

GREEN ACCOUNTING AS AN INFORMATION SYSTEM

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INTRODUCTION

The increasing pressures in the environment and the environmental awareness have produced the need for studying interactions between the sectors of economy and environment. The conventional national accounts (gross, domestic or net national product) are focused in the measurement of economic performance and growth. For a more comprehensive evaluation of sustainability and development, the field of financial accounting needs to be expanded in order to comprise the use of natural resources, as well as losses, in the production process.

The purpose of this paper is to measure the natural assets and to calculate the environmental benefits and the costs, so as to include all the above in the financial statements. Moreover, this article examines the interaction between the environment and the economic performance of enterprises by the adoption of environmental management systems and information green accounting systems. Moreover, this article examines the possible interaction between the environment and the economic performance of enterprises, by the adoption of environmental management systems and information green accounting systems.

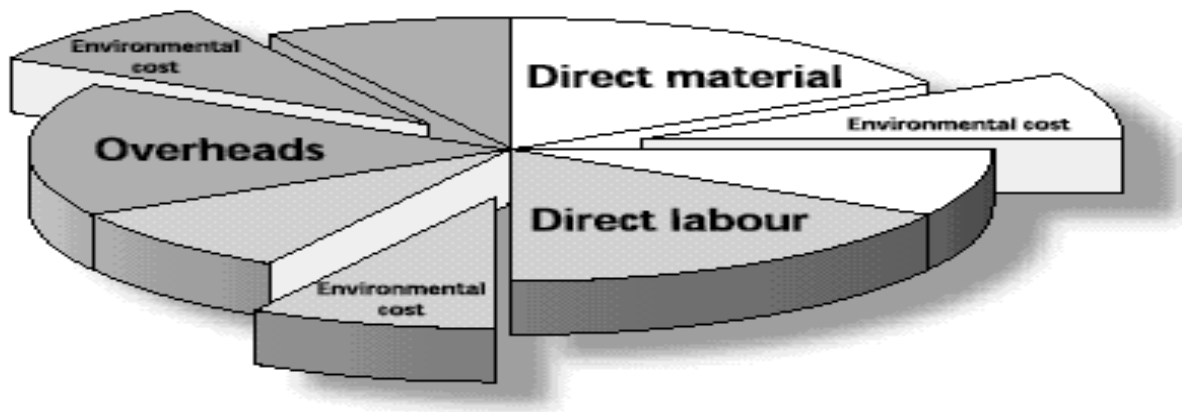
DETERMINE ENVIRONMENTAL COSTS AND REVENUES

The financial accounting theory, identifies and records tangible and intangible assets at the lowest price between historical and present value. However, the above theory does not evaluate the use of natural and environmental resources, as well as the losses in the income, which are caused by the reduction of natural capital. Moreover, until today

a lot of environmental resources like, water, air, continue to be considered as ‘free goods’ without appearing in the financial statements.

In the financial accounting operation, the production and distribution of products or the offering of service, requires among other, the utilisation of direct materials, direct labor, manufacturing overheads costs (M.O.C.), administrative and sales expenses, as well as research and development costs. On the other hand, the environmental expenses while constitute part of production and administrative expenses are not recorded in specific accounts but are debited as general expenses. (Exhibit 2.1)

EXHIBIT 2.1
ENVIRONMENTAL EXPENSES



The environmental accounting theory, tries to restore the above picture in ‘T’ accounts by including in the profit and loss statement environmental revenues as well as expenses. The former is the income from the disposal of waste as well as income from the recycling of produced goods. The later refers to expenses for the redress of environmental damage from contagious emissions or oil slicks.

The connection between natural-green and financial accounting, can be achieved by adoption of environmental management and information systems which more and more are essential in order to link the environment and the economic performance of an enterprise.

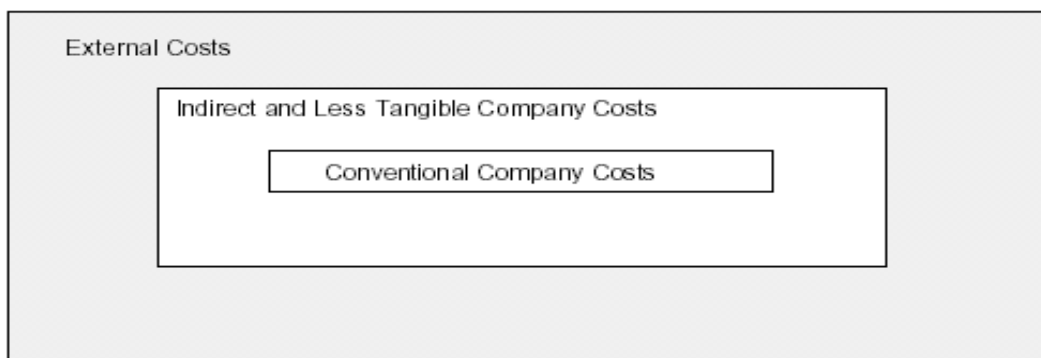
The green-environmental accounting can be useful in deciding about issues like, distribution of environmental cost and green taxes. Generally, the recipients of prepared green accounting information are the people inside the company who practice the administration and manage the corporate funds (managers, owners of firms). Also

recipients can be people outside of the company (investor, creditors, tax authorities, local residents) who have direct or indirect interest in the company. All of the recipients need reliable information in order to:

- Determine the environmental opportunities and limit the additional expenses that do not provide added value.
- Estimate the environmental expenses that are found in M.O.C.
- Identify environmental opportunities to produce net income.
- Execute and maintain an environmental system of administrative information (Environmental Monitoring and Information System-E.M.I.S.) with the incorporation of environment in other aspects of operations management.
- Determine the expenses and the future yield of application of E.M.I.S.
- Formulate the methods of cost accounting and pricing of environmental products.
- Design an environmental production process for goods and services.

Most environmental costs discussed in the paper are characterised as 'internal'. However, there are certain types of costs that are considered as 'external' or 'social'. The former, can be described as conventional, incompatible (potential hidden) and tangible, causing an economic impact in the company. The latter, are environmental expenses for which the enterprises are not responsible and these expenses do not have any direct economic consequence for their financial progress. (Exhibit 2.2).

EXHIBIT 2.2 TYPES OF COSTS



The environmental cost is often included in different parts of accounting system and it is difficult to collect the necessary green information that is required for the decision-

making. The enterprise seeks to achieve the environmental objectives such as the reduction of green expenses, the increase of income and the improvement of environmental output. Then, the enterprise needs to predetermine, measure and present the environmental costs created by environmental activities.

The line between the external and internal expenses is often subtle, particularly with the fast altered regulations and the increasing market requirements aiming at the protection of environment (De Andraca and Mc Cready, 1994). Consequently, it is important for the companies to recognise and comprehend the factors that create the external environmental costs.

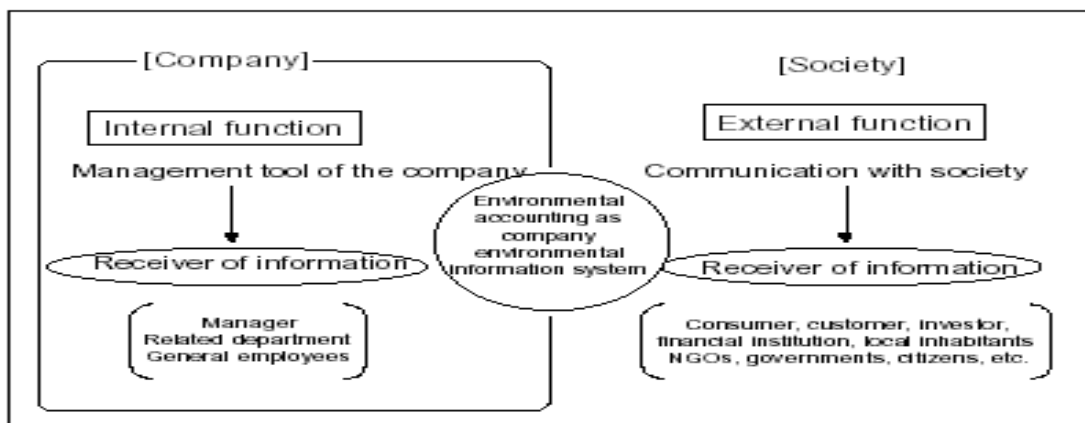
The environmental costs, traditionally, are accumulated as general administrative expenses and are considered as extraordinary and unexpected, creating difficulties in their identification and measurement. Thus, there is the tendency to separate them from the corresponding products, processes or activities, that cause them.

The operations that are expected to be influenced by the environmental accounting are categorized as 'internal' as well as 'external'. In the former, the environmental-green accounting helps the management of environmental expenses and the analysis of effects related with the cost of environmental measures. Also, it promotes efficient and effective investments in the environment.

In the later, the system influences the reception of decisions of interested contracting parts. Since the information can be used as an element for environmental classification of enterprises as well as an element of income, the values applied by environmental accounting reflects the stabilization of stocks and the smooth supply of capital. (Exhibit 2.4).

EXHIBIT 2.4

Function of environmental accounting system



At the announcement of environmental accounting information to the external users such as, consumers, investors, local residents, there are two functions, the internal and the external. The data base of environmental accounting that is developed by an enterprise is the same one either used internally or externally. For the internal use, the objects that are important for the enterprise are selected. For the distribution of information externally, the cohesion and the resemblance are required for the information on the benefit of precise information for the users.

For the healthy operational administration, an essential element, is the measurement of environmental expenses as well as the results of environmental measures. The enterprise should measure and analyze the amount of money invested and the environmental cost with regard to the environmental conservation and the knowledge of effects of investments. These factors are exceptionally important for the enterprises in order to improve the efficiency of application as well as for the users to accept the reasonable environmental decisions. The measurement of environmental cost and the consequent results of environmental measures are useful for the growth and the operation of precise environmental administrative system. In other words, the environmental accounting can be used as an indicator for the management of their environmental performance.

The analysis of environmental expenses and the results of environmental measures, can be used as an internal administrative tool of an environmental administrative system. The announcement of environmental cost becomes a measure for the evaluation of enterprise's environmental behavior. Through, the announcing of the content of environmental cost and its proportion in the operational activities, the receivers of financial information can be informed as to how an enterprise handles the environmental conservation. A lot of enterprises have prepared already and have announced environmental reports. The number of enterprises that announce their environmental cost using the environmental accounting process increases and a lot of enterprises recognizes its need.

The application of environmental accounting suitable for each enterprise is developed basically via a lot of trials and improvements by each enterprise. An application of environmental accounting system is not fully developed. Each enterprise conducts experiments which need improvement. The proposed process for the installation of the above environmental system is, to recognise and measure the

environmental effects of operational activities, as well as evaluate the environmental results.

GREEN ACCOUNTING AND ENVIRONMENTAL SYSTEMS OF MANAGEMENT

The environmental system of management (Environmental Management Systems-E.M.S.) is ensemble of processes and policies which determine how an enterprise will manage the possible effects in natural environment, health and prosperity of citizens. The program creates a system that evaluates, registers and expresses in quantitative terms the environmental impacts, in all aspects of an enterprise.

The adoption of environmental administrative systems by enterprises can generally change the relationship between the economic performance and environmental yield. The enterprise that applies E.M.S. has the ability to redesign its organisation in order to reduce its unfavourable impacts to the environment. Moreover, with the adoption of high quality E.M.S., it is likely the enterprise to discover cases of reduction of use the natural and monetary resources.

The Total Environmental Accounting and Management System (T.E.A.M.S.) is an application of database on recording, handling and confirming quality and reporting environmental elements. The significance of this program is to establish the balance of each individual chemical substance. The elements are registered in a database, on further environmental submission of reporting and handling and thus the environmental reports can be presented at any moment. These used sums portray the quantity of waste that are emitted. From the entry of consumed sums of chemical substance, the program calculates the sums that are removed. (Exhibit 2.3)

EXHIBIT 2.3

A PICTURE OF T.E.A.M.S. PROGRAM

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| <input type="checkbox"/> | yes | ORGANISATION.Vessels.Standl | Diesel Fired | 31.3.2002 | Exploration | Combustion | iteams |
| <input type="checkbox"/> | yes | ORGANISATION.Vessels.Standl | Diesel Fired | 17.2.2002 | Exploration | Combustion | ITEAMS |
| <input type="checkbox"/> | yes | ORGANISATION.Vessels.Standl | Diesel Fired | 31.1.2002 | Exploration | Flaring | iteams |
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The T.E.A.M.S. program has been developed in accordance with the international models for the environmental management (US, ISO 14001). With this program, the manager of an enterprise has the complete control of collection, recording and use of environmental elements, qualitative assurance and access in all the levels of production and distribution of environmental reports.

The program facilitates the complete documentation of environmental effects from the operations of an enterprise. Also, it helps in the documenting results of corrective measures. Furthermore, it contributes to the complete awareness of environmental location of enterprise and constitutes an administrative tool that shows desirable environmental objectives are achieved.

In the same direction, the Geographic Informative System (G.I.S.) constitutes a fundamental component of environmental management because is capable of recording, registering and treating of geographic data. The effective environmental management involves the collection and analysis of elements from the dissimilar sources. The G.I.S. allows the precise, efficient and repeated trial of administrative strategies in order to

evaluate their appropriateness before its application. Also, the G.I.S. can be linked with an environmental program, like TEAMS, providing an efficient source of flows for the model and effective means for the observation and analysis of results.

The problem with the environmental information systems is the unavailability of proportional entries (information). For example, if we want to define materials of productive process, including work in process as well as raw materials, the components should be known. All the programs presented above show that even the suppliers cannot or are not always willing to provide environmental information because of the competition.

CONCLUSIONS

The environmental-green accounting is an emerging aspect of accounting science that will influence, in the near future, the enterprises. The adoption of basic elements of green accounting, will portray the role of environment in the economy as well as render easier the analysis of macroeconomic questions with the help of accounting information systems and thus, lead the economy to a viable path.

Despite the fact that the corporate environmental expenses increase not only in importance but also in monetary units, some enterprises continue to underestimate and enter environmental costs in accounts as general expenses. However, some companies try to connect environmental costs with products or services but the methods of allocation cost used are inappropriate. When no proper allocation method, is used, the manager of an enterprise do not receive reliable information with regard to the real costs and profits in order to maintain or change the products and/or processes. Furthermore, the above situation prevents the effective follow-up of yield of an enterprise as well as the right pricing of products and the important activities for the maintenance of competitiveness of an enterprise.

The green accounting still faces a number of problems, such as, the lack of support of information, specialised personnel as well as the absence of proportional international accounting models. In recent years, the efforts for the growth of environmental information systems have led to the creation of proportional systems of administration (Environmental Management Systems) which face problems with regard to the treatment of complicated environmental data. The new tendencies that are found in evolution foresee a more proactive environmental planning through the recognition and

the reduction of environmental cost and consequently the improvement of profitability of enterprises.

The Cost Benefit Analysis is a method that examines the economic sustainability of an activity, comparing the costs and benefits and selects activities with the highest monetary benefits. However, the data of environment (natural resources) can not be easily expressed in monetary terms facing difficulties in the application of the environmental C.B.A. which can become expensive.

Lastly, although many accounting information systems of environmental management have been developed, no significant progress was made in the growth of green accounting information systems due to the inherent difficulty for the monetary expression of environmental benefits and natural resources. The allocation of environmental cost continues, being a challenge for an accountant. As the development of domestic capital market increases, the need for reliable financial information becomes more evident.

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