

Environmental Accounting: A Review of Some Specific Accounting Issues

Tilak Ch Das
Assistant Professor,
Department of Commerce,
Gauhati University.

Abstract

Environmental accounting is a critical aspect of sustainability reporting, allowing companies to measure and report on their environmental impact and associated financial costs. This paper presents a review of environmental accounting, including the history and development of the field, the methods and techniques used for identifying and reporting environmental costs and liabilities. Overall, this review highlights the importance of environmental accounting for promoting sustainable business practices and corporate social responsibility, and underscores the need for continued research and development in this area to address the complexities of environmental management and reporting.

Key words: Environmental Accounting and Reporting(EAR), International Financial Reporting Standard(IFRS), International Accounting standard.

Introduction:

Environmental accounting is important for organizations because it helps them understand and measure their environmental impacts, costs, and risks. By identifying and reporting on their environmental performance, organizations can improve their resource efficiency, reduce their environmental footprint, and enhance their reputation with stakeholders.

Environmental accounting is also important for legal compliance, as environmental regulations and laws are becoming increasingly strict and complex. Organizations that implement environmental accounting can reduce the risk of non-compliance and avoid fines and legal penalties. Moreover, environmental accounting can help organizations identify cost savings opportunities by improving resource efficiency, reducing waste, and avoiding fines and penalties. This can lead to significant cost savings over time, which can benefit both the organization and the environment. Environmental accounting can also be used as a tool for risk management, as it helps organizations identify and manage environmental risks, such as supply chain risks, reputational risks, and regulatory risks. By measuring and reporting on their environmental impacts, organizations can develop strategies to mitigate those risks and improve their resilience to environmental challenges. Overall, environmental accounting is important for organizations that want to demonstrate their commitment to sustainability and enhance their competitive advantage. It helps them understand and manage their environmental impacts, costs, and risks, and improve their environmental performance over time.

Since Mid 1990s some professional bodies in USA, UK, Belgium, Denmark and Australia have started taking some initiative in this regard, but they are still in the process of examining the need for a separate conceptual frame work or guidelines on environmental Accounting and reporting.

Objective of the study:

The broad objective of the study is to examine the various conceptual and theoretical considerations involved in Environmental Accounting & Reporting.

Methodology:

Study is based primarily on Secondary data. The data has been collected from the books on accounting, environmental accounting and reporting views and recommendations of various professional accounting bodies and committees on social and environmental reporting; articles published in this area in different national and international journals etc.

Environmental Accounting

The International Federation of Accountants (IFAC) defines environmental accounting as "the identification, measurement, and communication of information about environmental costs, liabilities, and performance"

The Institute of Management Accountants (IMA) defines environmental accounting as "the identification, measurement, analysis, and interpretation of environmental costs and liabilities to assist management in measuring and improving environmental performance" (IMA, 1991).

The United Nations Environment Programme (UNEP) defines environmental accounting as "a tool for integrating environmental costs and benefits into decision-making processes" (UNEP, 2001).

The European Commission defines environmental accounting as "the identification, measurement and reporting of environmental costs and revenues in the regular financial reporting and decision-making processes of an organisation" (European Commission, 2001).

These definitions highlight the key elements of environmental accounting, including the identification, measurement, analysis, and reporting of environmental costs, liabilities, and performance. Environmental accounting aims to integrate environmental considerations into decision-making processes, and to help organizations measure and improve their sustainability performance.

Gray, Bennington, and Walters (1993) defined environmental accounting as "the identification, measurement, and communication of information about environmental costs and performance to a range of interested parties." They emphasized the importance of environmental accounting in providing a more comprehensive view of organizational performance, which includes the environmental impact of organizational activities.

According to Gray et al. (1993), environmental accounting involves the use of financial and non-financial data to track and communicate environmental costs and benefits. Financial data includes direct costs such as energy and resource use, as well as indirect costs such as fines and penalties for environmental non-

compliance. Non-financial data includes environmental performance indicators such as greenhouse gas emissions, water use, and waste generation.

Gray et al. (1993) also emphasized the importance of communicating environmental information to a range of interested parties, including shareholders, customers, regulators, and the general public. They argued that effective communication of environmental information is critical for building trust and credibility with stakeholders, and for demonstrating an organization's commitment to environmental sustainability.

Burritt and Lehman (1995) discussed environmental accounting as a tool for measuring and communicating the environmental costs and benefits of organizational activities. They defined environmental accounting as "the identification, collection, analysis, and dissemination of information about environmental impacts associated with an organization's activities" (p. 53).

According to Burritt and Lehman (1995), environmental accounting involves the integration of environmental data with financial data to provide a more comprehensive view of organizational performance. This includes tracking environmental costs such as pollution control expenditures and waste disposal costs, as well as environmental benefits such as reduced energy consumption and improved resource efficiency.

Burritt and Lehman (1995) also emphasized the importance of environmental accounting in supporting strategic decision-making and environmental management. By providing accurate and relevant environmental information, organizations can identify opportunities for improvement, measure the effectiveness of environmental management strategies, and demonstrate their commitment to environmental sustainability to stakeholders.

Schaltegger and Burritt (2010) explored the evolution of environmental accounting and sustainability reporting, and their integration into corporate social responsibility (CSR) and sustainable development frameworks. They argued that environmental accounting and sustainability reporting have become essential tools for organizations to measure, manage and communicate their environmental and social impacts and performance.

Schaltegger and Burritt (2010) discussed the various approaches to environmental accounting, including traditional cost accounting, full cost accounting, and life cycle costing. They also discussed the development of sustainability reporting frameworks, such as the Global Reporting Initiative (GRI), the Carbon Disclosure Project (CDP), and the United Nations Global Compact (UNGC).

Schaltegger and Burritt (2010) emphasized the importance of integrating environmental accounting and sustainability reporting into organizational strategy and decision-making. They argued that this integration requires a shift from a narrow focus on financial performance to a more comprehensive view of organizational performance that includes environmental and social factors.

Howes (1999) discussed the role of environmental accounting in facilitating sustainable development. He argued that environmental accounting can provide a means for measuring and managing the environmental and social impacts of organizational activities and for promoting greater accountability and transparency.

According to Howes (1999), environmental accounting can help organizations to identify the full costs of their activities, including the environmental and social costs that are often hidden or externalized. This can help organizations to make more informed decisions about resource use, waste reduction, and pollution prevention, and to develop strategies for improving their environmental performance.

Howes (1999) also emphasized the importance of environmental accounting in promoting stakeholder engagement and participation. By providing stakeholders with accurate and meaningful environmental information, organizations can build trust and credibility and enhance their reputation as socially responsible actors.

Finally, Howes (1999) discussed the challenges and limitations of environmental accounting, including the difficulty of measuring and valuing environmental and social impacts, and the need for greater standardization and comparability of environmental accounting data.

Various Professional bodies and other have defined environmental accounting differently. At the corporate level, environmental accounting is sometimes taken as a subset of social accounting.

Environmental accounting and reporting are important tools that organizations can use to track and communicate their environmental impact, and to identify opportunities for improvement. These tools provide a systematic way to measure and report on environmental performance, and to integrate environmental considerations into financial decision-making.

Environmental accounting is the process of identifying, measuring, analyzing and reporting environmental costs and benefits in a company's financial accounts. The goal is to provide a more comprehensive view of a company's financial performance that includes its environmental impact. Environmental accounting can help companies to identify and manage their environmental risks, track their progress towards environmental goals, and make more informed decisions about resource allocation and investment.

Environmental accounting can be divided into two main categories: external and internal. External environmental accounting refers to the reporting of environmental costs and benefits to external stakeholders, such as shareholders, customers, and regulators. Internal environmental accounting, on the other hand, refers to the use of environmental information within an organization to support decision-making, planning, and control.

Environmental reporting is the process of communicating a company's environmental impact to its stakeholders. This can include both quantitative data, such as greenhouse gas emissions, water use, and waste generation, as well as qualitative information, such as environmental policies and initiatives. The goal of environmental reporting is to increase transparency and accountability, and to demonstrate a company's commitment to sustainability.

Environmental reporting can take many forms, including sustainability reports, annual reports, and standalone environmental reports. Sustainability reports are typically the most comprehensive, providing information on a company's environmental, social, and governance (ESG) performance. These reports often follow a framework such as the Global Reporting Initiative (GRI), which provides guidelines for reporting on ESG issues.

The concept of environmental accounting and reporting has evolved over time, in response to changing societal expectations and regulatory requirements. In the past, environmental accounting and reporting were primarily focused on compliance with environmental regulations.

One key driver of this shift has been the growing recognition of the importance of sustainability to business success. Companies are increasingly aware that their environmental impact can have a significant impact on their reputation, their relationships with stakeholders, and ultimately their bottom line. By taking a proactive approach to environmental management, companies can reduce their environmental risks, improve their resource efficiency, and differentiate themselves from competitors.

One of the most widely recognized sustainability reporting frameworks is the Global Reporting Initiative (GRI). The GRI provides guidelines for reporting on a range of environmental issues, including environmental impact. The GRI framework includes a set of indicators that companies can use to report on their environmental performance, including indicators related to energy use, water use, and greenhouse gas emissions.

In conclusion, environmental accounting and reporting are important tools for companies that are committed to sustainability. These tools can help companies to identify and manage their environmental risks, track their progress towards environmental goals, and communicate their environmental impact to stakeholders. By taking a proactive approach to environmental management and reporting, companies can reduce their environmental risks, improve their resource efficiency, and differentiate themselves from competitors.

The term environmental accounting has many meanings and uses; it can support national Income accounting, financial accounting or management accounting. Environmental protection Agency (EPA) of USA has explained environmental accounting at these 3 levels.

Types of Environmental accounting	Focus	Audience
1) National Income accounting	Nation	External
2) Financial Accounting	Firm	External
3) Management Accounting	Firm, Division, Facility, Product line or System	Internal

Source: (EPA An introduction to Environmental accounting as a Business Management Tool. US EPA, 1995)

(1) National Income Accounting: - It is a macroeconomic measure. In this context environmental accounting has been termed as natural resource accounting.

2) Financial Accounting: - It enables companies to prepare financial reports for use by investors, lender and others. Here GAAP are the basis for reporting. Environmental accounting in this context refers to the estimation and public reporting of environmental liabilities and financially material environmental costs.

3) Management Accounting: - It is the process of identifying, collecting and analyzing information principally for internal purpose. The key purpose of management accounting is to support the management in decision making. It serve business managers in making capital investment decision, costing determinations, process/product design and decisions , performance evaluation, and a host of other forward looking business decisions.

Just as management accounting refer to the use of a broad set of cost and performance data by a company's managers in making a business decisions, environmental accounting in this context refers to the use of data about environmental costs and performance in business decisions and operations.

“Environmental accounting is an important management tool that can be used for a number of purposes. It can improve environmental performance, control costs, help invest in "cleaner" technologies, help develop "greener" processes, and inform management decisions about product.”(U S EPA).

United Nation Expert Working Group on EMA and United Nation division for sustainable development (2001) which highlights both the physical and monetary side of EMA, broadly defines EMA as the “identification, collection, analysis and use of two types of information for internal decision making

namely: physical information on the use, flood and destinies of energy, water and materials (including wastes) and monetary information on environmental related costs, earnings and savings.”

Issues involved in Environmental Accounting

Some of the specific issues related to environmental accounting

- **Valuation of Environmental Impacts:** Another critical challenge in environmental accounting is the valuation of environmental impacts. Measuring the economic value of environmental impacts such as air pollution, water pollution, and habitat destruction is complex and often subjective. The lack of a standardized valuation framework can make it challenging to compare the environmental performance of organizations across sectors and regions (Gibson and Guthrie, 1995).
- **Scope and Boundaries:** Defining the scope and boundaries of environmental accounting is another significant challenge. Organizations often face difficulties in determining which environmental impacts to include in their reporting, which can affect the accuracy and comparability of their environmental performance data (Deegan and Gordon, 1996).
- **Integration with Financial Reporting:** Integrating environmental accounting with financial reporting is another challenge. Organizations must determine how to integrate environmental performance data into financial statements effectively. This can be difficult, given the different measurement and valuation approaches used for environmental and financial data (Gray et al., 1995).
- **Legal and Regulatory Frameworks:** Organizations must comply with various legal and regulatory frameworks related to environmental accounting and reporting. These frameworks can be complex and vary significantly across jurisdictions, making it challenging for organizations to develop standardized reporting practices (Bebbington et al., 2008).
- **Stakeholder Expectations:** Stakeholders increasingly expect organizations to report on their environmental performance. However, stakeholders can have varying expectations and interests, which can create challenges for organizations in developing relevant and meaningful environmental reporting practices (Guthrie and Parker, 1990). Moreover implementing environmental accounting systems can be resource-intensive, requiring investments in data collection, reporting systems, and employee training. Smaller organizations may face challenges in developing and implementing environmental accounting systems due to limited resources

Some specific Accounting Issues

1. Identification of environmental cost

Identification of environmental costs is a critical step in environmental accounting, which involves measuring and reporting the environmental impacts of an organization's operations. Environmental costs can be broadly defined as the costs incurred by an organization as a result of its environmental impacts.

The U.S. EPA has classified environmental cost incurred by a firm as shown in the Table below:-

1.	Potential Hidden Costs		
	<u>Regulatory</u>	<u>Upfront</u>	<u>Voluntary</u> (Beyond compliance)
	Notification	Site studies	Community relations/ outreach
	Reporting	Site preparation	Monitoring/testing
	Monitoring/Testing	Permitting	Training
	Studies/Modeling	R & D	Audits
	Remediation	Engineering and procurement	Qualifying supplies reports e.g., annual environmental reports)
	Record keeping	Installation	Insurance
	Plans		Planning
	Training	2. Conventional Costs	Feasibility studies
	Inspections	Capital equipment	Remediation
	Manifesting	Materials	Recycling
	Labeling	Labour	Environmental studies
	Preparedness	Supplies	R & D
	Protective equipment	Utilities	Habitat and wetland protection
	Medical surveillance	Structures	Landscaping
	Environmental	Salvage values	Other environmental projects
	Insurance	<u>Back-End</u>	Financial support to environmental groups and/or researchers
	Financial assurance	Closure/ decommissioning	
	Pollution control	Disposal inventory	
	Spill response	Post-closure care	
	Storm water	Site surveys	
	Management		
	Waste management		
	Taxes/fees		
3.	Contingent Costs		
	Future compliance costs	Remediation	Legal expenses
	Penalties/fees	Property damage	Natural resource damages
	Resource to future releases	Personal injury damage	Economic loss Damages
4.	Image and Relationship Costs		
	Corporate image	Relationship with professional staff	Relationship with lenders
	Relationship with customers	Relationship with workers	Relationship with host communities
	Relationship with investors	Relationship with suppliers	Relationship with regulators
	Relationship with insurers		

Source: U.S EPA (1995). *An Introduction to Environmental Accounting as a Business Management Tool: Key Concepts and Terms*, Office of Pollution Prevention and Toxics.

The success of environmental accounting does not depend on "correctly" classifying all the costs a firm incurs. Rather, its goal is to ensure that relevant information is made available to those who need or can use it (US EPA). The concept of environmental Accounting requires a segregation of costs which are identifiable with environmental pollution, degradation, detection, prevention and remediation.

The identification of environmental costs is a critical step in environmental accounting, as it helps organizations measure and report their environmental impacts accurately. The methods discussed above can help organizations identify the different types of environmental costs and prioritize their environmental management efforts accordingly. By identifying and managing their environmental costs effectively, organizations can improve their environmental performance, reduce their environmental impacts, and enhance their reputation among stakeholders.

United Nations Conference on Trade and Development, Guidance Manual for Accounting and Financial Reporting for Environmental costs And Liabilities 2002 recommend that:

a) *Environmental costs should be recognized in the period in which they are first identified it should be charged to income in the period in which they are identified.*

b) *If the environmental costs meet the criteria for recognition as an asset, they should be capitalized.*

An asset is a resource controlled by an enterprise arising from past events and from which future economic benefits are expected to (directly or indirectly flow to the enterprise).

Environmental assets are environmental costs that are capitalized because they satisfy the criteria for recognition as an asset.

c) *Environmental cost should be capitalized if they relate directly or indirectly, to future economic benefit that will flow to the enterprise through:*

- *Increasing the capacity or improving the safety or efficiency of other assets owned by the enterprise.*
- *Reducing or preventing environmental contamination likely to occur as a result of future operation.*
- *Conserving the environment.*

Some cost may not directly increase economic benefits to the enterprise but may be necessary if the enterprise is to benefits from its other assets for example, removal of asbestos from building. It would be inappropriate to recognize asbestos removal as a separate asset as it does not result in a separate future economic benefit. Alternatively, a piece of machinery that removes pollution from the water or atmosphere has a specific or separate future benefit and therefore should be recognized separately.

d) *Environmental costs that do not meet the criteria for recognition as an asset should be charged to profit and loss account.*

Many environmental costs do not result in a future benefit or are not sufficiently closely related to future benefit to enable them to be capitalized.

For example environmental cost that may be expensed.

- *The treatment of waste product*
- *The cleanup costs relating to current operating activities.*
- *The cleanup of damage incurred by the reporting enterprise itself in prior period.*
- *Ongoing environmental administration.*
- *Environmental audit.*

- *Fines and penalties for non compliance with environmental regulation.*
- *Compensation to third party for environmental damage.*

The primary difference between those bodies which have issued guidance on defining environmental cost is whether cost, penalties and compensation to third parties relating to environmental activities or inactions should be included in the definitions of environmental cost/ expenditure. Fines, penalties and compensation are different from other types of environmental cost in that they provide no benefit or return to the enterprise- separate disclosure is therefore appropriate.

e) When an environment cost that is recognized as an asset is related to another asset, it should be included as an integral part of another asset and not recognized separately.

f) When an environment cost is capitalized and included as an integral part of another asset, the combined asset should be tested for impairment and where appropriate written down to its recoverable amount.

Similarly, capitalized cost recognized as separate assets should also be tested for impairment. (UNCTAD, 2002)

The decision to capitalize or expense environmental costs can have a significant impact on an organization's financial statements and sustainability reporting, and thus it is essential to consider all relevant factors

Environmental Liabilities

In accounting, liabilities refer to an organization's legal obligations or debts that must be paid back to creditors or third parties in the future. Liabilities can arise from various sources, such as borrowing money from banks or issuing bonds to investors.

Environmental liabilities refer to an organization's legal obligations or potential costs associated with environmental damage or pollution caused by its operations, products, or services. These liabilities can arise from various sources, such as environmental regulations, legal settlements, and cleanup or restoration costs.

Examples of environmental liabilities include fines or penalties for non-compliance with environmental laws and regulations, costs associated with cleaning up contaminated land or water, and compensation for damages caused by pollution to local communities or ecosystems.

Environmental liabilities can have a significant financial impact on organizations, as they can result in large expenses and negative publicity that can harm their reputation and brand image. Moreover, environmental liabilities can have a long-term impact on an organization's financial performance and sustainability, as they can tie up financial resources that could be used for other purposes and reduce the organization's ability to invest in new projects or growth opportunities.

Contingent environmental liability refers to a potential liability that may arise in the future as a result of an uncertain event or circumstance related to environmental damage or pollution. These liabilities are uncertain because they depend on the occurrence of a future event that is outside of the organization's control, such as a natural disaster or a change in environmental regulations.

Examples of contingent environmental liabilities include potential fines or penalties for non-compliance with future environmental laws and regulations, the cost of cleaning up contaminated land or water that

may be discovered in the future, and compensation for damages caused by pollution that may be discovered later.

Contingent environmental liabilities can have a significant impact on an organization's financial performance and sustainability, as they can tie up financial resources that could be used for other purposes and reduce the organization's ability to invest in new projects or growth opportunities

contingent environmental liabilities are an important consideration for organizations that want to demonstrate their commitment to sustainability and enhance their long-term financial performance. By managing their contingent environmental liabilities, organizations can reduce their environmental impact, comply with current and future environmental regulations, and improve their reputation and financial sustainability over time.

Estimating environmental liabilities requires a comprehensive analysis of various factors, including the nature and extent of environmental contamination, the potential costs of cleanup and restoration, the likelihood of third-party claims or legal actions, and the potential impact on the organization's financial statements and reputation. The following are some key factors to be considered:

- The nature and extent of environmental contamination: The type and severity of environmental contamination can have a significant impact on the estimated cost of remediation. The location, size, and depth of the contamination, as well as the type of pollutants involved, should be carefully analyzed.(AICPA, 1994)
- Applicable environmental laws and regulations: Organizations must consider the specific environmental laws and regulations that apply to their operations and the potential costs of compliance. Failure to comply with these regulations can result in penalties and fines.(US EPA)
- Third-party claims and legal actions: Organizations must consider the potential for third-party claims or legal actions related to environmental contamination. These claims can result in significant costs, including legal fees, fines, and damages.(US EPA)

United Nations Conference on Trade and Development, Guidance Manual for Accounting and Financial Reporting for Environmental costs And Liabilities 2002 recommend that

a) Where environmental damage relates to the enterprise's own property, or to environmental damage to other property caused by enterprise operation or activities for which there is no legal obligation on the enterprises part to rectify (due to the absence of an obligation at the balance sheet date) the extent of the damage should be disclosed in the notes to the financial statement or in a section outside the financial statements.

b) When there is reasonable possibility that such damage may have to be rectified in some future period a contingent liability may have to be disclosed.

c) Cost relating to site restoration or the closure or removal of long lived assets which the enterprise is under an obligation to incur should be recognized as an environmental liability at the time of identifying the need to undertake the remedial action relating to such site restoration, closure or removal and not deferred until the activity is completed or the site is closed.

d) In the case of long term decommissioning costs, however an enterprise may choose to provide for such costs over the life of the related operations.

e) Under IAS 37 (effective July, 1999) it is no longer possible to spread such costs over the life of the operation (extraction) or a deferred cost until the activity is completed or the site is closed. The purpose of this development is to highlight the need to recognize an environmental liability at the time the damage is caused and need for future restoration is required.

f) Future site restoration costs which relate to damage incurred in prior periods which were necessary to prepare an asset or activity for operation and which are recognized as an environmental liability at the time the related damage is incurred (identified) should be capitalized (and amortized to the income statement over the life of the related operations).

g) When there is difficulty estimating the amount of an environmental liability a reasonable estimate should be provided. Details of how the estimates was made should be disclosed in the notes

h) The estimates may be based on information that provides a range of loss and the best estimate within the range should be provided. Where it is not possible to arrive at a best estimate at least to minimum estimate should be recognized.

i) It would be rare situation when no estimates can be made. In such a case, the fact that no estimates can be provided, and the reasons therefore should be disclosed in the notes to be financial statements.

- Liabilities not settled in the near term

A number of approaches have been proposed for measuring liabilities relating to future site restoration, or closure and removal, cost and of other situation where expenditures relating to the settlement of the liability are not expected to be incurred for a considerable period of time.

a) For environmental liabilities that will not be settled in the near term ISAR expressed a preference for measuring the liability at the present value of the estimated future expenditures that will be needed, based on current cost of performing the required activities and existing legal and other requirement.

b) The present value approach which ISAR considers to be the preferred approach, the liability is measured at the present value of the estimated future expenditure that will be needed. The discount rate to be used should be risk free rate, such as the rate of govt. Securities

c) Measuring the liabilities at the full current cost amount is also considered acceptable. (UNCTAD)

Environmental liabilities are an important consideration for organizations that want to demonstrate their commitment to sustainability and enhance their long-term financial performance. By managing their environmental liabilities, organizations can reduce their environmental impact, comply with environmental regulations, and improve their reputation and financial sustainability over time.

Future recommendations on environmental accounting and reporting include the adoption of integrated reporting, recognition of Environmental costs, Assts and liabilities, and assurance of environmental information. These practices can improve stakeholder engagement, demonstrate a company's commitment to sustainability, and ensure the accuracy and reliability of environmental information.

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