

GOOD ENVIRONMENTAL PRACTICES IN THE WINE INDUSTRY: THE CASE OF A COOPERATIVE SOCIETY¹

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Abstract

This investigation has the objective to analyse, from a multidisciplinary point of view, how the integration of environmental aspects, through the implementation of good environmental practices, influence the strategic behaviour of wine industries and their ecological and economical results. Hence, in this paper we analyse the case of a cooperative society in this sector, in order to get closer to the reality which it crosses and to analyse how it confronts the threats from the present-day environment, how are the emerging countries in the world-wide wine market, the *Common Market Organisation* (CMO) for wine or the Integrated Environmental Authorization (AAI). The results show that the management's commitment has been the main promoter for adopting good environmental practices in the company. These are practices which have been easy to apply, have had low economic costs and have allowed for improvements in the productivity and quality in the products obtained. Finally, this study has evidenced a series of implications whose encouraged future contrast is susceptible of contributing to the existing knowledge about the environmental strategy success factors in the wine industry.

Key words:

Ecological strategy; Good environmental practices; Wine industry; Case study

¹ The authors are grateful to anonymous reviewers for their valuable comments and suggestions on earlier versions of this paper. The study benefited from the financial support of the Vice-Rectorate for Research at the University of Castilla-La Mancha (GE20080465).

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1. INTRODUCTION

Considering that the Spanish wine sector confronts a series of threats derived from the recent changes produced in the environment that are going to decisively influence the survival of many wine industries in our country over the following years, such as the alarming loss of competitiveness against emerging countries in the world-wide wine market, such as Australia or Chile; the uncertainty on the real application of the CMO for wine, passed at the end of 2007; or the Integrated Environmental Authorization, amongst others; constitutes a sector of great interest to study.

On the other hand, in the present Spanish context in which the literature considers the environmental variable as a high-priority factor to the competitiveness of our companies (Aragón-Correa, García y Hurtado, 2005; Brío, Fernández and Junquera, 2005; Claver, Molina and Tarí, 2005; Rivera and Molero, 2006; Rubio, Chamorro and Miranda, 2007; Fundación Entorno, 2009), the percentage of these with any type of environmental certification is still very low. This is partly because, from a business point of view, the environmental variable still has the consideration of a cost that does not add any value to the final product. In this paper we hold on to the idea that it cannot only be considered as an inversion, but also, can be considered as an important source for competitive advantages (Claver et al., 2006) and therefore improves the economic result of the companies, in addition to the environment.

The reasons which justify this are, amongst others, those which are able to lead to improvements in such diverse aspects such as the quality of its products, the reduction in cost production or the opening of new markets (Fraj and Matute, 2006). However, it is not easy to explain the strategic environmental behaviours of the companies and their incidence in their results.

So, the objective of our work is to further our understanding on the environmental behaviour of businesses, especially the wine business, from the study of one case. This methodology will allow us to expand in the phenomenon within its own context (Cepeda, 2006; Hamel, Dufour and Fortín, 1993; Yin, 2003). To achieve this, we begin by carrying out a review of the literature on the integration of the environmental variable in the business strategy, and, from the identification of environmental aspects in the wine production process, to analyse the environmental impacts on the wine industry, orientating the company's management to take advantage of the benefits derived as much from an increasingly

ecological market, with more environmental consciousness, such as eco-efficiency, reverting in this way better economic performances in the long term.

In this sense, one of the main contributions of the work is the development of a series of implications derived from the findings of this case study, whose contrast in future works will increase the existing knowledge about the possibility of generalizing these results to all the wine industry.

Finally, from the link between theoretical revision and empirical evidence we will extract a series of conclusions which will enable us to further our understanding of the influence of ecological behaviours in the wine business by their own results.

2. REVIEW OF THE LITERATURE

The companies' environmental pledge has converted itself into an important variable within the present competitive panorama. Investigations on companies' organisation begin to show an increasing interest in environmental aspects. In this way, there are authors who have shown how the environment, which had been ignored by the Theory of Organisation a few years ago (Gladwin, Kennelly and Krause, 1995; Shrivastava, 1995a), now considers it as a new paradigm based upon the company-environmental relationship (Banerjee, 2002; Garrod and Chadwick, 1996). This paradigm proposes a re-conceptualisation in the Theories of Organisation for the inclusion of the environmental variant in its analyses. We can find reference to this in the works of Hart (1995) and Jennings and Zandbergen (1995). Both articles established the environmental theme in direct relation with a paradigm specific to the Business Organization (Rueda, 2005). Hart (1995) defines his work in the context of the perspective of resources and capacities and proposes a scheme with three environmental strategies capable of generating basic resources for the development of the competitive assets of the organisation. On the other hand, Jennings and Zandbergen (1995) analyse the extension of institutional set-ups with regard to the subject of sustainability on three aspects: a) the acceptance and valuation of sustainability within the organisations, b) the construction of some social and organisational contexts and the diffusion of sustainability practices, and c) the implantation of sustainability in constituent, normative and regulative rules.

These articles are a key reference point to console investigations in this area. Since then, literature on the relationship existing between the environment and companies is relatively

extensive; in Table 1 we present some of the latest studies carried out in this field to determine what the present situation of the investigation is and what the future lines which these works should follow are. In this way, we can identify five big lines of investigation:

Table 1. Principle lines of investigation

LÍNES OF INVESTIGACIÓN	AUTHORS
Influence on making strategic decisions	<i>Bravo, Fraj and Matute, 2006; Christmann, 2000; Hart, 1995; Judge and Douglas, 1998; Rugman and Verbeke, 2000; Sharma and Vredenburg, 1998.</i>
Influence on environmental regulations	<i>Angell and Klassen, 1999; Del Brío, Fernández and Junquera, 2001; Henriques and Sadorsky, 1999; Murillo, Garcés and Rivera, 2004; Rugman and Verbeke, 2000; Russo and Fouts, 1997; Vicente and Ruiz, 2002.</i>
Pressure groups	<i>Azzone et al., 1997; Delmas, 2002; Buysse and Verbeke, 2003; Céspedes, Burgos and Álvarez, 2003; Collins and Usher, 2004; Garrod, 1997; Klassen and Vachon, 2003; Sharma and Henriques, 2005.</i>
The role of management in the environmental theme	<i>Aragón-Correa, Matías and Senise, 2004; Banerjee, 2001 and 2002; Bansal and Roth, 2000; Del Brío and Junquera, 2001; Fineman, 1997; Jones, 1995; Sharma, 2000.</i>
Introduction of good environmental practices	<i>Angell and Klassen, 1999; Christmann, 2000; Henriques and Sadorsky, 1999; Sharma and Vredenburg, 1998.</i>

SOURCE: Barba and Atienza (2008).

- 1 The works which study the influence of the environmental factor in making strategic decisions within the company. Within this line we can include the articles of Christmann (2000), Hart (1995), Judge and Douglas (1998), Rugman and Verbeke (2000) and Sharma and Vredenburg (1998) which suggest that environmental questions progressively influence these strategies, giving rise to the main environmental strategies, concentrated in the prevention of contamination, energy conservation, the designing of ecological products or the use of non-contaminating technologies which can lead to improvements such as a reduction in production costs or the increase in product quality.
- 2 Another line of investigation is the one which identifies the role of Public Administrations and its legislation such as induced environmental behaviour factors (Del Brío and Junquera, 2001; Del Brío, Fernández and Junquera, 2001; Murillo, Garcés and Rivera, 2004). The development of this legislation and environmental politics is one of the factors that have contributed to the increasing importance of the

environmental variable in company decisions (Angell and Klassen, 1999; Henriques and Sadorsky, 1999; Russo and Fouts, 1997; Vicente and Ruiz, 2002).

- 3 The line that has received and continues to receive a lot of attention from investigators is the one which analyses the theory of pressure groups under an environmental perspective (Garrod, 1997). These studies can be divided into four blocks (Céspedes, Burgos and Álvarez, 2003): a) the studies that emphasise the role of external pressure groups in the valuation of output and environmental risk (Klassen and Vachon, 2003; Sharma and Henriques, 2005); b) those that emphasise the importance of interest groups so that companies adopt communication and environmental information programmes (Azzone et al., 1997); c) those that identify the most relevant pressure groups in relation to environmental questions and the study of their influence on the environmental strategy of the company (Buysse and Verbeke, 2003; Céspedes, Burgos and Álvarez, 2003); and d) other studies that analyse the cooperation between the company and these groups (Collins and Usher, 2004; Delmas, 2002).
- 4 Another series of works is those which affirm that the role of direction is the key to the management of environmental strategies. They emphasise the studies of Aragón-Correa, Matías and Senise (2004); Banerjee (2002); Bansal and Roth (2000); Del Brío and Junquera (2001); Fineman (1997); Jones (1995) and Sharma (2000) that affirm that high direction plays an important role in the process of adapting a more respective attitude towards the surroundings, because depending on the level of commitment shown by the directors towards these causes is going to determinate their disposition to readapt their present practices.
- 5 The last line of investigation which we show is the one which includes articles that deals with the development of good practices in environmental management. Authors such as Angell and Klassen (1999), Christmann (2000), Henriques and Sadorsky (1999) or Sharma and Vredenburg, (1998), base themselves on the level of implantation of a series of good environmental practices to develop ways of measuring the awareness or environmental implication.

As one can assess, the majority of the literature which has dealt with explaining strategic environmental behaviours in companies has centred itself in only a theoretical approach. In this sense, Murillo (2007) affirms that this is insufficient to study the relationship between the environment and the company's strategy, of which it deduces that the joint consideration of

different approaches and theories allows us to offer a more comprehensive and enriching vision of these behaviours. For that reason, we have opted for case methodology, giving that this is especially useful and adequate for the study of complex and dynamic phenomenon and for the processes of change and innovation (Cepeda, 2006; Yin, 2003).

3. CASE STUDY DESCRIPTION

3.1. Methodology overview

In order to carry out the present investigation, we adopted a qualitative methodology based on the study of cases (Creswell, 1998; Eisenhardt, 1989; George and Bennett, 2005; Stake, 1995; Yin, 2003). This is being used more frequently each time in areas of Business Economics (Cepeda, 2006) and its main advantage is that the study of cases can be used to document the experiences that occur in the companies, learning from them and, including, generating theories from all of it (Bonache, 1999). In our case, we conceived the study of the case such as complementary and quantitative methodology, which serves us, along with the theoretical revision, in order to generate a set of theoretical implications that later on will be able to be examined and contrast empirically using a more ample sample of companies (Yin, 2003).

In particular, we have selected the longitudinal study of a unique case with the purpose of obtaining a better understanding of the phenomenon in which to study: how the integration of good environmental practices affects the management of wine cellars, both in a strategic and operational level.

Table 2 summarizes the technical details of the case study. To do this, the first visit to the company took place in March, 2007, in which we carried out various in-depth interviews of approximately two hours in length for each one, with various members of the company's management (see Figure 1): the manager, the agricultural engineer who is also in charge of the *Department of vineyard plant advice*, the enologist and the person in charge of the *General Administration Department*. The reason for the participation of different professionals within the company was to try and secure the validity of the contents. Afterwards, they carried out four more visits to the installations which lasted for two hours each, combining interviews with various responsible persons and guided visits of the installations, thanks to which we can

contribute a practical vision to our study and clear up any lack of information or vague interpretations.

Table 2. Technical data of the case study

Source type	Source of information	Type of data obtained	Length of time to collect information
Primary	Interviews: - Manager - Agricultural Engineer - Enologist - Administration Director	Qualitative	March 2007- March 2009
Secondary	Observation	Quantitative	March 2007- March 2009
Secondary	Documentation: - Internal - External	Quantitative	January 2005- December 2008 March 2007-March2009

Furthermore, direct observation was used (by visiting the installations and contact with the employees) and the analysis of inside documentation (yearly memoires from 2005-2008) as well as external (the press and web pages). In particular, we consulted the business' web page, <http://www.vinos-saac.com>, which included information about the types of products that the company has and other pages such as <http://www.MeGuias.com> and <http://www.e-informacom>.

So, during the collection of data phase (March 2007-March 2009), primary sources as much as secondary sources were used by method of triangulation (Yin, 2003), which have allowed to maintain and secure one of the basic principles of qualitative focus based in the case, according to which the relative evidence of each case is more solid when it proceeds an ample range of sources of data (Rial et al., 2005). In this sense, the belief that the result is valid is increased and is not an artificial methodology, giving a more solid validation of the results (Bouchard, 1996; Yin, 1998).

Lastly, Table 3 gathers the auto-evaluation realising the development of the case by applying the quality criteria developed by Kein and Myers (1999). As a result we can confirm that it reaches a satisfactory level within the seven criteria collected, if correct it is certain that the theoretical generalisations obtained, in form of implications, as a result of an in-depth study of this case, must be contrasted empirically with the carrying out of a quantitative analysis of a sample which represents the population concerned with this study.

Table 3. Application of quality criteria to the development of the analysed case

PRINCIPLES	QUESTIONS FOR EVALUATION	SELF-EVALUATION OF THE DEVELOPMENT OF THE CASE
Fundamental principle of the hermeneutics circle	Does the investigator shift through the interpretations and the data of the case (backwards and forwards), so much to guide the application of the other six principles in order to cover gaps or contradictions?	√
Contextualisation	Does the case fix the object of study within its historical, political, economic, social context, etc?	√
Interaction between the investigators and the subjects	Does the case describe how the collection of data and the interpretations made have affected them mutually? Does it describe what effects has the study on the participants in the case?	√
Abstraction and generalisation	Do the authors achieve theoretical generalisations from the results that contribute to the case?	√
Dialectic reasoning	Do the authors confront their budgets, which have oriented the design of the initial investigation, with the data that arises from the dynamics of the investigation? Is this relation explicit in the writing of the case?	√
Multiple interpretations	Does the case show all the alternative points of view of the participants in the case? How do they conciliate these?	√
Suspicion	Do the authors adopt a critical perspective and do not take as absolute all the affirmations from the participants in the case?	√

SOURCE: Own elaboration from the criteria elaborated by Kein and Myers (1999) and adapted by Cepeda (2006:76).

3.2. The case of the San Antonio Abad Cooperative Society

This can be found situated in Villamalea, a village in the province of Albacete, to the north of the La Mancha region, between Madrid and Valencia (Spain). This is a village with a long wine-producing tradition, where the cultivation of grapevines and the production of wine are much more than just work. Wine culture is the spirit and tradition of the entire village, even arriving to be a way of understanding life.

In the 1940s decade, the cultivation of grapevines began to extend in Villamalea, forcing the farmers to transport its fruit with rudimentary machinery to the neighbouring villages,

because the wine cellars that were in Villamalea were not sufficient to contain the ever increasing production of grape. To avoid these displacements and with the refusal of the wine cellar owners to extend their installations, many farmers opted to create their own wine cellars and elaborate their own wine instead. The problem was that this wine had to be sold to the owners of the wine cellars who previously did not accept the grape or they had to continue transporting to the neighbouring villages to commercialise it.

These farmers found the answer in the legislation passed by the government of that epoch. This contained the *Rural Development Plan*, where the so-called *Colonization Groups* obtained a series of aids to commercialise their products. In the case of the wine-growing sector this help was obtained through the *Board of Purchases of Surplus Wine*. Thanks to these aids, various enterprising farmers dedicated themselves to form the Wine Cooperative of Villamalea, and with the help of a loan, they bought the land and the materials to construct it. The endorsement for this loan was the property of these farmers and manual labour was done for free. As a result, in 1947 the San Antonio Abad Cooperative Society was opened. Its creation contributed to the economic development of Villamalea. It improved the quality of its wines and the service to its associates, which implied the cultivation of more vineyards and this forced the extension of the Cooperative on successive occasions.

At present, it has 1330 cooperative partners, of which 860 are wine producers, with approximately 4640 working vineyards that extend over an area of 4452 hectares in total. This cooperative elaborates and commercialises its liquids, with a production amount of around 20,000,000 litres of wine, of which, 14,000,000 is commercialised as table wine, 5,000,000 litres as Vin de pays, and 1,000,000 as D.O. Manchuela wine.

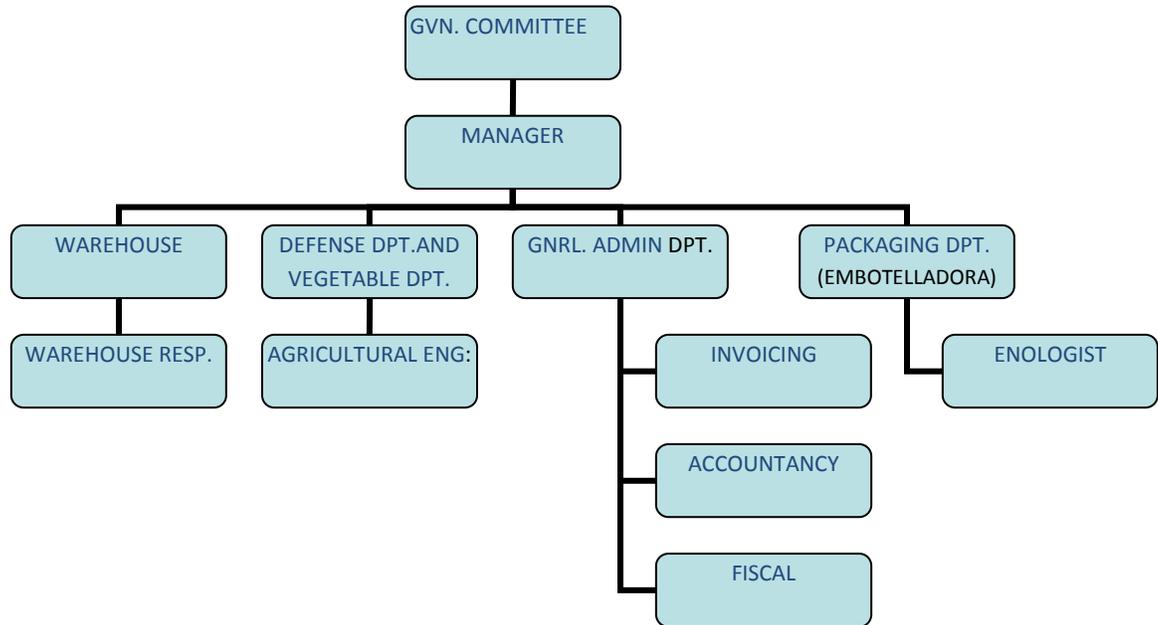
In respect to its organisational structure, it is divided into four sections, each one having a responsible section:

- 1) *The phytosanitary product section*: disposes of all the products that the associate might need for the daily activity of cultivating grapes. In this section we find a wide selection of products such as fertilisers, pruning scissors, and including boots.
- 2) *The oil-press section*: dedicates itself to the elaboration of oil for the exclusive consumption of the associates, it is understood as a benefit of the service for themselves.
- 3) *The agricultural machinery section*: the purpose of this section is to loan a machinery service to the associates that need them, due to some associates living in Valencia,

other associates are already retired or, simply do other work and do not have the time to look after the fields. Here, they dispose of tractors, guarantors, and the personnel necessary to carry out agricultural jobs.

- 4) *The wine cellar section:* main activity of the cooperative object of our study (figure 1).

Figure 1: Flow chart of the San Antonio Adab Cooperative (Wine cellar section)



4. MAIN FINDINGS

4.1. Environmental aspects

In our case, the environmental aspects found in the San Antonio Abad wine cellar that can generate impacts on the natural environment and could extrapolate any type of wine cellar, are found in the following activities:

- 1 *The entrance of prime materials.* Grapes do not always enter into the wine cellar in optimum condition due to inefficient transport, mistakes made or bad practices during the grape harvest epoch. Being a fruit which deteriorates easily can cause premature fermentations due to bad handling, possibly resulting in occasional loss in output in the wine-making process and an increase in the volumen of residue made from not achieving the quality required in the end product.

- 2 *The bottling.* The wine sector, regarding marketing and image, pays a lot of importance to bottling and packaging. These are usually carried out with eye-catching designs, which generate additional costs for the purchase of these bottles, as well as the by-product of its treatment as a potential residue. The cooperative usually includes, within the integrated systems of managing the packing established by legislation, all the bottles connected to its production, that is, as much destined to the final consumer as those destined to industries, trade, transport, etc.
- 3 *The consumption of electrical energy.* The main source of energy that the cooperative uses is electrical energy, whose consumption has repercussions on the costs of production. It is true that there exists various machines and installations which, due to their high energetic consumption, are especially relevant in this analysis on environmental impacts (as in the case of the hoppers, picks, pumps, pressure cleaning equipment, bottling plants, labellers, packers, refrigeration installations, lighting, offices and warehouses, etc.); without any doubt, refrigeration systems and fermentation systems and, to a lesser degree, stabilization are the main consumers of energy.
- 4 *Water consumption.* During the grape collecting harvest, this also coincides with the period in which the wine cellar has most activity, is when the consumption of water is at its highest. Water is usually used in a multitude of processes and jobs, such as cleaning the hoppers and picks, the presses, the tanks, wine presses, barrels, bottles and bottling plants, refrigeration equipment and floor cleaners.
- 5 *Generation of spillages.* Apart from the spillages as a result of the cleaning processes mentioned before, another type of spillage can be mentioned such as pilfering, loss of wine, sanitary water and laboratory water. In the margin of carrying out intermediate operations of inadequate processes, rasps, waste and dirt are dumped with an excessive amount of organic matter into the water, the deposits and barrels can contain the rest of the salts, such as tartrates and bitartrates and strong wines which usually have an acidic PH. The use of hydro-cyclones and centrifuges to eliminate the tartrates from the wine are supposedly a benefit to the process, minimizing the consumption of water for cleaning and avoiding the generation of residues by not using soils for filtering. Furthermore, not using these ecological filters can provoke, to a lesser degree, the contamination of the lands.

- 6 *Atmospheric emissions.* In general, it is quite insignificant, as much the origins of combustible gases from the boilers, due to the combustible fossils that are used in the same burners; like those given out in determined phases in the wine making process, such as in the case of CO₂ which is generated in the fermentation of the grape juices and the SO₂ produced from the sulphate in the grape juices and wines.
- 7 *Generation of residues.* These can be classified into three types: those coming from the acquired products and/or packaging in the wine cellar, such as glass, paper, card, plastic and wood, easily recyclable or reusable; the marcs, rasps and mess, by-products from the fabrication of wine, can be made of good use to elaborate organic fertilisers; and agricultural residues, coming from the rest of the grape pruning.

These findings, derivatives of the environmental impacts of the wine cellar under study, allows us to extract a relevant research proposition, whose future empirical contrast allows us to generalise this result to all wine producing industries:

The level and variety of environmental aspects of activities in the business will be positively related to the incorporation of good environmental practices within it.

4.2. The Company's Ecological Strategy and her good environmental practices

Environmental questions are progressively influencing companies' strategies, giving rise to the denominated environmental or ecological strategies. These are centred in the prevention of contamination, energy conservation, the design of ecological products, the use of non-contaminating technologies, the reduction in costs and recycling and the use of recycled materials, and can make improvements in areas such as cost production, an increase in the quality of the products or the opening of new markets (Fraj and Matute, 2006; Martín-Peña and Díaz, 2006).

In this sense, Aragón-Correa (1997) and Sharma and Vredenburg (1998) affirm that the environmental strategy of the organisation materialises in the selection of a series of environmental practices to start up the company and the degree in which the same ones are developed and are coherent between themselves. Other authors such as Buysee and Verbeke (2003) propose that the environmental strategies of companies can be characterised according to three patterns: those based on legal fulfilment, those centred on punctual practices that

simultaneously and immediately allow for environmental and competitive improvements and the most proactive practices.

In fact, many classifications of environmental strategies exist, but the two extreme positions which are distinguished in the review of the literature usually are: a) environmental reactivity, belonging to the companies that look to exclusively fulfil the legislation and limit themselves to introducing the minimum of changes, including the increase in pressures exercised by the legalisation and the actions of other interest groups, such as the consumers, the shareholders and the community where the company is installed (Angell and Klassen, 1999; Henriques and Sadorsky, 1999; Russo and Fouts, 1997); and b) environmental pro-activity, which is a demonstration of the growing social sensitivity towards the environment and implies the voluntary adoption of methods which contribute to reduce the impact on the natural surroundings. Authors such as Angell and Klassen (1999), Christmann (2000), Henriques and Sadorsky (1999), or Sharma and Vredenburg (1998), have developed ways of measuring this pro-activity, awareness or environmental implication, the majority based on the degree of implantation of a series of good environmental practices.

But the performances which the companies carry out can vary and the integration of these variables can occur at distinct strategic levels (González-Benito and González-Benito, 2005), depending on the perception that the managers have on the importance of those aspects (Banerjee, 2001). In general, those companies whose economic activity has a high impact on the natural surroundings are going to be more inclined to carry out environmental strategies at all levels.

In our case, the environmental practices that the San Antonio Abad Cooperative Society implements are the following:

1 Progressive use of clean energy.

- a. *Solar energy.* At the end of 2007 a solar garden was installed, under the consideration that solar energy was the clean energy which adapted mostly to its needs. Making the most of this energy has two fundamental applications: technical solar energy, which is used as heating and hot water for the offices and the oil press; and solar photovoltaic energy, which transforms solar energy into electrical energy and uses it to cover 20% of the electrical needs of the wine cellar. As the experience was very positive, during 2009 they have forecasted increasing the solar garden to cover 50% of its energy needs.

- b. *Biomass*. The cooperative is considering the use of agricultural wooden residues of the associates (the remains from pruning the olive trees and vines or the straw from cereals) and the residues of the oil press and wine cellar (such as olive stones or the skins and seeds of grapes from the wine cellar) for making biomass. The advantages of this new source of energy are to avoid the burning or recycling of these residues. The main inconvenience is the high cost of chipping or cutting down the material for transporting it. After carrying out this study we are assessing possible subventions and specialized investigations in this topic for future developments.
- 2 *Recycling of Residues*: Now the residues from the oil press are recycled in a recycling plant situated in another village in Albacete (Spain). A specialized company collects the residues of the wine cellar and they are transformed into chemical and organic fertilizers. Also the cooperative separates glass, paper, card, plastic and wood resulting from the bought and packaged products in the wine cellar. These residues are collected by another specialized company for recycling. In this way, the management of the cooperative prepare the team about the importance of reducing and controlling the amount of residues generated. It should be necessary to foment a better use or remove the agricultural residues, for example the remains from pruning the vines which generate alternative energy as biomass. For this reason we are studying to create a biomass generating plant.
- 3 *Reducing water consumption*. A rational use of water helps to reduce the enviromental impact of the wine cellar and also reduces the cost of spending. The main practices introduced are the following:
 - a. Installation of meters in the machines where water consumption is high. Apart from controlling how much water is used, it also prevents leakages.
 - b. Mechanical sweepers to clean the systems.
 - c. Pressure cleaning methods which are more effective and use less water.
 - d. Periodic revisions of the systems to assure their good function.
 - e. Develop awareness in the personnel in the need to optimize the consumption of water.
- 4 *Managing the material*.
 - a. The packaging and cans are closed carefully to avoid spillages.

- b. Scales are used to test that the agriculturiers use the correct amounts of prime materials so as to control efficiency.
 - c. Industrial packages are used which are not destined to the end consumer (pallets, plastic or wooden boxes etc.) which are reusable.
- 8 *A reduction in the consumption of electrical energy.* The different equipment and electrical systems can be treated with methods which reduce energy consumption, some of which are:
- a. Stand-by systems, for example photocopiers which automatically deactivate themselves when not used over a determined amount of time.
 - b. Develop awareness in the personnel to switch off machines and equipment during non-working hours (lunches, interruption in production, etc.).

10 *Treatment of residues.*

- a. Dangerous residues, such as hydrochloric oils, used oils, fats and dissolvents are separated from the rest of the residues.
- b. Waste and rasps are collected in open containers, because storing directly on the floor can provoke spillages which apart from making a loss, can contaminate the floor.
- c. The first fraction of water used to wash the tanks, deposits and casks are sent along with a fraction of wine to the alcohol tester.
- d. The residues from the process which have an organic origin are destined as a prime material in other production processes (for example, the rasps are used as organic fertiliser for the grape harvest).

12 *Emissions and waste control.*

- a. They control the emission of SO₂ from the sulphated must and wines, handling the SO₂ in isolated and ventilated areas.
- b. They inject the SO₂ in storage by means of a rapid connection system. The addition equipment is ready to inject the watery sulphurous solution automatically into the pipes of the grapes harvest.
- c. They comply with the limits on atmospheric emissions, maintaining the equipment in good condition, cleaning and carrying out the filtration and purification of gases periodically.
- d. Neutralisation of the waste from the oenological laboratory prior to being dumped.

- e. Special attention is paid during the racking of products in order to avoid any accidental spillage.

13 Other good environmental practices in the Cooperative Society.

- a. The requirements regarding the preservation of prime materials (grapes) and of finished products (wines) are strictly observed. It is important to keep the storage time of the prime materials to a minimum; the stocks are managed in such a way as to avoid residual waste being produced due to products expiring.
- b. Recently a Danger and Critical Checkpoint Analysis system has been put into place. Its implementation ensures proper maintenance of the installations.
- c. They try to use as small a variety of solvents as possible in each operation.

On the basis of evidence drawn from the implementation of good environmental practices in the wine cellar object of this study, we can draw the following proposition, the future contrast of which is could contribute towards increasing present awareness regarding the possibility of generalising this phenomenon to the whole industry:

The implementation and development of good environmental practices in the wine sector promotes proactivity in the company's ecological strategy, reinforcing the organisational learning capacity which, in turn, by generating advantages, makes it possible to achieve better economic and environmental results.

4.3. Factors which condition ecological strategies

The motives or factors which cause companies to implant environmental management systems are diverse and have evolved over the course of time. Following Cruz, Úbeda and Llimiñana (2005), we can group together the principle motives into two groups, which coincide with those aimed at by the San Antonio Abad Cooperative Society:

- 1) *Internal motives.* Those which are related with improving the quality of product/service, a goal established by the management, the reduction in costs, improving the infrastructure of the organisation, promoting management quality, testing efficiency and managing quality and improving staff satisfaction. In this respect, the Cooperative has undertaken a series of investments and improvements in all its sectors, whereby its priority has been to aim not only to provide a better service for its partners, enabling them to work in greater comfort and with greater benefits, but basically that this should have repercussions in its products.

The improvements in the wine cellar section were carried out in order to take all necessary measures to achieve a production process which aims at quality. The fermentation systems have been improved by efficient cooling equipment, micro- oxygenation systems, automation of the wine cellar to make viable its design, and aspects of wine and harvest. Similarly, all storage tanks are made of stainless steel and are installed with the means to control the temperature of the wine all year round.

- 2) *External motives or of the market.* Those related to the clients' demands, to follow the market's trends, to promote a cooperative image, pressure from the competition, to develop new markets, to increase international competitiveness and to increase the market's quota. So, the company has recently certified its quality control management under regulation ISO-9000, and in the near future intends to implement ISO 14000 and ISO 22000 in all sections of the Cooperative, aware of the demand upon the market to tackle commercialization on a national and world-wide level.

Next, we show some of the factors identified in the economic literature that influence the limits of environmental strategic development (Del Brío and Junquera, 2002a; Fraj and Matute, 2006):

- 1 *Financial resources:* the shortage of financial resources as a factor which limits the environmental development of companies (Noci and Verganti, 1999).
- 2 *Human resources:* environmental management is intensive in human resources and depends on the development of skills of a tacit nature through the implication of the employees (Hart, 1995).
- 3 *Organisational structure:* it is easier to introduce these practices in companies with a standardised and well-structured organisation, such as bigger companies (Alberti et al., 2000).
- 4 *The role of higher management:* the attitude of managers with respect to caring for the environment decisively influences the environmental behaviour of the company. That is to say, for the company to decide to initiate control practices or to introduce an Environmental Management System (EMS), managers should get a priori of the sources of opportunities and threats from the sector that can affect their environmental action (Claver et al., 2006).
- 5 *Environmental interest groups:* amongst those found in the governments, consumers, competitors, clients, etc., that is to say, their interest in protecting the natural surroundings

brings them to pressurise companies to adopt environmental practices (Delmas and Toffel, 2004).

We have to show that all of these factors cannot be considered as isolated elements, but are strongly interrelated and are necessary to protect the coherence and effectiveness of introducing an Environmental Management System (EMS) into the company (Cruz, Úbeda and Llimiñana, 2005). Despite this, in our case, the support and conviction of the management, together with the institutional grants that management was able to secure, have been the two key factors in promoting the introduction of good environmental practices.

Upon studying the discoveries obtained which relate to the principle facilitator of the integration of the environmental variable in a wine cellar, interesting implications can be drawn for the management, which reaffirms the key role that literature grants in this process: *The commitment of management is positively related to the incorporation of good environmental practices in a wine cellar.*

Carrying out future investigations designed to contrast such an implication will allow us to discover whether this is generally the case in this industry.

4.4. Obstacles for adopting an ecological strategy

Wood (1991) suggests that to improve the social output of a company means altering its behaviour to reduce damages and produce beneficial results for the association. However, apart from the agents who put pressure on a company to adopt ecologically responsible measures and the advantages that they can carry, there is also a series of barriers that represent an obstacle in the adoption of such measures (Murillo, Garcés and Rivera, 2004a). Authors such as Hillary (2003), Izaguirre, Vicente and Tamayo (2005), classify the barriers for the application of an ecological strategy into two types: internal and external.

4.4.1. Internal barriers

The internal barriers to the company that can be produced are the following:

- 1 *Organisational restraints:* the small commitment made by high managing employees to the environment, as well as their meagre training or qualification. Added to this there is the lack of information, since the directors as much as the consumers have very little

understanding of environmental problems (Hillary, 2003; Izaguirre, Vicente and Tamayo, 2005; Murillo, Garcés and Rivera, 2004b).

- 2 *The negative attitudes of the directors:* in relation to environmental matters, due to an unfavourable business culture that grants little importance to environmental investigation or to its perception of environmental pressures as a threat, these attitudes are an important obstacle so that the company introduces more advanced approaches to environmental management.
- 3 *Technical and technological problems:* such as uncertainty and high cost associated with the introduction of new clean technologies, and failing to make the best use of a range of economies and experience of old technologies, amongst others (Murillo, Garcés and Rivera, 2004; Ríó, 2002).
- 4 *Other internal barriers:* can be, among others, the lack of resources, the difficulty of strategic and organisational adaptation and the difficulties associated with the introduction of an EMS (Hillary, 2003; Ríó, 2002).

In the case of the San Antonio Abad Cooperative, reluctance on the part of the workers - many of whom are cooperative partners-, together with problems of a technical nature, have been the main factors in slowing down the implementation of good environmental practices. The input in raising management awareness and the training received by some of the members of the organisation have helped to ease this.

4.4.2. External barriers

In respect to the external barriers, these can be summed up in the following:

- 1 *Investments to fulfil:* Post and Altman (1994) consider that the investment in clean technologies or the high cost of ecological projects, as well as the introduction and certification of the environmental management systems, is one of the obstacles for not introducing ecological strategies. However, as Izaguirre, Vicente and Tamayo (2005) affirm, the question is if such costs can be compensated by greater long term profitability as a result of improved competitiveness.
- 2 *Inadequate regulations:* various authors criticise the present regulation for its lack of flexibility in the terms and forms of adaptation, the lack of information on this, as well as favouring the adoption of control strategies as opposed to prevention. To this they add

certification costs and a lack of support and orientation (Hillary, 2003; Murillo, Garcés and Rivera, 2004).

- 3 *Pressure from shareholders:* there are authors who see the pressure from this group as an obstacle because an ecological strategy can reduce the profitability of the company in the short term and, therefore, the output of the investors (Izaguirre, Vicente and Tamayo, 2005).
- 4 *Uncertainty:* associated with the little development of the environmental offer sector, which is translated into a shortage of information on clean environmental technologies and an insufficient offer in machinery/equipment for the adaptation, as well as services such as environmental consultancy and the withdrawal and re-use of residues (Murillo, Garcés and Rivera, 2004).

In this case under study, regulation has encouraged the implementation of good environmental practices, since it has been accompanied by subsidies which ease the process of adaptation to such practices, as well as, for example, the introduction of clean technology. On the other hand, the major difficulty encountered has been the lack of qualified companies offering specialist services in the re-cycling and collection of residual waste, something which is slowing down the procedure towards certification of its environmental management system.

These findings allow us to draw the following research proposition, which contradicts the conclusions reached by the prevailing literature (Hillary, 2003), making its future contrast particularly desirable when we look at the possibility of generalizing this result to the wine industry as a whole:

A greater governmental intervention in the wine sector, both positive (with subsidies and measures of support in the sector) as well as negative (with higher requirements on environmental regulation), will be positively related to the incorporation of good environmental practices in the company.

4.5 Competitive advantages derived from adopting an environmental strategy

Rivera and Molero (2002) affirm that the high costs associated with environmental actions and the small competitive advantages gained can de-motivate companies from carrying out environmental actions. However, Ottman (1995) suggest that companies that direct themselves to the segment of ecological consumers can make the most of the advantage of being the first

ones to offer less contaminating products. Later on, Proto and Supino (1999) argue that the quality of environmental information presented by the company on its activities can be a major source of competitive gain before the possibility of reaching the loyalty of their clients. Furthermore, Claver, López and Molina, (2004) affirm that the savings in costs for reducing the use of raw materials and energy, the improvement of the productive processes, etc., can convert themselves into important competitive advantages for companies. In this way, we can distinguish between (Shrivastava, 1995a and Christmann, 2000):

- 1 *Cost advantages:* Environmental practices can reduce companies' general costs, due to adequate management and optimisation of natural resources reducing the consumption of energy, water, raw materials and use of and minimisation of residues. (Porter and Van der Linde, 1995; Shrivastava, 1995b). Christmann (2000: 668) indicate that the integration of environmental questions before competitors or with anticipation for the new regulations, *"can contribute to advantages in costs in three ways: 1) the anticipation minimises the disruptions of the production processes associated with the development and introduction of required technologies; 2) the companies which integrate environmental questions with more speed can gain a competitive advantage by means of the learning curve; 3) the integration of environmental questions before an obligatory regulation appears can influence the development of this regulation, providing an advantage to pioneering companies"*. In our case the cost advantages are associated with eco-efficiency, that is, the reduction in the amount of water and energy consumed.
- 2 *Differentiation advantages:* Some specific practices contribute to reach a competitive advantage of differentiation, such as the redesign of packaging and products in a more respectful manner with the environment, developing new products and making publicity on the benefits derived from them (Peattie, 1997; Reinhardt, 1998). This should support itself in the development of an image or a channel of commercialisation to assure the customer of the environmental characteristics of the product (Carmona, Céspedes and Burgos, 2003). In this respect, the San Antonio Abad Cooperative has received various international awards, and has committed itself to its commercialization in more demanding segments of the market, and for entry into such, it is essential to bear the label of an ecological or organic product, a distinct sign of quality and know-how. Lastly, in relation to the competitive advantages derived from the integration of the environmental variable in the management process, it is possible to present the following research proposition:

The implementation of good environmental practices in the company will be positively related to obtaining competitive advantages, both in costs and in differentiation.

5. DISCUSSION AND IMPLICATIONS

The ever-more frequent and strong regulations, as well as client pressures, shareholders, etc. urge companies to advance rapidly on the track of sustainable development and, as a consequence to the introduction of environmental practices, capacities arise that allow the companies to surpass the competitors and satisfy their customers (Bansal and Bogner, 2002; Barney, 1991; Del Brío, Fernández and Junquera, 2005; Porter and Van der Linde, 1995). Between these, they emphasise the capacity to integrate with the pressure groups that surround and form the company, in order to obtain better treatment and to find allies for a sustainable growth; the capacity to generate understanding and further the learning process, when exploring new market opportunities derived from the integration of the environmental variable to the business strategy; and the capacity for the innovation to continue, since this integration promotes the generation of innovative technologies, reducing organisations and operatives, and including eliminating environmental impacts.

By apply the methodology of the case study to the analysis of a wine producing cooperative situated in Castilla-La Mancha (Spain), we have been able to observe how the implementation of the Danger and Critical Checkpoint Analysis System, a product of the legislation in force, has enabled us to carry out rigorous controls on the emission of gases and on the treatment of residues and residual waste. In addition, thanks to the subsidies and the expected savings to be made in energy costs, the cooperative has installed solar panels in order to use renewable energy and is considering manufacturing biomass with the residues that are generated.

However, the transformation of these capacities into competitive gains that can be made of good use by the company in a sustainable way originates itself in the combination of a triple perspective theory: The Theory of Resources and Capacities, Dynamic Capacities and Cooperative Social Responsibility. Based on the resources and environmental strategic capacities of the company, as well as its level of social obligation, we will find ourselves with an ecological strategy with a higher or lower degree of environmental pro-activity, which will

influence in larger or smaller measure in the generation of the previously mentioned competitive gains and in their impact on business output.

In the San Antonio Abad case study it can be seen how good environmental practices adopted have a direct bearing on environmental problems, without provoking big changes in the existing production processes. They are easy to apply, are low in economic cost and the immediate results are a notable increase in the productivity and quality of the products obtained, which in turn brings improvements in the economic results.

On the other hand, the implementation of certifiable environmental management systems has a number of advantages, because a systematic control of the processes reduces the possibility of errors and, as a result, minimizes the consumption of resources, energy and impact generated. In short, the expectation of obtaining such advantages as the minimization of costs, the reduction in energy consumption and in the cost of eliminating residues, the increase in public esteem and improvement in image, and the strengthening of client relations mean that this company, which has the certification of Quality Management System, can now apply for certification of its Environmental Management System.

Furthermore, we have to take into account the internal barriers that are the main obstacle for the adoption of measures to protect the environment. However, if the directors perceive some of the barriers, whether external or internal, as an obstacle to advance in the environmental strategy of the company, this perception will negatively influence the adoption of environmental practices (Post and Altman, 1994; Izaguirre, Vicente and Tamayo, 2005).

In our case, the implementation of the system of environmental management does not entail any major problems in the company, other than the rejection by some of the workers of the change in business culture; for this reason the management must have a high level of commitment in order to motivate and raise awareness in the workers to this effect. Thanks to this, such good practices have been implemented as the rational consumption of water which helps to minimize the environmental impact upon the wine cellar, using pressure cleaning methods that use a smaller quantity of water; or raising awareness of the personnel to switch off the machines and equipment during non-working hours (mealtimes, interruption in production etc) in order to save energy.

Lastly, as far as the limitations and plans for the future are concerned, it should be said that this study is an exploratory investigation, term used by Yin (2003), and its principal aim is to suggest new approaches in studying the environmental problems of the wine industry. In this

respect, an in depth analysis of the case has lead us to some theoretical propositions (Table 4), which could be a starting point for carrying out future quantitative investigations upon a representative sample of companies from the sector, with the aim of obtaining statistically significant information about the incident level of the environmental variable in the management of vineyard businesses and in their results.

Table 4. Main theoretical propositions derived from the case study

Elements analysed in this case	Theoretical propositions derived from empirical evidence	In accordance with prevailing literature
Environmental aspects	<i>The level and variety of environmental aspects of the activities in the company influence its implementation of good environmental practices.</i>	√
Good environmental practices	<i>The implementation and development of good environmental practices in the wine sector improve the company's economic and environmental results.</i>	√
Principal facilitator	<i>The management's commitment plays a key role in the implementation of good environmental practices in the wine cellar..</i>	√
Principal barrier	<i>Greater governmental intervention in the wine sector facilitates the incorporation of good environmental practices in the company.</i>	X
Competitive advantages derived from the integration of the environmental variable:	<i>The incorporation of good environmental practices in the company can involve obtaining competitive advantages, both in costs and in differentiation..</i>	√

It would be particularly useful to carry out a fuller analysis of the fourth proposition, that which relates to governmental intervention as a facilitator for the incorporation of good environmental practices in the company, contrary to prevailing literature. More cases should be studied, not only in the wine sector but also in other agro-food sectors in which greater governmental pressure is necessary to guarantee compliance with the legislation in force

governing environmental issues, thus establishing the same rules of the game for all and preventing disloyal competitive practices.

Such confirmatory analysis, both qualitative and quantitative, will enable us to find out whether these results are only applicable to the specific company studied or whether they can be generalised to the wine industry as a whole. In this sense, the principal limitation of this research project derives from the analysis of one case only, even though it is certainly relevant and representative of the largest wine producing region in Europe, which Castilla-La Mancha is.

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