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Advent of Environmental Management Accounting and Case Study of ACC Cement with respect to Environmental Disclosures in India

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Abstract: *As the industries and their production have grown in India over the years, the risk of sustainability increases because industries have been polluting the environment at an alarming rate. The industries are hence contributing to the pollution of the environment which raises the question of their regulation and monitoring. Various countries have mandated environmental reporting to be furnished to stakeholders in the companies' annual reports through Environmental Management Accounting (EMA). This provides an insight into the activities of the company towards preservation of natural resources and environment. Environmental Reporting has still been in its nascent stage in India which provides scope for standardization of rules and regulations. This paper hence understands the concept and importance of EMA and problems faced in its adoption. Also, this study studies the Environmental Disclosures practices in ACC Cement.*

Keywords: *Environmental Management Accounting (EMA), Environmental Reporting and Indian Industries*

I. INTRODUCTION

The Industrial Revolution led to the development of factories for large-scale production with consequent changes in society. Originally the factories were steam-powered, but later transitioned to electricity once an electrical grid was developed. The mechanized assembly line was introduced to assemble parts in a repeatable fashion, with individual workers performing specific steps during the process. This led to significant increases in efficiency, lowering the cost of the end process. Later automation was increasingly used to replace human operators. This process has accelerated with the development of the computer and the robot.

Historically, some of the manufacturing industries have faced downfall because of different economic factors, like the advancement of replacement technology or the loss of competitive advantage. Manufacturing is one of the most lucrative and growing sectors in India. In order to make India a manufacturing hub, Mr. Narendra Modi, Indian PM launched the 'Make in India' program. Since then, Indian economy is on the path of global recognition as the country by 2020 is expected to become the fifth largest manufacturing country in the world (Bishnoi, Vishal, 2017)

The migration of prosperous and industrialized nations towards a post-industrial society has been evidenced as a recent trend. This is manifested by an increase in the service sector at the expense of manufacturing, and the development of an information-based economy, the so-called informational revolution. In a post-industrial society, manufacturers relocate to more profitable locations through a process of off-shoring.

Measurements of manufacturing industries outputs and economic effect are not historically stable. Traditionally, success has been measured in the number of jobs created. The reduced number of employees in the manufacturing sector has been assumed to result from a decline in the competitiveness of the sector, or the introduction of the lean manufacturing process.

The question is if related to this change, the upgrading of the quality of the product which is being manufactured is happening. While it is possible to produce a low-technology product with low-skill labor, the ability to manufacture high-technology products well is dependent on a highly skilled staff.

Manufacturing industry refers to any business that transforms raw materials into finished or semi-finished goods using machines, tools and labor. Manufacturing sectors include production of food, chemicals, textiles, machines and equipment. This study also studies the Environmental Disclosure practices in ACC Cement, a leading Cement company. The Indian cement industry has evolved significantly in the last two decades, going through all the phases of typical cyclical growth process. With sound economic growth and infrastructure development, the demand for cement is on an upward trend, further addition to capacity is coming up to cater to the increasing demand for cements.

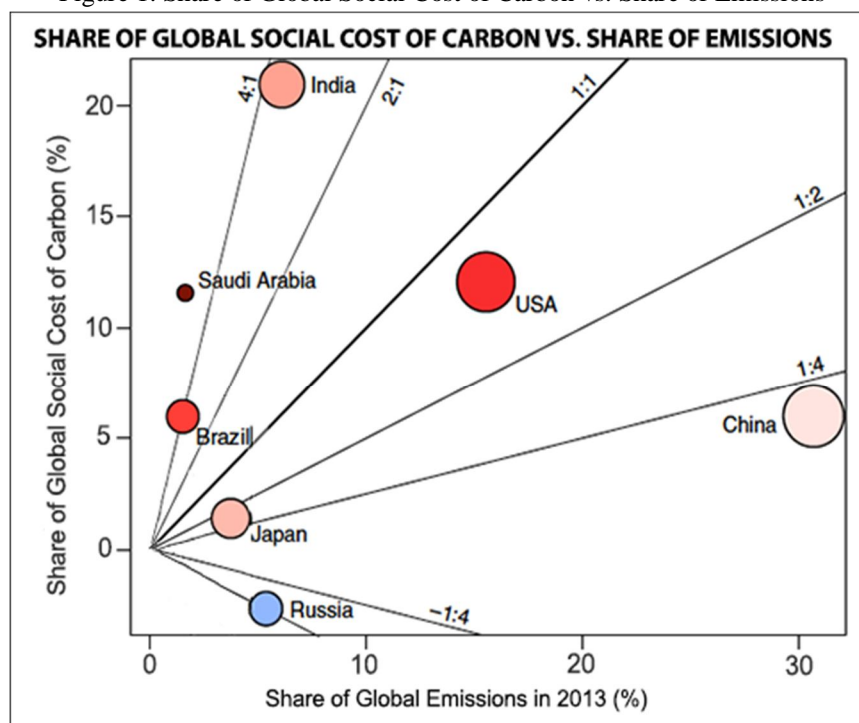
Without paying attention to the environment, Economic development of any kind in any country can lead to environmental crises. In the global market, the responsibility of corporate players towards the environment owing to their business activities is important.

Preserving the natural resources and environment has become very important in India and hence sustainable development management is the need of the hour. Global awareness and acceptance of issues relating to the environment has developed the concept known as “Corporate Environmental Management” which is a part of the overall management system.

A. Environmental Management Accounting

The manufacturing industry is a major player in environmental sustainability issues due to their required inputs, such as water, energy and raw materials, and from unwanted outputs such as emissions released to the air and water sources and waste to landfill sites. Major industrial incidents such as Seveso (University of Bristol), Bhopal 1984 (Union Carbide Corporation), and the recent 2010 British Petroleum Gulf of Mexico disaster (Tripod Incident Analyses, 2010) have highlighted the impact of industries on the environment.

Figure 1: Share of Global Social Cost of Carbon vs. Share of Emissions



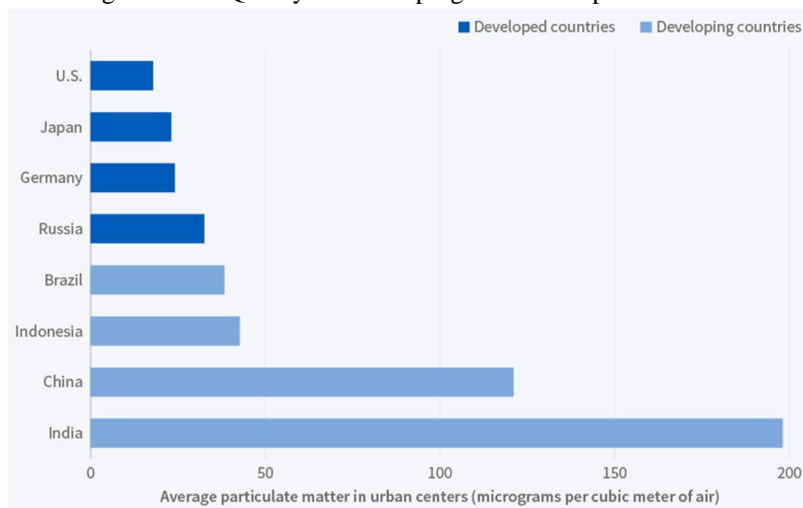
Source: Ricke, et al., Nature Climate Change, 2018

In August 1999 the United Nations set up a working group to develop procedures and principles with regards to Environmental Management Accounting. ‘Environmental Management Accounting Procedures and Principles’ was the document published by the United Nations in 2001 (United Nations, 2001).

Environmental concerns have been on the rise over the past two decades (United Nations, 2001). As a result of this interest of environmental issues by various stakeholders many companies are publishing triple bottom line and sustainability reports. Many of these companies are reporting according to the Sustainable Reporting Guidelines of the Global Reporting Initiative (Global Reporting, 2013). The Global Reporting Initiative (GRI) is a voluntary guideline that companies use to report on the significant economic, environmental and social impacts. According to the World Commission on Environment and Development (WCED, 1987), “Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of needs, in particular the essential needs of the world’s poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.”

Sustainable development incorporates three building blocks, namely economic, social and the environment. Environmental Management Accounting (EMA) integrates two of these, environment and economics, as they relate to an organization’s internal decision making (Savage & Jasch, 2005). It was stated by M. Greenstone and B.K. Jack that developing countries have worse air quality.

Figure 2: Air Quality in Developing and Developed countries



Source: M. Greenstone and B.K. Jack, NBER Working Paper No. 19426

Environmental Management Accounting is a system that industries can implement to assist in decision making of environmental issues and associated costs. Environmental Management Accounting is the application of conventional accounting principles to environmental issues, such as waste and emission analysis. According to Seal, Garrison and Noreen (2012), EMA may be defined as the identification, collection and analysis of physical and monetary information. Physical information is about the use, flows, and rates of energy, water and materials, including wastes. Monetary information is about environment-related costs, earnings, and savings. Both monetary and physical environmental accounting information could be used by industry to be sustainable.

B. Definition

Environmental management accounting (EMA) is defined by CGMA as the identification, collection, analysis and use of two types of information for internal decision making. The first is physical information on the use, flows and rates of energy, water and materials (including wastes). The second is monetary information on environment-related costs, earnings and savings.

C. Environmental Accounting Disciplines

Environmental accounting can be broken down in to three disciplines:

- 1) 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.
- 2) 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.
- 3) 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: a) Environmental Management accounting and b) Environmental Financial accounting.
- 4) Environmental Management Accounting 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 required 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.
- 5) Environmental Financial Accounting 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.

II. REVIEW OF LITERATURE

Neetu Prakash (2016) in her article mentions that the matter of environmental responsibility and the sustainable industrial development has brought forth the new part of accounting i.e. environmental accounting which is intended to guarantee that all stakeholders, financial institutions and public have access to standard, tantamount and constituent condition data as corporate financial reporting. Essentially, the environmental accounting is the treatment of different natural issues of the corporate within the financial statements. Environmental accounting incorporates estimation of environmental expenditures, its actual ascertainment, and acknowledgment of natural liabilities and, disclosure of every environmental liability in a particular segment of the annual reports of an organization. The modern business approaches like as activity based management costing, TQM, life cycle costing, business process-reengineering, Life cycle assessment, life cycle planning, and so forth give the stage to coordinating environmental data into business decisions. Present investigation depended on ID of yearly reports of eighty-five Indian organizations and demonstrated that Indian Companies were uncovering environmental accounting on a voluntary premise in a positive way. At last, the examination additionally features the a few proposals for the consolation of environmental accounting in India.

Mohammed Fazlur Rahman Khan and Rokeya Parvin Jui (2016) in their investigation assessed the environmental reporting practices of 15 manufacturing organizations listed in Dhaka Stock Exchange whose data was collected through secondary data. Results uncover that overall environmental reporting practices of chosen organizations are unregulated because of absence of consistence with particular accounting norms and some different arrangements of BSE. There is no reliable or managed pattern for disclosure of such data of the organizations. Essentially supportable data is revealed through descriptive basis yet nominal part is financial in nature. They accentuate on their reputation and achievement factors instead of satisfying stakeholders' needs and desires. The company requires strong administrative system to build the acts of disclosing environmental impact of the concerned organizations. Essential arrangements ought to be made obligatory for the listed organizations in order to curb non-compliance and increase satisfaction of the stakeholders.

Ahmet Tanc and Kadir Gokoglan (2015) in their article titled "The Impact of Environmental Accounting on Strategic Management Accounting: A Research on Manufacturing Companies" mentioned that the study determined to examine the sensitivity towards environmental issues of manufacturing companies functioning in the industrial zone of Diyarbakir. Also, environmental accounting approaches under the ambit of social responsibility accounting along with examining the pertinent concepts in the organizations which had significant effect on strategic management accounting. With respect to the fundamental results of the research, it was found that firms that implemented environmental accounting got an added value and competitive advantage which increased company's social responsibility in turn.

T. Anuradha (2014) in her article expressed that Environmental accounting is an essential tool for understanding the part played by the natural environment in the economy. The paper takes a look at the manner by which organizations represent issues other than quick financial concerns. This incorporates environmental accounting and its application. The paper firstly considers the alternate point of view of accounting practices is; the second piece of the paper considers environmental accounting and its training in the Indian cement industry. The examination recognizes that the Indian cement industry consents to Kyoto convention standards and a few environmental disclosures bringing about unprecedented performance in curbing environmental pollution.

Mishelle Doorasamy (2014) in his article 'Utilizing Environmental Management Accounting to Investigate Benefits of Cleaner Production at A Paper Manufacturing Company in Kwadakuza, Kwazulu Natal' mentioned that the investigation was based on a contextual analysis of a paper producing organization in Kwadakuza, KwaZulu-Natal. The point of this examination was to utilize Environmental Management Accounting (EMA) to distinguish advantages of CP. Paper producing expends a lot of common assets and creates issues.

Thus, the operational activities of paper plants have a negative environmental effect. In any case, the extent of this investigation was constrained to the steam age process and concentrated principally on the effectiveness of the current coal boilers utilized in the kettle plant. The examination strategy utilized in the investigation was both quantitative and subjective including triangulation. Information was gathered by methods for a questionnaire, semi-organized meetings and narrative audit.

A. Objectives of the Study

- 1) To understand the concept of Environmental Management Accounting (EMA).
- 2) To analyze the advent of EMA in India and its impact on the industries.
- 3) To understand the problems associated with the adoption of EMA in India.

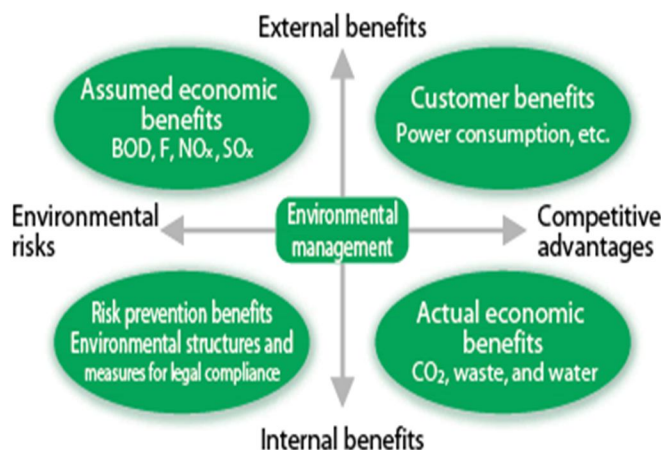
B. Hypothesis of the Study

- 1) *H0*: The Indian Cement Company ACC Cement does not significantly use Environmental Management Accounting (EMA).
- 2) *H1*: The Indian Cement Company ACC Cement significantly uses Environmental Management Accounting (EMA).

C. Benefits of Environmental Management Accounting

Environmental Management Accounting (EMA) assists organizations to monitor and manage its physical and associated monetary resources more effectively. It also allows the organization to identify opportunities for cost savings, efficiency improvements and better decision making based on reliable and accurate information thereby giving the organization strategic advantages.

Figure 3: Benefits of Environmental Management Accounting



Source: www.cgma.org

According to Ambe (2007), some of the benefits of EMA include

- 1) More complete and precise information to support the establishment of cost-effective programmes to improve environmental performance.
- 2) The capability to monitor and manage the consumption and flow of energy and materials more accurately.
- 3) The capabilities to identify, estimate, allocate and manage/reduce environmental types of costs more accurately.
- 4) Implementation of EMA by industry should strengthen the effectiveness of existing government policies/regulations by revealing to companies the true environmental costs and benefits resulting from those policies/regulations.
- 5) Industry's EMA data can be used to inform government programme/policy design.
- 6) Industry's EMA data can be used for accounting purposes at regional or national level.
- 7) To enable the more efficient and cost-effective use of natural resources, including energy and water.
- 8) To enable the cost-effective reduction of pollutant emissions.

To provide industrial environmental performance information that can be used in the broader context of the evaluation of environmental performance and conditions in economies and geographic regions.

D. Factors Inhibiting the Development of Environmental Accounting

Improving the environment for sustainable development is possible and necessary. Environmental aspects of sustainable development add another dimension as to how to share the benefits and costs among and between current generation and future generation. This makes more sense to identify and measure environmental costs.

Accounting information system is a critical component of management information systems. It plays an important role in helping to protect the environment by making polluting production companies to take responsibility for the environmental protection - how the companies reflect in their accounts or how they might expose issues, etc. However, necessary rules and regulations are necessary to protect the environment. Further, well established accounting guidelines are required.

Environmental Accounting needs to work as a tool to measure the economic efficiency of environmental conservation activities and the environmental efficiency of business activities of companies as a whole. Management seldom tries to make proper arrangement

to save the environment unless it is required by law as there is no direct relationship between investment and benefits. In many contexts, environmental accounting is taken to mean the identification and reporting of accounting for any costs and benefits that arise from change to a firm's products and processes where the change also involves environmental impact.

Business enterprises are facing the challenge of determining their true profits which are environmentally sustainable ones. It may be noted here that this requires companies to account for the environment. They should take account of most significant external environmental impacts to determine what profit level would be left if they attempted to leave the planet in the same at the end of the accounting period as it was in the beginning.

E. Challenges to Environmental Management Accounting

Many limitations of conventional management accounting systems and practices can make it difficult to effectively collect and evaluate environmental related data. These limitations can easily lead to inaccurate decision making by management, based on missing, inaccurate and/or misinterpreted information (Ambe, 2007). As a result, these can have negative financial consequences on the company and environmental performance will reflect poorly.

Savage and Jasch (2005) have documented some environmental management accounting challenges that may be experienced in an organization:

- 1) Communication between accounting and other departments are often not well developed. Frequently accounting personnel are withholding accounting information that can be useful for environmental and technical personnel.
- 2) Environmental costs are not correctly allocated from overhead accounts back to processes, products and process lines
- 3) The communication between accounting and other departments is poor
- 4) Environment related cost information is not found in the accounting record
- 5) Investment decisions are made on information that is incomplete
- 6) Volumes are inaccurate for wasted raw materials and costs will then also be inaccurate.

F. Environmental Disclosures in ACC Cement

Materials

Table 1: Usage of Raw Materials

Raw materials – Cement	Unit	2015	2016	2017
Limestone	mn tonnes	22.82	22.41	20.11
Gypsum	mn tonnes	1.14	0.86	1.17
Alternative raw material	mn tonnes	0.22	0.33	0.32
Slag	mn tonnes	2.61	2.68	3.53
Fly ash	mn tonnes	4.17	3.9	4.48
Additives	mn tonnes	0.01	0.016	0.09
Others (bauxite, iron ore etc.)	mn tonnes	0.79	0.67	2.07
Lubricating oil (tonnes)	tonnes	489	489	533
Grease	tonnes	167	167	160
Weight of bags consumed	tonnes	31,473	29,992	27,248
% recycled materials used	%	22.04	22.38	26.37

Source: Annual Report of ACC Cement 2015-2017

Table 1 exhibits the extent of consumption of conventional and alternate materials. It must be noted that over the years the consumption of the recycled material has increased and there is more need for alternate raw materials to be used. 20.11 million tonnes of Limestone was used in 2016-17 which was less compared to the previous years. 1.17 million tonnes of Gypsum was used in 2016-17 which was higher compared to the previous years. Fly Ash was used as much as 4.48 million tons in 2016-17 which was higher than that of the previous years. 3.53 million tons of Slag was used in 2016-17 which was comparatively higher than 2.68 million tons in 2015-16. Lubricating Oil was also used up to an extent of 533 tons which was higher than that of the previous years.

The usage of Grease and Additives stood at 160 tons and 0.09 million tonnes in 2016-17, much lesser than that compared to the previous years. All the materials after recycling were used up to 26.37% in 2016-17 which was higher than 22.38% in 2015-16. Hence, it can be inferred that the company tried its best to use the recycled material and aims at using the raw materials optimally. The company commitment to mineral conservation is demonstrated in different ways, principally by promoting the manufacturing of blended cements using non-fossil fuels, petcoke and industrial and municipal waste for co-processing. While the company co-processes waste generated by other industries and processes, no product made by the Company is reclaimed in any way.

G. CO₂ Emissions

ACC has demonstrated a deep commitment to environment protection ever since its inception and initiated remedial measures to adopt strict carbon discipline in a bid to minimizing its carbon footprint. The Company's specific CO₂ emissions are among the lowest in the cement company globally. ACC is an active member of the Indian Chapter of the Cement Sustainability Initiative (CSI) and an important signatory of the Low Carbon Technology Roadmap for the Indian cement company, a voluntary commitment by CSI member companies with time bound targets for reduction of carbon emissions leading to the year 2050.

Table 2: Gross and Net CO₂ Emissions

CO ₂ Emissions – Cement	Unit	2015	2016	2017
Total CO ₂ Emissions - Gross	Tonnes	1,29,78,374	1,27,37,840	1,44,91,481
Total CO ₂ Emissions - Net	Tonnes	1,28,85,699	1,26,28,887	1,43,51,799
Specific CO ₂ Emissions - Gross	kg/ tonne cement material	556	551	534
Specific CO ₂ Emissions - Gross	kg/ tonne cement material	552	547	525

Source: Annual Report of ACC Cement 2015-2017

Table 2 shows the extent up to which the Carbon Dioxide (CO₂) emissions happen in Cement company. The data has been analyzed from 2014 to 2016. The Carbon Dioxide (CO₂) emissions in tonnes have been determined and it is noted that the Gross CO₂ emissions in 2016-17 was 1,44,91,481 tonnes which was relatively higher when compared to the previous years. The Net CO₂ emissions in 2016-17 were 1,43,51,799 tonnes which was higher when compared to the previous years. Also, the Net Specific CO₂ emissions in 2016-17 stood at 534kg/tonnes reduced when compared to the previous years. The Gross Specific CO₂ emissions in 2016-17 stood at 525 kg/tonnes reduced when compared to the previous years.

H. Reducing CO₂ Emissions

ACC's SD 2030 Plan, aligning with that of Lafarge Holcim, includes targets for "reduction of specific CO₂ emissions by 40% per tonne of cement (vis-à-vis the base of 1990)". The Company is working on five key levers to help in overall CO₂ reduction:

- 1) Clinker factor to raise clinker substitution
- 2) Use of green energy and waste heat recovery
- 3) Use of alternative fuels and raw materials
- 4) Adoption of new low carbon technologies
- 5) Production of more blended cements

I. Alternative Fuels & Resources (AFR)

As a way to reduce the use of fossil-based fuel and other mineral Resources, the Company has gainfully utilised industrial, municipal and agricultural waste and biomass to serve as alternative fuel by co-processing them in its cement kilns. Co-processing of various waste streams enabled us to achieve a Thermal Substitution Rate (TSR) of 4.0% in 2017 as compared to 3.2% achieved in 2016.

J. Other Emissions

Besides CO₂, there are other emissions from the cement manufacturing process such as dust, Sulphur Oxides (SO_x) and Nitrogen Oxides (NO_x).

Table 3: Hazardous Emissions

Emissions	Unit	2015	2016	2017
NO _x	g/tonne clinker	1,544.79	1,966.91	2,020.61
	g/tonne cement	1,001.80	1,289.25	1,319.30
	Tonnes	23883.5	29880.7	35040.3
SO _x	g/tonne clinker	175.6	128.74	136.2
	g/tonne cement	113.88	84.38	88.93
	Tonnes	2,714.92	1,955.72	2,361.89
Dust	g/tonne clinker	36.58	41.5	38.93
	g/tonne cement	23.72	26.24	25.41
	Tonnes	565.53	630.52	675.01

Source: Annual Report of ACC Cement 2015-2017

K. Circular Economy and Managing Waste

The company follows the Lafarge Holcim approach of promoting a circular economy by “repurposing waste through material recycling and energy recovery.” In doing so, the company transform waste, create livelihood opportunities and offer gainful solutions for waste. The extent of hazardous and non-hazardous waste disposed in tons in the years 2014 to 2016 were: When the disposal of the hazardous waste was determined, it was found that 1,85,063 litres of waste oil and 50,490 kgs of grease were disposed in 2016-16. The quantity of waste disposed in 2016-17 was higher in comparison to the previous year 2015-16. When the disposal of the non-hazardous waste was ascertained, in 2016-17, 12,579 tons of steel scrap, 92,908 filter bags and 4,412 tonnes of miscellaneous waste was disposed which was considered less in comparison to the previous years. As more hazardous waste was disposed by the company, steps in order to reduce the disposal should be implemented along with the recycling and reusing the same.

L. Water Management

Table 4: Total Water Withdrawal for Cement Production

Total water withdrawal - Cement	Unit	2015	2016	2017
Surface water	mn m ³	5.37	5.44	6.68
Harvested rainwater	mn m ³	8.01	6.85	6.76
Municipal water	mn m ³	0.07	0.07	0.14
Ground water	mn m ³	1.23	1.99	2
Percentage of sites with water recycling	%	88.24	88.24	100
Total Quantity of Water Treated and Reused Annually	%	9.84	9.1	10.5
Total Quantity of Water Treated and Reused Annually	mn m ³	1.45	1.31	1.63

Source: Annual Report of ACC Cement 2015-2017

The above table 4 shows the water withdrawn by the company from various sources. The water withdrawn from various sources has been measured in million m³. Water from municipality was used up to an extent of 0.14 percent in 2016-17 which was comparatively higher than that compared in the previous years. However, the company used rainwater up to an extent of 6.76 million m³ in 2016-17, lower in comparison to the previous years. Out of the total water withdrawn, 10.5% of the water withdrawn was recycled and reused in 2016-17, higher than that in the previous years. The company commendably used 1.63 million m³ of treated water and successfully reused it in 2016-17 which was better than the quantity used in the previous years. Therefore, it is clear that the company has not made its best efforts to cut down its water withdrawal from surface, ground and the municipality. The company however tries to utilize a maximum percentage of rainwater.

M. Sustainable Development 2030 Plan

The Group's SD 2030 Plan lays down a target to reduce specific fresh water withdrawal by 30% by 2030. To meet this target, various initiatives are being taken such as:

- 1) Reduction of fresh water intake by lowering water demand in process and non-process areas.
- 2) Process optimization and upgradation to water efficient technologies wherever feasible.
- 3) Installation of Sewage Treatment Plants (STP), Effluent Treatment Plants (ETP), and Zero Liquid Discharge (ZLD) systems for effective reutilisation of waste water. Efforts to conserve water through rain water continue at all plants, mines, colonies and community areas.
- 4) Installation of water metering and monitoring systems at most plants help identify the source of leakages and potential scope for water conservation.

N. Implementing WASH - Ensuring a Safe and Healthy Future

Access to water, sanitation and hygiene (WASH) is one of the Sustainable Development Goals (SDGs) to be achieved by 2030. The WASH pledge is an initiative by the World Business Council for Sustainable Development (WBCSD) and its compliance is one of the company SD 2030 targets. During the year, ACC assessed the WASH score at all its plant sites, and developed action plans for each plant to implement the WASH pledge.

O. Biodiversity

ACC's SD 2030 Plan includes an assurance that the company aim to create a "positive change on biodiversity by 2030 vis-à-vis 2020." All plants continued to pursue other ongoing efforts to conserve biodiversity, flora and fauna in plants, townships, mines and surrounding areas. These include some of the following:

- 1) Tree plantation: Around 1.40 lakh trees were planted with an average survival rate of over 80%, comprising native and local species best suited to the local ecology.
- 2) Rain water harvesting: All worked-out mining pits harvest rainwater which continues to enhance water self-reliance at some of the company plants.
- 3) Top soil preservation: This is regularly practiced so that top soil is preserved for future use in afforestation and plantation activities.

The main focus of the company has been to reduce CO₂ emissions and mineral conservation. Also, recycled material was used effectively and raw materials were planned to be used optimally. One of the decisive steps of the company is to substitute limestone and increasing its clinker factor. The company safely co-processed more than 0.4 mn tones of waste. The company reduced water withdrawal from surface and ground by a minimal percentage and tried to use maximum percentage of rainwater. Steps in order to reduce the disposal of hazardous and non-hazardous waste were done by recycling the waste in an appropriate manner. Awareness on major biodiversity conservation issues through conducting training programmes was done by the company.

Environmental Management Accounting (EMA) is mandated to be adopted by cement companies in India as it is an initiative of the Government to preserve the environment and its resources for a sustainable living. The indicators of an effective Environmental Management Accounting (EMA) are Energy and Climate Change, Water, Resources, Waste Management and Biodiversity.

Adequate steps in order to preserve water, biodiversity, energy, natural resources and dispose waste effectively were taken by ACC Cement deploying effective R&D and updated technology which found the company is on the path of using Environmental Management Accounting (EMA). As all indicators of EMA were catered to by the company, it was proved that the company significantly used EMA. Hence, null hypothesis was rejected and alternate hypothesis was accepted.

III. CONCLUSIONS AND SUGGESTIONS

It has been observed that the environmental accounting and reporting performance of Indian companies are advancing very slowly with poor environmental disclosure practices. The majority of the disclosures are descriptive in nature with little quantifiable data. Most of the disclosures focus on philanthropic and charitable activities or describing the commitment to the sustainability issue. There is also a lack of continuity in disclosing environmental information in the annual reports of the selected companies. As there is no standardized compulsory environmental disclosure requirement the disclosures are voluntary in nature and not comparable at all. Environmental accounting and reporting is an effective tool for better environmental management and therefore it should be made mandatory for all industries particularly the polluting ones. Companies have to consider environmental accounting and reporting as a strategic management tool for gaining competitive advantage. Companies should adopt a comprehensive management

system which ensures accountability for implementing environmental policies and programmes in their organization. Environmental audit and its public reporting should be made mandatory for all polluting organizations for proper accountability and reliability towards environment.

Environmental management with the support of environmental accounting would prevent exploitation and depletion of natural resources. In India, the Environmental Reporting Practices followed by the corporate sectors are not satisfactory as the reporting seems to be more of a statutory obligation than social responsibility. The concept of environmental reporting is still not developed in India due to lack of legal obligation and necessary standard.

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