THE WINE SECTOR MANAGEMENT IN PORTUGAL: AN OVERVIEW ON ITS THREE-DIMENSIONAL SUSTAINABILITY

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ABSTRACT: The paper scrutinizes wine sector sustainability management in Portugal, which is a traditional wine producer. In Portugal, wine is strategic to its agri-food industry. As the wine market faced changes in consumption and an increase in the quality of the wine offered, new green products (organic, biodynamic) appeared for market niches concerned with environmental and health issues, as well as new ways of communication through the Internet and social media. First, we discuss a global wine market that affects wine market in Portugal, and then we present the internal situation and tendencies, including some examples of sustainable management of this sector in the economic, societal, and ecological dimensions. In the present work, the perspective is essentially of an entire economic sector, since in the Portuguese wine market the Old-World model prevails. This situation comprises high market fragmentation, and strong power exercised by distribution and consumers; it also means that wine production is subject to strict national and common market regulations. However, we do not abandon the micro analysis at the level of the company's relations with its stakeholders. The methodology adopted in this review is qualitative and it consists of critical analysis of the literature from diverse disciplines, but it also uses secondary sources, such as institutional and technical reports, databases, statistics, notes and media news.
KEY WORDS: wine; vine and wine sector; sustainability; social responsibility; social marketing; Portugal.

1. INTRODUCTION

Wine is one of the oldest alcoholic beverages (Moraes & Locatelli, 2010; Roese, 2008), as well as "a product, in which heterogenous facets are marketed abundantly" (Risius et al., p. 141). Vine-growing and a wine-related economy shape the natural environment and the Mediterranean landscape (Elías, 2008; Silva, Fernão-Pires, & Aguiar, 2018), affect the people working there, their families, culture, and prosperity. The concept of sustainable wine and grapevine management is defined broadly, because, in connection with ecological, social, and economic dimensions, it also includes culture, landscape and aesthetics as well as history and heritage (Borsellino et al., 2016; Merli et al., 2018; OIV, 2004, OIV, 2008; Sogari et al., 2016). The issues of sustainable wine sector management concern the market around the world, although some countries are more involved in them than others (Santini et al., 2013).

Portugal is one of the traditional producers and one of the largest per capita wine consumers (Alberto & Ferreira, 2007; Aurand, 2018; GPP, 2007). A strong sector of enotourism/wine tourism has also developed in Portugal around wine and in connection with local gastronomy and culture (Lourenço, 2017; Seguro & Sarmento, 2014, 2015; Silva et al., 2018; Simões, 2008). Besides the primary motivations of enotourism (wine testing, buying wine and learning about wine), there are others, no less important, reasons for wine tourism, such as entertainment, socialization, travel, and rest in rural areas, which are appreciated by people who do not necessarily have to be wine consumers (Bruwer, Prayag, & Disegna, 2017). During the recent coronavirus pandemic, wine tourism, like tourism in general, stagnated. However, frequency of wine consumption has increased, simultaneously decreasing the frequency consumption of other alcoholic beverages in European wine producing countries (EuAWE, 2020).

The main objective of this study is to analyse the current state of wine sector development in Portugal and show it from the point of view of sustainable management. Since the wine market is global (Aurand, 2018, Menna & Walsh, 2019; Rebelo, 2017; Roese, 2008), it is impossible to analyse only Portugal, without outlining the general trends in the wine market in the world.

The principal methodology of research adopted in this work is critical analysis of literature (desk research) from various fields of knowledge concerning this business sector, and including other secondary sources of information, such as discussion forums, blogs, press release, institutional and technical reports, and data bases. "Good critical literature reviews tell a story and help to advance our understanding of what is already known" (Jesson & Lacey, 2006, p.139). As we undertake research on a broader topic that is conceptualized and studied differently within different fields of knowledge, Snyder (2019) suggests in this case a semi-systematic review approach as an appropriate strategy for synthesizing and identifying knowledge gaps in literature. On the other hand, as Snyder (2019) argues, an integrative review approach is useful when the purpose of the review is not to cover all articles ever published on the topic, but rather to combine perspectives to create a new one. "By integrating findings and perspectives from many empirical findings, a literature review can address research questions with a power that no single study has. (Snyder, 2019, p. 333). Therefore, we adopt a mixed methodological approach.

The wine sector is a branch of the alcohol industry, which together with the tobacco industry, gambling etc., is included in the so-called industry of "sin", or controversial, morally stigmatized industries (Byrd et al., 2016; Grougiou, Dedoulis, & Leventis, 2016; Jahdi & Acikdilli, 2009). These are legal industries but perceived as harmful to human health and society because they may bring serious social problems (Byrd et al., 2016; Tsileponis & Tsintza, 2011).

For some time now issues of the so-called health-beneficial glass of red wine have also been raised (Moraes & Locatelli, 2010; Wilk, 2011). On the other hand, viticulture and wine processing are a branch of the agri-food industry, which significantly contributes to the devastation of the natural environment (Falcone et al., 2016; Pretty, 2008). At the same time, the agri-food market is characterized by a greater volatility of prices and income, and lower margins, due to limited government involvement and strong international competition (Rebelo & Caldas, 2015). Ecological or pro-

environmental practices and green production, which resort to organic production certificates or different logos, may influence consumers' choices, offering winegrowers the possibility to differentiate their products from competitors (Castellini et al., 2017; Junquera & Barba-Sánchez, 2018; Risius et al., 2019).

The following section offers a framework that guides review on sustainability management of wine sector. The changes and trends observed in the world wine market, including some insights from the pandemic state, precedes the analysis of the Portuguese wine sector, since they impact the latter. The sustainability management of the Portuguese wine sector is analysed in the later section. The review outlined in this paper closes with final considerations.

2. MAPPING THE TERRITORY OF KEY TOPICS ON SUSTAINABILITY MANAGEMENT IN THE WINE SECTOR

Sustainable development consists of maintaining a long-term relationship between humans and the environment in which the survival of the production system depends on the preservation of natural resources, social capital, and the provision of enough income to support them (Abraham, Alturria et al., 2014). Sustainable development is an incremental process in the ecological, social, and economic dimensions (Abraham et al., 2014; Mariani & Vastola, 2015). All activities aimed at sustainable management should always consider first the natural environment, second - social aspects, and third - economic results (Markman & Krause, 2016; Ostasiewicz & Ostasiewicz, 2017). However, sustainable management issues do not seem to be a priority in strategy-making (Santini, Cavicchi, & Casini, 2013).

The notion of sustainable development/management, which is not very precisely defined (Borsellino et al., 2016; Castellini, Mauracher, & Troiano, 2017; Markman & Krause, 2016), is assumed here as synonymous for equally imprecise concept of social responsibility (Murphy & Schlegelmilch, 2013) and triple bottom line or people, planet and profit, as it often comes up in the literature of the subject (e.g., Garriga & Melé, 2004; Kudłak & Low, 2015; Merli, Preziosi, & Acampora, 2018).

Wine has always been treated by vine and wine producers as a natural product (Alberto & Ferreira, 2007; Merli et al., 2018; Sogari, Mora, & Menozzi, 2016). While, in other sectors, the effects of degradation of the natural environment have long been seen as an effect of the race to maximize profit or utility - bottom line, and the growing need to take action with regard to sustainable production and consumption has been felt, wine producers started to worry about these issues relatively late (Alberto & Ferreira, 2007; Merli et al., 2018; Sogari et al., 2016). Other potential factors that may have aroused the interest of wine producers in sustainability issues in traditional producing countries may be the stifling competition in the common European market (Castellini et al., 2017; Lombardi et al., 2016; Mariani & Vastola, 2015; Menna & Walsh, 2019) and the competitive threat of new producer countries (Menna & Walsh, 2019), taking into account that the wine market is global (Aurand, 2018; Lombardi et al., 2016; Menna & Walsh, 2019; Rebelo, 2017; Roese, 2008) and in the stage of maturity (Menna & Walsh, 2019). Currently, issues of sustainable production are increasingly considered in the wine sector, in addition to other quality characteristics such as origin or ratings (Sogari et al., 2016; Risius, Klann, & Meyerding, 2019), while environmental proactivity is assumed to be a source of competitive advantage (Junquera & Barba-Sánchez, 2018).

Schaltegger and Burritt (2018), analysing the motivations and activities of social responsibility, distinguish four situations of business cases regarding sustainability management activities. This means that the approach to sustainability management can be based on different ethical foundations and result in different economic performances for the company to survive in the long term. Schaltegger and Burritt (2018) define the "business case" as "a device to represent the perspective managers of business take on commercial activities related to sustainability" (p. 241). These types are as follows: the "reactionary" (CSR activities treated as necessary costs in order to maintain and protect conventional business; short-term profit maximizing as a primary goal of activity; self-seeking behaviour; financial approach to sustainability; corporate philanthropy as sustainability activity, and utilitarianism as an ethical basis), the "reputational" (narcissistic CSR management; focus on reputation and image and short-term profits; CSR as a mean of communication to protect the company's and/or brand reputation; seeking for grandiosity; CSR activities well-advertised and reported), the "responsible" (technocratic sustainability management; business as a responsible citizen; search for excellence in terms of efficiency, quality and performance in three dimensions - economic, social and environmental; clean production; process and product/service innovation; long-term success), and the "collaborative" business case logics (dialog-based management and engagement; involvement of a wide range of stakeholders; sustainability as an opportunity to enhance societal and environmental well-being, not forgetting the company's financial viability; joint value creation to solve sustainability problem). In any national wine market in Europe, we can probably find a mixture of the four, with changes over time and depending on the type of leadership, economic, social, and political situation etc. According to Schaltegger and Burritt (2018), smaller firms more easily evolve to the "collaborative" type, since they have few decision-making levels.

Consumers identify themselves more with companies that are strongly committed to a social cause (Gautier & Pache, 2015; Guerreiro, Rita, & Trigueiros, 2016). Cause-related marketing aims to create a positive image of the brand (brand awareness) and increase business results (profit, market value, market share, etc.) by supporting a social cause (Baghi, Rubaltelli, & Tedeschi, 2009; Guerreiro et al., 2016). Cause-related, or more widely, social marketing is not an easy task in the case of wine producers, as most countries impose strong restrictions on the advertising and promotion of alcoholic beverages. Direct association of a social cause with the purchase or consumption of an alcoholic beverage, belonging to the controversial industry (Byrd et al., 2016) can be counterproductive, creating an immediate sensation of hypocrisy, which can lead to loss of reputation or damage the image (Jahdi & Acikdilli, 2009). Consumers may have a sceptical attitude towards green claims, environmental certifications, and other seals of approval, questioning who benefits most from this ethical campaign (Guerreiro et al., 2016), they can take it as a form of greenwashing, especially in controversial industries (Jahdi & Acikdilli, 2009). Byrd et al. (2016) underline that companies in the controversial industries, when communicating with the market, often use the language that subtly seeks to mitigate the negative impact, e.g., using the phrase "responsible drinking" instead of "drinking problem".

Another way to attract consumers and earn their trust is corporate philanthropy, whose importance increased during the 2007/9 recession (Gautier & Pache, 2015) and certainly even more so in the recent 2020/21 coronavirus pandemic. The difference between philanthropy and cause-related marketing may be very small, and in the opinion of some authors none, because philanthropy "is used as a form of public relations or advertising, promoting a company's image or brand through cause-related marketing or other high-profile sponsorships" (Porter & Kramer, 2002, p. 57). Philanthropy consists mainly of donating money, other material resources, including donations in kind and volunteering to social charity causes, without expecting anything in return directly (Gautier & Pache, 2015). Philanthropy indirectly serves the interests of the company, by creating the goodwill of society in general and local communities, strengthening the company's or brand reputation and image, and shaping the competitive context (better environment for business) (Gautier & Pache, 2015¸ Porter & Kramer, 2002). Companies in controversial sectors with significant consequences on the natural or social environments (e.g., alcohol, tobacco industries) practice philanthropy to mitigate their negative impact on consumers (Gautier & Pache, 2015). "Global effectiveness of corporate philanthropy on consumer choice is, at best, equivocal" (Gautier & Pache, 2015, p.358).

3. THE WORLD WINE MARKET

Wine is one of the noblest and oldest alcohol beverages, consumed in the Mediterranean region for about 7,000 years (Moraes & Locatelli, 2010). In addition to economic value, it is also of great ritual and symbolic importance in various religions (Roese, 2008). Compared to other food products, wine does not spoil quickly, but during storage it can improve its quality, giving the owners the opportunity to get a higher sale price in the future (Tul-Krzyszczuk & Kołakowska-Paszkiewicz, 2008).

In 2017 there were 7.5 million hectares of vineyards worldwide, which gave 73.3 million tons of grapes (37% in Europe, 34% in Asia and 19% in America), being almost half of them used to produce wine (90%), musts and juices (10%), yielding 248 million hl of wine (Aurand, 2018; OIV, 2018). In the meanwhile, from 2000 to 2016 the volume of wine produced in the world has not undergone major changes (Gouveia & Macedo, 2017).

Spain, China, France, Italy, and Turkey are the countries where half of the world vineyards grows (OIV, 2018; OIV, 2019); and 63% of world wine production comes from five countries - Italy, France, Spain, USA, and Argentina (Aurand, 2018; OIV, 2018; OIV, 2019). USA, France, Italy, Germany, China, Great Britain, Spain, Argentina, Russia, and Australia are the 10 largest global wine consumers (Aurand, 2018; OIV, 2018; OIV, 2019).

The growth of international wine trade has made it a global product and industry (Aurand, 2018; Lombardi et al., 2016; Menna & Walsh, 2019; Roese, 2008). In 2000, imported wine accounted for 29% of world wine consumption, while in 2017 it reached already 44%, what indicates its globalization (Aurand, 2018). The wine market is now a mature market (Menna & Walsh, 2019).

According to Statistical Report (OIV, 2019), the biggest positive variation in wine consumption for 2018/2014 was in the case of Portugal (29%), Mexico (28.6%), and Poland (21.2%), while the respective negative variation was greater in the case of Chile (-22.2%), Austria (-21.6%), and Greece (-20.6%).

"Winery, once compared to art, now turns gradually into one of the most impressive industries in modern Europe" (Wilk, 2011, p.135), becoming a fashionable product and a trend around the world (Elías, 2008). "Wine does more than create a warm bond between people /.../ takes us to another level of living which we call lifestyle" (*Wine Touring*, 2007, p.13). The wine market is mainly operated by SMEs – small and medium-sized enterprises (Glinsky, Newton, & Vega, 2016). In connection with wine, the enotourism sector is also thriving, not only due to the direct economic interest of winemakers, as a leverage of their current activity, but also and mainly as a result of the development of events related to local wine and gastronomy (Montella, 2017).

The world wine market has undergone a profound change with the entry of producers from the so-called New World (USA, Argentina, Chile, Brazil, Australia, New Zealand, South Africa) and the emergence of a new global culture of wine consumption (Garcia-Parpet, 2004; Glinsky et al., 2016; Inhan et al., 2013; Roese, 2008). Over half of the world's wine export falls into countries of the Old World (Glinky et al., 2016; OIV, 2019) and Europe remains the largest wine production and consumption market (Lombardi et al., 2016).

In general, we can now talk about two ways of producing and commercializing wine: The Old-World way and the New World one. The Old-World way is characterized by highly fragmented national European markets, small family-owned vineyards, privately held firms and cooperatives, small-scale, often manually picking grapes; strict regulations control many aspects of wine-making; long multilevel value chain; classification of wines according to the designation/denomination of origin or geographical indication based on the rules of "terroir"; higher rivalry among wineries and higher price sensitivity of consumers etc. The New World way is characterized by generally concentrated national markets, dominated by large publicly traded corporations retaining bargaining power with distributors; control of the full value chain; strong investment in technology and innovation to reduce operating costs; large-scale, industrial mode of production, mechanical grape harvesting; little control of viticulture and wine production; up-to-date marketing and market orientation; consumers' education about wine by wineries; classification and differentiation of wines according to the variety of grapes used for wine production etc. (Elías, 2008; Menna & Walsh, 2019; Roberto, 2003; Silva et al., 2018).

Dissemination of wine consumption is the result of an increase in the supply of quality wines and a fall in their prices (Hisano, 2017; Menna & Walsh, 2019; Roese, 2008). Lombardi et al. (2016) add the excellent image of the European lifestyle. Another important factor in the growth of interest in wine is linking it with the social status of the client, as a visit to a vineyard, knowledge about wine, and the opportunity to taste selected brands of wine ennoble the consumer (Elías, 2008; Hisano, 2017). "The selection of a wine with simultaneous consideration of a multitude of attributes requires knowledge on the consumer side" (Risius et al., 2019, p. 141). Enotourism, visiting wineries and cellars, provides authentic experience, increases consumers' awareness of wine brands, extends their knowledge about the characteristics of the vine and wine region, and influences their subsequent buying behaviours (Bruwer, Prayag, & Disegna, 2017).

In the literature on the subject, numerous attempts are made to strategically analyse the wine market (e.g., Alberto & Ferreira, 2007; Roberto, 2003; Tul-Krzyszczuk & Kołakowska-Paszkiewicz, 2008; MarketLine, 2014). In addition to the differences, mainly concerning the specificity of domestic wine markets and emerging markets, the following features are common to these analyses: significant impact of substitutes (beer and other alcoholic beverages perceived as more attractive in terms of taste, convenience of consumption and availability); impact of the bargaining power of buyers/customers (prices, margins, quality and organoleptic requirements; negotiating power of distribution channels - economies of scale, learning and scope); the threat from the emergence of new competitors (in the case of Portugal, this applies only to competition on the international market) (Alberto & Ferreira, 2007; Tul-Krzyszczuk & Kołakowska-Paszkiewicz, 2008).

For new emerging competitors, the wine sector seems to be attractive due to its size, global reach, increase in consumption and sales in some markets, as well as social interest in wine, related to fashion and social prestige (Alberto & Ferreira, 2007; Elías, 2008; Tul-Krzyszczuk & Kołakowska-Paszkiewicz, 2008). However, as wine is a product of complex experience, in which the intangible characteristics of credibility are a determining factor for success in the market, it is suggested for new competitors to look for new, niche markets (Rebelo, 2017a; Lourenço-Gomes et al., 2017).

From the consumer's perspective, the most important thing when deciding about a wine purchase is its quality, taste, price, and the client's personal preferences (Mariani & Vastola, 2015; Martins et al., 2018; Rebelo, 2017b; Tul-Krzyszczuk & Kołakowska-Paszkiewicz, 2008), because most people consume wine for pleasure and not to have any intellectual or geographical experience (Woodard, 2014). Most consumers do not want to pay too much for wine that is environmentally friendly or certified as "biodynamic", "organic" etc. (Glinsky et al., 2016; Mariani & Vastola, 2015; Martins et al., 2018; Merli et al., 2018), although these types of wines are also future-oriented segments worthy of attention and care (Rebelo, 2017a). Similarly, on-line sales (e-commerce) are becoming more and more popular, especially among wealthier, better-educated consumers (Rebelo, 2017a, 2017b), as well as new ways of communication via Internet and social media (Antonio, Basiricò, & Seccia, 2019).

In high-income countries, consumers increasingly prefer wines of superior quality (Menna & Walsh, 2019). There are also niches in the wine market that place emphasis on environmentally friendly production (Junquera & Barba-Sánchez, 2018). Green products (considered vague term) confuse consumers, who are not well informed about their characteristics, and that may influence their choices (Castellini et al., 2017). Risius et al. (2019), from a survey of a sample of German consumers, conclude that geographic origin (*terroir*) as an attribute of wine quality is important for the consumer, while information about organic production or respective medals and awards still does not seem to have much impact. Depending on the situation (formal or other occasion), consumers want to pay a moderate price for wine, which does not support the opinion that they seek only low prices (Risius et al., 2019).

During the coronavirus lockdown of 2020, as the authors of the survey on a sample of 7300 alcohol (including wine) drinkers from Spain, France, Italy and Portugal conclude, the frequency of wine consumption has increased, the average price of wine and the consumption of other alcoholic beverages have decreased; the frequency of alcohol consumption has increased more among people aged 30-50, while among young people it has decreased, people with higher incomes have consumed wine more frequently, while those with lower incomes have consumed beer more frequently, about 70% of drinkers considered it important during the crisis to buy local wine (EuAWE, 2020).

Unlike white wine, red wine contains in its composition a high level of antioxidants (resveratrol etc.) as red wine stays longer in contact with the peel and seeds in which antioxidants are contained (Moraes & Locatelli, 2010; Pinder, 2011). In 1992, the so-called "French paradox" was put forward, i.e., a lower incidence of coronary diseases was stated in France regarding people with a high intake of saturated fats, what was attributed to the consumption of wine (Moraes & Locatelli, 2010). The beneficial effect of antioxidants on health, with limited consumption of red wine during a meal (two glasses a day for men and one glass for women) is supposed to have anti-cancer and anti-inflammatory effects, to help reduce LDL cholesterol and triglycerides and reduce the risk of cardiovascular diseases (Moraes & Locatelli, 2010; Pinder, 2011). Research and literature on the positive impact of limited wine consumption on human health are ambiguous, and the alcohol it contains may cause addiction and other negative effects (Moraes & Locatelli, 2010; Pinder, 2011). The legislation of many countries, including Portugal, strongly restricts the advertising of alcoholic beverages.

Ecological issues in the wine market have long been non-existent because viticulture and wine production were widely considered to be natural and biological processes (Alberto & Ferreira, 2007; Merli et al., 2018; Sogari et al., 2016). Sustainable viticulture and wine production have become of interest to the International Organisation of Vine and Wine (OIV) since 2004 at least (OIV, 2004; OIV, 2008). Thanks to the increase in awareness, over the last 20 years, in this sector numerous initiatives have been developed and various tools and programs for sustainable management have been implemented (Mariani & Vastola, 2015; Merli et al., 2018, Sogari et al., 2016). Despite the efforts made in this direction, the concept of sustainable management of the wine sector is not sufficiently developed yet (Martins et al., 2018; Merli et al., 2018). In the European wine sector, sustainable wine is often limited to organic, or biodynamic wine, whose production minimizes the negative impact on the environment, mainly when it comes to the use of chemicals; for a wine to be considered organic, it must meet certain criteria that are not homogeneous in different countries and must be certified by a competent institution (Borsellino et al., 2016; Castellini et al., 2017; Rebelo, 2017c). Organic and biodynamic wines are growing businesses, but they have little weight in the wine sector in general, with Spain, Italy and France being the largest European producers (Castellini et al., 2017). Producing a bottle of biodynamic wine can cost 50% more than traditional one, and its price cannot be much higher (Castellini et al., 2017).

In scientific research, the dominant approach to sustainable vine-growing and wine production is the so-called life cycle thinking/assessment - LCT/A (e.g., Falcone et al., 2016; Mariani & Vastola, 2015; Martins et al., 2018; Merli et al., 2018; Neto, Dias, & Machado, 2013). In the wine lifecycle, which covers, inter alia, such areas as agriculture, marketing and logistics, waste utilization, meeting standards, the following phases are generally distinguished: viticulture,

winemaking, bottling and packaging, storage, distribution, retail sale, consumer use and recycling (Martins et al., 2018; Merli et al., 2018). Literature shows that one of the most important threats to natural environment and source of costs in the supply/value chain of wine, regardless of the country or the producer, is viticulture, due to the use of plant protection chemicals, fertilizers, and fuel for machinery (Falcone et al., 2016; Mariani & Vastola, 2015; Martins et al., 2018; Merli et al., 2018; Neto et al., 2013). Another important stage that has a significant impact on the natural environment is processing and fermentation (Martins et al., 2018). Numerous authors draw attention to the stage of bottling of wine and the emission of greenhouse gases associated with the production of bottles (Mariani & Vastola, 2015; Martins et al., 2018; Merli et al., 2018; Neto et al., 2013). However, consumers of quality wines belonging to the more affluent part of the society, do not want to buy wine in thinner bottles, which would reduce the carbon footprint, as they associate that with a decrease in the quality of the product (Mariani & Vastola, 2015). At all stages of the wine life cycle, water consumption is a very important factor, and this problem will grow due to climate change negatively affecting the quality of production (Fraga et al., 2012; Fraga et al., 2017; Mariani & Vastola, 2015; Merli et al., 2018).

The specified and assessed or omitted phases of this cycle in each study are so different that it is practically impossible to draw precise conclusions and use comparative analysis. In addition, almost all these analyses, as well as initiatives and practical activities, focus mainly on the ecological dimension, to a lesser extent economic, almost omitting the social dimension and the cycle stages related to distribution, sales, and consumption (Martins et al., 2018; Merli et al., 2018; Neto et al., 2013). Such stakeholders as vineyard workers exposed to chemicals used in the protection or fertilization of plants, people living in the neighbourhoods of vineyards etc., they are often overlooked (Glinsky et al., 2016).

4. PORTUGUESE WINE SECTOR AND EFFORTS TO ITS SUSTAINABLE MANAGEMENT

The origins of wine culture and vine plantations in Portugal date back to the Bronze Age, or over 2,000 years BC, although wild vine fossils from the lower Pleistocene have been found there (Silva et al., 2018; Wines of Portugal, n.d.). Wine has been a component of the daily diet in today's Portugal since 700 BC, and the development of Christianity in the VI - VII centuries gave it a symbolic character, increasing its range and scale of consumption (Silva et al., 2018; Wines of Portugal, n.d.). In the 12th - 13th century wine became the first export commodity of Portugal (Silva et al., 2018). At the time of geographical discoveries, Portuguese wines reached all continents, and the return journey gave them fame thanks to the new technique of aging wine (Silva et al., 2018). The first "designations of origin" were established in Portugal as early as in 1907/8 (Vinho Verde, Dão, Colares, Carcavelos, Madeira and Moscatel from Setúbal); there are currently 14 geographical indications and 31 designations/denomination of origin, but the oldest demarcated region in the world (Port wine region) was established in 1756 (ANDOVI, n.d.; Fraga et al., 2017; Inhan et al., 2013; Silva et al., 2018).

The culture of vine is strongly rooted in Portugal, representing the main agricultural crop (15% of arable land), whereas wine plays an important role in the Portuguese economy (Alberto & Ferreira, 2007; Fraga et al., 2012; GPP, 2007; Neto et al., 2013; Silva et al., 2018).

Wild vines (*vitis sylvestris*) can still be found on the banks of such Portuguese rivers and river basins like Tagus, Sado, Guadiana or Odelouca (Silva et al., 2018). Portugal is the country with the largest diversity of grape types, over 300 varieties (Alberto & Ferreira, 2007; Fraga et al., 2012; GPP, 2007). Up to 89% of the total vine-growing area (constituting protected geographical indications and protected designations/denominations of origin) grows 34 main vine varieties (18 red varieties and 61% cultivated areas and 16 white varieties and 28% cultivated areas) representing at least 1% of crops (Silva et al., 2018).

In 2017, Portugal occupied the 10th place in the world regarding the vine-growing area (decrease of 15.4% over the last five years), the 11th concerning wine production and consumption (increase in consumption by 23.1% in the last five years) and the 9th place as a wine exporter (Aurand, 2018; OIV, 2018). In 2017 wine consumption *per capita* in Portugal reached the highest level in the world (58.8 l), gaining France (50.7 l) and Italy (44 l) (Aurand, 2018). For the foreseeable future, it is expected that the major producing countries and exporters in southern Europe, with excess of production relative to domestic consumption (e.g., Spain and Italy), will limit Portugal's position in the international market, as they are direct geographical competitors who base their business on the "terroir" rules (Rebelo & Gonçalves, 2017). The "terroir" wine refers to a unique, original, delimited geographical area, characterized by specific conditions (geomorphology, climate, soil type, specific vine-growing practices, particular wine-making techniques etc.) as well as to identity and cultural/historical heritage (Garcia-Parpet, 2004; Inhan et al., 2013; Risius et al., 2019; Roese, 2008; Silva et al., 2018); in comparison with branded wine, "terroir" wine has a higher market value and differs in terms of market positioning and distribution (Martins et al., 2018).

Menna and Walsh (2019), distinguishing four wine market environments and related strategies for the wine industry, classify Portugal along with France, Italy, and Spain as a cluster of traditional producers in which wine demand and consumption is falling (which is true only in the case of France), with a very mature market and with high vino-sophistication.

The Portuguese wine market is very competitive and highly fragmented (Alberto & Ferreira, 2007; MarketLine, 2014). About 50% or less of wine is produced by small and medium-sized producers/farmers associated in cooperatives (GPP, 2007; IVV, 2011; Rebelo & Caldas, 2015). However, as globalization and competition on the wine market increase, cooperatives lose their share in this market, because they gather small farmers/producers (about 1.6 hectare/farm), mostly male with a very low level of education and an advanced age – average age around 60 (Figueiredo & Franco, 2018; Rebelo & Caldas, 2015). Cooperatives are very resistant to change and operate based on a strong sense of belonging to the community, as well as mutual trust among their associates, where economic performance or success is not the most important factor (Figueiredo & Franco, 2018). In 2011, in Portugal, there were 90 cooperatives with 32,000 associates in the vine and wine sector, 13 cooperatives less and 15% fewer associates than in the previous 3 years (IVV, 2011). 21849 companies operate in Portugal at different stages of wine processing (IVV, 2017). Most of them are micro and small and

medium-sized enterprises (Alberto & Ferreira, 2007; Lourenço, 2017). In Portugal, as in other European wine producing countries, vertical integration is common among wine producers (MarketLine, 2014; Stasi, Seccia, & Nardone, 2009), because most of them own or lease vineyards, although large companies often must obtain grapes from external suppliers (MarketLine, 2014). The wine sector is characterized by a long cycle of conversion into liquidity (Lourenço, 2017).

Employment at grape harvest is seasonal, and the once cheap labour force, with the current lack of hands to work, especially when it comes to specialized work like pruning, has resulted in a significant increase in daily payments (Alberto & Ferreira, 2007). At present, the average cost of hired labour during the grape harvest in Portugal is around 40-45 euros per day (8 hours of work) and depends on various factors, mainly the slope of the land and the wine region (Sousa & Barros, 2011). These costs are more or less three times higher in the Douro region than in Alentejo, because the Douro region is a mountainous area where recruitment is difficult due to hard work and its seasonality; in the Douro region manual labour dominates, and the labour cost reaches 70-80% of total costs, while in the Alentejo mechanization is already significant in some places; the majority of seasonal workers are people with minimal education, coming from the same region or neighbouring villages; however, in the years when there were no hands to work, foreigners were employed, from Eastern Europe (Sousa & Barros, 2011). Nowadays the tendency is to resort to workers from Asia (India, Thailand, Pakistan, and Nepal) as well as from Africa (Faget, 2018). In Minho, the Vinho Verde region, the cost structure is as follows: 38% labour cost, 23% cost of machinery and equipment and 38% indirect costs (Sousa & Barros, 2011).

Portuguese consumers prefer domestic wines, what was strongly confirmed in the recent coronavirus pandemic (EuAWE, 2020a), exerting strong pressure on prices and margins; price is the basic criterion of choice, although the segment of more demanding consumers is constantly growing; apart from the price, the type of cork, the year of the wine harvest, the colour of the wine, the region and the label are important for the customers; impact of large grocery distribution networks ("on-trade/horeca" distribution - including bars, restaurants, clubs, cafés and hotels, excluding retail outlets, i.e. "off-trade", super- and hypermarkets, stores etc.); cork suppliers (with the Amorim group - the world leader in the cork market) and glass packaging (bottles) have a significant impact on the wine sector; in the wine market, there is a strong rivalry between current producers, resulting from large fragmentation of production, a large number of protected geographical indications and denominations, overproduction of wine and accumulated stocks (Alberto & Ferreira, 2007; Lourenço-Gomes et al., 2017; MarketLine, 2014). As far as distribution is concerned, the share in the Portuguese wine market is as follows: "on-trade/horeca" - 62.4%, specialized retailers - 13.8%, supermarkets and hypermarkets - 11.6%, gas stations - 5 %, others - 7.2% (MarketLine, 2014).

During the coronavirus lockdown, as the authors of the survey on a random sample of 1699 alcohol (including wine) drinkers conclude, most Portuguese have consumed alcoholic beverages in normal conditions; 36% have drunk wine more frequently, compared to the consumption of other alcoholic beverages; the average wine expenditure has decreased; wine purchases in physical stores have decreased while self-stocking and online purchases have increased; 73% preferred to buy local wine, supporting the Portuguese economy; 28% participated in family or friend online meetings to taste the wine and 30% of them said they would continue to do this after the lockdown (EuAWE, 2020a).

To promote the general image of Portuguese wine, all producers in the sector are charged a fee, which reverts to a public institution, IVV – Instituto da Vinha e do Vinho (GPP, 2007; https://www.ivv.gov.pt/np4/home.html). The amount charged subsequently reverts to an association that makes the generic promotion of Portuguese wine – ViniPortugal (GPP, 2007). ViniPortugal (https://www.viniportugal.pt), founded in 1997, it associates producer associations and organizations, distributors, cooperatives and distillers and aims to promote Portuguese wine, including the management of the national brand Wines of Portugal (http://winesofportugal.info/). The network of regional vine and wine commissions, CVR - *comissão vitivinícola regional*, which also has the responsibility of promoting the wines of the respective region, and does not have specific rates for this purpose, channel a part of their revenues for this purpose. In the promotion of Portuguese wine other organizations are also involved, such as AICEP Portugal Global (http://www.portugalglobal.pt/PT/Paginas/Index.aspx) or Andovi – Associação Nacional de Denominações de Origem Vitivinícolas (http://www.andovi.pt/).

In Portugal, as in other wine-producing countries, in research, the concept of sustainable management in this sector is defined broadly, as "a long-term strategy connecting the environmental, heritage, cultural, economic and social components" (Rebelo, 2017, p.18). Among the numerous initiatives on sustainable vine-growing and wine production covering all regions of Portugal, the wine sustainability program from the Alentejo region, *PSVA*/WASP – Programa de Sustentabilidade dos Vinhos do Alentejo, is probably the one that stands out the most (CVRA, n.d.; Inácio, 2018). It was initiated by the regional vine and wine commission of the Alentejo, CVRA – Comissão Vitvinícola Regional Alentejana, including the University of Évora, 323 producers representing 7889 hectares of viticulture and 72 million litres of quality wines (CVRA, n.d.). The last annual report of IVV for 2015/16 reported that 490 Portuguese producers obtained 20099 hl of organic wine from 2719 hectares of vines (IVV, 2017), but beyond general statistics on organic production, and their compliance with European Union standards and a few slogans on a sustainable economy, the report did not contain information on actions towards sustainable management of this sector. Currently, more than 90% of vines in Portugal possess a certificate of integrated or organic production stating a minimal interference, both in terms of plant protection products and the use of mechanical means (Ramos, 2018). The problem of water scarcity, known in other parts of the world, is also increasingly felt in Portugal (Fraga et al., 2012; Fraga et al., 2017).

Biodynamic or organic production does not necessarily mean sustainable production (Borsellino et al., 2016; Merli et al., 2018; Santini et al., 2013), as it may result from economic motivations only (marketing strategy, company image etc.), associated with an increase in demand for this type of products, and not from environmental and/or social motivations, or, more broadly, from ethical reasons.

For some time now, in Portugal, wine producers and wineries have joined forces with fine arts, music, literature, photography etc., to promote each other, organizing arts and wine events (sessions, meetings, expositions, concerts,

workshops, visits, recitals, wine dinner, tastings etc.) which insert in the concept of social marketing, where, e.g. a new bottle label is created to promotes art among wine consumers, to build a company image or reinforce its reputation; at the same time, it is a source of income for the artist and enhances the image of the region where the wine is produced (https://vinhoearte.pt/; https://nit.pt/comida/gourmet-e-vinhos/ea-quando-vinho-e-arte-se-juntam).

In the initial phase of the 2020 pandemic, one of the examples of fighting the virus in Portugal was the production of alcohol-gel by the wine cellar, Casa Ermelinda Freitas (http://www.ermelindafreitas.pt/en/), in cooperation with the Polytechnic Institute of Setubal, in a period when this type of alcoholic hand sanitizer lacked or was sold out in the market (Carvalho, 2020). This was not the only case of social responsibility that made news in the national media and helped the local community (hospitals, prisons, social solidarity institution etc.). This philanthropy action made by the company may reinforce its image and reputation.

5. FINAL CONSIDERATIONS

The vine and wine sector has traditionally been assumed to be natural or biological what led to the late implementation of the concept of sustainability in this case.

The reviewed authors draw attention to the high heterogeneity of indicators of sustainability, a situation that does not facilitate the work of farmers/vine-growers and wine producers and make it impossible to carry out a precise comparative analysis. This multitude of technical indicators, the diversity of certificates and programmes increases the costs of running business operations, introduce confusion among producers and discourage consumers. Consumers are not totally aware of eco-labelling, the information on wine labels seems to be too complex and incomprehensible etc. Consumers are also sceptical about green claims, although the niche of organic and biodynamic wines markets is stabilizing. An important factor in the development of sustainable management of the wine and viticulture sector, especially in the economic and social dimension, seems to be enotourism. Wineries need to offer visitors a holistic experience of the region and an experience that combines wine with local food and tradition, but this requires a professionally prepared and adequately paid staff with foreign language skills, different from the skills required for manual workers who do seasonal work in the grape harvesting. The mature wine market still offers many other possibilities of innovation and their communication to the market.

During the coronavirus pandemic, wine tourism was overtaken by several forms of digital marketing since direct contact became impossible.

Portugal and Portuguese wine producers are following European and world trends in sustainable wine market management, and experimenting with new solutions (enotourism, social marketing, online tasting, viticulture renovation, biodiversity care etc.), but they are limited by the requirements imposed by clients (on-trade/*horeca* distribution) and consumers of wine as well as increasing production costs.

The initiatives of external stakeholders (institutes as well as supervisory and control institutions, e.g., OIV, IVV, IVDP – Instituto do Vinho do Douro e do Porto; regional commissions of vine and wine – CVR; associations, national and international legislative bodies as well as political ones; research and development and university institutions) have a very important role in promoting sustainable vine-growing and winemaking, beyond the inner motivation of its producers. Although the most important issue is the consumers' conscious purchase of wine, consumers do not seem to attach much importance to the issue of sustainable management in this sector.

In order to raise the standards of sustainability in the market, wine producers, wine and vine associations, as well as national and international institutions that oversee this sector, have to undertake multifaceted actions: educating and sensitizing the consumer and vine grower; influencing their behaviour (e.g. using the tax incentives like in greener or less polluters vehicles), simplifying (but not trivializing) access to information by standardizing eco-labels, trying to relate eco-labels to geographic origin (*terroir*), grape variety etc.

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