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GAMBERO ROSSO



First Report on Sustainable Winegrowing

towards EXPO Milano 2015

October 2014





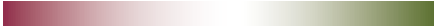
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The Forum for the Environmental Sustainability of Wine was set up in February 2013 on the initiative of **Attilio Scienza**, **Michele Manelli** and **Marco Sabellico**, and with the support of **Gambero Rosso Holding** and the **Italian Wine Union**, with the aim of promoting the environmental sustainability of wine as a fundamental element of the qualitative excellence and the competitiveness of Italian wines on the market. The Forum is based on the premise that the definition of a single, common and comparable approach is essential to the development of a system based on social, economic and environmental improvement. The first aim of this group was to illustrate the current movement in support of wine sustainability, covering the whole supply chain, in order to permit a more decisive affirmation of its values. This gave life to a program that immediately began to pursue a broad vision of the concept of sustainable development as the harmonious integration of social, economic and environmental needs. In the initial phase of its work, however, the founding members have focused in particular on environmental aspects, as they represent the “hottest” area and the one that probably requires greatest attention. *The First Report on Sustainable Winegrowing* summarizes the initial stage in a journey and intends to:

✱ *mark the birth of a movement within the Italian wine sector*

AIM OF IDENTITY AND INTERNAL AND EXTERNAL COMMUNICATION

✱ *respond to the first research questions*

SCIENTIFIC AIM

✱ *propose the launch of a common and concrete process of improvement in the sector*

OPERATIONAL AND MANAGEMENT AIM

In the current phase this document also represents an organizational proposal for the creation of a “place” capable of catalyzing and transmitting the demands of all stakeholders: the Forum for the Sustainability of Wine.

The following document is the result of a complex journey that has involved 36 experts on the topic of sustainable wine from the technical and scientific community, united by this manifesto of values and goals. Two working groups have conducted in-depth studies and research on the system, including cognitive investigations regarding over 1000 wineries and 15 national programs for the sustainable development of wine. Three specific studies have emerged from this work: the first examines the economic features of the current movement (by Prof. Eugenio Pomarici of the University of Naples Federico II; co-author Dr Riccardo Vecchio); the second illustrates the synoptic framework of the Italian sustainable development programs (by Prof. Fabio Mencarelli of the University of Tuscia; co-author Luciano De Propris); the third seeks to define how a strategic orientation towards sustainability is transforming the business models of Italian wineries (by Prof. Lorenzo Zanni of the University of Siena; co-author Dr Tommaso Pucci). The Forum for Wine Sustainability has selected the essential points from these basic premises to form the technical and cultural proposal it intends to put forward for the next leg of this journey.

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SUMMARY

Premises

This report is structured with the aim of responding to certain questions regarding the indicators defined as the macro-objectives of the Forum's work, which will continue to be monitored: the aim of identity and internal and external communication (defining the features of the current movement), the scientific aim (answering research questions related to the needs of the movement), and the operational-management aim (proposing operational tools to effectively bring about improvements in the sector). Specific questions were therefore put to those in charge of the studies, which have allowed for debate on a summary and the definition of a proposed future direction by and among all members of the Forum.

Chapter 1 (Pomarici-Vecchio) answers in particular questions about:

- * the definition of sustainability
- * examples of successful international experiences
- * the importance of the economy of sustainable wine (for the definition in the short-term of a Sustainable Domestic Product for Wine – SDP-Wine).

Chapter 2 (Mencarelli-De Propriis) answers in particular questions about:

- * how to clarify sustainability-related terms and create a specific glossary
- * how to define indicators of environmental sustainability
- * current sustainability policies and programs

Chapter 3 (Zanni-Pucci) answers in particular questions about:

- * the definition of business models in the wine sector
- * how sustainability permeates business models in the wine sector, providing an up-to-date picture of its features in Italy

* the relationships between company performance and sustainability, and trajectories of growth.

The world of Italian wine has embarked upon a course of development strongly characterized by sustainability. **The approach to sustainability of this movement is based on a holistic vision of wineries within society and the ecosystem**, setting itself broad and exhaustive social, economic and environmental goals (see figure 4, chapter 3). While research and models characterized by environmental spheres and technical characteristics have prevailed (see figure 1, chapter 2), the wineries' intention to orient their models of development towards the improvement of territories and provision of social services, with a strong emphasis on their positive impact on the finished product (see figure 6, chapter 3), is also very clear. Both the movement's interpretations of sustainability and the scientific literature on the matter reveal a basic cohesiveness regarding the recognition of fundamental issues, although with different levels of intensity.

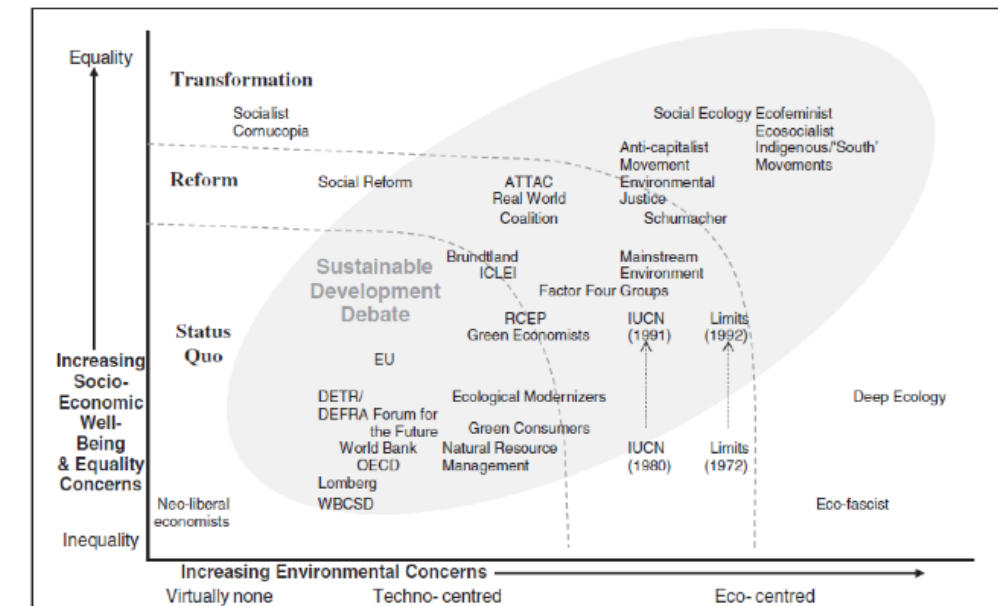


Figure 2, Chapter 1

Range of positions in terms of interpretations of the concept of sustainable development

Extract from Table 4,
Chapter 3:

Cluster
characterization: size
and position
N.B.: the results of
the investigation
define Cluster 1 as the
“high sustainability”
cluster, Cluster 2 as
“intermediate” and
Cluster 3 as “low”.

The companies directly involved in specific sustainable development networks represent at least *a third of the GDP from wine and a total annual turnover of an estimated €3.1 billion. Over 500 wineries are involved, as well as 31 Universities or Research Centers and 10 Associations or Government Institutions.* These actors have gathered around various discussion tables: the last of these in chronological order but first from the point of view of representation and aggregating capacity being the Forum for Wine Sustainability, which counts on the direct participation of 13 of the 15 national sustainable wine programs set up over the last five years.

The rootedness of this sustainability movement can also be seen in the common goals and approach it shares with the *over 1000 wineries studied by the Forum* (see chapter 3, section 4), *over 80% of which deem sustainability to be a strategic driver of development.* These firms are present throughout Italy (see chapter 3, figure 16) and represent all categories of size, thus revealing a sustainably-oriented business model that is homogeneous in its approach but differs in intensity: medium to large firms characterized by higher quality ratings and higher average sales prices tend to show a greater focus on sustainability.

	Cluster 1	Cluster 2	Cluster 3	Sample
Hectares	86.91	45.79	35.59	60.71
Mean Prod. in Bottles (last 2010-2013)	540,393	391,569	210,865	407,665
Gambero Rosso Green Glasses 2013	7.82%	6.38%	3.42%	6.17%
Gambero Rosso Red Glasses 2013	0.75	0.56	0.55	0.64
Mean Bottle Price (for labels assessed) 2013	19.01 €	16.71 €	15.39 €	17.41 €
No.	359	235	234	828

The strategic basis that seems to strongly characterize this movement from the point of view of company management (see chapter 1, section 4) is formed of: *a strong inclination towards innovation*, and in particular technological innovation; *the perception of an economic advantage* to be gained first and foremost through the better management of resources, as well as by making processes more efficient; *the ability of networks of companies to boost the success of individual firms* through policies of sharing difficult-to-access knowledge, but also through communication campaigns with greater market impact (although these are not yet common in Italy and in the world of wine, as can be seen from figure 10, chapter 3).

These issues are anything but new to the consumer market (see chapter 1, section 3), which is starting to show clear expectations concerning environmental and social issues. Consumers are also becoming demanding in this sense: in fact *they are not prepared to trade organoleptic quality for sustainability, and are still uncertain about granting a premium to a sustainable product, also because they have difficulties in perceiving its specific characteristics.* It has also come to light that consumers are more indulgent regarding the potential environmental impact of wine than other agricultural and food products, although this may be expected to change in the near future.

A complex legal framework is dedicated to the issue of environmental sustainability (see chapter 2, section 1), including the first specific areas regulated directly by the legislator (Legislative Decree 150/2012 and subsequent National Action Plan on the sustainable use of plant protection products, of 22 January 2014), although *reference is made in particular to a series of voluntary norms providing general guidelines* that are not specific to the wine sector. The most important of these are: ISO 14001 (environmental management systems), ISO 14064 (greenhouse gas inventory), ISO 50001 (energy consumption), ISO 14040-44 (product life cycle-based approach), ISO TS14067 and PAS 2050 (carbon footprint), EMAS (environmental management scheme) and WFN (water footprint). All these norms constitute valid procedural reference points and have prompted the proliferation of studies and applied analyses, but they must necessarily be associated with a specific and complex sector, such as that of wine. To date *the only authoritative guidelines on environmental analysis in the sector, referring to greenhouse gas inventories, is the O.I.V. Resolution 431 of 2011*

(General Principles of The OIV Greenhouse Gas Accounting Protocol - GHGAP). A European Commission program is currently aiming to lay down specific guidelines for a host of sectors, to which wine has been added in the last few months: these will regard the environmental footprint of the company/organization and its reference product(s) from a complementary and synergic viewpoint (OEF Organization Environmental Footprint – PEF Product Environmental Footprint). The first results are expected to be achieved within the next two years.

★ information related to those programs were not confirmed by participating to forum activities

In Italy 15 programs have sought to model approaches to sustainable development in the wine sector (see chapter 2, section 2. To these we can add numerous other projects, with several aims and methodologies but seeking to promote (sometimes biased) sustainability-related concepts; these projects are promoted by winegrowers' associations, consortia for the protection of designations of origin, and individual Regions.

The 15 Italian programs for Sustainable Development in the Wine Sector

Name of Program	Coordinator / Sponsor
1 Biodiversity Friend	World Biodiversity Association
2 CasaClima Wine	Energy Agency of Alto Adige - CasaClima
3 ECO Prowine	CIRCE – Centro de Investigacion de Recursos y Consumos Energeticos Universidad de Zaragoza
4 Eko Cantina / Eko Wine ★	Officinae Verdi / WWF / FederBio / University of Tuscia
5 Gea Vite / Ita. Ca.	SATA Studio Agronomico
6 Magis	Bayer Cropscience s.r.l.
7 Montefalco 2015:	New Green Revolution Ass. Grandi Cru Montefalco
8 Salcheto Carbon Free	Soc. Agr. Salcheto srl / CSQA Certificazioni s.r.l.
9 SosTain ★	Ass. Alleanza per la Sostenibilità in Viticoltura / OPERA
10 Environmental Sustainability of Agrifood SupplyChain by LCA Assesement	CCPB s.r.l. / APOCONERPO s.c.a.
11 Tergeo	Unione Italiana Vini Soc. Coop.
12 Vino Libero	Ass. Vino Libero
13 Vite.Net	Horta srl – spin off UNICATT Piacenza
14 V.I.V.A. Sustainable Wine	Italian Ministry of Environment / UNICATT / Agroinnova
15 Vini 3S	DIBAF University of Tuscia / Az. Agr. TREBOTTI

Many programs are recognizable by the mean of brands and logos, sometimes with specific communication disciplines.



Some are instead recognizable through specific company or certification bodies brands which developed their regulations.



In this context of applied research and development, it is therefore apparent that the environmental sustainability of wine requires a methodological approach that considers both the company and the product, preferably

bearing in mind the synergies between the two areas (figure 3, chapter 2). *Consequently the three environmental macro-indicators that emerge*, to be considered as interconnected and used together, except in the case of analyses of specific areas of environmental management (and therefore not sustainable development), *are*:

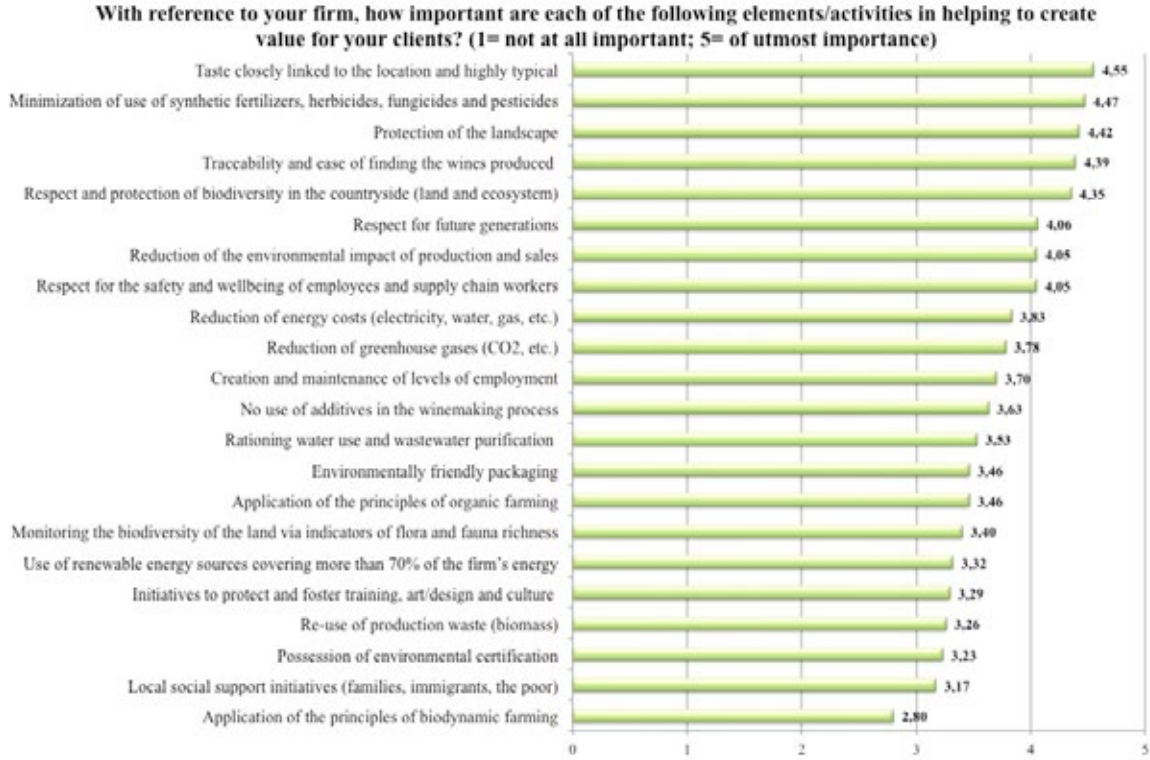
- 1 **GHG emissions** *Emissions of greenhouse gases - both direct (including from the use of energy) and indirect – related to the process and/or product*
- 2 **Water** *Consumption of water, and direct and indirect water pollution*
- 3 **Biodiversity** *Maintenance and Protection of Biodiversity in the ecosystem*

In this *Italian context the macro-indicator of Biodiversity in particular stands out as a highly innovative proposal* from both environmental and social viewpoints, as well as due to its interesting connections with the agronomic management of wineries. This new vision seeks to combine the best practices adopted so far with an analytical interpretation of the state of the ecosystem, *forming a direct connection between wineries' agronomic decisions and the maintenance of effective levels of biodiversity* in the ground, air and water of wineries and their surrounding ecosystems.

As illustrated by the national programs, the Italian wine sector aims to establish systems of managing sustainability policies that are generally comparable to *risk management schemes, based on self-assessment and continuous improvement* and, in the majority of cases, define *procedures for verification by second and third parties* within the national programs (see figure 6, chapter 2).

It is equally clear from the report that *Italian companies intend to strengthen the connection between the new sustainability-related demands and traditional aspects of their marketing mix*. According to Italian wineries the top 5 sustainability-related strategic factors for value creation are associated with key words such as landscape, work and safety, healthiness of the product. Among these drivers the first and only typically environment-related is the

protection of biodiversity (indirectly, through the reduction of treatments, which companies consider to be the top sustainability-related strategic factor for value creation), while energy, greenhouse gases and water are considered important but secondary, as are organic and biodynamic certification, which are judged to be less significant.



The investigations and reflections reported show very clearly that the Italian wine sector - historically perceived as being slow to apply models of sustainable development compared to countries such as the USA, New Zealand, South Africa, Chile and Australia, which had already launched specific national programs in the 90s – is instead a potential leader, due to both the technical and scientific contents developed than for the critical mass of the companies involved.

Figure 6,
Chapter 3:
*Evaluation of drivers
of value creation.*

Sustainable development in the wine supply chain: premises, rationality and the involvement of Italian firms

by *Eugenio Pomarici*¹ and *Riccardo Vecchio*²

Introduction

- ① Sustainable development: the origin and evolution of a concept
- ② Sustainable development initiatives in the wine sector: a global view
- ③ The business case for the sustainable development approach
- ④ System-level effects of the orientation towards sustainability
- ⑤ The sustainable wine movement in Italy: general framework

The subject of sustainability in the wine supply chain is currently a highly topical one. As the world of wine is inevitably affected by events in society as a whole, it too has witnessed the birth and development of a multitude of individual and collective initiatives linked to the subject in varying ways: together these generate a situation of creative chaos that is undeniably interesting and stimulating, but also difficult to navigate.

This chapter of the First Report on Sustainable Winegrowing precedes more specific analyses and will therefore seek to establish some points of reference. First, we intend to contextualize the evolution of the concept of sustainable development and, with reference to wine, describe the operational initiatives aimed at fostering sustainable wineries abroad, as well as the initiatives aimed at identifying and sharing a definition of the concepts of sustainable development specific to the wine sector. We will then look at the economic

reasons behind the quest for production models in line with the principles of sustainable development, and at the system-level benefits that the transition towards such models can bring about. Lastly, we will introduce some elements to describe the scope and characteristics of the movement for sustainable winegrowing in Italy.

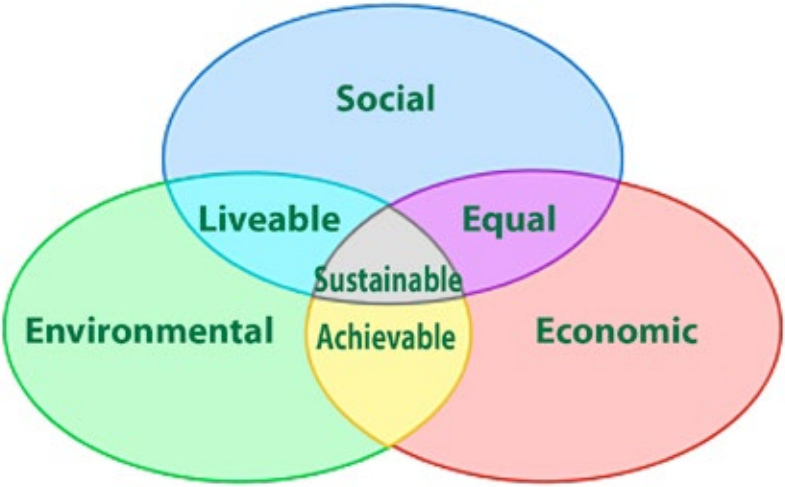
1. Sustainable development: the origin and evolution of a concept

Classical economists clearly identified the issue of the relationship between the development of human society and natural resources between the eighteenth and nineteenth centuries, also pointing out the possible conflicts it could entail. However, the subsequent phenomenal boom of all production processes cast the specific subject of the limits that natural resources can place on the development of human society into the shadows. This situation persisted until the biologist Rachel Carson succeeded in appealing to global public opinion with her volume *Silent Spring* the 1960s: dealing with the question of the relationship between man and nature, it is considered a cornerstone in the establishment of environmentalism around the world. The book - a clear accusation against the irrational industrialization of natural ecosystems and a well-documented report of the environmental damage caused by the spread of pesticides - sparked debate that eventually involved institutions at the highest level worldwide. This was followed by numerous non-governmental and government-led initiatives (both single-state and multilateral) and triggered a series of global summits under the aegis of the United Nations. The issue was highlighted by the UN's 1992 Earth Summit in Rio de Janeiro and came to a head at the UN World Summit on Sustainable Development held in Johannesburg in 2002. Along this journey, the concept of sustainability became increasingly well structured, starting from a focus on safeguarding the environment and arriving at an indissoluble connection between the conservation and improvement of natural resources on the one hand and the economic convenience and reproducibility of production processes and respect for the rights, dignity and health of all individuals on the other. In fact, to begin with a notion of sustainable development was adopted that implied

“development which meets the needs of the present without compromising the ability of future generations to meet their own needs”. However, there is now a belief that commitment to social equity between generations (leaving the world as we found it for the next generation) should be extended to intragenerational equity, with the aim of ensuring equal opportunities for all participants in civil society. This has led to a distinction within the concept of sustainability of three specific types: social, environmental and economic

Figure 1

Economic
development,
ecological
development and
social equity



The greater structuration of the concept of sustainable development does not, however, imply its unambiguous interpretation, leading to not insignificant political and operational problems. In fact, the institutional focus on the issue of sustainability entails the development of policies based on regulations, incentives and information, intended to guide production systems towards a model consistent with sustainable development: such policies require a clear, explicit and common vision of sustainable development in order to be formulated. A typical example is the debate between “hard” and “soft” sustainability. Those who support the concept of “soft” sustainability maintain

that what is needed to achieve sustainable development is the transfer from one generation to the next of a constant aggregate capital stock, within which natural capital can be substituted by man-made capital. The advocates of a “hard” interpretation of sustainable development deny this possibility. For them it is incorrect to assume perfect substitutability between the different forms of capital, as certain elements of the stock of natural capital cannot be substituted (unless to a very limited extent) by man-made capital. More generally, figure 2 illustrates the variety of potential positions regarding the question of sustainable development, according to their different focuses: on the issues of equality and collective wellbeing on the one hand, and the environment on the other. The scholars who carried out this analysis identify three different approaches to the choice of sustainability goals, characterized by the basic aim of transforming socioeconomic systems, reforming them, or, more modestly, intervening on the functioning of the whole production system but without altering the status quo. Figure 2 illustrates the fact that the EU and other key international institutions have adopted the latter position.

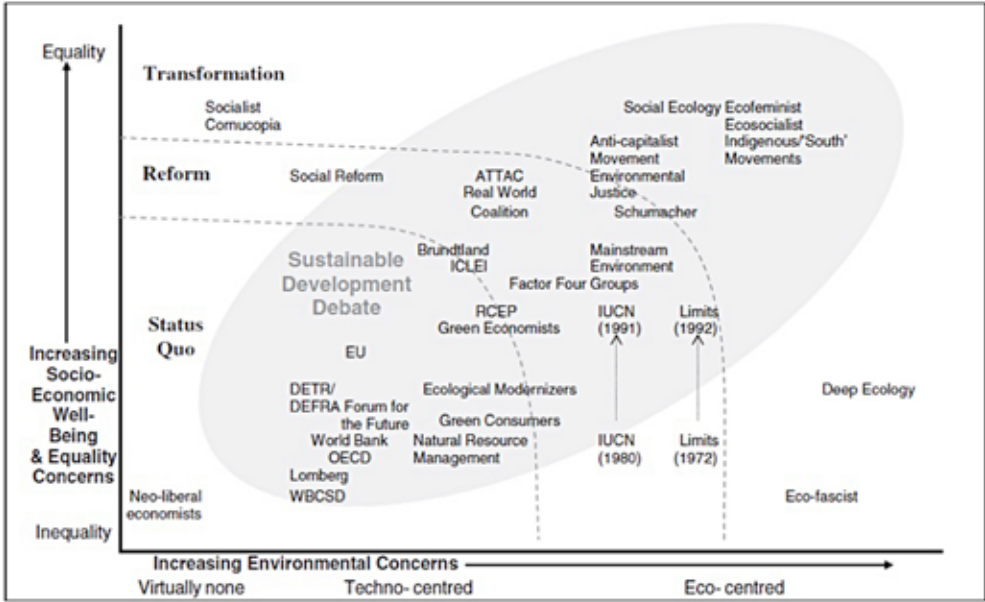


Figure 2

Range of positions
in terms of
interpretations of the
concept of sustainable
development

In this complex picture one element in particular stands out: that the challenge of sustainability is essentially a technological challenge. Commitment alone to the protection of natural resources and the transfer of that stock to future generations risks shutting society in a Malthusian trap: the level of widespread wellbeing that underlies long-lasting intragenerational equity can only be achieved by adopting adequate processing and organizational innovations, backed by state-of-the-art technologies. All this becomes a challenge for research – the supreme driver of innovation – which will be more effective the more it knows how, and manages, to operate in synergy with other economic actors to find appropriate solutions for different territorial and production situations.

2. Sustainable development initiatives in the wine sector: a global view

The world of wine has traditionally dedicated ample attention to the natural environment, recognizing it as a factor of wine quality that can act in many different ways. As far back as the nineteenth century, this awareness of the technical and commercial importance of the connection between production site characteristics and the characteristics and identity of the wine led to the development of the concept of *terroir*. Subsequently, as awareness of social and environmental issues has grown in more developed societies, many firms have adopted innovations in their production processes aimed at improving respect for the environment and people, as well as with a view to social responsibility. A particularly interesting aspect of the wine world's response to the challenge of sustainable development lies in the launch of group projects, which have led to the birth of business networks to set up what could be defined sustainability programs. Such programs analyze and evaluate production processes in the companies involved, with a view to improving their compliance with the principles of sustainability; this is also done through the joint development of best practices to ensure continuous improvement and communicate the performance achieved in terms of sustainability both internally and externally. In this context, the first structured initiative in support of the evolution of wine growing and

production processes in line with the principles of sustainable development was the Lodi Winegrape Commission in California, set up in 1992 (Ross and Golino, 2008). This was followed by the development of many other prominent projects in various New World wine producing countries. In Australia, New Zealand and South Africa, as well as in California, significant resources are currently being invested in the development of these programs to improve the sustainability of wine growing and producing processes and document the progress achieved. In Chile sustainability has even been placed at the heart of a new national strategic plan for wine, which has given rise to a national sustainability program involving certification. Of the various ongoing sustainability programs, some aim exclusively to document and communicate environmental performance, especially regarding carbon emissions, while others focus on the overall sustainability of processes, thus also taking economic and social aspects into consideration. In this somewhat varied context it is nonetheless possible to identify four programs of particular importance – as they have the characteristics of true certification programs or are already widely adopted in their relative areas – which therefore represent useful points of reference to understand the organizational forms that the sustainable winegrowing movement could take on in the various territories.

Certified California Sustainable Winegrowing

In 2002 members of the Wine Institute and the California Association of Winegrape Growers (CAWG) introduced a code of sustainable winegrowing practices to encourage protection of the environment and social responsibility within the Californian wine sector. The CAWG's self-assessment workbook for winegrowers and producers provides practical information on the conservation of natural resources, protection of the environment and improvement of relations with staff, neighbors and local communities. To date, over 1,566 winegrowers and producers - who represent about 68% of California's vineyard acreage and 62% of the volume of wine produced – have carried out self-assessments of their operations.

<http://www.sustainablewinegrowing.org/swpcertification.php>

Oregon Certified Sustainable Wine

The state of Oregon has set up a special labeling program for wines produced following agricultural and vinification processes deemed as sustainable by an independent third party: LIVE (Low Impact Viticulture and Enology), USDA Organic, Demeter biodynamic and Food Alliance.

Integrity & Sustainability

In South Africa, the body that introduced labels certifying the origin, vintage and grape variety now also certifies sustainability. Wine producers are required to follow the guidelines drawn up by the Integrated Production of Wine (IPW) scheme and the national Wine and Spirits Board (WSB). 85% of quality wines were carrying the new certification seal in 2011.

<http://www.swsa.co.za/>

New Zealand Sustainable Winegrowing

In 2007 New Zealand Winegrowers announced their intention to adopt a sustainability policy, with the aim of having all New Zealand wines independently audited by 2012. This policy sought in part to encourage participation in the Sustainable Winegrowing New Zealand (SWNZ) program, but also to stimulate the spread of other certification programs based on respect for the environment, such as ISO 14001, organic certification and biodynamic production.

www.swsa.co.za/

Among other national programs, the abovementioned recent system of Certified Sustainable Wine of Chile merits a mention due to the strong institutional and industry involvement it is characterized by, as does the Australian environmental protection system (Entwine). Also in Europe, aside from Italy, important sustainability programs have been developed. Among these it is worth mentioning the Vignerons en Développement Durable and

Bilan Carbon initiatives in France, and the Fair Choice project in Germany. Probably due to the greater breadth and lack of homogeneity in European winemaking systems, programs of national importance like those of the new wine producing countries have not yet been established.

Such individual and collective initiatives prompted by the wine world's sensitivity to the issues of sustainable development, and as a consequence of their objective importance for winegrowers and producers, have nonetheless developed in the absence of a consensus on sustainability-related concepts and definitions (Santini et al., 2013). Indeed, as mentioned above, the lack of a single definition of the general concept of sustainable development has led to the diffusion of diverse interpretations: these have spawned different operational approaches in the pursuit of sustainability and caused problems in terms of competition between companies and public comprehension of the sustainability policies of the wine chain as a whole. Since the beginning of the new millennium, this has prompted the International Organization of Vine and Wine (OIV) - the largest multilateral body operating in the interests of the world of wine - to seek to provide winegrowers and producers with definitions and tools to favor the adoption of production processes in line with the principles of sustainable development, avoid phenomena of unfair competition, and foster dialogue on sustainability-related issues between the world of production, the distribution system and society as a whole. In this context, with resolution "CST 1-2004" OIV proposed the following definition of sustainable winegrowing: <Global strategy on the scale of the grape production and processing systems, incorporating at the same time the economic sustainability of structures and territories, producing quality products, considering requirements of precision in sustainable viticulture, risks to the environment, products safety and consumer health and valuing of heritage, historical, cultural, ecological and aesthetic aspects>. Through the approval of subsequent resolutions (CST 1-2008 and OIV-Viti 422-2011) OIV has helped to identify ways to improve the sustainability of winemaking, and with resolution CST 431-2011 in particular it proposed a harmonized method for calculating a company's greenhouse gas emissions. Activities are currently underway to update previously approved resolutions and develop guidelines

and other practical tools, also within the framework of a new strategic plan for 2015-2019, which places sustainability at the core of OIV's interests.

The need to share - as widely as possible and on an international scale - a vision of how actions in line with the principle of sustainable development can be imported into the winegrowing world gave rise to the international conference on "Sustainable viticulture and wine production", which took place at the SIMEI 2013 fair. This resulted in the document "Vision on the sustainable future of our wine and vineyards" (Capri et al., 2014), proposing a set of fundamental ideas intended to form the conceptual basis for corporate and public sustainable winegrowing policies. Such policies need to affirm a holistic vision of sustainability: involving the whole supply chain, taking into consideration all three dimensions (environmental, social and economic), defining public and private responsibilities, and identifying innovation and cooperation as the keys to breaking down the barriers that hinder the achievement of certain goals.

3. The business case for the sustainable development approach

The current number and variety of sustainability-related initiatives prompts the question of the rationality of certain courses of action from a company-oriented viewpoint and, therefore, to what extent seeking to create sustainable production systems has a positive impact on firm costs (by improving technical efficiency or increasing consumer interest in the products made available).

The literature to date certainly fails to provide an exhaustive response to these questions, as the issue of sustainability's cost/benefit ratio is distinctly under-investigated at both national and international levels. Studies identifying which practices bring the greatest environmental and social benefits, while evaluating their economic impact, possibly with reference to the different strategies adopted by the various sustainability programs, should therefore be encouraged. However, some of the information already available, from the areas of the world with the greatest experience, demonstrates that following the routes suggested by sustainability programs brings companies economic benefits due to lower direct costs, higher quality grapes and healthier vineyards.

A recently conducted study on a sample of companies participating in the Certified California Sustainable Winegrowing program, with the aim of exploring owners' and managers' perceptions of both the economic and environmental costs and benefits of sustainable practices from the vineyard to the cellar (Pomarici and Vecchio, 2014), highlighted that the majority of interviewees perceive that the overall economic advantages deriving from the sustainable practices introduced to meet the requirements of the certification system outweigh the costs. The results seem to be credible and sound, as the sample includes both a significant number of large wineries (in terms of both production volume and marketing power) and other types of company, and are of particular interest as the companies interviewed had been obliged to adopt numerous innovations and managerial changes. In particular, the results show that changes in vineyard practices bring the greatest environmental and economic benefits. Moreover, previous studies (Marshall et al., 2010) have reported similar results, albeit with a significant variability in specific vineyard and cellar practices.

In terms of the costs and benefits of sustainability, it must be pointed out that, apart from the savings to be made by reducing the use of certain inputs (water, pesticides, energy...) thanks to individual changes in specific production steps, a key element to be taken into account is the tendency towards continuous improvement: this is one of the cornerstones of sustainability programs and encourages greater efficiency also through the discovery of new and better ways of doing things. The research presented in chapter 3 of this report also shows that increased efficiency in the use of resources and performance of operations is the main and most significant economic effect of the pursuit of greater sustainability.

However, with reference to consumer interest in wines from sustainability-oriented production systems, a subject upon which more literature is available (albeit very varied), there is as yet no clear evidence that the pursuit of sustainability enhances the perceived value of products: what's more, the reasons why consumers tend to buy sustainably produced products - including wine - remain largely unexplored. Nonetheless, public interest in this type of product is probably on the rise, given the commercial success of many food

products that guarantee protection of the environment and respect for ethical and social principles (Euromonitor International, 2013).

The analyses dedicated specifically to the tendency to buy sustainable wines (being distinct from those focusing on consumers of organic wine) are few and characterized by significant limitations. Even so, these studies provide some useful information, as well as important starting points for future research. One element of remarkable interest brought to light by this literature is the hierarchy of consumer concerns: while consumers generally show clear signs of concern for the negative effects of food production on the environment, they see the production of wine as a case apart and do not appear to be particularly worried about its negative environmental externalities.

An analysis of the scientific literature reveals that consumers' knowledge of the concepts of sustainable viticulture and winemaking is currently somewhat limited and the expression "sustainable wine" is still met with some confusion. Moreover, scholars express very diverse opinions on the number of wine consumers interested in buying this type of product in the near future, and on their willingness to pay a price premium for sustainable wines. However, other studies have begun to investigate the behavior of consumers of sustainable wine in more detail, seeking to compare and estimate the value assigned to certain sustainable attributes. These studies also reveal heterogeneous behavior regarding consumers' propensity to pay a higher price for wines with sustainability-related attributes. D'Souza and colleagues (2006) in particular, in their study of Australian consumers, show that around 70% of their sample population would be willing to buy sustainable wines, even if they were more expensive. On the other hand Bazoche and colleagues' (2008) survey of French consumers shows that wines with environment-protecting characteristics are not perceived as having greater value than traditional wines. Likewise, Remaud and colleagues (2008) highlight the fact that in Australia a wine's environmental attributes do not influence consumers' choice.

Forbes and colleagues (2009) in New Zealand report identical percentages of consumers concerned with the issues of sustainability to those in Australia. Loveless and colleagues (2010) reach the same conclusion following research on an international panel of consumers (from the USA, Canada, UK, Ireland

and Sweden) and show that environmental protection is less important than other characteristics, such as quality control and traceability. In contrast Berghoef and Dodds (2011) find a much smaller segment of the Canadian population to be interested in such products. Louriero in Colorado, and Schmit and colleagues (2012) in New York State report that US consumers are not willing to trade the organoleptic/sensory quality of a wine for better environmental/social performance, nor to grant such attributes an added value, reaching the conclusion that sustainable wines should be sold at the same price as conventional ones.

In research conducted in the USA, Canada, France, Germany and the UK, Mueller and Remaud (2013) underline that knowledge of and interest in environmental certification are limited to small groups of consumers, albeit with remarkable differences between countries. Vecchio (2013) investigated the willingness of young Italian wine consumers to pay for three products with "sustainable" labels, finding that women and more mature consumers had a greater propensity to pay a price premium for such wines.

Seeking to summarize the heterogeneous results in the literature on consumers' stance regarding sustainably produced wine, it can probably be affirmed that, so far, only specific segments of consumers acknowledge the added value of sustainable attributes, which can generally not be traded for sensory quality. These consumers' numbers could be boosted with appropriate communication campaigns, whose success, however, seems to depend on their ability to avoid conflicts between approaches to sustainability and "sustainable brands" and instead propose collaborative and even institutional actions, as suggested in chapter 3 of this report. The broad variety of responses regarding the association between qualitative stimuli and sustainable attributes may also depend on the different conditions under which the individual surveys were conducted, thus highlighting the problem of how sustainability attributes are presented and defended. Interest in these attributes should nonetheless grow in time due to a probable increased public focus on the issue: this may be encouraged by public policies favoring the consumption of sustainable food, as yet in the planning phase (European Commission, 2008). It remains to be discovered what effects such increased interest may have: greater willingness

to pay, or merely greater willingness to buy; and what interactions may develop between the acquisition of information on sustainability attributes and perceived sensory quality.

4. System-level effects of the orientation towards sustainability

The paragraph above has shown that there is a business case for pursuing greater sustainability: when the business model adopted on an individual basis manages to turn sustainability attributes to account on the market, also thanks to favorable background conditions (see discussion in chapter 3), companies can gain benefits in terms of efficiency and cost containment and take advantage of a greater perceived value of the products offered. Another key aspect of the consequences that pursuing sustainability can lead to is the effect appreciable at system level, when this tendency becomes widespread in the regional or multi-regional business community.

Indeed, the spread of behaviors guided by the principles of sustainable development has significant consequences at system level, in terms of reinforcing network relationships and triggering demand for what are known as “green jobs”³.

The route towards the adoption of sustainable processes generally involves the businesses interested joining networks composed of wine producing companies and other subjects, such as professionals, service providers and producers of technical equipment. Members of such networks exchange experiences and knowledge with the aim of continuously seeking new and more effective solutions to the problems of how to organize more environmentally and people-friendly production processes. These networks get stronger the more the benefits of the relationship itself are apparent, thus creating new and rewarding social ties, and can also lead to fresh opportunities for cooperation on other fronts, such as the promotion and planning of products, supplies, market research and distribution. An orientation towards sustainability therefore facilitates the transition towards a network-based economy, which is the objective of the EU’s industrial and agricultural policy for small and medium sized enterprises, and which

could transform today’s fragmented production system (which seems to be an element of weakness) into an element of strength. This can occur when the network on the one hand helps reduce costs and, on the other hand (by generating synergies) exploits the widespread entrepreneurship that characterizes a production fabric based on SMEs, such as wine growers and producers, moving in the direction suggested by the “Knowledge Economy” (Rullani, 2004).

It should also be pointed out that the transition towards a more environmentally and people-friendly organization of production processes implies not only reduced inputs and the abandonment of hazardous practices, but also the substitution of inputs that are potentially harmful to the environment and people and hazardous behaviors with other inputs, represented by new skills. Processes thus become more labor intensive in terms of the additional intellectual input needed to control, analyze, assess and accompany firms towards new organizational models. Indeed, adopting forms of organization of production in line with the principles of sustainable development demands careful planning and control regarding environmental conditions and plant behavior in the vineyard, and various process parameters in the cellar, which therefore require specific new skills. These may be available within individual companies or through special services: in any case, as a greater number of companies gradually choose the path of sustainable development, the wine growing and producing system will boost overall demand for specific skills and qualifications in the various areas necessary to improve the sustainability of production and distribution processes.

5. The sustainable wine movement in Italy: general framework

Explicit interest in the subject of sustainable development has emerged later in Italy than in other countries. In a Delphi consultation carried out between 2006 and 2007 between entrepreneurs and top managers from the main Italian wine firms (Mariani and Pomarici, 2010) the question of sustainability seemed important, but specific initiatives were not deemed

necessary, as Italian wine growing and production appeared to already have a high level of sustainability. More recently, however, a remarkable level of activism has developed, which has seen the direct involvement of wine growing and producing companies, suppliers of technical equipment and services, producers associations, research institutes and public administration; the birth of the Forum for the Sustainability of Wine fits perfectly into this process. Chapter 3 of this report presents key evidence of how the focus on sustainability has in many cases guided business decisions, while chapter 2 analyses the sustainability programs launched in Italy, which, in some ways, are the most tangible (and measurable) sign of the Italian wine chain's transition towards greater sustainability.

Concerning this aspect of sustainability programs, in concluding this chapter it is important to mention that the set of current initiatives represent an already significant wealth of experience that covers, albeit not homogeneously, all three aspects of sustainability (environmental, social and economic) and the whole chain (from the vine to the table), and includes the use of the various organizational models and instruments necessary (indicators, systems to coordinate and exchange information, methods of evaluation and self-evaluation of sustainability-related performance, labeling, etc.).

This wealth of experience has been nourished by the involvement in sustainability programs of a relatively large number of wine firms, which in chapter 2 are estimated to be around 500. This number is certainly small in relation to the overall number of Italian wine growers and producers, even if we consider only those present on the market with their own brand; however, what counts in order to understand the substance of the sustainability movement is the composition of the population of firms committed to sustainability programs. Those involved include all Italian companies oriented towards the production of quality wines (both private firms and cooperatives) of vast, large, medium and small sizes which, altogether, represent a third of the total value of Italian wine. This is without doubt a significant share, considering the extremely recent launch of an explicit pursuit of greater levels of sustainability. However, beyond the number

of companies, it is important for the sustainability movement to involve firms of all sizes and types, as this is the best proof that the organizational models of production inspired by the sustainable development paradigm are capable of bringing benefits under all conditions – precisely because they are intrinsically flexible. This clearly implies favorable conditions for the ever greater involvement of Italian wine companies.

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3- The European Union defines as 'green jobs': all jobs that depend on the environment or are created, substituted or redefined (in terms of skills sets, work methods, profiles greened, etc.) in the transition process towards a greener economy (SWD(2012) 92 final)

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Map of sustainable production models: indicators of sustainable winegrowing

Fabio Mencarelli¹ and Luciano De Propris²

- ① Overview of voluntary standards on environmental sustainability
- ② Analysis of sustainability programs implemented in Italy
- ③ Considerations on the use of indicators, calculators and measures
- ④ Self-monitoring, control and certification for improvement
- ⑤ Proposals for the definition of guidelines to standardize environmental analysis tools

1. Overview of Voluntary Standards on Environmental Sustainability

For a number of years, the topic of sustainability has been attracting growing interest from stakeholders: consumers, producers and standards organizations, not to mention the EU legislator. The environmental aspect of sustainability is undoubtedly the most progressed and the one attracting the most attention.

In addition to the considerable efforts being made by companies to innovate and offer sustainable products, the EU legislator has also set out a European policy on environmental matters, which has been the driving force behind numerous public and private initiatives in this field. Since 2001, the EU

legislator - through the Green Paper - has set about promoting a European framework for corporate social responsibility and encouraging sustainable *production* and consumption through to the Europe 2020 project, which sets out a strategy for smart, sustainable and inclusive growth and promotes a greener, more competitive and more efficient economy in terms of resources.

Companies making the shift towards sustainability are identifying a *new way of being competitive* in order to distinguish themselves from their competitors and *communicate* their activities. Interest in environmental issues shifts the focus from companies – which produce their goods with respect for the environment - to their product and how they convey their environmental commitment to the consumer. The environment thus becomes a factor helping companies to stand out, achieve added value and communicate in order to reach out to a category of consumers who are becoming increasingly aware of environmental issues.

The result of this “inwards to outwards” shift by companies is an exponential increase in environmental brands and a continuing rise in the number of eco-labels. If, on the one hand, businesses, institutions and companies recognise the huge value of sustainability and labelling as a tool for developing the Green Economy, on the other it cannot be denied that communication of sustainability-related issues is a critical factor. In fact, across all sectors, labelling is a critical element and sustainability-related claims are no exception. Consumers must be able to understand the information carried on or relating to products immediately and easily and the information must be truthful and verifiable. In order to prevent infringements, a number of *authorities* tasked with checking the accuracy of communication and advertising have been set up. These include the AGCM (Italian Antitrust Authority), for example, as well as a number of self-regulation institutes such as the IAP (Italy’s Advertising Standards Authority), which aim to limit the phenomenon of greenwashing.

There are several guidelines that provide clarification on how a “*robust*” *environmental communication* requires the adoption of recognized

methodologies during the study stage and the use of *verifiable standards* at the communication stage, whether at company or product level, especially in cases where statements concerning a product's performance are being made. For a commitment to sustainability to be communicable, it needs to be demonstrable using recognized methodologies and – depending on the type of communication – relate to all company activities/processes (management system) or to the product. Communication becomes an integral part of environmental management and, indeed, the duty of care requires that information and results be communicated only when there is accurate, reliable and verifiable scientific and documentary evidence to support them.

Against this background, “*technical standards*” (ISO – international, EN – European, UNI – national) play a very important role as a consensual, transparent and voluntary tool aimed at defining the characteristics of a product or a process according to the highest level of development. Certification can play a pivotal role here, as a tool with which to endorse companies' communications in matters of environmental sustainability, providing solid and objective support.

Standardization provides tools which focus on environmental management (ISO 14001, ISO 14064) and energy management (ISO 50001), tools for assessing environmental impact through the study of life cycles (ISO 14040-44), tools for evaluating environmental sustainability indicators of interest, such as the carbon footprint (ISO 14067) and the water footprint (ISO 14046 currently being developed), environmental communication tools (ISO 14063) and labeling tools (Type I -UNI EN ISO 14024, Type III -UNI EN ISO 14025, other Type II environmental declarations or product brands established by binding standards).

The transition from a “Command and Control” style of managing environmental topics to one based on prevention, aimed at reducing environmental impact, has led to the diffusion of environmental management systems as a tool for ensuring compliance with current laws and the development of a system of self-regulation that identifies and manages actual and potential environmental impacts. The logic behind environmental management systems is common to

all management systems and involves a method of “continuous improvement” based on the Deming Cycle, the main elements of which are: environmental policy, planning (Plan), implementing the Plan (Do), checking and taking of corrective action (Check), ending with a review of the plan (Act). The two standards forming the basis for this tool are international standard UNI EN ISO 14001 (2004 version) and the EU EMAS regulation, currently in its third edition (2009).

A new tool that lays down the requirements for *Energy Management Systems* - ISO 50001 (2011) – was recently introduced. This standard is almost identical in its approach to the ones mentioned above, but focuses essentially on energy variables.

Specific standards such as ISO 14064-1 (2012) and the GHG PROTOCOL (CORPORATE version) have also been developed for *the management of greenhouse gases*, with the principal purpose of giving credibility and trust to GHG reporting and monitoring processes.

The *ecological footprint*, a topic which is attracting more and more interest on the part of stakeholders, is a more recent concept. Developed by Waker Nagel and Rees in 1996, the ecological footprint is a synthetic indicator and measure of human consumption of the earth's natural resources, in relation to nature's capacity to regenerate. By further restricting the boundaries to the topic of climate change, it is possible to define a specific indicator known as the “carbon footprint”, which quantifies the impact of the activities of a product, a service or a process in terms of their emissions of greenhouse gases (or GHG), measured in tonnes of CO₂e. The main standards currently applicable here are ISO TS 14067 (2013), GHG PROTOCOL (PRODUCT version) and BS PAS 2050.

Another type of footprint has also been established in recent years: the “*water footprint*” represents the volume of fresh water used and polluted (in relation also to the production site). This indicator is regulated by the Water Footprint Assessment Manual (2011) developed by the Water Footprint Network (newly published ISO 14046 standard).

These two indicators are based on the “*Life Cycle*” approach that analyzes all the consecutive and interconnected stages of a production system, from the

acquisition of raw materials and the generation of natural resources, to their disposal. This approach analyzes the environmental aspects both prior to the production stage and “post consumption”, owing to the fact that goods and services have an environmental impact, the effect of which may be felt far away from the production site and much further down the line.

At a European level, the strategic importance of the LCA (*LIFE CYCLE ASSESSMENT*) method as a scientifically appropriate tool for identifying important environmental aspects is already well consolidated, as clearly expressed in the Green Paper COM 2001/68/CE and in COM 2003/302/CE on the Integrated Product Policy and the Ecolabel Regulation (now Reg. 66/2010/CE). The LCA is an essential source of support for the development of *Environmental Labelling schemes*, owing both to the fact that it establishes the environmental criteria for a particular group of products (type I Ecolabels first and foremost), and because it is the main tool through which to obtain an Environmental Product Declaration (EPD – type III eco label).

A special mention must also go to a very interesting initiative that the European Commission has been working on in recent years through the Joint Research Centre, involving some very ambitious goals between now and 2016.

The project envisages two methods, applicable in all the Member States, one being the Organization Environmental Footprint (OEF) and the other the Product Environmental Footprint (PEF), both based on the LCA method. Through its communication “Building the Single Market for Green Products”, the European Commission is promoting these two voluntary methods applicable both to public environmental policies and to the private sector. The main objectives of the project, presently in its 3-year pilot stage, are to develop product-specific rules (“category rules”) for the PEF, and sector-specific rules for the OEF, explore ways of making their application more simple, especially for SMEs, evaluate the different assessment systems and, finally, consider how to communicate the performance measured to the different stakeholders.

In summing up the long list of voluntary standards on environmental sustainability, we should not forget to include the field of sustainable biomass. Although this resource is apparently unrelated to the food sector, it is interesting to observe how the subject of “biomass sustainability” has been regulated not

so much by voluntary standards (which in any case include private standards recognised at European level), as by regulations laid down by Ministerial Decree. Directives 2009/28/EC and 2009/30/EC of the European Parliament introduced the concept of sustainability as a necessary condition for biofuels and bioliquids to qualify for incentives, as well as for them count towards achieving the mandatory national targets laid down by said directives. In Italy, this has led to the creation of the “National Certification System of the sustainability of biofuels and bioliquids”, an accredited scheme established by Ministerial Decree dated 23 January 2012.

On the other hand, UNI ISO 14063 standard is broader in scope: this standard provides guidance on general principles, policy, strategy and activities relating to both internal and external environmental communication. It describes environmental communication as the “process that an organization conducts to provide and obtain information, and to engage in dialogue with internal and external interested parties, to encourage a shared understanding on environmental issues, aspects and performance”.

There is therefore a vast array of internationally recognized voluntary regulatory standards that companies can adopt in order to support their sustainability strategies. The adoption of verifiable/certifiable methodologies and voluntary standards is a way of giving substance to the concept of sustainability, and certification becomes a tool for guaranteeing the reliability and verifiability of the management and communication of companies’ eco-sustainability.

2. Analysis of Sustainability Programs Implemented in Italy

In the last five years, Italy has been the clear protagonist of a decisive drive to define a model of sustainable development for the wine growing and producing sector. There are 15 structured programs in existence (not excluding other less well known ones) involving companies, academic and research bodies, institutions and service providers, aimed at codifying and modelling an approach for the sustainable development of the sector. This veritable scientific-productive movement has seen the combined participation of 31 Universities

★ information related to those programs were not confirmed by participating to forum activities

and Research Centres, 10 Associations and Government Institutions and 537 producing companies, in addition to various other service providers in the sector. Thanks to the integrated research and development work carried out in the sector, these broad-ranging and in-depth studies have given us a very clear picture of elements that could help to distinguish this new production model. In our analysis of these programmes, we shall be referring in particular to research conducted by Prof. Eugenio Pomarici and Dr. Riccardo Vecchio (University of Naples Federico II) in 2013/2014 on behalf of the Italian Wine Union/ Forum for Wine Environmental Sustainability, using the data provided by the sponsor organizations that filled in an exploratory questionnaire, as well as observations gathered by the authors.

The 15 Italian programs for Sustainable Development in the Wine Sector

Name of Program	Coordinator / Sponsor
1 Biodiversity Friend	World Biodiversity Association
2 CasaClima Wine	Energy Agency of Alto Adige - CasaClima
3 ECO Prowine	CIRCE – Centro de Investigacion de Recursos y Consumos Energeticos Universidad de Zaragoza
4 Eko Cantina / Eko Wine ★	Officinae Verdi / WWF / FederBio / University of Tuscia
5 Gea Vite / Ita. Ca.	SATA Studio Agronomico
6 Magis	Bayer Cropsience s.r.l.
7 Montefalco 2015: New Green Revolution	Ass. Grandi Cru Montefalco
8 Salcheto Carbon Free	Soc. Agr. Salcheto srl / CSQA Certificazioni s.r.l.
9 SosTain ★	Ass. Alleanza per la Sostenibilità in Viticoltura / OPERA
10 Environmental Sustainability of Agrifood SupplyChain by LCA Assesement	CCPB s.r.l. / APOCONERPO s.c.a.
11 Tergeo	Unione Italiana Vini Soc. Coop.
12 Vino Libero	Ass. Vino Libero
13 Vite.Net	Horta srl – spin off UNICATT Piacenza
14 V.I.V.A. Sustainable Wine	Italian Ministry of Environment / UNICATT / Agroinnova
15 Vini 3S	DIBAF University of Tuscia / Az. Agr. TREBOTTI

Many programs are recognizable by the mean of brands and logos, sometimes with specific communication disciplines.



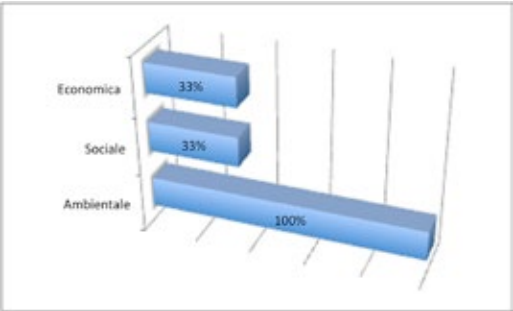
Some are instead recognizable through specific company or certification bodies brands which developed their regulations.



All 15 programs have been designed with a holistic vision of sustainability as their overall value/goal to be pursued and with a strong focus on improvement and innovation. Although their stated overall aim is to pursue an integrated environmental, social and economic goal, our analysis clearly shows that, in

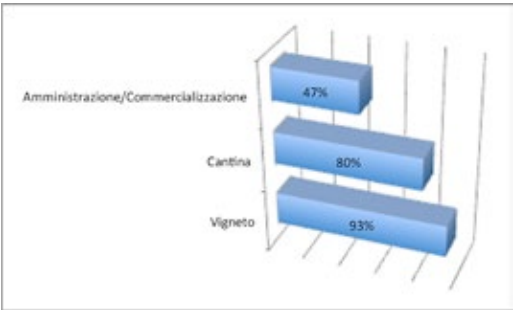
this stage, priority has been given to carrying out detailed studies and applied research and that all 15 programs have environmental aims (5 also have social aims and 5 economic aims).

Scope of Program Sustainability Fig. 1 (percentage expressed per scope considered out of the total number of programs analyzed ⁴)



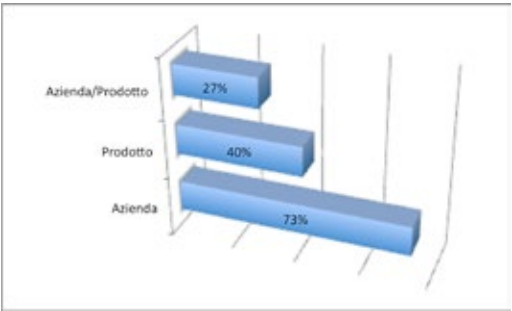
Our examination of the programs reveals equally clearly how scopes of analysis have been defined which favour wide boundaries structured according to an approach that is consistent with the peculiarities of the process and split into Vineyard, Wine Cellar and Administration/Marketing. 80% of the programs were found to have chosen at least two areas of analysis whilst 40% covered the entire process.

Area of Program Analysis Fig. 2 (percentage expressed per area of analysis considered out of the the total number of programs analyzed ⁵)



Although there is some inconsistency in the definitions, it is possible to categorize the approach taken in the various programs as relating either to the Company (the production process of the entire organization) or to the Product (extrapolation of the effects-impacts relating to one specific product of the organization-process). Although the two approaches are largely distinct, a number of initiatives offer integrated evaluations (see also Section 1 concerning the approach of the EU Commission in relation to the OEF – PEF project), and this has been borne out by our observation of the programs taking into consideration the four multiple-approach company-product cases.

Subject of Program Analysis Fig. 3 (percentage expressed per subject of analysis considered out of the total number of programs analyzed)



Despite having different levels of coding and transparency, all the programs have the following in common:

Use of Environmental Analysis Tools (Indicators, Calculators, Measures)

Use of Behaviour Guidance Tools (Training, Manuals, Protocols)

If we take a look at the environmental theme more closely, what is particularly interesting to note (Fig. 4) are the parameters that characterize the analysis tools, described in the programs as distinguishing the “Sustainability Indicators” used, grouped together as follows:

4- Many of the programs (47%) deal with several scopes simultaneously.
5- Many of the areas of analysis have been dealt with simultaneously within individual programs (80% deal with more than one)

Direct emissions (including those resulting from energy consumption) and indirect emissions of greenhouse gases related to the process-product

GHG Emissions

Distribution of products in the vineyard and their toxicity levels

Treatment-Fertilization

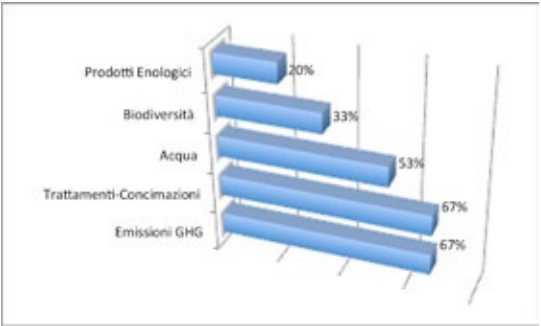
Consumption of water and direct and indirect water pollution / Water Biodiversity levels in the company's ecosystem

Biodiversity

Use of processing aids and additives in the transformation process and their salubrity levels

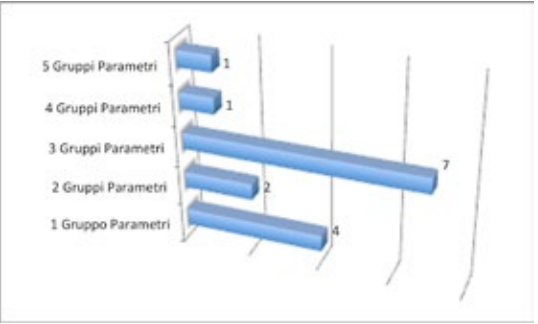
Wine Products

Fig. 4 (percentage expressed per indicator considered out of the total number of programs analyzed)



Looking at the level of structure in the use of the parameter groups in Figure 5, the sustainable development approach taken in the Italian programs needs to be considered from a variety of viewpoints, in line with the most consolidated theories on the subject. More specifically, 60% of the programs analyzed have adopted at least 3 of these indicators simultaneously (9 out of 15).

Fig. 5 (number of indicator groups considered in the individual programs)

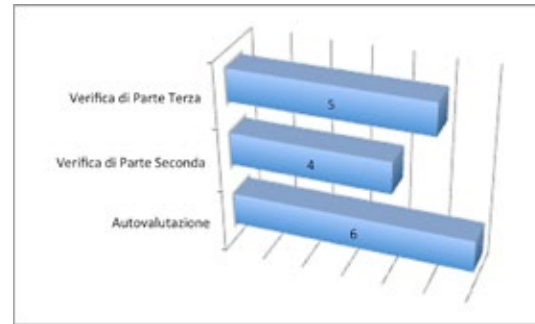


We therefore need to consider the fact that the Treatments-Fertilizations group (included in the Water group) is normally considered to be a causal factor in water pollution, as well as in the decline in biodiversity levels (Biodiversity group). It is therefore reasonable to consider this group, which falls under one of the behaviour indicators (best-practices in the choice of type of action at risk and the intensity of the actions), as one that can potentially be monitored using a broad indicator such as Biodiversity. The choice of indicators could, therefore, be additionally grouped together with GHG Emissions, Water, Biodiversity and Wine Products. Moreover, if we consider how the Wine Products group overlaps in terms of product health monitoring purposes and not just environmental purposes, we can see 3 parameter groups emerging which predominantly make up the environmental indicators used, namely: *GHG Emissions / Consumption and Pollution of Water / Maintenance of and Increase in Biodiversity*. In fact, 10 programs out of a total of 15 use at least 2 of these three groups and 7 programs (47%) use all three.

What can therefore be seen is the fact that all the programs are strongly characterized by their use of quantitative data collection and processing tools, while also providing a tool with which to assess

performance, albeit using different approaches. In fact, (Fig. 6) 60% of the programs aim to verify the results of the monitoring activity by means of second or third party certification mechanisms, whilst 40% favour self-monitoring tools.

Fig. 6 (number of programs correlated to monitoring tool)



The picture that emerges from our study of the programs nonetheless reveals a common scenario one that has different, yet largely complementary, approaches. The subject of Environmental Sustainability is considered a priority area of focus at the present time, and it therefore seems appropriate to measure it in an integrated way according to three basic parameters: emissions of greenhouse gases, consumption and pollution of water, as well as the protection of biodiversity in the ecosystem. At the same time, the fact that the programs contain references to aspects relating to the transparency of production processes and the salubrity of the product reveals how this subject is considered to be the next key area of focus in the area of sustainability, as part of a wider vision of sustainability on which to focus attention.

As already pointed out by Pomarici-Corbo-Vecchio-Capri in their document “The Pursuit of Sustainable Winegrowing in Italy: Experiences and Prospects for Achieving an Italian Model for Sustainable Winegrowing”,

the phenomenon is complicated to understand if we just look at individual initiatives. While all the programs show a strong inclination to include processes by which they inform the market of their actions (4 of them have, for example, already produced specific logos for the labels of products of member companies), it is clear that the absence of a standard and consensual regulatory-legislative framework makes the message confusing and not particularly credible, and risks making it appear to third parties as being insufficiently transparent and incomprehensible, as well as making it hard to associate with the aims of improving the quality of the product that the consumer expects.

Across the different programs, the inclination shown by companies to demonstrate their sustainability efforts with regard to their finished products appears to be suffering a further slowdown, owing to the almost complete absence of any players downstream of the production sector and, generally speaking, the absence of public communication management policies, or the failure to integrate the models into the product’s marketing mix. In fact, just 1 program out of 15 has collaborated closely with a retail distribution company: the only one to have linked one of the typical characteristics of its product on the consumer market (the presence-use of SO₂) to its sustainability model. The observations made by Zanni and Pucci in chapter 3 reveal just how large the gap between the sustainability models proposed by the programs and the market actually is. It would also appear that marketing strategy experts tend to associate the sustainability approach with a product’s features, such as the typical character and authenticity of its taste, landscape, traceability and use of additives, as much as or even more than they do to the well-known environmental pillars of Greenhouse Gases, Water and Biodiversity (with its various sub-categories). The need to bridge this gap therefore seems obvious, not least by putting forward clear evidence of cause-effect between sustainability management models and a product’s characteristics: a task that, whilst within the reach of the program sponsors, requires structured and cohesive communication actions.

3. Considerations on the use of Indicators, Calculators and Measures

The most recent agricultural regulations on environmental sustainability have been the reform of the CAP and Communication COM 2006 508, as well as the OIV guidelines (specific to the wine sector). These measures have supported environmental monitoring initiatives, based on the list produced by the European Commission (“Towards Environmental Pressure Indicators for the EU”, Eurostat), despite there being a clearly understood need to allow individual communities the freedom to select the most appropriate indicators for their situation, so that their specific environmental situations are reflected in the best way possible.

This ample freedom of choice has resulted in the development of a number of national and international projects based on analytical studies carried out by the OECD (Organization for Economic Co-operation and Development) and the European Environment Agency (EEA).

Some examples of European projects dealing with agriculture and sustainability are ELISA (Wascher, 1999- Environmental Indicators for Sustainable Agriculture), aimed at defining indicators grouped into 5 areas: soil, water, air, biodiversity and landscape, and IRENA 2004 (Indicator Reporting on the integration of ENvironmental concerns into Agricultural policy), which instead carried out a more comprehensive analysis of the 35 indicators identified in the EU communication (2000 and 2001), leading to the publication of ‘Agriculture and Environment in EU-15 - The IRENA indicator report’.

Despite sharing the same aims as the IRENA project, the PAIS (2002) project suggests 115 indicators grouped into 3 subjects: landscape, agricultural practices and rural development. Regarding Italy, we must not forget the 15 programs described and discussed earlier.

In order to gain a proper understanding of sustainability issues, it would be useful to clarify the meaning of some, often confusing, terms such as parameter, index, measure, model, approach, calculator and indicator.

The OECD (1999) provides a definition for some of these:

- *parameter*, a directly measurable property of the system being analyzed;
- *indicator*, a value derived from parameters which points to or provides information;
- *index*, a set of aggregated indicators and relative information.

A brief description of the basic meanings of the other terms is given here:

environmental measure: measuring tool used for quantifying the exact value of a physical or chemical component of the environmental system;

model/approach: the mathematical reconstruction or the synthesis of how the environmental process to be described works. These models or approaches are normally transcribed into policy guidelines which regulate their basic parameters, performance algorithms and required outputs;

calculators: calculation tools that automate the algebraic procedures codified in the models and standardized (in some cases) by means of codified acts (see UNI, ISO, etc.).

All previous definitions normally contribute to the construction of macrodescriptors that provide information and evaluations about ongoing phenomena.

These tools can be used to describe the entire set of complex systems and are known as indicators (see glossary).

Any parameter can be an indicator as long as it can be interpreted in an evaluative way, thereby favouring the analysis of complex situations, the synthetic description of an organization’s behavior, as well as the transfer of information to decision-making organizations. In addition to reflecting the current state of our systems, the purpose of indicators is to inform government systems and action programs, despite their negligible subjectivity, depending on the training undergone by the operator using them. Their evaluation therefore needs to be related to a measurement, known as a criterion, which represents the interface between the physical system being studied and the operator (human dimension). The relationship between the indicators, the phenomena to be studied, the descriptive possibilities and the spatial-temporal comparisons of the information is highly sensitive.

The factors affecting the possibility of using indicators relate as much to their properties as to their political significance. A good indicator must be representative, that is to say, it must be able to be correlated with the phenomenon to be analyzed. It must also be easy to measure and be sufficiently analytically valid, a premise that forms the technical-scientific basis of standard international models. Indicators should also ensure the accuracy and clarity of any information obtained, as well as sensitivity, understood as the capacity to instantly describe spatial-temporal changes.

One of the problems with indicators is the value to ascribe to them. The physical interpretation (“weight”) to assign to the information obtained is highly subjective and has more political-cultural value than technical-scientific value. From an operational point of view, the choice of indicator must take into account *the specific objective established in the study*. The indicator must fulfil an initial criterion of admissibility, according to the goal to be pursued, followed next by principles of comprehensibility and measurability. The objective sets out precise guidelines on monitoring data and on the type and number of variables required to process the indicator. The wrong choice can affect how consistent the results are with reality, leading to a relative rather than an absolute assessment. It is therefore important to establish the correct type and number of indicators necessary to achieve the preset goals. Status indicators should be used when the aim is to describe a system or how it has evolved over time, whereas diagnostic indicators will be required in order to analyze the system’s behavior; finally, environmental compatibility indicators should be used when the goal is to confirm that the pre-set standards have been achieved.

In an agri-environmental context, indicators are used not so much to assess the economic convenience of the choices made by farmers, as to assess the “externalities”, i.e. those factors operating outside the market. The assessment of “externalities” using indicators is an assessment of the effect that environmentally sustainable practices have on farming. In fact, agri-environmental indicators help transfer physical and economic data on

human activities and products. By providing information on the effects that environmental practices have on the territory, indicators provide opportunities for reflection with a view to reviewing agri-environmental measures.

The study of ecosystems using indicators is based on the PSR model developed by Anthony Friend in the ‘70s. The Pressure-State-Response (PSR) model highlights the relationships between environmental systems and anthropic activities and is based on the concept of causality: human activities put pressure on the environment and alter the quality and quantity of resources; in other words, they alter the state of the environment and, more specifically, the wine produced. This model is based on the concept of cause and effect and envisages a series of environmental indicators, broken down as follows:

- pressure indicators, i.e. human activities which represent sources of pressure on the environment. These indicators include the carbon footprint and the water footprint;
- state indicators, i.e. the quality of the environment and any changes to it (biodiversity and landscape);
- response indicators, i.e. measures aimed at improving the state of the environment.

Although there are differences in how they process indicators, all the programs developed to date achieve the same objective, highlighting the importance and success of monitoring, controlling and assessing environmental parameters and agricultural policies. In the last few years, interest in the study of agricultural systems has increased the need for analytical tools which enable agri-environmental systems to be described from an agronomic, environmental, social and economic point of view. These assessments require rapid and effective analysis, as well as time and space comparisons whilst maintaining an acceptable level of estimate quality.

The basic problem now being faced is how to achieve a strategic consensus on the objectives to be pursued in order to improve the environmental, social and economic sustainability of agri-food systems. There is a need to

identify, monitor and control the macro-indicators considered essential for an understanding of the dynamics of sustainability. This is where the various initiatives/programs underway initially differ. The indicators analyzed range from air quality to the use of water; from vineyard management to the protection of biodiversity; from social consequences to economic aspects, etc. The programs use a number of different indicators according to their particular method for describing the system, but, most of all, according to their objectives for improvement in terms of sustainability.

The difference in the type of indicators chosen is the first difference to be identified, closely followed by the method for constructing individual indicators, and it is in this respect that the differences often increase according to the parameters chosen, the measurement tools used, the limitations of the system, the standards followed, etc. Some indicators also differ in the type of approach used (Life Cycle Assessment or Impact Assessment, for example) or in the algorithms designed for reconstructing the environmental dynamics or processes. Within each indicator, the difference could even be based only on the types of databases used.

Taking a quantitative rather than a qualitative approach can also result in an indicator (atmospheric emissions, for example) following completely different paths.

What clearly emerges, therefore, is the complexity and diversity of the different programs. The growing number of ways in which to aggregate the various indicators and the possibility of adapting individual indicators to specific requirements illustrate the enormous difference in the results obtained and the difficulty in comparing them.

4. Self - Monitoring, Control and Certification for Improvement

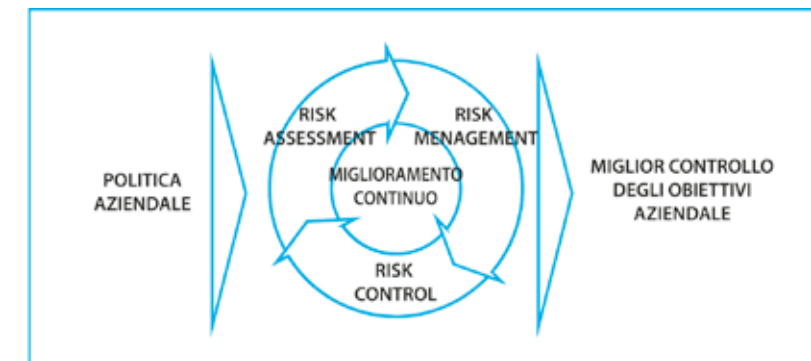
Close examination of all the Italian and international programs that have promoted sustainable management models in companies clearly reveals the

generalized existence (regarding all the programs analyzed in the previous points) of approaches aimed at defining self-monitoring and assessment procedures which are instrumental for improving companies' performance. This approach is clearly based on consolidated risk management schemes.

Formalizing a risk management system is just the first step along a lengthy (practically endless) path that triggers a so-called virtuous circle of improvement. In order to instigate a process of improvement, the most important thing to do is to adopt a particular way of thinking that involves looking beyond the here and now, beyond the individual and the organization, in order to invest in a better future.

The philosophy underpinning this approach is one of continuous learning, never settling for the quality achieved but doing more and better whilst providing constructive encouragement.

Internal controls and internal audits have an essential role to play in these systems, since they make it possible to reveal any gaps between plans made and actions taken, highlighting areas of corporate processes and actions which may require improvement, all the while embracing a vision of continuous improvement.



All corporate and associated risk management systems require the adoption of the “internal control” concept. The term “self-monitoring” is familiar to those working in food companies, where its meaning is normally associated

exclusively with the management of hygiene and health hazards relating to food production. Given the above considerations, internal control systems can be applied ubiquitously, whereas the management of any type of production risk, regardless of type of production and type of risk, has a broader application inside production companies.

In any management system, **audits** are an important monitoring stage that allows the system to evolve. The concept of the audit represents an asset for companies, and must be viewed and applied as a useful tool in their growth. No company is “perfect”, and the fact that non-conformities may emerge during an audit should be seen not as a problem (one that needs to be hidden from outsiders but often also from insiders), but rather as a good opportunity for improvement.

The conclusions drawn by an audit should result in a review of the management system, and either confirm its soundness or lead to its adjustment in the light of any changes to the company’s external or internal reference framework, applying a dynamic approach that leads to a constant update and improvement of the system, so that problems can be anticipated and not merely managed.

It is through internal controls, continuous checking, monitoring, audits, reviews and recordings that a company is able to show others (control bodies and stakeholders more generally) that it is complying with mandatory and voluntary requirements in matters of risk management. The more robust a company’s self-monitoring system, the easier it is for it to demonstrate its due diligence. To arrive at this result in terms of efficacy and efficiency, however, the entire management system and its associated activities must become part of the company’s fabric, its experience and its strategy, otherwise it becomes nothing more than an onerous, hard to manage and difficult to understand bureaucratic formality.

This background of openness, transparency and collaboration also encompasses voluntary certification, a tool available to companies with which they can demonstrate to others the compliance of their management systems / products / services with one or more reference standards. Indeed, certification can be a robust tool with which companies can communicate their **risk management policy** as well as the reliability and verifiability of their

management of particular requirements inside the company, and demonstrate their management to their stakeholders.

To sum up, we believe that the adoption of recognised corporate organization models helps companies with their own risk management strategies. The systematic control of processes and systems is the key to continuous improvement, efficacy and efficiency. We should also stress that these organizational models must be an integral part of the company’s reality and be incorporated by all corporate functions in order to provide real added value. It is also evident that a sector with such clearly defined processes as the wine sector requires management initiatives that fit these characteristics, just as it is necessary to correlate these proposals to macro-objectives for improvement. While there appears to be some disparity in methodological approach between the models, as well as a lack of correspondence between management proposals and the specific sector dynamics, analysis of the environmental management models implemented in Italy up till now positively highlights the prevalence of a number of macro-objectives, which could constitute the main risk factors to be managed (GHG, water, biodiversity). For example, there is a lack of evidence on the management of the supply chains which no-one has actually taken into consideration in their methods, as well as weaknesses in the connection between the production and marketing functions, as mentioned in section 2. These weaknesses could undermine the aims of improving processes and products, as well as hinder the necessary training initiatives which need to be implemented along the entire supply chain and extended to all corporate levels.

5. Proposals for the development of guidelines to standardize environmental analysis tools

What are the advantages of using the same indicators for different subjects, that is, for them to be common and therefore shared? Here again, the answer lies in their cultural origin. Since the indicator is not merely a measurement, its aims are several: to encourage communication among different players,

even those outside of the administration and territory in question; to facilitate the learning of others' strategies and therefore make it possible to assess the transferability of policies (and not only the transferability of indicators) to the territories managed, as 'seen' and assessed using indicators; to distinguish good practices from those which are less so; to facilitate mobility between experts and of experiences; to promote common languages, breaking down useless local barriers; to promote democratic assessment processes from the bottom up so that a citizen will find it easier to evaluate the results achieved; finally, to highlight critical aspects through dialogue with others.

Rejecting the use of common indicators would be the same as choosing not to communicate, or making meaningless instrumental use of them. The policymaker's freedom does not lie in choosing an indicator but primarily in designing a policy that will, undoubtedly, vary from place to place and from period to period. Let us take the metaphor of the barometer as an example. Although people may respond differently to the information provided by the barometer, in many cases their responses may be equally valuable and effective. However, the possibility of using the same indicator enables people to compare their choices quickly, efficiently and effectively, and communicate with one another in order to agree upon strategies or simply ask for information.

What we have tried to do here is to show that indicators are a useful tool in the decision-making process, helping to simplify and organize it. Indicators aim to improve the efficacy of the entire process rather than play second fiddle. Indeed, against a background characterised by complexity, participation and the increasing devolution of power to local authorities to draw up sustainability policies, indicators are even necessary in the development of many local public policies.

Indicators complement the decision-making process rather than follow it; they require administrations to reorganize part of their own information flows and customs in order to break down local boundaries and enter into a scenario of debate and exchange that helps in the definition of sustainability policies.

The indicator is a demanding tool in terms of methodology, since it requires some that some simple 'rules' be followed. For example, indicators must be defined at the start of the decision-making process, and not during nor after policies have been applied or implemented, since part of their usefulness lies in shaping the process and those who are involved in it, allowing problems to emerge, as well as enabling the optimum definition of (possibly measurable) objectives and comparison with other strategically useful situations. This is also why monitoring is seen as a new tool in establishing the right time for drawing up a public environmental policy, one that is capable of providing more precise information for decision-makers and of feeding back an efficacy assessment – in short, a new starting point for the renewal of the decision-making process.

Simplicity is a key consideration when defining and choosing indicators, just as sharing is an extremely important characteristic that increases the usefulness of indicators and helps policy drafters and administrators feel supported: thus they feel able to communicate with one another, and enjoy the benefits of sharing information in order to exchange tools for managing and drawing up sustainability policies.

This suggests that while indicators are key factors in the “decision-making process”, particularly for evaluating planning choices and verifying the results obtained during monitoring, they are also fundamental to the process of constructing the basic themes underlying strategic environmental assessments.

Close examination of the national situation regarding sustainable environmental management in the wine sector, as described in section 2, leads to an important proposal, namely to define 3 indicators based on: A - Greenhouse Gas Emissions; B - Water Consumption and Pollution; C - Maintenance and Protection of Biodiversity. An initial, more detailed examination of the analysis/management tools underlying these indicators reveals a number of critical aspects, the mediation of which must surely be one of the top priorities on the agenda of round tables such as the Forum for Wine Environmental Sustainability.

A Greenhouse Gas Emissions. On the assumption that the main initiatives are based on a “cradle to grave” approach to estimating GHG emissions, the criticalities to be addressed may be:

- the link between corporate approach (GHG Inventory) and product approach (example of criticality: define the corporate approach as a minimum requirement and allow product as weighted average?)
- standardizing operating limits (example of criticality: should raw materials be included in Scope 3? Should the shelf life of packaging be included? Should transport be excluded from distribution or can an average index for all based on weight be agreed?)
- the use of common units of measurement (example of criticality: 750ml bottle? or liter of wine)
- consideration of supply chain approach (example of criticality: define a common regrouping of the process which also allows for the analysis of processes/products involving the acquisition of semi-finished products, such as grapes, wines, must)
- clarify which databases to use (example of criticality: draw up a common list that highlights how to manage the missing emissions factors)
- establish method for calculating vineyard absorptions and materials taken from the vineyard
- establish which shrub assets besides the vineyard could be included as absorptions in the analysis (example of criticality: only include those shrub assets which are essential for production? Exclude non-additional shrub assets?)

B Water Consumption and Pollution. On the assumption that the Waterfootprint Network model will be widely accepted, the criticalities to be addressed may be:

- Operating boundaries and process aggregation along the supply chain (example of criticality: see above on GHG)
- Defining which reservoirs should be considered instrumental and therefore

included in the evaporation calculation (example of criticality: classify natural lakes used as reservoirs)

- Method for calculating pollutant dilution (examples of criticality: define the analytical values of unpolluted water in comparison)
- Databases to be used (example of criticality: see above on GHG)

C Maintenance and Protection of Biodiversity. Two basic approaches are described below. The first criticality concerns which one to choose or how they coexist, and possible definition of a hierarchy between the two:

- 1** Methodologies for assessing the biodiversity of a particular ecosystem (IBF, QBS). Biological fertility is assessed by carrying out a specific analysis, mainly of the soil but also of water courses and shrubs, that measures the quantity and quality of earthworms, insects and plant species.
- 2** Methodologies for assessing practices which are either directly or indirectly harmful to biodiversity. We are referring in particular to the toxicity levels of products used in illegal phytosanitary products or in fertilization practices.

Both approaches therefore include some specific critical aspects that need to be managed, namely:

- 1** definition of the possible weighting between different ecosystems when carrying out an assessment; definition of the level of detail for the soil analysis (example of criticality: visual analysis and/or measurement in the laboratory);
- 2** definition of an approach which only supports the decision-making process or verifies results;

CONCLUSIONS

To conclude this extensive analysis of the programs and our observations regarding indicators, having reviewed the initial objectives of the Forum for Wine Environmental Sustainability, as a body providing information and training with the aim of raising awareness of environmental sustainability in

the wine sector, and having also discussed the necessary standardization of the systems currently employed in the different programs for the parametric monitoring of sustainability, we felt it was important to contribute to the definition of indicators by drawing up a glossary that would help clear up any confusion surrounding the terms ‘indicators’, ‘measures’ and ‘calculators’. Clarifying these terms has led us to identify a need for innovative multi-parameter measuring tools which are cheap and easy to use, yet reliable and accurate, and will allow producers as well as controllers, in the event of certification, to obtain rapid measurements that provide information on what is happening in the soil, as well as in the air or water. Leaving aside the development/application of sustainable wine producing and enological practices, it is therefore important that research organizations, in agreement with the relevant government institutions, steer their research towards the development of these tools or to fine-tuning some existing tools (for example, the development of sensors to analyze volatile soil compounds as indicators of the existing micro- and macrofauna in the case of the soil biodiversity index). In fact, simplifying the management of these assessment procedures for producers, as opposed to further complicating complex certification systems, is considered a fundamental aim of a credible proposal for sustainable development. While certification is undoubtedly an important step to be pursued, producers must feel supported in the cultivation and wine making process in order to achieve economic as well as environmental and social sustainability. In order for this to happen, the tools to be used to achieve correct certification in future must be proper measurement tools which will minimize the use of sterile data provided by databases possibly relating to other climatic conditions, to produce calculators. Viticulture is a biological and therefore dynamic system and we cannot restrict ourselves to simply modelling it.

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Business Models and Sustainability: an analysis of value creation in Italian wineries

by Lorenzo Zanni ¹ and Tommaso Pucci ²

- ① Research aims
- ② Business models and sustainability: the interpretative model adopted
- ③ Research methodology
- ④ Results
- ⑤ Discussion

1. Research aims

The concept of “sustainability” in the wine sector has been the subject of growing attention from the scientific community over the last few years. However, while debate surrounding the matter has occupied plenty of space in numerous academic journals, the literature to date has failed to provide a generally accepted definition of “sustainability” (Santini and Cavicchi, 2011). The term lacks clear perimeters (Warner, 2007) and encompasses aspects connected not only to the environmental dimension but also to the economic and social dimensions (Szolnoki, 2013). This has spawned a broad

range of taxonomies, which has further contributed to increasing confusion regarding use of the term (Glavič and Lukman, 2007). This is one of the reasons why it is not easy to find quantitative empirical analyses in the literature which explore the impact of sustainability on business structures and organization, and how this influences the creation of economic, social and environmental value (Santini and Cavicchi, 2011, p. 9). Particularly rare are analyses of the impact of sustainability on the components of a firm’s business model (Stubbs and Cocklin, 2008) and how this affects the three dimensions of value mentioned above.

From the point of view of strategic analysis, the construction of a sustainable business model is recognized as a complex process that develops over time, affecting three profoundly interrelated elements (economic, social and environmental) (Bonn and Fisher, 2011). With the aim of improving knowledge on this subject, some authors suggest focusing on certain critical variables, and in particular on how they affect firm performance (Guthey and Whiteman, 2009). Others suggest studying the internal and external drivers behind the move towards sustainability in the wine sector, also in the light of analyses conducted in other sectors (Marshall et al. 2005).

Based on these theoretical considerations, the main research questions we intend to answer are three:

- ① Which components of a business model does an orientation towards “sustainability” affect most? Or rather, how pervasive is the concept of “sustainability” within the business model of a winery?
- ② Are there different levels of orientation towards “sustainability”?
- ③ Is there a relationship between orientation towards “sustainability” and firm performance?

This chapter is structured as follows: first, the conceptual model behind the work plan adopted is briefly illustrated (§ 2); the empirical

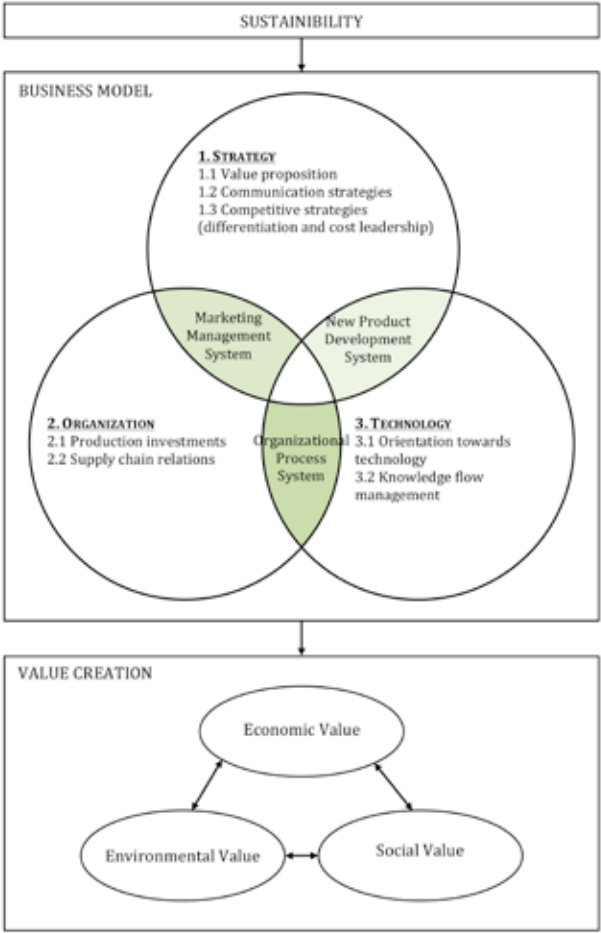
setting and methodology used in the empirical study are explained in detail (§ 3); then the results of the field research conducted are described (§ 4); lastly, the results are discussed and preliminary concluding remarks provided, in the light of the information gathered (§ 5).

2. Business models and sustainability: the interpretative model adopted

This paper applies to the wine sector a business model already tested in other traditional “Made in Italy” sectors (fashion, cosmetics and cultural heritage). A business model is a systemic representation of the combination of a firm’s strategic, organizational and technological activities, of how these mold the firm’s relationships with its context of reference and the relative financial structure supporting it, with the aim of explaining how the firm manages to create or capture value (Pucci, Simoni and Zanni, 2013, p. 29).

Figure 1 highlights, within the conceptual framework under analysis, the fundamental elements of a business model in relation to three main components: the systems of New Product Development, Marketing Management and Organizational Processes. These are created by the intersection of three different blocks of activities and decisions regarding, as shown, to strategy, organization and technology management. In our empirical test of the research hypotheses, we will therefore refer to these three different components of the business model for the wine sector.

The decision to test the model above in the wine sector allows us to investigate a key segment of Italian industry in which the concept of sustainability has been deep-rooted for years (Santini and Cavicchi, 2011), and which therefore represents a perfect field of investigation both to answer the research questions posed and as a basis for future comparison with other “Made in Italy” sectors or international entities in the world of wine.



3. Research methodology

This study is based on data collected by the authors in collaboration with Gambero Rosso and the Forum for Wine Environmental Sustainability, between September and December 2013. The data was collected via an online questionnaire sent to a “convenience” sample of 4,787 Italian wine companies surveyed in the database of Gambero Rosso. A semi-structured

Figure 1:

Conceptual framework

Source: developed and adapted from Pucci, Simoni and Zanni (2013, p. 29)

questionnaire was used, composed of a total of 15 questions subdivided into 4 sections regarding: a) structural data and firm performance; b) strategy, c) organization; d) technology. The questionnaire was validated in advance by a panel of experts designated by the Forum for Wine Environmental Sustainability: Marco Caprai, Antonio Ferro, Michele Manelli and Marco Sabellico. The final response rate was 21.58%, with 1033 questionnaires collected, of which 828 (17.30%) were complete.

From a methodological viewpoint, for the purpose of answering the research questions a series of multi-item scales were used to measure the constructs used in the model. As for the structural components of a business model, we made reference to the conceptual framework applied in previous investigations regarding other “Made in Italy” sectors (Pucci et al., 2013b; Casprini et al., 2014). The survey analysis conducted made it possible to process the data and analyze them using both quantitative (descriptive statistics, cluster analysis) and qualitative (focus groups, panels of experts) methods of investigation.

4. Results

We will conduct our analysis by progressing through increasingly fine levels of detail: firstly, we will analyze the data in aggregate form, with reference to some simple descriptive statistics regarding the individual sections of the questionnaire. Then we will use the cluster analysis technique to identify groups of actors characterized by similar behaviors: cluster analysis is a set of multivariate data analysis techniques whose purpose is to select and group together homogeneous elements in a dataset.

The characteristics of the sample studied, based on their size category in terms of staff, confirm:

- The vast number of microenterprises that characterizes the wine sector in Italy (75.1%);
- The existence of a significant group of small enterprises (24.3%);
- The very limited number of medium to large sized enterprises (0.6%).

With reference to the geographical distribution of the firms surveyed (Table 1), the sample effectively represents the whole country, which makes it possible to divide the data into three regional macro-areas for comparison: North (42%), Center (36%), South and Islands (22%).

Table 1: Geographic distribution of the sample

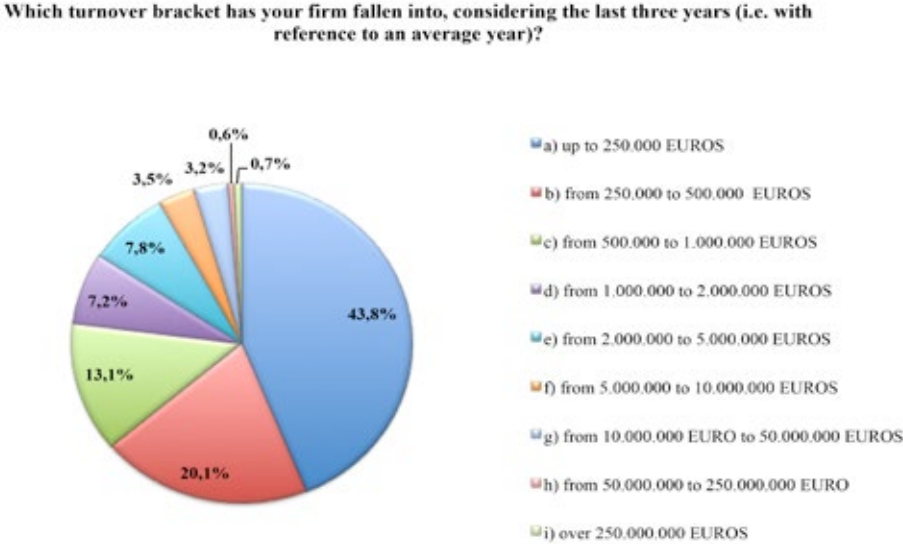
Region	no. of firms	%	Macro-Area (%)
North			42.06%
Aosta Valley	10	0.99%	
Friuli Venezia Giulia	59	5.85%	
Liguria	15	1.49%	
Lombardy	52	5.16%	
Piedmont	122	12.10%	
Trentino Alto Adige	43	4.27%	
Veneto	83	8.23%	
Center			36.20%
Abruzzo	22	2.18%	
Lazio	23	2.28%	
Marche	40	3.97%	
Tuscany	249	24.69%	
Umbria	31	3.08%	
South and Islands			21.74%
Apulia	43	4.27%	
Basilicata	15	1.49%	
Calabria	12	1.19%	
Campania	68	6.75%	
Molise	3	0.30%	
Sardinia	41	4.07%	
Sicily	37	3.67%	
Total	1008*	100.00%	100.00%

*Note: * one firm was excluded as located beyond the French border*

The small size of the firms is also confirmed by analysis of the sample based on turnover bracket, which shows (figure 2) that: 77% of the firms studied have an annual turnover below 1 million Euros; 18.5% have a turnover of between 1 and 10 million Euros, and 4.5% have a turnover of more than 10 million Euros.

Figure 2:

Distribution of the sample by turnover bracket (N = 1009)



The small size of the firms does not, however, seem to prevent them from achieving satisfactory performance from the point of view of management, at least according to the entrepreneurs interviewed (figure 3). Using a scale (De Luca et al., 2010) from 1 (not at all satisfied) to 5 (fully satisfied), the entrepreneurs' self-assessment of their performance seems to be very positive concerning the achievement of planned strategic objectives (3.32), their main direct competitors (3.13) and the average performance of the sector (3.10). In relation to the Italian production sector, we are therefore analyzing a sample of wineries that, overall, seem to have found an answer to the current economic problems

of the market, at least in the sense that they have nonetheless managed to meet their own strategic objectives, also in terms of comparison with the sectorial average.

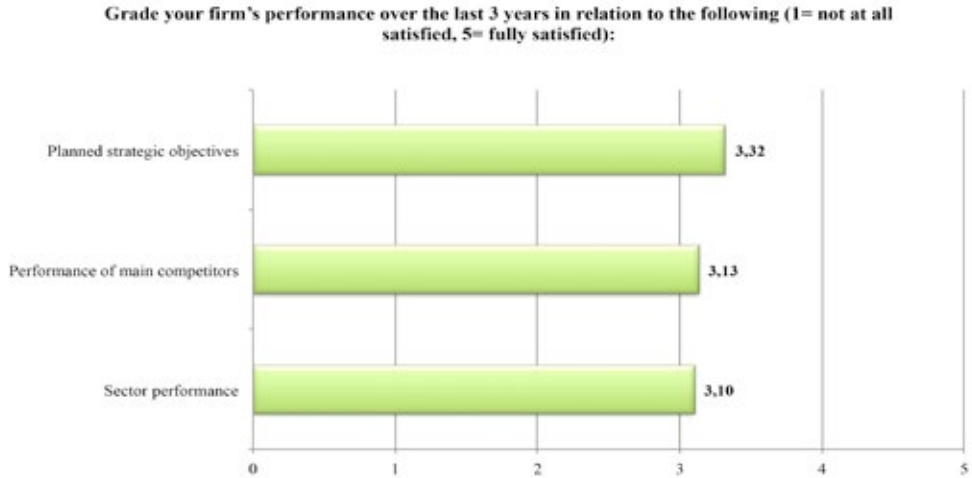


Figure 3:

Evaluation of performance (N = 1009)

In line with the literature, the data collected confirm that in the world of wine a “sustainable development” strategy concerns all three dimensions of sustainability, which are viewed as a set and without great differences in opinion (figure 4). The highest level of agreement regards the definition of “environmental sustainability” (4.6 on a 5-point scale of agreement), while the lowest level is recorded for the definition of “economic sustainability”, albeit still with a high score (4.35). This indicates that, in general, Italian wineries tend to implement sustainable development strategies by focusing on different critical variables of sustainability, not by practicing decisions or behaviors that affect single areas.

With reference to the issue of “environmental sustainability” as a specific driver of firms' development we can see that 80% of the entrepreneurs interviewed

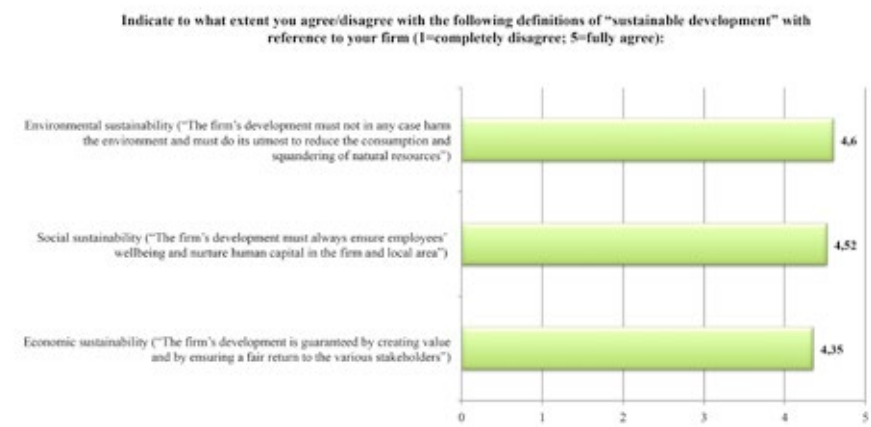
Figure 4:

Level of agreement/
disagreement with
the definitions
of “sustainable
development”
(N = 979)

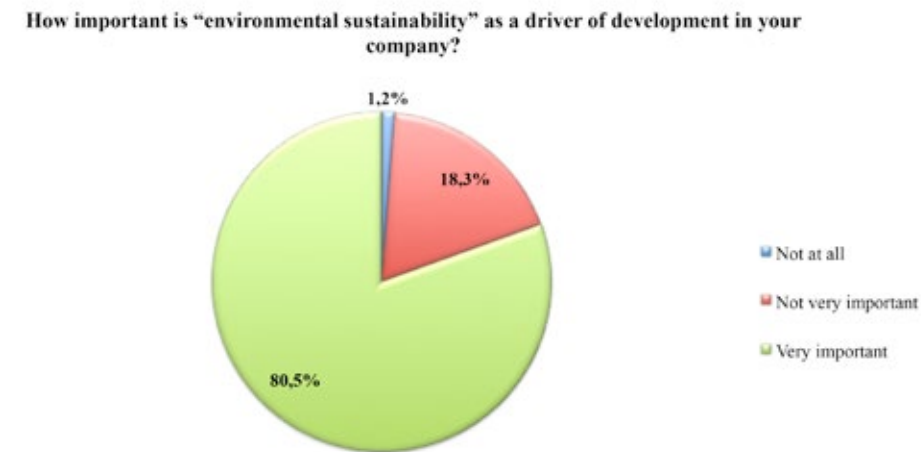
Source:
developed and
adapted from
Stubbs and Coklin
2008, p. 104; OECD
Report, 1987, p. 41;
Dahlsrud, 2006;
Atkin et al., 2011,
p. 7; Dyllick et al.,
2002, p. 132

Figure 5:

“Environmental
sustainability” as a
driver of company
development
(N = 979)



attribute great importance to it (figure 5); only a very limited minority in the world of wine grant no importance at all to environmental sustainability (1.2%).

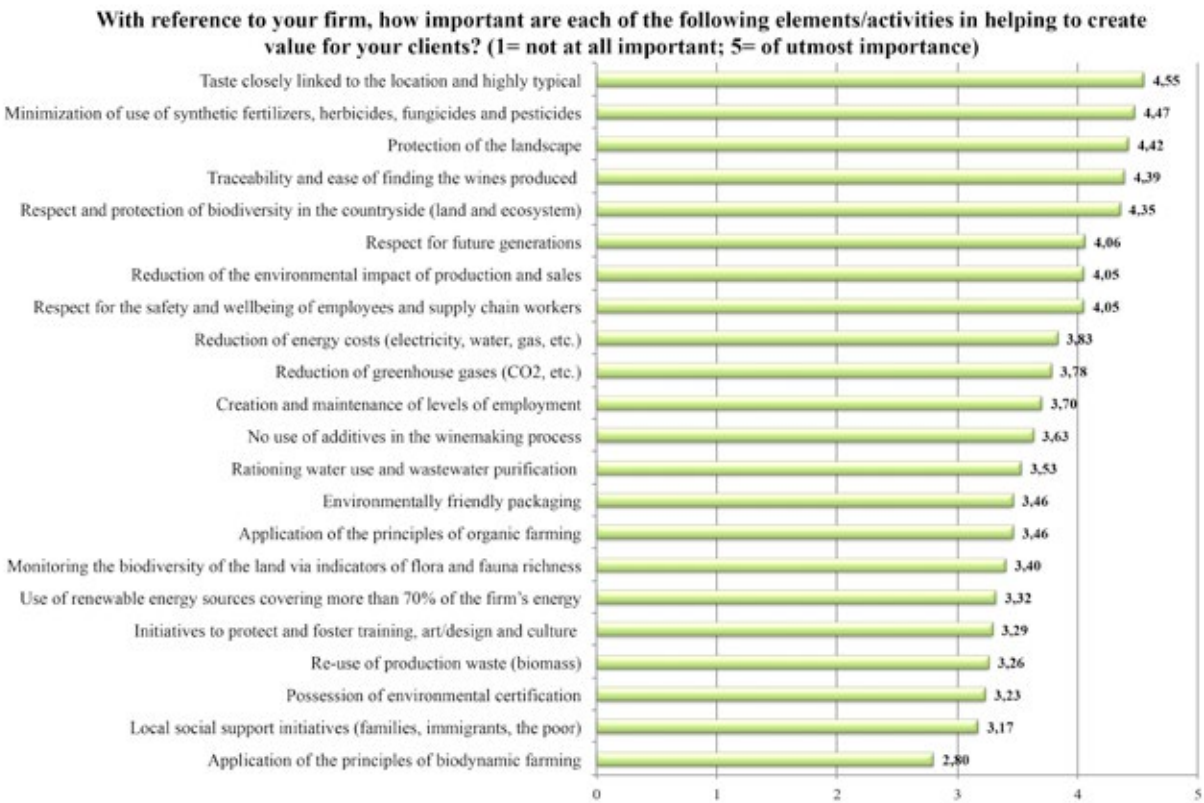


The fact that the firms interviewed attribute great importance to sustainability and consider all three of its dimensions as significant does not automatically mean that they adopt the same behaviors. This can first

be understood by observing the varying importance attributed to different activities/elements in the implementation of a sustainable development strategy as potential drivers of value creation for customers (figure 6). Particularly high values were recorded for certain entrepreneurial behaviors that demonstrate a high level of social awareness (taste linked to the location, protection of the landscape, respect for future generations) and for certain environmental drivers of value creation (reduced use of synthetic fertilizers and herbicides, traceability, respect for biodiversity, etc.); while other activities (biodynamic production, local social support, environmental certification), were deemed less important, although behaviors varied within the set of firms investigated.

Figure 6:

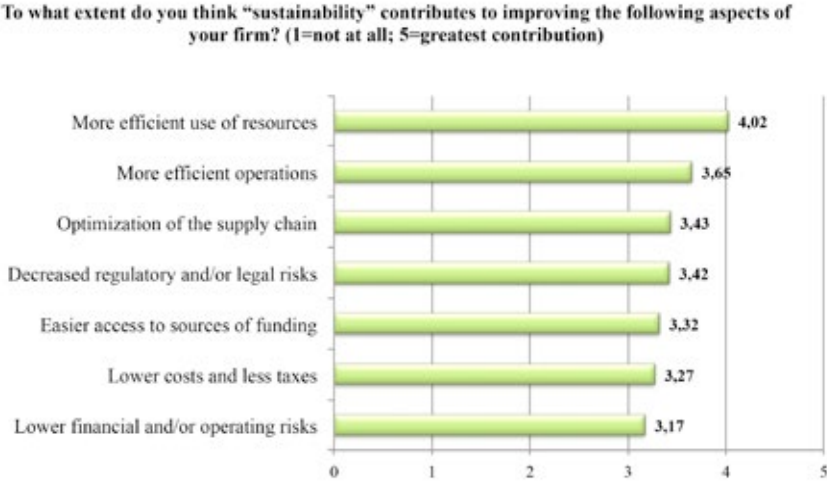
Evaluation
of drivers of value
creation (N = 864)



The broad range of actions implemented by wineries demonstrates that the set of decisions imposed upon them are compatible with various basic strategic options regarding both cost leadership and product differentiation (Atkin et al., 2011 and 2012). Considering first cost leadership strategies (figure 7) we can see that firms prefer to achieve efficient use of factors of production and operational processes, while they are less focused on efficiency targets regarding financial risks and tax benefits, the latter of which are not negligible when state incentives are available to lower the cost of implementing a strategy of sustainable development. This is not surprising, considering the prevalent professional background of Italian wine entrepreneurs, which tends to favor functional hands-on learning “in the field”; this leads them to neglect certain managerial dimensions of business culture which are the prerogative of some larger firms in particular.

Figure 7:

The contribution of “sustainability” to improving economic aspects (cost leadership) (N = 864)



On the other hand, considering sustainability as a potential driver of the “differentiation” of winery products, the values observed are slightly lower and more similar to each other than those regarding cost leadership strategies (figure 8). This means that when sustainability is used as a driver of differentiation it affects various other strategic targets at the same time (increased customer

satisfaction, brand reinforcement, entrance into new markets, premium price policies).

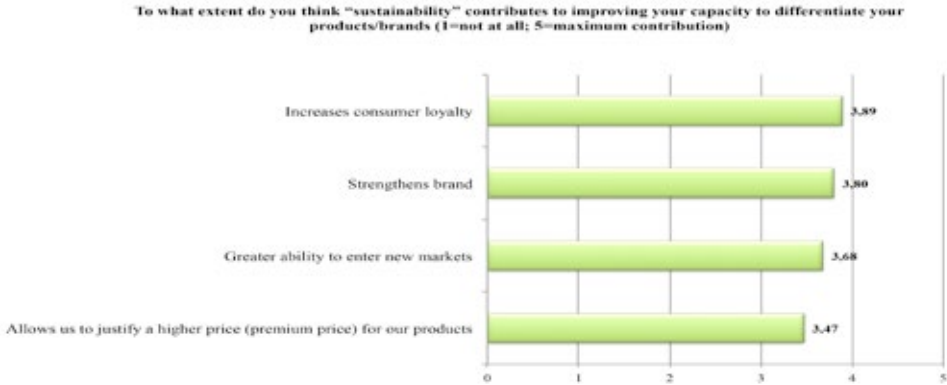


Figure 8:

“Sustainability” as a factor of differentiation (N = 864)

In order to be effective, the implementation of sustainable development strategies must be accompanied by coherent communications towards the wineries’ various stakeholders. From the data collected it would seem that the firms consulted are interested in conveying their sustainable development policies in different ways along the supply chain (figure 9): downstream of the supply chain there is a greater focus on communicating sustainability to clients and distributors, while upstream of or alongside the supply chain (towards suppliers, local bodies, other institutional partners) this focus is less evident.

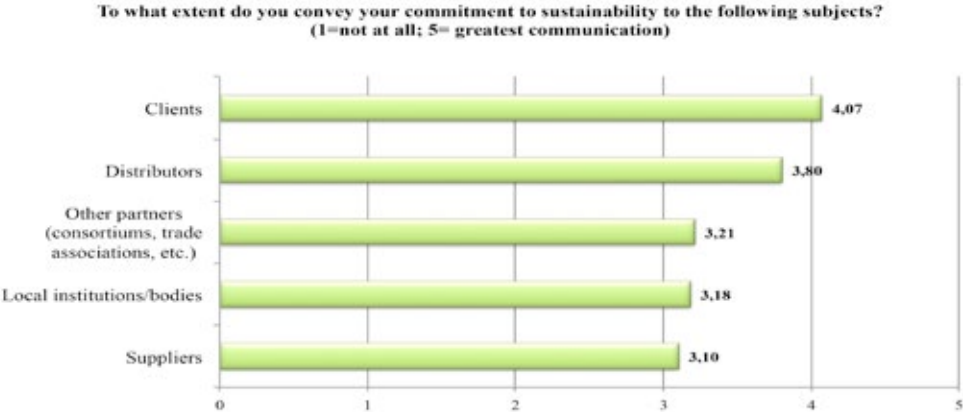


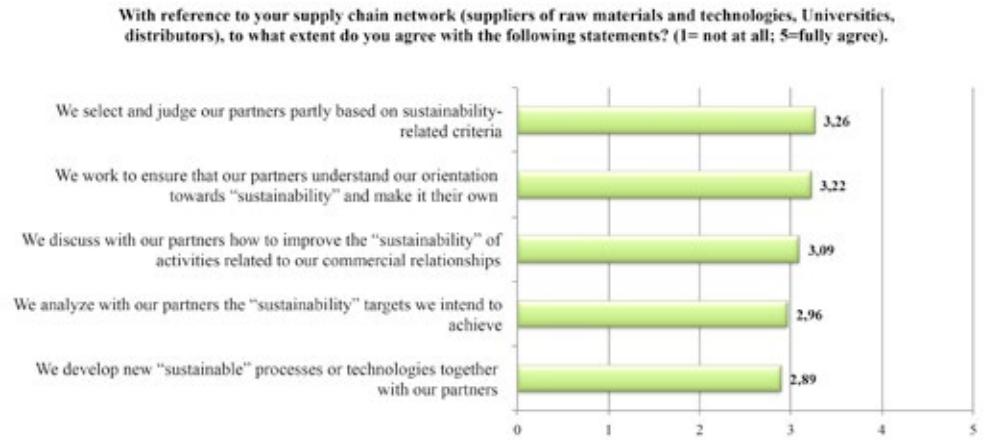
Figure 9:

Extent of communication (N = 864)

As stated in the literature (Santini and Cavicchi, 2011, p. 4), the efficacy of a sustainable development strategy depends not only on internal drivers, but also on drivers external to each individual firm. Experiences in other countries have highlighted (Broome and Warner, 2007; Dlott, 2004; Warner, 2007) that the actions of institutions, consumers' associations, regulatory and control bodies can represent a powerful tool to boost attention and the trend towards sustainability within a network actors at the local level. To this end various organizational instruments are used concerning actors' communications, training, diffusion of best practices, and mechanisms for the selection of partners.

With reference to the supply chain networks in the scenario studied (figure 10), Italian entrepreneurs seem to favor the use of sustainability more as an operational instrument for the selection of their partners, rather than adopting models of relations with greater strategic involvement (co-planning of targets/objectives, sharing knowledge and innovations).

Figure 10:
“Sustainability” in
supply chain
relations
(N = 855)



The drivers of sustainable development within individual firms are, instead, often the result of specific investments in resources and firm competences accumulated over time. In Italy's experience, investments in sustainability seem to favor certain assets, such as

(figure 11): production processes (reduced use of inputs, traceability, new winemaking processes), regulatory compliance and socially useful investments (safety in the workplace, protection of the landscape, training), energy saving. Investments in processes such as biodynamic production, environmental certification and improving supply chain efficiency are less important.



Technology management represents the third set of activities composing a firm's business model regarding which it is interesting to ascertain the impact of an orientation towards sustainability. The wineries interviewed highlight quite a high level of willingness to adopt sustainable technologies in their operational processes, but seem less inclined to join a network of research partners (universities, public or private research centers) for the purpose of developing new sustainable products (figure 12). The network of relationships in the Italian wine world gives the impression, in contrast to that of other countries, of still being small and lacking “depth” from the point of view of the quality and type of actors involved, especially if its aim is to support sustainable development strategies based on radical innovations.

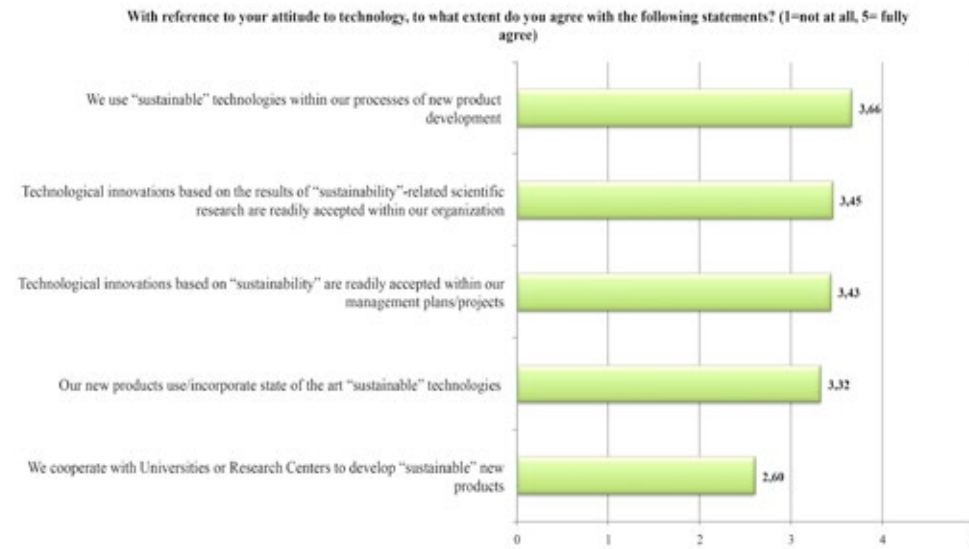
Figure 11:

Investments in
“sustainability”
(N = 847)

Figure 12:

Orientation towards
technology
(N = 828)

Note:
items adapted from
Zhou and Li, 2010.



This impression would seem to be confirmed by the analysis of firms' knowledge flows (figure 13). These are characterized by a prevalence of "updating" strategies (through online or printed reports, local supply chain relations), which are easier to manage and less demanding from a "relational" viewpoint, while the use of sustainability-related training or forums are as yet less widespread. This can partly be explained by the simple corporate structure of the firms studied: entrepreneurs are directly involved in various tasks and operational processes in many Italian micro wine enterprises and this often leads to current activities being favored over activities that will only bring results in the medium term; at the same time the fact of having a small staff prevents certain threshold effects from being reached through the specialization of tasks, as this requires specialist professional roles.

Through aggregate analysis, the descriptive statistics reported above enable us to highlight some preliminary features of Italian wineries' business models and to identify certain aspects of how sustainability

With reference to "flows of knowledge" to and from your firm, to what extent do you agree or disagree with the following statements? (1=not at all, 5= fully agree)

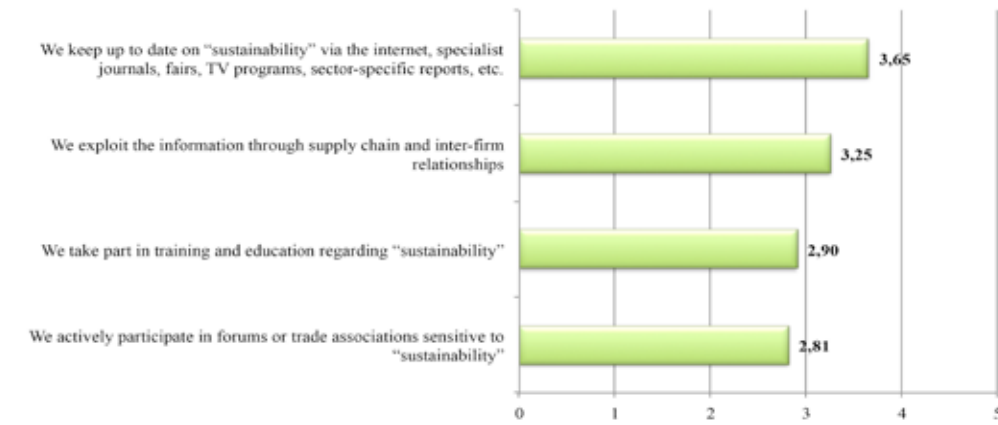


Figure 13:

Knowledge flow
management
(N = 828)

is influencing their evolution. In order to check for differentiated logics of action within the sample studied, we used cluster analysis, which allowed us to capture different entrepreneurial behaviors or, at least, strategies characterized by different intensities of action.

The choice of variables of relevance for the cluster analysis draws on the conceptual outline of the business model illustrated in figure 1, where the business model is presented as a combination of three sub-systems regarding a firm's strategic, organizational and technological activities, which themselves are also characterized by specific key variables (Pucci, Simoni and Zanni, 2013b). This set of sub-systems conditions the firm's relations with its context of reference and supporting financial structure, and allows us to explain how the firm manages to create or capture value through the driver of sustainability. Table 2 reports the clustered variables used in this study with reference to the three main blocks of activities in the business model (strategy, organization, technology) and the system of value creation. In addition to the level of reliability (alpha) the mean values for each construct are reported.

<i>Clustered variables</i>			
	Construct	Rel. (α)	Mean
Component 1 B.M.	Communication	0.87	3.49
	Differentiation strategy	0.88	3.73
	Cost strategy	0.86	3.47
Component 2 B.M.	Supply chain	0.93	3.09
	Inv. Prod. (Energy)	0.81	3.38
	Inv. Prod. (Environment)	0.84	3.48
	Inv. Prod. (Social)	0.75	3.60
Component 3 B.M.	Technology	0.87	3.29
	Know-how	0.85	3.15
	Value Creation		
Value Creation	Value (Social)	0.87	3.67
	Value (Territory)	0.84	4.39
	Value (Energy)	0.87	3.52
	Value (Processes)	0.73	3.29
	Performance	0.79	3.24
N = 828			

Table 3 displays the results of the cluster analysis, showing the different behaviors within the sample population; in particular 3 groups of firms with different approaches to sustainability can be identified. Cluster 1 includes firms “highly sensitive” to sustainability, with an already consolidated strategic planning process and a set of indicators that show high values on all levels; cluster 2 identifies an “intermediate” stage, in which the evolution towards sustainability is ongoing but strategies for sustainable development are not yet fully-fledged and do not yet permeate all the key business dimensions with high levels of intensity; cluster 3, on the other hand, identifies firms with a lower level of intensity in relation to the axes of sustainability considered, which have begun to pursue sustainability but have not yet adopted a fully-fledged strategy or actions that overcome certain threshold levels.

The sustainability logics that seem to be common to all three clusters

identified (i.e. where there is less of a gap between the strategic groups) regard values related to the territory and the social sustainability of the wine business; the entrepreneurs’ opinions and actions concerning these variables of sustainability are, on average, associated with higher values than the others examined.

Table 3: Cluster analysis results

	Cluster 1	Cluster 2	Cluster 3	Total
Communication	4.17	3.29	2.64	3.49
Differentiation strategy	4.28	3.70	2.91	3.73
Cost strategy	3.99	3.40	2.76	3.47
Supply chain	3.82	2.90	2.17	3.09
Inv. Prod. (Energy)	3.91	3.34	2.59	3.38
Inv. Prod. (Environment)	4.02	3.47	2.66	3.48
Inv. Prod. (Social)	4.09	3.55	2.89	3.60
Technology	3.99	3.11	2.40	3.29
Know-how	3.87	2.91	2.30	3.15
Value (Social)	4.19	3.66	2.87	3.67
Value (Territory)	4.75	4.45	3.79	4.39
Value (Energy)	4.14	3.52	2.58	3.52
Value (Processes)	3.84	3.33	2.41	3.29
No.	359	235	234	828
Performance	3.46	3.15	3.00	3.24

Another distinctive element that can clearly be seen with reference to figure 14 is that the degree to which sustainability influences the different components of the business model is generally consistent, albeit with different levels of intensity for the individual indicators in the 3 groups identified. In other words the three strategic groups identified do not differ greatly in their preference for some drivers of sustainability over others: firms’ behaviors seem to be quite similar and the main differences emerge especially in relation to

the “threshold” level of the actions in favor of sustainability (highest in cluster 1, lowest in cluster 3). Overall 43.7% (n = 359) of the firms studied belong to the “high sustainability” cluster; 28.6% (n = 235) to that of “intermediate sustainability”; and 28.5% (n = 234) to the cluster of “low sustainability”. This confirms that sustainability is by now an established course of action among Italian wineries, with good levels of intensity and influence in winery business models. Company performance, measured according to the entrepreneurs’ opinions, is positively associated with a sustainable development strategy (figure 15): cluster 1 shows better performance than cluster 2, which in turn is better than that of cluster 3.

Other points for reflection emerge from an analysis of the data regarding the geographical distribution of the strategic groups identified by the cluster analysis (figure 16). At first glance it may seem that the wineries farthest down the path to sustainability are those located in Southern Italy and the Islands. However, this demands a more in-depth look, as the level of coverage of the study in the individual regions varies and, therefore, potentially distorting elements can arise in the interpretation of the results, due to the firms’ different levels of representativeness on a regional basis. Considering the different distribution of the clusters in the 4 most highly represented regions in the sample analyzed (figure 17), a different geographic distribution of the responses is observable, which may depend upon: 1) some of firms’ internal structural characteristics (such as their age or size); ii) external factors (such as the presence of specific regional or EU policy concessions); iii) the different statistical representation of the sample studied on a regional basis (for example, the wineries interviewed in Tuscany were 200; in Campania 60). These aspects of the territorial interpretation of the data acquired merit further study, also with a view to supplementing the information we currently possess.

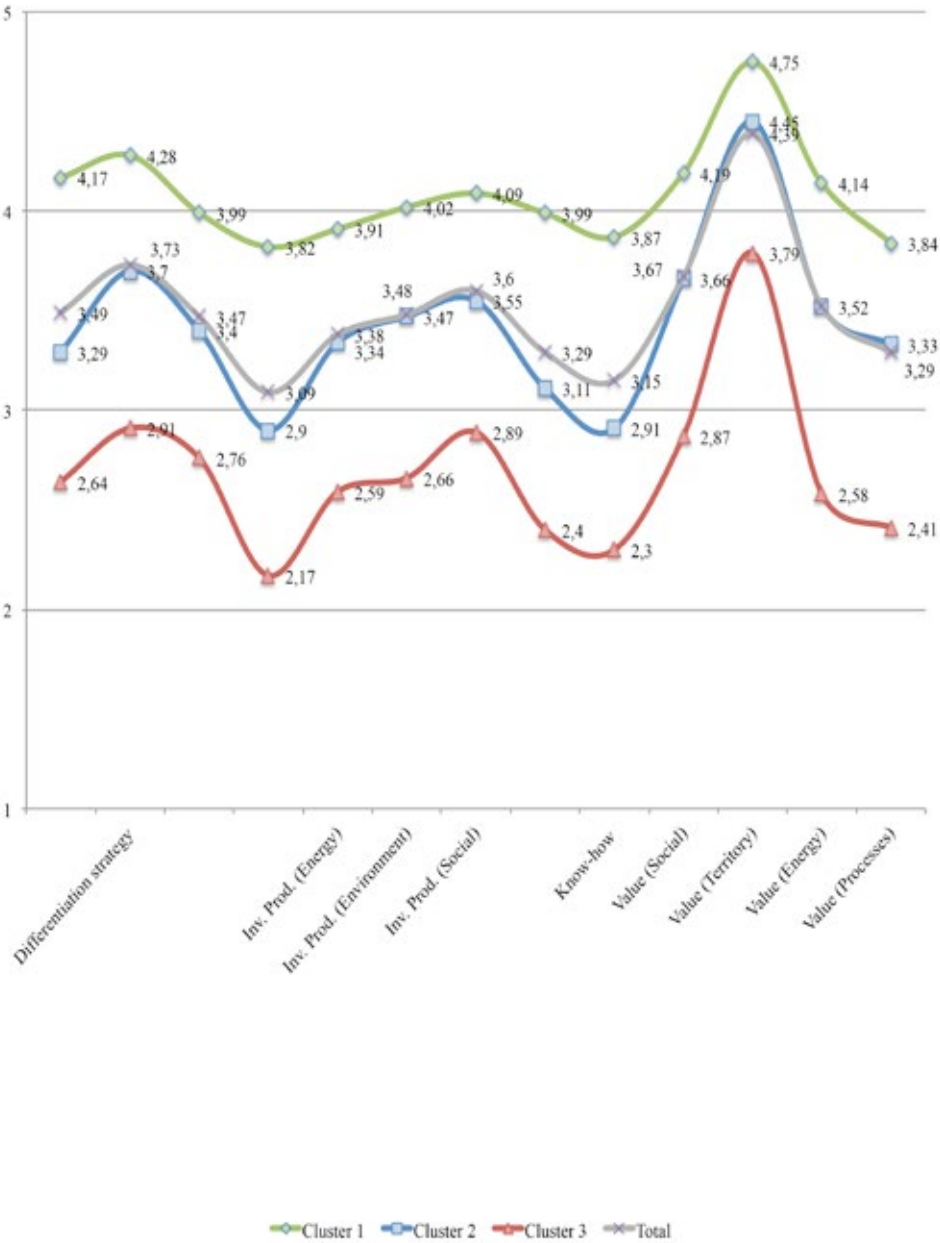
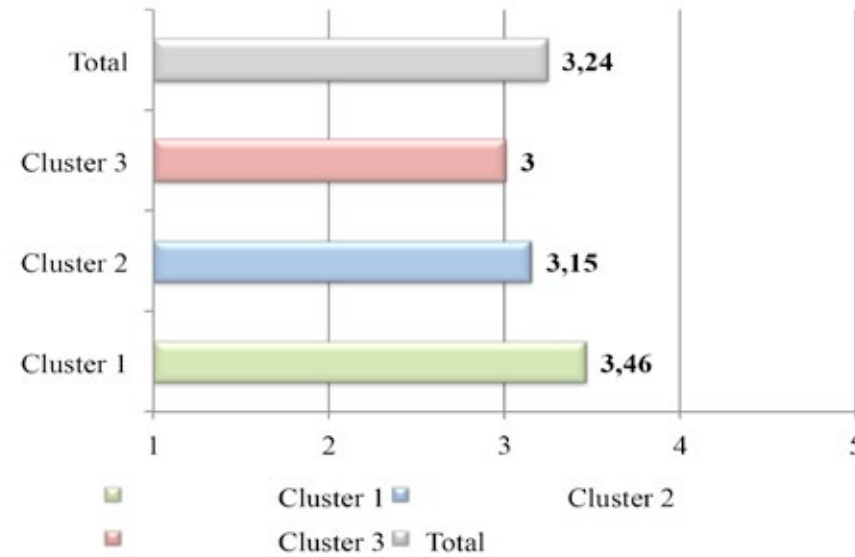


Figure 14:
Cluster analysis
results

Figure 15:

Cluster
characterization:
performance



Further reflections were made possible thanks to the availability of secondary data kindly placed at our disposal by Gambero Rosso, concerning (table 4): winery size, environmental certification, indicators of qualitative excellence and strategic positioning (mean price).

Figure 16:

Cluster
characterization:
location (N = 828)

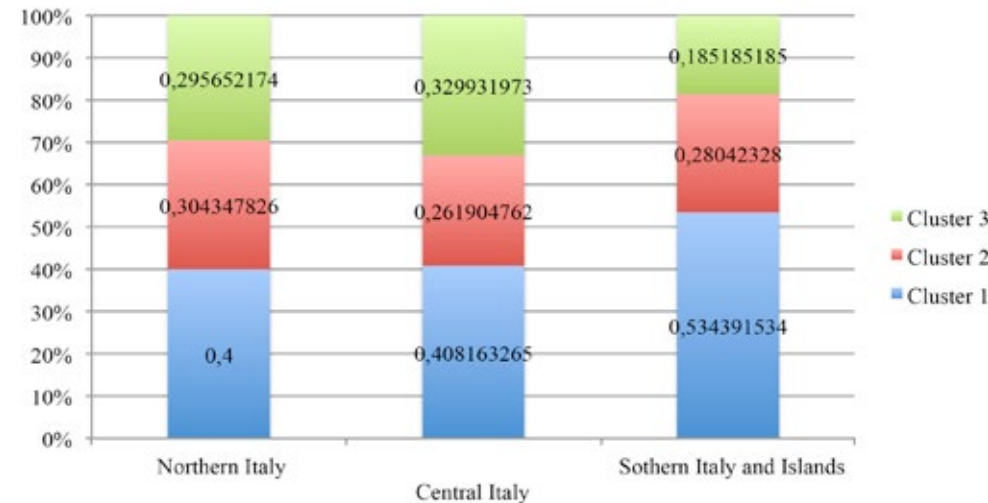
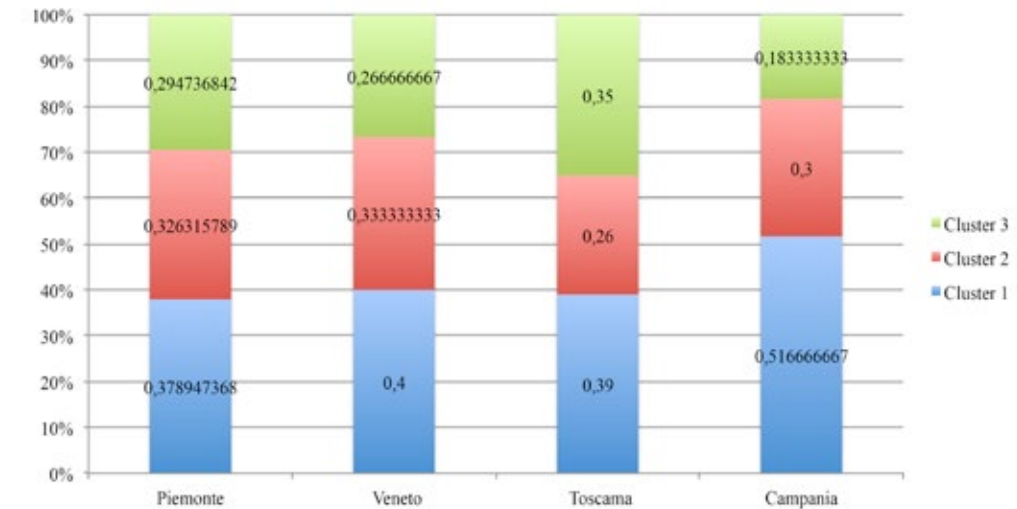


Figure 17:

Cluster
characterization
in 4 significant
regions
(N = 430)



A look at the size of the wineries, measured in terms of hectares planted with vines and the volume of production in bottles, reveals that the size of wineries certainly helps explain wineries' different positions in the individual clusters, with cluster 1 ("high sustainability" firms) containing firms which are on average larger than those of clusters 2 and 3. The different business dimensions of the wineries may therefore be seen as evidence of their different capacity to overcome certain "thresholds of action" regarding sustainability which, in turn, allow them to achieve higher levels of strategic effectiveness. In other words, while firm behaviors in the sector studied are generally homogeneous, micro-wineries could experience limited results in their pursuit of sustainability as they are less capable of overcoming certain thresholds in their actions affecting either quantitative (resources) or qualitative (know-how) variables. Coherently, belonging to these different clusters also seems to be associated with different capacities to obtain organic certification and the receipt of certain such accolades as the Tre Bicchieri Verdi (three green glasses) of the Gambero Rosso's Vini d'Italia guide; this acknowledgement rewards wineries' commitment to environmental sustainability and is only bestowed upon the wines of firms which demonstrate particular dedication in this sense (organic and biodynamic management, greenhouse gas management systems). In fact, cluster 1 has a higher level of organic certification and a higher number of firms that have gained three

green glasses over the last four years (2010-2013). Belonging to a certain cluster is also associated with a different capacity to implement product differentiation and positioning strategies: cluster 1 is characterized by a higher number of awards for qualitative excellence (the Gambero Rosso's Tre Bicchieri Rossi - three red glasses) and a better ability to occupy segments of the market in which higher prices are paid (based on the sample of labels assessed by Gambero Rosso).

	Cluster 1	Cluster 2	Cluster 3	Sample
Hectares	86.91	45.79	35.59	60.71
Mean Prod. in Bottles (last 2010-2013)	540.393	391.569	210.865	407.665
Possession of Organic Certification	26.46%	22.98%	15.38%	22.37%
Green Glasses 2013	7.82%	6.38%	3.42%	6.17%
Green Glasses 2012	5.03%	5.53%	3.85%	4.84%
Green Glasses 2011	5.03%	6.38%	2.99%	4.84%
Green Glasses 2010	4.47%	5.53%	2.56%	4.23%
Red Glasses 2013	0.75	0.56	0.55	0.64
Red Glasses 2012	0.69	0.58	0.51	0.61
Red Glasses 2011	0.67	0.57	0.48	0.58
Red Glasses 2010	0.74	0.52	0.52	0.61
Mean Bottle Price (for labels assessed) 2013	19.01 €	16.71 €	15.39 €	17.41 €
Mean Bottle Price (for labels assessed) 2012	18.36 €	16.26 €	14.48 €	16.73 €
Mean Bottle Price (for labels assessed) 2011	17.19 €	16.35 €	14.47 €	16.18 €
Mean Bottle Price (for labels assessed) 2010	17.11 €	15.08 €	12.69 €	15.38 €
No.	359	235	234	828

5. Discussion

This study had a double aim. First, from a theoretical viewpoint, it has sought to answer certain research questions on the subject of wine and sustainability, making reference to real data recently obtained through interviews with wineries throughout Italy. Secondly, better knowledge of the business models implemented in the world of wine has allowed us to carry out a preliminary evaluation in terms of marketing implications, to help firms and institutional actors interested in the issue of sustainability. This theoretical basis allowed us to define an interpretative model that, overall, was effectively supported by the subsequent empirical investigation. In summary the main points for reflection that emerged during the field research are:

- 1 The concept of “sustainability” is now well-rooted in the world of Italian wine, with good average values for all the indicators examined, demonstrating that the sector is gaining awareness in this sense.
- 2 As a consequence, all the components considered in the business models of Italian wineries (related to the three sub-systems of strategy, organization, technology) are now thoroughly permeated by sustainability.
- 3 The high average value of the various indicators does not, however, imply perfect uniformity in terms of structural characteristics and entrepreneurial behavior within the study population. In fact, 3 groups of firms with different approaches to sustainability can be identified within the sample examined; these strategic groups are associated with different threshold levels in the achievement of indicators of sustainability.
- 4 The different degree of influence of sustainability on the different components of the business model follows the same pattern, albeit with different levels of intensity in the three groups identified.
- 5 The variable of size appears to be a factor that favors a generally more structured approach to sustainability; this seems to be in line with observations in other “Made in Italy” sectors, where firm size is a determining factor in explaining the business models implemented (cfr. Pucci, Rabino and Zanni, 2013). Nonetheless, this does not prevent many

micro-wineries from implementing strongly sustainability-oriented behaviors.

⑥ Sustainability seems to have a positive impact on performance, as self-evaluated by the entrepreneurs interviewed; the best business performance does not seem to be associated with individual indicators of sustainability, but rather with groups of actions undertaken, which gain strength from each other.

⑦ The variables identified as drivers of value creation are all relevant, although some are apparently more widely accepted. In particular, drivers related to territorial variables seem to have more force than those related to technology and energy, as well as more marked intensity, probably because they are deeply rooted in the history and economic and social behavior of the sector in Italy. At first glance this may appear to be a distinctive feature of the world of wine in Italy, compared to other national models.

⑧ “Sustainability” seems to act as a driver of value in relation to strategies of both product differentiation and cost reduction; on the strategic level pro-sustainability actions seem to follow parallel paths, which mutually support each other.

⑨ With reference to the firms studied, further margins of improvement towards sustainability are visible, especially regarding their ability to create “networks” concerning certain fundamental aspects, such as: supply chain relations, technology transfer and knowledge management. As observed in the literature and through other countries’ experiences, sustainability-related actions can be more effective when a “systemic” capacity for action is created and when a “collective strategy” in favor of sustainability emerges in relation to individual aspects.

This report seeks not only to describe the “sustainable” business models present in the Italian wine sector, but also, as far as possible, to provide preliminary suggestions in terms of strategic and operational marketing with the aim of satisfying a potential demand present on the market. With reference to the implications in terms of strategic and operational marketing, we can observe that:

● Despite the sometimes significant efforts of individual actors in terms of investments made, a collective sectorial strategy based on turning the concept of sustainability to account still appears to be lacking. We believe that greater cooperation between the actors in the Italian wine sector would have beneficial effects on several fronts (communication, innovation, dissemination of best practices, etc.) and, above all, would allow smaller companies to reach certain threshold effects, which as yet prevent them from achieving better performance.

● Albeit in the presence of homogeneous models of development, the cluster analysis highlighted the existence of different strategic groups in the sector. This suggests that the companies have potentially different levels of adaptation and trajectories of development, which would advise against excessively standardized approaches in terms of communication and marketing; instead it would seem more appropriate to differentiate these levers in relation to the strategies and threshold levels of sustainability achieved.

● Both cost leadership and product differentiation strategies seem capable of positively impacting economic performance; indeed, these strategies are often used in combination to achieve set targets. However, it remains to be understood which exact combination of factors and different trajectories should be adopted by companies, as there seems to be no sole valid option from commercial and production viewpoints.

● Company efforts are met with greater rewards when certain business threshold levels are met. One of these thresholds seems to be company size, confirming the findings of previous studies regarding the world of wine in other countries (Gabzdyllova et al. 2009). However, internal growth is not always an option for individual companies, although interesting areas of cooperation are arising through “network contracts”, involving the pooling of resources and competences on commercial, financial and operational levels (Zanni and Bellavista, eds., 2012). This could also be encouraged by institutional intervention, through local policies in support of business networks that aim to strengthen sustainability in the wine business through external growth models.

● While the broad acceptance of the values of social and territorial sustainability does not always impact company performance, it does appear to be a distinguishing element of Italian wineries' business models. This aspect could be exploited as a possible driver of institutional communication if a policy of internationalization of Italian wine associated with the concept of sustainability were to be followed. The topic seems to merit further research, in particular to focus more on the influence of external institutional variables that may differentiate the approach to sustainability between "Old" and "New World" wineries (Marshall et al. 2005; Gabzdylowa et al. 2009).

We are aware that this investigation has some interpretative limits which, however, can be overcome by future studies involving four dimensions:

● Firstly, by studying the different impacts of the individual variables on the business models and different trajectories of sustainable development using more sophisticated investigative methods (econometric analyses).

● A more detailed territorial interpretation of the data on a regional basis should then be performed, in order to better understand the impact of contextual factors (trade associations, regional policies) on business models and company performance.

● A comparative analysis at international level could be attempted, to identify any typical characteristics in the approach to sustainability of the Italian model compared to those of other significant Old and New World wine producing countries.

● Lastly, the interpretative hypotheses regarding wine production investigated in this study could be compared with an analysis of the relative demand, in order to determine the validity of business behaviors adopted, also in the light of the opinions of wine consumers.

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Our working plan

The proposals below - veritable guidelines for the development of the wine supply chain from a sustainable viewpoint - emerged from debate within the Forum for the Sustainability of Wine, which endorsed all the requirements described by the studies in this report. We have also specified the areas of research and development to be pursued in order to build on and improve the reference model.

We will work to see that **the national programs take into account the needs that have come to light and the definitions contained in this report**, encouraging continuous dialogue at consultation tables, such as the Forum for the Sustainability of Wine, which must always be inclusive and open. The Forum undertakes to create a specific **glossary of the methodological approach to the sustainability of wine** and continue to **promote the fusion and aggregation of complementary or contiguous sustainable winemaking programs**, in order to simplify the message of “sustainable products” and render it more comprehensible to consumers and buyers in general.

In this context **we want to launch a process of spontaneous and free communication, but within a cohesive and homogeneous framework.**

We want to foster research and development aimed at an **increasingly clear cause-effect link between the indicators of sustainability programs and the goals of environmental, social or economic improvement that they pursue**, with the added aim that any indicator used be validated by this link, **thus also promoting the definition of both methodological and technological national minimum requirements**. In this task we will refer first and foremost to measurements rather than estimated results; **we will also promote the**

adoption of reference indicators, calculators and measures at the national level.

At the same time we want to launch a phase of collecting and sharing practices that, thanks to the advanced analytical tools available these days, can be closely correlated with the goals for improvement and prefigure the minimum requirements in the pursuit of sustainability. In this sense we consider the recent innovations in the field of genetics for viticulture as potential instruments with which to bring about improvement.

We consider the **organizational simplification of firms moving towards models of sustainable development as being of primary importance for the success of any initiative.** In this sense, management systems in already regulated areas (such as the National Action Plan on the sustainable use of plant protection products) could be combined with the tools proposed by the sustainability programs.

We will dedicate an increasing amount of resources to the identification of indicators of social sustainability, focusing in particular on the issues of the rural landscape and the healthiness of products.

We consider it essential, **in pursuing success for the model on the market, to combine technical choices established as sustainable with a product's cultural aspects.**

We want to encourage studies aimed at correlating the costs and benefits of companies' sustainability-oriented approaches in a more in-depth manner. This would include investigating the connections between regional, national and EU incentive and performance-related measures aimed at involving and stimulating companies. The resulting studies could be made available for new economic policy actions. **We will look in depth at the question of critical "threshold" levels (qualitative and dimension-related) that allow individual companies to achieve significant performance from the points of view of**

sustainability and economic results. We will also encourage the comparison of the results of these studies with international experiences.

We want to promote the inclusion of studies concerning consumers and the distribution chain in future editions of the report.

We have launched a **process of opening the Forum for Wine Sustainability to all the actors in the supply chain and stakeholders in general,** in order to guarantee the diffusion of information that is essential for the future of this movement.

We want to encourage **national institutions to consider the requirements of the productive sector presented in this report in the context of the definition of calls for the next Rural Development Program 2014-2020.**

We want the OIV's GHGAP to be considered a prerequisite in the study of GHG emissions in the wine sector, thus granting this intergovernmental body a fundamental role as a supranational point of reference. We would likewise want OIV to accept the invitation to dialogue made by the Forum for Wine Sustainability.

We want to establish a **continuous dialogue with the working group on the OEF-PEF guidelines** as part of the European Commission program with the aim, amongst other things, of proposing as the minimum methodological and technical requirements for the environmental sustainability of wine those identified at national level.

Lastly, we propose that the movement for sustainable development be considered above all as a process of cultural growth for the whole wine supply chain. Only in this way can traditional strategic conflicts, such as those between quality and sustainability, inexpensiveness and respect for the environment, products and territory, achieve a virtuous resolution for the future good of the system and as part of a holistic vision that becomes a "generational promise."

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Stampato nel mese di Ottobre 2014 - a cura del Forum per la Sostenibilità del Vino



