

ENVIRONMENTAL ACCOUNTING – NECESSITY IN THIS DYNAMIC BUSINESS ENVIRONMENT

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Abstract

In current era of highly volatile business environment organizations are facing emerging challenges in environmental issues and this environment become major interest area of corporate social responsibility (CSR) and social and environmental accounting (SEA) among business, Governments, public policymakers, investors, unions, environmentalists and corporate and industrial houses in today's word. In order to sustain in this competitive world most of the industrial and corporate houses globally are incorporating the concept of environmental element in their daily business operations. Numerous movements towards protecting environmental pollution and environmental degradation helped to grow an awareness of the value of the world in which we live, and our obligations to it. As that awareness grew, the public and industry alike began to see the potential for major environmental problems. This realization brought environmentalism into the world of business. In recent years everyone in world have witnessed increasing concern for environmental degradation and degeneration, because of pollution of various types, viz. air, water, sound, soil erosion, deforestation, etc. which leads to spoils human health, reduces economic productivity and loss of amenities. Today businesses face a ladder of environmental regulations and industries from manufacturing to technology must now consider their ecologic and social impact. Financial health and profitability seldom happen by accident, and without proper planning and foresight, navigating environmental legislation and social reporting could drain a business dry. The present research paper concentrates on exploring the concept of environment accounting (green accounting) and its practices, cost benefit analysis, problems and reporting along with that current literature focuses on environmental sustainability and lacks quantitative ways to make capital budgeting decisions at corporate level in India. This paper also focus on the insight view about the cause and effects of environment pollution on human by diseases and problems, animals and trees/plants and how corporate and industrial houses deal with this by taking remedial steps. According to author, time is still left in the hands to use the advance resources to balance the environment for living and initiates the breathed intellectuals to live friendly with environment.

Key Words: Green Accounting System, Resource Accounting, Environment, Protection, Accounting, Environmental Cost Benefit analysis

1.0.Introduction:

Accounting serves several functions in an enterprise. One, financial accounting, is a score keeping and reporting tool; a standardized means for compiling and communicating financial information to external audiences. Another, management accounting, is supplying information that helps managers to plan and control enterprise activities, and to evaluate performance of an enterprise, both profitability performance and environmental performance. This includes complete systems for identifying, monitoring, and reporting corporate environmental impacts, and for integrating those impacts into corporate decisions on product costing, product pricing, capital budgeting, product design, and performance evaluation. Responsibility towards environment has become one of the most crucial areas of social responsibility. Recent years have witnessed rising concern for environmental degradation, which is taking place mainly in the form of pollution of various types, viz. air, water, sound, soil erosion, deforestation, etc. It is a worldwide phenomenon. It spoils human health, reduces economic productivity and leads to loss of amenities. The developing countries like India are facing the twin problem of protecting the environment and promoting economic development. A tradeoff between environmental protection and development is required. A careful assessment of the benefits and costs of environmental damages is necessary to find the safe limits of environmental degradation and the required level of development.CSR (corporate social responsibility) is a concept which considers that how much company spends on social purpose and human resource and environment. The growing influence of CSR on the development of financial accounting and management accounting is visible from few decades. When there are few companies in USA which were accused for causing social problems, they are called and find a solution of this, then CSR accounting born. CSR accounting worked in the field of external and internal reporting so that all relevant parties could get relevant information on the social outcomes of given companies economic activities. Green accounting is a type of accounting that attempts to factor environmental costs into the financial results of operations. It has been argued that gross domestic product ignores the environment and therefore decision makers need a revised model that incorporates green accounting. In this scenario where environmental pollution is increasing day by day, environmental accounting not only has financial impact but also it has environmental and social impact. The CSR concept is extremely broad in cover responsibility of human resource, local community, society etc.

Today an increasing number of companies and other organizations are engaging in environmental management as part of their management strategies to specify measures for dealing with environmental issues and to internally carry out environmental conservation activities. Environmental accounting is a tool to supplement environmental management. Environmental accounting data is not only used by companies or other organizations internally, but is also made public through disclosure in environmental reports. The disclosure of environmental accounting data as one of the key elements in an environmental report enables those parties utilizing this information to get an understanding of the company's stance on environmental conservation and how it specifically deals with environmental issues. At the same time, a more comprehensive grasp of the companies and other organizations' environmental information can be obtained.

2.0. Research Methodology

Being an explanatory research it is based on secondary data collected from various books, national and international Journals, government reports, articles, newspapers and magazines, publications from various websites which focused on various aspects of environmental accounting and environmental reporting guidelines, rules and regulations. Considering the objectives of study descriptive type and informative type research design is adopted to have more accuracy and rigorous analysis of research study.

3.0. Literature Review

3.1.Necessity of Environmental Accounting

Accounting for environment has become increasingly relevant to enterprises because issue of the availability of natural resources and pollution of the environment has become the subject of economic, social and political debate throughout the world. Steps are being taken at the national and international level to protect the environment and to reduce, prevent and mitigate the effect of pollution. As a result there is a trend for the enterprise to disclose the community large data related to environment policies, environment management programmes and the impact of environment performance on their financial performance. The quantitative management of environmental conservation activities is an effective way of achieving and maintaining sound business management. In other words, in carrying out environmental conservation activities, a company or other organizations can accurately identify and measure investments and costs related to environmental conservation activities, and can prepare and analyze this data. By having better insight into the potential benefit of these investments and costs, the company can not only improve the efficiency of its activities, but environmental accounting also plays a very important role in supporting rational decision-making. In addition, companies and other organizations are required to have accountability to stakeholders, such as consumers, business partners, investors and employees, when utilizing environmental resources, i.e. public goods, for their business activities. Disclosure of environmental accounting information is a key process in performing accountability. Consequently, environmental accounting helps companies and other organizations boost their public trust and confidence and are associated with receiving a fair assessment.

The environmental accounting and reporting is a proposed discipline that deals with the consideration, and ultimately the inclusion into the customarily accounting procedures, general and specific issues related to environmental and social impacts, regulations and restrictions. Safe, environmentally sound, and economically viable energy production and supply policies should be essential part of any accounting and management issues. The start of this proposed consideration and inclusion of EA/ER should be in college syllabi in the form of collateral reading assignments, case studies and public and scientific student awareness in intermediate and advanced accounting courses in order to explore current state and future issues of environmental accounting and reporting.

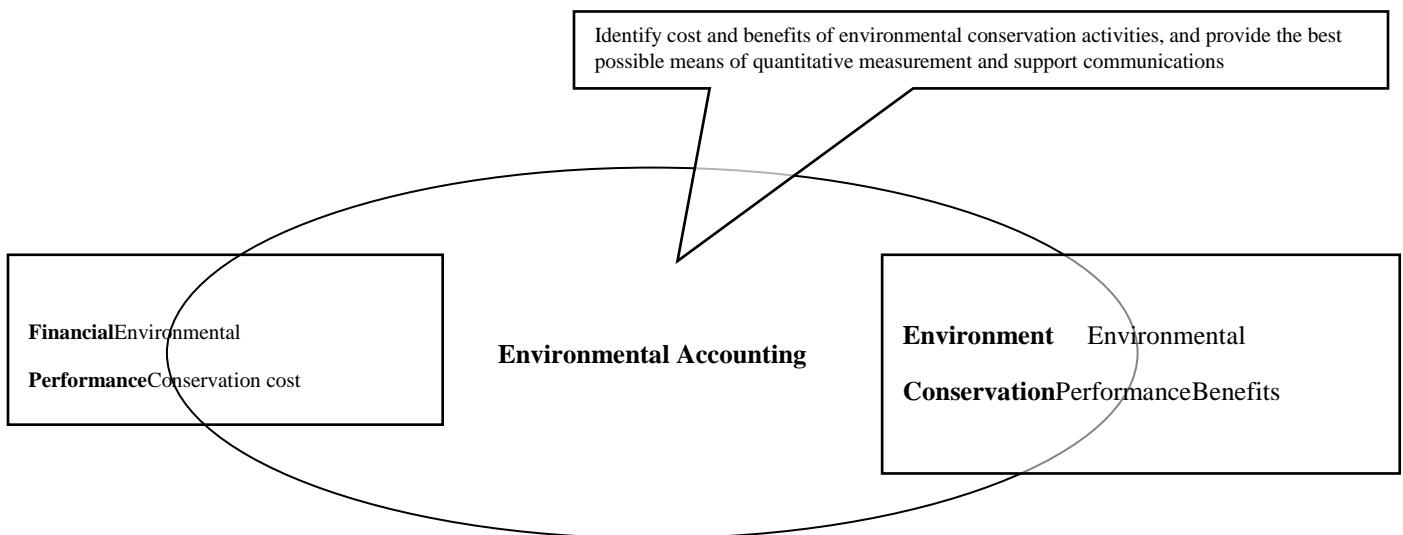
3.2.Environmental Accounting under These Guidelines

There are many dimensions to environmental accounting.

- Environmental accounting covers two distinct contexts. It can be used to provide insight on the interaction between the environment and a nation or region, or can target the activities of a company or other organization.
- Environmental accounting, within the framework of these guidelines, mainly focuses on companies and other organizations. Herein the term company refers not only to private corporations but also includes such organizations as public interest companies and municipal governments.
- Information obtained from environmental accounting by companies is given in two forms: monetary value and physical units. Explanations accompany all numerical figures.

Environmental accounting, as described within these guidelines, is composed of three key facets:

Environmental conservation cost (monetary value), environmental conservation benefits (physical units), and the economic benefit associated with environmental conservation activities (monetary value). Put in other words, environmental accounting is structured to identify, measure and communicate a company's activities based on its environmental conservation cost or economic benefit associated with environmental conservation activities, the company's financial performance which is expressed in monetary value, and its environmental conservation benefits, the organization's environmental performance, which is designated in physical units.



3.3. History of environmental accounting

The first environmental accounts were constructed in several European countries working independently of each other. Norway was one of the first. Influenced by the publication of Limits to Growth (Meadows et al. 1972) and a burgeoning environmental movement, Norwegian officials were concerned that their natural resources, on which their economy is relatively dependent compared with other European countries, would run out. They, therefore developed accounts to track use of their forests, fisheries, energy, and land. In the 1980s, they developed accounts for air pollutant emissions, which were closely tied to the energy accounts. The energy accounts were integrated into models used for macroeconomic planning, taking into consideration the roles of resource-based sectors in economic growth. The Netherlands was also a leader in the development and adoption of environmental accounting. Dutch interest in this area originated with the work of Roefie Hueting, who developed and sought to implement a measure of sustainable national income that would take into account the degradation and depletion of environmental assets resulting from economic activity. Although his approach was not implemented at that time, his work led the national income accountants to develop the national accounts matrix including environmental accounts (NAMEA), which builds on portions of the national income accounts by adding physical data on pollutant emissions by sector. The NAMEA approach has been adopted by Eurostat, implemented in many other European countries, and integrated into the environmental accounting procedures developed. France was a third early adopter of environmental accounting. In the 1980s, it began developing an approach termed the Comptes du patrimoine, or patrimony accounts. These involved an integrated system structured around three distinct, but linked units of analysis.

First natural, cultural, and historical resources were to be measured in physical terms and their stocks and flows quantified. Second, places were to be organized into geographic accounts, giving physical data about assets organized by location and by ecological and land characteristics. Third, people and institutions were to be described in both physical and monetary terms in agent accounts, which were to be linked to data about how and where each agent used resources. Portions of this system were constructed, particularly those focused on forests and water, but its complexity made it difficult to implement fully (Hecht 2000). An accounting effort that had considerable influence on the field was a study of Indonesia undertaken by the World Resources Institute (Repetto et al. 1989). The authors estimated what GDP might have been, had natural resources been depreciated in the same way as manufactured ones. They, then compared trends in conventional GDP with trends in their environmentally adjusted measure over a period of 15 years. The results show that Indonesian growth rates would have been considerably lower with the adjusted GDP than in the conventional accounts. Though widely criticized on technical grounds and rejected by the Indonesian government, this study has been very influential. It was written for a lay audience and distributed widely, and did much to stimulate interest in the field. Another early accounting project took a very different approach. In the late 1980s, US Environmental Protection Agency (EPA) undertook the development of a set of pilot accounts for the Chesapeake Bay region of the eastern United States (Grambsch et al. 1989). This work was led by an economist, Henry Peskin, who felt that the accounts should incorporate the full value of non-marketed goods and services, and that all changes in value of capital should be deducted from gross indicators to calculate net ones, rather than adjusting only for changes attributable to economic activity. Peskin also brought this approach to USAID-funded work in

the Philippines. These accounts, built by the Department of Natural Resources rather than the accounting agency, added in the value of non-marketed services of the environment, subtracted harm caused by pollution, and calculated an environmental NDP by subtracting the depletion of natural capital and adding in both the natural growth of forests and new discoveries of minerals (ENRAP 1999).

3.4.Countries adopting environmental accounting

Norway: Norway was the first country in the world to prepare environmental accounts in the 1970s. It collected data on energy sources, fisheries, forests and minerals to address the issue of resource scarcity. Subsequently, the country had added data on air pollutant emissions in its environmental accounts. After feeding environmental accounting data into the national economy, policymakers in Norway assess the energy implications of alternative growth strategies.

Philippines: The Philippines Environmental and Natural Resource Accounting Project (ENRAP) have been working on environmental accounts since 1993. Treating the environment as a productive sector in the economy, they integrated the valuation of pollution impacts, non-marketed goods and services and other economic aspects of the environment into conventional accounts. Though, this method of preparation of environmental accounts different from SEEA, government agencies and researchers in Philippines get a rich array of data from their accounts for policymaking and analysis.

Namibia: In Namibia, the SEEA approach to environmental accounting has been adopted in a phased manner. It is focused on several key natural resources sector and is designed to answer such questions, as how to allocated water among competing uses and how land degradation, affects the productivity of range land.

Netherlands: in Netherlands, the National Accounting Matrix, including Environmental Accounts (NAMEA), are routinely constructed which is an extended from of National accounts input and output matrix. NAMEA tracks pollution emission by the economic sector and assesses the accomplishment of environmental protection objectives by the country.

Chile: In Chile, the Central Bank undertook the development of environmental accounts that focused on the forest and mineral sectors. These accounts suggest that the country's forest-based development strategy may not be sustainable and hence warrants change in the strategy for sustainable development.

USA: The United States of America has not been a leader in the environmental accounting endeavor. In the beginning of the Clinton Administration, the Bureau of Economic Analysis (BEA) made a foray into environmental accounting in the mineral sector. Opposition from the mineral industry as well as political controversy stood in the way of operational zing environmental accounting in the country. The government then asked the National Research Council (NRC) to from a blue-ribbon panel to consider what the country should do on the environmental accounting front.

JAPAN: In Japan, the Ministry of Environment has issued comprehensive guidelines titled "Environmental Accounting Guidelines-2002" in March 2002, encompassing the definition,

functions, roles, basic dimensions and structural elements of environmental accounting. The guidelines emphatically state that environmental management has to occupy the center stage of management strategy and environmental accounting would work as a vital tool of environmental management. The guidelines also envisage that the environmental conservation cost benefits, including economic benefits associated with environmental conservation activities, are to be measured. Environmental accounting information, both physical as well as monetary units, needs to be disclosed in the environmental report for the benefit of management as well as the general public. According to the guidelines, environmental accounting comprises three key elements, viz., environmental conservation cost (monetary value), environmental benefit (physical units) and the economic benefits associated with environmental conservation activities (monetary value).

4.0.Objectives of the study

Objectives of this research study are listed below

- A. To provide a brief historical overview of the development of environmental accounting system and need of environmental accounting system.
- B. To discuss the concept of environment accounting (green accounting) and its practices which include elements of environmental accounting, recognition of environment cost, assets, liabilities etc. along with that this paper also discuss the concept of the measurement of environmental accounting (green accounting) cost?
- C. To discuss the concept of environmental reporting and historical development of environmental reporting and example of few private sector companies and public companies use environmental reporting along with that cost benefit analysis of a company for environmental reporting.
- D. To investigate steps which needs to be followed for report production.
- E. To discuss discloser requirement of environment cost in companies financial statement?
- F. To discuss how can environmental accounting support business decision making?
- G. To discuss how to start integrating environmental accounting to capital budgeting.
- H. To discuss the problems regarding this environmental accounting system.
- I. To investigates how environmental management accounting has effect to the society.
- J. To discuss about the cause and effects of environment pollution on human by diseases and problems, animals and trees/plants and how corporate and industrial houses deal with this by taking remedial steps.

5.0.Observations and findings

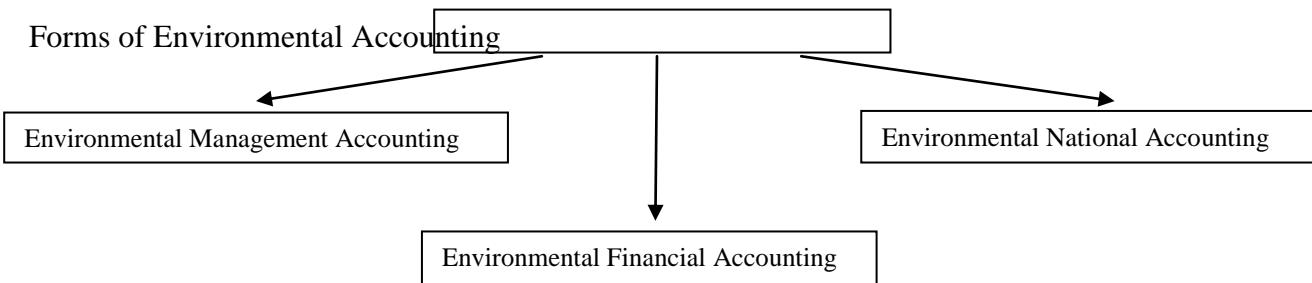
5.1.Green accounting (Environmental accounting)

Environmental accounting, as defined in these guidelines, aims at achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities. These accounting procedures allow a company to identify the cost of environmental conservation during the normal course of business, identify benefit gained from such activities, and provide the best possible means of quantitative measurement (in monetary value or physical units) and support the communication

of its results. Environmental accounting is the practice of using traditional accounting and finance principles to calculate the costs that business decisions will have on the environment. For example, before choosing to close down a manufacturing plant and outsourcing the function to a foreign corporation, a business uses environmental accounting to determine the short- and long-term effects of the decision, such as unemployment in the plant's region. Environmental accounting is often championed as a component of corporate social responsibility.

Herein, environmental conservation is defined as the prevention, reduction, and/or avoidance of environmental impact, removal of such impact, restoration following the occurrence of a disaster, and other activities. The environmental impacts are the burden on the environment from business operations or other human activities and potential obstacles which may hinder the preservation of a favorable environment.

5.2. Form of environment accounting



- (i) **Environmental Management Accounting (EMA)** - Management accounting with a particular focus on material and energy flow information and environmental cost information. This type of accounting can be further classified in the following subsystems:
 - Segment Environmental Accounting: This is an internal environmental accounting tool to select an investment activity, or a project, related to environmental conservation from among all processes of operations, and to evaluate environmental effects for a certain period.
 - Eco Balance Environmental Accounting: This is an internal environmental accounting tool to support PDCA for sustainable environmental management activities.
 - Corporate Environmental Accounting: This is a tool to inform the public of relevant information compiled in accordance with the Environmental Accounting. It should be called as Corporate Environmental Reporting. For this purpose the cost and effect (in quantity and monetary value) of its environmental conservation activities are used.
- (ii) **Environmental Financial Accounting (EFA):** Financial accounting with a particular focus on reporting environmental liability costs and other significant environmental costs.
- (iii) **Environmental National Accounting (ENA):** National Level Accounting with a particular focus on natural resources stocks & flows, environmental costs & externality costs etc.

5.3.Reasons for adopting environmental accounting

Environmental costs are one of the many different types of costs, businesses incur as they provide goods and services to their customers. Environmental performance is one of the many important measures of business success. Organizations use environmental accounting for several reasons, including the following:

- To help managers make decisions that will reduce or eliminate their environmental costs.
- To better track environmental costs that may have been previously obscured in overhead accounts or otherwise overlooked;
- To better understand the environmental costs and performance of processes and products for more accurate costing and pricing of products;
- To broaden and improve the investment analysis and appraisal process to include potential environmental impacts; and
- To support the development and operation of an overall environmental management system.
- Many environmental costs can be significantly reduced or eliminated as a result of business decisions, ranging from operational and housekeeping changes, to investment in “greener” process technology, to redesign of processes/products. Many environmental costs (e.g., wasted raw materials) may provide no added value to a process, system, or product.
- Environmental costs (and, thus, potential cost savings) may be obscured in overhead accounts or Overlooked otherwise
- Many companies have discovered that environmental costs can be offset by generating revenues through sale of waste, by-products or transferable pollution allowances, or licensing of clean technologies, for example.
- Better management of environmental costs can result in improved environmental performance and significant benefits to human health as well as business success.
- Understanding the environmental costs and performance of processes and products can promote more accurate costing and pricing of products and can aid companies in the design of more environmentally preferable processes, products, and services for the future.
- Competitive advantage with customers can result from processes, products, and services that can be demonstrated to be environmentally preferable.
- Accounting for environmental costs and performance can support a company’s development and operation of an overall environmental management system.

5.4.Benefit of environment accounting and reporting

An enterprise which recognize its environmental responsibilities and which institute appropriate and effective systems on environmental management to ensure both competitiveness and compliance will minimize its exposure to future financial risk arising from environmental incidents. At the same time:

- Such as enterprise should be able to secure lower insurance premium, reflecting reduce risk

- A favorable environmental risk rating may secure the enterprise better borrowing terms – either when issue corporate debt or borrowing or when issuing new equity
- Pure compliance cost should not result in market penalty unless an enterprise can demonstrate to be running higher compliance cost than its sector peer.

An enterprise which in addition to recognizing and responding to its statutory environment responsibilities, also determine to be at the leading edge in terms of utilizing environment friendly technologies or moving towards a more sustainable mode of operation should reap additional benefits such as –

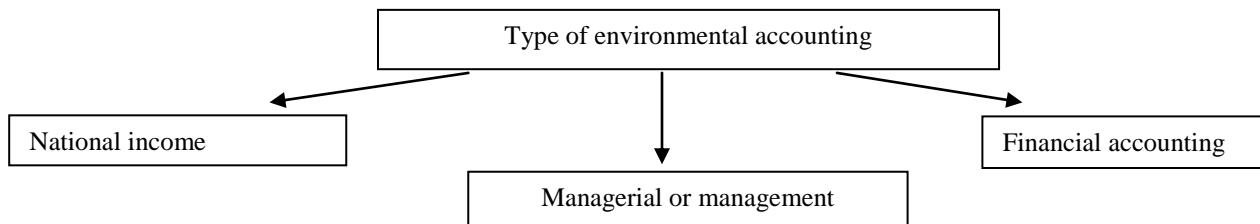
- Increased employee commitments and morality.
- Eliminate green tax, levies and fines
- Lower operating cost and lower disposal cost
- Improve corporate profile
- Increased market opportunities (Including public sector and public procurement opportunities).
- Provide strong focal point for internal EMS development.
- Include the setting and publishing of performance standard which drives continuous development.
- Establish environmental issue as a key policy / strategy element.
- Enable companies to re assure investors / lenders as to environmental risk and corporate environmental engagement.
- Minimize risk of regulatory intervention regarding this issue.
- Provide quality public relation / profiling opportunities.
- Support the audit / reporting culture which will make a company more capable of new development – e.g. social and ethical reporting etc.

5.5.Challenges of Environmental Management Accounting (EMA)

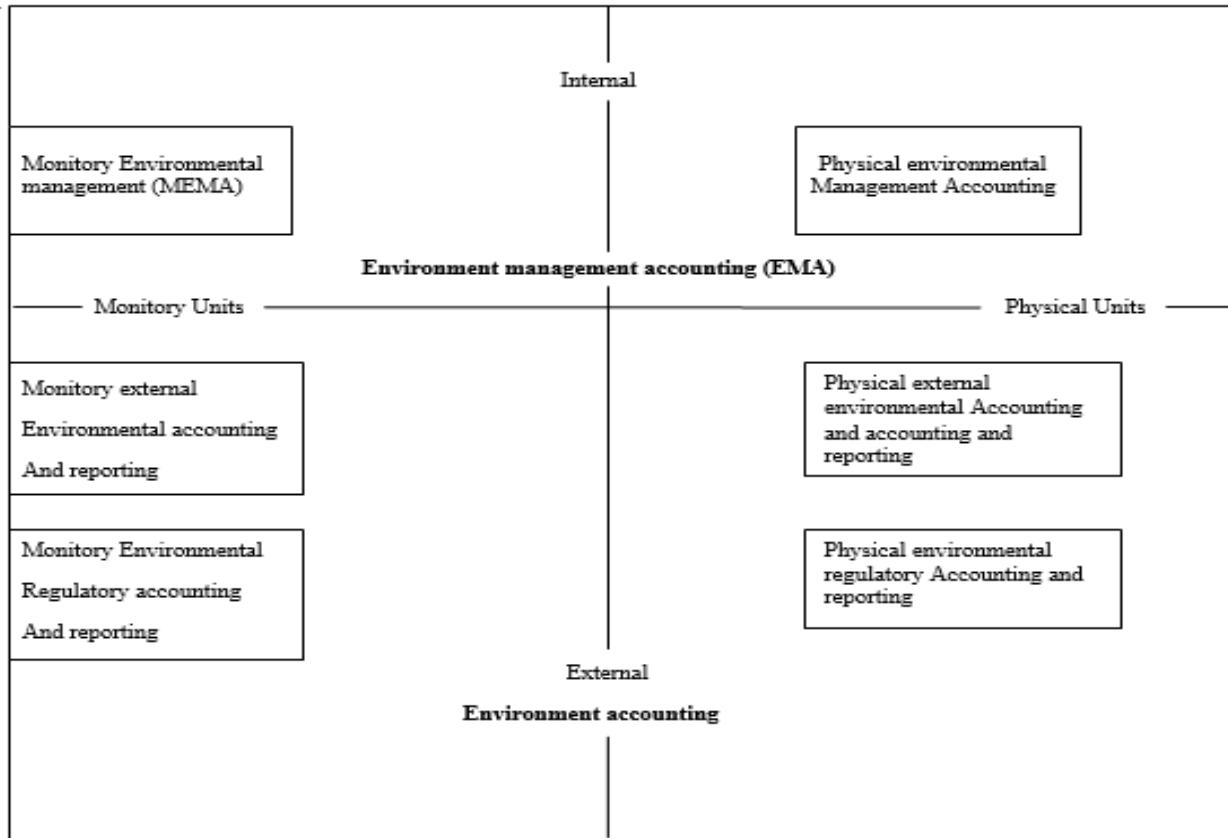
Several limitations of conventional management accounting systems and practices can make it difficult to effectively collect and evaluate environment-related data. These limitations can lead to management decision making being based on missing, inaccurate or misinterpreted information. As a result, managers may well misunderstand the negative financial consequences of poor environmental performance and the potential costs and benefits of improved environmental performance. There are few challenges in environmental management accounting (EMA) –

- Communication/links between accounting and other departments often not well developed
- Materials use, flow and cost information often is not tracked adequately
- Investment decisions are often made on the basis of incomplete information
- Many types of environment-related cost information are not found in the accounting records

5.6.Type and categories of environmental accounting



5.7.Categories of environmental accounting



5.8.Objectives of environment accounting

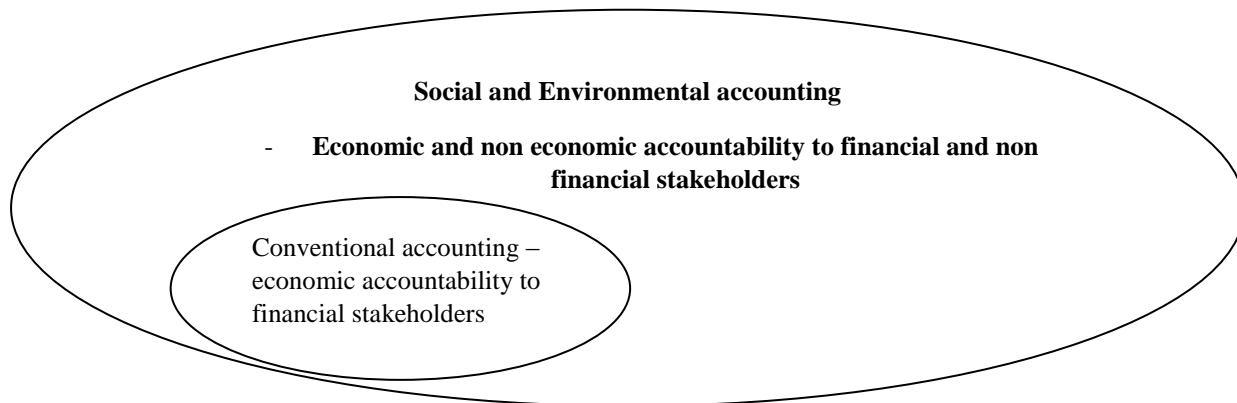
Objective of environmental accounting are listed below -

- Taking the total stock of assets or reserves related to environmental issue and changes therein.
- Estimation of the total expenditure protection or enhancement of environment.
- To identify that part of the gross domestic product which reflect the cost necessary to compensate for the negative impact of economic growth i.e. the so-called defensive expenditure to protect environment.
- Assessment of environmental costs & benefits

- The decrease (depletion) in natural resources due to their use in production & final demand and
- The changes in environmental quality resulting from pollution & other impacts of production & consumption and other natural events on one hand, & the expenditure for environmental protection & enhancement of the environment on the other.
- Elaboration and measurement of indicators, relating to environmentally adjusted product & income which are disclosed by Environmentally Adjusted Net Domestic Product (EDP), i.e., Net Domestic Product minus Environmental costs.
- Analysis of EDP: It is to plan the use of resources by squeezing them & reducing waste to attain sustainable development.

5.9. Conventional accounting as a subset of social and environmental accounting

Social and environmental accounting does represent a broader, more expansive accounting when compared to the traditional accounting paradigm. In this sense, the conventional accounting paradigm can be viewed as a subset of social and environmental accounting.



Source: Adapted from Grojer & Stark 1977, p.350; Gray 2002, p.692.

5.10. Environment Accounting Support Business Decision Making

The concepts of environment accounting as they apply to internal management decisions are the focus of this document. Accurate, timely information is the critical underpinning of business decision making, and environment accounting practices provide means of exposing information obscured by conventional management accounting practices. In this context, environment accounting concepts can be applied at all levels of an organization to help make sound business decisions such as

- Product Design
- Capital Investments
- Process Design
- Cost Control
- Facility Sitting
- Waste Management

- Purchasing Cost Allocation
- Product/Process Costing
- Product Retention/Mix
- Risk/Liability Management
- Product Pricing
- Strategic Planning
- Performance Evaluations
- Supplier Selection
- Plant Expansion
- Environmental Program Justification

5.11. Concept of environmental cost and measurement of environmental accounting (green accounting) cost

Environmental cost comprise the cost of step taken, or required to be taken to manage the environmental impact of environmental activities in an environmentally responsible manner, as well as other cost driven by the environmental objectives and requirements of the enterprise. It should be recognize in the period in which they are first identified

The green accounting is an emerging aspect of accounting science that will influence in the near future. The adoption of basic elements of green accounting will portray the role of environment in the economy as well as render easier the analysis of macroeconomic questions. This table gives an idea about the cost which incurred by the company for protection from pollution and environment.

5.12. Green accounting measures

| Description | Green Accounting Issues and Scope |
|---------------------------------|--|
| Pollution Prevention Costs | Costs incurred to prevent air and water pollution along with water treatment facilities and other activities |
| Environmental Protection Costs | Costs of energy saving measures as well as costs of global warming reduction measures |
| Costs of Resource Recycling | Costs incurred for waste reduction and disposal as well as for water conservation, rainwater usage and other measures aimed at efficient resources usage |
| Environmental Restoration Costs | Cost of environmental restoration operations (eliminating soil and ground water contamination, environmental compensation, etc.) |
| Management Costs | Management-related environmental protection costs including environmental promotion activities and costs associated with acquiring and maintaining ISO 14001 certification |
| Social Promotion | Environmental protection costs stemming from participation in social activities such as participation in organizations concerning with |

| | |
|--------------------------------|--|
| Activities Costs | environmental preservation etc. |
| Research and Development Costs | Environmental protection costs for research and Development activities and costs of environmental solutions business activities (Green product/environmental technology design and development costs, environmental solutions business costs, others) etc. |

5.13. Discloser requirement of environment cost in a company's financial statement

An argument commonly raised against separate disclosure of environment costs charged to income in the current period is that it is very difficult to determine the amount involved. In particular it is difficult to distinguish environmental cost from other cost such as operating cost and to assemble the information. Ultimately a judgement must be made as to the items that constitute environmental expenses. As ISAR recommends –

- Type of item identified as environmental cost should be disclosed
- Amount of environment cost charged to income -
 - I. Distinguish between operating and non operating cost and
 - II. Analysis in a manner appropriate to nature and size of the enterprise and / or type of issue relevant to enterprise
- Amount of environmental cost capitalized during the period disclosed in the notes
- An environment cost recorded as a –
 - I. Fine or penalty for non-compliance with environmental regulation and/or compensation to third parties as a result of loss or injury caused by past environmental pollution – no benefit and return to the enterprise,
 - II. Extraordinary item. Should be separately disclosed.
- Environment liabilities also should be disclosed either in the balance sheet or notes to the financial statements
 - i. A brief description about the nature of liability
 - ii. A general indication of timing and term of their settlement
 - iii. Any significant uncertainty over the amount of liabilities or timing of settlement and range of possible income should be disclosed

5.14. Environmental reporting

Environmental reporting is the term now commonly used to describe the discloser by an entity of environmental related data verified or not , regarding environmental risk, environmental impact policies, strategies, target, cost, liabilities, or environmental performance to those who have an interest in such information as an aid to enriching their relationship with the reporting entity. This report can be prepared in

- The annual report and accounts package
- A standalone corporate environment performance report
- A site-centered environmental statement

- Some other medium (i.e. staff newsletter, video, CD Rom etc.)

5.15. Historical development of Environmental Reporting

| | | |
|------|---|-------------------|
| I. | Financial accounting and reporting | From the 1850's |
| II. | Financial aspects of corporate governance | From the 1990's |
| III. | Environmental reporting` | From early 1990's |
| IV. | Social and ethical accounting and reporting | From late 1990's |

5.16. Environmental reporting in private sector and public sector

Majority of environmental accounting example are found in public sector but there is no rule. The following are the examples of name of some organization that have issue environmental reports.

| Private sector | Public sector |
|--|---|
| Anglian water – BP Amoco, Body shop international, British airways, NatWest bank, Shell(UK) etc. | New York state pension fund for the fire service |
| Novo nor disk(Denmark) | DSB / Banelstyrelsen (Denmark's national railway company) |
| Neste(Finland) | Eskom (S, Africa) |
| Sony, Toyota (Japan) | Dutch hospital Group AZU |
| China light and power (HongKong) | London borough of Sutton (Local authority) |
| General motors, Sun company, Pand G, Baxter healthcare (USA) | Liverpool John moores university (Education sector) |
| Northam telephone limited (Canada) | The corporation of London |
| SAS, Volvo (Sweden) | The environment council (NGO) |
| Bayer (Germany) | The new economics foundation (Social reports) |
| South African Breweries (S Africa) | Department of environment, Transport and regions (Gov Dept UK) |

5.17. The Need of environment Accounting and reporting

There are many reason why environment accounting issue needs to be integrated into corporate accounting.

- Enterprise accounts should reflect firm's attitude towards the environment and the impact of environmental expenditure, risk and liabilities upon the financial position of an enterprise.
- Investors need information on environmental performance and expenditure to make investment decisions.
- Environment issue are management issue, manager's needs to identify and allocate environmental cost so that products are correctly priced and investment decision are based on true cost and benefits.
- Enterprise may be able to exploit a competitive advantage with customers if they are able to show that goods and service are environmentally preferable.

Most corporate leaders agree that main objective for the economy is sustainable development. Sustainability requires companies to strive for eco-efficiency, but they can only measure that by producing accurate information on both environmental cost and revenue and environmental performance.

5.18. Eco-efficiency indicators

The concept of eco-efficiency was initially developed as “ecological-economic efficiency” by Schaltegger and Sturm (1994). Based on this Schaltegger and Burritt (2000) developed a more general framework of EPIs. They state that, in order to measure corporate eco-efficiency, the set of economic and ecological information available has to be transformed into eco-efficiency information. By this is understood that economic numbers (measured in monetary terms) and environmental figures (measured in ecological terms) as indicators of efficiency have to be integrated.. Examples of eco-efficiency indicators¹ -

| Stakeholder group | Eco-efficiency indicators (examples) | Focus |
|--------------------------|---|--|
| Shareholders | SHV / NPEIA | Assessment of financial investment |
| Government, management | Top VA / EIA | Assessment of impacts on society as a whole |
| Government, management | Top Corp. taxes / EIA | Assessment of impacts relevant for the government and the tax agency |
| Top management | Income / EIA | Assessment of annual performance |
| Site management | ROCE / EIA | Assessment of site |
| Project management | NPV / NPEIA | Assessment of capital investment project |
| Divisional management | CM /EIA | Assessment of product group |
| Product management | CM / EIA | Assessment of product |

¹CURRENT TRENDS IN ENVIRONMENTAL COSTACCOUNTING – AND ITS INTERACTION WITH ECOEFFICIENCYPERFORMANCE MEASUREMENT ANDINDICATORS / STEFAN SCHALTEGGER AND MARCUS WAGNER / chapter – 3/ page no - 58

(SHV = shareholder value, VA = value added, ROCE = return on capital employed, NPV = net present value, CM = contribution margin, Cor = Corporate, NPEIA = net present)environmental impact added, EIA = environmental impact added)

5.19. Applying Environmental Accounting to Capital Budgeting

Capital budgeting includes the process of developing a firm's planned capital investments. It typically entails comparing predicted cost and revenue streams of current operations and alternative investment projects against financial benchmarks in light of the costs of capital to a firm. It has been quite common for financial analysis of investment alternatives to exclude many environmental costs, cost savings, and revenues. As a result,

Corporations may not have recognized financially attractive investments in pollution prevention and "clean technology." This is beginning to change. When evaluating a potential capital investment it is important to fully consider environmental costs, cost savings, and revenues to place pollution prevention investments on a level playing field with other investment choices².

5.20. The following are the number of factors which drive companies into reporting process :

- International standard / Mandatory requirement (US, Denmark, Netherland, Thailand)
- Competitive advantage / Best in class
- Environmental management system base
- Supply chain pressure
- Credit and investment conditionality
- Other stakeholder concern
- Peer group pressure

5.21. The cost and benefit analysis of environmental reporting

The company make huge expenditure (i.e. direct expenditure and indirect expenditure) for environmental reporting and in return benefits which they receive. The cost benefit analysis of environmental reporting are discussed below

Direct cost of reporting

- Installing the appropriate environment management system
- Employee specialist staff / internal auditors
- Appointing external verifiers
- Publication, distribution cost, web site design cost
- There is also a potential reporting risk cost

Indirect cost of reporting

²Allen White and Monica Becker, "Total Cost Assessment:Catalyzing Corporate Self Interest in Pollution Prevention," NewSolutions, (Winter, 1992), p. 34.

- Poor environment profile *vis a vis* competitors
- Potential loss of market / investors
- Loss / foregoing of other benefits

These are the cost which company spends for environmental reporting.

5.22. Extent to which Indian corporates practice voluntary environmental reporting

The following list of voluntary environmental reporting practice of corporates in India³

| Sl. No. | Parameters | Manufacturing (12) | | Non-manufacturing (13) | | Total (25) | |
|----------------|--|---------------------------|---------------|-------------------------------|---------------|-------------------|---------------|
| | | Yes(%) | No(%) | Yes(%) | No(%) | Yes(%) | No(%) |
| 1. | Environmental Policy | 75.00 | 25.00 | 76.92 | 23.08 | 76.00 | 24.00 |
| 2. | Health Safety and Environment | 91.67 | 8.33 | 69.23 | 30.77 | 80.00 | 20.00 |
| 3. | Energy conservation | 75.00 | 25.00 | 61.54 | 38.46 | 68.00 | 32.00 |
| 4. | Corporate Sustainability /Environmental Initiatives | 83.33 | 16.67 | 84.62 | 15.38 | 84.00 | 16.00 |
| 5. | Sustainability Reporting | 41.67 | 58.33 | 30.77 | 69.23 | 36.00 | 64.00 |
| 6. | Waste Management | 83.33 | 16.67 | 38.46 | 61.54 | 60.00 | 40.00 |
| 7. | Water Management | 75.00 | 25.00 | 46.15 | 53.85 | 60.00 | 40.00 |
| 8. | Wind/renewable Energy sources | 58.33 | 41.67 | 15.38 | 84.62 | 36.00 | 64.00 |
| 9. | Environmental information system | 91.67 | 8.33 | 30.77 | 69.23 | 60.00 | 40.00 |
| 10. | Environmental disclosure practices | 41.67 | 58.33 | 46.15 | 53.85 | 44.00 | 56.00 |
| 11. | Environmental targets | - | 100.00 | 69.23 | 30.77 | 40.00 | 60.00 |
| 12. | Environmental reporting indicators | 75.00 | 25.00 | 76.92 | 23.08 | 76.00 | 24.00 |
| 13. | Environmental costs and benefits | - | 100.00 | 0.00 | 100.00 | 0.00 | 100.00 |
| 14. | Environmental liabilities | - | 100.00 | 0.00 | 100.00 | 0.00 | 100.00 |
| 15. | Environmental assets | - | 100.00 | 0.00 | 100.00 | 0.00 | 100.00 |

Source: Asia Pacific Journal of Research February 2014

5.23. Steps to be followed to start preparation of environmental report

Successful work on environmental accounting depends on two crucial factors:

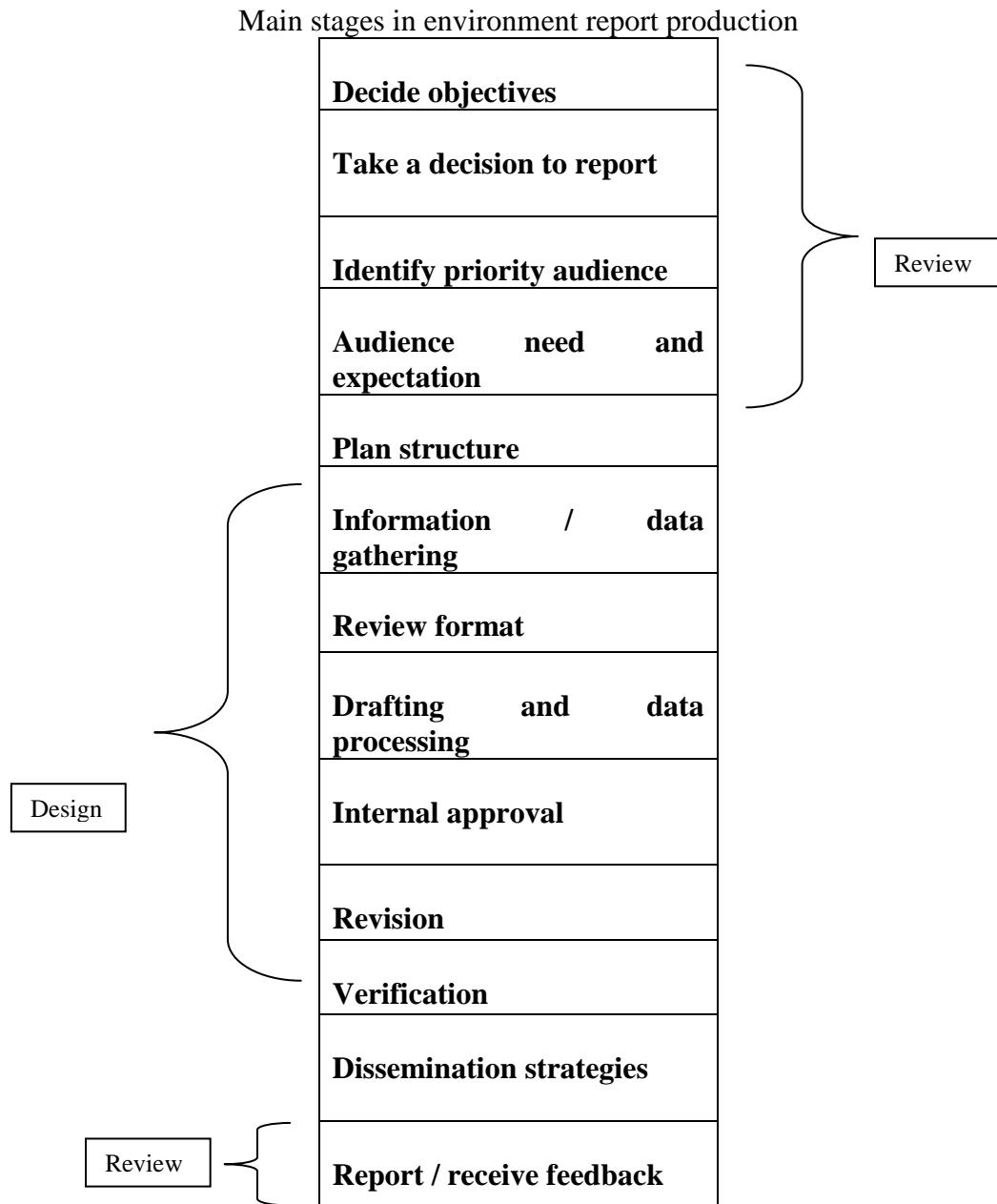
³International Journal of Commerce, Business and Management / A Study of Green Accounting Practices in India / Dr. Preeti Malik, Dr. Alka Mittal /Vol. 4, No.6, December 2015 /page no - 786

- **First**, it must be focused on answering important policy questions. This ensures that the accounting work responds to a real demand for policy guidance, and is not driven simply by a desire to build databases.
- **Second**, it must bring in the major players in the areas of environmental policy, economic policy, national income accounting, and the development of information systems on the environment, the economy, and the population. This ensures that people who could either use or provide the data required will cooperate with and support the project.

The steps below suggest the activities which may be involved in initiating work on environmental accounting: .

- Learn more about the subject, by reading and where possible by talking to others with experience in the area. This learning should cover the purpose of the accounts, the policy questions which they could answer.
- Bring together the key players in the country and help them learn about the subject. Key players may include representatives of the national accounting office, the national bank and the ministries of environment etc.
- Identify the pressing policy questions facing the country. Where is there a clear demand for better understanding of the linkages between the environment and the economy? Are specific resource-based sectors crucial to the economy? Are certain resources constraining economic development? Are pollution problems growing in importance, affecting well-being, or imposing excessive costs?
- Select a sectoral focus and areas to work on which ensure that key policy issues will be addressed.
- Choose a methodological approach (or approaches) which will be practical and will also enable the accounts to answer the key policy questions.
- Select an institution to carry out the initial accounting work.
- Build a team to compile the accounts.
- Build the first set of accounts. Like the national income accounts, environmental accounts should be produced annually, or every few years, to develop time series data; thus the accounting process is iterative.
- Publish the initial results and disseminate them widely. Even if they are statistically weak, it is crucial to publish them and use them to explore important policy questions from the start, for several reasons. First, wide dissemination of such publications will increase awareness of the work and show how it can address policy questions. This will create additional political and social support for institutionalizing the accounts. Second, publishing initial results based on weak data is likely to help in identifying better data. Often data exist, but those who control them do not see the connections to the accounting work, or are reluctant to make them available. The more widely the results are available, the more people will see connections to other existing data and pressure will increase to make them available to the project.
- In subsequent years, the focus of the accounting work will be determined by the outcome of the first cycle of accounts. It will be important routinely to update the accounts, so that they begin to present a record of how the economy-environment linkages are evolving

over time. In addition, areas where environmental costs or impacts are found to be particularly large may warrant further work or additional primary data collection. Emerging policy concerns may be introduced into the accounting framework. Special studies may be undertaken on particular questions of policy importance.



Source: Guide to environment and energy reporting and accounting 1997, association of chartered certified accountants, p29, Design review

6.0.Conclusion

For the last decade, corporate environmental accounting has gained increased importance in practice, of which cost accounting receives most attention. This paper gives an overall concept of environment accounting (Green accounting). Environmental accounting is in introductory stage in India and whatever shows in the accounts in this regard is more or less compliance of relevant rules and regulation in the Act. Actually, unless common people of India are not made aware towards environmental safety, development of accounting in this regard is a little bit doubtful. It is the call of the time that corporates prepare a firm environmental policy, take steps for pollution control, comply with the related rules and regulations, and mention adequate details of environmental aspects in the annual statements. For sustainable development of country, a well-defined environmental policy as well as proper follow up and proper accounting procedure is a must. Now in the current scenario where pollution has become major problem and environment protection issue become main concentration of almost all companies. This is why recently environmental performance indicators have received more attention. According to author time is still left in the hands to use the advance resources to balance the environment for living and initiates the breathed intellectuals to live friendly with environment and make our nation pollution free and environmentally aware and if required further research is necessary to identify the way in which improved environmental accounting can be tailored to fit the special needs of particular firms, industrial processes, and product markets.

7.0. References

- Accounting Standards Board ASB (UK). (2005). Reporting standard 1, operating and financial review. AICPA/CICA. (2002). Joint Task Force on Sustainability Reporting. Comment letter on draft GRI 2002
- Atkinson, G., and Hamilton, K. (1996). Accounting for progress: Indicators for sustainable development Environment,
- Bartelmus, P. (1996). Environmental accounting for sustainable development. In pricing the planet: Economic analysis for sustainable development, New York, Columbia University Press.
- Beets, S. D. and Souther, C. C. (1999). Corporate environmental reports: The need for standards and an environmental assurance service, Accounting Horizons, 13 (2).
- Brown, L. R. (1993). A new era unfolds. In state of the world, New York: W. W. Norton and Company,
- Burritt, R. L. (2002). Environmental reporting in Australia: current practices and issues for the future. Business Strategy and the Environment 11, (6).
- Burritt, R. L. and Welch, S. (1997). Accountability for environmental performance of the Australian Commonwealth public sector. Accounting Auditing & Accountability Journal 10 (4).
- Business and The Environment with ISO 14000 Updates. (2007), Vol. 18 Issue 7. CERES. (2002).
- Chertow, M., and Lombardi, D. (2005). Quantifying economic and environmental benefits of co-located firms. Environmental Science & Technology, 39(17).
- CRISP. (2003). CRISP—Construction and city related sustainability indicators. A European Thematic Network on Construction and City Related Sustainability Indicators.

- Daly, H. E., and Cobb, J. B. (1989). *For the common good: Redirecting the economy toward community, the environment and a sustainable future*. Boston: Beacon Press.
- Deelstra, T. and Boyd, D. (1998). Indicators for sustainable urban development. Advanced study course on indicators for sustainable urban development 197. The Netherlands: Delft.
- Diaconu, Paul. (2009). International accounting system and its major challenges in time. *Journal of Modern Accounting and Auditing*, Jan. Vol. 5(1).
- Eckelman, M. J. and Chertow, M. (2009). Industrial materials in Pennsylvania. *Environ. Sci. Technol.*, 43, 2550–2556.
- Eckelman, M. J., and Chertow, M. (2009). Quantifying life cycle environmental benefits from the reuse of industrial materials in Pennsylvania. *Environmental Science & Technology*, 43(7), 2550-2556.
- Elkington, J. (1998). *Cannibals with forks: The triple bottom line of 21st century business*. New Society Publishers, Stony Creek, CT.
- Epstein, M. J. (1996). Measuring corporate environmental performance. Irwin, Chicago.
- Fernandez, H. (2008) five steps to green accounting plan. Nov. 78, 10; ABI/INFORM Global, 66.
- Fleischman, R. and Schuele, K. (2006). Green accounting: A primer. *Journal of Accounting Education* [serial online], January;24(1).
- Gilbert, A. (1990). Natural resource accounting: A case study of Botswana. In *Dryland management: economic case studies*. London: Earthscan Publications Ltd.