

Development of the Accounting Concept for Sustainable Enterprise Development

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Abstract

Based on an expert survey, the authors systematize accounting types by user groups and provided/required information. They compile and analyze a matrix of accounting for sustainable development characteristics in the context of the monetary and natural definition in the orientation to the past and the future. The definitions of internal and external accounting for sustainable development characteristics are given. The concept of accounting for sustainable development characteristics according to monetary/natural and external/internal indicators is presented.

Key-words: Traditional Accounting, Natural Indicators, Ecology, Social Reporting.

1. Introduction

The importance of social and environmental security is manifested in the expenditure of resources for the restoration and protection of the environment and the satisfaction of a decent level of social security. This implies the need to reflect these issues in accounting. Sustainable development depends on considering environmental and social factors in all sectors of society (Millar et al.: 2018). Increased attention to environmental and social problems causes an increase in demand for information that characterizes the state of the environment and the impact of human society on it (Shortridge, Smith: 2009). Information, which is the basis of scientific knowledge and practical activity, plays an important role in solving various environmental and social problems by society. Therefore, the organization of accounting for sustainable development (ASD) is an urgent task.

The neglect of the methods of environmental and social accounting leads to the loss of the possibility of monetary valuation of objects that were not considered earlier. The advantage of the assessment methods recommended by the existing guidelines is their focus on various industries, depending on the specifics and other principles of activity (Allen: 2014; Wang: 2011). The most well-known and proven assessment methods are the "Integrated Environmental and Economic Accounting. An Operational Manual" of the United Nations (UN: 2000). There is no solid methodology for assessing the environmental and social components of enterprises' activities. This raises many questions that traditional accounting is not always able to provide a correct answer to in assessing the restoration of polluted land or the cost of avoiding CO2 emissions.

The methods for environmental and social accounting have been developing for the last 30 years. A solid scientifically grounded baseline has already appeared, with the help of which it becomes possible to measure the costs of restoring the natural environment (Alqotaish, Qatawneh: 2017; Yakhou, Dorweiler: 2002). However, a similar scientific and methodological approach to social impacts (positive or negative) is in its infancy (Birkin et al.: 2005). Work on social cost-benefit indicators is continuing around the world. Scientific and research institutions, with serious social, environmental, and economic aspirations, have the opportunity to make a significant contribution to the development of social accounting and its combination with environmental ASD, both methodically and practically (Schaltegger et al.: 2006; Schneider: 2015). There are several methods and techniques for generating environmental accounting reports, while there are less developed and widespread recommendations for compiling social accounting financial reports (Edens, Hein: 2013).

2. Literature Review

Today, there are several approaches to the formation of an accounting system for sustainable development. They can meet the needs of a company's management in making adequate management decisions and provide external stakeholders with reliable information about the economic, environmental, and social aspects of its activities (Table 1).

Table 1. Approaches to the formation of the accounting system for sustainable development

Source	Characteristics of the approach
(Şendroi, Roman: 2007)	Traditional accounting systems and differentiated environmental and social accounting systems for sustainable development process information caused by environmental and social problems and can be combined into a corporate ASD
(Cho, Patten: 2013)	ASD is a type of accounting that considers: activities and their variations, registration and analysis of transactions and reporting, the environmentally determined financial consequences, and the environmental consequences of a particular economic system
(Birkin: 2000, 2003)	ASD is the management of environmental and economic indicators through the development and implementation of appropriate accounting systems and practices related to the environment. This may include reporting and auditing in some companies. Environmental management accounting typically involves life cycle calculation, full cost accounting, benefit assessment, and strategic planning for environmental management
(Dai et al.: 2014)	ASD includes three equivalent components of the accounting system: cost, social, and environmental accounting. In turn, accounting is considered in two sections: financial and managerial. The elements of environmental accounting are environmental accounting, accounting for environmental costs, accounting for natural capital, eco-balance sheets, eco-audit, product life cycle analysis, environmental reporting. The components of social accounting are social reporting, social balance, human resources accounting, corporate social audit, social indicators system, net value-added report, income distribution report
(Rakos, Antohe: 2014)	Material flows that have an impact on the environment, expressed in physical units, are included in ASD. Therefore, this accounting is not purely monetary, but rather an information system of natural and monetary units

The analysis of various approaches has shown that managerial ASD includes environmental-oriented social aspects and the results of the impact on the external (social) environment in value and in-kind for making internal management decisions. In turn, financial ASD includes environmental monetary aspects, as well as physical environmental impact meters to report to external stakeholders. This second category of accounting system should cover accounting relationships with specific

external stakeholders, regardless of whether their information interest is financial, social, or environmental.

Research hypothesis: It is necessary to consider the environmental and social aspects of enterprises' activities, which necessitates expanding the boundaries of traditional accounting and its corresponding addition to meet the needs of different levels of management in timely, reliable information for making effective decisions.

3. Research Problem

- to determine the structure of accounting types by user groups and provided/required information;

- to develop a matrix of characteristics of ASD in the context of monetary and natural definitions, focusing on the past and the future.

The article consists of an introduction, literature review, methods, results, discussion, and conclusion.

4. Methods

To achieve this goal, several general and special scientific methods were used. Among them, it is necessary to highlight the method of comparison, the monographic method, the method of generalization in the analysis of the positions of researchers, the abstract-logical method in formulating research conclusions, and the expert survey method.

The main method of research was the expert survey method in this field of research. Experts were asked to voluntarily fill out a semi-formal questionnaire with questions.

Based on the expert survey, we identified the main users of the information on the results of ASD, monetary and physical indicators of internal and external ASD, and prerequisites for structuring the information of ASD, detailing the characteristics of ASD in the context of monetary and natural definitions in an orientation to the past and the future.

The survey was attended by experts in accounting and environmental audit (25 people). The experts were selected based on their professional expert status. The experts included people whose professional activities had been related to accounting and environmental audits for more than 7 years.

All participants were warned about the survey's purpose and that the organizers of the study planned to publish the results of the study in a generalized form in the future.

5. Results

The experts said that users of the information on the results of ASD are six important groups of stakeholders: buyers and customers, suppliers and contractors, staff, society, government agencies and organizations, owners, and potential investors. The list is not final and can be changed depending on the mission and priorities.

The identification of losses and benefits associated with stakeholders and their categorization as internal or external and by the nature of the impact as environmental, social, or economic is the basis of the accounting system for sustainable development.

Addressing the issues of different stakeholders requires individual approaches to accounting. The experts noted that some accounting systems can provide general information to all interested parties and some to a certain circle, depending on the essence of the information and user rights (Table 1).

Table 1. Structure of accounting types by user groups and information provided/required by them

Users	Traditional accounting system information				ASD Information			
	Financial accounting		Management accounting		Internal ASD		External ASD	
	Monetary indicators	Natural indicators	Monetary indicators	Natural indicators	Monetary indicators	Natural indicators	Monetary indicators	Natural indicators
Buyers and customers	■				O	O	■	■
Suppliers	■				O	O	■	■
Staff				O		O	■	■
Society	■					O	■	■
Public organizations, agencies, funds	■				O	O	■	■
Owners	■	■	■	■	■	■	■	■
Potential investors	■	■		■		■	■	■
Other users								

■ — full interest and full access to information

O — partial interest and partial access to information

Note: compiled based on the expert survey.

The experts noted that the prerequisites for the structuring of ASD information are:
the need to integrate environmental, social, and financial issues into one category;
a conceptual division into internal and external accounting, which is based on the fact that the level of detailing and aggregation of information and the degree of confidentiality differ between the needs of management and other stakeholders.

Based on the results of the expert survey, we propose to implement a matrix of characteristics of ASD by comprehensive detailing in the context of monetary and natural definitions in the orientation to the past and future (Table 2).

Table 2. Matrix of ASD characteristics

		Accounting for sustainable development (ASD)			
		Monetary accounting for sustainable development (MASD)		Natural accounting for sustainable development (NASD)	
		Short-term focus	Long-term focus	Short-term focus	Long-term focus
Focus on the past	Regular information	Accounting for the costs of social and environmental measures (calculation of variable costs, absorption costing, ABC method, etc.)	Accounting of expenses and income from the use of social, human, and environmental capital	Accounting for the movement of stocks and material assets	Accounting for the impact on environmental and social capital
	Special information	A realistic assessment of the environmental costs	Efficient calculation of production cycle costs, calculation of targeted environmental and social costs	Assessment of post-short-term environmental and social impacts	Inventory control of product life cycle. Investment valuation in the natural and social environment
Focus on the future	Regular information	Environmental and social operational budgeting, budgeting of environmental and social capital in monetary terms	Long-term planning of expenditures on social and environmental activities in value terms	Budgeting of the physical component of the environment (budgeting based on the ABC method)	Long-term planning of expenditures on social and environmental activities in natural terms
	Special information	Environmental and social expenditures for future periods	Assessment of investments in environmental and social projects. Production lifecycle budgeting and target pricing	Relevant environmental impacts (subject to short-term restrictions on activities)	Assessment of environmental and social investments. Life cycle analysis of a specific project

Note: compiled based on the expert survey.

6. Discussion

According to Table 1, each type of accounting can be presented in both monetary and physical terms. The usual personification of financial accounting is the cost expression of indicators, which does not exclude the possibility of presenting information in natural indicators. In turn, management accounting provides information, in most cases, in natural indicators. Thus, each of the traditional types of accounting can be represented in the form of indicators, both in physical and in value terms. Similarly, the indicators of internal and external ASD can be compared.

However, several differences characterize the information and its belonging to the traditional and ecological-social accounting system:

- from a material point of view, ASD is significantly different from traditional accounting. The object of ASD is environmental and social impacts, whereas traditional accounting is monetary;
- environmental, social, and monetary information is often obtained from different sources;
- environmental information is needed for various purposes by a wider range of stakeholders than monetary information;
- information about the environment has different quantitative indicators of quality and quantity (for example, kilograms) compared to financial information (for example, value-added in monetary terms) (Burritt et al.: 2002; Tanc, Gokoglan: 2015).

Typically, traditional accounting and ASD are recognized as two different categories of "sub-accounting". However, this is not an obstacle to their integration, since the information from both accounting categories can be combined using a separate analysis of eco-efficiency indicators for use by internal and external users. Internal and external ASD are combined using eco-efficiency indicators, which require the integration of these two systems (Zhou, Jing, Shihui: 2016).

According to the experts, the features of the internal and external ASD can be described as follows:

1) Internal ASD is designed to collect information on the activities of environmental and social systems, expressed mainly in natural indicators, for internal use by the owners and administrators of the enterprise. This information complements and expands the usual management accounting system. Methods for measuring the impact of an enterprise's production activities on the environment are the basis for making rational management decisions. Thus, internal ASD is a necessary condition for any system of environmental and social management.

2) An analog of a conventional financial accounting system, or rather an extension of it, is external ASD, the information of which is intended for external users interested in overcoming

environmental and social problems, namely, for the general public, the media, shareholders, environmental (or social) funds, and non-governmental organizations.

In general, ASD is a combination of cost and in-kind accounting and, if necessary, the result of integrating the environmental, social, and financial components of the activity. Therefore, it is proposed to define ASD as a general category that includes both MASD and NASD, as shown in Table 2.

MASD includes a standardized system of financial and management accounting, which measures the interaction of the environmental environment, society, and an enterprise in terms of value. MASD is a system for recording the results of economic activity in monetary terms related to the environment and the social environment. It is a tool for strategic and operational planning, providing a basis for decision-making, achieving desired goals or objectives, and monitoring and reporting.

NASD also acts as an information tool for making internal management decisions. However, unlike MASD, the main focus is on a company's impact on the environment, expressed in physical units. NASD tools are designed to collect information on environmental and social impacts in physical units, mainly for internal management use.

Another determinant of the classification of ASD is time. Environmental and social problems are mainly long-term. Considering this, accounting systems and corresponding analysis tools can be grouped as retrospective – backward-looking (for example, economic activity analysis) and with a focus on the future (for example, budgeting). The adoption of internal management decisions, regardless of the duration of the action, is accompanied by the accumulation of both regular (general accounting systems that regularly form information for management) and special information (special accounting methods that create information, as a basis, for making specific decisions).

7. Conclusions

The structure of the integrated ASD model presented in the study can be used for a broader context of environmental and social accounting. Accordingly, ASD can be classified according to the following criteria: 1) at the place of formation and provision of information: internal and external 2) according to the form of the information provided: monetary and natural.

The study made it possible to agree on the place of ASD in the general accounting system, by:

- systematization of monetary and natural accounting, which, both separately and in combination, are used by managers to reduce the negative impact of enterprises on the environment and improve social security inside and outside the organization;

- selection of tools available for ASD, with time reference points for use by managers in the analysis of a company's activities.

The main advantages of the proposed structuring of ASD are: 1) the recognition that ASD includes monetary and natural measures that can be considered independently or in combination; 2) the comparison of tools with subsystems of ASD that facilitate certain types of decisions; 3) the consideration of time as a key element in the classification of ASD to focus on the links between short-term and long-term cash flows and environmental and social considerations in management decisions.

After working out the concept of ASD, there is a need to develop a methodology, with the definition of goals, objectives, subject, object, methods, functions, and key aspects, which will form the prospect of further research.

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