



Sustainability in Wine Production: A study on stakeholders' perception

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Abstract

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Nowadays, sustainable development is an imperative in all sectors of the economy and society worldwide. The wine industry aligns with this observation, since it has experienced an increase in sustainability interest. This is due to the changes in consumer and market demand and the adverse effects of the extreme weather. But how do leaders perceive this transformation? This research investigates whether different perceptions on sustainability can affect its integrations in the Portuguese wine industry. To answer the research question, we conducted a qualitative study, with semi-structured individual interviews, to explore the own perceptions about the three dimensions of sustainability in wine industry, environmental, economic and social. The focus is the analysis of the company's relation with the nature, the stakeholders and internal and external community. The results indicate that the perceptions between cost-benefit and barriers-opportunities influence the adoption of sustainable practices and certification. Therefore, even with the perceived challenges, companies in the wine sector tend to continue to adopt sustainable practices in the production chain (vineyard, cellar and commercialisation). Also, recommendations to improve future research are given.

Key Words: Sustainability; Perceptions; Cost-benefit; Barriers-opportunities; Certification; Portuguese Wine Industry

Resumo

Atualmente, o desenvolvimento sustentável é imperativo para todos os setores da economia e da sociedade mundial. A indústria do vinho alinha-se com esta observação, uma vez que se tem verificado um aumento no interesse pela sustentabilidade. Isto deve-se à mudança das escolhas dos consumidores e do mercado, e aos efeitos prejudiciais das extremas condições climáticas. Mas como é que os líderes percebem esta transformação? Esta pesquisa pretende compreender se diferentes perceções sobre a sustentabilidade podem afetar a sua integração na indústria vitivinícola portuguesa. Para responder à pergunta da pesquisa, realizou-se um estudo qualitativo, com entrevistas individuais semiestruturadas, para explorar as próprias perceções sobre as três dimensões da sustentabilidade na indústria vitivinícola: ambiental, económica e social. O foco é a análise da relação da empresa com a natureza, as partes interessadas e a comunidade interna e externa. Os resultados indicam que as perceções sobre o custo-benefício e barreiras-oportunidades influenciam a adoção de práticas sustentáveis e certificação. Ainda assim, mesmo com os desafios evidentes, as empresas do setor vitivinícola tendem a continuar a adotar práticas sustentáveis na cadeia de produção (vinha, adega e comercialização). Além disso, são fornecidas recomendações para melhorar pesquisas futuras.

Palavras-chave: Sustentabilidade; Perceções; Custo-benefício; Barreiras-oportunidades; Certificação; Indústria Vitivinícola Portuguesa

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Table of Content

Abstract	2
Acknowledgements	4
Table of Content	5
Introduction	7
Literature Review	9
The Global Wine Industry	9
The Portuguese Wine Industry	9
Sustainability in Wine Industry	12
Barriers.....	14
Benefits	15
Sustainability in Portuguese Wine Industry.....	16
Methodology	19
Sample	19
Procedure	19
Data Collection	19
Data Analysis	21
Results	22
Social Dimension.....	22
Cost-Benefit and Barriers-Opportunities in Wine Industry	26
Beliefs about Sustainability and Certification in Wine Industry	30
Discussion	36
Community belonging	36
Forging competitive advantage.....	36
Roadblocks and highways to the sustainable transformation	37
Certification and its perceptions	38
Limitations and Future Research.....	40
Conclusion.....	42
Bibliography.....	43
Appendices	51
Appendice I – Methodology Table Summary.....	51
Appendice II - Invitation to Participate in the Study	52
Appendice III – Interview Script	53
Appendice IV – Social Dimension Thematic Analysis	54
Appendice V – Cost-Benefit and Barriers-Opportunities Thematic Analysis	59

Appendice VI – Environmental Dimension Summary	69
Appendice VII – Informed Consents	69
Appendice VIII - Interviews Transcripts	69

Introduction

Wine stands as one of the most antique alcoholic beverages. Over the past decades, there has been a rise in the awareness of the adverse effects and long-term harm caused by human activities on the environment (Martins *et al.*, 2019). According to Szolnoki (2013) increasing emissions of gases that contribute to climate changes, consumption of fossil fuels for energy generation and land usage for crop cultivations are some of the harmful examples. Sustainability has been positioned as the foundation of current development strategies and policies in the entire wine production chain, especially due to the understanding that practices have serious impacts in the environment (Martins *et al.*, 2019). Firms are starting to recognize sustainability challenges as significant to their operations and competitiveness. Sustainability has become a crucial factor for both producers and consumers; therefore, its implementation emerges new business opportunities (Szolnoki, 2013; Martins *et al.*, 2019). One of the primary priorities of the European Union (EU) is sustainability, demonstrated through the creation of policies aiming the sustainable growth. These policies include measures such as preventing climate change, promote resource efficiency, supporting responsible economic policies and reinforce social and territorial cohesion (European Commission, 2010). EU contributed to 45% of the global winegrowing areas, 64% of wine production and 48% of consumption (OIV, 2021). The wine sector as an important role in the Portuguese economy and producers are aligned with the European trends related to sustainable wine market. Portugal suffers from severe climate changes, being vulnerable to it (Fraga *et al.*, 2017; Flores *et al.*, 2018). Therefore, since the early 1990s, the Portuguese industry has become focused on developing and implementing sustainable initiatives. Nowadays, there are various sustainable programs and more than 90% of the Portuguese wines hold a certification for organic production (Swiatkewicz, 2021). Complementarily, several studies have been dedicated to identify the difficulties and results of implementing sustainable practices. However, there is a gap in understanding how the individuals' perception and characteristics can influence the adoption of the sustainable practices in their businesses. The aim of this study is to work towards that gap, using individual interviews for that effect. This qualitative research could contribute for the development of new policies at the management level and definition of new marketing strategies, raising awareness to sustainability principles and practices. Besides, it would increase the competitive advantage in the sector, improving business operations and the cooperation within the community. Following this introduction, the article is organized as: a literature review on the studied subject, a description of the adopted methodology, succeeded by the presentation of results, discussion,

limitations and future recommendations and finally the conclusions (Nave, Lauret & do Paço, 2021).

Literature Review

The Global Wine Industry

Wine has been consumed in the Mediterranean region for approximately 7000 years, and it is amongst of the noblest and oldest alcohol beverage (Moraes & Locatelli, 2010). According to Roese (2008), apart from its financial worth, it has a symbolic importance in various religions. Numerous countries' economies are highly dependent on wine industry, both in terms of production and tourism. While some nations have already a long history of wine production, others have experienced a recent increase in the wine sector and its value of exports (Duncan & Greenaway, 2008). From a global point of view, exportation is considered important and seen as the easiest and fastest way to reach foreign markets (Majocchi, Bacchiocchi & Mayrhofer, 2005). Pointed out by Pinho & Martins (2010), to expand this participation in foreign markets it requires that companies are ought to increase the number of employees managing international activities. Consequently, firms must hire qualified individuals with skills that enable the successful management of its global expansion. In line with Forsgren (2002) the global expansion of firms implies a learning process in which companies progressively acquire international experience, becoming more committed to overseas markets. Similarly, it allows a company to benefit from global competition and strengthen its position as a domestic player (Filipe Lages & Montgomery, 2004). Also, it benefits the country by contributing to long-term socio-economic development, employment opportunities increase, it generates a positive effect such as social prosperity and provides support for local industries to boost productivity (Leonidou, Katsikeas & Piercy, 1998; Katsikea & Skarmeas, 2003). Therefore, it is reasonable to expect that national governments would be interested in encouraging and implementing the best policies to stimulate the export activities (Rocha, Freitas & Silva, 2008). Due to this expansion, wine has become a global commodity and industry (Roese, 2008; Menna & Walsh, 2019). This globalization is highlighted by the fact that in 2000 imported wine accounted for 29% of the world consumption, while it has risen to 46% in 2021 (OIV, 2023). Portugal experienced the largest increase in wine consumption from 2014 to 2018, stated by the Statistical Report (OIV, 2019).

The Portuguese Wine Industry

Equal to, to other southern European countries, Portugal is a traditional wine producer. Accounting for 15% of the arable land, wine represents the main agricultural crop and has an important role in the Portuguese economy (Fraga *et al.*, 2017). Vineyards cover 175 791 ha with 173 518 ha for wine (INE, PORDATA, 2023). Despite its size as a small country, Portugal is

the fifth largest wine producer in Europe and eleventh worldwide. Also, in vineyard areas, after Spain, France and Italy, Portugal holds the fourth position in Europe (Trigo, Fragoso & Marta-Costa, 2022). Based on IVV, in 2022, Portugal registered 190 170 ha of vineyard surface area. Following Swiatkiewicz (2021), the first Portuguese wine culture and vine plantations date from the Bronze Age, more than 2000 years BC, despite the discovery of wild vine fossils from the lower Pleistocene. Wine has been a part of the daily diet in Portugal since 700 BC and gained a symbolic character with the development of Christianity in the VI – VII centuries, increasing its range and scale of consumption (Lavrador, Fernão-Pires & Bianchi-de-Aguiar, 2018). In addition, it became the first Portuguese export good, during XII-XIII century. Portuguese wines were found in every continent due to the era of geographical discoveries, gaining reputation on the return journey thanks to the new technique of aging wine (Lavrador et al., 2018; Swiatkiewicz, 2021). In 1907/8, Portugal introduced the first “designations of origin” – Vinho Verde, Dão, Colares, Carcavelos, Madeira and Moscatel – at the moment, based on IVV (2023), there are 14 geographical indications and 31 designations of origin. However, established in 1756, Porto wine region is the oldest demarcated region in the world (Inhan et al., 2013; Lavrador et al., 2018). With more than 300 varieties of grapes, Portugal is the country with the highest variety of grape types. In line with Lavrador et al. (2018), the main varieties used in the Portuguese “Geographical Indications” and “Denominations of Origin” have a notable number and quality. Additionally, 89% of the total vine area is composed with 34 main varieties (representing above 1%); 18 red varieties (61% of the total area), two of which are international varieties and 16 national white varieties (28% of the total area). Approximately 50% of the wine is produced by small and medium-sized farmer, affiliated with cooperatives. Due to the large number of geographical indications and designations of origin, the overproduction of wine and accumulated stocks, the wine sector is considered a very competitive and highly fragmented market (Alberto & Ferreira, 2007; Rebelo & Caldas, 2015). In 2022, Portugal occupied the ninth place in the world regarding the vine-growing area (decrease of 0.5% from 2021-2022), the tenth concerning wine production (decrease of 8% since 2021), the seventh place as a wine exporter (OIV, 2022). Portugal is demonstrating an increase in wine consumption since 2017, holding the highest consumption rate, with an average of 51.9L per person in 2021 (World Population Review, 2023; Statista, 2023). Portuguese consumers prefer domestic wines and, in addition to price, which is still the main criteria of choice, customers take into consideration the cork type, the year of the wine harvest, the wine color, the region, and the label. Meanwhile, other factors that impact the wine industry are the distribution networks, the cork suppliers (world leader is Amorim Group), and the

bottles packaging (glass). “**On-trade/horeca**” distribution includes bars, restaurants, clubs, cafés, and hotels, and it represents 62.4% of the wine market distribution. “**Off-trade**” distribution is composed by specialized retailers (13.8% of the market), hyper and supermarkets (11.6% of the market), gas stations (5% of the market) and others (7.2%) (Alberto et al., 2007; MarketLine, 2014; Swiatkiewicz, 2021). The majority of the enterprises within the wine sector are small and medium-sized businesses. In Portugal, there are 24702 companies involved in various phases of wine processing (Alberto et al., 2007; IVV, 2023). Similarly, to other European wine producers’ nations, vertical integration is common in the sector, with the majority of the firms owning or leasing vineyards. Larger companies frequently need to purchase grapes from other suppliers (MarketLine, 2014; Swiatkiewicz, 2021). The seasonality of grape harvest with the insufficiency of labour - especially in specialized work as pruning – led to a significant increase in daily payments (Alberto et al., 2007). Most of these workers are people with minimal educational backgrounds and from the local community. Nowadays with the absence of local labour, companies are employing workers from Easter Europe, Asia (India, Thailand, Pakistan and Nepal) and as well from Africa (Sousa & Barros, 2011; Faget, 2018; Swiatkiewicz, 2021).

All the producers in the Portuguese wine industry pay a fee to Instituto da Vinha e do Vinho (IVV) – a public organisation – to enhance the perception of the Portuguese wines (<https://www.ivv.gov.pt/np4/home.html>). Afterwards the amount charged is redirected to an association – ViniPortugal, founded in 1997, that reinforces the promotion of the sector (<https://www.viniportugal.pt/pt/>). Including the management of the national brand Wines of Portugal (<http://winesofportugal.info/>), it links producers associations and organizations, distributors and cooperatives. CVR (Comissão Vitivinícola Regional) is the network of regional vine and wine. It holds the responsibility of promoting the local wines without a specific rate for this purpose, allocating a part of their revenues for it. AICEP Portugal Global (<https://www.portugalglobal.pt/PT/Paginas/Index.aspx>) and ANDOVI (<https://andovi.pt/>) – Associação Nacional de Denominações de Origem Vitivinícolas – are also committed in promoting portuguese wines. Considering Flores (2018), the paradigm of sustainability is influencing various sectors, driven by an increasing of stakeholders’ pressure, economic or political reasons. The wine sector operations contribute to environmental impacts, and this industry also faces issues related to climate change, chemical exposure and availability of water an energy.

In the past few years, due to consumer interest, the increase of the global warming and the extreme weather impact on wine growers, there has been a notable surge in sustainability in the wine industry (Flores, 2018). The global wine-making industry has become highly competitive over the past decades, offering its consumers an ever-widening selection of wines and encouraging wineries to better understand consumer preferences and explore marketing strategies to attract different consumer segments (Sogari, Mora & Menozzi, 2016).

Sustainability in Wine Industry

Concerns about sustainability and sustainable development are significant for all the sectors of the economy and society. In 1987, sustainability was defined as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” by the United Nations Brundtland Commission (Brundtland, 1987). Regarding the wine industry, sustainability should encompass economics, ecology and community aspects associated with grape growing and winemaking process. A sustainable wine industry, following the International Organization of Vine and Wine, is 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” (OIV, 2004). Companies must be concerned about implementing sustainable practices because it enables them to pursue economic, environmental e social goals, implying resilience and ability to adapt to changes (Lin, 2011; Annunziata et al., 2018). The stakeholder’s perception of the firm actions can be influenced by sustainability reports (Byrd et al., 2017). The paradigm of sustainability impacts many sectors, driven by an increase of stakeholders’ pressure, economic or political motivations (Flores, 2018). Considering the environmental damage, the social consequences can be harmful and there might be a negative impact on the economy, sustainability is a challenge across all sectors of society (Nave et al., 2021). To ensure the long-term viability and the sustainable development of a farming firm or a rural region it is required a sustainable agriculture (Dantsis et al., 2010; Trigo, Marta-Costa & Fragoso, 2023). Stated by Flores (2018), the wine sector is concerned about sustainability in two ways: it faces threats from sustainability issues (climate changes, chemical exposure, water and energy availability) and the impact of its own operations. In this sector, to understand sustainability, wine producers must identify definitions, principles and review current practices. The concepts of sustainable viticulture such as definition (2004), guidelines (2008) and general principles are supported by the International

Organization of Vine and Wine (OIV). Simultaneously, wine regions have been developing their own programs to address local issues and adapt sustainability to their contexts. These programs can be seen as a response from wine regions to markets and demand of customers, a way of organizing current practices, an initiative to boost wine management and to encourage innovative processes (Nidumolu, Prahalad & Rangaswami, 2009; Flores et al., 2018). The European Union made sustainability a top priority, reflected in the policies formulated to support sustainable growth. These policies encompass initiatives such as promoting resource efficiency, preventing climate change, supporting responsible economic policies and reinforcing social and territorial cohesion (European Commission, 2010; Nave et al., 2021). Consequently, the United Nations Organisation (UNO) has collaborated with nations globally to create a more sustainable planet. A set of Sustainable Development Goals (SDG) was established, considering the practices towards a sustainable development, including one goal (SDG 12) which is specifically focused on more sustainable consumption and production (Can & Alatas, 2017; Nave et al., 2021). The concept of sustainability should be considered and interpreted collectively due to the interdependence of the three dimensions – **environmental, social and economic** (Corbo, Lamastra & Capri, 2014; Nave et al., 2021). Concerning wine sector, there are factors that should be taken into consideration. Regarding the wine production, it encompasses viticulture, winemaking, bottling and distribution. Besides that, these factors also include agriculture, marketing, logistics, waste treatment, regulatory compliance (Martins et al., 2018).

The **environmental dimension** is characterized by the conservation of natural elements and preservation of natural resources (Moldan, Janoušková & Hák, 2012). Also, as pointed by Ohmart (2008), it includes all business activities that impact the environment. This involves managing soil and wastewater and using plant protection products, as well as pollution, waste, recycling, environmental protection and biodiversity. This dimension guarantees development align with the preservation of diversity and biological resources. Since natural resources are typically non-renewable, they should be kept at sustainable levels (Nave et al., 2021).

The **social dimension** is linked to the activities of firms that impact individuals, specifically issues related to health, human rights, safety, justice, diversity, and social equality for everyone, along with ensuring fair income and job opportunities (Shnayder, Van Rijnsoever & Hekkert, 2016; Nave et al., 2021). Also, it involves people and the social environment, focusing on the well-being of the individuals and its community, covering topics such as community development, justice and social responsibility (Dempsey et al., 2011; Moldan et al., 2012). In

line with Elkington (1994), the firm should provide fair opportunities, encourage diversity, cultivate connections inside and outside the company, and guarantee the well-being of its collaborators, including a transparent and responsible governance structures.

The **economic dimension** has the goal of maintaining the produced capital, with the strategic objective being the optimization of the economic growth (Bartelmus, 2003). Besides, in line with Shnayder *et al.* (2016), this dimension focus on profitability, covering all the aspects involved in the company's financial situation, such as company growth, marketing, competitiveness and others. It aims for the efficient resource utilization to achieve a lasting profitability, ensuring they are available for future generations (Niñerola, Sánchez-Rebull & Hernández-Lara, 2019). Furthermore, minimize economic inequality is part of the economic dimension (Malyarets *et al.*, 2019). Hence firms prioritize aligning sustainability with profitability, and it's crucial to achieve a balance that encompasses the three dimensions: environmental, economic and social (Li & Toppinen, 2011).

Barriers

Barriers are circumstances or issues that constrain the execution of a task or an action (Laurett & do Paço, 2019). According to Neto *et al.* (2017) barriers can be classified into six categories: economic and financial; technical; cultural; legislative; governmental and organisational. Acknowledged by various authors, some barriers identified were: lack of human and material resources; insufficient collaborators and top management involvement/commitment; the company's disinterest or lack of concern regarding environmental management; financial constraints; inability to comprehend how to incorporate sustainable practices; insufficient knowledge and training; and resistance to change (Salomone, 2008; Grimstad & Burgess, 2014; Álvarez-García & Del RíoRama, 2016; Bhanot, Rao & Deshmukh, 2017; Laurett *et al.*, 2019). Following Salomone (2008), especially in the implementation phase to meet certification sustainable standards, the insufficient information and high expenses are considered significant barriers. One of the biggest obstacles that business face when creating sustainable goals is the absence of a strategic plan (Bhanot *et al.*, 2017; Nave *et al.*, 2021). Based on Pinzone, Lettieri & Masella (2015) particularly in environmental contexts, the lack of dedication from the company is the main obstacle to adopt a proactive environmental strategy. In addition, Bhanot *et al.* (2017) emphasizes that crucial barriers in the sustainable dimension include insufficient awareness of the sustainability concept, lack of awareness programs, elevated costs and challenges in operationalization. Summarising, following Neto *et al.* (2017), barriers can be classified in six categories: **economic and financial** – lack of financial incentives; **technical** –

deficiency in technical expertise and issues with infrastructure; **cultural** – resistance to change; **legislative** – limited understanding of legislation and challenges in adhering to rules; **governmental** – absence of supporting policies and **organisational** – insufficient interest.

Benefits

Amaeshi, Osuji & Nnodim (2008) stated that firms focus on implementing sustainable practices so they can achieve competitive advantage, increase operational efficiency, reduce costs, build a favorable reputation and social legitimacy, and to meet economic, social and environmental demands. They look as well for an improve in internal performance and external commercialisation, and also for the advantages derived from interactions with stakeholders were listed by Poksinska, Jörn Dahlgaard & Eklund (2003) as benefits. Benefits were classified into four categories by Gavronski, Ferrer & Paiva (2008), such as: **productivity** – from an operational perspective; **financial** – ability to minimize waste resulting in cost reduction; **market** – related with customers, competitors and suppliers, and **societal** – associated with external stakeholders (government and society). In addition, Prajogo (2011) claimed that the internal improvements that a firm achieves by adopting sustainable practices are contributing to a better performance, an increase in productivity and profitability, and leading to competitive advantage. Furthermore, sustainability is a crucial component of innovation processes for firms and can be viewed as a stimulating market strategy (Fiore et al., 2016). Early in the 1990s, the idea of sustainable winegrowing gained traction, Lodi-Woodbridge Winegrape Commission is one of the earliest examples, founded in the central valley of California in 1995. This program established demonstration vineyards, using sustainable winegrowing practices including monitoring pests and vineyards inputs such as fertilizers, pesticides and water. Consequently, other Californian winegrowing regions and associations adopted the Lodi program and adapted to fit their unique needs (Zucca, Smith & Mitry, 2009). Alongside, the Sustainable Winegrowing New Zealand was established in 1994 by the New Zealand Winegrowers Organisation and introduced in 1997. This program offered best models of environmental practices in the vineyard and winery to ensure quality from production to bottle, taking into account consumers' concerns about the environment (Martins et al., 2018). The Wine Institute and the California Association of Winegrape Growers (CAWG) established the Code of Sustainable Winegrowing Practices Workbook in 2001, serving as the guidelines for the Sustainable Winegrowing Program. This program uses performance indicators to assist winemakers improving their performance, including waste and energy use, greenhouse gas emissions and nitrogen use in the vineyard (Aguirre et al., 2012). A third-party state-wide certification program – Certified

California Sustainable Winegrowing - was introduced in 2002 by the CAWG, designed to provide growers and vintners tools to evaluate their operations (Aguirre et al., 2012). The "Commitment to Sustainable Development" initiative was started in France in 2007 by the Cooperative Wine Institute (ICV) Group, a group of cooperative wineries. This effort led to the successful creation of the trademark "Vignerons en Développement Durable" in 2010, which is a certification dedicated to sustainable development developed by an association of prestigious French wine-producers (Vigneron Engagés, 2010). The Entwine – Australian Environmental Protection System – was launched in 2009 as a voluntary sustainability program planned to be adaptable to the evolving needs and objectives of Australian grapes and wine producers (Winemakers' Federation of Australia, 2009). The sustainability reports to the Australian Wine Research Institute (AWRI) and the taking part in an authorized certification programme, are two components for Entwine members. In 2011, the Chilean Wine Industry created the Certified Sustainable Wine of Chile (which is a National Sustainability Code. It is a voluntary tool developed in response to the industry commitment for an environmental responsible production and efficient and sustainable utilization of natural resources ("The Code – Sustentavid", 2011).

Achieving sustainable practices in the wine industry is a systematic process that entails making small and quantifiable improvements at various stages of the life cycle. This includes steps such as viticulture, winemaking, bottling, packaging, storage, retail and distribution, consumer usage and final disposal or recycling. One crucial aspect involves the precise quantification of the main inputs/consumptions and outputs/emissions, such as energy, water, materials, product, by-products, wastewater, gas emissions (carbon emissions) and solid wastes. (Martins et al., 2018; Merli, Preziosi & Acampora, 2018; Wagner et al., 2023). Sustainable frameworks serve as a mean to contextualize sustainability concerns, provide guidance and motivate stakeholders. While some criteria are more focused on agriculture or wine industry issues others have a broader scope, addressing other sectors of society, such as human resources or biodiversity. Therefore, sustainability programs and parameters should consider local conditions, making it challenging to propose overarching guidelines for sustainability assessments (Flores, 2018).

Sustainability in Portuguese Wine Industry

Portuguese wine producers are aligning with global and European trends in sustainable wine market management. Thus, they are exploring and attempting new approaches and innovative solutions such as enotourism, social marketing, online tasting, viticulture renovation, biodiversity conservation. However, their efforts are constrained by clients' demand (on-trade/horeca distribution) and wine consumers, and also the rising of the production costs

(Swiatkiewicz, 2021). As stated by Frago & Figueira (2021), the wine industry is closely linked to the country's cultural heritage and traditions, having a crucial role in local economic growth, creation of jobs and other social effects in rural areas. Also, as pointed out by Fraga et al. (2016), the idea of sustainable management is considered a long-term strategy that links the environmental, heritage cultural, economic and social components, similarly to other wine-producing countries. Portugal has 14 wine regions with significant spatial and climate diversity, although Mediterranean climate conditions, with hot and dry summer, predominate. Severe climate changes effects are expected, like other Mediterranean regions (Fraga et al., 2016). As stated by Flores et al. (2018), the wine sector high vulnerability to the effects of climate change has been a major catalyst for the increase of sustainability consciousness. In addition, the sector is currently held responsible for environmental issues and negative impacts on both local communities and ecosystems. Hence, since the early 1990s, the industry has tackled and implemented sustainability initiatives, such as in response to climate changes effects, reduced availability of resources, market demands and emerging environmental policies. The wine sustainability programme from Alentejo – Programa de Sustentabilidade dos Vinhos do Alentejo (PSVA) – created in 2015, is the most notable among the numerous initiatives on sustainable wine production in Portugal (Swiatkiewicz, 2021). Together with wine producers and the University of Évora, the Wine Commission of the Alentejo (CRVA) created a set of guidelines to assist in the local production and promotion of the sustainable wines (Martins et al., 2018; Swiatkiewicz, 2021). The program involves 323 producers covering 7889 hectares and producing 72 million liters of quality wine. It consists in a large number of sustainable indicators, encompassing environmental, economic, social and cultural aspects. Based on their values, a certification was implemented, in order to encourage ongoing improvements (Martins et al., 2018). The 2022 IVV annual report stated that Portuguese producers yielded 53653 hectoliters of organic wine comparing with the 20098 hectoliters from 2015/2016. However, the report lacked details on initiatives for the sustainable management of the sector beyond general statistics, compliance with European Union. At the moment, more than 90% of the Portuguese wines hold a certification for integrated or organic production, which attests the minimal interference both in terms of plant protection products and use of mechanical means (Swiatkiewicz, 2021). Similarly, like is happening in other parts of the world, the water scarcity is highly felt in Portugal (Fraga et al., 2017). Biodynamic or organic production does not inherently equate sustainable production, it might arise from economic incentives, such as marketing strategy or brand image, due to an increase in market of these kinds of goods, rather than from social, environmental or ethical reasons (Merli et al., 2018; Swiatkiewicz, 2021). The

National Sustainability Certification Framework for the Wine Sector was developed in 2022 by a Technical Group and an entity chosen through competition. This framework addresses the urgent need for establishing a national certification regulation, responding to the expressed urgency from international markets and the growing consumer preference for this sustainable wine (IVV, 2022). The wine industry satisfies the imperative of integrating sustainability into the national context, creating value for the sector both domestically and internationally. The foundation of this value is the accreditation's legitimacy amongst customers and other stakeholders (IVV, 2022). In addition to assigning operational and managerial responsibilities for the Framework to ViniPortugal - meeting the expectations of the private sector and representative organizations - the establishment of the National Sustainability Council has improved inclusivity and expanded the commitment to include all stakeholders and entities in the complex and dynamic national wine industry (IVV, 2022). Thus, Martins *et al.* (2018) stated that the majority of the programs rely on defining, calculation of indicators and computation of metrics and indicators that facilitate process management and performance enhancement. Furthermore, these frameworks aimed to teach the winemaker how to enhance their overall sustainability and also to encourage the adoption of sustainable practices, its measurement and communicating its continuous improvement efforts. Within the concept of social marketing, wineries and producers have been collaborating with the fine arts, music, literature, photography, and other fields to promote each other. They have been doing this by hosting art and wine events, such as concerts, expositions, workshops, wine dinners, wine tastings and visits. To exemplify, a new label is designed to promote art amongst wine consumers, improving the company's reputation and at the same time serves as a source of income for the artist and enhance the image of the region (Fraga *et al.*, 2016; Martins *et al.*, 2018; Swiatkiewicz, 2021).

Methodology

This dissertation uses a qualitative method research. The aim of this research is to gain insights on the beliefs and values associated with sustainability and its' integration in the context of wine industry. Since there is still few information on this topic, according to Graebner, Martin & Roundy (2012) theory can be created with qualitative data, and it also enables the participants to express themselves in their own words, granting the researchers to closely record individuals' perceptions and understandings. Therefore, the applied methodology is selected to understand human behavior and experiences through non-numerical data analysis (Saunders, Lewis & Thornhill, 2009). After all, the aim of this dissertation is to recognize certain patterns on the beliefs of wine producers concerning sustainability and to understand how they incorporate these aspects into their operations.

Sample

The data was collected through individual semi-structured interviews to wine producers, resulting on a sample of 13 companies All of them were audio recorded for analysis.

Concerning the 13 participants (Appendice I), some data was collected: 46% were female, while 54% were male and the ages range was between 32 to 57 years old. Regarding the education background 54% held a bachelor's degree, 23% held a master's degree, 15% held a post-graduation and 8% held a post-doctorate. These participants come from different areas of studies from Biology to History, which 31% is from Engineering and 15% from Business area. The years of experience in the wine sector varied between 2 and 25 years, which 9 of the participants (69%) have 10 or more years of experience in the industry. The interviews lasted an average of 60 minutes, the longest lasted 1h35 and the shortest 18 minutes.

Procedure

Data Collection

The sample was selected based on the registration in "Clube de Vinhos Portugueses" and research on wine producers in Portugal. The "Clube de Vinhos Portugueses" is a platform that promotes Portugal's wine industry from the vineyard to the glass. It provides services dedicated to the promotion of the wine producers and it's a reliable source of information and knowledge for the consumer and the producers. In addition, they organize an annual campaign for the evaluation of free samples to any producer (Clube de Vinhos Portugueses).

All the companies were invited by email and firstly 123 emails were sent. The invitation to participate in this study (Appendice II) included a brief introduction of the interviewer and the purpose of the thesis. It also contained the main objective of the study and provided details about the interview, including who was meant to be the invitee, the duration of the interview, and the interview method.

Due to the limited timeframe a second email was sent, accomplishing a total of 161 emails. Contacts via telephone were also made. To be accessible to more participants, faster to organize and increase the acceptability, the chosen strategy for the interviews was the videoconference, via Google Meets (Deakin & Wakefield, 2014; Oates, 2015).

The type of interviews chosen was the semi-structured interviews. Even though questions were pre-prepared, prior to the interview, the interviewer gives the participant the opportunity to elaborate and explain particular issues, using open-ended questions. Based on Alsaawi (2014), semi-structured interviews enable the researchers to have an overview of their topic without compromising the depth and richness of the responses (Bryman, 2016). Additionally, its recommended by Dörnyei (2007) to formulate the questions before the interview. To minimize risks and concerns related to the loss of information, due to dropped calls, pauses, inaudible segments, inability to read body language and nonverbal cues, the researcher decided to use a distinct portable voice recorder (Khan & MacEachen, 2022).

The interview script was composed by four parts and a total of 15 questions. The interview can be seen in Appendice III and it started with the explanation of the study objectives, the consent form and a brief presentation of the interviewer. The first part was related to the interviewee description, such as age, gender and academic background/level education. The second section focused on the business description, main products, years of operation, position in the market and main competitors. The third part was composed by seven questions related to sustainability such as its practices and integration, relation between cost/benefits, perceptions about certification and barriers/opportunities and motivation to continuous improvement. The last part was related with social responsibility, including topics about the surrounding community, employment and working conditions.

These interviews started with the signature of the informed consent and the permission for the audio record, which is a crucial step of the process (Alsaawi, 2014). The interview was composed by three parts: first part was focused on the description of the participant; second part was related to the description of the company and its operations and regarding the third

part it was centered on sustainability, practices, adoption, certification and social dimension in wine production.

Data Analysis

Qualitative research is a suitable method to identify patterns (Bettis *et al.*, 2015). As Braun & Clark (2006) defined, thematic analysis allows the identification, the analysis, and report patterns within data. Maguire & Delahunt (2017) referred that this method involves interpreting data, collecting themes and patterns that emerge in the analysis of perspectives, perceptions, and awareness about specific topics. The significance of a topic is a matter of relevance to the research question (Braun *et al.*, 2006).

Formulated by Braun *et al.* (2006) one of the advantages of thematic analysis is its flexibility, allowing the researcher to capture information within the data without being restricted to any specific theoretical perspective. Besides its flexibility, thematic analysis is also reasonably quick and a simple method that can be used by researchers with no or little experience in qualitative research, capable of identifying similarities and distinctions in data. It's also valuable to obtain social and psychological interpretations of the data, produce unexpected insights and to summarize the essential aspects of the data, providing a detailed and comprehensive description of the data set (Boyatzis, 1998; Braun *et al.*, 2006).

The procedure of analysis was divided into three phases. First, the interviews were recorded (only audio) and transcribed to a word document. After being transcribed, the second step was to allow the researcher to identify patterns and organize data into codes and themes, translating the information from English to Portuguese. Additionally, mentioned by Braun *et al.* (2006) a theme is an essential aspect of the data concerning the research question, that denotes a degree of a pattern or meaningful response within the data set. After this, the information was inserted in a table, as a "thematic map", organized by levels (1-2-3) from less to more specific, gathering all data relevant to each theme. This map was composed by extract examples related to the research question, and for an effective thematic analysis, is imperative for the researcher to ensure that their interpretations and analytical insights align with the research question (Braun *et al.*, 2006; Maguire *et al.*, 2017).

Results

This section will include diagrams illustrating the primary outputs, together with a detailed discussion of the findings. Also, it is provided relevant insights from the participants to support the outputs in the tables of content and in the appendices.

Social Dimension

One of the dimensions of sustainability is the social component. Questions about the surrounding community, well-being of individuals and working conditions were made, in order to analyse if wine companies take into account the social impact that they may have. Related to social dimension, it is a concern for all companies, every company gives importance to the surrounding community.

LEVEL 1	LEVEL 2	Examples	LEVEL 3	Examples
Social Dimension	Well-being of individuals	<p>"Many of our mottos are do well at the first try. And for people to stay here for years it's not only about the bills, but because we are all here happy, because they like to be in the team and feel valued in it." // "If there is anything I believe in is the sustainability of the value chain as a whole and in the appreciation of winegrowers and the work that is done from the vineyard, in the rural part, which for A is also extremely important." // "Of course we have the social sustainability that is also essential, especially today that there are people mainly in this branch, linked to agriculture, where it is so difficult to get skilled labor, motivated and etc. If you can not take care of these people, not motivating them, not retaining them, you are not sustainable either"</p>	Working conditions = WC	"We are a Family Responsible Company, a Fundação "Família certification, and in the wine sector, there is no other company that has this certification, basically, it recognizes that there is already a set of practices in the company that value the person, your family life or your life outside of work." // "We have enough accommodation, we have cafeteria in practically all spaces, we have some health insurance, there are criteria to go implementing and for people to acquire as an extra benefit." // "It is a topic for us, to always keep this awareness that it is necessary to retain people, to give them conditions, that the company is attractive so that they continue to be part of the cadres, and we see it this way, even more in the Douro because as we know there are fewer and young people study and usually do not come back." // "We had conditions for them to arrive, change clothes, leave their food, with good refrigeration conditions, have a place to heat their food, in a decent, air-conditioned place, with conditions to wash their hands, shower at the end of the day, if they wish. Although these were conditions that we wanted to improve, we could make the investment, and the the quality benchmarks are also demanding."
			Bonus = B	"the company promotes a series of wellness initiatives, discounts in gyms, in pharmacies, Yes, the company promotes a series of wellness initiatives, discounts in gyms, in pharmacies (...) we have access to health insurance plans, I would say that for the sector, for the branch where we met is quite positive, is quite positive indeed." // "We have medical appointments at work too and all wages come with a health insurance aggregated and the mandatory work accidents insurance too." // "We reward seniority (...) This year we will honor 11 people who have worked for more than 35 years in the house and 2 who have worked for more than 50."
			Formation = F	"We also have a very strong incentive for increasing knowledge, for example we have available training (...) We often have leadership trainings in the company that give us personal and professional skills." // "We also do internal formations about our products for anyone in the company to taste our wine and feel part of the final result and not only the process." // "In terms of training, the quality benchmarks, requires us to keep our teams formed not only with the minimum that the law requires. I'm not going to give a training just because I have to meet the calendar, they need to have meaning and I look for different trainings, that we might need and adds value." // "We have an annual training program also quite complete with training, on one hand, we give the required training according to each function, each category, but on the other hand, we also have optional, additional training for people who want to evolve personally, professionals."
	Well-being of the community	<p>"The local economy that is essentially, (...) that the money (...), to be invested here and not to be ready invested in another business. K does this, from the profits it has continues to reinvent ways to maintain the business, but also to promote the entire local economy, to promote the Douro business." // "If we produce locally and consume locally, we can have much shorter chains and we can respect the seasonality of things. We can have good products, cheaper and not feed the food industry but feed the communities." // "Then we have several activities throughout the year, in the various regions, as things go on and people get involved." // "Every year we offer a comic opera that is translated and we have 2 performances at the farm, because I wanted a show, I wanted to offer anything to the community, which is not available in Ourém."</p>	Local employment = LE	"Currently, as we have several properties, we can work with the same team during several phases of the year throughout the year, which helps us to be more captivating, we have always occupation, it's not a seasonal work, we have a constant agricultural and rural work to offer, and this in the context of Penaflor and Paredes is very important." // "We always give priority to local people, both in terms of workers and suppliers. So, it is equal circumstances to make the local economy work (...) In terms of "manpower", we also prefer the local ones, for the harvest season, we try to contact the closest people." // "We have open recruitments and precisely to retain people in the region, we have winemakers resident in the Douro, young people who are from there and who are still there, we have technical teams from the Douro, Vila Real, Régua and etc., and we also have others who are not from the Douro, but we created the conditions for them to stay there, so the company is increasingly in Douro."
			Community = C	"The surrounding community is very important, because even the people of the community themselves identify a lot with our brands, almost as if they were part of the group itself and we participate in many activities in the various locations, we have some museums and some gardens, which makes it closer to the local communities and we work accordingly." // "We give assistance to some farmers in the area, we allow them to do the analysis at a competitive price and then we all make a prescription of how the wines can be treated. We help N producers, we do N things for our neighbors." // "one of the premises of circularity, in the part of regeneration and restoration is using local resources and local partners and this was also a process of building L (...) we wanted local partners to be able to help local development and second to make an important cultural rescue." // "The importance with the community is total (...) Another issue I wanted to highlight is that people who are from here, practically pass to our door daily and when they enter they are surrendered to what it was, how it was and what we did. We adapted and transformed something absolutely degraded, a ruin, which has been there for 30 years and which has now returned to being a productive area, generating wealth, giving jobs"
			Institutions = I	"We are supporters of Bagos d'Ouro, that is, we made a program that is the opportunity in which we donate waiting to be bottled wine, for a product that will be sold. The entire returned revenue will be delivered to Bagos d'Ouro." // "ACIP, which is an association for disabled citizens in the area of Penaflor, we work with Bagos d'Ouro, which is an institution in the Douro region, which promotes the education of children in the region, therefore, it has several development initiatives of the younger generations and we also work with Humanwinety, which is a movement, which aims to boost integration measures within companies, racial, cultural integration, gender, and we're also part of that movement." // "Our goal in the coming years is to increase to 5 institutions and increase the amount we put annually for these sponsorships, to further strengthen our responsibility to companies or movements that have a significant impact."
	Partnerships	<p>"We are members of the World Vine Conference, which is not quite in the region, but has to do with this positioning of the Old Vineyards and this money is used for education, and training on the importance of preserving Old Vineyards." // "We have relationships with our competitors, we even have meetings with them, we share a lot. So in sustainability ... I will have a meeting with the So grape team because of a particular issue of sustainability, so there are good relationships here, relationships that we look for, because their problems are ours and ours are theirs." // "We are part of the Porto Protocolo and we also help with panels, with discussions, with material production, content and I am always there to see what evolution exists and packaging is an important part as a challenge for us and for our industry"</p>	Other Businesses = OB	"In terms of the grape we purchase, we pay the highest price, we agree with the producer, obviously we try to figure out how much other people are paying so we know that we are paying a good price for grapes" // "We also have jams, we make pumpkin jam, tomato, strawberry and so on, and part of this production is ours and part is bought, for example, strawberries are cheaper to buy in the market at the time of peak than I produce." // "we always have our presence in the market and then we are doing small highlights or collaborations with other brands, other types of business areas, as is the case with Vintage Ocean Aged in which we age 100 bottles under water"
			Universities = U	"Fortunately we have here the University of Trás-os-Montes and Alto Douro that have Oenology, Agricultural and forest courses and that help technicians stay in the region." // "we spent an exorbitant amount of water (...) we also found the need to connect to a working group that worked on this theme. We are linked to a project with the Agrarian School of Santarém, with the Higher Institute of Agronomy" // "We are in permanent contact with the nearest schools: Escola Profissional de Alcobaca, Escola Profissional em Ruma, a seguir a Torres Vedras, Escola Superior Agrária de Santarém, Universidade de Évora, Instituto Superior de Agronomia, every year we have contacts and requests to receive the students" //
			Investigation = IG	"We are always on top of what it is if you are studying in the market. We are studying new agrochemicals, we want to have at least someone working with us in that area." // "We have always been connected to research institutes, we were perhaps the first company to introduce, first with trials with the Instituto Superior de Agronomia, with the University of Évora, with INIAF (...) they need space and we want the knowledge." // "We were always very connected with the community (...) I am very attached to sanity and trials."

Table I – Social Dimension Thematic Analysis Summary

The first topic is linked to **individuals' well-being** and the themes founded were: working conditions, bonus and formation. All companies give importance to its employees, and 85% of the companies refer that the salary is not the only factor that they pay attention to. Firms are aware that operational conditions, a working contract with a monthly income are not enough to retain people – *“If there is anything I believe in the sustainability of the value chain as a whole, is the appreciation of winegrowers and the work that is done from the vineyard, in the rural part, which for G is also extremely important.”*. The main goal is to have motivated and happier employees, in order to retain people and to increase productivity. Associated to working conditions, firms offer benefits, such as health care insurance, transportation, medical appointments, accommodation, discounts in gyms and pharmacies, birthday day as holiday and rewards of seniority. Three companies (23%) also refer they offer marriage and child incentives, and another company has 2 university scholarships. Regarding formation, 39% of companies give more formation than the minimum required by the certification depending on the position and interest of the employee. Training about communication, leadership, sustainability is available to employees and one of the companies offers *“internal formations about our products for anyone in the company to taste our wine and feel part of the final result and not only the process.”*.

The second topic is connected to **community well-being** and the themes founded were: local employment, community itself and institutions support. The 13 interviewed firms give major importance to the development and well-being of the community – *“The local economy is essentially, (...) that money (...) to be invested here and not to be ready invested in another business. K does that, from the profits it has, it continues to reinvent in ways to maintain the business, but also to promote the entire local economy, to promote the Douro business.”*. In terms of local employment is logistically easier to have people that are close to the vineyard and also that are already related to these operations, mainly the agricultural work. 46% of the companies have initiatives within the community, such as free tours of the wine cellar, events organization (concerts, book launching), opening the wine cellar for the regional festivities, visits to the near cities and the majority of the families live in the community where they operate. Additionally, one company had an initiative with the Oceanarium, where part of the revenues was donated to the students of the municipality to give formation about no pollution of the oceans. Also, to increase the local economy, one firm has a partnership with a restaurant that has a chef with Michelin Star, reaching other consumers. Concerning the institutions

support, two companies contribute to various institutions and the goal is to grow not only the number of institutions, but also the monthly donated amount.

The third topic of the social dimension are the **partnerships**, with other businesses/brands, universities or investigation centers – “*We have relationships with our competitors, we even have meetings with them, we share a lot (...) because their problems are ours and ours are theirs.*”. Two companies give major importance to increase knowledge, to be pioneer in techniques, to receive new talent, with new technology, to innovate. Therefore, they partner with investigation centers – “*We have always been connected to research institutes (...) they need the space and we want the knowledge.*” - and with universities – “*We are in permanent contact with the nearest schools.*” and also “*Fortunately we have here the University of Trás-os-Montes and Alto Douro that have Oenology, Agricultural and Forest courses and that help technicians stay in the region.*”. Aligned with the community development, 31% of the firms refer they purchase grapes to other local and smaller producers and they help them with the grape and soil analysis. In addition, one of the companies collaborated with a vegan shoe brand, other company has other business, selling honey and another firm sells pumpkin, tomato and strawberry jams. Lastly, companies referred that the competition in the wine industry is healthy and companies depend on one another, where the progress of firm A is the progress, the new knowledge, the new technique of the firm B, contributing for the development of the sector as a whole.

In conclusion, it's unanimous that the social dimension of sustainability seems to be relevant for the firms. The concerns are not only linked to its internal community (employees) but also to the surrounding community, helping in the development of the region. Tourism activities, such as visits to the wine cellar, to near cities, and activities similar to events, book launchings, concerts, volunteering and donations are mentioned in the results. Wine companies appear to be interested in belonging to the community where they operate. At the moment, firms value the promotion of local business, smaller producers and to partner with other entities such as restaurants or other businesses. Besides, firms also take into account the individual well-being, extending compensations beyond the monthly income. Working conditions such as availability of a locker room, a canteen, protection equipment, transportation, health insurance, are also mentioned in the interviews. In addition to these conditions, firms offer continuous training and formation, related to job functions and discounts in other businesses, such as healthcare institutions, rewards of performance and seniority, marriage and child-birth bonuses. Therefore,

social dimension seems to be a topic on top of the table when the administration is taking decisions.

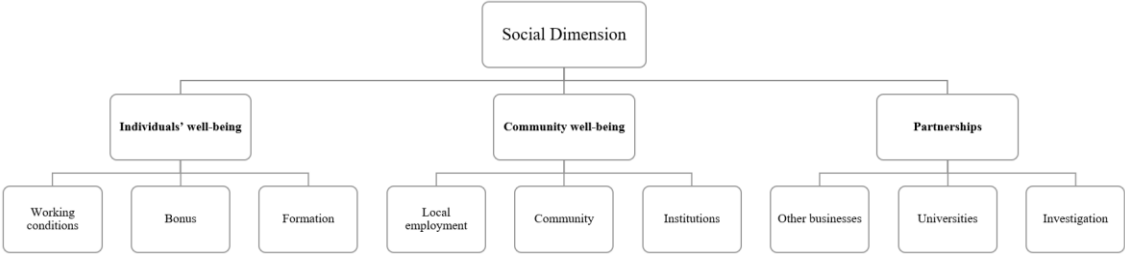


Figure I – Social Dimension Chart

Cost-Benefit and Barriers-Opportunities in Wine Industry

The three dimensions of sustainability – economic, environmental and social – were included in the relations between cost-benefit and barriers-opportunities. In table II it's possible to see the majority of the topics that the firms take into account when they think about sustainability, having 3 themes determined to each topic.

LEVEL 1	LEVEL 2	LEVEL 3	Examples
Beliefs	Costs	Financial Costs	"the only barrier on that solar issue is a matter of initial investment, because there are projects and all that, but there needs to be some... The projects are very good, but there must be money to invest." // "Climate change creates barriers, creates uncertainty and uncertainty brings costs, whether moral costs or financial costs" // "We don't have data on this yet. The cost benefit at this point is the investments we made"
		Time	"Regarding the barriers, the costs, it has been more in terms of time, study and bureaucratic and to break paths. We had to develop internally a whole tool for calculation that did not exist. We had to have the consultants working with us about a model and now they are better prepared to be able to give this service, this product to other companies. (...)" // "There's a lot of work here that you don't do overnight. The actions that are taken today can only see results that can be of almost credible results and written in stone, we know how science is, it needs time to prove things. (...) nature has this different time." // "The support plans related sustainability are increasing, but all this takes time to submit. Therefore, companies really need to be willing to give up the time of some employees who had traditionally more priority needs"
		Study	"Where we invest some money, in soil analysis, we do a lot and make investments in analysis of new products, in study of new products." // "Climate change has been dramatic for the last 8 years (...) and we are not getting time to study. Studying the adaptation of each variety (...) So we don't have time to do studies to realize this adaptation, now they are happening." // "We are a small structure and all this has costs of hours studying the new legislation."
	Benefits	Wine Quality	"Our wine has been greatly appreciated for being a wine, that people who have already started to know the project and who continue with us" // "Treating my vineyards in a biological way is more because I have purer plants and I have cleaner fermentations in the cellar." // "The benefits in the vineyards are clear. The wines are fabulous, always have excellent scores are well received by the consumer or the customer and guarantee a stable product over time. So, in terms of the qualitative outcome of what we sell, even what we put on the table, which people consume, it is indisputably, the result is getting better and better."
		Profitability	"nowadays, it is already being realized that it is possible to make a viticulture or agriculture in a sustainable way and that the exploitation is also more profitable" // "but the truth is that being more environmentally sustainable allows us to be more financially sustainable." // "If it is an investment and the investment brings a return of the money and a better position in the market. If I can have more sustainable wines, wines of zero waste, the market will ask for it and certainly will be payed with a price increase in wine."
		Productivity	"In productive terms, which for us in financial terms, we have greater productions, is an advantage. It has also happened, so the direct result of improving practices in the vineyard are better wines, more quality, more quantity." // "If I see that I can maintain my productivity only with 5 waterings instead of the 10 I did until then, I have here 2 gains: less electricity and less environmental impact, so I'm having a smaller impact on resource extraction." // "Sustainability requires a little patience, to think more long-term. (...) I think sustainability brings benefits. If people are happy they are more productive. Our productivity is not measured by the time we are working, but for what we produce exactly, if we can produce more in less time (...)"
	Barriers	Bureaucratic	"No, I just happened to be honest with you, I haven't felt many barriers, maybe the biggest barrier is the bureaucracy that we have in our country" // "One of our goals is to invest in photovoltaic panels, but there are a number of bureaucracies that we still have to overcome." // "greenwashing is always a problem, because it always leads to overregulation and then we lose focus. (...) It may fall into excess of bureaucracy and that is unhealthy."
		Operational/Physical Limitation	"Especially in smaller companies, I think the biggest limitation is more operational issues." // "I would like to have a WWTP, but I do not have space in the cellar... and then there is the economic part." // "In terms of agricultural tools, we don't have much flexibility. Is a major difficulty and it is one of the issues that I find most sensitive. I think that in the agricultural environment people want to do this shift, but they can't, because we don't have alternatives available, at least that are efficient, for the autonomy and power needed. Currently, we do not have fuel alternatives for a viable change"
		Disinformation	"Now there will be a greater, more aggressive communication on wine consumption and the incentive not to consume wine, which will also penalize immense industry, so there is a very great concern, although this is for health, there's a very big concern about how this will impact the industry." // "Giving information is good, but if you don't inform people, it's not worthy." // "It is true that demonstrating this sustainability and what society demands is that it has to be communicated daily, always, even more on social networks. This demanding is a bit against the logic of sustainability, so there has to be a lot of care here"
	Opportunities	New Markets	"there are certain markets that no longer import wine if they do not have sustainable production, sustainable production certifications. It's an issue that the company will have to evaluate and understand the market that could be lost and how much cost was the certification" // "The opportunities are related to the entries and/or stays in some markets" // "All our wines are suitable for vegan consumption, we ban any kind of intervention that used albumins and protein glues, and it is an expanding market."
		Continuous Improvement	"I think this path is more about opportunity and improvement. I don't see barriers." // "The referential for us was a barrier, but without this barrier, we can not be where we are today, because we were also adapting." // "sustainability is always a continuous improvement, I think we'll never get to a point where there's nothing to do, it's all done, there's always something to improve"
		Innovation	"companies do not have to be afraid to innovate in their products, perhaps this is not 100% the basis of the portfolio and would be a step later to take, but within our short history, we can innovate" // "The sector has practices very traditional and ancestral. And it must be optimized, there is even a lot of opportunity here, for savings and innovation (...)" // "The new generations want challenges and want modernity and, therefore, it is a sector that manages to create this opportunity as well." // "This concern was always taken into account, if we are not sustainable, the business does not work, but there was really a big jump with the reuse of bottles. I think the brand F was not very well known until the reuse of bottles, because there were magazines and televisions giving this news and I think that this had a really great impact."

Table II – Cost-Benefit and Barriers-Opportunities Thematic Analysis Summary

Concerning relationship between **cost and benefit**, the results are very similar between firms. Related to costs, it was found themes such: financial costs, time investment and study investment. Pointed out by 100% of the firms, the financial costs are the biggest concern they have. Also, the time of nature itself was mentioned by 61% of the firms, stating that the results are not able to be seen in short time and it can lead to employee’s demotivation and administration impatience. Moreover, denoted by 25% of the firms, time to study grape diseases, grape adaptation to climate changes, new techniques, new technology and also restructuration periods linked to new teams, retaining talent and implementation of changes in main operations, are also considered as costs. Regarding benefits, 4 companies highlighted the increase in wine-grape quality and recognition by specialists and the consumers, demonstrated by sentences such as “*The wines are fabulous*”, “*Our wine has been greatly appreciated*”, “*I have purer plants*”. Additionally, 77% of the companies referred productivity and profitability has the main benefits of the transformation of its operations. For firms, to be able to lower costs, reduce number of interventions and treatments, reduce water expenses, having purer plants, increasing the surrounding biodiversity and having clearer fermentations, results in higher productions and also better grapes, enable the firm to increase the bottle price.

In summary, this transformation, even though it brings costs and companies are aware of it, firms highlight the benefits. The benefits appear to be more relevant for the company performance. The sustainable measures allow the reduction of the environmental impact of operations, but also allow the increase in the economic performance of companies. This financial situation is due to cost reduction, increase in production, resulting in efficient operations and gaining competitive advantage of competitors allowing the lasting business profitability open to future generations.

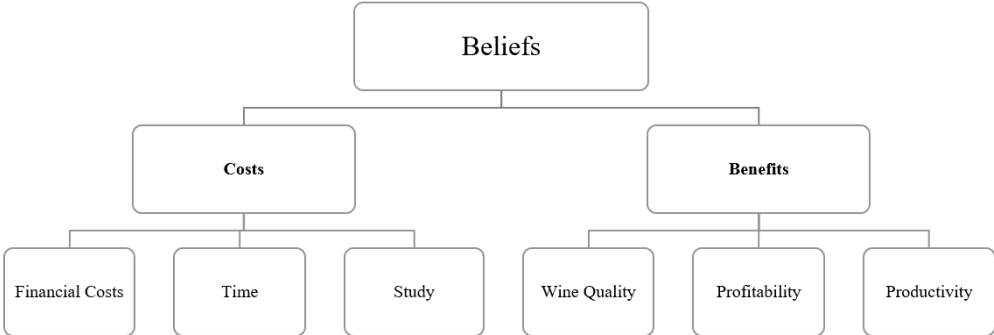


Figure II – Cost-Benefit Chart

Taking into account the binomial relation between **barriers and opportunities**, issues such as bureaucracy, operational/physical limitation and disinformation were the main themes founded.

Contrary to that, opportunities were classified as the entry in new markets, the possibility of continuous improvement and the ability to innovate, to increase knowledge, to learn more about grapes, new agricultural techniques and also registration and calculating metrics tools. Associated with certification and transformation into more sustainable practices, the great majority of the firms are aware that it has to do with entries or staying in bigger and expanding markets – *“The opportunities are related to the entries and/or stays in some markets.”*. Similarly, 9 out of 13 firms considered new markets the result of the transformation and use of sustainable techniques and stamp on their labels – *“there are certain markets that no longer import wine if they do not have sustainable production, sustainable production certifications. It's an issue that the company will have to evaluate and understand the market that could be lost and how much cost was the certification.”*. Some companies that have been in this path recently, couldn't yet clearly define these relationships and the result of having this transformation into new and more sustainable practices. Finally, 54% of the companies, considered that sustainability is a never-ending story, therefore they will always have criteria to improve, metrics to ameliorate, new techniques to discover, new equipment and technology to integrate, which is valuable for companies to gain competitive advantage and to be able to respond to more demanding costumers and markets - *“The sector has practices very traditional and ancestral and yet manages to optimize itself. And it must be optimized, there is even a lot of opportunity here, for savings and innovation, for digitalization, to go against what the young generations want. The new generations want challenges and want modernity and, therefore, it is a sector that manages to create this opportunity as well.”*; *“sustainability is always a continuous improvement, I think we'll never get to a point where there's nothing to do, it's all done, there's always something to improve”* and *“And I do not know if it is only because we are Portuguese, but when they speak to us in the word change, we say no very quickly. We are very averse to change, and very difficult to change. It is very much our beliefs. (...) We have to challenge ourselves in these barriers, we're going to force ourselves to do different things. Sometimes we can't do them right the first time. We have to train just like athletes that compete”*.

To sum up, firms are aware of the barriers and opportunities that they face when implementing new practices. In this section, apparently opportunities are stronger than barriers and teams seem to remain focused and motivated to continue in this path. Regarding opportunities, continuous improvement and innovation were highly mentioned, and the company alignment and teams' motivation and productivity were important too, enable firms to gain competitive advantage and answer to more demanding markets.

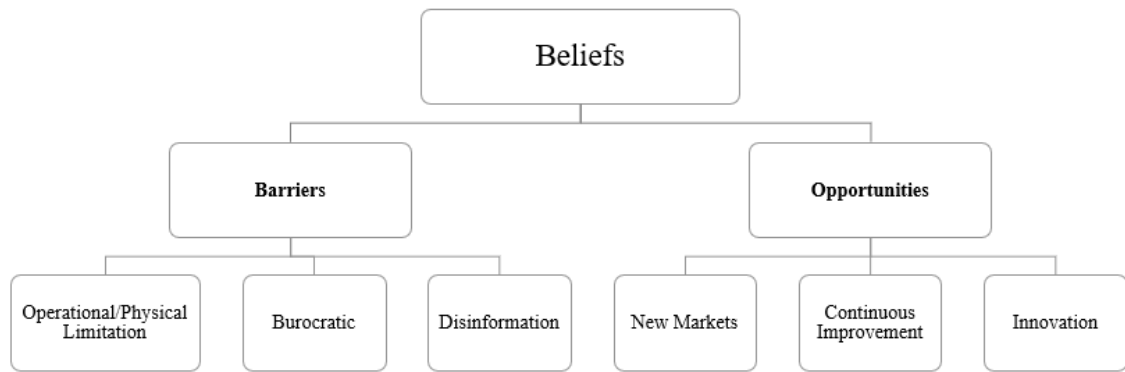


Figure III – Barriers-Opportunities Chart

Beliefs about Sustainability and Certification in Wine Industry

One of the concerns about sustainability in wine industry is the unknown of the perception of the administration, not only about the three dimensions of sustainability, but also related to national and international certification.

Company	Perceptions	Favorable/Unfavorable	Certification	Favorable/Unfavorable
A	"I think sustainability is a concern, no doubt, but it has to be a genuine concern, there are many companies that do it as marketing".	Favorable	"There are many things I believe, others not so much. There are things that know that they aren't honest and I prefer to do, but for now I do not need to pay someone to say I do. Maybe one day when some market asks for it, maybe I can ask for certification."	Unfavorable
	"Our wines are biologic, but for now we can not guarantee that the wines we launch are exclusively from our grapes. That is the goal in the future. We work with wine producers who do conventional agriculture. We try to advise them and try to work with those who respect the vineyards the most, but at the end of the day they do what they want."	Favorable	"If my distributor of the United States tells me "Look, it's much easier to sell the wine if you have the organic seal" maybe it would make sense to do it and maybe I will think that it doesn't cost me that much."	Unfavorable
	"I think we are trying to improve and are very central in these issues, obviously that sustainability is important, but our focus is on making wines linked to our land and we do that, all our production, goes in favor of having genuine wines from here."	Favorable	"We believe in these practices genuinely. I do not care so much about the stamp. I think our consumers buy our wines because they know our work."	Unfavorable
B	"Sustainability is a mixed feeling. On one hand, is very welcome, because it makes competition healthier, if there are certain rules and guidelines and that everyone follows the same, the production when presented, is honest, in the same way for everyone. On the other hand, we are always very afraid and we have been very attentive to the famous greenwashing"	Favorable	"Certification is not mandatory on labels, but we have the PSVA stamp on our Alentejo wines. We will make the certificate of the National Reference and then we will put in our wines."	Favorable
	"We remain completely motivated to maintain and implement new practices, that is the way."	Favorable	"greenwashing is always a problem, because it always leads to overregulation and then we lose focus. Instead of figuring out whether we are treating a particular plague well, we have to be concerned whether that was well registered, the time, the evidence that was taken. It may fall into excess of bureaucracy and that is unhealthy. "	Unfavorable
C	"our perspective can't be focused just on how much we produce per hectare. Classical agriculture is a lot of that (...) what interests me to produce 20 if I have to apply 15, if I can produce 10 applying only 2, for example. That is the reasoning, I think that agriculture and viticulture are developing a lot now in this direction."	Favorable	"In these sustainability certifications, we are in the implementation phase of PSVA and now, more recently, also appeared the National Reference for Sustainability of the Wine Sector and there is a parameter that is also Continuous Improvement. Companies have to be concerned, always to improve, there is always something to improve."	Favorable
	"In here, Mr. JS, who owns the company and runs the company with the support of a board of directors (...) he is perhaps the first person to know that sustainability today is a necessity, not an option. It is something that we really have to respect and improve, and therefore, this Mr. JS option facilitates within the company and employees."	Favorable	"Actually I have felt openness and enthusiasm, being still in the beginning and regarding the PSVA we have already started, but we are still far from having completed it, but internally, I think there is a great desire of the company in one day to be able to say to our customers, look, we have, we managed to have the PSVA, I think everyone will feel a huge joy and after that will come others too."	Favorable
	"We can't have this vision for 30 or 40 years, short. We need to try to explore it to the maximum, we have to have a vision a little more in the long term, so I think sustainability will always have benefits, it has to be looked at"	Favorable	-	-
	"This is the way, it is not an option, there is no other option and Mr JS, the owner of the company, is absolutely, absolutely involved in these decisions and motivated with the way. And we have felt that, and then it also forces us to speed up this process a little so that we can continue to be on the level where we are, otherwise we will miss the train."	Favorable	-	-

(Cont.)

D	<p>"I always have a lot of difficulty and I am very skeptical about many things I see in relation to "biologic agriculture", to "sustainability", there is a lot that is just for "english to see" or it's nice to say"</p> <p>"I believe that everything that is natural, that comes from the nature, that comes from the land, without great interference from large agrochemicals, that they also no longer exist (there are no longer powerful agrochemicals as there were 30 years ago), that there is a balance between everything: fauna, vegetal part and animal part that we can reach good port"</p> <p>"I am very skeptical about these perks that are put in relation to sustainability and biological, because everything is biological, I do not know anything that is not biological."</p>	<p>Unfavorable</p> <p>Favorable</p> <p>Unfavorable</p>	<p>"We are too small to be in PSVA, I do protection and integrated production, for many years, I have always done integrated protection, so I have all these requirements."</p> <p>"If we start exporting, we start exporting to markets that need certain certifications, as we know, then we have to do them, but now, this is not our idea"</p> <p>"We have CVR certifications, but these are wine certifications, certifications by the integrated production - acondubular, a certification from the vineyards. But the rest, the wine itself with some sustainability or organic name or something, no. As I told you, it's not my thing and I don't really agree with that."</p>	<p>Favorable</p> <p>Unfavorable</p> <p>Unfavorable</p>
E	<p>"When we talk about sustainability, we confuse it with biological, and biological with abstentionism. They're completely different things. Some people think that the biological is to do nothing, there are many people who think that sustainability is the business of biological and that is to take advantage of all resources. Sustainability, and I can talk a lot because I am involved in some projects, CVR of Alentejo was the first to start the sustainability project and to have certification of wines as a sustainable brand."</p> <p>"Of course I believe in the sustainability program, without going into fundamentalism,"</p> <p>"We're talking about a country that wants to be sustainable, and then the easiest thing is the one that doesn't work. We're all talking about sustainability, but then it's just for "english to see"."</p>	<p>Favorable</p> <p>Favorable</p> <p>Favorable</p>	<p>"I fully understand that to be awarded by a sustainability seal, that there are rules and ways to measure this sustainability. Otherwise everyone would say that it was sustainable. I believe and accept that there are rules and ways to attribute merit to sustainability."</p> <p>"The labels, could or not use the stamp of integrated production, but write that it is produced by integrated production and I did not do any of that, because I see that the average consumer does not give much value to it, they do not read the labels."</p> <p>"What is happening is that all producers exporting to the Nordic countries are almost obliged to do the certification. It is an imposition, because the Nordic countries value this much more."</p> <p>"We don't need a sustainability program to know that it's the way. Sometimes people are required by law to follow certain paths, but the farmer in general does not need to, because it is already sustainable by nature"</p>	<p>Favorable</p> <p>Unfavorable</p> <p>Favorable</p> <p>Unfavorable</p>
F	<p>"I think there's no alternative to being sustainable. I think somehow, we're all sustainable."</p> <p>"I use integrated production, but the focus is on zero waste, which is a hundred levels above that. Integrated protection is a bit simpler."</p>	<p>Favorable</p> <p>Favorable</p>	<p>"I'm not focused on certification. There is a certification for the wines and the criteria are so basic, that I fulfill that almost 100%. That is done for large companies"</p> <p>"There are other international certifications even quite demanding, but they have a cost so high that for an organization like mine, it is so difficult to bear it. But it's a process, I'm doing what I can, always improving my entire line and the certification will probably arise one day, but at the moment it is unaffordable."</p>	<p>Unfavorable</p> <p>Unfavorable</p>

(Cont.)

G	<p>"the mindset that this company has is always: "I receive a legacy and intend to leave it better than what I received for the generation that follows me." "</p> <p>"The company was born in 1870, I think its vocation for sustainability, I think there are few that are so obvious, because I think the question of having passed generation by generation until now"</p> <p>"We are a company that already cares a lot about this with this issue of sustainability, continuous improvement of working conditions and reducing impact for many years."</p> <p>"I think we're a little bit above average in terms of genuine concern, we want to improve and we want to do things that reduce our impact, but at the same time I feel there's always a lot to work on"</p>	<p>Favorable</p> <p>Favorable</p> <p>Favorable</p> <p>Favorable</p>	<p>"we were one of the first companies certified in ISO 9001 - Quality Management - since 2001 and ISO 14001 - Environmental Management System - since 2008, therefore, since this time that all our processes in terms of winery, production, are annually certified"</p> <p>"The IFS is a certification of Quality and Food Safety that we have since 2012, is a certification that some markets require us, namely in the United States, being very relevant to us."</p> <p>"We have two ongoing certifications, B-Corp and the National Reference for Sustainability Certification for the Wine Sector, a new reference in the Portuguese sector, by IVV.2</p> <p>"This is a practice that we had for a some time, in the production part, we always work with certified suppliers, is one of the requirements of one of the certifications that we have and these that we are working on."</p>	<p>Favorable</p> <p>Favorable</p> <p>Favorable</p> <p>Favorable</p>
H	<p>"Since I've joined the group, we have always tried, as far as possible to have the healthiest grapes, with the least possible phytopharmaceuticals or the least possible negative interactions with the environment, with the land, with the surrounding environment the vineyard. And from the outset, we started our production in the less aggressive production mode"</p> <p>"It's all a mix of strategies that we have, always focused on producing the maximum, the highest quality, but taking into account the environment and the sustainability of the resources we have today for the future"</p> <p>"On the vineyard level, many of the measures we have already implemented and I have been talking about them, I think not, I am sure, within the region, I will not say that we are the most advanced, but that we are at least the ones that are making the greatest efforts to implement measures, because I know that the kind of soil we have here is not easy soil."</p>	<p>Favorable</p> <p>Favorable</p> <p>Favorable</p>	<p>"We have implemented a Quality Reference - GlobalGAP - which is a little more than just an integrated production. We have to fulfill everything that the Ministry of Agriculture demands at the level of the integrated production referential. But this is just a base of work and we have a global benchmark that assesses not only our impact on agriculture in the field, but also at the level of winery and also at the level of special practices and energy"</p> <p>"the practices that we were adopting were also those that required us to have a referential in progress."</p> <p>"To have the Global GAP I had to make a bigger spend without a doubt. We have costs associated with all this, I already have one more person working with me, because these documents, these records all consume a very important thing, which is hours, hours of eyes, look at them and computerize them. But this also allows me to manage better"</p>	<p>Favorable</p> <p>Favorable</p> <p>Favorable</p>
I	<p>"We are pioneers of organic farming in Portugal, we started in 97 (...) we went from market to market explaining people what organic farming was, because nobody knew. We are the pioneers of organic farming, we have a very strong stamp at the beginning and we have made a great contribution, an initial contribution not only in the development of markets and shops, but also the street markets around"</p> <p>"This is all sad, I don't think we are going in the right direction. And for me sustainability is also that. They are the 3 pillars, therefore, have to be socially correct, therefore, most producers and a large part of producers can not treat employees as they treat in terms of working conditions, are people, are human beings."</p> <p>"The way of being in business is also reflected in the principles of life and, this I, the more I live more disgust I have from the entrepreneurs with whom I cross paths, the idea of profit is very good, and I support 100%, people should work to make a profit, but not worth everything."</p>	<p>Favorable</p> <p>Unfavorable</p> <p>Unfavorable</p>	<p>"There is also a wave of natural wines, wines that people want to say are bio, but do not want to commit to a certification. I understand in part, but the wine is not bio, if it does not have a certificate, it's not bio. In fact having a certificate, unfortunately, does not give me the guarantees that I would like to have, that the wine is free from contamination or fraud, but this is the certification we have..."</p> <p>"The bureaucracy is too big and it's getting bigger, certification is more on paper"</p>	<p>Unfavorable</p> <p>Unfavorable</p> <p>-</p>

(Cont.)

J	"We try to make the most of sustainability (...) we try our best to avoid waste (...) Water expenditure is very controlled (...) We reuse the waste"	Favorable	"All of our wines are certified, we can not sell anything at national or international level that is not certified by the commission, in this case by our CVRM."	Favorable
	"Completely motivated, this is the way, both in the cellar and in the vineyards."	Favorable	"At the moment, the certification of sustainable is not the most important, because we have our focus and our consumer and our consumer is not exactly looking for the label if it is vegan, etc.; if the market requires it, who knows, but at the moment, it is not our concern."	Unfavorable
K	"Our goal is not just to do what is required, it is to work for the near future (...) that in the medium and long term, the company can be prepared. It is in this sense that we have done all the work of organizing methodology, seeing what happens in the international directives on this, so we can prepare."	Favorable	"The measurement is very important, we started in 2019 the calculation of the carbon footprint of the entire organization, covering everything that is foreseen in the GHG Protocol (Greenhouse Gas Protocol), we follow these indications and they are currently an internal KPI of the company"	Favorable
	"From the point of view of the issue of the perception of sustainability, fortunately, this path, as I said, was formalized because the urgency of the moment forces it. Formalizing implied the initiation of projects, because the company, the sustainability seems to be a novelty, but it is not and therefore the company has always look for the best practices. Since the beginning, the company's values fully align with this"	Favorable	"In terms of winery, it's already a job and it started long before sustainability was the issue. It started with the issue of environmental management, so the fact that we have an environmental certification, already with so many years, allowed us to give a maturity in terms of environmental impacts and there we have it well measured."	Favorable
	"For us, there is no way that there is no sustainability, because all companies have it, may have the social and environmental pillars neglected and that nothing has happened because of it. The truth is that companies in their model must be sustainable, otherwise they will disappear. What is happening is that the same weight that is given to economic sustainability, is being said to be given to the environmental and social and when companies have imbalance, will as no longer be able to have business."	Favorable	"We have the B-Corp Certification, it was a challenge that we set ourselves and that we have already achieved, but it's a never ending story"	Favorable
	"We are motivated, this is the way, there is no other, there is no other, there is no other way as not to be motivated and not to want to change."	Favorable	"The Portuguese market needed this, the sector needed a certification, so as soon as a National Referential of Viticulture and Viticulture emerged we were the first to be certified last year"	Favorable
L	"We try to make the most of all resources, the philosophy of non-waste generation and this is very typical of my training, I do not want to have to treat a waste I want is not to generate waste, I want to work optimally and optimize all production, use of resources and while I do not classify as waste, I can do the negotiation of the subproducts."	Favorable	"We have the certification of biologic in the vineyards, but the wines are not certified, because not all grapes are ours, we have a small portion that we buy from small producers. We operate there in the part of the vineyards, assist and guide in organic production, but as they are not our vineyards, we do not certify the wines."	Favorable
	"Sustainability is inherent. The project does not exist without looking at the main factor, nature is determinant."	Favorable	"so I'm very skeptical of the issue of sustainability in wines (...) because we have to show that we do anything, then sign any paper and do not have the necessary depth and then we fall into a banalization"	Unfavorable
	"Sustainability is inherent to the project, all these elements, low intervention, as natural as possible, this way of working has to do with my academic background, with what I always believed, always taught. So it's applying all the theory in our project. This is not exposed in a very explicit way in our marketing vehicles, on our website. People until after visiting us say that we need to expose more what we do, but it is not there, we want to be recognized, but not in a very forced way, very bombarded in marketing."	Favorable	"This bureaucracy is not entirely concrete and does not have the necessary depth, perhaps it ends up benefiting those who have some economic power and who pay for certification. The certification can be for English to see, like all areas and all kind of product. And if all are certified, then it becomes not something differentiating."	Unfavorable
	"We are completely motivated, this is our philosophy, in business and in life. You can not be in the market otherwise."	Favorable	-	-
M	"The awareness of the way we work, because one of the things we did as soon as we picked up M and all the vineyards we've bought since 2020 is to do a restructuring of viticulture. We transform everything into regenerative viticulture and we are fully aware of the materials we buy, that is, sustainability, and the bases of the four are on the table in decision making. When we make a new purchase and what is the most sustainable material? This is on the table."	Favorable	"We have integrated viticulture and that's the certification we have, for the year we will move to the National Referential on sustainability in Portuguese wines"	Favorable
	"I have worked very focused on sustainability. All that is numbers, percentages, footprints, all these names are very sensitive, there is a lot of greenwashing and there is a lot going on and so I will not cross with numbers."	Favorable	-	-
	"Nowadays we are doing a preservation of the old vines, we are members of an association working on Education on Old Vines worldwide and on the importance of preserving old vines. (...) The preservation of old vines in the long term is a much more sustainable work than replanting every 20 years. Our work is very focused since always, long before this was a conversation, it was almost logical: we will preserve what exists."	Favorable	-	-
	"We remain completely motivated, this is the way."	Favorable	-	-

Table III – Perception about Sustainability and Certification Summary

Regarding the perceptions about sustainability, every company was able to give its opinion, answering to questions like “What are your beliefs about sustainability in the wine industry? Do you perceive it as positive or negative, and why?” or “Have these practices changed or will they change the certification/production of labels? What are the costs?”.

As available in table III, it's possible to see that all the firms consider sustainability important and favorable for this sector. Nonetheless, claims such as “*mixed feeling*”, “*there is a lot of greenwashing*”, “*it's just for marketing*”, “*I am very skeptical*” and “*we confuse it with biological, and biological with abstentionism*” were mentioned by 5 companies (38%). Besides, when question about certification, the participants and its answers are not so unanimous, where 54% of the companies demonstrated to have doubts about certification. Participant manifested concerns like “*we care about practices, not the stamp*”; “*I'm not focused on the certification*”; “*the bureaucracy is too big*”; “*we are too small to be in the PSVA*”; “*certification is not our concern*”, “*It may fall into excess of bureaucracy and that is unhealthy*” and “*This bureaucracy is not entirely concrete and does not have the necessary depth, perhaps it ends up benefiting those who have some economic power and who pay for certification*”. Therefore, it's possible to observe after a quick analysis of the interview transcripts (Appendice VIII), that grounds such as size of the company, lower economic power, excess of bureaucracy, no obligation of more demanding markets and not fully comprehension about the certification, could be reasons to not have the official stamp and greater transformations of wine companies. Some companies (46%) referred that certification is expensive, it is not their focus and it may be “unaffordable”.

In summary, sustainable transformation appeared to increase the awareness of companies, not only related to operations and metrics tools, but also it seemed to be an opportunity to review all internal processes, allowing an increase in efficiency. With the participation in these transformations, firms had to take into account all of sustainable dimensions, including the social. Wine producers had the opportunity to start evaluating and measure objectives, allowing its definition in short/medium term and helping the improvement of the value chain. The results show a positive attitude towards sustainability and its transformation. However, skepticism, concerns about greenwashing, bureaucracy and own certification stamps, indicates the need to have a clearer and transformation communication and simplified certification procedures. These mentioned concerns and the cost of certification, seems to be a reason for firms to not look for certification stamps.

Discussion

This study aimed to understand if the perceptions of directors of Portuguese wine producers influenced the integration of sustainable practices. A total of 13 participants from wine-producing companies were interviewed for this study. The results largely support the existing literature and simultaneously they add some valuable insights relating to various topics. First, wine companies appear to be interested in belonging to the surrounding community. Second, the sustainable transformation seems to ameliorate the market position and financial situation of companies. Third, the relationship between barriers and opportunities and certification and its perceptions were also discussed.

Community belonging

As referred in the results, wine companies appear to be interested in belonging to the community where they operate, focusing on regional development and employee's empowerment, heading towards the statement pointed out by Moldan *et al.* (2012). This clarifies the fact that this dimension involves people and the social environment, focusing on the well-being of the individuals and its community, guaranteeing the local development and the growth of relationships inside and outside the company.

This finding is particularly important because some of the barriers mentioned were the lack of human resources, insufficient collaborators and absence of top management involvement (Salomone, 2008; Grimstad *et al.*, 2014; Álvarez-García *et al.*, 2016; Bhanot *et al.*, 2017; Laurett *et al.*, 2019). The focus on the social dimension allows the improvement of relationships between companies and its internal and external communities. Regarding the well-being of workers, bonuses, benefits outside the company and formation enables firms to have happier employees and retain talent. The partnerships with other brands, universities and investigation centers, such as helping local and smaller producers, being pioneer in new techniques or in new technology increases the reputation of firms, not only for students, but for the public. Also, the community development is a major interest of companies, increasing the number of people in the surrounding villages and the local tourism, including wine tourism, which benefits firms. In summary, focusing in the social dimension helps to overcome some of the listed obstacles and allows the improvement of the company's reputation in the surrounding community.

Forging competitive advantage

The sustainable transformation seems to ameliorate the market position and financial situation of companies. As mentioned by Niñerola *et al.* (2019) the economic dimension covers the

profitability of companies and the efficient resources utilization to ensure the availability to future generations, which is demonstrated by this sector once it is composed by a high number of family businesses.

This finding is particularly important because, in line with the literature review, the transformation into more sustainable practices suggests a decrease in costs, in interventions, treatments and in water consumption. In addition, it helps in firms' resilience and ability to adapt and to face challenges such as climate changes (Lin, 2011; Annunziata et al., 2018). Also, the better use of resources, was manifested by purer plants, higher grape quality, increase in production and as a result of this better performance firms can improve the external commercialisation and elevate the price of the bottle (Poksinska et al., 2003). Balancing excellence of new practices with the gain of competitive advantage seem the way to get lasting profitability, ensuring the business for the future generations (Niñerola et al., 2019).

Roadblocks and highways to the sustainable transformation

Following the results and Neto et al. (2017), barriers such as economic and financial (lack of financial incentives), technical (operation limitations), cultural (resistance to change), legislative (no fully comprehension regarding certification) and governmental (absent of supporting policies) were found.

This finding is particularly important because these practices and certification rules appears to create a standard production allowing the creation of fair competition and equality between vineyards. However, the different firm sizes, type of structures and financial position seem to have an effect in the implementation of the techniques and in the certification stamps. A national certification regulation and policy making, fully transparent, taking into account all firms and its differences could be important to satisfy the necessity of integrating sustainable practices into a national context, increasing the legitimacy amongst customers and creating value to the sector national and internationally. Nonetheless, the opportunities seem to have a bigger weight comparing the barriers. Opportunities such as new markets and continuous improvement reflect the strategic advantages associated to this transformation. Sustained by Prajogo (2011) and reflected in the interviews, understanding that sustainability is a continuous journey corresponds with the concept that organisations need to constantly adjust to the market trends, mainly the sustainable issues. Also, according to Amaeshi et al., (2008) and reflected on interviews, the focus on implementing sustainable practices increases operational efficiency and leads to a better market position. Moreover, the sustainable practices lead to a reinvent of

the vineyard and cellar waste, mainly in it's the resell. Last, but not the least, this transformation into a more sustainable business is an indication of solidity and greater resilience to uncertainties, leading to the increase of firms' reputation, mainly internationally (Amaeshi et al., 2008). This is very important for the Portuguese wine industry, because since from the beginning of the discoveries, Portuguese wines are found all over the world, being one of the companies' priorities, to keep or improve its international presence (Lavrador et al., 2018; Swiatkiewicz, 2021).

This finding is particularly important because being pioneer in technology, or technique, or intervention or knowledge permits firms to have a greater position in the market, being the benchmark for competitors and a firm that attracts new talents and new markets, capitalizing every new implementation and improvements. Besides the economic gain, this transformation leads to a greater competitive advantage and increase of reputation. Portugal wine industry is particularly capacitated to lead this change firstly to keep its presence in international markets and second due to the variety of regions and grapes, which Portugal is characterized for. Companies seem to be interested to produce more than in one region exactly to continue the production all over the year, to be able to study different grapes and to see its adaptation to different climates and integration of new practices. In conclusion, Portuguese culture is characterized by a significant sense of resilience and this transformation manifest that, resulting in better brand reputation, improving firms' credibility and consumer loyalty.

Certification and its perceptions

As mentioned in the literature review, according to Byrd et al. (2017) the sustainability reports have influence in the perception of the stakeholders and its firm actions. The interviewees referred that the path to reach more sustainable practices are associated to innovation, more knowledge and company alignment. Apparently when a director has a more positive attitude towards what is sustainability and its increasing demand by customers, tend to look up for certifications (national and international). Size of the company, lower economic power and not fully understand of certification, addition to insufficient information, high expenses as mentioned on the results, seem to be barriers to (not) meet certification (Salomone, 2008).

This finding is important because it seems that different perceptions about sustainability have different approaches through certification. Even though the majority of the participants referred that more sustainable wine chains are the only way of being in the business, and that the best agriculture is the one that respects the nature, there are distinct feelings related to certification.

The certification is mandatory to be able to operate in some markets and that is the most relevant reason for the certified companies. Some companies are not sufficiently big in size for some national and international certification and the financial constraints are very high. Therefore, the barriers of certification to more conservative firms are significant. Thus, companies that mainly operate locally and smaller companies have certified wines, which is mandatory by the CVR, but they don't apply for certified production chain.

Limitations and Future Research

This study presents some limitations to be acknowledged, as well as some recommendations for future research in the same domain.

The first and major limitation is related to the different positions that the participants held in the companies. The goal was to interview the directors, but due to the conduction of the interviews during the harvest period that was not always possible. Even though all the participants have a function related to management, chief of production or sustainable departments they might have a different perception from the director itself. In addition, they can also have a different expert knowledge between the specific areas (vineyard vs cellar vs distribution) which can lead to a greatest diversification of answers.

The second limitation is associated with the low number of participants (<15) which could be important to help in the pattern's construction. A bigger sample size could help the strength of the results and a more correctly generalization of findings. The possible solution was to invite sooner the firms and to have longer availability of time.

The third limitation is also associated with the interview format, even though the online format allowed the participants to reduced costs, it also opened space to technology issues such as audio interruptions and the misinformation of the transcripts. Also, it may have created a limitation of the depth of the interpersonal connection, influencing data collection.

The fourth limitation is related to the time of the interview. Even though the questions were ready, some of the participants were more proactive and long in their answers, and on the other hand, some were not that committed in their answers and didn't want to elaborate much. In addition, limited time for data collection may restrict the depth of the answers. The interviews were conducted during the harvest period, leading to a greater challenge in the agenda availability and organization.

The qualitative nature of the study and the interviews too is a limitation as well. The type of interviews introduces subjectivity in the data analysis, and different researchers may interpret differently the same data.

Future researchers need to take this into account and could try to complement the study with quantitative data, such as other metrics to evaluate numerically the commitment towards sustainability. Also, it could be important to have a bigger sample, with more producers from each wine region. Best practices in qualitative data analysis involve inter-jury agreement for

the thematic grid. Due to time constraints this was not performed with our analysis and constrains the credibility of the analysis. An additional consideration that might be interesting was to interview the certification organisations and institutions that could increase the knowledge about the topics where the firms are evaluated and assessed.

Conclusion

The main goal of this study was to understand if the perceptions of directors of Portuguese wine producers influenced the integration of sustainable practices. Through a qualitative approach, involving individual interviews and content analysis, we directed our efforts towards the comprehension of the complex dimensions of sustainability seen from the eyes of the vineyard owners.

Winemakers often face decisions related to resource efficiency, climate change adaptation, innovation and the preservation of old practices. The data analysis led to the conclusion that both internal and external communities have influence in the integration of the social practices from companies. Constraints as financial costs, time and operational limitation, resistance to change and absence of supporting policies were found. Moreover, the opportunity to improve market position, to operate in new markets and to gain competitive advantage increases the urgency to integrate sustainable practices in the value chain and to apply for certain certifications. Besides, the sustainability results have influence in the firms' actions and stakeholders' perception. In addition, increasing reputation through innovation, new knowledge, new techniques, collaborations with universities and investigation centers were also referred as advantageous for companies. Furthermore, this transformation allows firms to restructure human resources, increasing the capacity to retain talent and it contributes for the company alignment. Thus, when a director has a more positive attitude towards sustainability it will tend to apply for certifications more easily. Finally, even if challenges arise on the way, if wine producers are motivated and encouraged to adopt sustainable practices, they will give more importance to the benefits and opportunities rather than the costs and barriers, contributing to the development of the business itself and the surrounding community.

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Appendices

Appendice I – Methodology Table Summary

	Male/Fem	Age	Level of Studies	Area of Studies	Time in Functions (y)	Duration
A	M	35	Master	Business	6	0:56:28
B	F	54	Bachelor	Hospitality Management	2	0:58:19
C	M	33	Master	Viticulture/Oenology	10	0:52:45
D	M	?	Bachelor	Engineering	25	0:32:14
E	M	57	Bachelor	Engineering	21	0:58:02
F	M	52	Bachelor	Business	10	0:42:03
G	F	33	Pos-graduate	Biology and Marketing Management	10	01:17:41
H	M	50	Master	Engineering	16	01:34:53
I	M	44	Bachelor	Engineering	22	01:06:12
J	F	32	Bachelor	Turism	2	0:17:52
K	F	46	Pos-graduate	Sustainability Management	25	01:13:32
L	F	50	Pos-Doctorate	Business and Management of Industrial Was	5	01:17:33
M	F	37	Bachelor	History	10	01:08:07

Minimum		32			2	01:34:53
Maximum		57			25	0:17:52

Appendice II - Invitation to Participate in the Study

Dear XXX,

My name is Débora Carpinteiro Mendes, and I am currently in the 2nd year of the Master's in Business at Católica Lisbon School of Business & Economics. As part of my studies, I am conducting a dissertation on sustainability practices in wine production. This thesis is supervised by Professor Sérgio Moreira, and its main objective is to understand the perceptions of directors of wine-producing companies regarding sustainability practices and their integration into wine production.

For this study, I am conducting individual interviews with directors of wine-producing companies in Portugal. The interviews are conducted via video call or at a mutually agreed-upon time, with an approximate duration of 40 minutes. Your collaboration is particularly important, once you pay attention to natural resource management and the surrounding community, making you a valuable contribution to the development of this thesis.

I would like to inquire about your availability to schedule this interview during the month of September.

If you prefer to arrange the appointment by phone or if you have any additional questions, you can contact me via my cell-phone number (XX).

Thank you for your attention.

Best regards,

Débora Carpinteiro Mendes

Appendice III – Interview Script

Interviewee Description:

1. How old are you? How do you identify in terms of gender? What is your nationality?
What academic degree/qualifications do you have?

Business Description:

1. Can you clarify the products you sell? What is the founding year of the company?
2. How long have you been working in the company? Can you tell me about your career path within this company?
3. Who are the main competitors? Direct competitors?
4. What position does the company hold in the market?

Sustainability Practices (and their integration) in Wine Production:

5. What are your beliefs about sustainability in the wine industry? Do you perceive it as positive or negative, and why? Should people in the sector adopt these practices?
6. How sustainable do you consider your operational practices?
7. Are there specific areas where you believe your business is particularly or especially sustainable?
8. Tell me about the costs/benefits of implementing these sustainable practices.
9. What opportunities arose after becoming more sustainable? And what about the barriers?
10. Have these practices changed or will they change the certification/production of labels?
What are the costs?
11. How motivated do you feel to maintain and implement new sustainable practices?

Social Responsibility:

12. How important do you consider the surrounding community?
13. How important is employment in the region to you?
14. How much importance do you give to the working conditions the company offers? Can you provide some examples?

Appendice IV – Social Dimension Thematic Analysis

LEVEL 1	LEVEL 2	LEVEL 3
Social Dimension	Well-being of individuals	Working conditions = WC Bonus = B Formation = F
	Well-being of the community	Local employment = LE Community = C Institutions = I
	Partnerships = P	Other Businesses = OB Universities = U Investigation = IG

(Cont.)

Company	LEVEL 2	LEVEL 3
A		<p>"The winery is in fact a very dear building for people, everyone loves the winery as an institution, it actually has that value for the village, the village. Exactly for this, and it ended now at the end of this week, we had the village parties in which we borrowed the cellar to make the restaurant of the parties." (C)</p> <p>"At the time of the harvest, we have been very lucky, we always managed to get friends (...) there is also some participation of our customers, this year we had the participation of restaurants that work our wines." (C)</p> <p>"we try to give support to those who need, there are gentlemen who make wine next door, have a farm and then bring the wine for me to analyze or for me to taste (...) we go at the vineyards and collect and analyze for him, there is always a part of mutual help between us and people, including when we need to." (P)</p>
B	<p>"Then we have several activities throughout the year, in the various regions, as things go on and people get involved." (WB - C)</p>	<p>"The surrounding community is very important, because even the people of the community themselves identify a lot with our brands, almost as if they were part of the group itself and we participate in many activities in the various locations, we have some museums and some gardens, which makes it closer to the local communities and we work accordingly." (C)</p> <p>"If we go to see at national level, from the Douro to the Alentejo, including temporary workers and long-time service providers, B has 350 employees." (LE)</p> <p>"our administrator has the Azulejo museum in Estremoz, which is a beautiful museum and we do a lot of activities and the schools, the nursing homes go there, so there is a great involvement with the community and the social area." (C)</p> <p>"When there are events, book launches, artists, music presentations, fados, we use our spaces and invite the surrounding community to be present." (C)</p> <p>"We also make wines for priests, for churches, we do activities related to firefighters, we are developing our own program at national level, with the Red Cross to involve all our employees to encourage them to volunteer." (C)</p> <p>"We have an annual training program also quite complete with training, on one hand, we give the required training according to each function, each category, but on the other hand, we also have optional, additional training for people who want to evolve personally, professionals." (F)</p> <p>"We reward seniority (...) This year we will honor 11 people who have worked for more than 35 years in the house and 2 who have worked for more than 50." (B)</p> <p>"we have protocols with various entities, in which employees have a certain type of benefit or discount, we have physiotherapy, we have a doctor once a week, "b" when babies are born." (B)</p> <p>"We have enough accommodation, we have cafeterias in practically all spaces, we have some health insurance, there are criteria to go implementing and for people to acquire as an extra benefit." (WC)</p> <p>"We have some proposals for approval for next year, namely a value for each employee who becomes a parent, 2 scholarships for children who enter the university." (B)</p>
C		<p>"We have vacation days beyond what is in the law, the company grants the birthday to employees." (WC)</p> <p>"C also offers health insurance." (B)</p> <p>"We have about 330 employees in the universe of the company, therefore in the various regions. Where we attach great importance to the local community." (LE)</p>
D		<p>"At the level of training we do the normal training, hygiene and safety at work, these training that we have to give to some of them (...) They end up being people who are not so involved and do not want to have more responsibilities, or more ordered, comes the time of 8 hours and drink a beer at the end of the day (or two or three or four)." (WC)</p> <p>"We also have a brand of honey, it is also a very small thing. It is a partnership with a regional beekeeper here in Castro Verde in which to make some Christmas baskets and some offers, works there." (B P)</p> <p>"We are 8 workers in all. Our workers are all from here, from Baixo Alentejo, they are all places of Castro Verde and Entradas." (LE)</p>
E		<p>"I do not have employees, but (...) I pay a service and the staff that goes there, I try to make them feel pleased when they go to the farm. (WC)</p> <p>"Some are local, others are not, but there is a group of people who collaborate with me from the beginning of the vineyard." (LE)</p> <p>"I trained them and then they collaborate with me. (...) people want to work here and they feel good, if they felt exploited or mistreated, they would not come." (WC)</p> <p>"The community that a worker has inside the cellar cannot be equal to what a worker has in the vineyard (...) during the meal, I am worried about a dry place for them to rest at lunchtime and take their meal, for them to have a place to wash their hands." (WC)</p>

(Cont.)

<p>F</p>	<p>"Of course we have the social sustainability that is also essential, especially today that there are people mainly in this branch, linked to agriculture, where it is so difficult to get skilled labor, motivated and etc. If you can not take care of these people, not motivating them, not retaining them, you are not sustainable either" (LWB)</p> <p>"And this is not only about the collaborators, it is more than that, the people who sometimes give me the vineyards to buy and I stay with them, they feel proud today to be me taking care of the vineyards and always come to help" (C.WB)</p> <p>"cement is a material that I have next to my cellar, it is across the street, in the cement plant of Souselas." (C.WB)</p>	<p>"The community is very important. First I treat people very well, if I do not treat them well they are not here with me, obviously, naturally I try to pay them worthily." (WC)</p> <p>"is curious that this year for the first time I had a relaxed harvest in which I had more people than I needed to harvest (...) because I treat them well, I don't pay them badly and they like to be here and they want to be part of the process." (WC)</p> <p>"Community it's so important to us, that we already have one more producer in the region (...) I can say that I've already reversed the process a little bit, I can abandon my project and the region will have people to take care of the vineyards." (C)</p> <p>"I also have winetourism, it brings people to visit my cellar, the vineyards and they visit the city of Coimbra, eat and consume locally and all this gives dynamic to the region, which is very important to me." (C)</p>
<p>G</p>	<p>"The company is concerned with creating opportunities for its employees to also have a healthier life, providing medical consultations at work with immense frequency for employees, we have health insurance" (LWB)</p> <p>"If there is anything I believe is in the sustainability of the value chain as a whole and in the appreciation of winegrowers and the work that is done from the vineyard, in the rural part, which for A is also extremely important." (LWB)</p>	<p>"ACIP, which is an association for disabled citizens in the area of Penafiel, we work with Bagos d'Ouro, which is an institution in the Douro region, which promotes the education of children in the region, therefore, it has several development initiatives of the younger generations and we also work with Humanwinety, which is a movement, which aims to boost integration measures within companies, racial, cultural integration, gender, and we're also part of that movement." (C - Ins)</p> <p>"In this area of people, the biggest investment will be in the future, we have strong partnerships, at the moment we have 3 institutions that we support steadily, which we support consistently every year, with an already defined amount. And then we have other institutions that contact us for sporadic and specific support and offer upon our availability." (C - Ins)</p> <p>"The group as a whole, we are 180 employees, many of whom are of course from the region, especially in the production part (...) In terms of local employability and especially for agricultural work, which is a constant need there and employment abounds, because it's always growing." (LE)</p> <p>"Currently, as we have several properties, we can work with the same team during several phases of the year throughout the year, which helps us to be more captivating, we have always occupation, it's not a seasonal work, we have a constant agricultural and rural work to offer, and this in the context of Penafiel and Paredes is very important." (LE)</p> <p>"Our goal in the coming years is to increase to 5 institutions and increase the amount we put annually for these sponsorships, to further strengthen our responsibility to companies or movements that have a significant impact." (C - Ins)</p> <p>"We have 2 days of homeworking per week, to reduce the displacement" (WC)</p> <p>"We are a Family Responsible Company, a Fundação +Familia certification, and in the wine sector, there is no other company that has this certification, basically, it recognizes that there is already a set of practices in the company that value the person, your family life or your life outside of work." (WC)</p> <p>"We also have birth rate incentives, every time someone has a child, a baby kit is offered and/or when someone gets married." (B)</p> <p>"We also have a very strong incentive for increasing knowledge, for example we have available training (...) We often have leadership trainings in the company that give us personal and professional skills." (F)</p> <p>"The company has a lot of small houses, buildings scattered throughout the vineyard and the area, which is still quite extensive, and these houses were recovered and are given to employees or former employees of G (...) the company has houses that will provide, whether they are being released or not, they provide homes to new employees and those who need it most." (B) / (C)</p> <p>"For production people, other types of training are available, for example, we will now do a sustainability training that covers all functions, anyone can apply to receive this training" (F)</p> <p>"We also do internal formations about our products for anyone in the company to taste our wine and feel part of the final result and not only the process." (F)</p> <p>"There are more technical trainings, tractors have more specific courses (machine handling), safety training at work (which are always for the whole company, obviously) the purpose is to adapt the training offer to the type of cadres." (F)</p>

(Cont.)

<p>H</p>	<p>"Many of our mottoes do well at the first try. And for people to stay here for years it's not only about the bills, but because we are all here happy, because they like to be in the team and feel valued in it." (LWB)</p>	<p>"Because we read and like to go to meet other producers who have the same problems as us, because we all have them, that's when we learn, it's not closed at home alone." (C) "The big problem we have regionally is that we lack labor and the labor we have due to the lack is more expensive." (LE) We were always very connected with the community (...) I am very attached to sanity and trials." (Investigation - P) "We have always been connected to research institutes, we were perhaps the first company to introduce, first with trials with the Instituto Superior de Agronomia, with the University of Évora, with INIAF (...) they need space and we want the knowledge." (Investigation - P) "We managed, through projects, to acquire one of the first mechanical pruning equipment for Portugal for one of the project participants and then he was like our service provider, he was on duty for other project partners." (C) "we spent an exorbitant amount of water (...) we also found the need to connect to a working group that worked on this theme. We are linked to a project with the Agrarian School of Santarém, with the Higher Institute of Agronomy" (Universities - P) "We are always on top of what it is if you are studying in the market. We are studying new agrochemicals, we want to have at least someone working with us in that area." (Investigation - P) "From the moment I ask one of my collaborators to do a certain task from Monday to Friday for a month, the first thing I have to have guaranteed the first day he works, is his salary more or less fair." (WC) "We are in permanent contact with the nearest schools: Escola Profissional de Alcobaça, Escola Profissional em Runa, a seguir a Torres Vedras, Escola Superior Agrária de Santarém, Universidade de Évora, Instituto Superior de Agronomia, every year we have contacts and requests to relieve the students" (Universities - P) "On top of the base salary, we have a food allowance that we exponentiate to the maximum of what is possible, we deliver it monthly in meal card." (WC) "We have medical appointments at work too and all wages come with a health insurance aggregated and the mandatory work accidents insurance too." (B) "We improve and we adapt some things, also because GlobalGAP also requires us that (...) even knowing that we had to improve some conditions, GlobalGAP was a help" (WC) "We had conditions for them to arrive, change clothes, leave their food, with good refrigeration conditions, have a place to heat their food, in a decent, air-conditioned place, with conditions to wash their hands, shower at the end of the day, if they wish. Although these were conditions that we wanted to improve, we could make the investment, and the quality benchmarks are also demanding." (WC) "In terms of training, the quality benchmarks, requires us to keep our teams formed not only with the minimum that the law requires. I'm not going to give a training, just because I have to meet the calendar, they need to have meaning and I look for different trainings, that we might need and adds value." (F)</p>
<p>I</p>	<p>"If we produce locally and consume locally, we can have much shorter chains and we can respect the seasonality of things. We can have good products, cheaper and not feed the food industry but feed the communities." (C.WB) "Every year we offer a comic opera that is translated and we have 2 performances at the farm, because I wanted a show, I wanted to offer anything to the community, which is not available in Ourém." (C.WB)</p>	<p>"In terms of working conditions, that is not only the salary, payed on time and hours and the correct amount. There are things that are now required by law, and I've been giving it a long time." (WC) "I don't really like to be forced to give X amount of training hours, without meaning (...) There are people who I pay to go school and there are others who also work with us, who practically can't read or write and I cannot invent training." (F) "I try to see what people's needs are and try to encourage them to go that way." (F) "Regarding working conditions, we have the concern, we know that is not everything, we give benefits /discounts and usually people like to work with us." (WC) "We also have jams, we make pumpkin jam, tomato, strawberry and so on, and part of this production is ours and part is bought, for example, strawberries are cheaper to buy in the market at the time of peak than I produce." (P-OB) "We give assistance to some farmers in the area, we allow them to do the analysis at a competitive price and then we all make a prescription of how the wines can be treated. We help N producers, we do N things for our neighbors." (C) "We always give priority to local people, both in terms of workers and suppliers. So, it is equal circumstances to make the local economy work. (...) In terms of "manpower", we also prefer the local ones, for the harvest season, we try to contact the closest people." (LE) "(...) I want it to be a socially sustainable issue as well. I don't want an exploitation that is purgatory of natural resources and does not take into account my neighbors or community where I live." (C)</p>
<p>J</p>		<p>"Totally important, we are 100% Portuguese, we are all here in the area, that is, we all live 10-15 minutes from here, so we value the community a lot." (C) "The people who come to the harvest, we always hire the locals," (LE) "The initiatives we do are with our employees. At the time of the harvest we always do our Adiafa, or a lunch, a dinner among us, we always have Christmas dinner, sometimes we lunch together, it's all local, but with employees" (C) "We have the insurance, we have the medicine at work, we have the salary which is not bad anymore." (B) "We are also certified regarding Hygiene and Work and usually they send some trainings that are available, there are some that are more for the production part, others more for the cellar part, others more for the office part, but we always have the possibility to do them." (F)</p>
<p>K</p>	<p>"The local economy is essentially, (...) that money (...) to be invested here and not to be ready invested in another business. K does that, from the profits it has, it continues to reinvent in ways to maintain the business, but also to promote the entire local economy, to promote the Douro business." (C.WB) "We have relationships with our competitors, we even have meetings with them, we share a lot. So in sustainability ... I will have a meeting with the Sogrape team because of a particular issue of sustainability, so there are good relationships here, relationships that we look for, because their problems are ours and ours are theirs." (P) "We're part of the IWCA, because K was prepared to partner and willing to decarbonize the industry so that in the business world, the wine sector could say it's not creating negative impact, on the contrary, it is mobilizing so that the negative impact is as small as possible." (P)</p>	<p>"We have open recruitments and precisely to retain people in the region, we have winemakers resident in the Douro, young people who are from there and who are still there, we have technical teams from the Douro, Vila Real, Régua and etc., and we also have others who are not from the Douro, but we created the conditions for them to stay there, so the company is increasingly in Douro." (LE) "There is a very big responsibility here, because we are aware of the impact we have, given our size, the impact we have on small local communities, towns, parishes and the whole business." (C) "It is a topic for us, to always keep this awareness that it is necessary to retain people, to give them conditions, that the company is attractive so that they continue to be part of the cadres, and we see it this way, even more in the Douro because as we know there are fewer and young people study and usually do not come back." (WC) "Fortunately we have here the University of Trás-os-Montes and Alto Douro that have Oenology, Agricultural and Forest courses and that help technicians stay in the region." (Universities - P) "Therefore, the family lives in the Douro also means this is a business of really close proximity between the very family that works in the company and lives the context of the region, lives the context of greater Porto, where we are inserted with our central offices and the bottling lines." (C) "The sector has been creating conditions for those who really want to know Portugal and who want to know the Douro and really the uniqueness of the Douro can come, so we have another wine tourism point we have in Gaia, prepared and well and already well awarded." (C) "We have a wine tourism with a partner restaurant, with a Michelin Star chef in Porto and who has his business and we do not know anything about cuisine, that part has to be delivered to who knows, but we have been forming teams related to restaurant." (C) "It has been a struggle because in fact people need to be able to live in the Douro and so we have bought apartments to be able to give accommodation to people (...) people in their places don't pay rent or any other expenses." (B) "there are events at Casa da Música to which we have more privileged access, let's say, we can access with a lower cost" (C) "the company promotes a series of wellness initiatives, discounts in gyms, in pharmacies, Yes, the company promotes a series of wellness initiatives, discounts in gyms, in pharmacies (...) we have access to health insurance plans, I would say that for the sector, for the branch where we met it quite positive, is quite positive indeed." (B)</p>

(Cont.)

<p>L</p>	<p>"We are part of the Porto Protocolo and we also help with panels, with discussions, with material production, content and I am always there to see what evolution exists and packaging is an important part as a challenge for us and for our industry" (P)</p>	<p>"One of the premises of circularity, in the part of regeneration and restoration is using local resources and local partners and this was also a process of building L. (...) we wanted local partners to be able to help local development and second to make an important cultural rescue." (P)</p> <p>"One of our jobs was to start bringing in young people to do the harvesting process and also somehow integrate this more experienced population with this younger population." (LE)</p> <p>"What we think is very necessary, even to keep the activity there, we started to bring our values, so when we hired people, for us it was a shock to identify that some practices there so recurrent and are not the values that we have, for example, it is very common that people there do not have working contracts." (WC)</p> <p>"There was a person who is absolutely fantastic within his competencies, but he is illiterate and has never had a formal working contract (...) he is a machine, he knows a lot of the field and for us it is logical that we want to have a formal contract with this gentleman and that was sensitive in the relationship with him when we formalized our contract." (WC)</p> <p>"Since the beginning we always wanted to promote not only the Dão, but the Dão with an excellence within a production of good Portuguese quality, raise the name of the production of Portuguese wines to the world market." (C)</p> <p>"Our goal is to spread the Portuguese wine in the world market, the Dão wine, the sub-region of Serra da Estrela, because the Douro already has a lot of strength, the Alentejo is already well known, but the Dão was a little forgotten, we want to reinvigorate this space and make known the products of a lot of quality." (C)</p> <p>"The importance with the community is total. (...) Another issue I wanted to highlight is that people who are from here, practically pass to our door daily and when they enter they are surrendered to what it was, how it was and what we did. We adapted and transformed something absolutely degraded, a ruin, which has been there for 30 years and which has now returned to being a productive area, generating wealth, giving jobs" (C)</p> <p>"today we employ a group of people, who are once again able to live there in the region." (LE)</p> <p>"There is a remuneration for performance, so in the peak period of the harvest, there is always a bonus that is paid to the employees." (B)</p> <p>"We have an average salary, a little above the minimum value. (...) We give the basic conditions, the protection equipment." (WC)</p>
<p>M</p>	<p>"We have a very important institution that is ADVID, is the institutions worldwide, with more information about castes, work super well, and works with the Membership set of various companies." (P)</p> <p>"We are members of the World Vine Conference, which is not quite in the region, but has to do with this positioning of the Old Vineyards and this money is used for education, and training on the importance of preserving Old Vineyards." (P)</p>	<p>"we always have our presence in the market and then we are doing small highlights or collaborations with other brands, other types of business areas, as is the case with Vintage Ocean Aged in which we age 100 bottles underwater" (P - OB)</p> <p>"part of the proceeds will be donated to the program called "Ocean Literacy", which is given by the Lisbon Oceanarium to the students of São João da Pesqueira, which is our Municipality, so 720 students in the week of 16 November, which is the National Sea Day, will receive a course on the importance of not polluting resources and combating pollution in Europe." (C)</p> <p>"there are several factors that are part of the decision processes in the production area: time, money, effort and final product quality. We still prefer that two people do a task in the warehouse that could be just for one person. It's repetitive and tiring job done by two persons, even if it could be just by one. When it comes to materials and the human factor, these factors are always included in the decision making process." (WC)</p> <p>"We are supporters of Bagos d'Ouro, that is, we made a program that is the opportunity in which we donate waiting to be bottled wine, for a product that will be sold. The entire returned revenue will be delivered to Bagos d'Ouro." (C - Inst)</p> <p>"We have donation activities, we have now donated a wine that we have, that PVP. is € 22,000 for the Gérard Basset Foundation, which gives formation to minorities within the wine sector, including people with physical or mental disabilities, people of war refugees, minorities in this sense." (C - Ins)</p> <p>"In terms of the grape we purchase, we pay the highest price, we agree with the producer, obviously we try to figure out how much other people are paying so we know that we are paying a good price for grapes" (P - OB)</p> <p>"We don't favor locals, it's a matter of logistics, but 90% of our company is local. Nowadays we have a Moroccan person working with us, but who lives there, in the Douro." (LE)</p> <p>"we give bonus whenever the company has a specific result and the prize is distributed. We have transportation for all employees, I think this is common practice in all companies, but in the harvest period we double the salary, they receive 15 months, at least in our company has always been so and I think it is practical." (WC)</p>

Appendice V – Cost-Benefit and Barriers-Opportunities Thematic Analysis

LEVEL 1	LEVEL 2	LEVEL 3
Benefi efs	Costs	Financial Costs Time Study
	Benefits	Wine Quality Profitability Productivity
	Barriers	Operational/Physical Limitation Burocratic Disinformation
	Opportunities	New Markets Continuous Improvement Innovation

(Cont.)

Company	LEVEL 1	LEVEL 2	LEVEL 3
A	<p>"I think sustainability is a concern, no doubt, but it has to be a genuine concern, there are many companies that do it as marketing".</p> <p>"I am very central in these things, I think we have to do our best, within our possibilities, and it costs me a bit to point the finger to others, because nobody is perfect."</p> <p>"Our wines are biologic, but for now we can not guarantee that the wines we launch are exclusively from our grapes. That is the goal in the future."</p> <p>"We work with wine producers who do conventional agriculture. We try to advise them and try to work with those who respect the vineyards the most, but at the end of the day they do what they want."</p> <p>"I think we are trying to improve and are very central in these issues, obviously that sustainability is important, but our focus is on making wines linked to our land and we do that, all our production, goes in favor of having genuine wines from here."</p>	Costs	<p>"within our reality, there is economic limitation, we are doing it slowly, but the physical limitation ends up becoming very complicated for certain things."</p> <p>"An important barrier for us is the physical space, cellar space, more than properly bureaucratic or costs. Costs are also associated with people and there is also a barrier, I can really want to do something, but then not have time to do it, we are only 4."</p>
		Benefits	"Treating my vineyards in a biological way is more because I have purer plants and I have cleaner fermentations in the cellar."
		Barriers	<p>"I would like to have a well (...) I would like to do was a WWTP, but I do not have space in the cellar... and then there is the economic part."</p> <p>"within our reality, there is economic limitation, we are doing it slowly, but the physical limitation ends up becoming very complicated for certain things."</p> <p>"Especially in smaller companies, I think the biggest limitation is more operational issues."</p> <p>"In the wine sector there are small details that hinder us on the part of the entities. The wine institution asks us to say the start date and end of harvest, there are records of everything, I can predict a date, but we can fail. (...) this is a rigor they try to have and in practice we can not have"</p>
		Opportunities	-
B	<p>"Sustainability is a mixed feeling. On one hand, is very welcome, because it makes competition healthier, if there are certain rules and guidelines and that everyone follows the same, the production when presented, is honest, in the same way for everyone. On the other hand, we are always very afraid and we have been very attentive to the famous greenwashing"</p> <p>"We remain completely motivated to maintain and implement new practices, that is the way."</p>	Costs	<p>"At the moment the investment has been more in terms of human resources(...) and the time invested restructuring the procedures"</p> <p>"We have several ongoing actions and all of them have a cost, of course. For the footprint we hired a company and it had a cost, certification had a cost. Everything had a cost and I think that only at the end of this year we will be able to make a balance and realize what is the cost-benefit, what are the benefits that these costs will bring us."</p> <p>"The costs have been mostly in terms of time, restructuring, human resources, we are improving processes."</p>
		Benefits	"there are certain markets that no longer import wine if they do not have sustainable production, sustainable production certifications. It's an issue that the company will have to evaluate and understand the market that could be lost and how much cost was the certification"
		Barriers	<p>"greenwashing is always a problem, because it always leads to overregulation and then we lose focus. Instead of figuring out whether we are treating a particular plague well, we have to be concerned whether that was well registered, the time, the evidence that was taken. It may fall into excess of bureaucracy and that is unhealthy. "</p> <p>"Bureaucracy is a barrier, it starts to be too much process, too much evidence. We want to consume less paper, but then we need paper for everything, because we need to have the presence signed, we need this, we need that..."</p> <p>"There is now a big lobby to consider, that is that wine causes cancer and it will be a very big barrier to be overcome. It's hard to turn around when you start creating these kinds of information and disinformation lobbies."</p> <p>"We don't buy wine, we produce all our wine, it's a bit unfair after they compare us with others that say their wine is organic, but they didn't produce it, they just bought it somewhere else."</p>
		Opportunities	<p>"with sustainability, this has been a year of reorganization, restructuring (...) the code of ethics has been revised and is waiting on final approval. Sustainability has accelerated this whole process, it's an opportunity to recruit and retain talent. "</p> <p>"The opportunities are related to the entries and/or stays in some markets"</p>

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C	<p>"our perspective can't be focused just on how much we produce per hectare. Classical agriculture is a lot of that (...) what interests me to produce 20 if I have to apply 15, if I can produce 10 applying only 2, for example. That is the reasoning, I think that agriculture and viticulture are developing a lot now in this direction."</p> <p>"In here, Mr. JS, who owns the company and runs the company with the support of a board of directors (...) he is perhaps the first person to know that sustainability today is a necessity, not an option. It is something that we really have to respect and improve, and therefore, this Mr. JS option facilitates within the company and employees."</p>	Costs	<p>"We don't have data on this yet. The cost benefit at this point is the investments we made"</p> <p>"In agricultural terms, we made this year an investment in a direct sowing seeder to sow these biodiverse coatings and, therefore, we intend that the investment through soil improvement, to be able to fix more carbon in the soil and to have the most fertile soils, it is expected that the investment will have this return. I still can't give you a concrete answer now."</p> <p>"The support plans related sustainability are increasing, but all this takes time to submit. Therefore, companies really need to be willing to give up the time of some employees who had traditionally more priority needs"</p> <p>"this issues are always things that cannot be achieved overnight and that one must study and that the recipe for an exploration is not valid for another exploration, because the climates are different and the conditions are different."</p>
	<p>"We can't have this vision for 30 or 40 years, short. We need to try to explore it to the maximum, we have to have a vision a little more in the long term, so I think sustainability will always have benefits, it has to be looked at"</p>	Benefits	<p>"Sustainability requires a little patience, to think more long-term. (...) I think sustainability brings benefits. If people are happy they are more productive. Our productivity is not measured by the time we are working, but for what we produce exactly, if we can produce more in less time, Maybe we can also enjoy more the time we are out of work, personal life etc., then it's a cycle, we come back the next day with more desire to produce, are all these benefits that after all is not a cost."</p>
	<p>"This is the way, it is not an option, there is no other option and Mr JS, the owner of the company, is absolutely, absolutely involved in these decisions and motivated with the way. And we have felt that, and then it also forces us to speed up this process a little so that we can continue to be on the level where we are, otherwise we will miss the train."</p>	Barriers	<p>"No, I just happened to be honest with you, I haven't felt many barriers, maybe the biggest barrier is the bureaucracy that we have in our country"</p>
		Opportunities	<p>"when people began to give importance to sustainability and speaking also in viticulture practices and biologic viticulture, many people joined because they realized that they could open new markets or open new customers or that they were losing markets or customers for not having this biological offer"</p> <p>"nowadays, it is already being realized that it is possible to make a viticulture or agriculture in a sustainable way and that the exploitation is also more profitable"</p> <p>"sustainability is always a continuous improvement, I think we'll never get to a point where there's nothing to do, it's all done, there's always something to improve"</p> <p>"This is the naturalness of things, nowadays, markets value sustainable practices, but I think that in a few years will be mandatory."</p>
D	<p>"I always have a lot of difficulty and I am very skeptical about many things I see in relation to "biologic agriculture", to "sustainability", there is a lot that is just for "english to see" or it's nice to say"</p> <p>"I believe that everything that is natural, that comes from the nature, that comes from the land, without great interference from large agrochemicals, that they also no longer exist (there are no longer powerful agrochemicals as there were 30 years ago), that there is a balance between everything: fauna, vegetal part and animal part that we can reach good port"</p> <p>"I am very skeptical about these perks that are put in relation to sustainability and biological, because everything is biological, I do not know anything that is not biological."</p>	Costs	<p>"I don't think it is the government that has to worry, nor the bodies that pay us and what they pay does not count practically for what we do. It is as I said earlier, the farmer always tries to do the best he can and the best he does is the best he will receive"</p>
		Benefits	-
		Barriers	<p>"Above all, it is something I do not believe, I have tasted "natural wines" and "organic wines" and all these denominations that today create and have tasted "natural wines" that are completely defective, what we put to burn and we do not want in wine, It's what's sometimes in a bottle, but that's all there is to it."</p>
		Opportunities	-

(Cont.)

E	<p>"When we talk about sustainability, we confuse it with biological, and biological with abstentionism. They're completely different things. Some people think that the biological is to do nothing, there are many people who think that sustainability is the business of biological and that is to take advantage of all resources. Sustainability, and I can talk a lot because I am involved in some projects, CVR of Alentejo was the first to start the sustainability project and to have certification of wines as a sustainable brand."</p> <p>"Of course I believe in the sustainability program, without going into fundamentalism."</p> <p>"We're talking about a country that wants to be sustainable, and then the easiest thing is the one that doesn't work. We're all talking about sustainability, but then it's just for "english to see"."</p> <p>"I will not consider that I am 100% sustainable, 100% is a very utopian thing. But everything I do, in general, is to not hurt the environment."</p> <p>"We don't need a sustainability program to know that it's the way. Sometimes people are required by law to follow certain paths, but the farmer in general does not need to, because it is already sustainable by nature"</p> <p>"communication is difficult. The biological is difficult, because it will not have a great future. The ideal was to combine the biological with conventional agriculture, do something that would result in a greener product. We are often talking about waste, less waste rates, zero waste, that is what we are looking for."</p>	Costs	<p>"For us to take the steps, we have to think about the investment part, and it has to be compensatory."</p> <p>"I think in agricultural terms the company is very sustainable. In terms of production inside the winery, I still have nothing related to solar energy. It's a goal. All profits from the operation are reinvested."</p> <p>"In the production part, I was forced, I had to accept the rules of the game because there was no other way"</p> <p>"Obviously, we want to continue on this path. The economic part is who commands these issues. Putting investment in the balance, even supported with projects, in solar panels, and at the same time considering energy costs."</p>
		Barriers	<p>"the only barrier on that solar issue is a matter of initial investment, because there are projects and all that, but there needs to be some... The projects are very good, but there must be money to invest."</p> <p>"And when it starts to have a lot of money dispersed by various investments, it becomes difficult. I just planted a vineyard, 9 ha, without project because the state did not support the project."</p> <p>"When it makes sense for us and this country decides to support renewables more... The help they give is still short (...) With larger companies is different, they have very high consumption and with high consumption, it is easier to monetize. The scale is unbalanced for consumption, while mine is for investment."</p>
		Benefits	-
		Opportunities	"That's why I say, it's easier to make operational sustainability, from the point of view of the production chain"
F	<p>"I think there's no alternative to being sustainable. I think somehow, we're all sustainable."</p> <p>"I use integrated production, but the focus is on zero waste, which is a hundred levels above that. Integrated protection is a bit simpler."</p>	Costs	<p>"the subsidies and support that exist for these practices, do not exist, I end up not getting this subsidy, because there are criteria that we can not get there"</p> <p>"international certifications (...) at the moment, they are unaffordable."</p>
		Benefits	<p>"This concern was always taken into account, if we are not sustainable, the business does not work, but there was really a big jump with the reuse of bottles. I think the brand F was not very well known until the reuse of bottles, because there were magazines and televisions giving this news and I think that this had a really great impact."</p> <p>"The cost benefit has been advantageous, the implementation of these practices has been advantageous."</p>
		Barriers	<p>"One of our goals is to invest in photovoltaic panels, but there are a number of bureaucracies that we still have to overcome."</p> <p>"I have not felt many barriers. This has been a path and we have evolved, I do not feel that it has been so difficult... and has been worth it"</p>
		Opportunities	"but the truth is that being more environmentally sustainable allows us to be more financially sustainable."

(Cont.)

G	<p>"the mindset that this company has is always: "I receive a legacy and intend to leave it better than what I received for the generation that follows me." "</p> <p>"The company was born in 1870, I think its vocation for sustainability, I think there are few that are so obvious, because I think the question of having passed generation by generation until now"</p> <p>"We are a company that already cares a lot about this with this issue of sustainability, continuous improvement of working conditions and reducing impact for many years."</p> <p>"I think we're a little bit above average in terms of genuine concern, we want to improve and we want to do things that reduce our impact, but at the same time I feel there's always a lot to work on"</p> <p>"the administration says that it doesn't matter if we don't meet the goals, because what we want is for people to realize that we are trying to improve, and not complying is part of the process. we are not perfect, nor is this the image we want to show, we want people to understand where we want to go and improve."</p> <p>"We remain super motivated, it's a challenge that doesn't end and what I feel is that I always have to do more than what I'm doing, and that's sometimes a bit tiring, but it's motivating because there's always something more to improve, there's always something new, there is always a goal that is achieved, there is always something that we want to share and so I think that, for me, is what motivates me the most, without a doubt."</p> <p>"at any meeting I saw lack of enthusiasm, or lack of commitment to sharing results, or lack of ideas on how we can improve, so I think this is a very transversal feeling"</p>	<p>Costs</p>	<p>"We made a very clear investment in our production, trying to pull the nature component and less animal intervention, through a transformation of our labels (...) we have the vegan certification in our wines"</p> <p>"It is always a bittersweet question because there are several market definitions that arise a bit more as impositions than as something properly sustainable."</p> <p>"There are some costs, for example, we are the companies that are more advanced at the moment in the process of digitalizing labels (...) what I feel is that there are many internal movements here that require a lot of work, a lot of organization, and sometimes people do not have much visibility of the benefit that will bring in the medium term."</p> <p>"The costs are sometimes a bittersweet sensation, the feeling that there are more obstacles than benefits and that maybe people start to look at the wine in a way not so nice because of certain measures (...) that's the hardest pain."</p>
	<p>Benefits</p>	<p>"The administration has always driven this path a lot, they have been the main drivers of this change. This mentality and trying to make this mentality as present as possible within the company, and one of the indicators that we are working on now is precisely the number of employees already with this training or this mindset"</p> <p>"in terms of the company's operation, I think we could not be more aligned in terms of objectives, we currently have a working group that includes all areas from human resources, to production (...) all areas are linked to this issue of sustainability so I think it is a completely common and consensual movement, I think we are all oriented to the same, so I think internally could not be more aligned."</p>	
	<p>Barriers</p>	<p>"We do not have biologic wines, but also for a doubt inherent in the sustainability of the organic product itself, in the Douro region would not be difficult to do, but in the Vinho Verde region, as it is a very humid region, requires many treatments, if we could only treat (and we are already very preventive on the treatment issue), if we could only treat with copper-based substances, we would be contaminating the soils dramatically and therefore in that case, for us and the greater volume of wines we produce, a certification of biologic wine would not be a positive thing for the environmental impact."</p> <p>"Now there will be a greater, more aggressive communication on wine consumption and the incentive not to consume wine, which will also penalize immense industry, so there is a very great concern, although this is for health, there's a very big concern about how this will impact the industry."</p> <p>"Another measure that worries us, because I think it has greater economic purpose, in terms of taxation, than properly in people's health (...) I find it hard to be such a penalised industry in this type of measure, while at the same time it is such an industry linked to nature and the countryside."</p> <p>In terms of challenges, I think it is mainly because the name "sustainability" is a buzzword already so beaten and very undefined. People say "sustainability" and only think about the environment, sometimes you don't think about the part of the generational issue or the human issue, which comes up little. I think it's a word that is already too worn out, and it shouldn't, because it actually has enormous value, but the truth is that the communication that has been made around this is already very tiring."</p> <p>"In terms of agricultural tools, we don't have much flexibility. Is a major difficulty and it is one of the issues that I find most sensitive. I think that in the agricultural environment people want to do this shift, but they can't, because we don't have alternatives available, at least that are efficient, for the autonomy and power needed. Currently, we do not have fuel alternatives for a viable change"</p>	
	<p>Opportunities</p>	<p>"I think there is a huge window that opens for us to share what we do well and that is intrinsic to us and therefore, that is an opportunity that also brings many challenges, such as is, how do we do it efficiently, and how we can do it better and better and that's an evolving process"</p> <p>"There are market opportunities that are beginning to open up to various external markets that really value this type of practices and certifications and that we now, with these ongoing certifications, will also be able to open these doors for sure."</p> <p>"Talking about sustainability is suddenly something that gives people a vision of what the company does as organic and is not conveyed through wines(...) we have a more direct bridge for consumers than through the product. This is also for us an opportunity and a different way of communicating and that is a big challenge, but it is a great opportunity."</p>	

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<p>H</p>	<p>"Since I've joined the group, we have always tried, as far as possible to have the healthiest grapes, with the least possible phytopharmaceuticals or the least possible negative interactions with the environment, with the land, with the surrounding environment the vineyard. And from the outset, we started our production in the less aggressive production mode"</p> <p>"It's all a mix of strategies that we have, always focused on producing the maximum, the highest quality, but taking into account the environment and the sustainability of the resources we have today for the future"</p>	<p>Costs</p>	<p>"We talked to several companies in the sector, we realized the need and already have panels to produce for us in other units and saw that the investment was profitable, and we are the company that is now making this type of investment"</p> <p>"When we switch from molecules to less toxic molecules sometimes it's the other way around, this molecule is more expensive."</p> <p>"We want to evolve in this direction, not everything is also economically gained, we will have to invest in some things."</p> <p>"related to costs they always existed, but what I associate here with costs, and there are direct, for example, invoices that I have to validate. I already did soil analysis to know the amount of nutrients I needed to contribute, per year, now, maybe I do it twice, but I was already doing it. I probably had an annual cost of 500 € in soil analysis, now I have 1000 €, but I have greater control. I associate this cost to more tools to measure, so I feel more comfortable having more analysis, I have a greater sense of what I have."</p> <p>"I think these financial expenditures were being made consciously, knowing what I spent, I need to know if I'm okay, so I have to have someone to be my consultant, to help me make the way"</p>
	<p>"lose less soil, interact as little as possible, have biodiversity, have diversity in the vineyard, have good grapes, treat as little as possible not only on the cost side, but the environmental cost of applying these products."</p> <p>"16 or 17 years ago when I joined the group no one or almost no one had viticulture in integrated production and today I do not know anyone who is otherwise, because the market came to this"</p>	<p>Benefits</p>	<p>"at the agronomic level the practices that have been implemented in the area of sustainability, especially mobilizations, reduction of treatment and even reduction of water in irrigation, I notice that I have managed to keep my focus on the quality of grapes, having less costs in the field"</p> <p>"but I notice that in terms of expenses and, for example, if I think about the amount of liters of diesel I spent when I mobilized all the plots, today I have a reduction, maybe 10% less in fuel, which is very interesting."</p> <p>"If I see that I can maintain my productivity only with 5 waterings instead of the 10 I did until then, I have here 2 gains: less electricity and less environmental impact, so I'm having a smaller impact on resource extraction."</p> <p>"also, I know that from the moment I use less toxic pesticides or manage to reduce the number of treatments and to do less and less amount of application per ha, the impact I will have on the fauna and flora involving my vineyard and my own vineyard, will be lower."</p> <p>"Also, any of these, makes me, in most cases, have some reduction on my cost per ha of my activity"</p>
	<p>"On the vineyard level, many of the measures we have already implemented and I have been talking about them, I think not, I am sure, within the region, I will not say that we are the most advanced, but that we are at least the ones that are making the greatest efforts to implement measures, because I know that the kind of soil we have here is not easy soil."</p>	<p>Barriers</p>	<p>"The referential for us was a barrier, but without this barrier, we can not be where we are today, because we were also adapting."</p> <p>"The referential was a "sine qua non" condition for us to be in the market. So, either we are with you or we are not with you, if we are you have to enter, or you will enter as far as you can."</p> <p>"And I do not know if it is only because we are portuguese, but when they speak to us in the word "change", we say no very quickly. We are very averse to change, and very difficult to change. It is very much our beliefs. (...) We have to challenge ourselves in these barriers, we're going to force ourselves to do different things. Sometimes we can't do them right the first time. We have to train just like athletes that compete"</p>
	<p>"Of course, of course we are motivated. We even went through to see if we could implement our zero waste in the field. It would be a very important measure of sustainability going forward."</p>	<p>Opportunities</p>	<p>"The market itself demands this, I have the perfect notion that in 10 years the market will demand more wines with greater sustainability and we will have to demonstrate this to the sector and the market and consumers."</p> <p>"There are opportunities, there are markets that demand a certain type of production"</p> <p>"And this will be my focus in the upcoming years, to realize how far can we enter and work with quality and be competitive in zero waste production mode."</p>
	<p>"At least here in the company we like (...) to innovate, not only go after what is the market trends, but go looking for what the market will trend in the future."</p>		<p>"we spent more, we invested, but also I think we can be today in the market position we are, because we made investments, so I do not like to call costs, I like to call investment expense, that I want to see ahead reflected in the cost and value that I will ask for each bottle"</p> <p>"If it is an investment and the investment brings a return of the money and a better position in the market. If I can have more sustainable wines, wines of zero waste, the market will ask for it and certainly will be payed with a price increase in wine."</p>

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I	<p>"Basically I is a farm that is in the same family for 5 generations, started with a small plot of land and all generations have been growing"</p> <p>"We are pioneers of organic farming in Portugal, we started in 97 (...) we went from market to market explaining people what organic farming was, because nobody knew. We are the pioneers of organic farming, we have a very strong stamp at the beginning and we have made a great contribution, an initial contribution not only in the development of markets and shops, but also the street markets around"</p> <p>"There's a nucleus here since the beginning of organic farming that has remained. And I think we will keep up with the difficulties that we feel every day. But in terms of positioning, we are known in the world of organic farming. We are a reference, but we are very small, even within the bio that is here, there are dozens of smaller projects."</p> <p>"We have not changed much the way we produce, than we already did, for us organic farming, is not a list of rules to be followed is a way of being in the rural world. We strongly believe that the world can be fed in organic farming"</p> <p>"It's sad to see the generation of my daughters or even a little older who don't know anything about farming, it's unbelievable. Foods are always something processed "</p> <p>"This is all sad, I don't think we are going in the right direction. And for me sustainability is also that. They are the 3 pillars, therefore, have to be socially correct, therefore, most producers and a large part of producers can not treat employees as they treat in terms of working conditions, are people, are human beings."</p> <p>"It does not occur to me to produce otherwise, because as someone said a few years ago, I do not own the farm, the sixth generation owns the farm, I'm just here to see if this gets there. It's a way of being in the countryside."</p> <p>"So my goal is to produce sustainably and see if the step to this generation in a better state than I found it. And I want them to have a reliable business with viable production conditions and that's the sustainability of production, but I want it to be a socially sustainable issue too."</p> <p>"The way of being in business is also reflected in the principles of life and, this I, the more I live more disgust I have from the entrepreneurs with whom I cross paths, the idea of profit is very good, and I support 100%, people should work to make a profit, but not worth everything."</p> <p>"We can afford to make decisions that are financially penalizing in the short term, but in the medium term are better for business sustainability. The business does not have to present growths at 2 digits a year and make sell everything and the soul to the devil to have results, I do not need this, fortunately"</p>	Costs	<p>"Nowadays there are a lot and there are many good professionals in vegetables-bio and it is one of the reasons that we practically stop making vegetables, because I stopped being competitive."</p> <p>"Above all, we started to fill out communication papers, all the paperwork is one of the things that comes with organic farming when others should have those costs"</p> <p>"We are a small structure and all this has costs of hours studying the new legislation. Now they want to oblige us that wine labels will start to have nutritional values. And that's all going to come at a cost, because either we put everything in reverse or we give it the chance we put in a website with a QR code."</p> <p>"I, unfortunately in Portugal can not sell all the wine I produce, but if I could sell everything nationally I have no doubt I would."</p>
		Benefits	-
		Barriers	<p>"We still suffer a lot from the issue of not having scale or not having large players"</p> <p>"Giving information is good, but if you don't inform people, it's not worthy."</p>
		Opportunities	<p>"I'm always very small, when I go to fairs I feel it. But my dimension has good things. We can provide the customer in a faster and more flexible way, in terms of own brands, if they want their cup and so on, make things happen all much faster and with more flexibility, something that large structures do not have or can not do."</p> <p>"It makes no sense to be using a heavy bottle, with a higher transportation cost, more glass, more energy, politically, just to get the wine in a more beautiful and presentable package, for me it was the absolutely natural decision when discussing the bottle, chose an efficient bottle, and in terms of transport costs and so on."</p> <p>"All our wines are suitable for vegan consumption, we ban any kind of intervention that used albumins and protein glues, and it is an expanding market."</p>
J	<p>"We try to make the most of sustainability (...) we try our best to avoid waste (...) Water expenditure is very controlled (...) We reuse the waste"</p> <p>"Completely motivated, this is the way, both in the cellar and in the vineyards."</p>	Costs	"We are still adapting to changes including solar panels, I still can not tell you much about it, maybe in a year we can have the difference between before and after."
		Benefits	-
		Barriers	-
		Opportunities	"We still can not tell you, at this time our consumer is not yet looking for that stamp."

(Cont.)

<p>K</p>	<p>"Therefore, the family lives in the Douro also means this is a business of really close proximity between the very family that works in the company and lives the context of the region, lives the context of greater Porto, where we are inserted with our central offices and the bottling lines."</p> <p>"Our goal is not just to do what is required, it is to work for the near future (...) that in the medium and long term, the company can be prepared. It is in this sense that we have done all the work of organizing methodology, seeing what happens in the international directives on this, so we can prepare."</p> <p>"we also have a small project that we have just acquired in Vinhos Verdes. This is very positive, it is not only K, which is continuing the stubbornness to bet on wine and the various regions. These are also strategies for, facing climate adaptation and how the business adapts to new challenges is not, and how it reacts to seek other regions, test new models so that it remains, always, if one weakens, the other is stronger, this from the business point of view that is important"</p> <p>"From the point of view of the issue of the perception of sustainability, fortunately, this path, as I said, was formalized because the urgency of the moment forces it. Formalizing implied the initiation of projects, because the company, the sustainability seems to be a novelty, but it is not and therefore the company has always look for the best practices. Since the begging, the company's values fully align with this"</p> <p>"And we are not in the phase of denial, times have asked for it for a long time and each one at his own pace has to make that transition and we have already started. Our current challenge is to take what we already do, review many processes that really need to be reviewed and then introduce tools such as digitalization, systematization, pure and hard management, to reassess what the sector has, the most traditional and secular practices and to introduce innovation."</p> <p>"We are sometimes proud of the steps we have taken, but we also have to realize that until we have visibility of the good results, things often take time. We do not depend only on us, we deal with nature, because our business, part of it is done with the help of nature, and we can not get rabbits out of the hat every day and can communicate good news every day, we have to give time to the time and the company is doing it."</p> <p>"For us, there is no way that there is no sustainability, because all companies have it, may have the social and environmental pillars neglected and that nothing has happened because of it. The truth is that companies in their model must be sustainable, otherwise they will disappear. What is happening is that the same weight that is given to economic sustainability, is being said to be given to the environmental and social and when companies have imbalance, will as no"</p> <p>"We are motivated, this is the way, there is no other, there is no other, there is no other way as not to be motivated and not to want to change."</p>	<p>Costs</p>	<p>"There's a lot of work here that you don't do overnight. The actions that are taken today can only see results that can be of almost credible results and written in stone, we know how science is, it needs time to prove things. So we think that much of the work that is being as developed now we can then report for sure more in 6 years, cannot be immediate now, because, in fact, nature has this different time."</p> <p>"There is an investment as I said, it is evident that there must often be resources, it is a luxury that K is be able to have resources thinking about sustainability. And then tell the other departments where they can actually better incorporate sustainability, what the trends are, what the threats are, what the financial sector is demanding, and so there's not a very positive side or a very negative side to it here."</p> <p>"we are investing a lot in the issue of sustainability, you can imagine that it was a whole process of calculating footprint and it was a very high investment"</p>
	<p>Benefits</p>	<p>"we also have competitors with a lot of quality, very good wine houses that are also buying and growing in other regions, which is great, because we know that, as I said earlier, wine still exports a lot of Portuguese wine and for the trade balance is great and also for the local economy"</p> <p>"First there is no possibility to avoid this, point number 1, because if it is not in a good way, is in a bad. So if the industry itself does not seek it, the whole system will condition it, whether the legal system and the entire system of taxation of companies will condition. And on the other hand it is beneficial for business, for companies, there is an investment, but there is also a whole efficiency that takes advantage of this investment, so I see this very, very obvious."</p>	
	<p>Barriers</p>	<p>"Regarding the barriers, the costs, it has been more in terms of time, study and bureaucratic and to break paths. We had to develop internally a whole tool for calculation that did not exist. We had to have the consultants working with us about a model and now they are better prepared to be able to give this service, this product to other companies. In fact, as pioneers, we have this thing of it's good to go ahead, but we can't learn from the mistakes of others, we have to learn from our own."</p> <p>"Impatience also needs to explain that sustainability takes time"</p> <p>"It is true that demonstrating this sustainability and what society demands is that it has to be communicated daily, always, even more on social networks. This demanding is a bit against the logic of sustainability, so there has to be a lot of care here"</p>	
	<p>Opportunities</p>	<p>"The sector has practices very traditional and ancestral and yet manages to optimize itself. And it must be optimized, there is even a lot of opportunity here, for savings and innovation, for digitalization, to go against what the young generations want. The new generations want challenges and want modernity and, therefore, it is a sector that manages to create this opportunity as well."</p>	

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L	<p>"We try to make the most of all resources, the philosophy of non-waste generation and this is very typical of my training, I do not want to have to treat a waste I want is not to generate waste, I want to work optimally and optimize all production, use of resources and while I do not classify as waste, I can do the negotiation of the subproducts."</p> <p>"Sustainability is inherent. The project does not exist without looking at the main factor, nature is determinant."</p> <p>"Sustainability is inherent to the project, all these elements, low intervention, as natural as possible, this way of working has to do with my academic background, with what I always believed, always taught. So it's applying all the theory in our project. This is not exposed in a very explicit way in our marketing vehicles, on our website. People until after visiting us say that we need to expose more what we do, but it is not there, we want to be recognized, but not in a very forced way, very bombarded in marketing."</p> <p>"Not starting from a correct production, as we usually say, is a shot in the foot, I will harm myself, my region, the collective, it does not make sense otherwise."</p> <p>"With this sharing of the media, it was we were able to enter the American market, by a wine club that began to request our wines and then began to enter some markets, even in the pandemic period."</p> <p>"When we left the pandemic, we started to participate in wine fairs and then the market opened up and had a great acceptance, especially by Michelin Star Chefs who began to adopt wine in their tasting menus."</p> <p>"When I look at my impact, in front of others, it is already smaller, but even though we can improve our conditions"</p> <p>"We are completely motivated, this is our philosophy, in business and in life. You can not be in the market otherwise. "</p>	<p>Costs</p> <p>"With the pandemic and the restaurants were closed, we had a complicated period. What we did as a strategy was to forward wine samples to some critics and to some wine clubs, to some experts who began to taste and evaluate the wine. It began to have a good acceptance, very positive reviews, including being presented in the specialized media, with important names to sign these criticisms and then began to generate a certain curiosity for them to know us."</p> <p>"About the labels or we do now or we will be penalized, but why only now talk about it? Why don't we train ourselves from the beginning? And it's an added cost. And that weighs, it's an additional cost, I have 15 different labels, 15 brands, 15 different bottles, and I'm going to have to pay again for the entire design to remake those labels."</p>	<p>Benefits</p> <p>"Our wine has been greatly appreciated for being a wine, that people who have already started to know the project and who continue with us"</p> <p>"The vineyards that were not being very well cared for or that were there in the very basic treatment, when we made this transformation to the biological quickly saw an improvement in quality, an improvement in productivity."</p> <p>"It is not easy to have much greater attention, but this shows that the work, when done well also brings great results. It needs a much closer look at the production of the vineyards, and this philosophy is also continued within the cellar."</p>	<p>Barriers</p> <p>"Our biggest challenge today is the packaging. We will never have a wooden box to sell our wines. For us it is absolutely unthinkable to spend from a natural resource like wood, quite long for nature. Nature has an important timing to offer us this to be absolutely neglected by us in such banal use, this for us makes no sense at all."</p> <p>"As we export, I have a big problem, I can not do reverse logistics of my bottles, goes to Brazil, United States, United Kingdom, so this is a problem, is a concern factor and it is a big challenge."</p> <p>"From what I do inside the gate, I try to manage there in the best way, but from the outside, it also depends on me. I do not control, but I am responsible. If I originate the product, if I make a heavy bottle even outside the house, I am responsible and that is where we are looking for improvement, it is a challenge."</p> <p>"Now there will be a greater, more aggressive communication on wine consumption and the incentive not to consume wine, which will also penalize immense industry, so there is a very great concern, although this is for health, there's a very big concern about how this will impact the industry."</p>	<p>Opportunities</p> <p>"In terms of opportunities, I can't concretely say that I migrated from a market A to market B, we've already entered this format."</p> <p>"The opportunities themselves, they come naturally with our placement, are intrinsic to the project and our philosophy. This has brought a more specific look to the product."</p>
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M	<p>"We are the oldest family of Port wine, we have been working in the business since 1620. The first records of the word Port wine are 1624, so we have records of the sale of wine even before the official designation of Port wine. And from 2020 until today we are once again opening markets, reactivating old customers."</p> <p>"The awareness of the way we work, because one of the things we did as soon as we picked up Ms and all the vineyards we've bought since 2020 is to do a restructuring of viticulture. We transform everything into regenerative viticulture and we are fully aware of the materials we buy, that is, sustainability, and the bases of the four are on the table in decision making. When we make a new purchase and what is the most sustainable material? This is on the table."</p>	Costs	<p>"Where we invest some money, in soil analysis, we do a lot and make investments in analysis of new products, in study of new products."</p> <p>"Costs are related to time, bureaucracy and the cost itself you have to pay an auditor."</p>
	<p>"I have worked very focused on sustainability. All that is numbers, percentages, footprints, all these names are very sensitive, there is a lot of greenwashing and there is a lot going on and so I will not cross with numbers."</p> <p>"I'm going to start with Governance, first this is a conversation that's on the table. It is part of the decision-making process, it's a question that is posed at all levels, whether it is by the human effort that is needed in some tasks, the workload, the task itself, all this, obviously, are taken into account in decision making"</p> <p>"Within the wine area we have wine, cellar, sales process. In the vineyard I can say that we are making a path to be as sustainable as possible, there is nothing called 100% sustainable. We will not risk a year of production if we have to use herbicides, we will not, because despite sustainability we need to pay bills, wages, etc. This is our path and the way."</p>	Benefits	<p>"The benefits in the vineyards are clear. The wines are fabulous, always have excellent scores are well received by the consumer or the customer and guarantee a stable product over time. So, in terms of the qualitative outcome of what we sell, even what we put on the table, which people consume, it is indisputably, the result is getting better and better."</p> <p>"In productive terms, which for us in financial terms, we have greater productions, is an advantage. It has also happened, so the direct result of improving practices in the vineyard are better wines, more quality, more quantity."</p> <p>"We are being largely rewarded in terms of costs, the cost of this has not only to do with the cost of study and testing and that manpower, but actually they are not that much higher costs"</p>
	<p>"What we have been learning is that what has been done since the 70s has causes in the medium term, much more serious, not only for the environment, but also for the vineyard itself, directly the vineyard. So we're doing a reverse path and that's spectacular. It's going back to ancient traditions, and it's not even a crazy science. You don't need to learn much, you need to talk to people who knew what was done in the 50's and 60's, in Portugal in the countryside."</p> <p>"Nowadays we are doing a preservation of the old vines, we are members of an association working on Education on Old Vines worldwide and on the importance of preserving old vines. (...) The preservation of old vines in the long term is a much more sustainable work than replanting every 20 years. Our work is very focused since always, long before this was a conversation, it was almost logical: we will preserve what exists."</p>	Barriers	<p>"Climate change creates barriers, creates uncertainty and uncertainty brings costs, whether moral costs or financial costs"</p> <p>"Climate change has been dramatic for the last 8 years (...) and we are not getting time to study. Studying the adaptation of each variety, soil, location, solar orientation, altitude, for these new changes, because they are happening fast and they themselves change (...) So we don't have time to do studies to realize this adaptation, now they are happening."</p>
	<p>"We remain completely motivated, this is the way."</p>	Opportunities	<p>"I think this path is more about opportunity and improvement. I don't see barriers. Of course we've been with this project for 3 years, so it's all a short time to be talking about what it is that can be our impediments, but never linked to sustainability or our practices or anything like that."</p> <p>"companies do not have to be afraid to innovate in their products, perhaps this is not 100% the basis of the portfolio and would be a step later to take, but within our short history, we can innovate"</p>

Appendix VI – Environmental Dimension Summary

https://docs.google.com/spreadsheets/d/1GBtaB46WzLA6u84Co1LAB1Sa1UhsJF8K/edit?usp=drive_link&oid=105882276385422491634&rtpof=true&sd=true

Appendix VII – Informed Consents

https://drive.google.com/drive/folders/1LvrvLpzyjU4OCWM23qglQi9ibHylEly-?usp=drive_link

Appendix VIII - Interviews Transcripts

https://drive.google.com/drive/folders/1fR4zXgpzTWY7D3SAf94L3qdWApkCsutJ?usp=drive_link