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## PURPOSE AND STRUCTURE

Corporate managers make decisions and act in the present, usually guided by their experience and the information available to them about the past. The aim of their present decisions and actions is to achieve objectives that are established for the future of their organisations. Such objectives are usually complex, but for commercial corporations the pursuit of financial gain for shareholders is a high priority. As the future is uncertain, managers need access to all the relevant information they can obtain about alternative courses of action available to them (Chambers 1957: 3). In this decision-making context, information provides purpose-oriented knowledge for users: that is, knowledge about how a desired future state might be achieved. Uninformed action is not considered to be a particularly successful way to make decisions in the long run. To generate information, managers have to measure and record data in the same terms as their specific goals. Therefore, the steps in managing information, after having determined a set of objectives and goals, are to collect, classify, analyse and communicate data that relate to the desired goals. Provision of such information in financial terms is traditionally the central topic of accounting. Conventional financial accounting provides the most important information management system for any company because it links all company activities with performance and expresses these in the form of a single unit of account—money—which can be used as a basis for comparing available alternatives. Accounting information to assist with decision-making is a fundamental idea behind contemporary corporate environmental accounting.

A second conceptual strand woven through this text relates to accountability. Accounting information not only assists decision-makers with the efficient allocation of scarce resources but also enables management and governing bodies to discharge their accountability to people with a right to know how organisations have used resources entrusted to them. This second strand is important because, as Ijiri (1983: 75) comments, an accountability-based framework considers relationships between the producer and user of information, not just the needs of a decision-maker. Organisations can be held accountable to external or internal parties. External parties include shareholders, the public, regulators, suppliers and consumers. Internal parties are predominantly represented by different levels of management and employees.

At the conceptual level, this book presents and discusses an integrated framework of environmental accounting. It examines the interrelationships between accounting, the

environment and the management of information for decision-making and accountability purposes. In doing so, it proposes an extension of the scope of conventional accounting to include the practical environmental and economic implications of the concepts of corporate ‘sustainability’ and ‘eco-efficiency’. During the past 25 years environmental issues have grown to become a major concern for company managers. Yet, although notions of ‘eco-efficiency’ and ‘sustainable development’ have entered discussions in boardrooms throughout the world, practical execution of these ideas still remains at an early stage of development.

*Contemporary Environmental Accounting* uses a micro-based approach to examine environmental accounting as it is, or could be, practised within companies. National environmental systems of accounting and reporting are not considered in detail, although some references to micro–macro links are made. The text does not explicitly deal with other related issues such as information technology (IT); the history and management of information systems (i.e. computer systems); data acquisition; database management; software issues (for a brief introduction, see Rikhardsson 1999a); the application of information management to specific industries; links between information management, leadership and corporate culture; management of information for media purposes; or market research.

The book is organised in four parts:

- Part 1: Introduction and framework
- Part 2: Environmental issues in conventional accounting
- Part 3: Ecological accounting
- Part 4: Integration

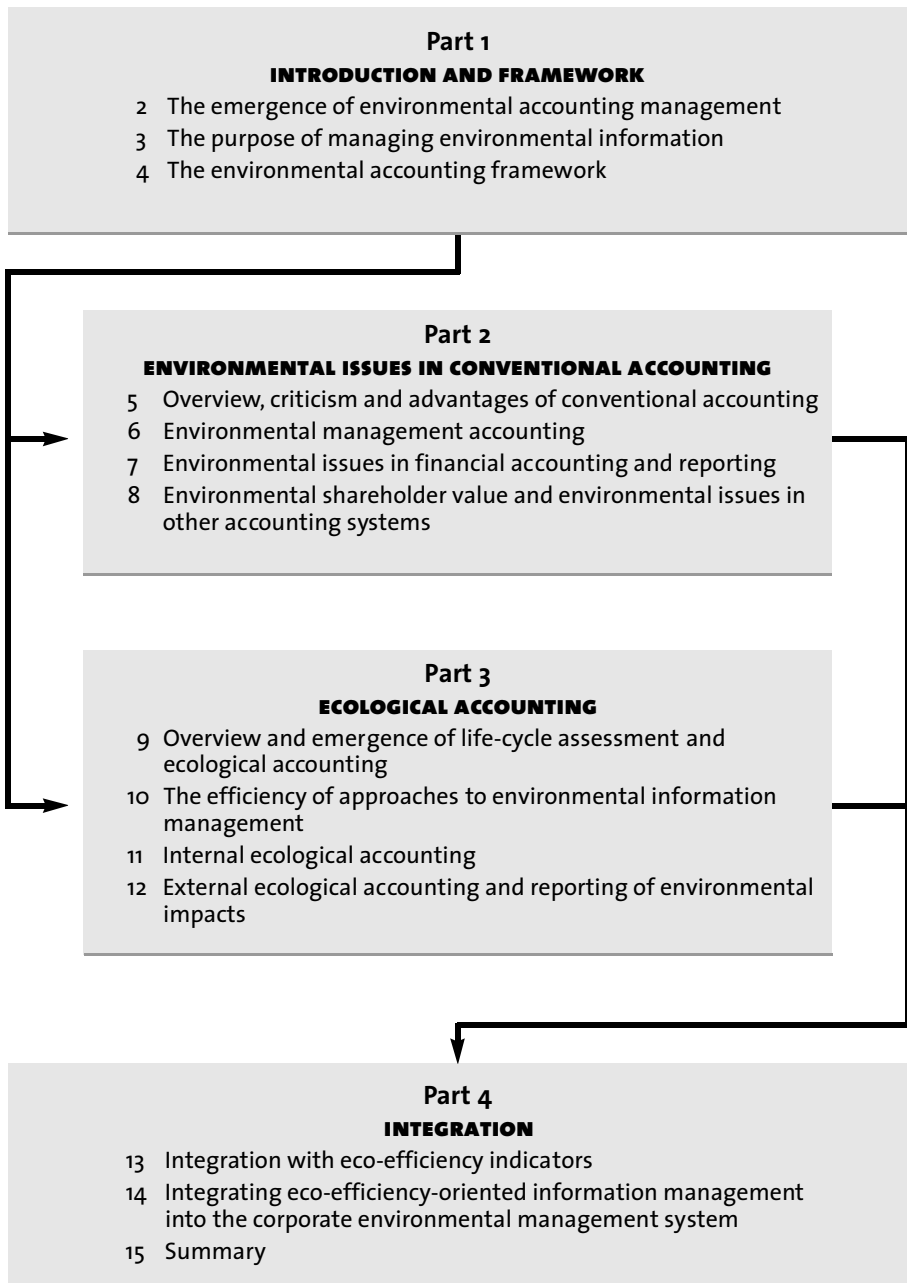
A number of discussion questions are provided for review at the end of each chapter. We will now discuss each part in greater detail.

Part 1 (Chapters 2–4) provides an introduction to environmental accounting and the management of relevant environmental information. It introduces the basic framework for contemporary corporate environmental accounting.

In Chapter 2 we explain the main drivers of recent growth in demand for new accounting systems that integrate environmental aspects of corporate activity.

In Chapter 3 we discuss the notions of environmental information as purpose-oriented knowledge and as a means of accountability. As the purposes of information management are to support decision-making to help managers achieve specific goals and to provide stakeholders with corporate environmental information that they have an ethical or legal right to know, concepts of sustainable development and eco-efficiency are introduced because they underlie decision-support and accountability relationships.

The overall framework of the book is then presented in Chapter 4. This chapter is the conceptual centrepiece of the book. Its ideas permeate the remainder of the text. Environmental accounting is concerned with effectiveness, efficiency and equity issues. Effectiveness can be considered in the context of policies designed to achieve sustainable development. Eco-efficiency ensures that ecological and economic matters are integrated

*Figure 1.1* Structure of the book

in the environmental accounting framework. Finally, equity issues are brought to the fore through the concept of accountability.

- **Sustainable development** is development that meets the needs of the present without compromising the ability of future generations to meet their own needs (UNCED 1987: 87).
- **Eco-efficiency** expresses the efficiency with which ecological resources are used to meet established economic goals (Schaltegger and Sturm 1992a, 1992c; OECD 1998b: 7). Efficiency is the achievement of specific output goals with the minimum level of inputs.
- In an **accountability**-based framework, the objective of accounting is to provide a fair system of information flow between the accountant and the accountee (Ijiri 1983: 75).

The basic structure of environmental accounting, as explained in this book (see Fig. 1.1), reflects two aspects of measurement. The influence of environmental issues on an organisation's financial performance and the environmental impacts of corporate activities themselves have to be examined.

Measurement of the links between environmental and financial performance requires a discussion of environmental issues in both management accounting and financial accounting as these two systems provide the foundation for economic information about corporations. In addition, the influence of environmental management on corporate financial performance is assessed through the concept of shareholder value because this is an important measure of economic success. Both of these links provide measures of corporate eco-efficiency.

The main information management concepts related to the second aspect, the measurement of environmental impacts, are internal and external ecological accounting and life-cycle assessment. Ecological accounting, as developed in this book, is viewed as the application of the principles and methods of conventional accounting to the collection, classification, analysis and communication of environmental impacts measured in biophysical terms. Ecological accounting provides a major foundation for physical information systems relating to sustainable development. Life-cycle assessment is product-focused and measures environmental impacts in physical terms over the entire life of any given product.

Finally, a link is made between environmental management systems and environmental accounting. Accountability relationships between a corporation and its stakeholders form the focal point of this link. Central to accountability relationships is the development of communication media to make corporate environmental accounting transparent to outside parties. Environmental reporting and independent environmental assurance services hold the key to the development of successful accountability interrelationships.

Parts 2–4 of this book examine aspects of environmental accounting related to eco-efficiency, sustainable development and, finally, accountability.

In Part 2 (Chapters 5–8) we consider the implications of incorporating environmental issues in conventional accounting systems: that is, the implications for management,

financial and other accounting systems. The term 'environmental accounting information' is used to refer to information about the environment expressed in financial terms.

In Chapter 5 we provide an overview of the benefits and costs of pursuing or neglecting corporate environmental protection and examine criticism and advantages of conventional accounting.

In Chapter 6 environmental issues in management accounting are discussed in considerable depth. Management accounting measures and reports financial and other types of information that assist managers in fulfilling the goals set for their organisation or organisational unit (Horngren *et al.* 2000: 2). Management accounting information systems are assumed to provide information about formulation of overall strategies and long-range plans; internal resource allocation; cost control of operations and activities; and performance measurement and evaluation of people. Consequently, this chapter examines the financial aspects of environmental impacts on management accounting information systems, including investment appraisal. After a review of the conventional management accounting approach to incorporating financial aspects of environmental impacts, a method of activity-based costing using material and energy flows is proposed.

The development of financial accounting standards related to environmental issues, including environmental assets and liabilities, is reviewed in Chapter 7 within the context of financial reporting.

In Chapter 8 we examine other environmental accounting systems and investigate links between environmental management and shareholder value. This analysis provides a systematic framework as well as indications about how corporate environmental protection should be characterised to enhance the value of a company.

Part 3 (Chapters 9–12) deals with ecological accounting systems, where the environmental impacts of the company on the natural environment are identified and measured, and where data are expressed in physical units (Chapter 9). The term 'ecological accounting systems' is used to refer to information about the environment expressed in biophysical terms. Part 3 explores the notion that goals need to be established about the ecological impacts of an organisation's activities and that accounting information is required in order to establish whether the set goals are achieved. The main emphasis is on provision of a set of accounting information that will allow measurement of the effectiveness of an organisation in achieving its goals for ecological impacts.

In addition, in Part 3, a measure of 'environmental impact added' (EIA) is introduced as an important component of the assessment of eco-efficiency. EIA is seen to be the denominator in an eco-efficiency ratio. Methods of environmental information management have to provide relevant and accurate information on environmental impacts for the least possible cost. Thus, corporate attempts to achieve sustainable development and eco-efficiency can be improved by increasing the relevance and reliability of environmental information provided and/or by reducing the costs of collecting, analysing and communicating this information.

Life-cycle assessment (LCA) was the first, and is still the most frequently used, approach to environmental information management. By using a graphical model, we analyse the efficacy and efficiency of LCA. Based on theoretical argument and supported by examples used within the context of LCAs, analysis shows that information created with

the current approach to LCA is of poor quality and, in fact, of little value for decision-making and accountability purposes. The relevance of data quality and site-specific information for environmental management are seen to be important, even though managers are mostly unaware of these issues. The structure of ecological accounting corresponds to that of conventional accounting and a distinction is made between internal, external and other ecological accounting systems (Chapters 10–12). A set of core principles for ecological accounting is identified.

Given the relevance of site-specific information, internal ecological accounting is discussed in detail in Chapter 11. The main concerns of internal ecological accounting are related to the classification, recording, assessment and allocation of environmental impacts for a company and its various production sites (Sections 11.3–11.5). Investments in pollution prevention, designed to reduce environmental impacts, and the creation of environmental indicators are also addressed in this chapter (Sections 11.5 and 11.6), followed by a discussion of whether discounting projected environmental impacts might be a useful approach to measure the net present value of expected future environmental impact added (Section 11.7 and 11.8).

In Chapter 12 we examine external ecological accounting—the gathering of information and reporting to external stakeholders about environmental impacts as part of a company’s accountability process. The main thrust of Chapter 12 is on environmental reporting to these stakeholders in a way that is equitable to the producers and users of information. Analysis of the current practice of reporting environmental impacts shows that much of the quantitative information in today’s corporate environmental reports is quite meaningless. Hence some basic rules are introduced to help improve the information value in external ecological accounting and the reporting of corporate environmental impacts (Sections 12.3 and 12.4).

Part 4 (Chapters 13–15) begins with a discussion of how economic and environmental information can be integrated to help organisations effectively achieve their ecological and economic goals, while operating in an eco-efficient manner as shown by eco-efficiency indicators (Chapter 13). The purpose of eco-efficiency indicators is to operationalise eco-efficiency at the corporate level. Chapter 13 concludes with a section on benchmarking (Section 13.4).

In Chapter 14 the link between environmental accounting and environmental management systems is established. This chapter includes discussion about the concept of eco-control in the context of environmental accounting and shows how the resulting figures can be used for improved strategic decision-making and accountability. It also demonstrates how the management of eco-efficiency-oriented information can become part of the corporate environmental management system and considers specific issues related to redesign of existing accounting and reporting systems.

The book concludes with a summary and outlook for the future of environmental accounting (Chapter 15).

## Questions

1. Explain how the notions of effectiveness, efficiency and equity are related to decision-making, sustainable development and accountability.
2. What is the difference between an accountant and an accountee? Is it important for the needs of both to be taken into account when designing an accounting system? Provide reasons for your view.
3. Environmental accounting systems have been proposed for sovereign nations as well as for companies. Consider how a macro (national) and a micro (company) view of environmental accounting might differ.
4. Why is a distinction made between conventional accounting and ecological accounting?