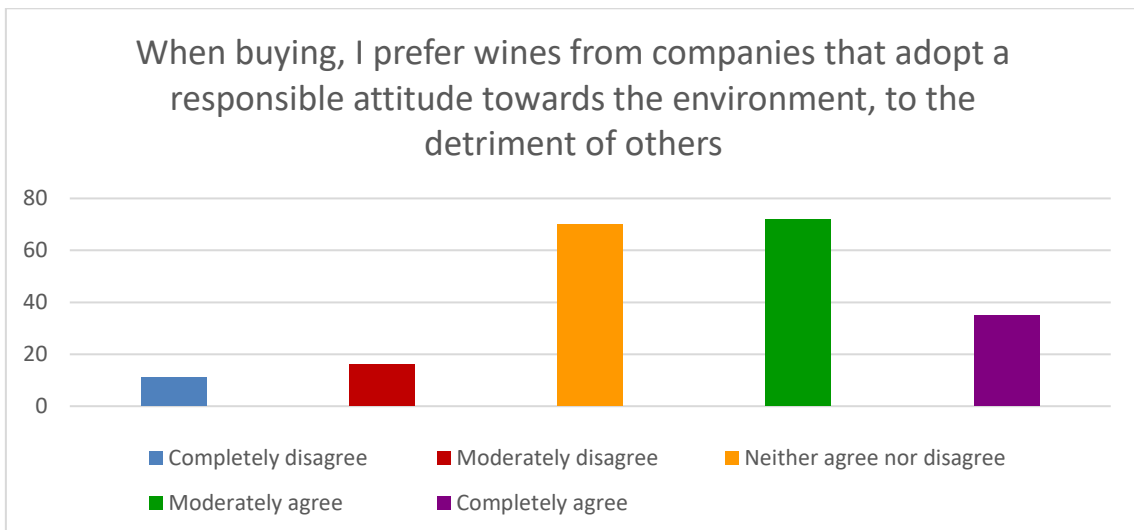


Figure B.6 – Group AMEV Question 6

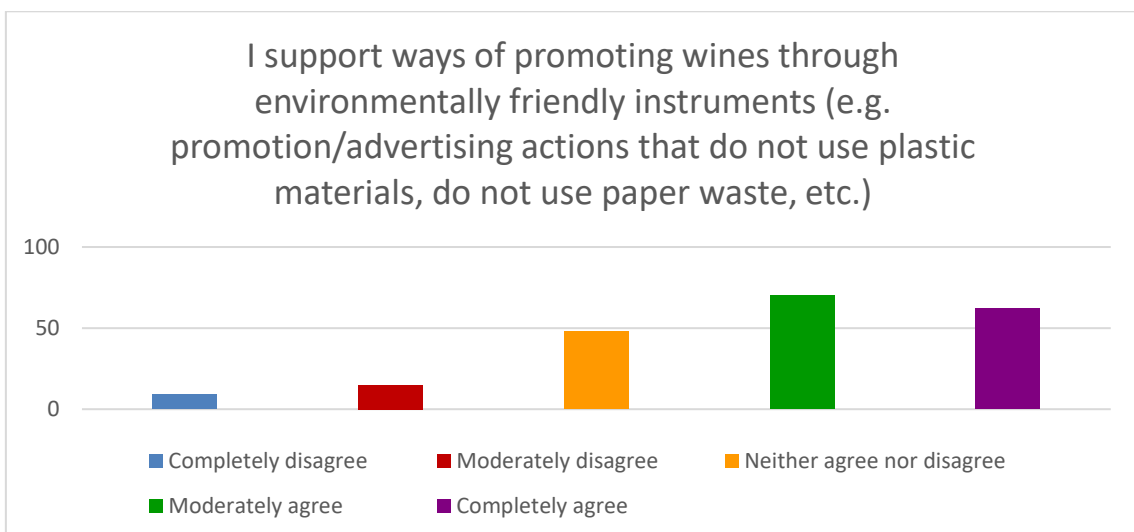
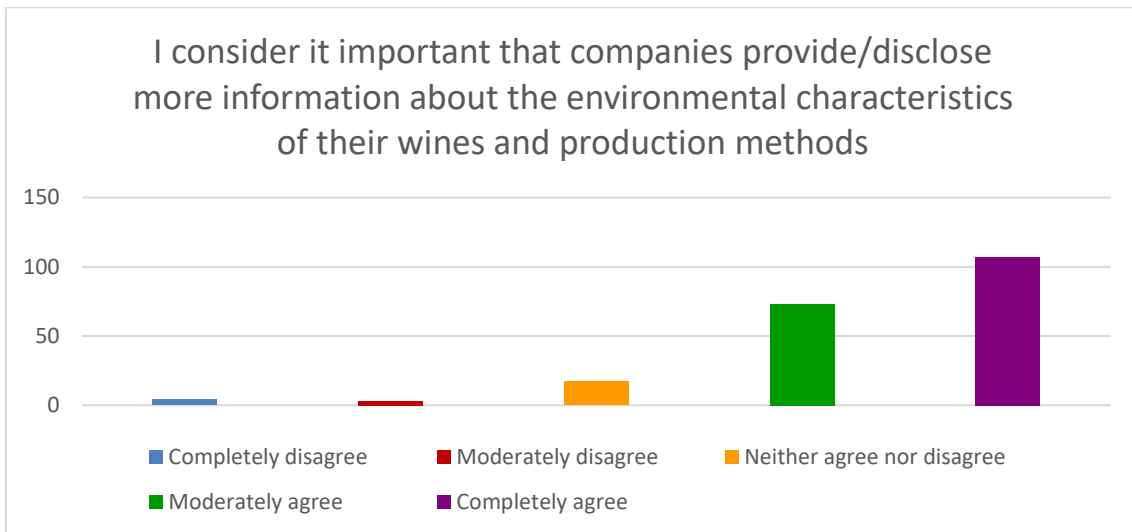


Figure B.7 – Group AMEV Question 7



### Appendix C

This appendix contains the graphics related to the answers to the groups of questions CPS, from the survey that was applied to collect data for this research.

Figure C.1. – Group CPS Question 1

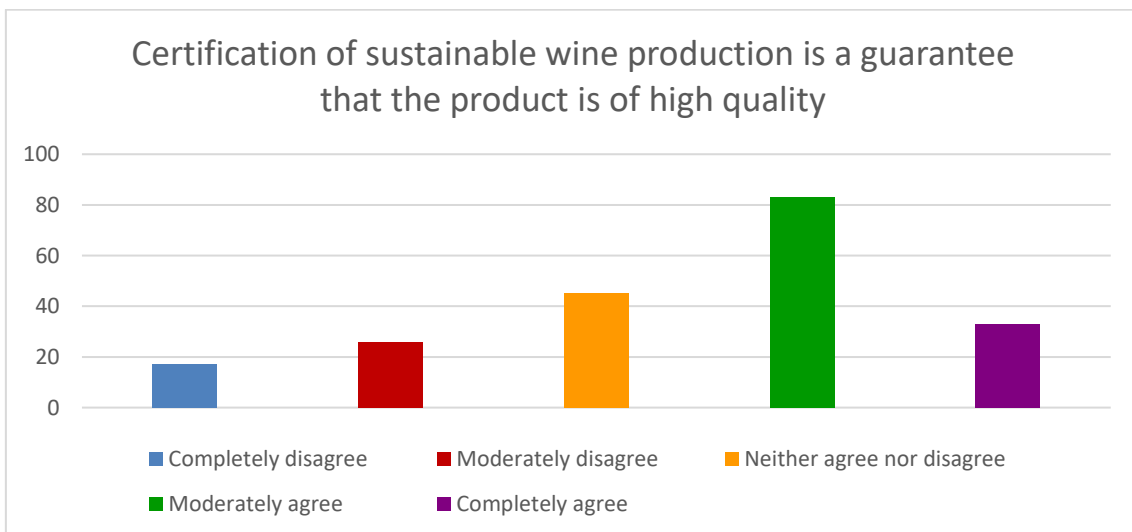


Figure C.2 – Group CPS Question 2

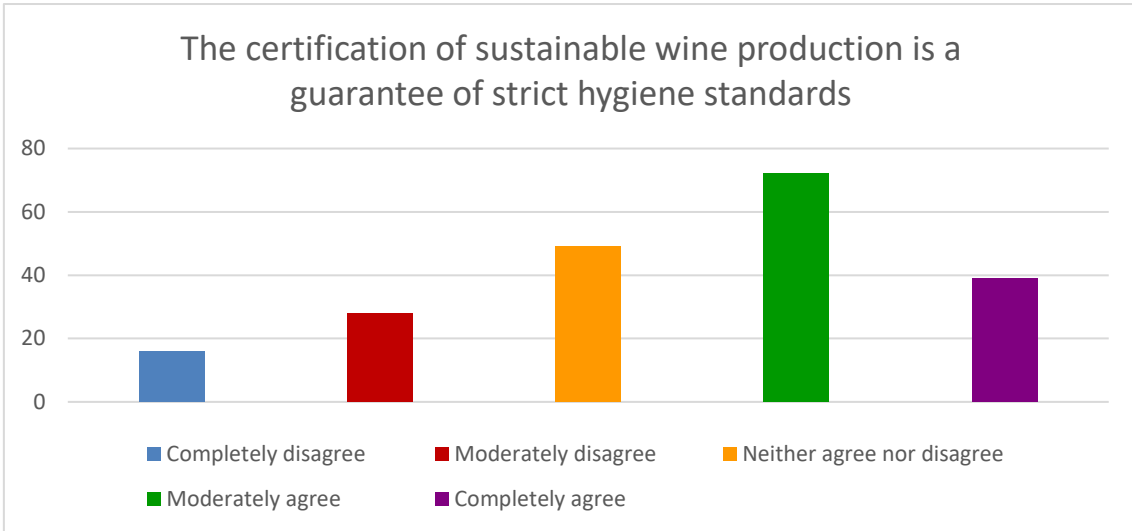


Figure C.3. – Group CPS Question 3

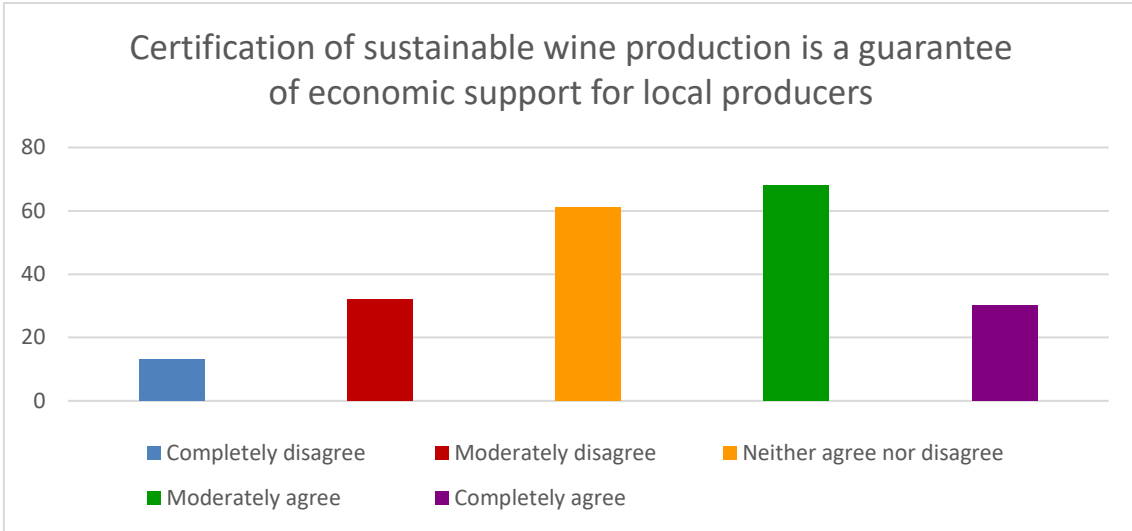


Figure C.4. – Group CPS Question 4

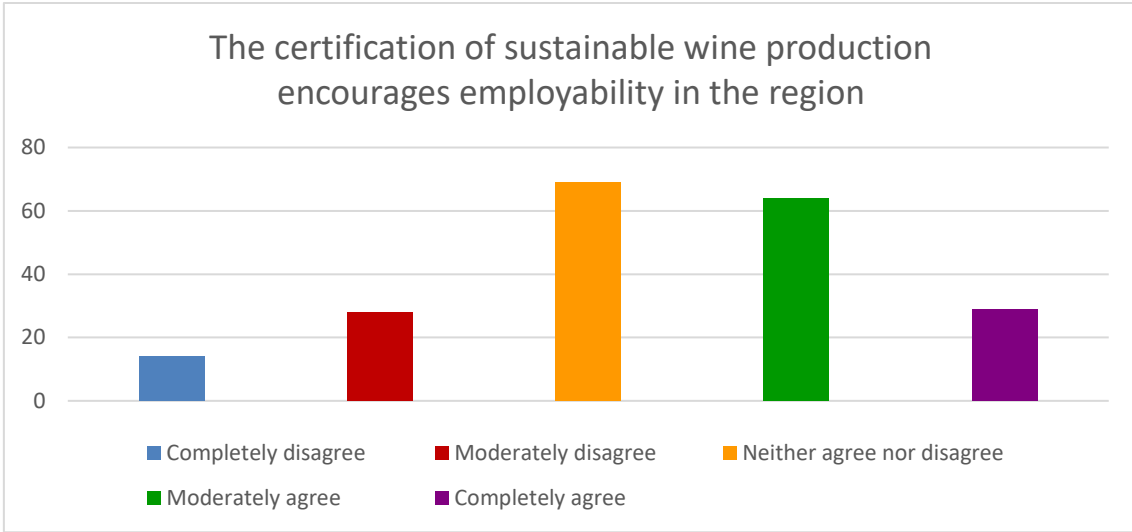


Figure C.5. – Group CPS Question 5

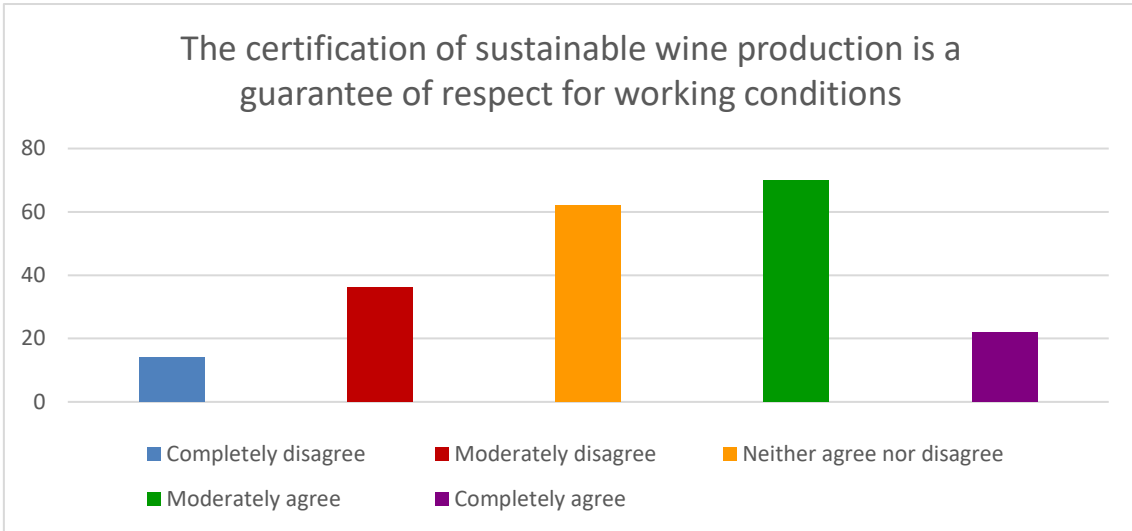


Figure C.6. – Group CPS Question 6

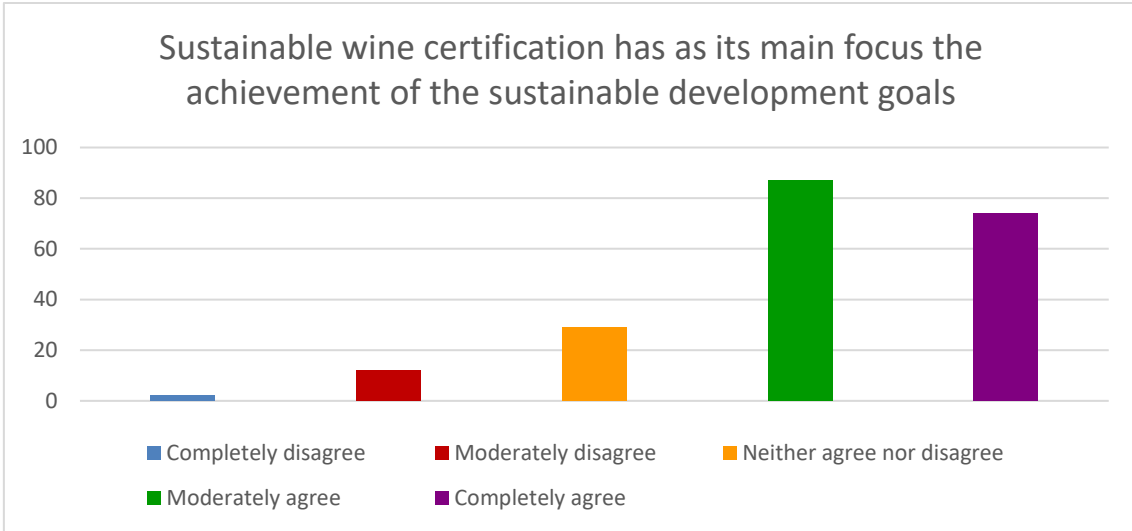


Figure C.7. – Group CPS Question 7

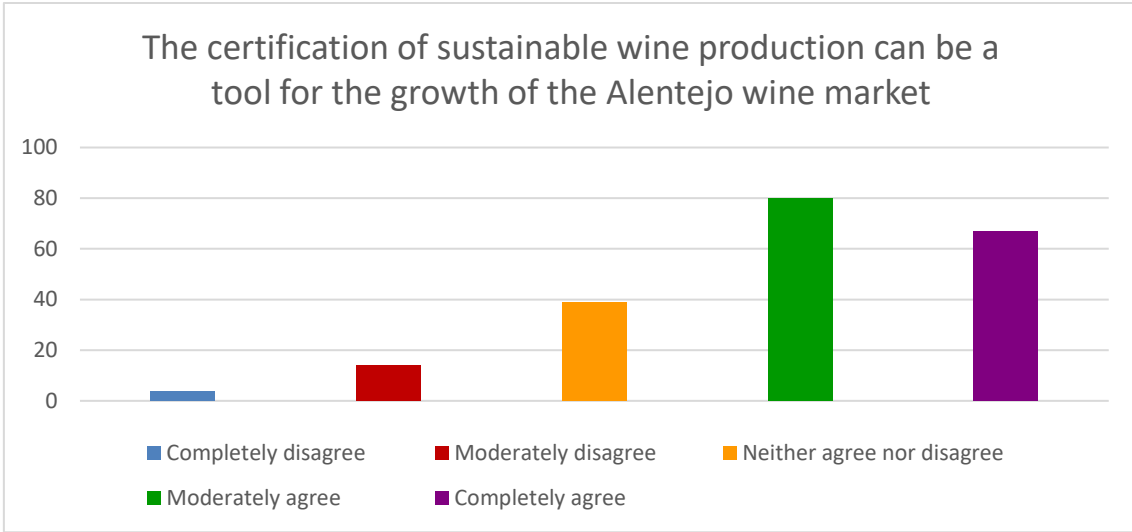


Figure C.8. – Group CPS Question 8

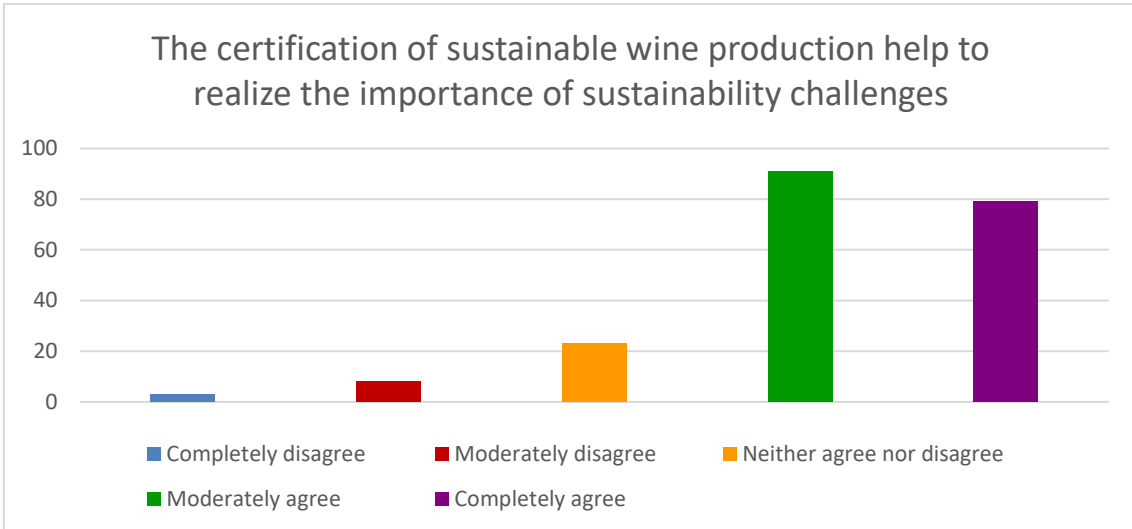


Figure C.9. – Group CPS Question 9

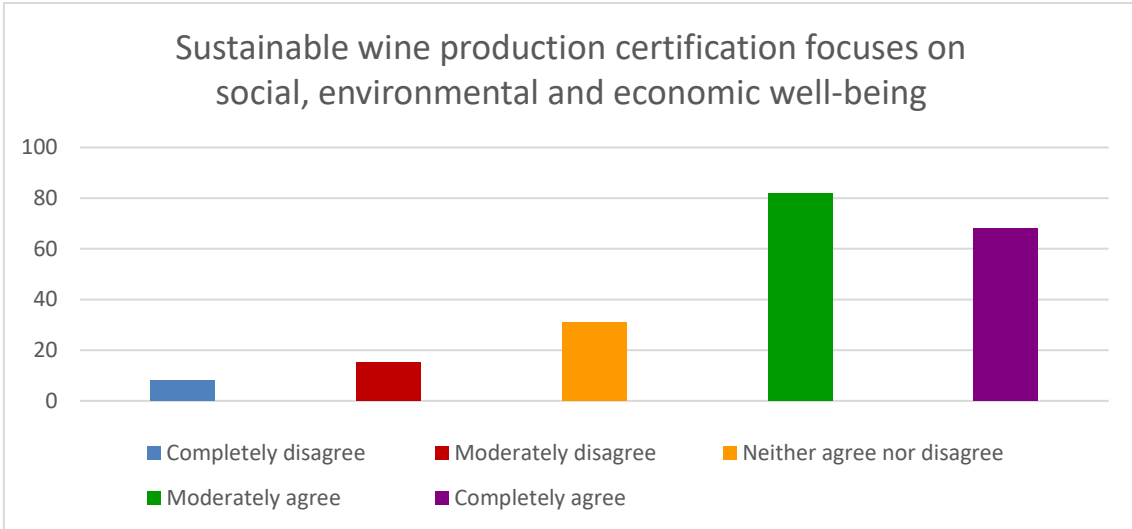


Figure C.10. – Group CPS Question 10

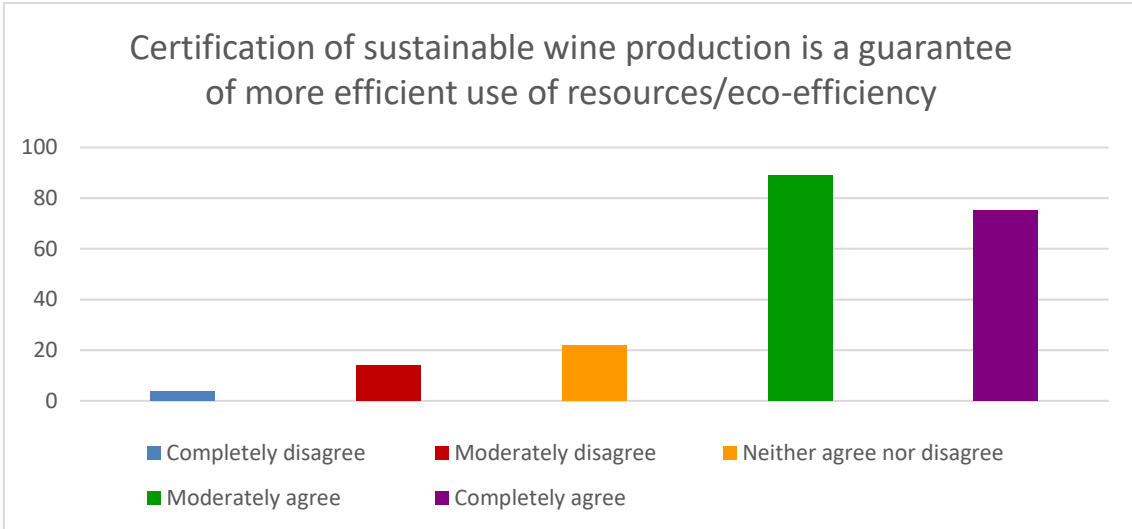


Figure C.11. – Group CPS Question 11

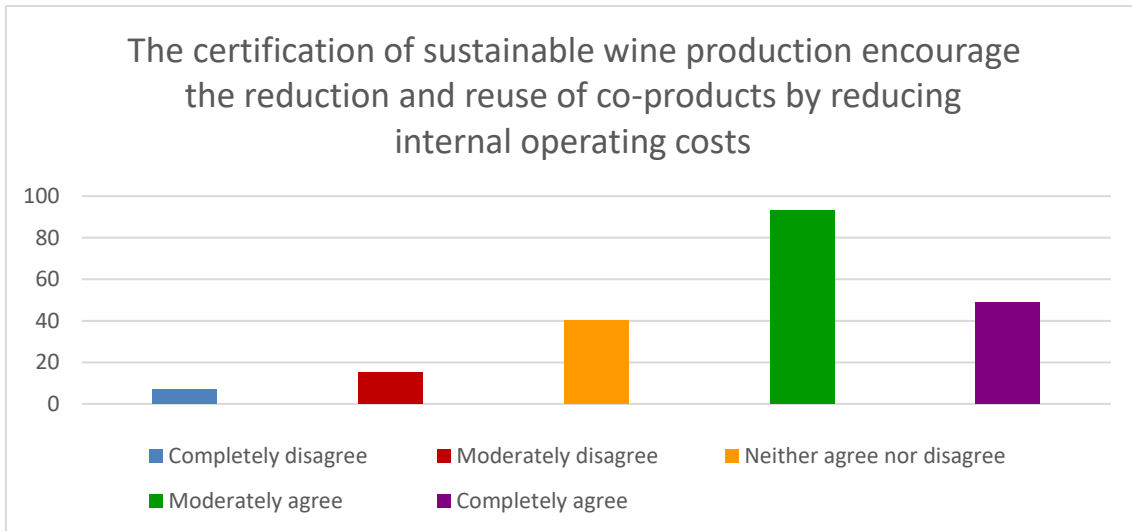
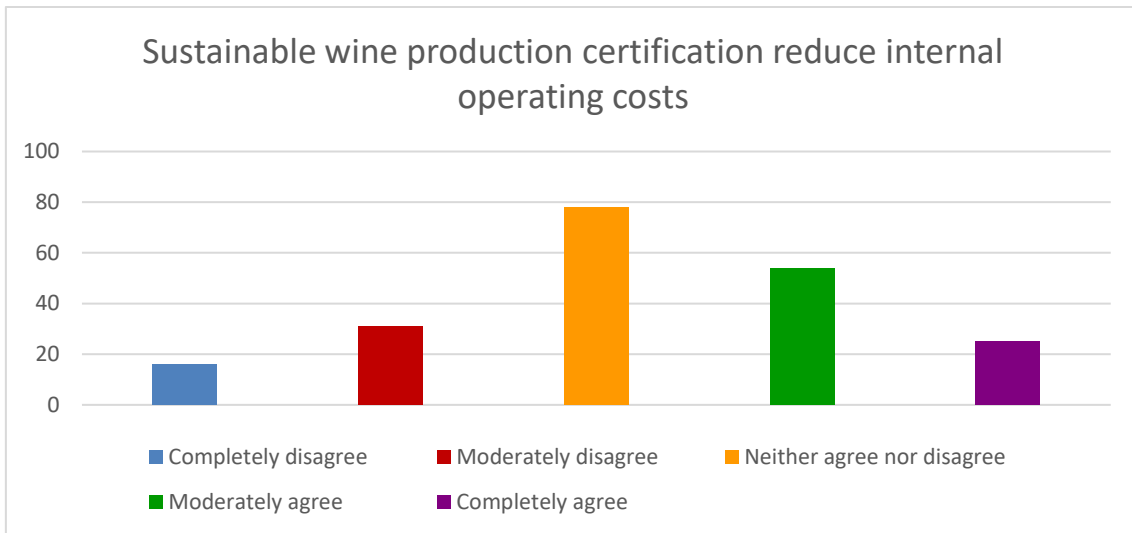


Figure C.12. – Group CPS Question 12



## Appendix D

This appendix shows further information regarding the hierarchical clustering analysis of this research.

Table A.1. – Hierarchical Clustering with 3 clusters

Clusters	N	R <sup>2</sup>	AIC	BIC	Silhouette
3	204	0.500	322.580	352.440	0.290

Table A.2. – Hierarchical clustering with 3 clusters – Cluster Information

Cluster	1	2	3
Size	76	59	69
Explained proportion within-cluster heterogeneity	0.333	0.480	0.187
Within sum of squares	101.430	146.211	56.936



Figure D.1. – t-SNE Cluster Plot for the 3-Clusters attempt

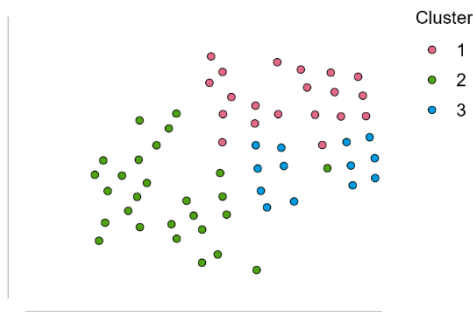


Table A.3. – Hierarchical clustering with 4 clusters – Cluster Information

<b>Cluster</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
Size	76	59	34	35
Explained proportion within-cluster heterogeneity	0.371	0.535	0.045	0.049
Within sum of squares	101.430	146.211	12.287	13.293

Table A.4. – Hierarchical Clustering with 4 clusters

Clusters	N	R <sup>2</sup>	AIC	BIC	Silhouette
4	204	0.551	297.220	337.040	0.250

Figure D.2. - t-SNE Cluster Plot for the 4-Clusters attempt

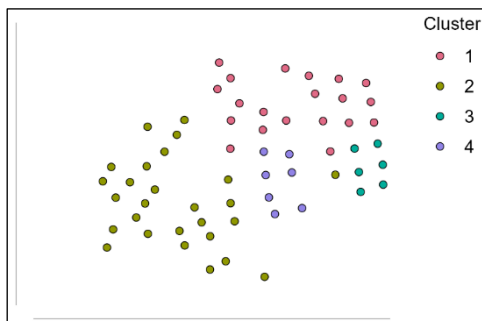


Table A.5. – Hierarchical Clustering with 5 clusters

Clusters	N	R <sup>2</sup>	AIC	BIC	Silhouette
5	204	0.621	261.080	310.850	0.300

Table A.6. – Hierarchical Clustering with 5 clusters – Cluster information

<b>Cluster</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Size	<b>30</b>	<b>46</b>	<b>59</b>	<b>34</b>	<b>35</b>
Explained proportion within-cluster heterogeneity	<b>0.169</b>	<b>0.087</b>	<b>0.633</b>	<b>0.053</b>	<b>0.058</b>
Within sum of squares	<b>39.093</b>	<b>20.192</b>	<b>146.211</b>	<b>12.287</b>	<b>13.293</b>

## ANNEX

### *Annex A – Questions asked to the respondents in the survey used in this work*

Group PSA
I am willing to make personal sacrifices for the sake of the environment
I would be willing to change my behaviour for the sake of the environment
I believe that buying sustainable products helps protect the environment
Buying sustainable products does not benefit the environment
I am concerned about the environmental damage caused by humans in the use of land and water
I am concerned about the overuse of natural resources in the world for food production
It is important to me to preserve the environment for future generations
Group AMEV
I tend to pay attention to advertising messages that talk about environmental protection
I appreciate wine brands/companies that have environmental certifications and labels
I respond favourably to brands that use environmental protection messages in their advertising
I pay close attention to the labels and tags of wines with all the information about their environmental impacts
When buying, I prefer wines from companies that adopt a responsible attitude towards the environment, to the detriment of others
I support ways of promoting wines through environmentally friendly instruments (e.g. promotion/advertising actions that do not use plastic materials, do not use paper waste, etc.)
I consider it important that companies provide/disclose more information about the environmental characteristics of their wines and production methods
Group CPS
Certification of sustainable wine production is a guarantee that the product is of high quality
The certification of sustainable wine production is a guarantee of strict hygiene standards
Certification of sustainable wine production is a guarantee of economic support for local producers
The certification of sustainable wine production encourages employability in the region
The certification of sustainable wine production is a guarantee of respect for working conditions
Sustainable wine certification has as its main focus the achievement of the sustainable development goals
The certification of sustainable wine production can be a tool for the growth of the Alentejo wine market
The certification of sustainable wine production help to realize the importance of sustainability challenges
Sustainable wine production certification focuses on social, environmental and economic well-being

Certification of sustainable wine production is a guarantee of more efficient use of resources/eco-efficiency
The certification of sustainable wine production encourages the reduction and reuse of co-products by reducing internal operating costs
Sustainable wine production certification reduces internal operating costs
Group DP
I am willing to buy wine with a certification label of sustainable production, if there is an offer
Is it acceptable for me to pay more for wine with a sustainable production certification label
I would be willing to pay the following additional price for a bottle of wine with a sustainability label

*Annex B – Scale used for answering the questions of the survey*

- completely disagree
- moderately disagree
- neither agree nor disagree
- moderately agree
- completely agree

*Annex C – Scale used to answer the last question of the group DP of the survey*

- 0 to 1€
- 1,01 to 2€
- 2,01 to 3€
- 3,01 to 4€
- 4,01 to 5€
- More than 5€

*Annex D – Survey used in the work Sogari et al. (2016b)*

<p>I am willing to make personal sacrifice for the sake of the environment</p> <p>I would be willing to change my behavior to help protect the environment</p> <p>I feel that purchasing sustainable products helps protect the environment</p> <p>Purchasing sustainable products does not really do much to help the environment (reverse scored)</p> <p>I think that protecting the environment is a worthwhile goal</p> <p>It is important to me to preserve the environment for future generations</p>
<p>Sustainable wine labelling certification is a guarantee of high product quality</p> <p>Sustainable wine labelling certification is a guarantee of high hygiene standards</p> <p>Sustainable wine labelling certification is a guarantee of the origin of raw materials</p> <p>Sustainable wine labelling certification is a guarantee of economic support for local producers</p> <p>Sustainable wine labelling certification encourages employment in the area</p> <p>Sustainable wine labelling certification is a guarantee of the respect of working conditions</p>

If it is a sustainable wine label, sustainability might be an important factor  
Sustainable wine label could be a good tool to grow the Italian wine market  
Sustainable wine label could help me to understand sustainable winegrowing issues  
I could be interested in buying a bottle of wine with a sustainable label (showing environmental, economic and social aspects)

**WTP for a bottle of wine with a sustainable label**

Nothing and less than 1€

1.01-2€

2.01-3€

3.01-4€

4.01-5€

more than 5€