

“Link between Corporate Environmental Disclosure and Firm Performance” – Perception or Reality?

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ABSTRACT

Long standing debate on usefulness of issuing environmental reports has been a trigger for this research. Environmental reports issued by corporates on their environmental performance are mainly non-financial in nature. Previous empirical studies carried out in developed countries provide mixed results about impact of environmental disclosures on firms' performance. There is little empirical evidence available on the relationship between environmental disclosure and firm performance in developing countries, including India. Primary objective of this research is to understand whether there is any significant relationship between Corporate Environmental Disclosure (CED) and firm performance of selected companies listed in Bombay Stock Exchange (BSE), India. This research uses content analysis methodology by developing an environmental disclosure index (EDI) and formulating hypotheses to test the association between firm performance and level of environmental disclosure through a sample of 85 companies from chemical, energy and metal sector listed in BSE. A regression model with EDI as dependent variable and return on capital employed (ROCE), return on assets (ROA), net profit margin (NPM) and earnings per share (EPS) as independent variable is used to analyse data for this research. Results show there is no significant relationship between the level of environmental disclosure and firm performance.

Keywords: annual reports; content analysis; corporate environmental disclosure; firm performance

1. INTRODUCTION

"This one trend, climate change, affects all trends."

- U.S. President Barack Obama, COP 21, UN Climate Change Conference Paris 2015

Global warming caused by rising temperatures, rising sea levels and unexpectedly shifting weather patterns are likely to have serious economic consequences for countries

putting greater strains on economic and military resources (LA Times 2015)¹. Consequently, the scarce resources spent on dealing with climate related issues will compete with what could have been achieved for economic growth and development of the nation. Global Assessment Report on Disaster Reduction, 2015 has put economic losses from disasters such as earthquakes, tsunamis, cyclones and flooding at an average of US\$250 billion to US\$300 billion annually. These resources could be used to invest in infrastructure, social protection, public health and public education (UNISDR 2015)².

Consumption and degradation of natural resources and environment is a global phenomenon and continues to grow over a period of time (Bernauer et al. 2007)³. Environmental degradation caused due to uncontrolled growth of urbanisation and industrialization has become so grim that various legislations have been enacted at national and international level for protection of environment. Increased awareness from society over implications of globalisation resulted in increased pressure from stakeholders (Kolk 2003)⁴. A profitable company is successful but a company doing so without any negative impact on environment is sustainable (Kundra 2013)⁵. Environmental performance is a major issue facing corporates due to demand from society and extensive environmental legislation (Wiseman 1982)⁶. Organisation try to meet the demand from stakeholders through sustainability reporting (Hahn & Kühnen 2013)⁷. Sustainability reporting is reporting of credible and relevant corporate environmental, social and economic performance (Palenberg et al. 2006)⁸. Campbell (2004, p. 108)⁹ defined environmental disclosures as “those disclosures pertaining to the impact that an organizational process or operation may have on the natural environment”. Most companies provide environmental information in annual report or a separate sustainability report (Chaklader & Gulati 2015)¹⁰. A longitudinal and cross-sectional

¹LA Times. (2015), “Organizing the world” 1 December,

<http://www.latimes.com/world/europe/la-fg-climate-change-talks-paris-updates-htlstory.html> accessed 15 January 2016.

² UNISDR. (2015), “Making Development Sustainable: The Future of Disaster Risk Management”, *Global Assessment Report on Disaster Risk Reduction*, Geneva, Switzerland.

³ Bernauer, T. et al. (2007), “Explaining green innovation: Ten years after Porter's Win-Win Proposition: How to Study the Effects of Regulation on Corporate Environmental Innovation?”, *Politische Vierteljahresschrift*, 39(17), 323-341.

⁴ Kolk, A. (2003), “Trends in sustainability reporting by the Fortune Global 250”, *Business Strategy and the Environment*, 12, 279-291.

⁵ Kundra, S. (2013), “Environmental disclosure practices by companies in India: A study of Nifty companies”, *Pacific Business Review International*, 6(2), 66-73.

⁶ Wiseman, J. (1982), “An evaluation of environmental disclosures made in corporate annual reports”, *Accounting, Organizations and Society*, 7(1), 53-63.

⁷ Hahn, R. & Kühnen, M. (2013), “Determinants of sustainability reporting: a review of results, trends, theory, and opportunities in an expanding field of research”, *Journal of Cleaner Production*, 59, 5-21.

⁸ Palenberg, M., Reinicke, W. and Witte, J.M. (2006), “Trends in non-financial reporting”, *Prepared for the United Nations Environment Programme, Division of Technology, Industry and Economics (DTIE)*, Berlin.

⁹ Campbell, D. (2004), “A longitudinal and cross-sectional analysis of environmental disclosure in UK companies-a research note”, *The British Accounting Review*, 36(1), 107-117.

¹⁰ Chaklader, B. & Gulati, P.A. (2015), “A study of corporate environmental disclosure practices of companies doing business in India”, *Global Business Review*, 16(2), 321-335.

analysis of environmental disclosure in UK companies between 1974 and 2000 showed a marked increase in volume of disclosure. Previous studies have suggested that the perceived need to be socially recognised as a cause for increase in level of environmental disclosure (Campbell 2004)¹¹. Some of the disclosures were in response to new government regulations, while much of the disclosure were voluntary (Freedman & Stagliano 2015)¹². KPMG International Survey of Corporate Responsibility Reporting 2011 on corporate reporting (CR) reporting trends, companies are increasingly realizing the benefits of CR reporting and those not yet reporting on their CR activities are under substantial pressure to start. Perspective of CR reporting, considered as a moral obligation to society has become a business vital (KPMG 2011)¹³. Managers in their decision making process face environmental issues involving ethical and social values that should be promoted by companies and ensuring sustainable economic success. In the current competitive scenario, firms consider commitment to natural environment as a strategic issue (Molina-Azorín et al. 2009)¹⁴. Producing environmental reports involves considerable real costs and opportunity costs (Qiu et al. 2014)¹⁵. Yet number of companies issuing environmental reports in India, as in many countries around the world (Gray et al. 2001)¹⁶, has increased in past decade from a half page narrative disclosure (Harte & Owen 1991¹⁷; Wiseman 1982¹⁸) to a stand-alone sustainability report with higher and better quality disclosure.

1.1 Corporate Environmental Disclosure

Corporate sustainability reporting has a relatively long history going back to the practice of environmental reporting. Environmental Accounting also known as Corporate Social Reporting, Non-Financial Reporting or Sustainability Reporting is the process through which firms' communicate effect of their economic action on society and environment to particular interest groups within society and to society at large (Gray & Babbington

¹¹ Campbell, D. (2004), "A longitudinal and cross-sectional analysis of environmental disclosure in UK companies-a research note", *The British Accounting Review*, 36(1), 107-117.

¹² Freedman, M. & Stagliano, A.J. (2015), "Environmental Reporting and the Resurrection of Social Accounting", *Public Interest*, 10(04), 131-144.

¹³ KPMG. (2011), International Survey of Corporate Responsibility Reporting.

¹⁴ Molina-Azorín, J. F., Claver-Cortés, E., López-Gamero, M. D., & Tarí, J. J. (2009), "Green management and financial performance: a literature review", *Management Decision*, 47, 1080-1100.

¹⁵ Qiu, Y., Shaukat, A. & Tharyan, R. (2014), "Environmental and social disclosures: Link with corporate financial performance", *The British Accounting Review*, 1-15.

¹⁶ Gray, R., Javad, M., Power, D., & Sinclair, C.D. (2001), "Social and environmental disclosure and corporate characteristics: A research note and extension" *Journal of Business Finance & Accounting*, 28, 327-356.

¹⁷ Harte, G. & Owen, D. (1991), "Environmental Disclosure in the Annual Reports of British Companies: A Research Note" *Accounting, Auditing & Accountability Journal*, 4(3).

¹⁸ Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, 7(1), 53-63.

2000)¹⁹.

PricewaterhouseCoopers in a global survey of around 1000 CEOs from 43 countries, 79 per cent of them stated sustainability was important for profitability of any company (PWC 2004)²⁰. In their Global Survey of CEOs in 2016, 77 per cent CEOs defined business success by more than financial profits, indicating meager profits are not enough for long term success. CEOs opinion is that to navigate a world with increasing urbanisation, climate change and rapid demographic and social shift, customers will increasingly judge companies on how they help greater society. About a quarter of CEOs stated changing their sense of purpose to include border impact their company has on the society (PWC 2016)²¹. These responses indicate the changing attitude of corporates and positive influence of sustainability reporting on financial performance of the company. Those arguing against state that considerable resources and management effort are drawn away in creating environmental reports which could be used by the companies in their core resulting in lower profits (Molina-Azorín, Claver-Cortés, and López-Gamero & Tarí 2009)²². Producing environmental and social disclosure reports entail real and opportunity cost (Li & McConomy 1999)²³. Everyone wants a cleaner planet but working towards a cleaner planet is not economically beneficial. Prevention and cleanup cost for industries increase prices and reduces competitiveness (Porter & Linde 1995)²⁴. On the other hand firms that are efficient at pollution control can be efficient at production and firms that do well financially can afford to spend more on environmental resources and cleanup (Cohen et al. 2014)²⁵. Companies get certifications (ISO certification), publish sustainability reports or get ratings in environmental index to share their environmental information with stakeholders (Chaklader & Gulati 2015)²⁶. Despite the growing need for environmental disclosure from the stakeholders in the last decade, usefulness of reporting on environmental performance has been a debate (Sarumpaet 2005)²⁷.

Research needs to be done on possible relationship between environmental disclosure and

¹⁹ Gray, R. & Bebbington, J. (2000), "Environmental Accounting, Managerialism and Sustainability: Is the planet safe in the hands of business and accounting?" *Advances in Environmental Accounting & Management*, 1(1), 1-44.

²⁰ PWC. (2004), "Sustaining value through people", *European Business Forum*, (17), 85.

²¹ PWC. (2016), "Redefining business success in a changing world, CEO survey", (January). Available at: www.pwc.com/ceosurvey, Assessed on 27-03-2016.

²² Molina-Azorín, J. F., Claver-Cortés, E., López-Gamero, M. D., & Tarí, J. J. (2009), "Green management and financial performance: a literature review", *Management Decision*, 47, 1080-1100.

²³ Li, Y., & McConomy, B. J. (1999), "An empirical examination of factors affecting the timing of environmental accounting standard adoption and the impact on corporate valuation", *Journal of Accounting, Auditing & Finance*, 14(3), 279-313.

²⁴ Porter, M.E. & Linde, C. Van Der. (1995), "Green and competitive: ending the stalemate", *Harvard Business Review*, 28(6), 128-129.

²⁵ Cohen, M.A., Fenn, S.A. & Konar, S. (2014), "Environmental and Financial Performance: Are They Related?" *IGARSS*, 1997(1), 1-5.

²⁶ Chaklader, B. & Gulati, P.A. (2015), "A study of corporate environmental disclosure practices of companies doing business in India", *Global Business Review*, 16(2), 321-335.

²⁷ Sarumpaet, S. (2005), "The Relationship between Environmental Performance and Financial Performance of Indonesian", *Jurusan Akuntansi & Kewangan*, 7, 89-98.

firm performance to investigate if a relationship exists. Previous studies on relationship between the two have been conflicting, some studies showed significant positive relationship while others found it insignificant. Most of these studies come from developed nation where environmental awareness is considered high. However there have been very few studies conducted within developed countries. As India is a developing country, general view is that majority of companies will focus on profit maximisation with minimum concern for environment; hence there is a need to see the direction of relationship between environmental performance and financial performance.

2. REVIEW OF LITERATURE

2.1 Environmental Disclosure

Environmental disclosure began to be part of annual reports from the 1970s. Disclosures were in narrative form, about half page and provided incomplete details of environmental performance (Harte & Owen 1991²⁸; Wiseman 1982²⁹). Investors may not be receiving adequate environmental disclosure which is potentially dangerous for investors and securities market. Sadowitz (1992)³⁰ recommended inclusion of more details in management discussion and analysis on environmental liability and to make environmental audits mandatory. Companies only report constructive part in the sustainability reports; negative news is never reported. Quality of financial disclosure is very high for firms with best social performance and worst social performers make least disclosure (Cahan & Malone 1995)³¹. In a study of 20 successfully prosecuted firms for environmental violation and 20 non-prosecuted firms, both set of firms appeared reluctant to disclose any negative news, however prosecuted firms provided significantly more positive environmental disclosure in the year of prosecution (Deegan & Rankin 1996)³². As a preventive step, firms may increase their environmental disclosure significantly as to avoid adverse regulatory pressure in future. Craighead and Hartwick's (1998)³³ through a survey of 68 CEOs of Canadian Public companies found

²⁸ Harte, G. & Owen, D. (1991), "Environmental Disclosure in the Annual Reports of British Companies: A Research Note" *Accounting, Auditing & Accountability Journal*, 4(3).

²⁹ Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, 7(1), 53-63.

³⁰ Sadowitz, M. (1992), "Environmental Disclosure: What is required and what is needed", *Environmental History Review*, 16(4), 69-82.

³¹ Cahan, S.F. & Malone, D. (1995), "An Empirical Examination of the Relationship between Corporate Social Responsiveness and Extent of Disclosure", *Business & Professional Ethics Journal*, 14(2), 23-46.

³² Deegan, C. & Rankin, M. (1996), "Do Australian companies report environmental news objectively? An analysis of environmental disclosures by firms prosecuted successfully by the Environmental Protection Authority", *Accounting, Auditing & Accountability Journal*, 9(2), 50-67.

³³ Craighead, A.J., & Hartwick, J. (1998), "The effect of CEO disclosure beliefs on the volume of disclosure about corporate earnings and strategy" *Behavioral Research in Accounting*, 10, 240-262.

CEOs who believe that high level disclosure has benefits like reduction in firm's cost of capital disclose more than CEOs who believe that market is fixated on EPS and hence disclose less.

2.2 Environmental Disclosure in India

Most of the environmental reporting in India is not methodical, hence not comparable (Sahay 2004)³⁴. Very few companies are providing good information and the rest of the reporting seems to be aimed at publicity. There is lack of information with respect to the environment related issues and environmental expenditure & costs (Shukla & Vyas 2013)³⁵. Though Indian companies match the companies in the developed world in providing financial data, environmental reporting is unsystematic and inadequate. Prevailing environmental regulation needs rigorous enforcement and implementation (Sahay & Singh 2004)³⁶. (Malarvizhi and Yadav 2008)³⁷ observed that level of environmental disclosure was more in manufacturing companies and companies tend to report only positive environmental information and negative information is not disclosed. Large companies and companies certified by external agencies tend to disclose more environmental information (Chaklader & Gulati 2015)³⁸. Luthra, Kumar, Garg, & Haleem (2015)³⁹ found high initial capital as the number one barrier for adoption of renewable/sustainable energy.

Singh and Joshi (2009)⁴⁰ found a growing trend in the level of disclosure and found a positive relationship between profitability, size of company and environmental disclosures. Mitra (2012)⁴¹ states India is known for its cost effectiveness and high quality output. Suggested corporate world to seize sustainability reporting as a business showcase and carve a special position in the global front. Sandhu, Smallman, Ozanne, & Cullen (2012)⁴² in a study on stakeholders who can leverage business organisation in India into being environmentally responsive found supply chain & internalization

³⁴ Sahay, A. (2004), "Environmental reporting by Indian corporations", *Corporate Social Responsibility and Environmental Management*, 11(1), 12-22.

³⁵ Shukla, A & Vyas, N. (2013), "Environmental Accounting & Reporting in India (A comparative study of Bharat Petroleum Company Limited & Oil & Natural Gas Company Limited)", *Pacific Business Review International*, 5(7), 52-59.

³⁶ Sahay, A. & Singh, N. (2004), "Indian Corporate Environmental and Financial Performance: Empirical relationship between them", *Journal of Advances in Management Research*, 1 (3), 105-116.

³⁷ Malarvizhi, P., & Yadav, S. (2008), "Corporate environmental disclosures on the Internet: An empirical analysis of Indian companies", *Issues in Social & Environmental Accounting*, 2(2), 211-232.

³⁸ Chaklader, B. & Gulati, P.A. (2015), "A study of corporate environmental disclosure practices of companies doing business in India", *Global Business Review*, 16(2), 321-335.

³⁹ Luthra, S., Kumar, S., Garg, D. & Haleem, A. (2015) "Barriers to renewable/sustainable energy technologies adoption: Indian perspective", *Renewable and Sustainable Energy Reviews*, 41, 762-776.

⁴⁰ Singh, G., & Joshi, M. (2009), "Environment management and disclosure practices of Indian companies", *International Journal of Business Research*, 9(2), 116-128.

⁴¹ Mitra, P.K. (2012), "Sustainability reporting practices in India: Its problems and prospects" *International Journal of Marketing, Financial Services & Management Research*, 1(5), 109-115.

⁴² Sandhu, S., Smallman, C., Ozanne, L.K., & Cullen, R. (2012), "Corporate environmental responsiveness in India: Lessons from a developing country", *Journal of Cleaner Production*, 35, 203-213.

pressures as the driver for pollution control, recycling wastes and decreased resource consumption. Commitment of top management was the top driver for adoption of green products and industrial ecology. Aggarwal, P (2013)⁴³ in a study on 20 non-financial listed issuing sustainability reports as per Global Reporting Initiative (GRI) guidelines found no significant influence of corporate sustainability on financial performance. Makori & Jagongo, (2013)⁴⁴ studied the relationship between environmental accounting and profitability of 14 random companies from Bombay Stock Exchange (BSE) and the analysis revealed significant negative relationship between environmental accounting, return on capital employed & earnings per share and a significant positive relationship between environmental accounting, net profit margin and dividend per share.

Vinayagamoorthi, Murugesan, & Kasilingam (2015)⁴⁵ in a study of BSE 500 index companies to analyse the impact of profitability on environmental performance found Return on Assets, Return on Equity, Return on Sales to have a positive impact on environmental performance and Return on Capital Employed had a negative impact on environmental performance indicating a significant relationship between financial performance of the firm and environmental performance.

Few numbers of researches done on relationship between environmental accounting/disclosure and firm performance in India show mixed results.

2.3 Corporate Environmental Disclosure

Corporates are using environmental reporting as a tool to display their corporate awareness (Sumiani, Haslinda & Lehman 2007)⁴⁶. Level of environmental disclosure varies across companies, countries, industries and time (Gray et al., 2001⁴⁷; Hackston & Milne 1996⁴⁸). Reliable social responsibility disclosures would prove useful to external users (Estes 1972). Environmental disclosure helps corporates discharge their environmental responsibilities – namely, regulatory requirements, disclosure of environmental performance to stakeholders, ensure environmental damages do not

⁴³ Aggarwal, P. (2013), "Impact of Sustainability Performance of Study of Listed Indian Companies", *Global Journal of Management and Business Research Finance*, 13(11), 61-70.

⁴⁴ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

⁴⁵ Vinayagamoorthi, V., Murugesan, S. & Kasilingam, L. (2015), "Impact of Firms' Profitability on Environmental Performance: Evidence from Companies in India", *Mediterranean Journal of Social Sciences*, 6(1), 109-119.

⁴⁶ Sumiani, Y., Haslinda, Y., & Lehman, G. (2007), "Environmental reporting in a developing country: A case study on status and implementation in Malaysia", *Journal of Cleaner Production*, 15(10), 895-901.

⁴⁷ Gray, R., Javad, M., Power, D., & Sinclair, C.D. (2001), "Social and environmental disclosure and corporate characteristics: A research note and extension" *Journal of Business Finance & Accounting*, 28, 327-356.

⁴⁸ Hackston, D., & Milne, M.J. (1996), "Some determinants of social and environmental disclosures in New Zealand companies" *Accounting, Auditing, and Accountability Journal*, 9(1), 77-108.

occur and as a result have better control over potential liabilities due to environmental damages. Focus of the researchers switched from corporate social disclosure to corporate disclosure & reporting of environmental information in 1980s and the trend continued in the next decade and beyond. Environmental disclosures which are mainly non-financial in nature is a part of social reporting (Hossain & Andrew 2006)⁴⁹. Most study on corporate disclosures mainly focuses on factors contributing to voluntary disclosures (Williams 1999⁵⁰).

KPMG International Survey of Corporate Responsibility Reporting 2011, on CR reporting trends companies are increasingly realizing the benefits of CR reporting and companies not yet reporting on their CR activities are under substantial pressure to start. CR reporting considered as a moral obligation to society has become a business vital. Companies derive financial benefits from direct cost savings and enhanced reputation in the market (KPMG 2011⁵¹). Toms (1999)⁵² says that firms disclosing environmental information have a better image in society resulting in better stock market and consumer market performance. By adopting environmental accounting helps companies in creation of a better image globally as well as save cost (Chaklader 2001)⁵³.

2.4 Measuring Environmental Disclosure

Environmental issues are complex and measuring environmental disclosure has many challenges as there is no standard measure available like those for financial disclosure, however a range of guidelines have been developed now. There is difficulty in measuring environmental performance data and accounting researchers have often used content analysis on annual reports (Hackston & Milne 1996⁵⁴). Content analysis, a technique used for condensing many words into fewer content categories based on coding rules in a common approach used to measure quality of environmental disclosure from Wiseman (1982)⁵⁵'s study. Content analysis converts large amount of information into data useful for study in a systematic way.

⁴⁹ Hossain, M. & Andrew, J. (2006), "Corporate Social and Environmental Disclosure in Developing Countries: Evidence from Bangladesh", *Asia Pacific Conference on International Accounting Issues*, Hawaii, October 2006.

⁵⁰ Williams, S.M. (1999), "Voluntary environmental and social accounting disclosure practices in the Asia-Pacific region: an international empirical test of political economy theory" *The International Journal of Accounting*, 34(2), 209-238.

⁵¹ KPMG. (2011), *International Survey of Corporate Responsibility Reporting*.

⁵² Toms, S. (1999), "Financial incentives for corporate greening: Some UK evidence", *Social and Environmental Accounting*, 19(1), 5-7.

⁵³ Chaklader, B. (2001), "Green accounting: Methodology for global corporate sustainability", *Productivity*, 42(1), 12-15.

⁵⁴ Hackston, D., & Milne, M.J. (1996), "Some determinants of social and environmental disclosures in New Zealand companies", *Accounting, Auditing, and Accountability Journal*, 9(1), 77-108.

⁵⁵ Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, 7(1), 53-63.

Wiseman (1982) made a list of 18 items divided into four categories: Economic factors, litigation, pollution abatement and other environmental related information. Disclosures made by companies on these items were assigned scores. Many researchers have adopted similar measurement of environmental disclosure with changes in items and assigned scores (Cahan & Malone 1995⁵⁶; Deegan et al. 2002⁵⁷; Patten 2002⁵⁸).

Parker (2005)⁵⁹ did an analysis of research methodologies employed in papers published in four leading interdisciplinary research journals over a period of time. Most of the papers used literature, theory or commentary indicating that theorising in Social and Environmental Accountability research needs a much closer engagement with practice.

2.5 Measuring Firm Performance

Economic performance of a firm is ultimately reflected in corporate profits (Freedman & Jaggi 1992)⁶⁰. Profitability or performance of a firm can be measured using accounting based or stock market based measures. Accounting based measure reflects past performance of the firm; whereas stock market based measure reflect future expectations of the shareholders (Peloza 2009)⁶¹. McGuire, Sundgren & Schneeweis (1988)⁶² discussed weakness in both methods and have assessed firm performance using both methods. Stock market returns may not reflect risk or asymmetry of information. It assumes efficient market and no confounding effects from other events like declaration of dividend, announcement of a new product, impending merger, signing a major contract, changes in key executive etc. It is difficult to control for confounding effects during event window (McWilliams & Siegel 1997)⁶³. Stock prices only relate to financial stakeholders and environmental disclose impacts non-financial stakeholders too (McWilliams & Siegel 2012)⁶⁴.

⁵⁶ Cahan, S.F. & Malone, D. (1995), "An Empirical Examination of the Relationship between Corporate Social Responsiveness and Extent of Disclosure", *Business & Professional Ethics Journal*, 14(2), 23-46.

⁵⁷ Deegan, C., Rankin, M. & Tobin, J. (2002), "An examination of the corporate social and environmental disclosures of BHP from 1983-1997: A test of legitimacy theory", *Accounting, Auditing & Accountability Journal*, 15(3), 312-343.

⁵⁸ Patten, D.M. (2002), "The relation between environmental performance and environmental disclosure: a research note" *Accounting, Organizations and Society*, 27(8), 763-773.

⁵⁹ Parker, L.D. (2005), "Social and environmental accountability research: A view from the commentary box", *Accounting, Auditing & Accountability Journal*, 18(6), 842-860.

⁶⁰ Freedman, M. & Jaggi, B. (1992), "An investigation of the long-run relationship between pollution performance and economic performance: The case of pulp and paper firms", *Critical Perspectives on Accounting*, 3(4), 315-336.

⁶¹ Peloza, J. (2009), "The Challenge of Measuring Financial Impacts From Investments in Corporate Social Performance", *Journal of Management*, 35, 1518-1541.

⁶² McGuire, J.B., Sundgren, A. & Schneeweis, T. (1988), "Corporate Social Responsibility and Firm Financial Performance", *Academy of Management Journal*, 31(4), 854-872.

⁶³ McWilliams, A. & Siegel, D. (1997), "Event Studies in Management Research: Theoretical and Empirical Issues" *Academy of Management Journal*, 40(3), 626-657.

⁶⁴ McWilliams, A. & Siegel, D. (2012), "Research Notes and Communications and Social Responsibility Corporate or Financial Performance: Correlation Misspecification?", *Strategic Management Journal*, 21(5), 603-609.

Accounting based measure shows efficient use of assets to generate value (Peloza 2009)⁶⁵. They reflect internal decision making abilities as they are subject to managers' discretionary allocation of funds to different projects rather than external perception of performance (Orlitzky et al. 2000)⁶⁶. Accounting based measures are more likely to capture unsystematic risk which is unique to firm since activities undertaken by firms which lead to high or low perceived corporate social responsibility might be mostly unsystematic (McGuire et al. 1988)⁶⁷.

Freedman & Jaggi (1992)⁶⁸ used return on equity and return on assets as a measure for long term profitability measure. However they are subjected to bias from managerial manipulation and difference in selection of accounting methods or policies. Such bias can be mitigated by collecting data over a reasonably longer period (Herremans et.al., 1993)⁶⁹ and averaging financial data to remove any potential distortions arising from unusual entries in any particular year. Environmental disclosure is unique for each firm; hence accounting based measure is preferred.

Most researchers have used Earnings per share [EPS], return on assets [ROA], return on equity [ROE], return on investment [ROI], return on capital employed [ROCE], gross profit to sales [GPS], net profit margin [NPM], dividend per share [DPS], earnings before interest, tax, depreciation and amortization [EBITDA], total assets, sales growth, asset growth, and operating income growth as a measure of profitability. (Makori & Jagongo 2013⁷⁰; Oeyono et al. 2011⁷¹; Skouloudis et al. 2014)⁷².

2.6 Link between Environmental Disclosure and Firm Performance

Firms may increase the level of environmental disclosure in anticipation of better environmental performance and improving corporate image. However despite these

⁶⁵ Peloza, J. (2009), "The Challenge of Measuring Financial Impacts From Investments in Corporate Social Performance", *Journal of Management*, 35, 1518-1541.

⁶⁶ Orlitzky, M., Schmidt, F.L. & Rynes, S.L. (2000), "Corporate Social and Financial Performance: A Meta-analysis", *Organisation Studies*, 24(3), 403-441.

⁶⁷ McGuire, J.B., Sundgren, A. & Schneeweis, T. (1988), "Corporate Social Responsibility and Firm Financial Performance", *Academy of Management Journal*, 31(4), 854-872.

⁶⁸ Freedman, M. & Jaggi, B. (1992), "An investigation of the long-run relationship between pollution performance and economic performance: The case of pulp and paper firms", *Critical Perspectives on Accounting*, 3(4), 315-336.

⁶⁹ Herremans, I.M., P.Akathaporn and M. McInnes. (1993), "An investigation of corporate social responsibility reputation and economic performance", *Accounting, Organizations and Society Journal*, 18, 7-8.

⁷⁰ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

⁷¹ Oeyono, J., Samy, M. & Bampton, R. (2011), "An Examination of Corporate Social Responsibility and Financial Performance: A Study of the Top 50 Indonesian Listed Corporations", *Journal of Global Responsibility*, 2(1), 100-112.

⁷² Skouloudis, A., Jones, N., Malesios, C., Evangelinos, K. (2014), "Trends and determinants of corporate non-financial disclosure in Greece", *Journal of Cleaner Production*, 68, 174-188.

benefits firms are reluctant to disclose more information due to a lack of evidence linking disclosure with improved firm performance. Porter & Linde (1995)⁷³ argue that costs of complying with regulation can be offset by benefits derived due to complying with regulations which can trigger innovations. Innovation can be in the form of minimizing cost of pollution after it occurs or improving productivity to avoid pollution in the first place. Berry & Rondinelli (1998)⁷⁴ found multiple factors for linking environmental performance and firm performance. Costs of regulatory expenses will be less for environmentally proactive firms and may result in increased business opportunity due to demand for cleaner products. Environmentally responsible firms may have improved relationship with customers, investors and employees which results in extra sales resulting in improved financial outcome. By disclosing environmental information companies become more aware of the impact of their business on environment and would want to report only positive news. To report positive news they have to improve their environmental performance. These companies also do not want to publish reports of breaking environment laws and want to avoid the risk of getting fines. Further firms with superior environmental and financial performance have resources and may want to deliver this message to stakeholders by making more extensive disclosures. They further stated that about \$650 billion was held by investors in social investment funds and analysts used both financial and social performance criteria to screen potential investments. Prior research also indicates a favourable response from institutional investors towards companies with higher corporate social disclosure (Teoh & Shiu, 1990⁷⁵; Graves and Waddock, 1994⁷⁶).

Molina-Azorín et al. (2009)⁷⁷ in an examination of literature of 32 quantitative studies on influence of environmental management on financial performance found mixed results. However in a large number of studies, impact of environment on financial performance had a positive result.

A number of researchers have used profitability and firm performance as an explanatory factor for differences in level of environmental disclosure. Justification being a profitable

⁷³ Porter, M.E. & Linde, C. Van Der. (1995), "Green and competitive: ending the stalemate", *Harvard Business Review*, 28(6), 128-129.

⁷⁴ Berry, M. & Rondinelli, D. (1998), "Proactive corporate management: environmental new industrial revolution", *The Academy of Management Executive*, 12(2), 38-50.

⁷⁵ Teoh H.Y. & G.Y. Shiu. (1990), "Attitudes towards corporate social responsibility and perceived importance of social responsibility information characteristics in a decision context", *Journal of Business Ethics*, 9, 70-77.

⁷⁶ Graves and Waddock. (1994), "Institutional owners and corporate social performance", *Academy of Management Journal*, 37(4), 1035-1046.

⁷⁷ Molina-Azorín, J. F., Claver-Cortés, E., López-Gamero, M. D., & Tarí, J. J. (2009), "Green management and financial performance: a literature review", *Management Decision*, 47, 1080-1100.

firm will be in a position to invest in environmental activities thereby able to disclose more. Companies making huge profits may want to reassure to the society that high profits were not earned by polluting the environment. However companies earning less profit with not have resources to invest in environmental activities and hence disclose less.

2.6.1 Positive Findings

Clarkson et al. (2011)⁷⁸ examining the consequences of adopting a proactive environmental strategy stated that firms that choose to improve their environmental performance over time tend to experience improvement in their financial resources and improvement in environmental performance results in improvement in economic benefits. However results of these studies measuring the relationship between corporate social and environmental disclosure and firm profitability show mixed results. Deegan & Gordon (1996)⁷⁹; Fry and Hock⁸⁰ (1976); Gray et al. (2001)⁸¹; Pahuja (2009)⁸²; Roberts (1992)⁸³; Singh & Joshi (2009)⁸⁴, (Teoh et al. 1998)⁸⁵ found a positive association between profitability and extent of corporate social and environmental disclosure.

2.6.2 Negative Findings

Wu et al. (2010)⁸⁶ in a study of 100 S&P firms from 2004 to 2008 found that environmental disclosures have a negative impact on firm performance. Freedman and Jaggi (1988)⁸⁷ provided the justification stating firms with weak financial performance tend to disclose heavy investment made in relation to pollution prevention to justify poor financial performance.

⁷⁸ Clarkson, P.M., Lic, Y., Richardson, G.D., Vasvari, F.P. (2011), "Does it really pay to be green? Determinants and consequences of proactive environmental strategies", *Journal of Accounting and Public Policy*, 30(2), 122-144.

⁷⁹ Deegan, C., & Gordon, B. (1996), "A study of the environmental disclosure practices of Australian corporations", *Accounting and Business Research*, 26(3), 187-199.

⁸⁰ Fry, F.L. and R.J.Hock. (1976), "Who claims corporate social responsibility? The best and the worst", *Business and Society Review*, 18, 62-65.

⁸¹ Gray, R., Javad, M., Power, D., & Sinclair, C.D. (2001), "Social and environmental disclosure and corporate characteristics: A research note and extension" *Journal of Business Finance & Accounting*, 28, 327-356.

⁸² Pahuja, S. (2009), "Relationship between environmental disclosures and corporate characteristics: A study of large manufacturing companies in India", *Social Responsibility Journal*, 5(2), 227-244.

⁸³ Roberts, R.W. (1992), "Determinants of corporate social responsibility disclosure: an application of stakeholder theory", *Accounting, Organizations and Society*, 17(6), 595-612.

⁸⁴ Singh, G., & Joshi, M. (2009), "Environment management and disclosure practices of Indian companies", *International Journal of Business Research*, 9(2), 116-128.

⁸⁵ Teoh, H.Y., Pin, F.W., Joo, T.T., Ling, Y.Y. (1998), "Environmental Disclosures-Financial Performance Link: Further Evidence From Industrialising Economy Perspective", *Second Asian Pacific Interdisciplinary Research in Accounting Conference (APIRA)*. Paper presented at APIRA 98 in Osaka Conference, Japan.

⁸⁶ Wu, J., Liu, L., & Sulkowski, A. (2010), "Environmental disclosure, firm performance, and firm characteristics: An analysis of S&P 100 firms", *Journal of Academy of Business and Economics*, 10(4), 73-83.

⁸⁷ Freedman, M. & Jaggi, B. (1988), "An Analysis of the Association between Pollution Disclosure and Economic Performance", *Accounting, Auditing & Accountability Journal*, 1, 43-58.

2.6.3 Neutral Findings

Cowen, Ferreri & Parket (1987); Hackston & Milne (1996)⁸⁸; Ingram and Frazier (1983⁸⁹); Stanny & Ely (2008)⁹⁰; Qiu et al. (2014)⁹¹ found no association between the variables. Ingram (1978⁹²) found no relationship without taking into consideration the market segments. These results suggest that other extraneous variables may exist which should be controlled for.

2.6.4 Control Variables

Level of environmental disclosure continues to be more for larger companies (Belkaoui & Karpik 1989⁹³; Blacconiere & Patten 1994⁹⁴). Larger firms are subject to public scrutiny and were more likely to disclose a higher level of performance to satisfy stakeholder demand. Leverage requires disclosure to reduce information asymmetry cost and agency cost. Capital structure measured as leverage found a positive association between environmental performance and voluntary environmental disclosure (Connors & Gao 2011).⁹⁵

As per literature, industry, size and risk are three variables impacting the level of disclosure. For better validity of the results, two control variables size and risk are considered in the analysis. To control for size: total assets and total net sales are used and to control for risk: total debt to total assets. Control for industry effect was not done in this study as sample for this study consists of companies from 3 industries which belong to potentially polluting industries. In this way the effect of industry differences on a firm's environmental disclosure is mitigated.

3. OBJECTIVE

Main objective of this research is to establish whether there is any significant relationship between corporate environmental disclosure and firm performance of selected firms listed in Bombay Stock Exchange, India.

⁸⁸ Hackston, D., & Milne, M.J. (1996), "Some determinants of social and environmental disclosures in New Zealand companies" *Accounting, Auditing, and Accountability Journal*, 9(1), 77-108.

⁸⁹ Ingram, R.W. and K.B.Frazier. (1983), "Narrative disclosures and annual reports", *Journal of Business Research*, 11, 49-60.

⁹⁰ Stanny, E., & Ely, K. (2008), "Corporate environmental disclosure about the effects of climate change", *Corporate Social Responsibility and Environmental Management*, 15(6), 338-348.

⁹¹ Qiu, Y., Shaukat, A. & Tharyan, R. (2014), "Environmental and social disclosures: Link with corporate financial performance", *The British Accounting Review*, 1-15.

⁹² Ingram R.W. (1978), "Investigation of the information content of certain social responsibility disclosures", *Journal of Accounting Research*, Autumn, 270-285.

⁹³ Belkaoui, A., & P. Karpik, P.G. (1989), "Determinants of the Corporate Decision to Disclose Social Information", *Accounting, Auditing and Accountability Journal*, 2 (1), 36-51.

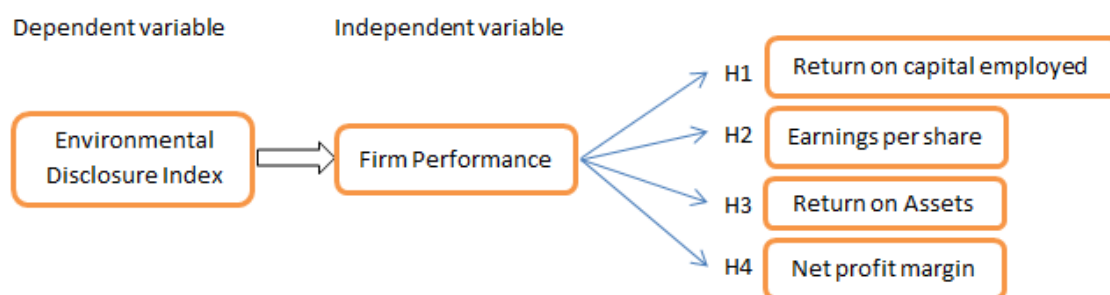
⁹⁴ Blacconiere, W., & Patten, D. (1994), "Environmental disclosures, regulatory costs, and changes in firm value", *Journal of Accounting and Economics*, 18(3), 357-377.

⁹⁵ Connors, E. & Gao, L.S. (2011), "Corporate Environmental Performance, Disclosure and Leverage: An Integrated Approach", *International Review of Accounting Banking & Finance*, 3(3), 1-32.

The specific objectives of this research are:

- i. To determine whether there is a significant relationship between CED and return on capital employed (ROCE)
- ii. To determine whether there is a significant relationship between CED and earnings per share (EPS)
- iii. To determine whether there is a significant relationship between CED and return on asset (ROA)
- iv. To determine whether there is a significant relationship between CED and net profit margin (NPM)

4. CONCEPTUAL FRAMEWORK



4.1 Environmental Disclosure Index

Non-financial or sustainability reporting is the practice of measuring, disclosing and being accountable to internal and external stakeholders for organisational performance towards the goal of sustainable development. The content, format and size of Non-financial reports (NFRs) usually issued with annual reports are voluntary publications and therefore vary widely (Simonsen 2010)⁹⁶. As no specific guidelines are available, organisations struggle to provide relevant data to stakeholders (Azam, Warraich & Awan 2011)⁹⁷. A need has emerged to standardize the structure of sustainability reports.

The United Nations Global Compact, the Global Reporting Initiative (GRI) and the International Organization for Standardization recommend and contribute in

⁹⁶ Simonsen, C.D.D. (2010), "Historical Account of Key Words in Non-Financial Report Titles (A review of FT 500 corporations from 1989 to 2007)", *Issues in Social and Environmental Accounting*, 4(2), 136-148.

⁹⁷ Azam, S M Z., Warraich, K M., & Awan S H. (2011) "One Report: Bringing Change in Corporate Reporting through Integration of Financial and Non-Financial Performance Disclosure", *International Journal of Accounting and Financial Reporting* 1, 50.

development of sustainability reporting guidelines as an organizational tool towards sustainable development. GRI guidelines have emerged as the most widely used set of sustainability reporting standards. GRI provides a framework to report their information to stakeholders. These guidelines represent the first global framework for comprehensive sustainability reporting (Epstein 2008)⁹⁸. Many organisations from developed nations have adopted GRI format, which has been adopted as a globally established benchmark on how these reports are prepared and judged (Brown, Jong & Lessidrenska 2009)⁹⁹.

4.2 Environmental Regulations in India

No precise environmental policy existed in early years of Indian independence. Governments tried to make attempts from time to time as per growing needs of society. Policies and attitude of Indian Government shifted from environmental indifference during the period of 1970s and various steps were taken to improve environmental conditions (Mugunthan 2014)¹⁰⁰. Government of India enacted The Environment (Protection) Act, 1986 soon after Bhopal Gas Tragedy to address the pressing sustainability problems faced by country. This was the first major step to integrate global and national environmental considerations into a policy framework (Damodaran 2012)¹⁰¹. The National Green Tribunal (NGT) Bill was passed in June 2010 with the sole mission to quickly dispose of environmental protection cases (Das 2012)¹⁰².

Although it is mandatory for all companies operating in India to submit environmental audit report in the prescribed format to State Pollution Control Board (SPCB) disclosing details regarding consumption of materials and water, level of emissions generated, discharge of effluents, generation of solid waste, pollution control measures adopted, efforts put by the company on conservation of natural resources and investment made by the concern for benefit of environment, disclosure of environmental activities in annual report is not mandatory.

As per the provision of Companies Act, 2013 it is mandatory to disclosure conservation of energy, technology absorption, foreign exchange earnings and outgo, in the manner

⁹⁸ Epstein, M. J., & Buhovac, A. R. (2014), "Making sustainability work: Best practices in managing and measuring corporate social, environmental, and economic impacts", *Berrett-Koehler Publishers*.

⁹⁹ Brown, H. Jong, M and Lessidrenska, T. (2009), "The Rise of the Global Reporting Initiative (GRI) as a Case of Institutional Entrepreneurship", *Environmental Politics*, 18:2, 182-200.

¹⁰⁰ Mugunthan, S. (2014), "An Appraisal Of Environmental Law: Birth Of The Right To Environment In India" Available at: www.legalserviceindia.com-articles-evn.htm. Assessed on 27 July 2014.

¹⁰¹ Damodaran, A. (2012), "The Challenge of Multi Level Environmental Governance in India", *Periodica Oeconomica*, 29-37.

¹⁰² Das, S.S. (2012), "Environmental Law in India", Available at: https://www.academia.edu/4982826/Environmental_Law_in_India assessed 21 August 2014.

as prescribed in Rule 8(3) of the Companies (Accounts) Rules, 2014. Securities Exchange Board of India (SEBI) governs the stock exchanges in India, however there is no mandatory listing requirement to disclose environmental information. Recently SEBI add clause 55 to the listing agreement making it mandatory for top 100 listed companies as per market capitalisation to disclose Business Responsibility Reports (BRR) in the suggested format as part of Annual Report. A BRR reports discloses steps taken by a company towards environmental, social and governance perspective. The Institute of Chartered Accountants of India (ICAI) governs and issue financial accounting and reporting guidelines. Companies in India are required to prepare annual accounts in accordance with accounting standards issued by ICAI. Both the Companies Act and ICAI do not have any mandatory requirement for quantitative disclosure of environmental information in the Annual reports or to prepare any stand-alone environmental reports.

Based on above regulatory requirements Indian companies are not under obligation to issued reports disclosing environmental information. However there are few disclosure requirements in annual report which is more descriptive in nature and is not quantitative or financial. Hence any information disclosed on environment by Indian companies is mostly voluntary in nature.

Need for consistency in environmental reporting motivated international organisation to provide a framework for the corporates to report on their environmental performance (Dixon et al. 2005)¹⁰³.

The Global Reporting Initiative (GRI) and the Global Environmental Management Initiative (GEMI) have been involved in developing reporting guidelines. The GRI group is working “to develop and disseminate globally applicable Sustainability Reporting Guidelines”. It is a non-governmental organization that has an association with the United Nations. Their process of creating reporting guidelines is similar to the process used by the International Organization for Standardization. GRI initiative attempts to standardize environmental reporting, however, participation in this initiative is voluntary. As of March 2016, 8900 organisations have registered with GRI. GEMI has developed extensive tools to help companies improve the environment and provide business value. The efforts of GEMI and GRI both establish the guidelines for

¹⁰³ Dixon, R., Mousa, G.A. & Woodhead, A. (2005), “The role of environmental initiatives in encouraging companies to engage in environmental reporting”, *European Management Journal*, 23(6), 702-716.

measuring and reporting environmental information. Since GRI reporting is used more widely GRI guidelines have been used to develop the environmental disclosure index.

4.3 Firm Performance

Stakeholders look at firm's financial performance to look at its ability to generate profits and achieve its economic goals. Financial performance can be accounting based or stock market based. Each measure is an indicator which focuses on different aspect of financial performance and is subject to specific biases.

In this research four different accounting based financial performance indicators have been identified; return on capital employed [ROCE], earnings per share [EPS], return on assets [ROA] and net profit margin [NPM] are used. Average financials of 4 years (2011-12 to 2014-15) have been used to remove any bias resulting in different accounting procedures used by companies.

4.3.1 Return on Capital Employed

ROCE measures success of a business in realising its goals, indicating the overall efficiency and profitability of firm (Chen et al. 2014)¹⁰⁴. It measures how well the firm is utilizing its capital employed to generate revenue, where capital employed includes long term borrowings (Devinney et al. 2010)¹⁰⁵. ROCE is a useful measure to evaluate longevity of a firm as it shows how effectively assets are performing considering long term financing. A company should earn a ROCE higher than its cost of capital to ensure sustainable business; else earning of the shareholders would get reduced gradually. ROCE is a better measure than ROE (return on equity) as it shows how well a company is using both its debt and equity. Makori & Jagongo (2013)¹⁰⁶ used Profit before tax/capital employed to compute ROCE and found a negative relationship between environmental accounting and ROCE.

4.3.2 Earnings per Share

EPS is a measure of firm's financial performance as it indicates the corporates wealth and has a disclosure advantage (Oeyono et al. 2011)¹⁰⁷. All listed companies are required to

¹⁰⁴ Chen, L., Tang, O. & Feldmann, A. (2014), "Applying GRI reports for the investigation of environmental management practices and company performance in Sweden, China and India", *Journal of Cleaner Production*, 1-11.

¹⁰⁵ Devinney, T.M., Yip, G.S. & Johnson, G. (2010), "Using frontier analysis to evaluate company performance", *British Journal of Management*, 21(4), 921-938.

¹⁰⁶ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

¹⁰⁷ Oeyono, J., Samy, M. & Bampton, R. (2011), "An Examination of Corporate Social Responsibility and Financial Performance: A Study of the Top 50 Indonesian Listed Corporations", *Journal of Global Responsibility*, 2(1), 100-112.

disclose their EPS on the statement of profit or loss. EPS relates to the profit attributable to equity shareholders for the year divided by average equity shares during the year. Alikhani & Maranjory (2013)¹⁰⁸ used EPS as a variable to measure profitability and found no significant relationship between the level of corporate social and environmental disclosure and profitability. However Makori & Jagongo (2013)¹⁰⁹ found a negative relationship between EPS and environmental accounting.

4.3.3 Return on Assets

ROA measures efficient use of assets in producing income and is widely used as a measure for firm performance (Cohen et al. 2014)¹¹⁰. For computing ROA net income which is end result of a firm's performance is divided by total assets to find total income generated per dollar of asset. Other alternative is to add interest expense to net income to calculate the total income generated irrespective of debt or equity financing used. As per findings of the research ROA were significantly lower for companies releasing high volume of toxins though statistically not significant. Freedman & Jaggi (1988)¹¹¹, Teoh et al. (1998)¹¹² used the formula $ROA = \text{net income} / \text{total assets}$ for computing ROA. Return on assets (ROA) is an important ratio for consideration as it relate to total investment of the firm (Jaggi and Freedman 1992).¹¹³

4.3.4 Net Profit Margin

Net profit is the most popular profitability ratio that evaluates the overall profitability of a business. It is computed by dividing net profit after tax by net sales revenue achieved during the year. A high NPM indicates overall efficient management of business. However it measures profitability in percentage terms and neglects the firm size (Sarumpaet 2005)¹¹⁴. (Makori & Jagongo 2013)¹¹⁵; (Teoh et al. 1998)¹¹⁶ used the

¹⁰⁸ Alikhani, R. & Maranjory, M. (2013), "An Investigation on the Relationship between social and environmental Information disclosure level and firms Performance in Iran", *International Research Journal of Applied and Basic Sciences*, 5(1), 125-128.

¹⁰⁹ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

¹¹⁰ Cohen, M.A., Fenn, S.A. & Konar, S. (2014), "Environmental and Financial Performance: Are They Related?" *IGARSS*, 1997(1), 1-5.

¹¹¹ Freedman, M. & Jaggi, B. (1988), "An Analysis of the Association between Pollution Disclosure and Economic Performance", *Accounting, Auditing & Accountability Journal*, 1, 43-58.

¹¹² Teoh, H.Y., Pin, F.W., Joo, T.T., Ling, Y.Y. (1998), "Environmental Disclosures-Financial Performance Link: Further Evidence From Industrialising Economy Perspective", *Second Asian Pacific Interdisciplinary Research in Accounting Conference (APIRA)*. Paper presented at APIRA 98 in Osaka Conference, Japan.

¹¹³ Freedman, M. & Jaggi, B. (1992), "An investigation of the long-run relationship between pollution performance and economic performance: The case of pulp and paper firms", *Critical Perspectives on Accounting*, 3(4), 315-336.

¹¹⁴ Sarumpaet, S. (2005), "The Relationship Between Environmental Performance and Financial Performance of Indonesian", *Jurusan Akuntansi & Kewangan*, 7, 89-98.

¹¹⁵ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

¹¹⁶ Teoh, H.Y., Pin, F.W., Joo, T.T., Ling, Y.Y. (1998), "Environmental Disclosures-Financial Performance Link: Further Evidence From Industrialising Economy Perspective", *Second Asian Pacific Interdisciplinary Research in Accounting Conference (APIRA)*. Paper presented at APIRA 98 in Osaka Conference, Japan.

formula $\text{Net profit/sales} * 100$ to compute net profit margin and found that environmental accounting has a positive relationship with NPM.

5. RESEARCH HYPOTHESIS

Based on past research, the findings are inconclusive. However there are few study which support the existence of a link between the financial performance of a firm and environmental disclosure. Accordingly the hypothesis has been formulated as:

Ho₁: There is no association between ROCE and level of Environmental disclosure

Ho₂: There is no association between EPS and level of Environmental disclosure

Ho₃: There is no association between ROA and level of Environmental disclosure

Ho₄: There is no association between NPM and level of Environmental disclosure

Previous researchers who have used this hypothesis are: Ho₁:(Makori & Jagongo 2013) Ho₂:(Alikhani & Maranjory 2013)¹¹⁷; (Makori & Jagongo 2013)¹¹⁸ Ho₃: (Alikhani & Maranjory 2013)¹¹⁹ NPM Ho₄:(Alikhani & Maranjory 2013)¹²⁰; (Makori & Jagongo 2013)¹²¹

6. RESEARCH METHODOLOGY

The research is empirical and involves use of data from annual reports, sustainability/ standalone reports of companies. Simple & multiple correlation and regression techniques are used to find if a relationship exists between environmental disclosure and firm performance. Population for the research consists of companies listed in Bombay Stock Exchange. A sample of 85 companies (*Annexure - 1*) using convenience sampling technique from three sectors namely chemical, energy and metal were selected from BSE 500 index.

Regression analysis is used to analyse the relationship between variables using the following regression equation:

¹¹⁷ Alikhani, R. & Maranjory, M. (2013), "An Investigation on the Relationship between social and environmental Information disclosure level and firms Performance in Iran", *International Research Journal of Applied and Basic Sciences*, 5(1), 125-128.

¹¹⁸ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

¹¹⁹ Alikhani, R. & Maranjory, M. (2013), "An Investigation on the Relationship between social and environmental Information disclosure level and firms Performance in Iran", *International Research Journal of Applied and Basic Sciences*, 5(1), 125-128.

¹²⁰ Alikhani, R. & Maranjory, M. (2013), "An Investigation on the Relationship between social and environmental Information disclosure level and firms Performance in Iran", *International Research Journal of Applied and Basic Sciences*, 5(1), 125-128.

¹²¹ Makori, D.M. & Jagongo, A. (2013), "Environmental Accounting and Firm Profitability: An Empirical Analysis of Selected Firms Listed in Bombay Stock Exchange, India", *International Journal of Humanities and Social Science*, 3(18), 248-256.

$$\text{EDI} = f(\text{ROCE}, \text{EPS}, \text{ROA}, \text{and NPM})$$

Where: EDI, ROCE, EPS, ROA, and NPM represent environmental disclosure by companies, return on capital employed; earnings per share; return on assets and net profit margin; respectively. The environmental disclosure index is used as a proxy for the level of environmental disclosure by firms; while ROCE, EPS, ROA and NPM are used as proxy for firm profitability. In addition to this size and leverage are assumed to be crucial and the control variable for size is Total Assets and Total Net Sales, for leverage is Debt Equity ratio.

Data for this research were collected from published annual reports, sustainability reports, and GRI reports available in public domain on company's official website for the financial year 2013-2014. Annual reports and standalone sustainability reports were selected as sources of corporate environmental disclosure as these are recognised as principal means for corporate communication used by companies to disclose their performance and future intentions to their shareholders. In developed countries like the United States non-profit organisations publish information on social and environmental performance of the companies. In the absence of such source, annual reports are the most easily available source in India through which the corporates disclose their activities and intentions. The primary source for virtually all the previous research on corporate disclosures has been the annual reports (Cahan & Malone 1995¹²²; Deegan & Rankin 1996; Patten 2002¹²³; Ullmann 1985¹²⁴; Wiseman 1982¹²⁵). Data with regard to financial performance of the companies were taken from ACE Analyser, a database providing financial information source for a period of 4 years from 2012 to 2015.

6.1 Data and Variables

This research focuses on companies from chemical, energy and metal sectors. A sample of 85 Indian companies (*Annexure – 1*) from these sectors from BSE 500 index listed in Bombay Stock Exchange was identified. Financial data and the level of environmental disclosure for these companies were collected from annual reports and standalone

¹²² Cahan, S.F. & Malone, D. (1995), "An Empirical Examination of the Relationship between Corporate Social Responsiveness and Extent of Disclosure", *Business & Professional Ethics Journal*, 14(2), 23-46.

¹²³ Patten, D.M. (2002), "The relation between environmental performance and environmental disclosure: a research note" *Accounting, Organizations and Society*, 27(8), 763-773.

¹²⁴ Ullmann, A.A. (1985), "Data in Search of a Theory: A Critical Examination of the Relationships among social performance, social disclosure and economic performance of U.S.Firms", *Academy of Management*, 10(3), 540-557.

¹²⁵ Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, 7(1), 53-63.

sustainability reports for the year 2013-14.

Formulas used for financial variable are:

ROCE	Earnings before interest & tax/capital employed <i>Where Capital employed = (Total assets – current liabilities)</i>
EPS	Net profit after tax and after making divided payments / No. of equity shares
ROA	Net Profit after tax / Total assets <i>Where Total assets = Fixed assets plus net working capital</i>
NPM	Net profit after tax/ Total Net Sales * 100

In this research environmental disclosure includes disclosures made by corporates within the framework of annual report and standalone sustainability report in the website of respective companies. Content Analysis which has been widely used in literature has been used in this research to determine the environmental disclosure variable. It is a coding scheme widely used to compute the environmental disclosure index similar to Wiseman (1982)¹²⁶ study. From the Global Reporting Initiatives (GRI) reporting performance indicators 19 items of environmental disclosure were identified. GRI guidelines provide detailed indicators for reporting on all parameters of CR performance including environmental performance indicators. Against each of these themes/items scores were assigned basis the level of disclosure. A score of 0 if the item is not present, 1 if the item is mentioned in general terms, 2 if specific information is present but not quantitative and 3 if monetary or quantitative information is present. Environmental disclosure of 85 sample companies was measured and scores obtained.

7. ANALYSIS & RESULTS

Result of this research indicate that relatively large per cent of companies (Table – 1) from Energy sector (63%) are reporting, followed by Metal sector (52%) and least disclosure is from Chemical sector (40%). On further analysis of individual companies within the sample, it is observed that, large numbers of companies in the energy sector were public sector/quasi government undertakings or private sector in which government has substantial participation in shareholding/management and affairs, indicating ownership to be a variable impacting the level of environmental disclosure. Table – 2 provides a detailed list of reporting and non-reporting of environmental performance by Indian companies. In addition to this, absolute values of control variables (Total Assets, Net Sales and Debt – Equity Ratio) as an extract from corporate

¹²⁶ Wiseman, J. (1982), "An evaluation of environmental disclosures made in corporate annual reports", *Accounting, Organizations and Society*, 7(1), 53-63.

annual reports is represented in Table – 3 for ready reference

Pearson's correlation analysis was carried out for this research and the results indicate that there is no collinearity between the variables. This supports the fact that no two variables are statistically similar.

Table 2: Financial Performance of Reporting & Non-Reporting Indian Companies

Sector	Sample	No. of Companies		Average							
				ROCE		ROA		NPM		EPS	
		R	NR	R	NR	R	NR	R	NR	R	NR
Chemical	30	12	18	18.9%	21.1%	11.4%	15.9%	6.9%	10.1%	24.68	32.64
Energy	32	20	12	16.7%	15.2%	11.4%	10.2%	20.2%	13.9%	27.28	3.96
Metal	23	12	11	13.9%	15.3%	9.1%	9.4%	19.6%	8.9%	21.84	22.52
Total	85	44	41	16.5%	17.8%	10.8%	12.5%	16.4%	10.9%	25.09	21.53

R – Reporting

NR – Not Reporting

Table 3: Data on Control Variables of Reporting & Non-Reporting Indian Companies

Sector	Sample	No. of Companies		Average					
				Total Assets (Crores INR)		Net Sales (Crores INR)		Debt Equity (Ratio)	
		R	NR	R	NR	R	NR	R	NR
Chemical	30	12	18	3754	1763	4885	2725	0.6	0.04
Energy	32	20	12	56720	6973	81588	11054	1.2	0.9
Metal	23	12	11	34169	5239	18713	2513	0.5	0.7
Total	85	44	41	36124	24178	43521	31733	0.8	0.5

Source – Extracts from published annual report for the financial year – 2011-12 to 2014-15

R – Reporting

NR – Not Reporting

Table 4: Summary of Results

	Beta	Significance	Correlation
Dependent variable: EDI			
Independent variable: ROCE	-.026	.789	-.113
ROA	-.030	.757	-.102
NPM	.112	.243	.147
EPS	.027	.779	.080
Control Variables:			
TotalAssets	.495	.000	.495
Net Sales	.149	.277	.426
Debt Equity	-.060	.535	.012

7.1 ROCE

The sample consists of companies each from Chemical (30), Energy (22) and Metal (23) sectors. Average ROCE of companies (Table – 2) reporting on environmental performance is 16.5 per cent and that of companies not reporting is 17.8 per cent. Beta value is -.026 (Table 4) which means only 2.6 per cent variance in EDI can be explained with the help of regression. The result shows no significant association between ROCE and EDI.

Results of this research indicate that ROCE has negative correlation with environmental performance disclosure by corporates. There is no association between ROCE and environmental disclosure at 10 percent level of significance.

7.2 ROA

The average ROA of reporting companies (Table – 2) is 10.8 per cent, however the average ROA of companies which are not reporting is higher at 12.5 per cent. The Beta value is -.030 (Table 4) which means only 3 per cent variance in EDI can be explained with the help of regression. The result shows no significant association between ROA and EDI.

Results of this research indicate that ROA has negative correlation with environmental performance disclosure by corporates. There is no association between ROA and environmental disclosure at 10 percent level of significance.

7.3 NPM

Overall reporting companies have a better NPM of 16.4 per cent compared to 10.9 per cent of non-reporting companies (Table – 2). The difference between companies reporting and not reporting is only 5.5 per cent which is contributed largely by chemical sector in this sample. In case of chemical sector the non-reporting companies have a better NPM compared to reporting companies. The reason could be companies with low profits try to report more as an explanation for poor financial performance. In future research the sample companies of energy and metal can also be scaled up to match the size of companies in the chemical sector then there are possibilities of NPM average to reflect a clear picture about environmental performance of reporting and non-reporting companies. The Beta value is .112 which means only 11 per cent variance in EDI can be explained with the help of regression. The result shows no significant association between NPM and EDI.

7.4 EPS

The overall average EPS (Table – 2) for reporting companies is higher than the EPS for non-reporting companies. For Energy sector the EPS is substantially high in comparison to non-reporting companies. However for Chemical and Metal sector the average EPS is lower than the average EPS of non-reporting companies. The Beta value is .027 which means only 2.7 per cent variance in EDI can be explained with the help of regression. The result shows no significant association between EPS and EDI.

The correlations for TotalAssets and NetSales (control variable for Size) are significant, indicating size to be an important variable influencing the level of environmental disclosure. TotalAsset with the value of Beta (.495) is relatively high and contributes to the regression model. Since the p value is less than .05 it is statistically significant. This is consistent with the results of previous studies by Belkaoui & Karpik (1989); Blacconiere & Patten (1994) indicating large firms provide a high level of environmental disclosure.

Rest of the variables does not contribute to the regression equation and are statistically insignificant. Hence there is no significant relationship between the level of Environmental Disclosure and firm performance (ROCE, ROA, NPM and EPS). The results are similar with previous studies by Alikhani & Maranjory (2013); Cowen, Ferreri & Paret (1987); Hackston & Milne (1996); Ingram and Frazier (1983); Stanny

& Ely (2008); Qiu et al. (2014) which showed that profitability is not a significant variable.

8. LIMITATIONS OF THIS RESEARCH

There is lack of a standard for reporting on environmental performance in contrast to financial performance. Few companies have begun to report using the GRI guidelines; still the adoption of GRI is low. Content analysis of annual report and sustainability report has been done to arrive at the level of environmental disclosure. Environmental disclosures in these reports are voluntary and companies may be disclosing only the positive news. The potential bias in reporting needs to be considered. Future work could study the quality of disclosure made by companies, i.e. positive news vs. negative news.

The sample consists of companies from BSE500 index which consists of large companies in India. Future work could investigate the relationship between environmental disclosure practices and profitability for smaller companies.

9. RECOMMENDATIONS & CONCLUSION

Only few large sized companies are disclosing their environmental information and level of reporting for the rest of the companies continues to be low. Government should make environmental reporting mandatory to ensure increase in the level of reporting. It is time for countries around the world to follow a carrot and stick approach for rewarding better disclosing companies with incentives, namely environmental tax benefits/incentives and penalising companies for their poor disclosure. Corporates should be educated on the benefits of better environmental performance and encouraged to comply with the requirements for long term survival. As part of environmental governance government should include education on ethical environmental disclosure at societal level, school level.

This study tested the relationship between the level of environmental disclosure and firm performance for a sample of 85 companies from Chemical, Energy and Metal sector during the period 2011-2015 listed in BSE. The level of environmental disclosure was measure using content analysis from the annual reports and standalone sustainability reports. These companies are likely to cause environmental pollution and are expected to invest substantial amount on pollution controls. Stakeholders would be interested in environmental information disclosed by these companies than companies in less environmentally-sensitive industries, yet the level of disclosure continues to be

poor. The results show that there is no significant association between the level of environmental disclosure and firm performance. The results of this research further indicate that firms that are not making huge profits also disclose information about the environment. In order to sustain in the global environment companies have to disclose environmental information notwithstanding of their financial performance.

There is a significant correlation with size of companies indicating large companies tend to disclose more environmental information on their annual reports and sustainability reports. These firms are more likely to be in the public view and disclose more to meet the expectations of the public.

APPENDIX

Annexure 1: List of 85 Sample Indian Companies from BSE 500 Index

Sl No	Company	Sector	Reporting Yes or No	Sl No	Company	Sector	Reporting Yes or No
1	Astral Poly Technik Ltd.	Chemicals	N	44	NHPC Ltd.	Energy	Y
2	VIP Industries Ltd.	Chemicals	N	45	Gujarat Mineral Devp. Corpn. Ltd.	Energy	Y
3	Finolex Industries Ltd.	Chemicals	N	46	Essar Oil Ltd.	Energy	Y
4	Aarti Industries Ltd.	Chemicals	N	47	CESC Ltd.	Energy	Y
5	Berger Paints India Ltd.	Chemicals	N	48	Neyveli Lignite Corpn. Ltd.	Energy	Y
6	Monsanto India Ltd.	Chemicals	N	49	SJVN Ltd.	Energy	Y
7	Solar Industries India	Chemicals	N	50	Coal India Ltd.	Energy	Y
8	UFLEX Ltd.	Chemicals	N	51	Petronet LNG Ltd.	Energy	Y
9	Clariant Chemicals (India)	Chemicals	N	52	Power Grid Corpn. Of India Ltd.	Energy	Y
10	Supreme Industries Ltd.	Chemicals	N	53	Reliance Infrastructure Ltd.	Energy	Y
11	UPL Ltd.	Chemicals	N	54	Tata Power Co. Ltd.	Energy	Y
12	Gujarat Fluorochemicals	Chemicals	N	55	Hindustan Petroleum Corpn. Ltd.	Energy	Y
13	Linde India Ltd.	Chemicals	N	56	National Thermal Power Corp. Ltd.	Energy	Y
14	BASF India Ltd.	Chemicals	N	57	Oil India Ltd.	Energy	Y

15	Bayer CropScience Ltd.	Chemicals	N	58	Reliance Industries Ltd.	Energy	Y
16	Akzo Nobel India Ltd.	Chemicals	N	59	Cairn India Ltd.	Energy	Y
17	Coromandel International Ltd.	Chemicals	N	60	Bharat Petroleum Corpn. Ltd.	Energy	Y
18	Pidilite Industries Ltd.	Chemicals	N	61	Oil & Natural Gas Corpn. Ltd.	Energy	Y
19	Gujarat Narmada Valley Fertilizers & Chemicals Ltd.	Chemicals	Y	62	Indian Oil Corpn. Ltd.	Energy	Y
20	Asian Paints Ltd.	Chemicals	Y	63	Bhushan Steel Ltd.	Metals	N
21	Atul Ltd.	Chemicals	Y	64	Ess Dee Aluminium Ltd.	Metals	N
22	Gujarat State Fertilizers & Chemicals Ltd.	Chemicals	Y	65	Ahmednagar Forgings Ltd.	Metals	N
23	PI Industries Ltd.	Chemicals	Y	66	Grindwell Norton Ltd.	Metals	N
24	Gujarat Alkalies & Chemicals	Chemicals	Y	67	Carborundum Universal Ltd.	Metals	N
25	Deepak Fertilisers & Petrochemicals Corpn. Ltd.	Chemicals	Y	68	Jai Corp Ltd.	Metals	N
26	Chambal Fertilisers & Chemicals Ltd.	Chemicals	Y	69	Jindal Saw Ltd.	Metals	N
27	Rashtriya Chemicals & Fertilizers Ltd.	Chemicals	Y	70	Tata Sponge Iron Ltd.	Metals	N
28	Kansai Nerolac Paints Ltd.	Chemicals	Y	71	Maharashtra Seamless Ltd.	Metals	N
29	Jain Irrigation Systems Ltd.	Chemicals	Y	72	Balmer Lawrie & Co. Ltd.	Metals	N
30	Tata Chemicals Ltd.	Chemicals	Y	73	Hindustan Copper Ltd.	Metals	N
31	Aban Offshore Ltd.	Energy	N	74	AIA Engineering Ltd.	Metals	Y
32	BF Utilities Ltd.	Energy	N	75	Moil Ltd.	Metals	Y
33	GVK Power & Infrastructure	Energy	N	76	NMDC Ltd.	Metals	Y
34	Jaiprakash Power Ventures	Energy	N	77	National Aluminium Co. Ltd.	Metals	Y
35	PTC India Ltd.	Energy	N	78	Tata Steel Ltd.	Metals	Y
36	Selan Exploration Technology	Energy	N	79	Welspun Corp Ltd.	Metals	Y
37	Gulf Oil Lubricants India	Energy	N	80	JSW Steel Ltd.	Metals	Y
38	Torrent Power Ltd.	Energy	N	81	Hindustan Zinc Ltd.	Metals	Y
39	Castrol India Ltd.	Energy	N	82	Steel Authority Of India Ltd.	Metals	Y

40	Mangalore Refinery & Petrochemicals Ltd.	Energy	N	83	Hindalco Industries Ltd.	Metals	Y
41	Reliance Power Ltd.	Energy	N	84	Jindal Steel & Power Ltd.	Metals	Y
42	Chennai Petroleum Corpn.	Energy	N	85	Sesa Sterlite Ltd.	Metals	Y
43	GAIL (India) Ltd.	Energy	Y				

Annexure 2: Environmental Disclosure Indicators as per GRI

SI No.	Indicators of Environmental Disclosure
1	Compliance with environmental standards, EMS ISO 14001
2	Expenditure/investment on pollution control equipment
3	Information relating to present / potential litigation, provision, contingent liability, fine
4	Environmental policy / goal / sustainability roadmap
5	Training education for environmental protection/ Environmental initiatives
6	Environmental audits/External assurance
7	Awards for environmental protection
8	Conservation of energy
9	Conservation of natural resources/ remediation, clean-up, restoration
10	Conservation of Bio diversity/tree plantation/ sapling
11	Conservation of water/rainwater harvesting/Water management
12	Reducing Carbon emission/ Air emission / CO2/Greenhouse gas
13	Reduce consumption of materials
14	Waste management and disposal information
15	Noise emission information
16	Use of renewable energy/bio fuel/ solar/wind mill
17	Recycling waste
18	Supply chain management/green sourcing/green supply chain
19	Product development and innovation/Green products

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