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Keywords: viticulture, SOStain,
Magis, management system,
wineries

JEL codes: Q01, Q56, L66, M11

Sustainability initiatives and experiences in the Sicilian wine industry

The Italian wine sector shows an increasing interest towards sustainability issues. As a result, a wide number of programs and initiatives concerning environmental, social and economic sustainability has been developed in recent years. The aim of this manuscript is to describe the adaptation of the Sicilian wine sector to the new scenario of sustainable productions. To this purpose a direct survey of 5 Sicilian wineries involved in two different sustainability programs, SOStain and Magis, was carried out. The findings of the study reveal that the sustainability path undertaken by the wineries analyzed has led to management awareness that company activities can ensure social and human benefits, as well as fulfill environmental and economic objectives in the long term.

1. Introduction

Sustainability is progressively reshaping the global agri-food sector (Jones, 2012), although a universally accepted definition and measurement method is still far from being established (OECD, 2002; Zanoli, 2007; Ohmart, 2008; Pretty, 2008; Zucca *et al.*, 2009; Santini *et al.*, 2013; Szolnoki, 2013; Vecchio, 2014; Mariani and Vastola, 2015).

Sustainability is a broad concept, often viewed as a goal although it is not really a destination but a direction.

Implementing sustainability implies Environmental soundness (by adopting practices sensitive to the environment), social Equity (practices responsive to the needs and interests of society-at-large) and Economic feasibility (practices economically feasible to implement and maintain) to be combined within the firm's organizational logic (Parrish, 2010). These are often referred to as the three 'Es' of sustainability or the 'Triple-bottom-line' approach (Elkington, 1997).

The capacity of the various agricultural productions to conform their growth paths to the principles of sustainable development constitutes an opportunity for growth not only in a market sense, but also in relationship to society and the environment (Santini *et al.*, 2013; Gabzdylova *et al.*, 2009; Zucca *et al.*,

2009; Ohmart, 2008; Misso and Borrelli, 2013). Nowadays society expects agriculture to be concerned with many emerging important issues such as water use, air quality, energy use, greenhouse-gas production, wildlife habitat and human resources (Ohmart, 2004; Coudel *et al.*, 2013). Moving towards a sustainable agriculture, organized in its social, environmental and economic dimensions (Ohmart, 2008; Mencarelli and De Propris, 2014) is becoming a priority for firms operating in agriculture (Pretty, 2008), and needs a constant process of adaptation of the strategies of firm development (Viatte, 2001; Zucca *et al.*, 2009; Misso and Borrelli, 2013; Capri and Pomarici, 2014; Migliore *et al.*, 2015).

In agriculture, in fact, there is no single path to sustainability and no unique model of sustainable economic activity that could be applicable to all geographic, economic and social environments (Viatte, 2001; OECD 2002; Pretty, 2008). On the contrary, the specificities of the local culture, society and economy can generate a variety of methods to implement and articulate sustainability at a local level (Zanoli, 2007; Pretty, 2008; Szolnoki, 2013; Migliore *et al.*, 2015).

Sustainability is gaining importance also in the global winegrowing sector (Forbes *et al.*, 2009; Gabzdylova *et al.*, 2009; Zucca *et al.*, 2009; Santini *et al.*, 2013; Vecchio, 2014). During the last years, sustainable wine production has been receiving greater recognition from scholars, vine growers' associations and public institutions. On the one hand, scientific research in the field has focused on the producers' definition, evaluation and practice of sustainability in the wine industry (Thompson and Forbes, 2011; Szolnoki, 2013), on the role of internal and external drivers in enhancing wineries' adoption of a sustainable behavior (Marshall *et al.*, 2005; Broome and Warner, 2008; Gabzdylova *et al.*, 2009; Atkin *et al.*, 2012), on the relationship between a sustainability orientation and competitive advantage (Forbes *et al.*, 2009; Gabzdylova *et al.*, 2009; Flint and Golicic, 2009; Atkin *et al.*, 2012), on the implementation of codes and programs of sustainable winegrowing (Klohr *et al.*, 2013; Szolnoki, 2013; Capri and Pomarici, 2014; Corbo *et al.*, 2014a) and on consumers' perception of -and willingness to pay for- sustainable wine (Forbes *et al.*, 2009; Corbo *et al.*, 2014b).

On the other hand, encouraging sustainable initiatives and programs has been present in the government agenda and in several proactive behaviors of wine grapes growers associations, especially in countries belonging to the 'new world of wine' (Australia, New Zealand, South Africa and Chile, besides California), where programs and initiatives including a number of standards and voluntary codes of environmental, social and economic sustainability have been developed to promote sustainability (Gabzdylova *et al.*, 2009; Zucca *et al.*, 2009; Szolnoki, 2013; Corbo *et al.*, 2014b; Mencarelli and De Propris, 2014; Pomarici and Vecchio, 2014).

Also in Italy a wide number of sustainability programs – involving wineries, academic and research institutions, and service firms – have been launched in recent years by private businesses, vine-growers associations, consortiums, and some regional administrations (Corbo *et al.*, 2014a; Borsellino *et al.*, 2016), signaling the growing interest as well as the strong commitment of winegrowers and wine producers in sustainability principles. Mencarelli and De Propriis (2014) discuss 15 national programs created in the last five years on the wine-sustainability theme. 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 and 2014b; Mencarelli and De Propriis, 2014).

Among the several sustainability programs currently being used in the Italian wine industry, SOStain (without third-party verification) and Magis (with third-party verification) in 2014 involved 6 Sicilian wineries (Southern Italy) which decided to adopt a sustainability path and to make all the necessary innovations and managerial changes. By involving a group of universities and accredited Italian scientific research centers, individual researchers, associations and enterprises, these two programs promote a process aiming at achieving high levels of sustainability and at disseminating them through the entire network of wine production.

The objective of this paper is to illustrate through a descriptive approach the adaptation of the important Sicilian wine sector¹ (Borsellino *et al.*, 2012; Chinnici *et al.*, 2013; Di Vita *et al.*, 2013; Schimmenti *et al.*, 2014; Lanfranchi *et al.*, 2014; Galati *et al.*, 2015) to the new scenario of sustainable agricultural productions. To reach this goal we carried out an explorative analysis of the Sicilian wineries involved in the two above mentioned programs, SOStain and Magis, aimed at improving the sustainability in wine production. Exploring the perception by the management staff of the benefits of sustainable practices and their environmental benefits, economic costs and benefits should provide

¹ Sicily represents one the most important contributor to the Italian wine industry: with over 111 thousand hectares in 2014, it is the region with the largest area of vineyards in Italy, corresponding to around 17% of the overall Italian vineyard area; in the same year Sicily produced nearly 0.6 thousand tons of grapes for a value of 271 million euros (nearly 6.6% of the total national value, CREA, 2015). The sector presents a high number of quality awards obtained: by July 2014 there were 31 denomination trademarks (23 DOC, 7 IGT, 1 DOCG) (CREA, 2015). The commercial flow of Sicilian wine is significant, and with its positive balance significantly influences the agri-food balance of regional trade.

useful data for stakeholders and policy makers interested in enhancing the overall sustainability of the wine industry.

2. Materials and methodology

As previously mentioned, two sustainability initiatives have been selected for the analysis:

1. SOStain: it aims at promoting environmental, social and economic sustainability along the whole chain, both on the field and in the winery, in Sicily, and it is characterized by an iterative process through which each winery can assess, monitor and improve its sustainability performances. There is a logo and wineries participating in the program are required to self-evaluate and publish a report presenting the main results of the implemented program;

2. Magis: it is a sustainability program launched by Bayer CropScience in cooperation with the University of Milan. It aims at promoting sustainability in viticulture and minimizing the overall environmental impact by using precision viticulture techniques, hence only in the vineyard; it is characterized by a verification process provided by the program's staff and a third party and by a label of sustainability to inform consumers and stakeholders about the commitment of the wineries participating in the program.

To understand how the Sicilian wine sector is facing the new scenario of sustainable production, the present study uses an empirical enquiry to examine in some detail the 6 'sustainable' wineries involved in SOStain (4 units) and Magis (2 units) programs in Sicily in 2014. Out of the 6 firms we contacted, 5 have accepted to participate in the survey: in particular, 3 firms are involved in SOStain (2 are private enterprises, W1 and W2; one, W3, is a vine-growers' cooperative, one of the largest at the national and UE level) and 2 in Magis (both of them are private wineries, W4 and W5).

The study of the wineries was carried out through direct interviews with the sustainability issues representative for each company, i.e., the person in charge to decide and reflect upon the farm's implementation of sustainability initiatives. We used a questionnaire specifically designed on the basis of other survey tools used in former researches in the wine sector (Schimmenti *et al.*, 2014) and in other agricultural sectors (Schimmenti *et al.*, 2011 and 2013; Di Vita *et al.*, 2013), as well as in sustainable wine industry (Atkin *et al.*, 2012; Szolnoki, 2013; Mencarelli and De Propriis, 2014; Vecchio, 2014; Zanni and Pucci, 2014; Borsellino *et al.*, 2016). The questionnaire has three main sections. At the beginning, general information was asked about the interviewed people (age and position in the firm organization) and the farm (name, entity of the workforce, total firm area and vineyard area, number of vine varieties, quan-

tities produced, etc.). The second section was designed to gain information about sustainability and the way the wineries applied the ‘Triple-bottom-line’ (Elkington, 1997) approach (its perception and importance, sustainable practices currently employed in the vineyards and in the winery and the year they 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 firm). The last section concerns the commercial aspects of the firm’s wine production (type of marketing, packaging, distribution channels, sale markets, revenue classes and revenue variation in the last three years). The questionnaire allowed the collection of socio-structural, productive and commercial data referring to 2014. 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 less) and 5-point Likert scale questions (from 1, strongly disagree, to 5, strongly agree). The final questionnaire was previously tested with the advice of opinion leaders (agribusiness professionals, local academics, etc.); corrections were made following their suggestions. The questionnaire was sent via email prior to the meeting. The interviews were undertaken in February–April 2015. Follow up questions, clarifying specific issues or uncovered topics, were delivered through telephone or emails subsequently.

3. Findings

3.1 Structural and productive aspects

The vineyards’ area of the 5 wine farms covers 6,417 ha (ranging from a minimum surface of 20 ha to a maximum of 5,455 ha in the vine-growers’ cooperative) distributed in 15 holdings² in various areas of Sicily. In addition to this vineyard area there are herbaceous crops, and other types of trees, among which olives, as well as woods, grazing land and water areas, which enhance the landscape and safeguard the biodiversity through the presence of autochthonous species. This goes to show that these firms are multifunctional not only in their capacity to diversify their productive activities, but also in creating and protecting the agricultural landscape while respecting its ancient natural, productive and socio-cultural traditions.

² The whole land area of the cooperative, which has more than 2,000 members, has been considered as a single holding.

The farms sample grows on average 18 varietal grapes (ranging from 7 to 27 per farm), 8 of which are autochthonous (ranging from 3 to 12), with a total production in 2014 of 518,071 hl and a firm production ranging from 11,250 hl to 430,470 hl of wine; such variability, as well as variability related to other socio-structural and commercial factors, is due to the heterogeneous firm size of the sample.

The whole sample uses an integrated crop management approach including agronomic, physical and chemical tools of conventional vine-growing and the adoption of organic and biodynamic agriculture practices (only two farms obtained the EU organic certification for part of their vineyard area). This mixture is operated with an eye to the efficient utilization of resources and respect for the environment.

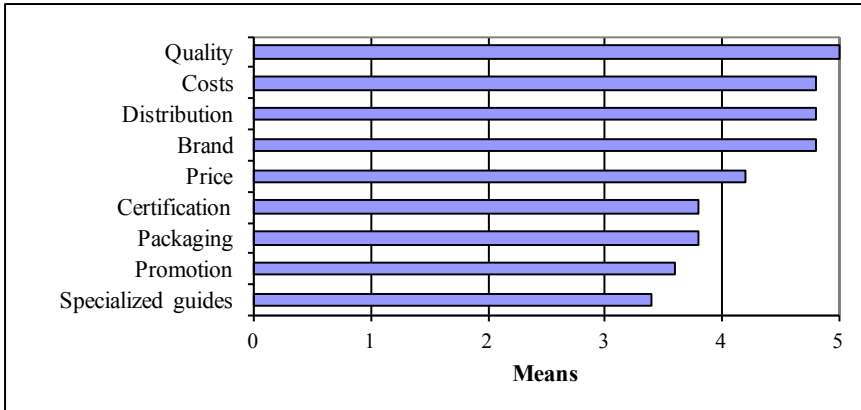
The whole sample at present supplies the market with 312 different types of wine (ranging from 21 to 200 labels within the surveyed sample). Labels reporting information about sustainability are 52 (ranging from 0, due to a specific entrepreneurial choice, to 25 labels); more in detail, 16 carry the SOStain logo, 1 the Magis label, 2 the VIVA logo, 8 the EU organic logo, 2 bear the writing 'senza solfiti aggiunti' (without sulphites added), while the remaining 23 labels report other information (sensible drinking, vegan, recycled packaging materials, etc.).

The sample adopts the same strategies and utilizes the same destination markets regardless of the type of wine produced, and therefore regardless of the sustainable techniques logo.

Buildings cover an overall surface of 120,903 m² (ranging from a minimum of 3,000 m² to a maximum of 58,900 m²) including 13 wine-making plants (ranging from 1 plant to 6 plants), together with plants for the bottling, packaging and storage of wines for an overall area of 100,495 m² (ranging from 2,700 m² to 79,650 m²).

The firms are also economically significant in terms of employment. The total workforce is composed of 178 permanent employees (ranging individually from 15 to 62 workers) and 601 seasonal workers (ranging from 8 to 212 workers), all resident in the municipalities near the firms' 15 estates. This has positive consequences in terms of the areas' economic development, which is a fundamental issue in a region such as Sicily that presents very high unemployment rates. Furthermore, the management has made investments in terms of personnel development, training and assistance, to make the staff gain qualifications and higher skill levels. The average age of the management staff is 44 years.

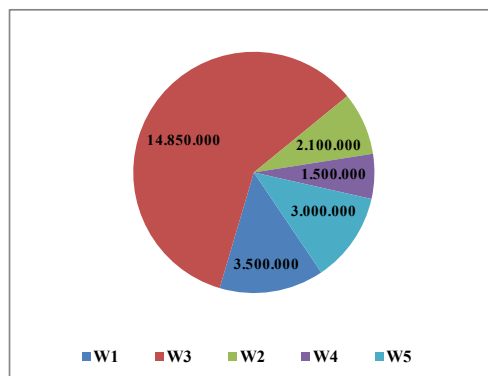
The whole sample considers 'quality' a highly influential factor for its competition strategies (every firm gave 5 in the 5-point Likert scale), followed closely, in terms of importance, by 'brand', 'production costs' and 'distribution'. The 'price', 'packaging' and 'certification' factors are considered slightly less important (Fig. 1).

Fig. 1. Influential factors for the competition strategies of the sample

Source: own elaboration on survey data

3.2 Commercial aspects

The firms have commercialized about 25 million bottles, especially of the 0.75 l type (ranging from 1.5 million of pieces to 14.8 million of pieces), 4.1 million of 1 l tetra brik and very little quantities of other packaging types (5 and 10 l bag-in-box and 2 l tetra brik) (Fig. 2); moreover, 2 firms have also sold unpackaged wine, and of these ones a firm has sold concentrated grape must/rectified concentrated grape must.

Fig. 2. Number of bottles produced by the wineries (2014)

Source: own elaboration on survey data

Wine sales take place above all through importers and own agents with both 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 main final destination. Four firms use their own website exclusively as a commercial 'shop window', while one uses it also for online sale. The 5 firms also promote their wines by means of fairs, brochures, newspapers and wine tasting in the farm and out of it; in only one case, promotion has been made also by television.

All firms are mainly oriented to the foreign markets, both EU and extra-EU, and in a lesser degree to the national market.

Of the sample firms, 2 have a turnover in between 5,000,001€-10,000,000 €, 2 belong to the 10,000,001€-25,000,000€ class, one, the wine cooperative, is ranging between 25,000,001€-100,000,000€. As declared by 4 of the 5 entrepreneurs interviewed, the economic performance of their firm has improved in the last 3 years, both in total value (in three cases there is an increase ranging between 5.0% and 9.9% and in the remaining firm between 1.0% and 4.9%) and in that one relating to foreign markets.

3.3 Implementation of sustainability programs

Of the sample, 3 firms have officially undertaken the path to sustainability in the year 2010, the other 2 respectively in 2012 and in 2014, although some good practices date back to the days of their foundation. The wine farms now use a large number of sustainable techniques, as presented in Table 1.

We notice that all the wineries we examined endeavor to minimize the use of chemicals, to pursue produce traceability of the grapes and wines produced, seek to defend the landscape and biodiversity, and practice crop diversification. On the contrary, wine-making without additives and the presence of environmental certifications are among the least common activities in the sample firms.

The firms 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 4 cases, offering hospitality in their facilities.

Among the reasons that have contributed to the decision to produce sustainable wine, 'ethical choice' has been indicated as the most important in 4 cases; 'protection of biodiversity' is the main motivation for one farm, and the second most important for the whole sample. 'Obtaining a higher-quality product' and 'meeting the demand of consumers and markets' are slightly less significant, followed at a distance, in terms of importance, by 'differentiation

Tab. 1. Sustainable practices implemented by the interviewed wineries (2014)

Technique	no. of wineries	Technique	no. of wineries
Minimization of the usage of fertilizers, herbicides, fungicides and synthetic pesticides	5	Promotion of the territory	4
Produce traceability of the grapes and wines produced	5	Reduction of energy expenditure	3
Defense of the landscape	5	Efficient purification of waste waters	3
Defense of biodiversity	5	Reduction of Green House Gas emissions	3
Crop diversification	5	Reduction of the weight of the bottles	3
Renewable energy sources (biomasses, photovoltaic, etc.)	4	Reduction of the environmental impact in the supply chain	2
Labor security	4	Developmento of organic/biodinamic agriculture	2
Labor training on environmental defense and sustainability	4	Firm's carbon and water footprint	2
Waste recycling	4	Wine-making processes without chemicals	1
Reduction of water consumption	4	Environmental certifications	1

Source: own elaboration on survey data

from competitors'. It is worth pointing out that 'having a greater scrutiny of corporate management', 'EU contributions/subsidies', 'lower production costs' and 'difficulty in selling conventional product' have been considered of no importance by 2-3 wineries.

Considering the perception and interpretation of the concept of sustainability, the sample's priority is the concern about climate, the environment, and social and economic issues; secondly, we find the idea of meeting the needs of the current generation without compromising the ability of future generations to meet their own needs. Scarce importance is held by more specific definitions limited to particular aspects of the single pillars such as: questions of social responsibility; other environmental issues; preservation of the firm's business. The results show that the firms of the sample have a complete perception and interpretation of the sustainability concept as a whole that is interdependent from the three dimensions of sustainability – environmental, social and economic.

In the answers to the next question, i.e., assigning a value in order of importance to the three pillars said above in pursuing and implementing the firm's policy of sustainable development, environmental sustainability is considered the most important, followed by social sustainability. Economic sustainability ranks third place.

Concerning the impact on the firm of the sustainable techniques, we have found out the extreme importance it has for a more efficient use of resources, followed by a higher customer loyalty and the strengthening of the firm's reputation as well as the capacity to enter new market outlets. Joining the sustainability programs allows the sample to obtain consultancies for the training of its personnel and for learning the techniques of self-evaluation of farm sustainability.

On average the self-evaluation of the company performance in the last three years is more than positive for what concerns the comparison to the main direct competitors, satisfactory with regard to the obtainment of the planned strategic objectives, while a medium satisfaction emerges in comparison to the sector's average.

Referring to the supply chain networks, the farms assert that they operate to make their partners informed and orient their own activities towards sustainability, besides discussing with them on how improving the sustainability of the activities connected to the commercial activities pursued. Simultaneously, the sample attributes little importance to the synergic project and works towards sustainability goals.

To and from knowledge flows are managed by means of training activities and the pro-active participation in sustainability forums.

4. Conclusions

Today sustainability is an important theme in wine industry. We witness a proliferation of international initiatives to develop the sustainable production of wine at the international level since 1992, but only in the last ten years in Italy. Despite such dynamism, we notice the lack of a common and shared language (techniques, methodologies, indicators, instruments, information, etc.). For example, from the cross-cultural study conducted by Szolnoki (2013), the difficulty in defining the term 'sustainability' emerges, since not only each country, but also each entrepreneur, has a different understanding of its meaning in the wine industry.

In this light, our explorative research has had the goal of verifying the approach to sustainability of the Sicilian firms involved in two sustainability programs aimed at improving the sustainable wine production, SOstain and

Magis; we also intended to study some socio-economic, commercial and strategic aspects of the firms in the sample. In line with the results of several authors (Marshall *et al.*, 2005; Gabzdylova *et al.*, 2009; Santini *et al.*, 2013), basing on what the interviewees declared, it is possible to assert that the sample we studied has been pushed to undertake a sustainability path prevalently by internal drivers, such as ethical motivations and personal attitudes, concern about environment and economic opportunism reasons. Such internal drivers have been playing a much larger role than external motivators. According to Forbes and De Silva (2012) strategic drivers, such as differentiation and cost savings, do not seem to be perceived, or play a less influential role.

The results of our research concerning 5 wineries in Sicily suggest that adopting sustainable productive methods has led in general to good technical and financial results by improving business efficiencies and management systems, with positive socio-economic implications at a local level, in agreement with what emerges from other researches (Thompson and Forbes, 2011; Vecchio, 2014).

On the whole, respondents report a more well-rounded understanding of sustainability than in other studies (Sipl, 2006; Szolnoki, 2013) according to which wineries often reduce sustainability to environmental protection without mentioning the other two dimensions. In particular, according to the results of Pullmann *et al.* (2010), the findings show that the managers interviewed have a clear comprehension that an inextricable interconnection among economy, society and environment is needed for an aware management of company 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. However, confirming the study by Hoffman *et al.* (2011), the environmental dimension is the most important issue for the wineries in pursuing and implementing a sustainable development, while the social and economic sides of sustainability have less recognition.

In contrast to Smith (2010) and Szolnoki (2013), who pointed out that sustainable, organic and biodynamic management systems are often being confused by many of their interviewees, wineries participating in this study see clearly the differences between these three different systems, arguing that organic or biodynamic systems focus only on the environmental dimension, are practiced only in the vineyard and do not consider the economic and social dimensions (it is worth pointing out that only two wineries conduct part of their vineyard area following the rules to obtain EU organic certification). All the interviewees consider that conventional farming can be sustainable: they all consider the reduction of resources consumption especially through a lesser usage of inputs central to sustainability, not only in the field. Also, a greater

attention to cellar practices, such as water management, energy use, transport or packaging, has already become an important part of sustainable wine management (Castellucci, 2008). Unlike Szolnoki (2013), a cross-national study conducted in seven countries, which shows a scarce implementation of sustainable production in the cellar, wineries in our study apply a more complete approach to sustainability, adopting 'ground to bottle' practices for producing sustainable grapes and wine.

Finally, it is worth pointing out that the firms show a willingness to continue their engagement in sustainable production in the future.

The results of our survey confirm the validity of the recent addresses of the CAP in terms of sustainability of agricultural food production.

Further research is likely to involve other 'green' Sicilian wine firms involved in other initiatives concerned with developing sustainable production methods (VinNatur, ViniVeri, Tergeo, TripleA, Ecoprowine, etc.) in order to draft an outline as complete as possible of the approach and of the strategies of the sustainable wine firms in Sicily.

References

- Atkin T., Gilinsky A., Newton S.K. (2012). Environmental Strategy: Does it Lead to Competitive Advantage in the US Wine Industry? *International Journal of Wine Business Research*, 24(2): 115-133. DOI: 10.1108/17511061211238911
- Borsellino V., Galati A., Schimmenti E. (2012). Survey on the Innovation in the Sicilian Grapevine Nurseries. *Journal of Wine Research* 23(1): 1-13. DOI: 10.1080/09571264.2012.668853
- Borsellino V., Migliore G., D'Acquisto M., Di Franco C.P., Ascuto A., Schimmenti E. (2016). 'Green' Wine through a Responsible and Efficient Production: a Case Study of a Sustainable Sicilian Wine Producer. Paper presented at the Florence SWIF - Sustainability of Well-being International Forum 2015 'Food for Sustainability and not just food'. Florence, 4th-6th June 2015. *Agriculture and Agricultural Science Procedia*, 8: 186-192. DOI: 10.1016/j.aaspro.2016.02.092
- Broome J., Warner K. (2008). Agro-Environmental Partnerships Facilitate Sustainable Wine-Grape Production and Assessment. *California Agriculture* 62(4): 133-141. DOI: 10.3733/ca.v062n04p133
- Capri E., Pomarici. E. (2014). Modelli di sostenibilità a confronto nel settore vitivinicolo italiano. *Il Corriere Vinicolo*, 9: 16-17.
- Castellucci F. (2008). *Resolution CST 1/2008, OIV Guidelines for Sustainable Vitiviniculture: Production, Processing and Packaging of Products*, pp. 1-12. Available at: <<http://www.oiv.int/public/medias/2089/cst-1-2008-en.pdf>> (accessed 26 October 2015).
- Chinnici G., Pecorino B., Rizzo M., Rapisarda P. (2013). Evaluation of the Performances of Wine Producers in Sicily. *Quality - Access to Success*, 14(135): 108-113.
- Corbo C., Lamastra L., Capri E. (2014a). From Environmental to Sustainability Programs: A Review of Sustainability Initiatives in the Italian Wine Sector. *Sustainability*, 6(4): 2133-2159. DOI: 10.3390/su6042133

- Corbo C., Sogari G., Macconi M., Menozzi D., Mora C. (2014b). Vino sostenibile: l'atteggiamento dei consumatori italiani: *Agriregionieuropa*, 10(39): 18-21
- Corduas M., Cinquanta L., Ievoli C. (2013). The Importance of Wine Attributes for Purchase Decisions: A Study of Italian Consumers' Perception. *Food Quality and Preference*, 28(2): 407-418. DOI: 10.1016/j.foodqual.2012.11.007
- Coudel E., Devautour H., Soulard C. T., Faure G., Hubert B. (eds) (2013). *Renewing Innovation Systems in Agriculture and Food: How to Go Towards More Sustainability?* Wageningen, The Netherlands: Wageningen Academic Publishers. DOI 10.3920/978-90-8686-768-4
- CREA (2015). *Annuario dell'agricoltura italiana 2014*. Vol. LXVIII. ISBN 978-88-8145-334-4. Roma: CREA - Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria. Available at: <http://web.inea.it:8080/annuario/edizione_2014>, <<http://www.crea.gov.it/annuario-dellagricoltura-italiana-2014/>> (accessed 22 February 2016).
- Di Vita G., D'Amico M., Bracco S. (2013). Economic Performances of Small Holders PDO Viticulture in Eastern Sicily. *Quality - Access to Success*, 14(Suppl. 1): 99-105.
- Elkington J. (1997). *Cannibals with Forks: The Triple Bottom Line of 21st Century Business*, Oxford: Capstone.
- Flint D.J., Golobic S.L. (2009). Searching for Competitive Advantage through Sustainability: A Qualitative Study in the New Zealand Wine Industry. *International Journal of Physical Distribution & Logistics Management*, 39(10): 841-860. DOI: 10.1108/09600030911011441
- Forbes S.L., De Silva T.A. (2012). Analysis of Environmental Management Systems in New Zealand Wineries. *International Journal of Wine Business Research*. 24(2): 98-114. DOI: 10.1108/17511061211238902
- Forbes S.L., Cohen D.A., Cullen R., Wratten S.D., Fountain J. (2009). Consumer Attitudes Regarding Environmentally Sustainable Wine: An Exploratory Study of the New Zealand Marketplace. *Journal of Cleaner Production* 17(13):1195-1199. DOI: 10.1016/j.jclepro.2009.04.008
- Gabzdylowa B., Raffensperger J.F., Castka P. (2009). Sustainability in the New Zealand Wine Industry: Drivers, Stakeholders and Practices. *Journal of Cleaner Production*, 17(11): 992-998. DOI: 10.1016/j.jclepro.2009.02.015
- Galati A., Borsellino V., Crescimanno M., Pisano, G., Schimmenti E. (2015). Implementation of Green Harvesting in the Sicilian Wine Industry: Effects on the Cooperative System. *Wine Economics and Policy*, 4(1): 45-52. DOI: 10.1016/j.wep.2015.04.003
- Hoffman M., Lubell M., Hillis V. (2011). Defining Sustainable Viticulture from the Practitioner Perspective. *Practical Winery and Vineyard*, (Spring 2011): 1-6.
- Jones G.V. (2012). Sustainable Vineyard Developments Worldwide. Presented at the 34th World Congress of Vine and Wine in Oporto. *Bulletin de l'OIV*, 85(971-972-973): 49-60. Available at: <http://www.sou.edu/assets/envirostudies/gjones_docs/Jones_Bulletin_OIV_2012.pdf> (accessed 5 November 2015).
- Klohr B., Fleuchaus R., Theuvsen L. (2013). Sustainability: Implementation Programs and Communication in the Leading Wine Producing Countries. In: *Proceedings of the 7th International Conference of the Academy of Wine Business Research (AWBR)*, St. Catharines, ON, Canada, 12-15 June (pp. 12-15).
- Janfranchi M., Giannetto C., Zirilli A., Alibrandi A. (2014). Analysis of the Demand of Wine in Sicily through Ordinal Logistic Regression Model. *Quality - Access to Success*, 15(139): 87-90.
- Mariani A., Vastola A. (2015). Sustainable Winegrowing: Current Perspectives. *Int. J. Wine Res.*, 7: 37-48. DOI: 10.2147/IJWR.S68003

- Marshall R.S., Cordano M., Silverman M. (2005). Exploring Individual and Institutional Drivers of Proactive Environmentalism in the US Wine Industry. *Business Strategy and the Environment*, 14(2): 92–109. DOI: 10.1002/bse.433
- Mencarelli F., De Propriis L. (2014). Mappa dei modelli di produzione sostenibile: gli indicatori della sostenibilità del vino. In: Forum per la Sostenibilità del Vino (Ed.), *Primo Rapporto sulla Sostenibilità del Vino*, pp. 35-61. Available at: <<http://www.vinosostenibile.org/wpcontent/uploads/2014/10/Primo-Rapporto-Sostenibilita-del-Vino-Ottobre-2014.pdf>> (accessed 15 October 2015).
- Migliore G., Di Gesaro M., Borsellino V., Ascuto A., Schimmenti E. (2015). Understanding Consumer Demand for Sustainable Beef Production in Rural Communities. *Quality - Access To Success*, 16(147): 75-79.
- Misso R., Borrelli I.P. (2013). Wine system e identità territoriale. *Economia & Diritto Agroalimentare*, XVIII(1): 97-113. DOI: 10.14601/EDA-12378
- OECD (2002). Adoption of Technologies for Sustainable Farming Systems. *Wageningen Workshop Proceedings*. Available at: <<http://www.oecd.org/greengrowth/sustainable-agriculture/2739771.pdf>> (accessed 15 October 2015).
- Ohmart C.P. (2004). What Does Sustainability Really Mean? *Wines Vines*, 85(11): 3.
- Ohmart C. (2008). Innovative Outreach Increases Adoption of Sustainable Winegrowing Practices in Lodi Region. *California Agriculture*, 62(4): 142-147. DOI: 10.3733/ca.v062n04p142
- Parrish B.D. (2010). Sustainability-Driven Entrepreneurship: Principles of Organization Design. *Journal of Business Venturing*, 25(5): 510-523. DOI: 10.1016/j.jbusvent.2009.05.005
- Pomarici E., Vecchio L. (2014). Sviluppo sostenibile nella filiera del vino: presupposti, razionalità e coinvolgimento delle imprese italiane. In: Forum per la Sostenibilità del Vino (Ed.), *Primo Rapporto sulla Sostenibilità del Vino*, pp. 16-34. Available at: <<http://www.vinosostenibile.org/wpcontent/uploads/2014/10/Primo-Rapporto-Sostenibilita-del-Vino-Ottobre-2014.pdf>> (accessed 30 October 2015).
- Pretty J. (2008). Agricultural Sustainability: Concepts, Principles and Evidence. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 363(1491): 447-465. DOI: 10.1098/rstb.2007.2163
- Pullman M.E., Maloni M.J., Dillard J. (2010). Sustainability Practices in Food Supply Chains: How is Wine Different? *J. Wine Res.* 21: 35–56. DOI: 10.1080/09571264.2010.495853
- Santini C., Cavicchi A., Casini L. (2013). Sustainability in the Wine Industry: Key Questions and Research Trends. *Agricultural and Food Economics*, 1: 9. DOI: 10.1186/2193-7532-1-9
- Schimmenti E., Ascuto A., Borsellino V., Galati A. (2013). The Role of Information and Communication Technologies and Logistics Organisation in the Economic Performance of Sicilian Fruit and Vegetable Enterprises. *International Journal of Business and Globalisation*, 10(2): 185-193. DOI: 10.1504/IJBG.2013.052254
- Schimmenti E., Borsellino V., Ascuto A., D'Acquisto M., Di Gesaro M., Zinnanti C. (2014). The Success Factors of a Sicilian Market-Oriented Wine Cooperative. In: Vrontis V., Weber Y., Tsoukatos E. (eds), *Proceedings of the 7th Annual Conference of the EuroMed Academy of Business*, 18-19 September, Kristiansand, Norway, pp. 1407-1421. EuroMed Press.
- Schimmenti E., Galati A., Borsellino V., Siggia D. (2011). *Lo scenario economico dell'ortofrutticoltura in Sicilia. Un'indagine empirica sulle strategie organizzative e gestionali delle imprese*. Milano: FrancoAngeli.
- Sipl D. (2006). *Nachhaltiges Wirtschaften im Weinbau, Grundlagen, Umsetzungsmöglichkeiten, Leistungsbewertungskonzept*. Berlin: Dissertation.de.

- Smith J. (2010). *What is Sustainable Wine?* Available at: <<http://www.wineandfoodtravel.com/wine/wine-types/what-is-sustainable-wine>> (accessed 22 February 2016).
- Szolnoki G. (2013). A Cross-National Comparison of Sustainability in the Wine Industry. *Journal of Cleaner Production*, 53: 243-251. DOI: 10.1016/j.jclepro.2013.03.045
- Thompson D., Forbes S.L. (2011). Going 'Green' To Find 'Gold' in Wine: A Case Study of a Sustainable New Zealand Wine Producer. In: *6th AWBR International Conference*, 9-10 June, Bordeaux, France. Available at: <<http://academyofwinebusiness.com/wp-content/uploads/2011/09/30-AWBR2011-Thompson-Forbes.pdf>> (accessed 30 October 2015).
- Vecchio R. (2014). Economic Impact of Sustainable Vitiviniculture Best Practices. *Bulletin de l'OIV* 87(995-996-997): 31-54.
- Viatte G. (2001). Agriculture and Sustainable Development: A Societal and Policy Challenge. In: Pasquali M., (Ed.), *Proc. Third Congress of the European Society for Agricultural and Food Ethics*, 3-5 October, Florence, pp. 97-102. Milano: A&Q.
- Zanni L., Pucci T. (2014). Modelli di business e sostenibilità: un'analisi sulla creazione di valore nelle imprese vitivinicole italiane. In: Forum per la Sostenibilità del Vino (Ed.), *Primo Rapporto sulla Sostenibilità del Vino*, pp. 62-91. Available at: <<http://www.vinosostenibile.org/wpcontent/uploads/2014/10/Primo-Rapporto-Sostenibilita-del-Vino-Ottobre-2014.pdf>> (accessed 5 November 2015).
- Zanoli R. (2007). Quale futuro per l'agricoltura sostenibile? *Rivista di Economia Agraria*, 62(3): 371-382.
- Zucca G., Smith D.E., Mityr D.J. (2009). Sustainable Viticulture and Winery Practices in California: What Is It, and Do Customers Care? *International Journal of Wine Research*, 2: 189-194. DOI: 10.2147/IJWR.S5788