

Hajnalka Ván

Environmental Accounting – A New Challenge for the Accounting System

SUMMARY: The appearance of environmental problems impacts every area of science globally, as a result, accounting has to answer these challenges as well, one way of which is environmental accounting. The main aim of the study is explore the roots and the tendencies of the development of environmental accounting. In addition, environmental accounting will also be discussed in terms of its relevance to supplementing the traditional accounting system, which topic will be concluded with an outlook on Hungary in this regard. The study – due to its nature – relies on processing and interpreting relevant professional literature. The importance of the study lies in the fact, according to my information, that this is the first analytical study of this sort in Hungarian professional literature. The roots of environmental accounting go back to the system of social accounting, where it has now developed into a sub-system that can supplement the traditional accounting system. In Hungary regulation is rather underdeveloped in the field of environmental accounting; at the same time, its use should not be disregarded for any organisation.

KEYWORDS: environmental accounting, social accounting, environmental protection, accounting

JEL-CODES: M41, Q56

The accounting system is subject to multiple challenges, of which this paper shall examine the challenges generated by environmental activities. The accounting system is ill-equipped to provide adequate information about the environmental activities of organisations. Environmental problems have become global, and as a result environmental accounting may be interpreted at several different levels, such as organisational, regional, and national. Due to the fact that a significant part of environmental damage is linked to the business sector, the corporate aspects of environmental accounting are a key topic of research.

The study seeks to find the factors that led to the formation of environmental accounting, the processes that it underwent as well as its

current relevance on an international and domestic level.

In terms of structure, the study can be divided into two major logical sections. The first logical section explores the roots of environmental accounting, i.e., social accounting will be examined. The development of environmental accounting first started in connection with sustainability and environmental disasters, the topic of which will be also be discussed in this paper.

The second logical unit discusses the relevance of environmental accounting and the deficiencies of the traditional accounting system. An outlook on Hungary is included in this section.

In terms of the methodology of this paper, the study relies on the processing and interpretation of the relevant professional literature, while the relevance of the study lies in the fact that, according to my knowledge, to date no such com-

E-mail address: Van.Hajnalka@eco.u-szeged.hu

prehensive, analytical study has been compiled in the topic of environmental accounting.

ROOTS

This chapter seeks to overview and categorise the concepts – because it is a new area of science – and history of environmental accounting. Sustainability and the social corporate responsibility programmes of companies can be found in Hungarian professional literature, but we are not aware of any Hungarian language literature specifically exploring the tendencies of environmental accounting. In order to be able to grasp the concepts of environmental accounting one must go as deep as the economic activity performed in the natural environment, which has unfolded under the concepts of sustainable development. With the intensification of environmental problems, the corporate social responsibility of organisations operating in the economy comes to the forefront; the first occasion on which accounting reacts to this is within the framework of social accounting, meaning that the relationship of environmental protection and accounting is rooted in social accounting.

The task of accounting is to supply information on the operation of the organisations active within the economy. Accounting facilitates the sharing of information, providing a method which increases the transparency of the operating processes (Dillard et al., 2005). The information need of the organisations, taking account of environmental and social effects, is a separate area of development of accounting, which follows from the relationships of the economic sphere and the environment.

In order to ensure that concepts are used in a uniform manner in the study, certain distinctions should be made right at the start. Sustainability accounting measures and analyses social and economic sustainability, i.e., it integrates the social, environmental and economic sides

of the activities of the organisation (Lamberton, 2005; Schaltegger – Burritt, 2010). Social accounting is a communication process, which mediates the social and environmental effects of the business activity of an organisation, with an emphasis on the transparency of the organisations (Brown et al., 2006). Environmental accounting on the other hand embodies a type of research and practice, which focuses on the effect the organisation has on the natural environment and the effect the environment has on the organisation. All of this may be interpreted and expressed in terms of financial and physical units (Schaltegger – Burritt, 2010).

Based on this, sustainability accounting may be regarded as the widest category to integrate social accounting. The main purpose of the social accounting system is to communicate organisational information to the interest holders – in particular about social and environmental issues. Environmental accounting may be regarded as a sub-category of social accounting, integrating the relationship between the organisation and the natural environment (Eugénio et al., 2010). The following section will focus on social and environmental accounting. Initially, social accounting was geared towards capitalising on the factors that create value for the stakeholders. This goal is losing its relevance putting its communication function to the forefront. The development of social and environmental accounting diverges in the 1980s, when environmental accounting becomes stronger and social accounting is relegated to the background.

THE PHASES OF DEVELOPMENT OF SOCIAL AND ENVIRONMENTAL ACCOUNTING

After clarifying the concepts, it becomes obvious that the historical summary should be started by examining the path of the develop-

ment of social accounting. Based on the professional literature it may be established that the following main phases of development may be distinguished in the course of the development of social accounting (Adams, 2004; Mathews, 1997; Eugénio et al., 2010; Gray et al., 2008; Parker, 2005; Perego, 2005).

EVOLVEMENT Increasing awareness of social accounting began in the 1960s (Gray, 2002; Dillard et al., 2005), first evolving in the areas of corporate ethics, social responsibility and ecological issues (Loew et al., 2004).

IN THE BEGINNING Interest in the topic increased (in the 1970s), but there is still a certain decline expressed in terms of questioning the role of accounting and the merits of publishing information about environmental activity.

THE NEW WAVE The natural disasters of the 1980s (e.g. Exxon Valdez¹) increase interest in the topic, because corporate activities are now causing problems on a global scale. Intensive development is also prompted by the fact this was the time when specialised accounting periodicals first appeared. This is the period when environmental accounting first starts to separate from social accounting.

MATURATION PHASE In the 1990s, the awareness of environmental accounting within social accounting increases and becomes a key topic of research, gaining recognition within accounting research.

ENVIRONMENTAL ACCOUNTING TODAY Environmental accounting helps measure environmental performance, which is closely tied to the social role played by companies. From a business perspective, more and more interest is being expressed in understanding, measuring and managing environmental costs and revenues.

The various developmental phases will be examined separately, with the exception of the first phase. In the 1960s the major environmental disasters encourage people to pay more attention to the environmental impact of human activity (Loew et al., 2004; Parker, 2005).

Publications in the topic deal fundamentally with the system of relations between the environment and the business sector as more and more negative effects impact the environment originating in the business sector (Brown et al., 2006; Herath, 2005). We must mention two publications from this period; the first is a book by *Howard Bowen* entitled *Social Responsibilities of a Businessman* (1953), which coined the term “corporate social responsibility”. The other is the work of *Rachel Carson* titled *Silent Spring* (1962), which focuses on the issue of environmental protection and sustainability.

In the first years of environmental accounting – the 1970s – the number of researchers, primarily Americans, focusing on the ethical issues and social impact of the operation of companies increases sharply (Csáfor, 2009). These researchers mainly dealt with what responsibility companies owe to society (Mullerat, 2009; Gray, 2002). In 1972, the Club of Rome report entitled *The Limits to Growth* is published (Meadows et al., 1972). The report calls attention to the harmful consequences of the sharp increase of the volume of economic activity; the utilisation of natural resources and environmental pollution will in time reach an extent that will have a catastrophic effect on humanity. Interest increases, culminating in the Stockholm Conference of 1972, which deals with the destructive impact of human activities on the environment. By the 1970s, it becomes clear that human activities – including corporate activities – have a destructive impact on the natural environment (Brown et al., 2006).

Observations of substance can be made from the 1970s regarding the research area of social accounting, and we consider it the start of the very first period from when the concept of social accounting is first mentioned (Eugénio et al., 2010). As far as social impacts are concerned, accounting realises the significance of human capital relatively early and attempts

to measure and integrate environmental capital into the report. The research behind social accounting can be considered an experiment in the 1970s to capitalise the value of employees, managerial skills and business acumen. This is driven by the goal to express all that creates value for stakeholders as a unit of quantity. Furthermore, social accounting strives to identify revenues and expenditures caused by the economy for society.

The period is characterised by a great number of empirical research studies, and the development of models that promote the public disclosure of social accounting information. Research in the seventies focused primarily on examining the relationships of accounting, organisations and society (Friedman, 1970; Jones, 2010; Gray et al., 1993; Bartolomeo et al., 2000; Jones, 2003; Owen, 2003). Environmental accounting is an integral part of social accounting (Gray, 2001).

The majority of publications of the period are less sophisticated empirical research studies, motivated by the goal of measuring and analysing information (often unorganised and not very reliable) published by a small number of companies. The outcome of most such studies is basically a “yes/no analysis” to determine whether or not information concerning the social dimension of accounting is significant (Mathews, 1997). The development of such “yes/no analyses” is caused by the differences in information. Organisation, the industry, size and profitability all provide different information. This generates a problem of subjectivity; namely a decision must be made on which factors are included in or omitted from the report by its maker. Also missing is a single theoretical basis, and the re-generation of results is also quite difficult (Gray et al., 1995a).

A considerable area is covered in empirical research by the analysis of the relationship between reports published on corporate social responsibility and revenues. This states

that the two factors are not independent of each other (Bowman – Haire, 1975). Very few models are created in this period with the purpose of creating a better founded theoretical underpinning. Similarly to practical analyses, elaborated theoretical models do not concentrate exclusively on environmental or social areas either, instead covering a wider research area. One of the models worthy of mention is the model introducing general social cost. This serves to measure negative externalities generated by the company and also attempts to measure social benefits by taking the area of positive externalities into account (Ramanathan, 1976). Another model is created that measures the impact of an organisation on the environment and also prepares a social impact analysis containing social revenues and social costs. The main objective is to express social outcome, social cost and revenue, built on a cash-flow basis. The problems of research, however, are caused by the difficult availability and low reliability of data (Estes, 1972). In this given period, most efforts are basically aimed at measuring effects outside the company, so-called external effects.

It is a unique feature of the period that all publications that are not made in the field of traditional accounting or which support socially-oriented data provision, are considered to be critical literature of the traditional approach (Linowes, 1968; Estes, 1972), and as such cannot stand up as an independent research area.

As we are speaking of an emerging area of science, other disciplines also have an impact on accounting research. On the one hand, the majority of researchers come from other fields or use models from other areas to examine accounting problems from a different aspect. The first researchers of social accounting came from the management field. Furthermore, environmental economics plays a significant role in the development of main lines of research. In the interest of being able to determine the private

cost of a given organisation, the externalities must be examined and assessed. Besides the haziness of this period, however, the above all contribute to the increasing interest in environmental accounting (Mathews, 1997).

At this time, only a few regulations exist with respect to international accounting rules. The Corporate Report and the UK Government Green Paper provide some support for social accounting (Mathews, 1997). In England (Accounting Standards Steering Committee), communication is released on the need to increase the significance of environmental and social information in reports. In the US (American Accounting Association), publication in the field of social accounting is actively supported. Two periodicals are of particular importance in this period – *Accounting Review* and *Accounting, Organisations and Society* – as they are supportive of the new topic and publish a number of empirical studies in this period. The other scientific accounting periodicals, however, are not open to this field of study (Gray, 2002).

In summary, in the given period, environmental accounting falls outside the focus of accounting literature. Researcher interest turns towards the social dimension, especially towards employees, which today is referred to as social accounting. The empirical analyses cover several areas, and are typically descriptive and less professional. A number of models are created aiming to measure and assess externalities. Two main trends are distinguishable within publications; one sets the goal of modifying traditional social accounting and uses a financial unit of measurement, while according to the other, new challenges require a new measurement system that do not use financial measurement units (Parker, 2005).

As social accounting for the most part consists of experimentation, by the end of the seventies the topic is surrounded by scepticism. The major accounting periodicals do not yet

exist; furthermore, the majority of existing accounting publications are not interested in this new topic. By the end of the 1970's, social and environmental accounting is relegated to the background as government and the business sector focus mainly on economic welfare instead (Perego, 2005). According to the traditional approach, the measure of corporate performance is profit; however, the need to maximise the social contribution of companies gains increasing prominence (Ramanathan, 1976). Interest in the topic gains new momentum when corporate social responsibility moves to the foreground, appearing as a new wave of the 1980s (Perego, 2005; Adams et al., 2004; Brown et al., 2006).

The new wave of the eighties is considerably more complex than the first, as the issue of the environment, sustainable development and sustainability enter the realm of public awareness due to the Brundtland Report (1987), and as a result the social and economic dimension gain increasing emphasis (Adams et al., 2004; Brown et al., 2006; Bebbington – Gray, 2001; Redclift, 1987; Elkington, 2004; Kerekes, 2007). Nothing proves this more than the fact that in 1984 and 1986, the concepts of “environmental excellence” and “green consumption” become widely used. Specialisation processes commence in the field of environmental accounting; for instance there is a separate group dealing with employee reports, added value, and the demand for a single, uniform accounting regulation and standards increases. At the organisation level, the main area of research is the internalisation of externalities, cost savings related to waste management and recycling and revenues attainable through green marketing (Mathews, 1997).

A number of new periodicals are established (e.g. *Accounting, Auditing and Accountability Journal* and the *Journal of Accounting and Public Policy*) accommodating new research areas, which support publishing in the topics of so-

cial and environmental accounting. Expectations towards research are also changing; more attention is paid to methodology in order to decrease subjectivity and increase the chance of reproducing analyses, and efforts are made to utilise verifiable data and concretise the principles applied. The common theoretical background, however, is still missing (Gray et al., 1995a, 1995b).

According to the effort characterising the period, accounting experts (accountants and auditors) must be involved in the research concerning social and environmental accounting, and attempts should be made to integrate certain concepts from other areas (social contract and organisational legitimacy) in order to justify the significance of accounting reports. Towards the end of this period, the number of publications in the field of social accounting is gradually increasing, and at the same time, there is a sharp increase in the number of publications on environmental issues. In the period in question, there are a number of external factors impacting environmental accounting such as philosophy, environmental problems and environmental economics. The concept of the social contract has the greatest impact on the establishment of the philosophical background of non-traditional, society-oriented accounting. The explanation of the environmental problem-set, the areas of the environment, sustainability and ecology, and the halting of environmental deterioration – as relevant topics – are becoming increasingly popular (Mathews, 1997).

Social responsibility has preoccupied accounting experts ever since the seventies; however, a standard system of concepts and framework still has not been established by the end of the eighties,² for which there could be a number of reasons (Gray et al., 1995a):

- social and environmental accounting are not linked to traditional accounting in all areas;

- social and environmental accounting concern significantly more areas than traditional accounting; for instance, financial and non-financial, quantitative and quality-related information all plays a role in the analyses;
- researchers have entered and exited the field. This is the main reason why a common theoretical background, which could govern regular research, is unable to form;
- the new research area is shrouded in constant legitimacy doubts.

In summary, publications of this period concern a significantly greater number of areas than those of the preceding period. Empirical research is more analytical than descriptive; the normative models typical of the 1970s are absent in this period. Progress, however, is much greater in the development of the philosophical background. With respect to the disputes, the main issue is what role accounting can play in connection with information provided from the area of activity of social and environmental accounting. At the same time, another debate is in progress on the nature of environmental problems and the type of report that best fits the needs of the users of information.

In the nineties, intense development begins in the maturation phase as the interest shown by managers and accountants in the topic increases (Deegan, 2002; Mathews, 1997, 2000). Social and environmental accounting is embedded in organisational rules, habits and laws (Gray, 2001); thus, the case of environmental sustainability gains ground among companies as well (Brown et al., 2006). However, the inclusion of information on employees or social issues in the annual report does not play a dominant role; emphasis is placed on environmental information instead (Adams, 2004; Eugénio et al., 2010). The main topics of research include the presentation of environmental issues in annual reports, management accounting implications of environmental accounting,

and the greening of accounting (Hines, 1991; Gray et al., 1993; Jones, 2003).

The major accounting periodicals, among them the *Accounting, Auditing and Accountability Journal* and the *Accounting Forum*, allow researchers to publish their environment-related research. Parallel to this, more and more people are dealing with the burning necessity of theoretical underpinning. On the one hand, the main consideration is to set up a philosophical background which attracts researchers from other fields, and on the other to establish the main frameworks of environmental accounting (Mathews, 1997; 2000).

In this period, a number of other research areas affect environmental accounting besides accounting, such as auditing and strategic planning. Gray et al. (1993) emphasise that environmental accounting will gain headway faster if the analysed organisations, managers, accounting experts and research units are supportive of the new topic. The evolvement of this approach increasingly facilitates the development of the environmental accounting system, with social accounting increasingly relegated to the background (Eugénio et al., 2010; Adams, 2004). Several publications are issued in the field of strategic management related to corporate social responsibility and environmental issues. For instance, one of the more popular research topics is the importance of the relationship between the company and the environment, the relationship of the value chain and recycling (Harte – Owen, 1991; Mathews, 1997).

Environmental regulation is gaining ground in more and more countries. Even though the regulation is not formulated due to the creation of accounting standards and frameworks, it is adapted and implemented by accounting when preparing reports and, as such, its impact cannot be neglected (Mathews, 2000).

The publications mainly concern three areas; the first analyses the effects of sustainable

development in accounting and according to its representatives “sustainability is a good thing and should be part of accounting activity” (Bebbington, 2001, p. 146). The next area studies the accounting reactions to sustainable development. Finally, the third encourages the development of a new accounting system; this would provide solutions to the new challenges of sustainable development.

In summary, the publications appearing in the field of environmental accounting reach far beyond the field of social accounting (Gray, 2002; Mathews 1997). Focus shifts to environmental accounting as interpreted today, and all further development is characterised by the diversity of the areas.

Today, pressure on environmental accounting is increasing in the interest of companies being able to integrate it into everyday practice. Environmental accounting is not treated separately from traditional accounting; in fact, it has an auxiliary function. Its role is to integrate the financial impact of environmental and social matters into existing record-keeping systems (Schaltegger – Burritt, 2010).

A number of publications are also issued to establish a philosophical background. As of the mid-nineties, various studies are released with the goal of establishing models and frameworks. One of the main publications is Mathews’ (1997) model, which develops a financial, social and environmental reporting model for external stakeholders that is based on the social contract. Elkington’s (1994) *triple bottom line* concept integrates the financial, social and environmental dimensions, and insists on the positive relationship between sustainability and corporate value (Perego, 2005). On the basis of this principle, companies provide information on social, environmental and economic matters within a single report (Eugénio et al., 2010). Schaltegger establishes a new form of accounting by bringing ecological accounting – as a measurement method based on

physical units – into the field of environmental accounting. Ecological accounting develops independently of traditional accounting, and is subsequently integrated into traditional accounting at the levels of both management and financial accounting. Ecological accounting takes the existing financial accounting system as a given, and does not concern itself with the collection of social accounting information of reporting (Schaltegger – Burritt, 2000).

This confirms that in accordance with the two approaches of traditional accounting, the separation of the areas of management and finances is also apparent within environmental accounting. Financial accounting primarily serves the information needs of external interest holders, while management accounting serves those of internal interest holders. The main areas of research within management accounting include environmental costs, life cycle analyses and input-output analyses. Within financial accounting, the fields of environmental audits and environmental reports merit mention.

Research aimed at environmental costs must be handled separately within management accounting. The framework of sustainable costs³ is the first to be applied and researched by companies (Howes, 1999; Bartolomeo et al., 2000). The objective is to express an organisation's social and environmental costs arising from economic operation (Lamberton, 2005). In this period, several empirical studies are published within environmental management accounting (Ditz et al., 1995). The focus is on sustainable cost calculation, which shows the economic, social, and environmental aspects of sustainable development, and therefore may be considered an alternative accounting tool (Bebbington – Gray, 2001; Bebbington, 2001). In addition to sustainable costs, research is also focused on accounting systems that feature natural capital accounting (Gray, 1992). This accounting system follows up on resource pro-

cesses in terms of quantifiable units and non-financial units; in the case of the latter the aim is to express the use of natural resources on the basis of financial units (Lamberton, 2005). This analysis ensures transparent registration for the inputs and outputs of the process, providing an additional possibility for analysis to state environmental impacts.

Within environmental financial accounting, environmental management systems are excellent tools for informing external stakeholders, as one of their main goals is to inform external stakeholders of environmental performance within the company. In 1992, the BSI Group (British Standards Institution) publishes the very first environmental management standard, BS 7750, which applies to Great Britain. In 1993, the EU publishes the Eco-Management and Audit Scheme (EMAS) (Regulation no. 1836/93), which builds on the BS 7750 system. This system helps to substantiate and implement environmental policy, assesses performance regularly and subjectively, and publishes information on corporate environmental performance (Kósi – Herczeg, 2006). The goal is to improve environmental performance; however, joining the programme is voluntary. The goal of the EMAS system is to encourage organisations to take well-organised voluntary steps to improve their environmental performance. In 1996, the International Organization for Standardization issues ISO 14001 for similar purposes. In 1999, the AA1000 standard (Institute of Social and Ethical Accountability) is released, aiming to increase the ethical performance of organisations (Mathews, 2000). Also worth mentioning is the Copenhagen Charter (1999), which contains management directives on information provision to stakeholders (Lamberton, 2005). Beyond environmental reports, an increasing number of indicators are created in order to measure company sustainability and rank companies accordingly (e.g. the Dow Jones Sustainability

Index) (Adams et al., 2004; Brown et al., 2006; Elkington, 2004).⁴

With regard to the field of environmental financial accounting one must highlight the accounting repercussions of emission rights trading, which have come to the forefront after the entry into force of the Kyoto Protocol in 2005. Quotas are set for every country in order to reduce their emissions, and trading of these quotas is also ensured. The countries participating in emissions trading may only emit as much as permitted by the emissions rights possessed by the given member. These quotas are distributed amongst the companies operating within the country, and as these rights are considered balance sheet asset items they are highly relevant from an accounting standpoint (in more detail: Reizingerné Ducsay, 2011; Milne – Grubnic, 2011; Rankin et al., 2011).

We can see that today the field of environmental accounting comprises complex branches of research. There are two major areas that can be distinguished based on the groups of stakeholders involved; these are financial and management accounting. The examination of the positive effects of the application of environmental accounting, the study of the special practice relevant to the countries, and analysing the relationship between reporting and corporate performance have a key role. The distinctive evaluation techniques, methods and comparisons in the various countries are now considered to be an important area of research (Bebbington, 2001; Eugénio et al., 2010).

Environmental accounting can also be considered at a national level. At the national level, the evaluation of natural resources includes the disclosure of environmental accounts in the System of National Accounts (SNA). Agenda 21 adopted in 1992 aimed to create an integrated System of Economic and Environmental Accounting (SEEA), supplementing the traditional SNA system (Giovanelli, 2004).

Today we are witnessing a strong integration

process, which tie together the three distinct areas discussed above (management, financial and national). There is a strong correlation between the information produced by the management accounting system and the information contained in environmental reports (Rankin et al., 2011), as environmental reports prepared by the individual organisations provide the input data on which the effects established at the national level are based. This intertwining is particularly true for the topic of carbon accounting.⁵ The field of carbon accounting basically measures pollutant emissions, communicating it inside and outside the company (Bowen – Wittneben 2011). As quantification can be performed on a global, national and organisational level, all three areas can be integrated. The context in which carbon accounting is interpreted includes carbon dioxide emissions measured at the national and global levels, carbon footprints, air contamination levels expressed in terms of monetary units interpreted from the perspective of management accounting, as well as air contamination levels expressed in terms of financial units measured with the help of financial accounting (Ascui – Lovell, 2011; Stechemesser – Guenther, 2012; Pellegrino – Lodhia, 2012).

After studying the phases of development of environmental accounting, the next section of the paper will discuss the characteristics of environmental accounting that supplement the traditional accounting system and feature a look at the regulations in Hungary.

THE SIGNIFICANCE OF ENVIRONMENTAL ACCOUNTING, HUNGARIAN OUTLOOK

One of the basic features of accounting is that it records events within the company, events that can be verifiably proven and business events that be expressed in terms of monetary value (Baricz – Róth, 2006). Taking environ-

mental factors into account is all the more problematic, because environmental impacts appear primarily outside organisations. These external events are usually internalised with the help of statutory regulation, although the notion that environmental protection is becoming a key factor in corporate competitiveness seems to be increasingly justified (Schaltegger – Burritt, 2000).⁶ Traditional accounting focuses on economic transactions and disregards social costs and the exploitation of natural resources. Increasingly strict environmental regulations are also a reason why it is becoming more and more important for decision makers to be able to appropriately factor environmental information into their decisions (Milne, 1996).

Traditional accounting provides even less information than environmental accounting on how corporate activity impacts the environment or how high social cost is. The main reason for this being that natural resources are not owned by the company and, as such, are not featured in the balance sheet; therefore, their depreciation cannot be shown either (Schaltegger – Burritt, 2000). The most important task of accounting is to provide true and fair information for the stakeholder, which can be used to make a substantiated decision (Baric – Róth, 2006). If the system builds on deficient information, this goal cannot be achieved. Given its original function, traditional accounting is a standardised system of statements that cannot quantify and take into account the limited quantity of natural resources (Gray et al., 1993).

Traditional accounting gives priority to profit and cannot fully address environmental and social factors. It uses money as the standard unit of measurement and basically values at past value, which does not necessarily provide comparable and up-to-date information. Besides the fact that internal decision makers require information from environmental accounting, there is also increasing demand from external interest holders, such as government

bodies, other organisations, buyers, and banks. Traditional accounting cannot provide adequate information on the financial efficiency of environmental activity either to internal, or to external interest holders. In order to be able to provide information on the environmental performance of an organisation, appropriate data is required, which in many cases is reached through information expressed in physical units. Occasionally, it is expedient to analyse input-output processes or examine the volume of output expressed in material units, which do not appear in traditional management accounting specifically for environmental factors (Jones, 2010).

According to Schaltegger “environmental accounting may be defined as a sub-branch of accounting that includes the activities, methods and systems that record, analyse and disclose the environmental problems of a defined economic system, or the economic effects of an environmental activity” (Schaltegger – Burritt, 2000, page 63). Its tasks include the presentation and examination of the financial consequences of environmental protection as well as the analysis of the effects of economic activity on certain environmental factors (Csutora, 2001).

Let us briefly review the Hungarian regulation related to environmental accounting. There is no separate regulation for the field of environmental accounting; there is minimal mention of environmental activity in the Accounting Act (Act C of 2000).

The Act in question refers to environmental obligations in connection with the balance sheet at the section on special reserves. It stipulates that expected future costs and obligations must be indicated among special reserves. These obligations will probably and certainly be in effect on the accounting date; however, the date and amount of occurrence is uncertain. Environmental obligations (e.g. restoration) are examples of such future obligations.

The balance sheet will naturally feature tangible assets purchased for environmental purposes under assets as well as the property rights linked to these (such as right of use, issue rights), and environmentally friendly stocks. Liabilities will include environmentally significant items under liabilities in addition to provisions, such as environmental indemnification obligations, credits and loans taken out to implement environmental investment projects. These are, however, not detailed in the Accounting Act.

The profit and loss account features environmental costs and revenues, but there are no detailed provisions about this in the Account Act either. There are specific categories defined for cost; these are called cost types. These cost categories may include environmentally relevant items. Material costs include raw and intermediate materials used for production; therefore, this category already contains environmental costs (such as environmentally hazardous raw materials used for the production of the product). There are several environmental costs that may be included under the cost category services used, such as cost of waste removal, cost of waste management, maintenance of environmental equipment, cost of environmental training or various licensing fees. The cost of other services includes fees connected to environmental protection, such as insurance premiums and the green tax.⁷ Personnel costs may include the salaries and contributions payable on staff dealing with environmental protection, such as the personnel costs of auditors, trainers and employees working in waste management facilities. The depreciation of environmental equipment should be highlighted in the depreciation cost category. Based on this it can be established that the existing cost categories treat environmental costs in a consolidated manner, and that is why they are inappropriate for the preparation of the relevant statements; therefore, it is justifiable to separate environmental

costs along different lines of consideration. The same is true on the revenue side; revenues include income generated from the selling of waste and environmentally friendly products/services, which are also not detailed by the Accounting Act.

The general data of the tangible assets directly involved in the protection of the environment must be shown in the supplementary written annex to the report. The gross value, accumulated depreciation and the net value of the assets calculated from these figures must be disclosed. The written parts also include the provisions generated for environmental obligations and costs. It is also important to talk about the actual figures of provisioned amounts released, the amounts booked as costs related to environmental protection, as well as any potential environmental restoration obligations expected in connection with environmental protection. We can see that the act does not require separate records, just a summary prepared on the basis of end-of-year calculations.

In the *business report* section of the statement, the role of environmental protection in influencing financial situation must be demonstrated, as well as the company's responsibility related to environmental protection, its planned environmental developments, funds potentially received for this purpose, and already implemented environmental measures and their level of implementation.

Based on the above, we can see that environmental accounting – at least at a regulatory level – is not very popular today in Hungary. There are no compulsory reporting obligations either (unlike in Japan) (Kokubu, 2002). Currently, companies active in environmental protection activities can be granted recognition by independent organisations; however, the statutory provisions are present at the level of obligations, primarily due to the emissions generated. In other words, the current regulation punishes emission and fails to reward

prevention. Perhaps this study can contribute somehow to shift the focus to the prevention of negative impacts on the environment.

SUMMARY

One of the primary aims in the study was to explore the tendencies of the development of environmental accounting. The roots of environmental accounting manifest themselves in social accounting. During the first relevant period of development phases (the 1970s), social accounting develops much more significantly than environmental accounting, which functions as a subordinate of the former. Empirical research is mostly analytical and less elaborate than in later periods. Annual reports place the main emphasis on communicating information regarding employees. In the second period (1980s), attention towards environmental matters increases. Empirical research is much more thorough, contains fewer normative observations, and more and more articles are written dealing with the philosophical background. Demand for environmental and social information – besides information on employees – increases. Non-accounting literature, environmental economics in particular, has a great impact on the development of environmental accounting. In the third period (1990s), environmental accounting undergoes dramatic development; new areas are created; new research and new

results have a stimulating effect. The communication of employee-related information is relegated to the background, with the focus shifting to environmental information. Today, macro and micro-levels are distinguished within environmental accounting, and within the latter, management and financial accounting are considered to be independently developing fields. Cooperation between the micro and macro-level is increasingly close. Today, at an international level, one of the main areas of research is the integration of environmental accounting into corporate practice.

The other goal of the study was to examine the significance and regulation of the new system. Environmental accounting currently functions as an auxiliary sub-system to the traditional accounting system, the primary objective of which is to provide information on environmental measures within the organisation and the external environmental impacts it is responsible for. Environment-related information has significance during both operation within the organisation and the communication of external information, and the traditional accounting system cannot appropriately handle this. At an international level, the application of environmental accounting has a priority role; however, reviewing Hungarian regulation, we can determine that the Act on Accounting does not specifically regulate the field of environmental accounting, thus the application of the method is basically voluntary at the level of organisations.

NOTES

¹ The Exxon Valdez was an oil tanker, which was shipwrecked in 1989. Damages and litigation costs amounted to 15 billion dollars (Schaltegger – Burritt, 2005).

² We must note that today we can find standard,

single frameworks with respect to sub-fields (macro/micro) within the environmental accounting system.

³ The area's restoration cost (sustainable cost).

⁴ By now, however, it has become apparent that the

environmental management systems have not been able to achieve their goals; in many cases they have been transformed into “a means of propaganda” without actually generating any substantive positive environmental effects (Brown et al., 2009; Bioral, 2007).

⁵ Carbon primarily refers to hazardous materials, but there is no agreement in the literature as to exactly what sort of emissions are covered by carbon. It may be interpreted as the emission of carbon dioxide

alone, other greenhouse gases or other gases set out in the Kyoto Protocol (Stechemesser – Guenther, 2012).

⁶ We can also find the very opposite in critical literature; to this day there is no standard position on the matter (Palmer et al., 1995).

⁷ The green tax due after self-produced stocks appears as an element of this category, as the green tax related to the procurement of equipment is part of historical cost.

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