REPORTING THE COMPANIES' SUSTAINABLE PERFORMANCE IN AGRICULTURE

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ABSTRACT: The current financial statements don't put in evidence the companies' sustainable performance due to the fact that the Financial Accounting does not recognize the social and environmental aspects with which a company is confronted. These impacts are more significant in agriculture, sector in which the natural environment and human resources are important production factors. This paper presents the external environmental impacts of agricultural production expressed in monetary terms that can be reflected in financial reporting. The case study is operationalized in a vineyard farm, and the analysis marks out the lowering of the profit with the environmental costs. The sustainability financial reporting is an option for developing finance mechanisms to help companies in becoming more sustainable.

Keywords: financial reporting, environmental impact, sustainable performance, Life Cycle Assessment, agricultural holdings

JEL Codes: Q12, Q51, Q56

Introduction

In the agricultural sector, the relationship between economy and external environment is very strong, economic activities placing pressures on the natural environment.

Agricultural activities generate various types of pollution, mainly by using synthesis chemical substances for treatments of diseases and pests, artificial soil fertilization, plant and animal residue discharge, air pollution through treatments applied to crops, soil depletion through the practiced intensive systems, non-correlation between plant needs and the land favourability level etc.

The present financial reporting standards do not highlight all effects that economic activities put on the environment and society, so that the implementation of an environmental management system and improvement of financial accounting framework becomes necessary. The financial accounting provides information on the management of patrimony and the direct economic results but it doesn't supply information about the environmental and social impact of companies' activity. These impacts could modify the economic performance. Adoption of an environmental management system will provide the technical and economic information concerning the environmental impact and substantiate the decisions of performance growth.

An environmental management system has an iterative action, it leads to successive improvements of the technical-productive infrastructure, thus in time the negative impact generated by the company's economic activities on the environment and society, will be reduced. Therefore, an environmental management system is an important operational tool through which agricultural holdings are leaded to restructure their own activities in order to improve the economic, social and environmental performances, and on this base, to increase sustainability.

Another action that can stimulate growth of sustainable performance is the complete monitoring of all impacts related to economic activities and using information on environmental and social financial flows for making sustainability reports.

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This study has as main objective to stress the importance of sustainability management and financial reporting, these being mechanisms that can inform stakeholders on the real capacity of the resources managed by the agricultural holdings to create value, concomitant with the application of sustainable development principles. The research results could contribute to a better knowledge of the relationship between agriculture and the environment, base on the frame of sustainability performance reporting.

For evidencing the environmental impact on the economic performance of agricultural holdings, I made a case study within a vineyard farm. I evaluated the environmental impact based on greenhouse emissions using Life Cycle Assessment (LCA). This impact led to a decrease of economic performance with 19.5% aspect which both demonstrates the utility of an environmental management system, and the implications of assessment and reporting the sustainable performance of agricultural holdings.

Literature review

Achieving a sustainable relation between the three basic elements of sustainable development – economic, social and environment – is the objective of special regulations put in place after the 1992 United Nations Conference on Environment and Development in Rio de Janeiro, when the ISO 14000 standards group was initiated (launched in 1996).

The ISO 14000 family of standards contains recommendations concerning good environmental and business practices that can be applied by companies in organisation organizing and unfolding their activity in order to produce benefits such as: efficiency improving, development stimulation, increasing the shareholders trust etc.

Another management system for environment problems that is available only in Europe is Eco-management and Audit Scheme-EMAS (EC, 2001). This requires for stricter regulations, and demands information transparency concerning the impact of activities on environment, so that it is less popular than ISO 14000.

An element that can be useful for companies in their action to implement the mechanisms of management and sustainability reporting is the Sigma project (2003). This refers to the possibilities to convert traditional accounting practices in sustainability financial accounting.

Important regulations on the sustainability reporting are included in Global Reporting Initiative (GRI, 2011). The GRI Guidelines can contribute to improving the usefulness and quality of information reported by companies about their environmental, social and economic impact and performance (Willis, 2003). The main headings for the sustainability performance indicators recommended in the GRI Guidelines for an organization cover economic, social and environmental aspects of companies' particular circumstances (Roberts et al., 2005). Based on the Global Reporting Initiative context some studies developed and utilized a GRI Index in order to reflect the implications of the toxic emissions on firm's performance (Clarkson et al., 2008; Clarkson et al., 2011).

One of the most urgent challenges that companies face today seems to be operating in an environmentally, socially and economically sustainable manner. Their continuity and long-term success will depend on their ability to respond to these constraints (Hopwood et al., 2010).

For an integrated approach of economic, social and environmental aspects it is necessary the adoption of a new perspective, which facilitates conversion of the profit-based financial accounting towards monitoring of business sustainability (Chousa and Castro, 2006; Schaltegger and Hertiz, 2006). Extending the information range used in traditional accounting and approaching it as Sustainability Accounting, ensures knowing about the various kinds of company impacts. These aspects are more convenient for stakeholders and at the same time can contribute to a more sustainable development. Sustainability Accounting aims „the generation, analysis and use of monetarised environmental and socially related information in order to improve corporate environmental, social and economic performance" (Sigma project, 2003).

In order to analyze the environmental impact resulted by agricultural activities it can use information of the Life Cycle Assessment. This is "a systematic set of procedures for compiling and examining the inputs and outputs of materials and energy and the associated environmental impacts directly attributable to the functioning of a product or service system throughout its life cycle"[2].

The studies on Life Cycle Assessment in agriculture sector are relatively recent and they had as main objective the prevention of the environmental pollution through selecting the alternative production systems. There were made studies on LCA for some agricultural products as, wheat (Gaillard and Hausheer, 1999), tomatoes (Antón, Montero and Muñoz, 2005), milk (Cederberg and Mattsson 2000), fruit production (Mouron et al., 2006), wine (Notarnicola et al., 2003) etc.

The research methodology

Changes demanded by the implementation of an environmental management system aim at both restructuring of the technical-productive capacity and reorganisation of the accounting system, in order to deliver reports on sustainability performance.

Due to their specific activity, agricultural holdings are strong related with the natural environment; therefore the preparation of some statements for sustainability reporting becomes both a necessary and opportune action. The sustainability reports allow monitoring and assessment of the impacts on external environment and revision of the firm's strategies and programmes in order to improve the sustainable development processes.

For achieving the paper's aim, information on costs, benefits and performance was primarily used, which resulted from the management of the economic resources used in vine growing derived by accounting system. Effects generated by the agricultural production on the exterior are environmental and social flows, and if they can be transformed in financial indicators, will complete the financial reporting framework rounding the company's image about the way it can manage its impact on sustainable development.

The possibilities of reporting the sustainability performance within the agricultural holdings were analysed based on the technology sheet for vine growing in the Romania Târnave Vineyard, from the Research and Development Station for Grapes and Wine Production of Blaj (RDSGWP).

Using the information of the technology sheet, it was determined the Life Cycle Assessment for wine grapes. LCA utilisation is stipulated by the international standard ISO (2006). According it, use of the LCA is made in four phases: the goal and scope definition, inventory analysis, impact assessment and interpretation (figure 1).

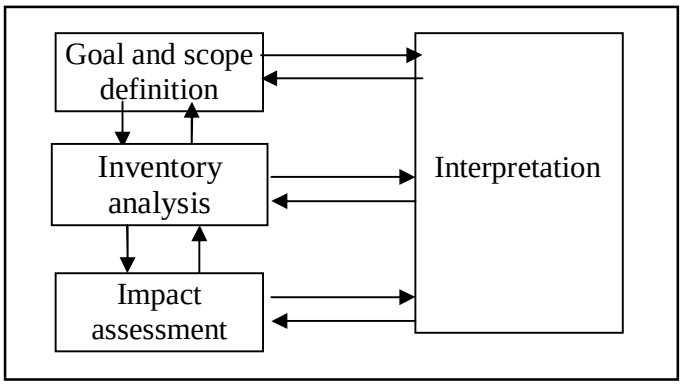

Figure no. 1. - Stages of a LCA
(Source: ISO 14040, 2006)

[2] *Defining Life Cycle Assessment (LCA).* US Environmental Protection Agency. http://www.gdrc.org/uem/lca/lca-define.html

The goal of the study is to evaluate the environmental impact of the wine grapes in the RDSGWP Blaj for determining the sustainable performance of this farm. Inventory analysis quantifies the relevant inputs and outputs of the production system. In this study inputs are represented by materials (chemicals, fertilizers and pesticides) and energy used (fuel and electricity), and outputs are represented by wine grapes obtained and Greenhouse Gases emissions. The impact assessment targets to quantify in monetary term the environmental impact of the Greenhouse Gases emissions.

The indicators of sustainability measuring will be introduced in sustainability financial statements according to the type of effects produced, their amount being calculated on a hectare of cultivated land.

Results and discussion

The economic-financial situation of Research and Development Station for Grapes and Wine Production put in evidence the monetary flows obtained from the grapes production. The main economic indicators that characterize the vine growing technology experimented on a hectare for 2010 are presented in table 1.

Table no. 1.

Economic-financial statement

Calculation elements	Measure unit	Amount
1. Incomes	euro/ha	3075
1.1. Physical production	kg/ha	7500
1.2. Price per unit for grapes	euro/kg	0.410
2. Direct costs	euro/ha	1443
2.1 Direct labour force	euro/ha	468
2.2. Materials, of which:	euro/ha	318
- chemical fertilizers	euro/ha	54
- pesticides	euro/ha	252
- other materials	euro/ha	12
2.3. Mechanized activities	euro/ha	657
3. Amortization	euro/ha	70
4. Indirect costs	euro/ha	191
5.Total costs	euro/ha	1704
6. Gross profit	euro/ha	1371

Source: RDSGWP Blaj

We can observe that the efficiency of vine growing is high; the gross profit for a hectare is 1371 euro. The environmental costs and benefits indicators necessary for making the environmental financial statement of RDSGWP are determined with the help of information derived from Life Cycle Assessment for sauvignon blanc wine grapes production (table 2).

Table no.2.

Life Cycle Assessment (LCA) for wine grapes

Elements Stages	Materials	Energy	Toxic emissions
Production: cropping, harvesting, packing, storing, conditioning, weighting, transport, distribution etc.	- Chemical fertilizers 0.05508 kg/kg grapes - Pesticides 0.002134 kg/kg grapes	- Fuel (diesel) 0.002471 l/kg grapes - Electricity 0.334 MJ/kg grapes	- Greenhouse Gases 2.1 kg CO2 eq/kg grapes

Source: RDSGWP Blaj

Usage of LCA in studying the environmental impact of grapes production reveals the effects of the three set of elements related to agricultural activities: materials, energy and toxic emissions-MET (Bentrup, 2004). The atmospheric emissions for a yield of 7500 kg/ha are 15.75 tonnes CO2 eq/ha (Burja and Burja, 2010).

An important problem in determining the environmental financial indicators is assessment and transformation of various impact categories in monetary expression. Some of the environmental impacts that mean resources consumption, as materials and energy inputs, are elements included in the direct production costs and are presented in the economic-financial statement; they are internalized effects.

Besides them, there are also other effects from the productive activity such as GHG emissions that are not reflected in financial accounting. They are from the externalities category side, which means elements of costs and benefits related on the firm's external environment that accrues to other stakeholders. In the approach of the accounting system through stakeholders' interests, the identification of all significant external environmental, social and economic impacts becomes necessary, tied to the companies' activity and their internalization for the accounting system to recognize them. In this case, the financial flows would reflect both the internal dimension of activity and the external effects, so that the real financial position of the company, appreciated through its sustainable dimension, can be identified.

For a value expression of environmental impact of GHG emissions, the European Commission intends to introduce a tax calculated based on carbon and energy concentration of fuels, at a suggested rate of 4 to 30 euro per tonne of CO2. This tax is considered a more correct alternative compared to the current tax on volume, which made that more polluting fuels (coal, diesel) to have lower taxes (Kanter, 2010). For the analyzed case, the evaluation of GHG emissions was made at an average rate of 17 euro/tonne CO2.

The main financial flows resulted from environmental impact on the firm's activity for a vineyard hectare, are presented in table 3.

Table no. 3.

Sustainability financial statement

Indicators	Measure unit	Amount
Economic effects		
Incomes	euro/ha	3075
Costs	euro/ha	1704
Gross Profit	euro/ha	1371
External environmental effects		
Environmental costs	euro/ha	268
- Emissions to air	tonne CO2/ha	15.75
- Price per unit for GHG emissions	euro/tonne	17
Environmental savings:	euro/ha	-
- Incomes from recycled waste	euro/ha	-
- Packaging cost reductions	euro/ha	-
- Subsidies received	euro/ha	-
Environmental profit	euro/ha	-268
Sustainability Gross Profit	euro/ha	1103

Source: author's own research

The social impacts of vine growing are more difficult to be expressed in monetary terms due to the difficulty of gathering information about the viticulture activity's impact on people and community from the point of view of social costs and benefits (Sigma, 2003).

The social costs can refer to expenses with professional training, additional costs for informing consumers, taxes and penalties for non-compliance to the health and safety norms, investments in communities etc. The social benefits can include supplementary sales from practising some social/ethical price premium, earnings from the firm's improved social credibility, avoidance of some costs due to a good policy of health and work protection.

The analysis of sustainability financial indicators reveals that the profit obtained from the grapes production is diminished in comparison with the situation in which we consider only the economic effects. Expenses with the atmospheric pollution are 268 euro/ha, and they represent elements that in present are not reflected in the financial accounting of the firm. But implications of agricultural activities on natural environment are vaster yet, such as: soil erosion, water contamination, destruction of natural habitats, biodiversity loss etc.

Conclusions

This study aimed the evaluation of the environmental impact on the economic performance in agricultural holdings for determining their sustainable performance and to justify the introducing of the environmental management system. The evaluation of the environmental impact was based on a case study performed by the author in the Research and Development Station for Grapes and Wine Production of Blaj.

The present research is the first study made in Romania concerning the assessment of the sustainable performance which utilized information of the Life Cycle Assessment for wine grapes. The quantification in money of the Greenhouse Gases resulted by production led to a lower economic performance with 268 euro/hectare (19.5%). The research findings reveal utility of introducing the environmental management system within the agricultural holdings, and necessity to develop the accounting system in order to reporting on sustainable performance to become more real.

The value expression of benefits and damages on environment, reflected by the external environmental and social flows, completes the information needed for complete resources management. Data that refer to the balance of all economic, social and environmental aspects constitute the core elements for the monitoring process of a company's own activity sustainability level.

Development of a sustainability management and a financial reporting system inside companies means introduction in current practice of a qualitative control. Its advantage consists in the fact that it allows identification of some possible development alternatives that can stimulate obtaining economic performance in a deep accordance with some external constraints on life's quality and natural environment.

The results of the analysis conducted on some sustainability financial indicators in an agricultural holding reveal that in the agriculture sector, the environmental costs are elements that strongly influence the sustainable profit size, a finding that is in accordance with the opinions of other researchers (Deschenes and Greenstone, 2006).

In this line, the introduction of some less polluting technologies for obtaining ecological products could reduce the negative impact of economic activities on the external environment, which will result in an increase in their sustainability. Aspects concerning the rational utilization of resources and lowering the negative effects are also of high importance for agricultural holdings because their activities are very strongly related with the environment.

Companies that have implemented the sustainability financial reporting, ensure the growth in the responsibility of their activity. At the same time, the system can contribute to improving the credibility of the financial reporting, the growth of the companies' prestige and thus lead to superior economic performances (Roberts et al., 2005).

Introduction of the sustainability approach in all aspects facing agricultural holdings, and especially, introduction of the sustainability financial reporting in their practice, represents

opportunities that are considered more and more as effective management instruments (White, 2009). Companies can use them in order to achieve the value added through their activity in conditions of economic efficiency and respect for preserving and protecting the natural environment and society.

The research will be further developed through analysis of the sustainable performance for the other agricultural crops or animals products. At the same time the research will be extended to analyze the social impact for highlighting all aspects of the sustainable development.

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