ANNQUEST December 2014

ISSN: 2321-3043

www.stannsannquest.com

Environmental Accounting – A case study of cement sector in India

T.Anuradha

Abstract

Environmental accounting is an important tool for understanding the role played by the natural environment in the economy. The paper looks at the way in which companies account for issues other than immediate financial concerns. This includes environmental accounting and its application. The paper firstly considers what the different perspectives of accounting practices are; the second part of the paper considers environmental accounting its practice in the Indian cement industry. The study identifies that the Indian cement industry complies with Kyoto protocol norms and several environmental disclosures resulting in phenomenal performance in improving environmental pollution.

Introduction

"We make the world we live in and shape our own Environment".

Environmental pollution is the build-up and concentration of toxic levels of chemicals in the air, water, and land, which reduces the ability of the affected area to support life. Pollutants may be gaseous- ozone, carbon monoxide, liquid-discharge from industrial plants and sewage systems or solid land-fills or junkyards which in response causes global warming.

In an attempt to tackle global warming and to reduce Environmental Green House Gases emission (GHG) Kyoto Protocol was agreed in 1997 to reduce worldwide environmental Green House Gas emissions to 5.2 percent below 1990 levels between 2008 and 2012.

Under the Kyoto protocol most developed nations other than the US committed themselves to targets for cutting or slowing their emissions of the key environmental Green house gases that cause climate change. The targets varied between nations. Some were allowed to increase their emissions by a certain amount; others were required to make significant cuts. The average target was a cut of around 5% relative to 1990 levels by 2012 (or more accurately 2008–12).

Due to increasing environmental problems such as global warming, rapid changes in climate, glacier meltdown there was an urgent need for identifying environment protection measures. Thus Kyoto protocol has given birth to new method of environment protection accounting.

Environmental Accounting

Environmental Accounting is "The collection, analysis and assessment of environmental and financial Performance data obtained from business management information system" – "Environmental agency of UK 1997"

Department of Commerce
St.Ann`s College for Women Mehdipatnam Hyd.
sekuanu@yahoo.com>

- Environmental Accounting aims to incorporate both economic and environmental information for achieving sustainable development, maintaining a favorable relationship with the community, and pursuing effective and efficient environmental conservation activities.

- It involves costs to clean up or remediation of contaminated sites, environmental fines, penalties and taxes, purchase of pollution prevention technologies and management costs.

- This system can operate at the company level or at the level of the national economy via links to the National Accounts of countries.

-

Objectives of the Study

1. To examine the need and importance of environmental accounting.
2. To analyse the application of environmental accounting in the cement sector in India and its implication on the Indian economy.

Scope of the Study

The study dwells with application, coverage, and the emphasis of environment accounting at the corporate level for the cement sector in India.

- The study highlights the Conceptual framework of environmental accounting.
- The study identifies the inferences that could be derived from the working data of the cement sector in India
- The study understands the customised application of Kyoto protocol which results in the reduction of pollution
- The period of consideration for the study is for two years, 2011-12 and 2011-10

Research Methodology

The data is primarily collected from various secondary sources pertaining to this topic from different books, articles and several web sites relating to environmental accounting and the working of cement sector in India. The data collected is analysed for the application of environmental accounting practices in the Indian cement industry. For this purpose the information is compiled in the form of tables for a better understanding of the subject.

Literature Review

Rob Gray, Jan Babington [1], discussed in the chapter entitled ‘‘Environmental accounting, managerialism and sustainability:’’ Is the planet safe in the hands of business and accounting’’? seeks to provide a review of the current state of the art in environmental accounting research through this ‘managerialist’ lens and then goes on to illustrate the essence of the problem through the reporting of a new analysis of data from an international study of accounting, sustainability and transnational corporations.

Heba Y.M. Abdel-Rahim and Yousef M. Abdel-Rahim entitled ‘Green Accounting – A Proposition for EA/ER Conceptual Implementation Methodology’ [2] have discussed about the concept and understanding on the environmental accounting education. This article explores the concepts of environmental accounting and the possibility of broadening the applicability of the environmental

reporting concept to be utilized by governments to make businesses more responsible for their externalities.

Yoshiaki Tsuzuki1[3] entitled 'Proposal of environmental accounting Housekeeping (each) books of domestic wastewater based on water pollutant roads per capita: a case study of sanbanzetidal coastal zone, Tokyo bay' has discussed about the Tokyo context on the particular issue such as: proposes a measure of dissemination and environmental education in the field of water pollution, which makes relations between water pollution problems of an enclosed coastal zone, Sanbanze tidal coastal zone, Tokyo Bay, and municipal lives.

Mehenna Yakhou, Vernon P. Dorweiler [4] discusses that the environmental accounting is on an expansion path. It deals and measures with the environmental performance. It works also the integration of environmental policy with business policy is the focus of this research.

Clementina Ferreira [5] argued that the quality of the environment depends on the behaviors of us that mean that it output of the people. Web need to preserve the nature conservation by enacting the laws. In companies, it is the administration's duty to make decisions and it is accounting's duty to present relevant information about patrimonial realities that help in the decision-making process of every user.

John Lintott [6] argued that the environmental accounting evaluates a general measure of welfare or progress, for policy to aim to maximize. Problems of monetary valuation are likely to lead to huge underestimation of environmental costs. Issues of inequality and poverty, essential to a more robust view of sustainability, are ignored.

Jeffrey Unerman (2007) entitled 'Environmental Accounting Education' discussed in it about the sustainability accounting, an ethic of accountability, standardization of sustainability, future prospects for corporate sustainability, accounting for sustainable development etc ; that may lead to the sustainability concept.

Ienciu and others [7] entitled 'Status of research in the field of environmental accounting'' discussed about the research on the environmental accounting based on the Journal publications. It means that the author discusses the publications that are published in the journal which is quite important for the spread of the accounting education in the world.

The innovative book (1995) on Environmental Accounting for the Sustainable Corporation: Strategies and Techniques is written by a Canadian chartered accountant who has specialized in environmental accounting for the past five years. The subject matter of environmental accounting assumes greater importance for the practicing accountant. Environmental investments include pollution abatement technologies, reengineering of plants, products and processes so as to recycle waste products; and environmental management systems, including an expanded environmental auditing capability published by the National Public Accountant.

Joy E. Hecht [8] entitled 'Environmental Accounting' Where We Are Now?, discusses about the current trends on the global environmental accounting education in the global education systems. The author discussed some questions pertaining to why change, which indicators are useful, who is doing this, how to account etc.
Odum Howard T. (1924) his book entitled 'Environmental Accounting Energy and Environmental Decision Making' discussed the environmental management maximises economic vitality with less

trial and error society that may improve efficiencies, innovate with fewer failures and adapts to change more rapidly. It also discussed the energy budget of the earth. It also discussed the nature of expenses on the energy and money etc.

Mark de Haan [9] has discussed the modes of the international harmonization of environmental accounting: comparing the National Accounting Matrix including Environmental Accounts of Sweden, Germany, the UK, Japan and the Netherlands. These countries have presented their results in a National Accounting Matrix including Environmental Accounts (NAMEA). The second section presents a preliminary comparison of the results which shows that comparable accounts will not automatically lead to comparable results.

United Nations [10] Handbook of National Accounting, Studies in Methods Series F, No. 78 Integrated Environmental and Economic Accounting: An Operational Manual, United Nations discussed about growing pressures on the environment and increasing environmental awareness that have been generated the need to account for the manifold interactions between all sectors of the economy and the environment.

Freer Speckle in 1981 articulated Triple Bottom Line while he mentioned social enterprises should be included in their performance measurement. Later the complete concept of TBL was created by John Ellington (1998) in his book Cannibals with Forks, The Triple Bottom Line of 21st century business. TBL, is the concept of sustainable development of business which requires thinking in three dimensions, i.e., taking into account ecological and social performance in addition to the financial element for its financial prosperity. The concept recommends companies to address environmental issues to minimize potential harm that emerges from the business activities and to create economic, social and environmental values.

From the above literature review it can be concluded that the fundamental premise behind environmental accounting is that organizations should internalize environmental costs. Currently these costs are externalized, and the society bears the impact of an organization's adverse activities on the environment due to the fact it is a "public good". It is expected that once organizations are made accountable for these costs, they would be compelled to minimize the potentially harmful effects of such activities. As environmental accounting requires organizations to forecast the potential environmental impact of their activities and accordingly estimate their contingent liabilities and create provisions for environ- mental risks. To compel businesses in performing accountability, disclosure of environmental accounting information has become a key process.

Need and Importance of the Study

Environmental accounting is an important tool for understanding the role played by the natural environment in the economy. It provides data which highlight both the contribution of natural resources to economic wellbeing and the cost imposed by pollution and resources degradation. It describes the effort to incorporate environmental benefits and costs into economic decision making.

There is a need for environmental accounting practices for developing countries like India. It's a twin problem solving about saving environment and developing the economy. A study by World Bank estimated that about 34,000 crores were lost by India due to environmental damage; hence the present study gains importance in wake of the World Bank observations. Through this study an attempt to

understand environment accounting practices in the Indian cement industry and its implications on the Indian economy.

The present study attempts to underline the fact that environmental accounting practices are important to enable the enterprise to understand the significance of reducing the negative impact of their business activities on the economy and the environment at large. In this paper a case study of the Indian cement industry is taken up to examine the quantitative management of environmental conservation activities in the sector.

Environmental Accounting

Introduction

In general environment refers to surroundings of an object. Environmental accounting is an important tool for understanding the role played by the natural environment in the economy. Environmental accounts provide data which highlights both the contribution of natural resources to economic well being and the costs imposed by pollution on resource degradation. Due to ignorance of environmental problems such as global warming, rapid changes in climate, glacier meltdown etc are commonly experiences in the present century for which both developed and developing nation may be held responsible . So in 21st century there is an urgent need of protecting our environment because environment is responsible for survival of human beings. The issue of environmental responsibility and the sustainable industrial development has given birth to new branch of accounting i.e. environmental accounting.

Environmental accounting is on an expansion path. With increasing social focus on the environment, accounting fills an expectation role, to measure environmental performance only stressing on the economic and industrial development. Unfortunately India forgot the importance of environmental accounting and the consequences of such forgetfulness gave birth to unremarkable incidence of Bhopal chemical leak (1984), tsunami in India (2004).

In fact the industrial and business activity are directly or indirectly responsible for various environmental problems such as global warming, glacier melt down, soil erosion, land degradation, deforestation, loss of bio- diversity and pollution of all kinds.

For proper implementation of environmental accounting in India a large number of researches, discussions, accounting standards and framework is necessary. The status of environmental awareness provides a dynamic business reporting in its environmental performance. Examining the integration of environmental policy with business policy is the focus of this project.

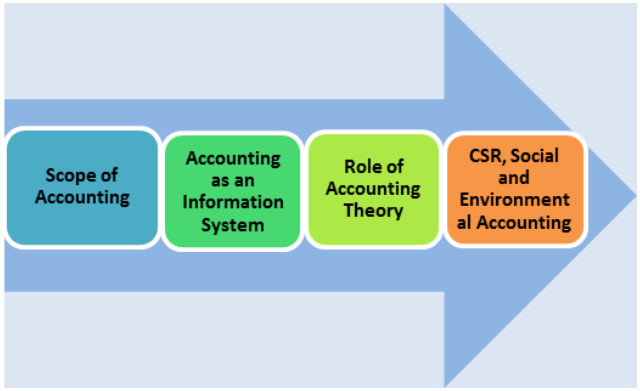
Definition

Environmental accounting describes the way to inventory and audit environmental Green house gas (GHG) emissions. A corporate or organizational environmental Green house gas (GHG) emissions assessment quantifies the total environmental house gases produced directly and indirectly from a business or organization's activities. It is also known as a carbon footprint, it is a business tool that provides information with a basis for understanding and managing climate change impacts.

Scope

The scope of environmental accounting is to look for the transformations in the ways in which accountants assess and report corporate performance. The development of the sustainability agenda is embraced by environmental accounting to account for the cost involved for sustainable development of the environment, society and the economy. This means that business people and accountants must recognize the delivery of economic prosperity, environmental quality and social equity simultaneously

Figure 1: Flow of environmental accounting

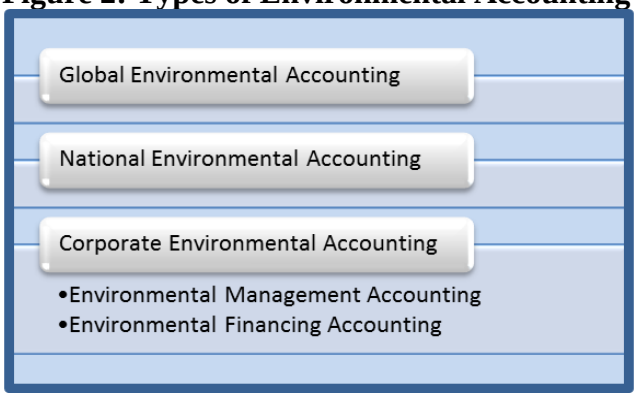


Environmental Accounting Disciplines

Environmental accounting can be broken down in to three disciplines:

1. Global Environmental Accounting,
2. National Environmental Accounting and
3. Corporate Environmental Accounting.

Figure 2: Types of Environmental Accounting



Global Environmental Accounting

Global Environmental Accounting is an accounting methodology that deals with Energetic, ecology and economics at a global scale. The earth is the system of Interest with the input, sequestration, and dissipation of solar energy - which Constitute its energy budget.

National Environmental Accounting

National Environmental Accounting is an accounting approach that deals with economics on a national level. National Environmental Accounting is a macroeconomic measure that looks at the use of natural resources and the impacts of national policies on the environment.

Corporate Environmental Accounting

Corporate Environmental accounting is an accounting approach to controlling and improving an organization's cost structure and environmental performance. It can be further sub-divided into Environmental Management accounting and Environmental Financial accounting.

- **Environmental Management Accounting**

It focuses on making internal business strategy decisions. It is defined as "the identification, collection, analysis, and use of two types of information for internal decision making"

The information requires is one, the physical information, on the use, flows and facts of energy, water and other materials (including wastes). Secondly, the monetary information of environmental related costs, earnings and savings.

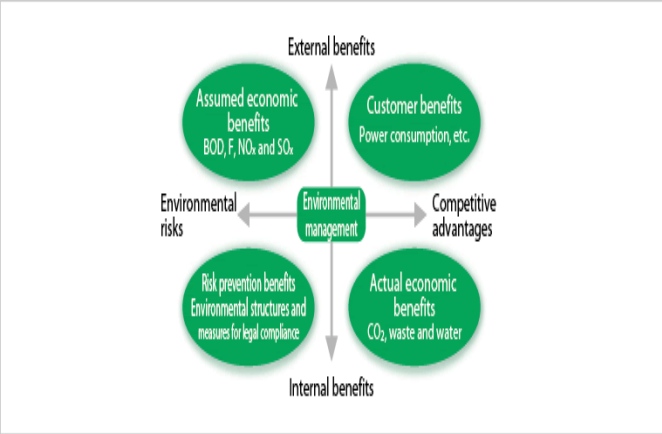
- **Environmental Financial Accounting**

It is used to provide information needed by external stakeholders on a company's financial performance. This type of accounting allows companies to prepare financial reports for investors, lenders and other interested parties. Various benefits are been derived from the different aspects of accounting.

Benefits of Environmental Accounting

- Improving environmental performance.
- Controlling costs.
- Investing in cleaner technologies.
- Developing environmental process and products forming decisions related to business activities.

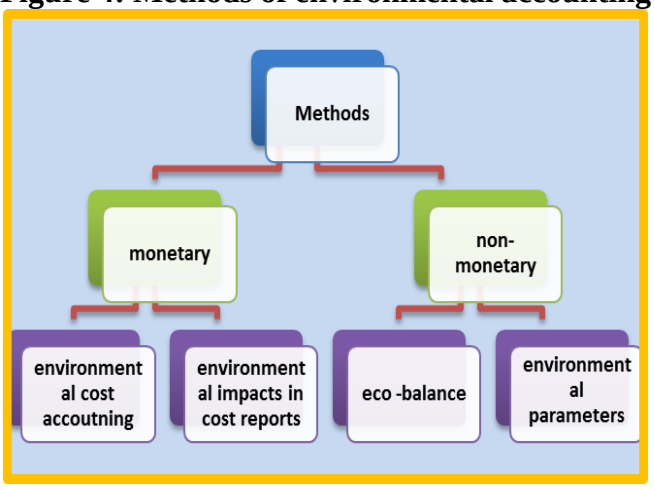
Figure 3: Benefits of environmental accounting



Methods of Environmental Accounting

Different methods have been implemented to calculate environmental accounting: 1.Monetary methods 2.Non–monetary methods

Figure 4: Methods of environmental accounting



1.Monetary

i)**Environmental cost Accounting** Environmental cost accounting process of collecting and presenting information about environmental, social and economic costs and benefits (collectively known as the "triple bottom line") ii)**Environmental Impacts In Cost Reports** This report is designed to help senior executives and decision makers for managing the firms environmental impacts.

2.Non-monetary **i)Eco-Balance**

The Ricoh Group introduced the concept of Eco Balance in fiscal 1998 to clarify the environmental impact caused by all its businesses activities and use it effectively which reduces the impact on pollution.

Figure5 : Cycle of Eco- Balance

ii)Various Environmental Parameters

Various parameters like eco-logical rucksack, eco logical foot print, carbon foot print, coal foot print and water foot print can be implemented for finding out the environmental accounting.

Limitations of environmental accounting

1.Conversion Expense- It can be costly for a corporation to go environmental initially. For example, the switch to solar power will create the need to install solar panels at business facilities. The cost reductions in energy savings gained by going environmental are not always enough to offset the initial upfront conversion costs.

2.Going Paperless

For some companies, a common method of going environmental is to minimize or even eliminate the use of paper. This can pose some disadvantages. For example, if employees lose or experience the theft of laptop computers, sensitive information that would normally be kept in a locked paper file could fall into the wrong hands. If companies don't properly back up their computer files, a system crash could prove disastrous.

3.CustomerBacklash

Companies may intentionally or unintentionally make false claims regarding the environmental friendliness of their products, a process known as "environmental washing." If consumers become aware that a company is engaging in environmental washing, the company may suffer harm to its credibility

Environment Accounting Vs. Indian Cement sector

Cement as a commodity plays a vital role in the growth of a nation since it is an essential raw material for concrete which is a key raw material in key sectors like infrastructure, construction, commercial and residential real estate. Globally, cement contributes about 5% of the total CO2 emissions.

Cement sector causes environmental pollution problems, and the pollutants of the cement sector produced the adverse impact on air water and land. During the last decades the emission of dust from cement factories has been increased alarmingly due to expansion of more cement plants. The increasing concentration of cement dust pollutant and several gaseous air pollutant are readily recognized as being the cause of injury to various type of vegetation. .In India, the cement sector is one of the prominent contributors to conventional as well as GHG emissions. Carbon dioxide creates global warming and it increases global emissions of carbon from fossil-fuel combustion and other smaller industrial sources.

Some of the most important environmental issues facing the cement industry are greenhouse gas emissions and atmospheric releases, primarily of NOx, SO2, hydrocarbons and particulates the health and safety issues relating to workers and community exposure to dust. Global warming is of special interest to the cement industry as almost 1 ton of CO2 is released for every 1 tons of cement produced or 5% of all global greenhouse emissions.

The manufacturing process for environmental cement succeeds in reducing, and even eliminating, the production and release of damaging pollutants and environment house gasses, particularly CO_2. Growing environmental concerns and increasing cost of fuels of fossil origin have resulted in many countries in sharp reduction of the resources needed to produce cement and effluents (dust and exhaust gases).

Table 1: Carbon dioxide Equivalent (t-CO2e) Green House Gas:

S. No	pollutant	Impact	Act emision limits (%) 2011-12	Permitted emission limits (%) 2003 presb	Deviation From Permitted limits (%)	Favble or Adverse
1.	coal generator	Surface run off	40	20	20	Adverse
2.	Biogenic emission (limestone, gypsum, slag, diesel)	Surface run off	20	12	8	Adverse
3.	Co2 emission	Surface run off	14	6	8	Adverse
4.	Electricity consumption	Air pollution	60	40	20	Adverse
5.	Heavy metal emissions	Increase in co2	25	6	19	Adverse

Source: compiled table from The Kyoto Protocol. (2003)

The environment factsheet presents below is the extent of cement sector pollution in the environment, which gives the levels of permitted emission limits (2003 prescribed limits) of the cement industry and actual emission limits (current levels 2011-12) that presently effecting the environment.

Table 2: Environmental Factsheet on cement

S.NO	Pollutants	Effect (in terms of %)
1.	Smoke and emissions	40 %
2.	Co2 emission	56%
3.	Heat of limestone	1450 degree Celsius
4.	Effect of chlorophyll	41%
5.	Increase in chloroform carbon	6500 tones
6.	Mixture of various components	27%
7.	Heavy metal present in clink	13.ph
8	Preclainer kilns	60%
9	Other emissions	31.5%

Source : Compiled table

Table 3: Cement Sector Pollutants

S.No	Gas emissions
1	Carbon dioxide (CO2)
2	Methane (CH4)
3	Nitrous oxide (N2O)
4	Per fluorocarbons (PFCs)
5	Hydro fluorocarbons (HFCs)
6	Sulphur hexafluoride (SF6

Source: Compiled table

Environmental Accounting and Its Application in Cement Sector

India ranks second in world cement producing countries. While it took 8 decades to reach the 1st 1000 Lakh tone capacity, the 2nd 1000 Lakh tones was added in just 10 years. The capacity, which was 29 Million tons in 1981-82 rose to 2190 Lakh tones at the end of FY09

India is the second largest country to produce cement in the world. The Indian cement sector is oligopolistic in nature on a national level with top 11 to 12 firms among more than 100 firms capturing 70% of the cement market.

Table 4: Major Cement industry players

S .No	Company Name
1	A.C.C. cements
2	Ambuja cements
3	Birla corporation ltd
4	India cements
5	J.K. cements
6	Ramco cements
7	Shree cements
8	Ultra tech cements

Source: Compiled table

Table 5: Carbon Emissions in the Cement Sector in India

No	Name	Actual Prodtn. '000 Tons	Total CO2e in '000 tones	TCO2e/to cement prodn	% intensity related to India avg Emission factor
1	A.C.C.	21369.00	17522.58	0.82	0.96
2	Ambuja	18828.45	13368.20	0.71	0.83
3	Birla	5698.00	4615.38	0.81	0.95
4	India	10494.22	8710.02	0.83	0.97
5	J.K.	4586.51	4540.64	0.99	1.16
6	Ramco	8030.00	6343.70	0.79	0.92
7	Shree	9371.92	7684.97	0.82	0.96
8	Ultra tech	17639.00	17991.78	1.02	1.19
	Total	96016.88	70777.27	6.79	7.94

Source: The C balance blog carbon emissions by Udit Bansal 2010

Environmental cement

With the impact of pollution from cement the environmental cement came into the market existence. Environmental cement is a cementations material that meets or exceeds the functional performance capabilities of ordinary Portland cement by incorporating and optimizing recycled materials, thereby reducing consumption of natural raw materials, water, and energy, resulting in a more sustainable construction material.

The manufacturing process for environmental cement succeeds in reducing, and even eliminating, the production and release of damaging pollutants and environment house gasses, particularly CO_2. Growing environmental concerns and increasing cost of fuels of fossil origin have resulted in many countries in sharp reduction of the resources needed to produce cement and effluents (dust and exhaust gases).

If all of these companies improve their efficiency using the various methods to at least the Indian average there will be a savings of up to 10.41 Million Tones of CO2. Indirect emissions from burning fossil fuels to heat the kiln can be reduced by switching to such as natural gas, biomass and waste-derived fuels. These less carbon-intensive fuels could help reduce almost a quarter of overall cement emissions from 2006 levels by 2050.

Increasing efficiency of the production process so as to reduce the demand for fuel through technical and mechanical improvements will also help drastically reduce emissions. Steps such as switching from inefficient wet ils to dry ones or regular preventive maintenance could help achieve emission reductions of up to 40%.

Reducing emissions from the calcinations process means looking for an alternative to limestone. Blended cement made up primarily of coal fly ash and blast furnace slag replaces some of the limestone-based clinker with other materials. This could help reduce CO2 emissions by as much as 20%.

Cement Sector in India Follows Kyoto Protocol

Out of the total CDM (Clean development mechanism), projects for registration under Kyoto protocol across globe 32.86% projects are from India, followed by Brazil with 21.12% china 11.59% and republic of Korea 3.95% while other countries collectively account 30.48%, currently the rate of one carbon credit is 13 euro. The carbon credit market was $25 billion last year and it is growing at tremendous space. There is demand to reduce 1 billion tons of carbon emission in the world so that threats like global warming could be mitigated. Over 200 Indian companies apply for CDM in race of carbon credit.

If India meets one fifth of carbon emission reduction demand, it works out to be 200 million tons of carbon emission reduction. with this India entities can earn 2 billion euro by 2014the main benefits can be expected from Kyoto mechanisms are potentially reduce industrialized countires costs of meeting the Kyoto protocol targets whereas it also supports host countries objectives regarding sustainable development.

Carbon credits are not always created for carbon dioxide alone they are six other gas emission classified which as directly responsible for global warming

Carbon credits create a market for reducing greenhouse emissions by giving a monetary value to the cost of polluting the environment. This means that carbon becomes a cost of business and is seen like other inputs such as raw materials or labor. The carbon market is one of the fastest growing markets in the world and has already generated about 1billion carbon credits. Out of this, India's carbon 30 million carbon credits, the second highest transacted volumes in the world.

Cement sector its environmental accounting facts in the course of ISO reports

The actual environmental standards of ISO 14000 deal with how a company manages the environment inside its facilities and the immediate outside environment. However, the standards also call for analysis of the entire life cycle of a product, from raw material to eventual disposal. These standards do not mandate a particular level of pollution or performance, but focus on awareness of the processes and procedures that can affect the environment. It should be noted that adherence to the ISO 14000 standards does not in any way release a company from any national or local regulations regarding specific performance issues regarding the environment.

Some of the standards in the ISO 14000 series are:

- ISO 14001 - Specification of Environmental Management Systems
- ISO 14004 - Guideline Standard
- ISO 14010 through ISO 14015 - Environmental Auditing and Related Activities
- ISO 14020 through ISO 14024 - Environmental Labeling
- ISO 14031 through ISO 14032 - Environmental Performance Evaluation
- ISO 14040 through ISO 14043 - Life Cycle Assessment
- ISO 14050 - Terms and Definitions.

ISO 14000 and 14001are given only to the companies who follow environmental accounting

ISO 14000 - Environmental management

The ISO 14000 family addresses various aspects of environmental management. It provides practical tools for companies and organizations looking to identify and control their environmental impact and constantly improve their environmental performance. ISO 14001:2004 and ISO 14004:2004 focus on environmental management systems. The other standards in the family focus on specific environmental aspects such as life cycle analysis, communication and auditing.

ISO 14001:2004

ISO 14001:2004 sets out the criteria for an environmental management system and can be certified to. It does not state requirements for environmental performance, but maps out a framework that a company or organization can follow to set up an effective environmental management system. It can be used by any organization regardless of its activity or sector. Using ISO 14001:2004 can provide assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved.

The benefits of using ISO 14001:2004 can include:

Reduced cost of waste management
Savings in consumption of energy and materials
Lower distribution costs
Improved corporate image among regulators, customers and the public

ISO 14001:2004 and SMEs

Small and medium sized enterprises (SMEs) also benefit from ISO 14001:2004. However, implementing an environmental management system in SMEs can be challenging. The publication ISO 14001, Environmental Management Systems - An easy to use checklist for small business, will help SMEs to achieve the benefits of implementing an environmental management system based on ISO 14001.

Table 6: Environmental Management Certification in Cement Sector during 2011-12

S .No	Name	Environmental management certification 2011-12	Environmental management certification 2010-11	Findings ISO -report
1	A.C.C.	ISO 14001	ISO 14001	favorable
2	Ambuja	ISO 14000	ISO 14000	favorable
3	Birla	ISO 14001	ISO 14001	favorable
4	India	ISO 14000	ISO 14000	favorable
5	J.K.	ISO 14001	ISO 14001	favorable
6	Ramco	ISO 14001	ISO 14001	favorable
7	Shree	ISO 14001	ISO 14001	favorable
8	Ultra Tech	ISO 14001	ISO 14001	favorable

Source: compiled table

The companies which are been certified with ISO 14000 and 140001 it is the verification that they are trying to conserve energy and control environmental pollution. These ISO are certified to only those companies who efficiently try to control pollution.

Under Sec 217 of the companies Act

Form A of disclosure of particulars with respect to conservation of energy is made mandatory by all large scale industries as part of their report of the board of directors. A exacting layout is been made mandatory as per the (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988. Cement industries have to comply with the mandatory regulations.They had come into force on the 1st day of April, 1989.

Every company shall, in the report of its board of directors, disclose particulars with respect to the following matters namely:-

A. Conservation of energy:

(a) Energy conservation measures taken;

(b)Additional investments and proposals, if any, being implemented for reduction of consumption of energy;

(c) Impact of the measures at (a) and (b) above for reduction of energy consumption and consequent impact on the cost of production of goods;

(d) Total energy consumption and energy consumption per unit of production as per Form A of the Annexure in respect of industries specified in the Schedule thereto.

Form A

(See RULE 2)

Form of disclosure of particulars with respect to conservation of energy of Ambuja cements

	Current year	Previous year	YOY	result
1.electricity (a) units purchased	53.16	40.20	12.96	increase
(b)Total amount(In crores)	257.85	169.69	88.16	increase
Rate/unit	4.85	4.22	0.63	increase
(b) own generation (i) through diesel generator unit	5.61	18.64	-13.03	decrease
Units per ltr of diesel oil (in crores)	3.77	3.90	-0.13	decrease
cost / unit	8.94	7.02	1.92	increase
(ii)through wind mill	1.04	nil	1.04	increase
Unit per ltr of fuel Cost/unit	nil	nil	nil	nil
(iii) through steam	120.01	120.93	-0.92	decrease
turbine generator Units	764	852	-88	decrease

Units per ltr of oil/gas Cost/unit	3.51	3.14	0.37	increase
2.coal Quantity (Million K. Cal)	10869166	10533678	335488	increase
Total Cost (Rs. in Crores)	1124	893	231	increase
Average Rate (Rs. / Million K. Cal)	1034.02	847.53	186067	increase
3.others Quantity	Nil	Nil	Nil	increase
Total cost	Nil	Nil	Nil	increase
Rate/unit	Nil	Nil	nil	

Analysis: from the above FORM A (rule 2) of ambuja cements of 2011-12 and 2011-10 it can be interpreted that there is raise in electricity consumption which can be condensed and more energy can be conserved. There is a drop off in diesel generator by which less emissions are exaggerated further we can shelter our atmosphere along with that there is boost in coal generator which affect the environment and causes various pollution. So supplementary required stepladder can be taken to reduce respective emissions.

Form A
(See RULE 2)
Form of disclosure of particulars with respect to conservation of energy of Birla corporation cement

	Current year (in lacs of rupees)	Previous year (in lacs of rupees)	YOY	result
1.electricity (a) units purchased(in lacs)	1776.35	1882.77	-106.42	decrease
Total amount	9685.74	9349.45	336.29	increase
Rate/unit	5.45	4.97	0.48	
(b) own generation (i) through diesel generator unit	7.79	9.41	-1.62	decrease
Units per ltr of diesel oil(lacs)	2.30	3.21	-0.91	decrease
cost / unit	9.92	9.84	0.08	increase
(ii) through waste recovery system Units	667.91	174.47	493.44	increase
(iii) through steam turbine generator Units	3250.51	3599.45	-349.45	decrease
Units per ltr of oil/gas(lacs)	1031.12	1012.96	18.16	increase
Cost/unit	2.30	2.19	0.11	increase
2.coal 1.power generation	315240	355334	-40094	decrease
2.process steam	nil	nil	Nil	Nil
locos	nil	Nil	Nil	Nil
kilns	575049	619649	-44600	decrease
others	5162.	5773	-611	decrease
Furnance oil/diesel oil Quality	92.76	99.70	-6.94	decrease

Total amount	24.73	26.55	-1.82	decrease
Average amount	26657	26230	427	increase

Analysis: from the above FORM A (rule 2) of Birla corporation cements of 2011-12 and 2011-10 it can be interpreted that there is decrease in electricity consumption which in turn reduces Co2 emission. There is a drop off in diesel generator and steam turbine generator by which less emissions are exaggerated further we can shelter our atmosphere along with that there is trim down in coal generator and other generators which controls the environment pollution to much extent . Boost in diesel fuel affects the environment as carbon is produced. Accordingly required stepladder can be taken to reduce respective emissions.

Form A
(See RULE 2)
Form of disclosure of particulars with respect to conservation of energy of India cement

	Current year (in lacs of rupees)	Previous year (in lacs of rupees)	YOY	result
1.electricity (a) units purchased	7185.18	8027.06	-841.88	decrease
Total amount	38530.99	32448.15	60824.84	increase
Rate/unit	5.36	4.10	1.26	increase
(b) **own generation** (i) through disel generator unit	637.96	697.66	-5.97	decrease
Units per ltr of diesel oil	3.10	3.31	-.021	decrease
cost / unit	2.64	2.69	-0.05	decrease
(ii) through HFO generator Units	653.57	739.87	-86.3	decrease
Unit per ltr of furnanace oil	288.71	314.30	-25.59	decrease
Cost/unit	44175	42481	1694	increase
(iii) through steam turbine generator Units	1469.71	Nil	1469.71	increase
Units per ltr of oil/gas	3.76	nil	3.76	increase
2.**coal** quantity	1259573	1165984	93589	increase
Total cost	79372	74367	5005	increase
average	6301	6378	-77	decrease
3.other	nil	Nil	nil	Nil

Analysis: from the above FORM A (rule 2) of India cements of 2011-12 and 2011-10 it can be interpreted that there is decline in electricity consumption which in turn reduces Co2 emission. There is a drop off in diesel generator by which less emissions are exaggerated further we can shelter our atmosphere along with that there is amplify to coal generator and other generators which affect the environment and causes various pollution . Drop in diesel fuel by which less emissions are exaggerated further we can shelter our atmosphere. Increase in steam turbine results to heat the

environment so steps should be taken to diminish it. Accordingly required stepladder can be taken to reduce respective emissions.

Conclusion

There are a number of environmental issues related to the cement sector, such as control of air pollutants (dust and gaseous emissions), reduction of green house gases (GHG), the control of fugitive dust, utilization of hazardous wastes as alternate fuels and the conservation of natural resources. The Indian cement sector has shown phenomenal performance in terms of improving air quality. Dust emissions are reduced and cement plants conform to the environmental parameters set by statutory bodies like Central Pollution Control Board of India. Government policies have energized and motivated the sector to take innovative actions to protect the environment and improve the lives of people working in the plant and living nearby. Environmental regulations operating in India that have given new direction to the cement sector in terms of environmental management

Environmental accounting and Pollution control measures in the Indian cement sector

Indirect emissions from burning fossil fuels to heat the kiln can be reduced by switching to such as natural gas, biomass and waste-derived fuels. These less carbon-intensive fuels could help reduce almost a quarter of overall cement emissions from 2006 levels by 2050.

Increasing efficiency of the production process so as to reduce the demand for fuel through technical and mechanical improvements will also help drastically reduce emissions. Steps such as switching from inefficient wet to dry ones or regular preventive maintenance could help achieve emission reductions of up to 40%.

Reducing emissions from the calcinations process means looking for an alternative to limestone. Blended cement made up primarily of coal fly ash and blast furnace slag replaces some of the limestone-based clinker with other materials. This could help reduce CO2 emissions by as much as 20%, but widespread use of blended cement is limited by other environmental regulations as these substitutes can contain toxic heavy metals; the limited availability of substitute material; as well as some building code restrictions since blended cement can take longer to set.

In India, both the Central Pollution Control Board (CPCB) and the respective State Pollution Control Boards (SPCB) deal with environmental issues. SPCB regularly inspects the cement plants/limestone quarries to verify compliance with emission norms. CPCB also inspects the cement plants to check compliance with emission standards under environmental surveillance squad activities. Cement plants also have to comply with the charter on Corporate Responsibility for Environment Protection (CREP).

- The global cement sector has reduced its specific net CO2 emissions per ton of product by 17 percent since 1990 – from 756kg/ton to 629kg/ton. Meanwhile, companies' cement production increased by 74 percent between 1990 and 2011, according to the World Business Council for Sustainable Development. Indian cement sector is also adapting similar emission cuts in tune with Kyoto protocol.

- Environmental accounting takes steps for pollution control, complies with related rules and regulations mention adequate detail of environmental aspects in the annual statements. For sustainable development of a country a well defined environmental policy as well as well follows up and proper accounting procedure is a must. The cement sector in India

- Environmental accounting helps in direct managerial attention to problem areas and Provide informational support for managerial decisions and promote harmonized goals throughout the organization.
- Regardless of the criticism, environmental accounting is necessary to place value environmental resources. If traditional economic growth measures included environmental resources that do not have a market price as well as environmental resource depletion, environmental accounting would not exist.
- Cement sector occupies an important place both in building industrial base of a country and providing infrastructure for development of the national economy. India is the second largest country of cement producer in world after china. it is been dominated by 20 companies which account almost 70% of total cement production in India
- Much is being done to control, monitor and rectify damage done by pollutants. The problems are diverse and some are only been recognized but it is important to keep a control over pollutants so that we can maintain the environment in an acceptable condition for future generation
- CPCB is in the process of evolving emission norms for the Indian cement sector. CPCB and NCB had carried out a study to develop emission norms for the cement sector. However, some of the state pollution control boards have set up emission limits for NO_X and SO_2 emissions from the cement sector.

The Indian cement sector has strong capacity base and produces quality cement that meets the global standards. It has achieved a tremendous success in technological up gradation and assimilation of latest technology and will be continuing to do so. There is also great scope for increase in export of cement on other hand it is accountable for pollution so to protect environment the permitted environmental rules and regulations related to Kyoto protocol limits should be brought under control and reduce global warming.

The various environmental acts enacted in India and implemented by regulatory agencies such as the MoEF/CPCB/SPCBs applicable to the Indian cement sector, cover different aspects of environment protection. The Indian cement sector is proactive and is taking voluntary steps, such as the utilization of alternate fuel, modernization of APCE, reduction of water consumption and rainwater harvesting in used quarries, and the use of treated waste water for dust suppression and environmental belt development. Some of the cement plants have incorporated waste heat recovery plants to generate energy.

Especially over the last decade, the importance of environmental impact has been well recognized by the cement sector and it has been clearly understood that the improvement of the environment is everybody's business. The Indian cement sector has come a long way in achieving technological up gradation, enhanced production, higher energy efficiency and improved environmental condition, conforming to policies and regulation of statutory/ regulatory bodies under government administration.

Suggestions:

Methods for Pollution Mitigation in the Cement Sector:-

- In order to minimize the human health risk due to cement dust exposure the factory managers are necessarily required to put in place the latest technology, routinely implement the activities that facilitate adherence to the emission norms prescribed under the pollution control legislation
- Creation of environmental belts which is nothing but innovations in planting technology can generate instant environmental plants to control pollution
- Re usage of waste materials such as rubber, paper, textiles, exhausted oils, wood, plastics, industrial waste, hazardous waste and solid urban waste.
- usage of alternative fuel such as natural gas and pet coke
- Prevent idle running of equipment by providing inter looking arrangement and operating with plc system. generate daily report on idle running of equipment
- Reduce energy consumption in manufacturing at each stage and monitor energy at plant
- Minimize waste by installing efficient dust collector equipment

The Indian cement sector must comply with the various environmental acts and regulations notified by the Ministry of Environment and Forests (MoEF), etc., which covers different spheres of the environment, encompassing emissions of air pollutants, consumption of water, generation and discharge of trade effluents, utilization and storage of hazardous waste, noise generation, utilization of forest land and wildlife areas. Specifically, these are as follows:

- Water (Prevention & Control of Pollution) Act, 1974.
- Water (Prevention & Control of Pollution) Cess Act, 1977.
- Air (Prevention & Control of Pollution) Act, 1981.
- Environment (Protection) Act, 1986 (EPA).
- Hazardous Waste (Management Handling & Tran boundary Movement), 2008.
- The Forest (Conservation) Act, 1980.
- The Factories Act, 1948.
- The Wildlife (Protection) Act, 1972.
- The Mines Act, 1952

Bibliography

Sources of online journals

[1] Gray, Rob Jan Bebbington, The Environmental accounting, managerialism and sustainability: Is the planet safe in the hands of business and accounting? in (ed.) (Advances in Environmental Accounting & Management, Volume 1), Emerald Group Publishing Limited, 1-44, 2010

[2]Abdel-Rahim, Y.M. Heba, Abdel-Rahim, M. Yousef. (OC09070–Accounting). Green Accounting – A Proposition for EA/ER Conceptual Implementation Methodology. Available http://www.aabri.com/OC09manuscripts/OC09070.pdf on Oct.13 2014.

[3] Suzuki1, Yoshiaki, The Proposal of environmental accounting Housekeeping (each) books of domestic wastewater based on water pollutant roads per capita: a case study of sanbanzetidal coastal zone, Tokyo bay. Journal of Global Environment Engineering, Vol.10 , 2004, the Japan Society of Civil Engineers. Retrieved onOct132014. http://www.jsce.or.jp/committee/global/kankoubutsu.htm, 187-196

[4] Vernon P. Dorweiler, Mehenna Yakhou, Environmental accounting: an essential component of business strategy, Asian Institute of Technology Thailand online, publication, Vol. 13, Issue 2, 2004, (edited) Richard Welford, available at http://onlinelibrary.wiley.com/journal, 65-77.

[5] Ferreira, Clementina, "Environmental accounting: the Portuguese case", Management of Environmental Quality: An International Journal, Vol. 15 Iss: 6, 2004, available at http://www.emeraldinsight.com/journals.html on Oct 13 2014, 561 – 573.

[6]Lintott, John, The Environmental accounting: useful to whom and for what? Online 9 December 1999, Vol. 13, Issue 2, available at http://www.sciencedirect.com, 174-190.

[7] Ieneiu, Ionel Alin, Matis, Dumitru, The status of research in the field of environmental accounting, International Academy of Business and Economics, Vol. 10, Issue: 2 Printing & Publishing NAICS Code: 511, Romania, 2010.

[8] Hecht, E. Joy, The Environmental Accounting Where We Are Now, Where We Are Heading. Spring 1999/Issue 135 Resources, 14-15, 1999.

[9] Haan, de Mark, The International harmonization of environmental accounting: comparing the National Accounting Matrix including Environmental Accounts of Sweden, Germany, the UK, Japan and the Netherlands, online 16, available at Ieneiu, Ionel Alin, Matis, Dumitru, The status of research in the field of environmental accounting, International Academy of Business and Economics, Vol. 10, Issue: 2 Printing & Publishing NAICS Code: 511, Romania, 2010.

[10] United Nations, 2000 The Handbook of National Accounting, Studies in Methods Series F, No. 78 Integrated Environmental and Economic Accounting: An Operational Manual, New York, United Nations publication via ST/ESA/STAT/SER.F/78, Sales No. E.00.XVII.17, ISBN 92-1-161431-7, 2000.

- www.articlenext.com
- www.capitalline.com
- www.economywatch.com
- www.moneycontrol.com
- www.researchmarket.com
- http://globalwarming.change.org/blog/view/is_obama_administration_failing_an_early_climate_tes
- Kyoto protocol agreement
- Environmental protection act and control

- The Kyoto Protocol. (2003) Environmental factsheet from the Swedish NGO Secretariat on Acid Rain. Air Pollution & Climate
- Secretariat. Retrieved Oct 14 2014from http://www.airclim.org/factsheets/factsheet12.htm.

Reports:

C.G.Burange and Shruti Yamani(2008) performance on Indian cement sector

- system on environmental accounting
- Anupam Rastogi (2007) Infra structure sector of India
- Addo MA, Darko EO, Gordon C. 2013. Contamination of soils and loss of productivity of Cowpea (Vigna unguiculata) caused by cement dust pollution. International Journal of Research in Chemistry and Environment.