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SUSTAINABLE DEVELOPMENT AND ENVIRONMENTAL ACCOUNTING: CONCEPTS, TRENDS AND QUALITY OF ACCOUNTING INFORMATION[1]

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ABSTRACT

Sustainable development requires changes in accounting in order to satisfy the accounting information users in their specific environmental decisions for attaining the goals set by this concept. With this end of view, the research team focuses on the following aspects: to define the environmental accounting and its position in the accounting system; to reveal the supplementary information in the benefit of the accounting users; to analyze the position of the Romanian companies towards the environmental accounting; to present the way the Romanian accounting laws affect the environmental accounting; to show how to increase the quality of accounting information if an environmental accounting is accepted; to describe the environmental performance and the quality of the environmental reports.

Sustainable development, environmental accounting quality, performance

INTRODUCTION

Environmental Accounting or Environmental Management Accounting (EMA)? This is a question that was raised during the study we have done about environment and accounting. Does another question with a difficult answer relate to another dilemma? Environmental Accounting or Green Accounting? Which will be the best title for this area of accounting? Are there substantial differences if different titles

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are used? How should EMA be defined? Which are the objectives of EMA? Do these differ from the general objectives proposed and accepted by accounting? Can the environmental performance be measured? Is the EMA a part of the Total Management Quality?

1. CONCEPTS CLARIFICATION

We only mentioned some questions whose answers are considered very important because a conceptual framework can be elaborated. In this research we proposed some questions and we try to answer to them. Some terms must be discussed in order to clarify the concept of EMA.
The World Commission on Environment and Development (WCED, 1987) popularized the concept of Sustainable Development (SD) as a normative goal for a long-term policy. SD was defined as a development that „meets the need of the present without compromising the ability of future generations to meet their needs". This definition is based on two concepts: intra-generational equity issues (present) and development over time (future).

SD is composed of two terms: sustainable and development. The problems with this concept are not so much with the word „sustainable", but with the term „development" (Pearce & Warford, 1993). SD is a dynamic concept that relates to inter-generational issues. SD is about the development of social welfare over time. Factors that can explain development are the human, natural and social capital. These factors are also important in determining if a development is sustainable or not.

The SD strategies concern three dimensions, as it is shows in the next table:

Table 1. **SD strategies dimensions**

Economic dimension	Social dimension	Environmental dimension
GDP per capital R&D expenditure	Measure of income inequality	Air pollution
Employment by age group Investment share of GDP	Old-age dependency ratio	Development in areas of nature, wood, farmland, housing and roads
Energy use and intensity	Noise pollution	Use of fertilizers and pesticides
Volume of transport (passenger and freight)	Voting activity Reported crimes	Consumption by chemical type
Municipality waste collected and its disposal Recycling of waste		

Accounting and managerial accounting can be considered as producers of information in the benefit of internal and external users that are disclosed in an appropriate form based on the relevance as a quality of accounting information. The managerial accounting elaborates and presents relevant information for decision making in order to achieve the goals proposed and accepted by the organization. The management accounting information can be measured in monetary and non-monetary terms. In order to measure information in monetary terms, the cost will be a basic element. Generally the cost is calculated following specific procedures set by the Cost Accounting. Can the Cost Accounting be considered as a part of the Managerial Accounting or will it be an independent part? In our opinion the Cost Accounting must be a part of the Managerial Accounting in order to calculate different type of costs for the need of management as a support for decision-making.

The environment concept can be defined from three points of view:

1) The environment represents the assembly of natural resources;
2) The environment represents the interaction between the natural resources and the human activities;
3) The environment is the assembly of all available resources (Tabără & Nuta, 2007).

According to the three points of view, the environment accounting can be structured as follows:

1) Accounting will take into consideration only the expenses and investments related to the natural resources protection;
2) Accounting takes into consideration, besides the expenses and investments regarding the environment protection, a series of additional activities that can directly or indirectly compete with the creation of impacts such as: expenses and investments regarding the transports, global warming, urbanization, agriculture and the raise of animals;
3) The accounting system is radically changing; therefore an environment/social balance sheet is imposed, in order to show all the flows of expenses destined to supporting the sustainable development of the aria.

We consider that the Environmental Accounting should be analyzed based on the classification of accounting users into two categories:

1) Environmental Accounting (EA) as an accounting for external users that had to be informed in monetary units once also in physical units;
2) Environmental Management Accounting (EMA) organized in the benefit of internal users in monetary units and in physical units.

Lafontaine (2003) describes the environment accounting evolution on three levels depending of its evolution in time. Therefore, according to the first level, the environment accounting role is to systematically take into consideration the facts relating to the environmental protection and the reconstruction of the natural environment, by respecting the traditional role of accounting of taking into account the flows and risks related to the natural environment in order to communicate a fair view to the users. According to the second level, the environmental accounting must take into consideration not only the recording of the company's activities consequences on the natural environment after they are produced, but also the administration of the company's actions for their avoidance. The third level increases the fields of action and considers the green accounting more that a passive instrument of recording the immediate or future, certain or potential flows, but also a leverage for inciting the companies towards activities and strategies which are subscribed to the logic of sustainable development.

2. INFORMATION DISCLOSED BY THE TWO ACCOUNTING SYSTEMS

2.1 Information disclosed by the Environmental Accounting (EA)

An important difference between EA and EMA can be identified due to the regulatory accounting system and reporting. In our opinion, EA must be integrated in the Financial Accounting because this accounting is based on a regulatory system. Furthermore, in this period the concept of sustainable development is impossible to be ignored and that means to disclose more information about the company's environmental position and environmental performance. Therefore we considered that the financial position might be divided in two parts:

1) a financial position;
2) an environmental financial position.

Likewise, the global performance can be separately reported as a financial performance and an environmental performance. Therefore, the set of the financial statements must contain additional forms for the environment, such as an Environmental Balance Sheet and an Environmental Profit and Loss Account.

The environmental accounting, dedicated to the external users, presently goes after the disclosure of information about the natural environment in the financial statements (by introducing in the balance sheet, the income statement or the explanatory notes some "green" lines), in the interim balances of profit and loss account (by the computation of the net current value that considers the consumption of natural resources), in the annual activity reports or in a specific report on the natural environment, disclosure that regards the improvement of the information provided to the users and that should be normalized or standardized.

As about the introduction of some green lines in the balance sheet, the investments done by the company for the protection of the natural environment should be

identified for their distinct disclosure. These investments can be classified in two categories: investments for the clearance of the pollution effects and antipollution investments (Christophe, 2003). The investments for the clearance of the pollution effects regard the elimination of the pollution at the end of the production process and usually can be easily valuated. The antipollution investments involve the restructuring of the entire production process by adding antipollution devices in order to avoid the pollutant emissions. As about introducing some green lines in the income statement, from all the expenses recorded by their nature, those related to the natural environment protection should be identified. The managerial accounting by in this regard could ensure a solution extending the rally of expenses on the four functions: production, administrative, outlet and environment protection. The environment costs of an economic activity can be more extended than they seem at a first sight and they can also include the cost of the resources, the costs related to the recycling and storage of the losses, the costs involved by a bad reputation for a pollutant industry.

The entities are usually tented to only compute those costs that affect them and not the costs for the collectivity. As an example, if an entity pollutes the natural environment and the local authorities exempts it of the payment of fines or of the expenses required for the clearance of the pollution effects, its cost is zero while the cost for the collectivity is very high. In addition, accounting doesn't take into consideration only the resources consumed with a price. The consumption of natural resources that are free is not included in the production cost. These resources are considered free because they are drainless, the stocks are superior to the consumption flows or due to their natural regeneration. Nowadays, the pronounced increase of the natural resources consumption, considered free, leads to their decrease. This will lead to an estimation of a cost for the free natural resources. Presently, the effects of the politics lead by some entities and even some collectivities to decrease the consumption of natural resources considered to be free are more and more remarked (Caraiani & Jianu, 2007).

In addition, a series of companies establish, by their own methods, a cost for those natural resources and they include this cost in the net added value, computed as a difference between the traditional added value and the free resources consumption (Dépoers, 2004). A standardized model for the consumption of free resources computation is imposed.

2.2 Information disclosed by the Environmental Management Accounting (EMA)

The managerial accounting of the environment has as a main objective to obtain useful information for the manager for decision-making. A challenge for the managerial accounting of the environment is to develop practices for the valuation of the pollution control alternatives, for choosing those materials that ensure the

cost decrease, for investigating the possible alternatives regarding recycling, all these leading to the financial and environmental performances of the company.

The *International Federation of Accounting* has published in august 2005 a guide for the managerial accounting applied to the natural environment, where the best practices observed worldwide are resumed and commented (www.emawebsite.org). This guide is not la law or other regulation. Its purpose is to propose an analysis demarche, a conceptual framework and definitions meant to end the errors done in this type of accounting. Even if till now there isn't any well-accepted definition of the managerial accounting applied to the natural environment, the guide doesn't intend to give one. It is tough considered that this managerial accounting must collect reliable data about the consumption of raw materials, water, energy, losses coming from the activities developed; monetary data about the cost of protection and the restoration of the natural environment; the gains obtained as a result of the policy applied by the protection of the natural environment and the decrease of the consumption of the natural resources.

Presently, the analysis of the life cycle helps to the decision-making by informing about the impact a product has on the environment along its entire life cycle – from the extraction of raw materials till its complete utilization of the product (Paugam, 2003). In addition, the appliance of a budgetary procedure allows the forecast and the surveillance of the green costs and through the elaboration of a green dashboard the significant indicators regarding the natural environment are synthetically presented. (Lafontaine, 2003). The table below presents in structured way the environmental management accounting system:

Table 2. **The environmental management accounting system**

<table>
<tr><td colspan="7">ENVIRONMENTAL MANAGEMENT ACCOUNTING</td></tr>
<tr><td colspan="7">▪ Identification and allocation of environmental costs
▪ Targets for resource productivity
▪ Measuring and monitoring progress</td></tr>
<tr><td colspan="4">↓</td><td colspan="3">↓</td></tr>
<tr><td colspan="4">Waste minimization</td><td colspan="3">Cleaner technology</td></tr>
<tr><td colspan="4">▪ Incremental improvements
(Doing it better)</td><td colspan="3">▪ Step-change improvements
(Doing it differently)</td></tr>
<tr><td>↓</td><td>↓</td><td>↓</td><td>↓</td><td>↓</td><td>↓</td><td>↓</td></tr>
<tr><td>Materials</td><td>Energy</td><td>Water</td><td>Cleaner design</td><td>Process optimization</td><td>New technology</td><td>Recovery and re-use</td></tr>
</table>

There is a direct connection between the Environmental Management Accounting (EMA) and the Environmental Management System (EMS). EMS is based on the following:

- ISO 14001 and EMA;
- Policy commitments, objectives and targets;
- Responsibilities, communication and training;
- Procedures, audits and management review;
- Environmental reporting;
- Government's general guidelines and guidelines for waste, energy and water.

3. THE ROMANIAN CASE

Presently, the Romanian companies don't know the advantages of the environment accounting, therefore they don't organize such an accounting and they don't disclose information about the environment. The state is the only involved actor in a policy of environment protection. One of the major problems our country is confronted with is the gap between the means used for the environment protection in Romania and those from European Union (Cretu, 2005). This gap can be reduced by applying the environment protection projects towards the local authorities and the commercial companies and by attracting European and internal funds.

In Romania, the environment protection has appeared in 1990 when it was for the first time set up by the Ministry of Environment (presently the Ministry of Environment and Sustainable Development) as an independent domain of the national policy. Until 2002, the main objectives regarding the environment could be synthesized as follows: the accomplishment of a general evaluation for identifying the existing needs; the development of complete plans for the implementation of financing strategies; the improvement of the administrative ability for the implementation of the communitarian acquis by supplementing and forming the adequate personnel at the central and local levels; the elaboration of the environmental legislation by the consultation of the interested parties and the detailed valuation of the implementation costs; the adoption of the legislation regarding the impact on the environment assessment and the access to information.

After 2002, the real protection policies were centrally and locally adopted. Therefore, based on the "polluter pays" and "the responsibility of the producer" principles, Romania has set up a Fund for the Environment in order to solve the protection problems. This fund was established for the first time in 2002 when the Administration of the Environment Fund was set up as a juridical personality

entity, that is responsible by the its management. The Administration of the Environment Fund is under the authority of the Ministry of Environment and Sustainable Development.
The revenues of the environment fund mainly come from a 3% quota from the revenues realized by the economic entities that collect and valorize ferrous and non-ferrous losses, the sums cashed for the pollution emissions in the atmosphere that affect the environment factors; the revenues cashed from the use of new lands for depositing recycled losses; a 3% quota from the value of the packages commercialized by the producers and the importers, with the exception of those used for medicines; a 2% quota from the value of the dangerous chemical substances commercialized by the producers and the importers, excepting those used in agriculture where there is a 0,5% quota and of those used in the medicines production with 0%; a 3% quota from the price of the timber bought from the National Administration of Forests and from other owners of forests, physical or juridical persons; a 1,5% quota from the cashed in value by selling tobacco finished goods and others (Law no. 73/2000 regarding the Environment Fund, with its ulterior changes).

The Environment Fund is used for sustaining the major public interest projects, mainly those for the environment protection, such as: the control and the reduction of the air, water and soil pollution, including the use of some clean technologies; the protection of the natural resources; the losses administration and recycling; the treatment and the elimination of the dangerous losses; the protection and the conservation of the biodiversity; the education and the awareness towards the environment protection and so on.

According to the Directive no.2003/4/CE, Romania, through its public authorities, must take all the necessary measures for ensuring the organization of the information regarding the environment to be disclosed to the public. According to Art. No. 2, the information about the state of the environment elements like: air and atmosphere; water; soil; land; landscapes and natural sites, including the humid arias; biological diversity and its components, including the genetically modified organisms and the interaction between them or factors like: substances; energy; noises; radiations or losses that affect or is likable to affect the above mentioned elements; measures (including the administrative ones) like policies, legislation, plans, programs, environment agreements and activities that affect or they are likely to affect the elements or the environment factors; reports about the appliance of the environment legislation; costs and benefits analysis, as well as other economic analysis and hypothesis used in the case of the measures and/or the environment activities; the human health state and security, in the extent in which they are or could be affected by the environment elements state.

4. THE REPORTING INFORMATION

How to define environmental performance management (EPM)? How to calculate EPM? What kind of indicators should be disclosed in environmental reports? These questions have been represented the starting point in our research. EPM represents the measurement of interaction between business and the environment (Bennet & James, 1997). SD indicators (SDI) generally are national indicators. A lot of countries accept the capital approach to measuring SD. A handbook on the System for Environmental and Economic Accounts (SEEA, 2003) characterize SD as follows SD: „SD is the development that ensures non-declining per capital national wealth by replacing or conserving the sources of that wealth; that is stocks of produced, human, social and natural capital" (SEES, 2003: 4). The total capital can be divided in four types: natural, economic (produced and financial), human and social capital.

The economic capital (real) is the produced capital that also includes the financial assets.

The natural capital can be divided in three recognized categories:

- Natural resources;
- Land;
- Ecosystems.

The human capital is defined as the knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal well-being.

The social capital can be defined as the networks of shared norms and values that facilitate cooperation within and between groups. So social capital refers to features of social organization in contrast with human capital that refers to individuals.

Based on the capital concept, the total national wealth (TNW) can be determined as follows:

THW = $p_R R + p_N N + p_H H + p_S S$ where:

R, N, H, S – real, natural, human, social capital;

P – theoretical accounting prices or shadow prices that are defined as the welfare effects of a marginal change in the corresponding types of capital (The marginal value of a unit of extra capital is called accounting price – Dasgupta, 2001)

The value of the real capital is recorded in the national accounts using the companies' accounts. **The natural capital** is difficult to be valued. Its valuation depends on the variety of resources. For most of the material resources the market price exists, but it will have to be corrected with different negative impacts. Also,

the non-marketable part of the natural capital should be measured in physical terms.

The human capital can be differently defined as:

a) an individual collection of human resources, including personal abilities, knowledge, skills, time and energy;
b) "the stock of economically productive human capabilities" (Bahrman & Taubman, 2006: 89);
c) "the knowledge, skills, competences and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being" (OECD, 2001: 18);
d) "education, job training and health with consequences for earnings and economic productivity" (Becker, 1964).

The social capital – "all things to all people" is a concept with an amazing history. Some definitions can be also presented:

a) "the institutions, relationships and norms that shape the quality and quantity of a society's social interactions" (World Bank, 2000);
b) "the rules, norms, obligations, reciprocity and trust embedded in social relations, social structures and society's institutional arrangements that enable members to achieve their individual and community objectives" (Narayan, 1997).

To use the capital approach in the calculation of SDI, an important aspect is how to measure or estimate the correct accounting price. It is difficult to estimate these so-called accounting processes if some services are not traded on the markets.

We consider that companies must have an important role in the elaboration of different information in order to calculate SDI main environmental indicators based on the capital approach. Therefore, companies must provide information about the capital valuation and also about the environment expressed in physical units such as: water quantity/quality; air quality; ecological integrity and others.

Consequently, we suppose that companies must prepare statements based on which environmental indicators can be computed and, in the same time, to use them for the benefit of SDI.

Initially, a report on the natural environment published is often associated to an annual financial report, because it is a part of it. That is because, initially, it was the responsibility of the accountants. Therefore, the financial aspect was dominating by disclosing the expenses done by the company for the natural environment. Nowadays though, they overcame the strictly financial aspects in order to supply qualitative, as well as quantitative information on the management system of the

natural environment, as well as on the results and performances on the company's natural environment. The analysis of the reports on environment has underlined the fact that against numerous types of information contained, the final quality is very diversified. In addition, the quantitative data don't allow comparisons between companies in the absence of the standard indicators. The used measures are relative and they refer to vast domains: emissions, losses, inputs, resources and efficiency. The studied reports show the lack of information regarding the development of the company's activities (Gallez & Moroncini, 2004). In the absence of the legal and regulating obligations, the content of the report on the environment is left to the companies' assessment.

Antheaume (2003) considers that the report on the environment must be an instrument used by the company to present its policy on the natural environment, its objectives in numerical terms, the appliance methods and its engagements regarding the environment protection. This report has the role of providing any useful information on the effects and the performances on the natural environment to the public, in general, and to all parties interested in the company's activity.

Gendron (2003) considers that this report should contain information to be grouped in 7 important categories:

- the disclosure of the activities developed by the company, of the products and services offered to public;
- the policy led by the company and the brief description of its management system of the natural environment;
- the direct and indirect significant aspects of the natural environment;
- the general and specific objectives set by the organization regarding the aspects and the impacts on the natural environment that result from its activity;
- the disclosure of the general and specific objectives the company set in the matter of the pollution emissions, the production of losses, the consumption of raw materials, energy and water, sound pollution;
- the conformity level of the company to the regulations;
- the name of the organization that checked the policy adopted by the company in the field of the natural environment and the validation of its report.

As one of the basic features of the accounting information is to ensure the comparability of information in time and space. Therefore, the information presented in such a report of the natural environment should allow the achievement of such comparisons. Nevertheless, as long as the entities have the possibilities to chose the indicators considered to be the most pertinent to be presented in such a report, the comparability is no longer ensured. In order to avoid any negative critics regarding the content of a voluntary report on the natural environment, the best

policy is to get adapted to the legal regulations. Countries like Denmark, France impose or on the verge of imposing the content of the report. The quoted European companies are presently put to present information regarding the natural environment.

The Global Reporting Initiative (GRI) issues the most advanced regulation in the matter of the standardization of information that should be presented in a report on the natural environment. GRI is an international body whose purpose is to promote the publishing of information on the sustainable development. It was set up in 1997 at the initiative of a committee - CERES (Coalition for Environmentally Responsible Economies) that regrouped the governmental organizations and the big companies from Boston, its works being sustained by the environmental program of the United Nations (www.globalreporting.org). GRI realized a social and environmental conceptual framework whose basic principles are the transparence and the inclusivity. The transparence implies that the public knows the policy adopted by the company for the natural environment protection, while the inclusivity underlines the objective of the report to satisfy the informational needs of an increased number of users. The achievement of this objective inside a single report leads to a series of risks: on one hand, the existence of a big number of indicators to satisfy the interests of all parties, but that doesn't answer to the requisitions of clarity and pertinence because too much information blur the transparency, and, on the other hand, the equilibrium objective is surreal because there will always be conflicts. Therefore, Colasse thinks that the objective of the receivers' universality is a real obstacle in the appliance of the conceptual framework issued by GRI. The indicators that should be presented by an entity in a natural environment report are grouped in three important categories: the resources consumption (raw materials consumption, water consumption, energy consumption); the impact of the company's activity on the natural environment (soil usage conditions, over falls in air, water or soil with severe effects on the environment); measures taken by the company for diminishing these impacts (initiatives for the exploitation of the renewable energy sources and for improving the energetic efficiency; objectives, programs and forecasts for protection and restoration of the ecosystems and the indigene spaces from the damaged arias).

CONCLUSION

Why is it good that a company provides information about the natural environment? Because, as the internal communication on the natural environment allows the personnel sensitization regarding its objectives, the external communication represents a prove of the company's concern towards the assembly of external interested parties: shareholders, financial entities, insurance companies, political responsible persons, competent administrations in the natural environment regard, protection agencies and the general public. The external communication on

the natural environment provides, among others, a responsible image of the company with a favorable impact on the brand image, as well as on the products and services offered.

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