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Is there sustainable entrepreneurship in the wine industry? Exploring Sicilian wineries participating in the SOSTain program

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Abstract

Global climate change and the accelerating depletion of natural resources have contributed to increase discussions about the role of private enterprises in reversing negative environmental trends. Rather than focusing on profit maximization, policy makers and consumers pressure groups expect firms to meet a triple-bottom line of economic, environmental and social value creation. Hence sustainable entrepreneurship has received recently increasing interest as a phenomenon and a research topic. More recently, the concept of sustainability has been taken seriously in the Italian wine industry. The organizational challenge for entrepreneurship is to better integrate social and environmental performance into the economic business logic. The aim of this manuscript is to illustrate, through a descriptive approach, the adaptation of the wine industry to the new scenario of sustainable entrepreneurship. To reach this goal we carried out an explorative analysis of 3 Sicilian wineries involved in the SOSTain program, which aims at the improvement of sustainability in the wine industry. The findings of the analysis show the existence of sustainability-driven entrepreneurship, in which the wineries undertake to behave ethically and contribute to economic development while improving the quality of life for the workforce, their families, the local and global community as well as future generations.

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1. Introduction

Research institutions and business schools around the world have confirmed that entrepreneurial activity plays a very important role in contributing to economic growth (Harding et al.,

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2002). Many studies in this field are based on the assumption that entrepreneurship involves economic activity driven by self-interested, profit-seeking motives, often overcoming nature's limits (Parrish, 2010; Tilley and Young, 2009; Beus and Dunlap, 1990). In fact, the firm is often viewed as one of the contributors to environmental degradation (Cohen and Winn, 2007).

Global climate change and the accelerating depletion of natural resources have led to an increase in the discussions about the role of business in reversing negative environmental trends. Therefore, rather than focusing on profit maximization, policy makers and consumers pressure groups expect firms to meet a triple-bottom line of economic, environmental and social value creation (Caracciolo et al., 2016; Cembalo et al., 2016; Migliore et al., 2015a; Lombardi et al., 2015; Hockerts and Wüstenhagen, 2010). Furthermore, the organizational challenge for entrepreneurship is to better integrate social and environmental performances into the economic logic of business. Hence, sustainable entrepreneurship has received in the last years an increasing attention both as a phenomenon and as a research topic (Gibbs, 2006; Schlange, 2006; Dean and McMullen, 2007; Choi and Gray, 2008; Hall et al., 2010).

The research on sustainable entrepreneurship has evolved from two independent research streams on social and environmental entrepreneurship (Migliore et al., 2015b; 2014; Schaltegger and Wagner, 2011; Hockerts and Wüstenhagen, 2010). Social entrepreneurship is defined as an activity whose main objective is not only the obtainment of a profit, but also the creation of social values, recognizing the new opportunities that have emerged because of the increased importance of social issues (Bacq and Janssen, 2011; Mair and Marti, 2006; Tilley and Young, 2009; Schimmenti et al., 2016). In the same vein as social entrepreneurship we find the concept of environmental entrepreneurship. Its main goal is to combine existing resources to solve environmental problems and leverage new economic opportunities (Cohen, 2006). In other words, the core motivation in environmental entrepreneurship is to earn money through contributing to solving environmental problems (Schaltegger, 2002).

Even though the concept of sustainable entrepreneurship is still poorly defined, Cohen and Winn (2007), drawing from Venkataraman's definition of entrepreneurship (Venkataraman, 1997), have described sustainable entrepreneurship "as the examination of how opportunities to bring into existence 'future' goods and services are discovered, created, and exploited, by whom, and with what economic, psychological, social and environmental consequences" (Cohen and Winn, 2007: 35). Sustainable entrepreneurship is viewed as the driving force of sustainable development, in which economic, social and environmental goals are combined within the firm's organizational logic (Parrish, 2010).

In a more narrow sense, sustainable entrepreneurship could be identified as an activity in which resources are innovatively recombined to create value by meeting the economic, social, and environmental needs of the present and future generations, and providing solutions to social and environmental problems (Schaltegger and Wagner, 2011).

From a strictly business perspective, the concept of sustainable entrepreneurship has been better defined by Crals and Vereeck (2004: 2) as the "continuing commitment by businesses to behave ethically and contribute to economic development while improving the quality of life for the workforce, their families, the local and global community as well as future generations".

Although the topic of sustainable entrepreneurship was not explicitly analyzed in the agro-food sector, in the last years many studies have shown that farms have conformed their growth paths to the principles of sustainable development, creating an opportunity for growth not only in a market sense, but also in relationship to society and the environment (Capri and Pomarici, 2014; Mencarelli and De Propris, 2014; Cembalo et al., 2013; Santini et al., 2013; Gabzdylova et al., 2009; Zucca et al., 2009; Ohmart, 2008). Sustainability in the agro-food sector has addressed many important emerging issues such as water use, air quality, energy use, greenhouse-gas production, wildlife habitat and human resources (Ohmart, 2004).

The concept of sustainability is taken seriously in the Italian agro-food sector, within which many initiatives have been developed to promote sustainability in the last years (Capri and Pomarici, 2014; Pomarici and Vecchio, 2014; Zucca et al., 2009). Among Italian agro-food industries, wine industry has had a significant socio-economic and environmental impact. The total vineyard area is approximately 656 thousand hectares. Italy is the third most important country per vineyard area in the world (INEA, 2015). In addition, the wine industry is an important contributor to the Italian economy, with a sales volume of 9.5 billion euro. To meet sustainable development principles, many wineries have adopted initiatives to develop sustainable wine production (Corbo et al., 2014a; Borsellino et al., 2016a). Over the past five years, in fact, in the wine industry there has been a considerable proliferation of initiatives and programs to promote sustainability. In 2014 we find 15 national programs that have involved wineries, academic and research institutions, and service firms (Mencarelli and De Propris, 2014). These often come with logos and labels, useful tools to reduce the information asymmetry that characterizes the market of wines (Corduas et al., 2013), and refer to such concepts as environmental protection, care and protection of landscapes, quality of life for vine-growers and for labor in general, the creation and sharing of value of the territory involving its inhabitants, conservation of cultural traditions (Corbo et al., 2014a; 2014b; Mencarelli and De Propris, 2014). Among these initiatives, particularly important is the SOSTain program which is the earliest such initiative in the wine industry in Italy, and the only program that includes a path of sustainability along the whole wine chain (from the vineyard to the winery).

As previously mentioned, to the best of our knowledge no studies on sustainable entrepreneurship have focused on the winegrowing sector. The aim of this paper is to study, through an explorative approach, how the paradigm of sustainable entrepreneurship is interpreted in the wine industry. The hypothesis underlying our analysis is that if sustainable economic, social and environmental goals are combined within the firm's organizational logic, then the concept of sustainable

entrepreneurship may also be used in the context of wine industry.

To reach this goal we carried out an explorative analysis of 3 wineries in Sicily (Southern Italy) involved in the SOSStain program, which is one among the numerous initiatives to promote sustainability in the wine industry in the region. Compared to other initiatives, only the SOSStain program aims to enhance the sustainability along the entire network of wine production, from the vineyard to the winery. Exploring the management staff's perception of the benefits of sustainable practices, of the resulting environmental benefits, and of the economic costs and benefits, should provide useful data for stakeholders and policy makers interested in enhancing the overall sustainability of the wine industry.

We have chosen to study the Sicilian wine industry, since in the last two decades important productive and commercial innovations have occurred in it, also in response to EU regulations as well as to consumer demand (Borsellino et al., 2012; 2016b; Chinnici et al., 2013; Di Vita et al., 2013; Schimmenti et al., 2014; Lanfranchi et al., 2014; Galati et al., 2015). Also, Sicily is one the most important contributors to the Italian wine industry: it is the region with the largest area of vineyards (111 thousand hectares), corresponding to around 17% of the overall Italian vineyard area and to 10.4% of the total grapes production (INEA, 2015).

2. Materials and method

2.1. The SOSStain program

Among the wide variety of sustainability initiatives and programs implemented in the Italian wine industry (Mencarelli and De Propriis, 2014), SOSStain is the earliest, as proved by its official “date of birth”. It was established in 2010 due to the initiative of the Tasca d’Almerita winery¹, with the involvement of the Observatory for Productivity and Efficient use of Resources in Agriculture (OPERA, of the Università Cattolica del Sacro Cuore), in cooperation with other Italian universities and research centers.

SOSStain is a complete sustainability program for wineries: it focuses on all the three pillars of sustainability with the aim to promote, assess and improve environmental, social and economic sustainability along the whole chain, from the vineyard to the winery.

The program has a strong focus on a specific territory: it promotes a process aiming to achieve high levels of sustainability and to disseminate them through the entire network of wine production in Sicily.

SOSStain is characterized by a “cycle of continuous improvement”, an iterative process through which each winery can assess, monitor and improve its own sustainability performances². The

principal themes on which the sustainable winegrowing and winemaking are based are identified in the SOSStain guidelines concerning the management of 10 resources: water, soil, air, technology (agrochemicals), energy, farming, nature, territory, human and economic resources. For each of them a series of possible practices to be adopted is listed, and a corresponding checklist is made available in which critical aspects are identified with a series of choices relating to different levels of sustainability.

SOSStain expects a “check” on the performances of its members, to ensure that they adhere to the program's guidelines and objectives. Threshold values are set, and the sustainability assessment outcomes have to be maintained within a certain limit. Checks are operated upon the thresholds, and the achievement, of levels of sustainability.

Wineries that want to take part to the program pay an annual fee, ranging from 250€ to 1500€ depending on their turnover and the number of bottles produced. They are also required to self-assess themselves and publish annually – on their website as well as on the program's website – a sustainability report³ about their sustainability performance, presenting the goals obtained and outlining strategies and objectives for the future. That ensures transparency towards consumers and stakeholders about the sustainability of the product. In order to allow the final consumer to recognize wines and wineries committed to the sustainability-improving path, the SOSStain logo, meant to be the “proof” that a wine has been produced according to the program rules, is provided as the final output of the program (Fig. 1).

The program, entirely Sicilian, as mentioned above was initially developed by the Tasca d’Almerita winery in 2010. Subsequently, in 2011 it involved the Planeta company; the Terre di Noto company joined the project in 2013 and in 2014 the Cantine Settesoli cooperative joined as well.

SOSStain's organization is based upon:

- An association comprising the firms that adhere to it which protects and updates the implementation procedures of the program, the technical regulations, inspections, and the filing of the data;
- A technical-scientific committee in which at least a representative for each of the organizations of the SOSStain program, and at least a representative of the selected firms, are present. It is a consultation and propositional body;
- A secretariat coordinating the various activities and facilitating communication between the internal and external subjects. It represents the operational arm of the technical committee, of which it is part;
- A temporary panel of the stakeholders in which the various subjects operating within the field of sustainability meet and dialogue with the SOSStain firms, offering tips for

(footnote continued)

objectivity, accuracy, consistency and transparency the company's performance in terms of sustainability: the SOSStain brand issued will testify to the company's performance.

³The reports are available on the SOSStain site (<http://www.sostain.it/EN/PressArea.aspx>).

¹Tasca D’Almerita is an important Sicilian winery both in terms of production volume and of turnover which decided to adopt a sustainability path and to make all the necessary innovations and managerial changes.

²Starting in 2016, environmental, social and economic performance of wineries are measured through sustainability indicators. These will be validated every two years by a third party certification body to testify with rigor,



Fig. 1. The SOSTain logo and the same printed on a back label.

improvement and consultancies on specific themes that are considered to be priorities by the technical-scientific committee and by the firms. The panel involves a plurality of subjects, among which representatives of the local public organizations, the public administration, local universities, local consultancy firms, representatives of the consumers and the press.

2.2. Data collection and survey design

The present work uses an empirical enquiry to examine in some detail the “sustainable” wineries involved in the SOSTain program in Sicily in 2014. Of the 4 wineries we contacted, 3 have accepted to participate in the survey: 2 are private enterprises, Tasca d’Almerita (TDA) and Planeta (PLA); one is the Settesoli (7Suns) vine-growers’ cooperative (among the largest at the national and EU level).

After a preliminary literature review, data were collected by means of a questionnaire in order to obtain information on the theme of sustainability as detailed and deep as possible, and at the same time to penetrate the point of view of the interviewees in order to understand their intellectual categories, their interpretations of sustainability and the motives for their actions. All the information provided by the interviews -motivations, opinions, attitudes, beliefs, behaviors, and all the information supplied by the interviewee- have been then analyzed to estimate the level of understanding and awareness of the firms about the theme of the research.

A relatively high number of scientific papers were examined, describing the background to what sustainability means, in particular in the wine industry. Based on this critical literature review, we have outlined the main aspects of sustainability, identifying its key concepts and its main dimensions, namely environmental, economic, and social.

The basic idea is that the management of the company activities should aim at pursuing a development that respects the environment and is socially fair and economically effective. This triple bottom line approach to sustainability (Elkington, 1997) has to be implemented by an efficient resource use (FAO, 2014) and appropriate environmental protection practices, applied to production, transformation, warehousing, and packaging (OIV, 2008; Mariani and Vastola, 2015).

Evidence suggests that the main areas of sustainability currently facing the wine industry are: the efficient use of resources (water use and management; solid waste generation, management and treatment; energy use and greenhouse gas emissions -GHGs; chemical use; land use), environmental preservation (reduction of the weight of the glass bottles and

energy production from photovoltaic plant), conservation of biodiversity and care and protection of the landscape (preservation of the local ecosystem and habitats, cultivation of indigenous varieties); the improvement of the quality of life for the employees (training programs and safety courses), support for the local community (creation and sharing of value of the territory involving its inhabitants), conservation of cultural traditions (promotion of tourism and of high-quality local food and wine) and economic viability (investing in intangible assets as a competitive tool; reducing dependence on external sources; increasing profitability and improving quantity and quality of produce) (Borsellino et al., 2016a; Mariani and Vastola, 2015; Corbo et al., 2014a; 2014b; FAO, 2014; Mencarelli and De Propriis, 2014; Vecchio, 2014; Zanni and Pucci, 2014; Capri and Pomarici, 2014; Christ and Burritt, 2013; Cembalo et al., 2013; Szolnoki, 2013; Santini et al., 2013; Jones, 2012; Atkin et al., 2012; Gabzdylova et al., 2009; Zucca et al., 2009; Ohmart, 2008; OIV, 2008; Pretty, 2008; Ohmart, 2004) (Fig. 2).

The study of the wineries was carried out through direct interviews with each management staff representative for the sustainability issues, as he/she was in the position to decide and reflect upon the farm’s implementation of sustainability initiatives. We used a questionnaire specifically designed on the basis of the above mentioned key concepts of sustainable entrepreneurship (Schaltegger and Wagner, 2011; Crals and Vereeck, 2004), and adapted from the survey instrument used in former researches in the wine sector (Schimmenti et al., 2014) and in other agricultural sectors (Schimmenti et al., 2013, 2011; Di Vita et al., 2013), as well as in wine industry sustainability (Borsellino et al., 2016a; Mencarelli and De Propriis, 2014; Vecchio, 2014; Zanni and Pucci, 2014; Szolnoki, 2013; Atkin et al., 2012).

Follow up questions, clarifying specific issues or uncovered topics, were delivered through telephone or e-mail subsequently.

The questionnaire had three main sections. At the beginning, general information was asked about the people interviewed (age and position in the winery organization) and the winery (name, entity of the workforce, total agricultural area and vineyard area, number of vine varieties, quantities produced, etc.). The second section was designed to gain information about sustainability and the way the wineries applied the triple bottom line approach (Elkington, 1997) (its perception and importance, sustainable practices currently employed in the vineyards and in the winery and the year they were started, reasons for their adoption, number of wines produced and of wines with the indication of sustainable techniques, participation to sustainability programs and projects, effects of the sustainable techniques upon the strategy and performance of the winery). The last section concerned the commercial aspects of the winery (type of marketing, packaging, distribution channels, sale markets, revenue classes and revenue variation in the last three years). The final version of the questionnaire was previously tested with the advice of opinion leaders (agribusiness professionals, local academics, etc.); corrections were made following their suggestions. Later, the questionnaire was sent via email prior to the meeting. The



Fig. 2. Main issues related to sustainable winegrowing.
Source: Own elaboration.

questionnaire, submitted during the period between February and April 2015, allowed the collection of socio-structural, productive and commercial data with reference to the 2014 year. Following previous scholarly approaches, the questionnaire included open-ended questions, closed-ended questions (multiple choice in “check-all-that-apply” form, where in some cases answers had to be ranked from the most important to the least) and 5-point Likert scale questions (from 1, strongly disagree, to 5, strongly agree).

3. Findings

3.1. Socio-structural and productive aspects and commercial data

The vineyards' area of the 3 wine farms covers nearly 6247 ha (ranging from a minimum surface of 370 ha and a maximum of 5455 ha in the vine-growers' cooperative) distributed in 12 holdings⁴ in various areas of Sicily (Table 1). In addition there are herbaceous crops, and other types of trees, among which olives, as well as woods, grazing land and water areas, enhancing the landscape and safeguarding the biodiversity thanks to the presence of autochthonous species. This goes to show that these wineries are multifunctional not only in their capacity to diversify their productive activities, but also in creating and protecting the agricultural landscape while respecting the ancient natural, productive and socio-cultural traditions.

The wineries grow on average nearly 25 varietal grapes (ranging from 21 to 27 per farm), 11 of which are autochthonous (ranging from 9 to 12), using an integrated crop management approach including agronomic, physical and

chemical tools of conventional vine-growing and the adoption of organic and biodynamic agricultural practices (only one winery was awarded the EU organic certification for part of its vineyard area). This mixture is operated with an eye to the efficient utilization of resources and to respect for the environment.

The sample of wineries has a total production of 483,821 hl in 2014 and a production ranging from 16,751 hl and 430,470 hl of wine; in this regard, it is important to note such variability, as well as that one related to other socio-structural and commercial factors, is due to the heterogeneous winery size.

The whole set of wineries at present supplies the market with 265 different types of wine (ranging from 21–200 labels within the surveyed wineries). Labels reporting information about the sustainability are 26 (ranging from 0, due to a specific entrepreneurial choice, to 20 labels); 16 of them carry the SOSTain logo, 2 the VIVA logo, 6 the EU organic logo, 2 show the writing “senza solfiti aggiunti” (without sulfites added). The scant presence of the SOSTain logo on the wine labels is explained, according to the interviewees' declarations, by the lack of recognition of the validity of the logo by some foreign markets -which represent the main markets for the firms- because it is based on the self-assessment of sustainability performance. In fact, starting from 2016, a third party certification body will certify the company's performance in terms of sustainability and it will regulate the use of the SOSTain logo through procedural guidelines.

Buildings cover an overall surface of 113,403 m² (ranging from a minimum of 20,503 m² and a maximum of 58,900 m²) including 11 wine-making plants (ranging from 2 to 6 plants), together with plants for the bottling, packaging and storage of wines for an overall area of 94,295 m² (ranging from 4362 m² to 79,655 m²).

⁴The whole land area of the cooperative, which has more than 2000 members, have been considered as a single holding.

Table 1
General aspects of interviewed wineries (2014).
Source: Own elaboration on survey data.

	TDA	7Suns	PLA	Total
Year of foundation	1962	1958	1985	
Total agricultural area (ha)	651	n.a. ^a	583	
– of which vineyards (ha)	422	5455	370	6247
Types of vines (varieties) (no.)	26	27	21	
– of which autochthonous (no.)	12	9	11	
Wine production (hl)	36,600	430,470	16,751	483,821
Types of wines produced (labels)(no.)	44	200	21	265
– of which with sustainability logo	20	6	0	26

^aIn this case only the datum regarding the vineyard surface area of the cooperative members is known.

Table 2
Number of employees in the interviewed wineries (2014).
Source: Own elaboration on survey data.

	TDA	7Suns ^a	PLA	Totale
Permanent employees	62	49	30	141
– Management	9	1		10
<i>Average age of management staff</i>	46	45	45	
– Administration	30	42	26	98
– Laborers	23	6	4	33
Seasonal employees	155	212	198	565
– Administration			10	10
– Laborers	155	212	188	555

^aIn this case the employees operating in the vineyards were not took into account.

The wineries are also significant in terms of employment. The total workforce is composed of 141 permanent employees (ranging from 30 to 62 workers) and 565 seasonal workers (ranging from 155 to 212 workers), all resident in the municipalities near the wineries' 12 estates (Table 2). This has positive consequences in terms of local economic development, which is a fundamental issue in a region such as Sicily that presents very high unemployment rates. Furthermore, the management made investments in terms of personnel development, training and assistance, to make the staff gain qualifications and higher skill level. The average management staff age is about 45 years.

The 3 wineries adopt the same strategies and target the same destination markets regardless of the type of wine produced, and therefore regardless of the sustainable techniques logo.

They considered “quality” to be a highly influential factor for their competition strategies (all wineries gave this issue 5 in the 5-point Likert scale), followed closely in terms of importance by “brand”, “production costs” and “distribution”. The “specialized guides” and “packaging” factors are considered the least important (Graph 1).

The wineries have commercialized about 20.5 million of 0.75 l bottles (ranging from 2.1 million of pieces to 14.8 million of pieces), nearly 4.2 million of 1 l tetra brick and very little quantities of other packaging types (5 and 10 l bag-in-box and 2 l tetra brick); in addition, 2 wineries have also sold

unpackaged wine, and of these 1 has sold concentrated must/rectified concentrated must (Graph 2).

Wine sales take place above all through importers and agents with both the sector of the food service industry that consists of establishments which prepare and serve food and beverages (Hotel/Restaurant/Café or HORECA), and the large-scale retail channel as the main final destination (Table 3). All wineries are mainly oriented towards the foreign markets, both EU and extra-EU, and in a lesser degree towards the national market, which is nonetheless considered important.

Two wineries use their own website exclusively as a commercial “shop window”, while one uses it also for online sale. The 3 wineries also promote their wines by means of fairs, brochures, newspapers and wine tasting in the farm and out of it; in one case only promotion has been made also by television.

Of the 3 wineries, 2 have a turnover in between 10,000,000 €–25,000,000€; one, the cooperative, is comprised between 25,000,001€–100,000,000€. As declared by the management staff in charge of sustainability issues in the 3 wineries interviewed, the economic performance of their winery has improved in the last 3 years, both in total value (in 2 cases there is an increase ranging between 5.0% and 9.9% and in the remaining one between 1.0% and 4.9%) and relative to foreign markets (in one winery the increase is ranging between 10.0% and 20.0%, in one case there is an increase ranging between 5.0% and 9.9% and in the remaining winery between 1.0% and 4.9%).

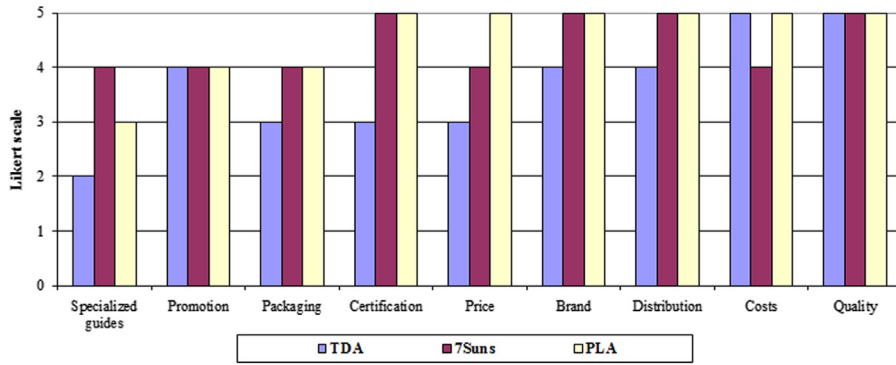
3.2. Perception and implementation of sustainability

With reference to sustainable entrepreneurship, of the 3 wineries interviewed 1 has officially undertaken the path to sustainability in the year 2010, the others in 2011 and 2014 respectively, although some good practices go back to the days of their foundation. The wineries now use a large number of sustainable techniques, as presented in Graph 3.

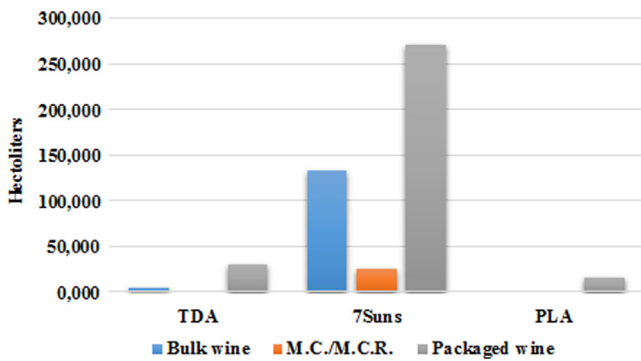
In particular, we find that all the wineries implement and track over time most of the wide range of winegrowing practices recognized in the literature examined previously as sustainable; on the contrary, the reduction of the environmental impact in the supply chain, of the weight of the bottles, and of water consumption, as well as the assessment of the firm's carbon and water footprint are practiced only by 2 wineries, while wine-making without additives and the development of organic/biodinamic agriculture are among the least common activities in the wineries interviewed.

The 3 wineries contribute to the enhancement of the image of the areas where they operate, and more in general of the region itself, and also to the strengthening of the tourist vocation of the area by making up events and, in 2 cases, offering hospitality in their facilities.

Among the reasons that have contributed to the decision to produce sustainable wine, the ethical choice has been indicated as the most important in 2 cases; the protection of biodiversity is the main motivation for the third winery. Lower production costs, meeting the demand of consumers and markets and



Graph 1. Influential factors for the competition strategies of the wineries. Source: Own elaboration on survey data.



Graph 2. Production of the interviewed wineries (2014). Source: Own elaboration on survey data.

Table 3 Main commercial aspects of the wineries (2014). Source: Own elaboration on survey data.

	TDA	7Suns	PLA
Distribution channels (%)	100.0	100.0	100.0
Wholesale operators (home market)	2.0	7.0	4.0
Importers (foreign markets)	45.0	60.0	57.0
Direct sale		1.0	3.0
Agents	53.0	32.0	36.0
Sale outlets (%)	100.0	100.0	100.0
Italy	40.0	40.0	43.0
Other EU countries	30.0	25.0	25.0
Other European countries	7.0	28.0	12.0
North America	15.0	4.0	12.0
Asia	7.0	3.0	5.0
Others	1.0		3.0

obtaining a higher-quality product are other reasons, though not a priority, however important for the three wineries.

When asked about the definition of sustainability, the whole set of wineries has proposed the meeting of the needs of the current generation without compromising the ability of future generations to meet their own needs; second, we find that sustainability refers to addressing issues from a long-term perspective and incorporates climate change, environment and social and economic issues. These results show that the

wineries have a complete perception and interpretation of the sustainability concept as a whole that is independent from the three dimensions of sustainability – environmental, social and economic. Scarce importance is, in fact, held by more specific definitions limited to particular aspects of the single pillars (sustainability refers to: corporate social responsibility issues; climate change issues; other environmental issues; maintaining the viability of firm's business).

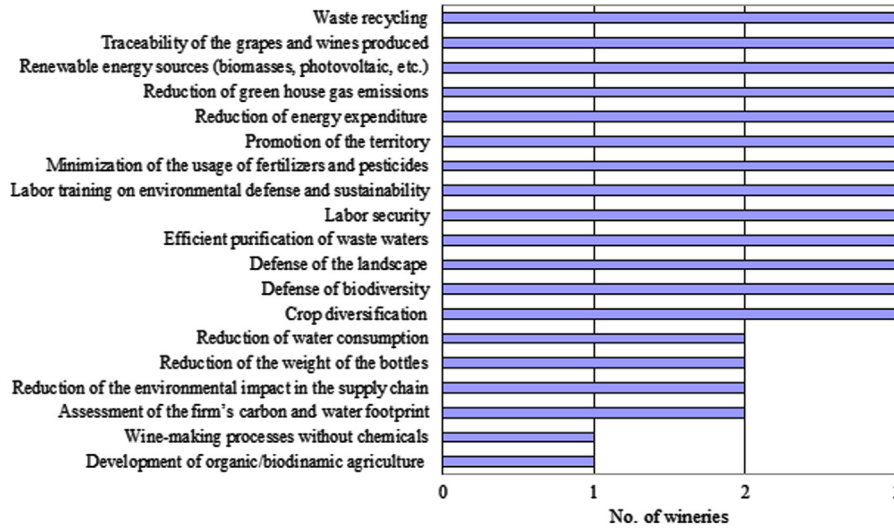
When asked to rank the importance of the three pillars said above in pursuing and implementing the winery's sustainable development policy, economic sustainability has been considered by the wineries the most important, followed by social sustainability. Environmental sustainability comes third.

Likert scales, with grades from “extremely important” (5) to “indifferent” (1), were used to assess the impact of the sustainable techniques on the winery's economic performance. The wineries reported that a more efficient use of resources has the highest impact (mean 4.3), followed by a higher customer loyalty (mean 3.7), a stronger brand (mean 3.7) and the Supply Chain optimization (mean 3.7). Similarly, the ability to justify and obtain a premium price for their wines and the possibility of lower financial and operational risks seem to have no major impact (mean 1.3 for both).

Joining the sustainability programs allows 2 of the 3 wineries to obtain consultancies for the training of personnel, for learning the techniques of self-assessment of winery sustainability, and to benefit of a network of experts.

Likert scales, with grades from “total satisfaction” (5) to “no satisfaction” (1), were used to assess the winery performance in the last three years. The wineries declared a major satisfaction in comparing their performance with that of their main competitors (mean 3.7). Simultaneously, a lower satisfaction emerges from the comparison with the sector's average performance (mean 3.3) and with the strategic business targets programmed (mean 3.3).

Coming to the supply chain networks, the use of Likert scales, with scales from “extremely important” (5) to “indifferent” (1), allowed us to find out that the priority of the wineries is to select and evaluate partners (also) on the basis of sustainability criteria (mean 4.0), and to develop, together with partners, new processes or new sustainable technologies



Graph 3. Sustainable practices implemented by the wineries.
 Source: Own elaboration on survey data.

(mean 4.0). Simultaneously, the wineries attribute little importance to the synergic project works towards sustainability goals (mean 2.7). The same Likert scale was used to analyze to and from knowledge flows: these are managed by means of training activities (mean 4.7) and the pro-active participation to sustainability forums sensitive to sustainable wine industry (mean 4.7).

4. Conclusions

In the agro-food sector sustainable development is gaining increasing importance as an influential concept for business and policy, and it represents a fundamental path to preserve the quality and the quantity of the resources that are necessary for the future generations.

Sustainable entrepreneurship is viewed as the driving force of sustainable development, in which economic, social and environmental goals are combined within the firm's organizational logic (Parrish, 2010).

The future of the winegrowing productions also depends on the sustainable management of the entire wine supply chain, with the goal of pursuing a pattern of development that is respectful of the environment, socially fair and economically effective. In fact, in the last few years further sustainable initiatives and programs have been implemented to promote environmental protection, care and protection of landscapes, quality of life for vine-growers and for labor in general, the creation and sharing of value of the territory involving its inhabitants, conservation of cultural traditions. Among these initiatives, SOSTain is a complete sustainability program for wineries, as it promotes, assesses and improves the 3 dimensions of sustainability along the whole supply chain.

By exploring the adaptation of the 3 Sicilian wineries to the new scenario of sustainable development by implementing SOSTain program, our findings support our hypothesis, demonstrating the existence of a sustainability-driven entrepreneurship.

The sustainable entrepreneurship dimension is coupled with an ethical behavior that contributes to sustainable development, while improving the environmental and economic performance of the wineries and the quality of life of the workforce, their families, the local and global community as well as the future generations (Crals and Vereeck, 2004).

Basing on what the interviewees declared, it is possible to say that the 3 Sicilian wineries we studied have been pushed to undertake a sustainability path by reasons that are prevalently internal to the winery itself, i.e. mainly ethical and environmental and, slightly less important, economic motivations. It is in this sense that we must interpret the scant presence of the SOSTain logo on the labels of the wines produced, with the consequence that such logo is not adequately used as a marketing tool. We are in other words in a pioneering phase for the wine sector. Yet the results we have obtained lead to think that the firms we studied are updating their productive processes in the direction of the production of sustainable wine.

In line with Crals and Vereeck's definition about sustainable entrepreneurship (Crals and Vereeck, 2004), the results of our research suggest that adopting sustainable productive methods has lead in general to good technical and financial results by improving business efficiencies and management systems, with positive environmental and socio-economic implications at the local level. In particular, the wineries have understood that a complete interconnection among economy, society and environment is needed for a management of winery activities capable to ensure social and human benefits, together with environmental and economic objectives in the long term, thus successfully implementing the triple bottom line approach to sustainability.

Finally, it is worth pointing out that the wineries show a will to continue their engagement in sustainable production in the future by implementing most of the wide range of sustainable winegrowing practices, and making all the necessary innovations and managerial changes, even as an answer to a predictable positive evolution in the consumption of wine produced with sustainable techniques. These findings provide

useful data for stakeholders and policy makers interested in enhancing the overall sustainability of the wine industry. However, further comparative research is needed to overcome the limits to the external validity of these results, which were produced using a small number of wineries implementing a single sustainability program, and concentrated in a single region of Southern Italy.

Further analysis of these 3 wineries is needed to monitor whether or not any significant operational or financial changes have taken place over time after the year 2014 (date of our investigation) as well as to ascertain how the sustainability practices of the 3 wineries have impacted on the prices charged for wines, on revenues, on costs and on differentiation strategy. Also, additional empirical and conceptual investigation is also needed to provide a more detailed picture of sustainable entrepreneurship and thus advance research in this field, involving other “green” Sicilian wineries (considering the importance of Sicilian viticulture at a national level) participating in other initiatives (VinNatur, ViniVeri, Tergeo, TripleA, Ecoprowine, Magis, etc.) concerned with developing sustainable production methods.

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