Sustainability Reporting of African Cement Companies

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ABSTRACT

The research conducted for this study is an analysis and comparison of the sustainability reporting practices of South African cement companies with African cement companies and the global cement industry. The focus of the study as identified from the literature review is mainly on:

- Determining the difference in reporting between South African cement companies and African cement companies
- Determining the difference in reporting between South African cement companies and global cement companies
- Understanding the extent of disclosure by South African cement companies in relation to the Cement Sustainability Initiative (CSI)

A qualitative study was done using company sustainability reports as the source of data and the CSI Reporting Key Performance Areas and Indicators as the research instrument. This data was evaluated in two ways:

i. Tick box approach of Yes or No - it established if a company reports on the Key Performance Areas according to the CSI Framework
ii. Content Analysis - it established what the companies are actually saying on a Key Performance Area

The results presented show that most of the African cement companies (South Africa included) report and disclose on similar areas with no targets or performance measures. This is in contrast to the global cement companies, which reported on all or most of the Key Performance Areas of the Cement Sustainability Initiative. Another finding was that most global cement companies have majority ownership in most of the African cement companies and yet the reporting and disclosure was different. In addition global cement companies with operations in African countries tended to report more on their global operation, with little or no information on their African operations.

DECLARATION

I, Danai Linda Mavunga, declare that this research report is my own work except as indicated in the references and acknowledgements. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration (MBA) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

……

Danai Linda Mavunga

Signed at …….

On the …….. day of ……. 2016

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- Douglas Taylor for very kindly agreeing to be my supervisor and providing me with the input and assistance I needed. I always came back from our meetings with clarity and understanding of what I needed to do.
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CHAPTER 1. INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to analyse and compare the sustainability reporting practices of South African cement companies with African cement companies and global cement industry with the intention of determining the differences and areas of possible improvement.

1.2 Context of the study

Cement will remain a key material to the meet the needs for global housing and infrastructure development. It is the main component for concrete, the second most consumed material on our planet (Lamas, Palau, & Carmago, 2013). From 2013-2018 a projected US$940 million will be invested in the cement industries for South Africa, Zambia and Zimbabwe (Frost & Sullivan, 2013). Government expenditure will mainly be in this area as the demand for infrastructure development rises. Also in support of this is the Southern African Development Community's Regional Infrastructure Development Master Plan whose main objective is the comprehensive development of infrastructure by 2027 (SADC, 2015). In this regard, cement is a key product for sustainable development as one of its aspects includes providing basic housing for all citizens. The role of cement in sustainability is three-fold: economic development (through infrastructure and buildings), social development (housing and employment) and environmental resource depletion (energy, land, water and air) (Bourdeau, 1999).

The South African cement industry annual production is approximately 17.5 million tonnes representing 0.6% of annual global production (Mapiravana, 2014). Global cement production for 2014 was approximately 4.8 billion tonnes (The European Cement Association, 2014) and this is growing at a rate of four percent per annum; driven largely by the demand from developing countries (Mapiravana, 2014). With these trends, cement is a viable business now and in the future and the demand will continue to increase to meet the needs of the market. The reviewing of the South African cement

industry's sustainability reporting practices thus becomes a focal point as mismanagement of this can have detrimental consequences on human and ecological life.

Sustainability reporting has been extensively researched in the last decades. It serves to communicate the efforts of a company and its progress with sustainability to multiple stakeholders and to assess the current state of its economic, environmental and social dimensions (Lozano, 2013). Sustainability Reporting can be used for assessing a company's performance over time (longitudinal), for benchmarking it to other organisations, and to also gain insight into a company's corporate culture by highlighting its stance on sustainable development (Hrebicek, Faldik, Kasem, & Trenz, 2015).

Theoretical frameworks for sustainable development were laid out with the Brundtland Report and have since evolved over time to conceive a Sustainability Report. Prior to actual guidelines being set up, there was an effort by organisations such as Coalition for Environmentally Responsible Economies (CERES) to encourage reporting, but it was found that most reporting was inconsistent and incomplete, was subjective with no set structure, and lacked comparability between companies and reporting periods (Brown, De Jong, & Lessindrenska, 2009).

The Global Reporting Initiative (GRI) was established in an effort to create common understanding and consistency, and since 1997 has been setting out principles and standard disclosures which organisations can use to report their environmental, economic and social performance and impacts over time (GRI, 2015). The GRI is not a legislative tool, but some countries will include it in their policymaking. In South Africa, the Johannesburg Securities Exchange Socially Responsible Investment (JSE SRI) index was formed based on recommendations by the King Code and GRI (JSE, 2015). The JSE SRI is aligned to GRI, while also keeping in mind the complexities of social responsibility in South Africa to contribute to sustainable business practice in South Africa (JSE, 2015). While these reporting frameworks are sound and continuously

reviewed for improvements, they are a more holistic industry approach and do not take into account the complexities of different sectors of industry.

Annual Sustainability Reports are also sometimes referred to as a company's 'business card' (Daub, 2007). It is referred to as such, as it provides readers with a comprehensive picture of the organisation's operations. For this study, we are benchmarking the reporting practices of South African companies in relation to the Cement Sustainability Initiative, a voluntary initiative with cement companies committed to sustainability issues. This research serves to bring better understanding on where South African companies are in terms of reasoning of sustainability reporting. African cement companies were also included for a more comprehensive analysis. The Cement Sustainability Initiative (CSI) is an initiative and project of The World Business Council for Sustainable Development (WBCSD), (WBCSD, 2015). This is a global CEO-led organisation, which takes shared action in dealing with sustainability issues now and in the future. As an offshoot of the WBCSD, CSI was formed by 25 companies with a 30 percent global market share operating in more than 100 countries with a strong commitment to addressing and coming up with solutions to sustainability concerns (WBCSD, 2015). Over a 10 year period it has focused on understanding, managing and minimising the effects of cement production and use through addressing a number of issues such as climate change, efficient fuel use, air pollutants, employee safety and health and recycling of concrete (WBCSD, 2015). The use of CSI as a benchmark for comparison of South African Companies is appropriate, as it is industry specific. It serves to give a more balanced approach with regard to comparison as companies are in the same sector. This research is looking to understand what gaps exist between South African companies and CSI for possible improvements within the cement sector in South Africa.

In conclusion, the cement industry is going to continue growing in the coming years in order to meet the growing market demand. Evaluation of companies as to depth and relevance of their reporting is therefore important in order to develop a better understanding of how to manage society, environment and the economy for the future.

1.3 Problem statement

1.3.1 *Main problem*

The main problem is to understand how South African cement companies reporting practices compare with African cement companies and global cement companies using the Cement Sustainability Initiative Reporting Framework as a benchmark.

1.3.2 *Sub-problems*

The first sub-problem is to compare the reporting practices of South African cement companies with African cement companies.

The second sub-problem is to compare the reporting practices of South African cement companies with global cement companies.

The third sub-problem is to understand the extent of disclosure by South African cement companies in relation to the Cement Sustainability Initiative Reporting Framework.

1.4 Significance of the study

The identification of patterns existing within and between the global and local market will provide insight on how these companies generally report on sustainability issues. It will allow for understanding on reporting trends and in so doing, shed more insight into which sustainability issues are reported on more or less. This will pose a further question as to what the standard of reporting is, a company's perception on what is viewed as more important or actual neglect on the part of the company. The results will provide insight on the efficiency of sustainability reporting in South Africa.

This report serves to fill a gap with regard to the research on the cement industry. Most research has focused on sustainable production e.g. energy use and cost saving in the industry, (Madlool, Saidur, Hossain, & Rahim, 2011) and assessing the environmental impact of cement production (Valderama, et al., 2012). While this is of great importance,

there is a need to provide an assessment from a management perspective. Sustainability Reporting sends a message that “what gets measured, gets managed” (Dillenburg, Greene, & Erekson, 2003, p. 170). To be able to benchmark South African operations on an African and global scale potentially helps to generate new ideas for business development and growth. This research may be seen as a holistic management tool from which companies and other stakeholders can answer the question with what we know and see of the future, and what can we do now to make improvements in production and continue to be relevant in the future.

This study may be of importance to funding partners and potential investors into the cement industry. Investors play an important role in shaping a country through employment creation and stimulating business activity. Investors are driven primarily by profit, but some also understand that future returns are dependent on the way the current operations impact and add value to society. This report can answer some questions about the type of businesses the companies are running i.e. whether these are non-compliance based and defer problems to others, or whether they are compliance-based or commitment-based. Sustainability Reporting may act as an efficient tool for screening in investment decision making especially for companies that have an interest in long term viability and returns (Willis, 2003).

1.5 Delimitations of the study

- Sustainability Reporting is not a uniform and consistent process. Companies have different approaches and different performance indicators for their reporting which means there is no standard measure on which to benchmark the adequacy of the information that is disclosed.
- This study is industry specific. Its focus is only on the cement industry and its reporting practices without a comparative analysis of other industries.
- This study is only focusing on one year of reporting (2014), it does not seek to do an analysis of change over time with regard to sustainability reporting in the cement industry.

- The research only considers the Sustainability Reports and does not go further to check if this is what companies are actually doing on the ground. Future research should aim to do a qualitative and quantitative analysis on how communities benefit from the companies operating in their area.

1.6 Definition of terms

Table 1: Definition of Terms

Term	Definition
Sustainability Indicators	OECD defines sustainability indicators as "a statistical measure that gives an indication on the sustainability of social, environmental and economic development. They measure progress made in sustainable growth and development" (OECD, 2007, p. 766).
Sustainable Development Report	GRI defines "sustainability reporting as a practice of measuring, disclosing and being accountable to both internal and external stakeholders towards achieving sustainable development" (GRI, 2006, p. 3). This report must include both quantitative and qualitative information, which focuses on the extent to which a company has made improvements in its economic, environmental and social effectiveness (Daub, 2003).

1.7 Assumptions

- The company sustainability reports used in this report are a true measure of what the company is doing on site. There is no bias in reporting to make one "look good."

CHAPTER 2. LITERATURE REVIEW

2.1 Introduction

This literature review will seek to address all matters that are pertinent to the main research problem. This will include addressing what is involved in sustainability reporting, the sustainability issues facing the cement industry and the evolution of sustainability reporting over time. The CSI Reporting framework; its creation and how it compares to the Global Reporting Initiative will also be discussed.

2.2 Sustainability Reporting

A report is considered a sustainability report if it is made publicly available and also informs the reader on the performance of a company with regards to economic, social and environmental dimensions. A sustainability report must have both qualitative and quantitative information on the extent to which a company succeeds or fails to improve on the three dimensions highlighted earlier (social, economic and environmental) and how they are incorporated into the main strategy of the organisation.

Gray (2010) argues that the word sustainability is at threat of being over-used and worthless through endless repetition and is treated the same as attitudes and activities which almost always bear minimal likeness to an accurate sustainable system. He asserts that for most businesses, sustainability reporting and activities intended to promote sustainability have very little or anything to do with sustainability at all, but are rather offshoots of how a company would like to understand sustainability issues and the hope that society concedes to the same view. Barkemeyer et al; (2011) also support this where they concluded that business codes and guidelines are deviating from the original themes that encapsulated the Brundtland report. What this means is that companies will now select the guidelines they consider significant to their view of sustainability and in so doing, only commit to sustainability principles without making substantial commitments towards sustainability. In being able to define sustainability, a change and challenging of the existing business paradigms can be made which can bring about reforms. As acknowledged by Gray and Bebbington:

> *"The real tragedy is that if sustainable business organisations are ever to be achieved, then societies, individually and collectively, need to know the extent to which corporations, with the very best will in the world, are not capable of delivering sustainability. It is this accountability for the extent to which a corporation cannot be sustainable, socially responsible and/or environmental benign that is the real potential of corporate reporting."*
> (2005, p. 5)

What this means is that sustainability indicators and minimum standards need to be adopted in order to address the challenges mentioned above. This should control the possibility that companies may put together "unfounded, unsupported and potentially dangerous sustainability claims" (Gray, 2010, p. 57).

The significance of a sustainability report is set by the scope that is declared by the company. This scope is linked to two key issues, namely how a company decides to define sustainability and how it views accountability (Van Zyl, 2013). Accountability is "the duty to provide an account or reckoning of those actions for which one is held responsible" (Cooper & Owen, 2007). From this definition, two key questions can be asked:

i. Who are companies accountable to?
ii. What are their responsibilities?

(Cooper & Owen, 2007; Van Zyl, 2013)

Accountability also encompasses getting an external opinion, which can validate and ensure objectivity of the reporting process. This contributes to a dialogue between the company and its stakeholders, which in turn might influence future decision-making and behaviour of all parties for reforms. In addressing these key issues, a company can thus make a sustainability report that will be of benefit to its audience and addresses the tragedies highlighted by Gray and Bebbington (2005) above.

2.2.1 *Key Concepts to consider in Sustainability Reporting*

A Sustainability Reporting Framework requires a high level of judgement, concern and expertise as it is up to the individual company to define its own process (Van Zyl, 2013). The key disclosures for the 3 areas (social, economic and environmental) should at least attempt to cover the following:

Social

The social aspect of sustainable development is often neglected and ignored being viewed as less important compared to the environmental and economic aspects of sustainability (Cuthill, 2010). Cuthill argues that there has been little effort made to develop a conceptual framework with research only focusing on diverse topics that include human capital development, human services and community capacity building. These are marred by definition constraints, which then results in a lack of agreement on how to monitor the progress made.

Furthermore, social aspects for sustainability are increasingly seen as public relations exercises in which companies strive to be seen as doing “good” or to buttress some link to profitability of the organisation (Gray, 2010). Key aspects that are enshrined in socially responsible business include fulfilment of legal obligations, investment in human capital, management of stakeholder relationships and the practice of fair trade (Cuthill, 2010). Van Zyl (2013) points out that social sustainability is a subjective and perception based construct that is informed by social values. However, companies should aim to cover environmental justice, labour relations, supply chain and sourcing. The main objective of these is to ensure the well-being of societies that companies operate in is not affected through health and environmental impacts and protection from forced labour and child labour.

Environmental

There is a growing trend in the business environment of assuming environmental sustainability equals eco-efficiency (Van Zyl, 2013). In truth a company’s profit in the interim may be improved through an operations shift which is energy efficient, has waste

minimisation techniques and improved environmentally-friendly designs (Gray & Bebbington, 2005) assuming that this gained competitive advantage does then stimulate more production. Environmental sustainability does not just focus on eco-efficiency, but also means managing resource use for the future. It also requires that companies hold themselves accountable for negative environmental impacts caused by their operations and the full life cycle of their product range. This also includes managing their supply chain through sourcing inputs from sustainable suppliers (Van Zyl, 2013). Van Zyl points out that at bare minimum, companies should consider the following three key aspects for reporting; i) ecological footprints of the operations, ii) supply chain and iii) product life cycle. The key theme addressed here is the issue of accountability; it cements the view that companies need to be transparent in the reporting of their impacts on the environment in their areas of operations, the basis of which is to manage usage of resources because we are currently living beyond our biophysical means (Mofatt, 2000).

Economic

Companies that contribute to economic sustainability in the communities in which they operate should disclose on equity and social justice (Van Zyl, 2013). This is in agreement with Schneider and Meins (2012) who argue that previous approaches did not place emphasis on economic issues and thus marginalised the poor. In practice, the economic aspect of sustainability seems to be confined to issues of corruption, bribery, money laundering and financial disclosure (Schneider & Meins, 2012). This emphasises the need for inclusion of equity and social justice in reporting.

2.2.2 *Evolution of sustainability reporting*

Corporate reporting based only on accounting standards faced criticism because it allowed companies to externalise environmental and social costs (Gray, 2010). This is because publishing financial results is isolated from the environment in which it operates and does not take into account the economy and society. Sustainability reports can be seen as a response by companies to increasing calls from various stakeholder groups to legitimise their actions (operations). The idea of legitimacy can be seen by increased

publishing of reports by companies, which vary on extent and quality of disclosure; this is enshrined in the social license to operate of firms.

The development and scope of sustainability reporting has had several stages (Kolk, 2010; Lozano, 2013). Financial reports publishing rose out of the Great Depression of the 1930's as a means with which to offer potential investors information they could use to make informed investment decisions (Hrebicek, Faldik, Kasem, & Trenz, 2015). In the 1970s, traditional financial reporting was sometimes coupled with social reports; the shift was more focused on environmental issues by the 1980s (Hrebicek; et al., 2015). An approach towards triple bottom line was apparent in the late 1990s as reporting started to put focus on both the social and the environmental dimensions, which was then published together with the financial reports. Following the global financial crisis of 2008, reporting research also incorporated the issue of corporate governance (Lozano & Huisingh, 2011). Presently the G4 Guidelines are being adopted as "the de facto global standard" for corporate sustainability reporting (Lozano R. , 2013).

According to Lozano and Huisingh, the commonly used sustainability guidelines and principles include: "the ISO 14000 series (especially ISO 14031) and EMAS; the Social Accountability 8000 standard (SAI, 2007); and the GRI Sustainability Guidelines (GRI, 2006, 2002). They go on to say ISO 26000 (ISO, 2009) shows potential to utilise the systematic approaches used in the ISO's series and apply them to Sustainability" (2011, p. 100).

Advantages and Disadvantages of the commonly adopted guidelines:

ISO 14000 series (especially 14031)

The focus area is the environment. It looks into assessing the impact of operations on the environmental and improvement in operational performance (Robert, 2000; Brorson and Larsson, 1999). The five key elements covered are:

1. Identification of environmental impacts
2. Understanding current and future legal obligations
3. Development of plans for improving performance

4. Assigning an individual or group to oversee implementation plans
5. Conducting periodic performance monitoring
(DeSimone & Popoff, 2000).

ISO 14031 is internationally recognised as a tool, which provides an organised and methodical way of understanding the environmental dimension as it reports internally about results, performance and plans. ISO 14031 is one of the most broad and inclusive in regards to environmental issues (Morhardt, Baird, & Freeman, 2002). Its main challenge however, is that it does not address economic and social dimensions and tends to be merely informational (Morhardt et al., 2002). In addition, it is a costly and labour-intensive process that does not take synergies among dimensions into consideration.

SA8000

The focus is on social issues. SA8000 is based on international workplace norms of International Labour Organisation (ILO) conventions, the Universal Declaration of Human Rights and the UN Convention on the Rights of the Child (SAI, 2015). It is an auditable certification standard, which clearly addresses human and labour rights throughout the company and provides the public with knowledge on the company's efforts (SAI, 2015). Its main disadvantage is that it only focuses on the social aspect of sustainability and, like ISO14031, does not consider synergies among the dimensions.

AA1000 Framework

AA1000 Framework focuses on social and ethical issues. It responds to the need for effective communication between the company and its stakeholders in a systematic manner to ensure transparency (ISEA, 1999). The main strength of AA1000 Framework is that it emphasises on innovation over conformity giving leeway for companies to steer their own course rather than following what has been set up by others (Leipziger, 2003). It does not fully consider the economic and environmental dimensions and the synergies among them. AA1000 is a complex and resource intensive process requiring great commitment from the company.

GRI Guidelines

The GRI is a worldwide-recognised tool, which provides guidelines for reporting on economic, environmental and social performance. It is a voluntary and multi-stakeholder approach to reporting (GRI, 2006). GRI is noted as one of the most comprehensive guidelines and principles to date (Hussey et al., 2001; Lozano, 2013; Morhardt et al., 2002). It is a complex reporting process for benchmarking and comparison as it has many indicators (Leipziger, 2003; Lozano, 2013). Due to the numerous indicators, data collection for reporting tends to be a costly exercise (Luken & Stares, 2005). Like the other indicators, the GRI guidelines "do not consider synergies among the dimensions," (Lozano & Huisingh, 2011, p. 101).

From this, we can conclude that the GRI guidelines have the broadest scope and are often used as the guidelines for Sustainability Reporting. The GRI G4 Guidelines are the most recent guidelines adopted by the GRI. The objectives of developing the GRI G4 Guidelines is to improve the technical quality of the organisation's content report and eliminate the previous problems of ambiguity and differing interpretations (GRI, 2013).

2.2.3 *Limitations of sustainability reporting*

The quality of sustainability reporting is often analysed by documenting the presence of a predetermined set of topics. Despite standardisation efforts being put in place, significant differences will remain in companies of different industry sectors with regard to the content and quality of sustainability reports resulting in differences in the level of disclosure. In addition to this, there are many international standards for implementing and certifying the sustainability pillars as highlighted in the previous section. This means that what is reported on or what gets more emphasis differs according to the preferable method used (Hrebicek et al., 2015).

2.3 Sustainability and the cement industry

2.3.1 *The cement industry*

As indicated earlier, the global cement industry has an annual growth rate of five percent through to 2017 to 4.8 billion tonne largely driven by the developing economies, increased infrastructure investment and improved markets in the developed economies (The Freedonia Group, 2010). This production of 4.8 billion tonnes was achieved by end of 2014 as shown in the figure below.

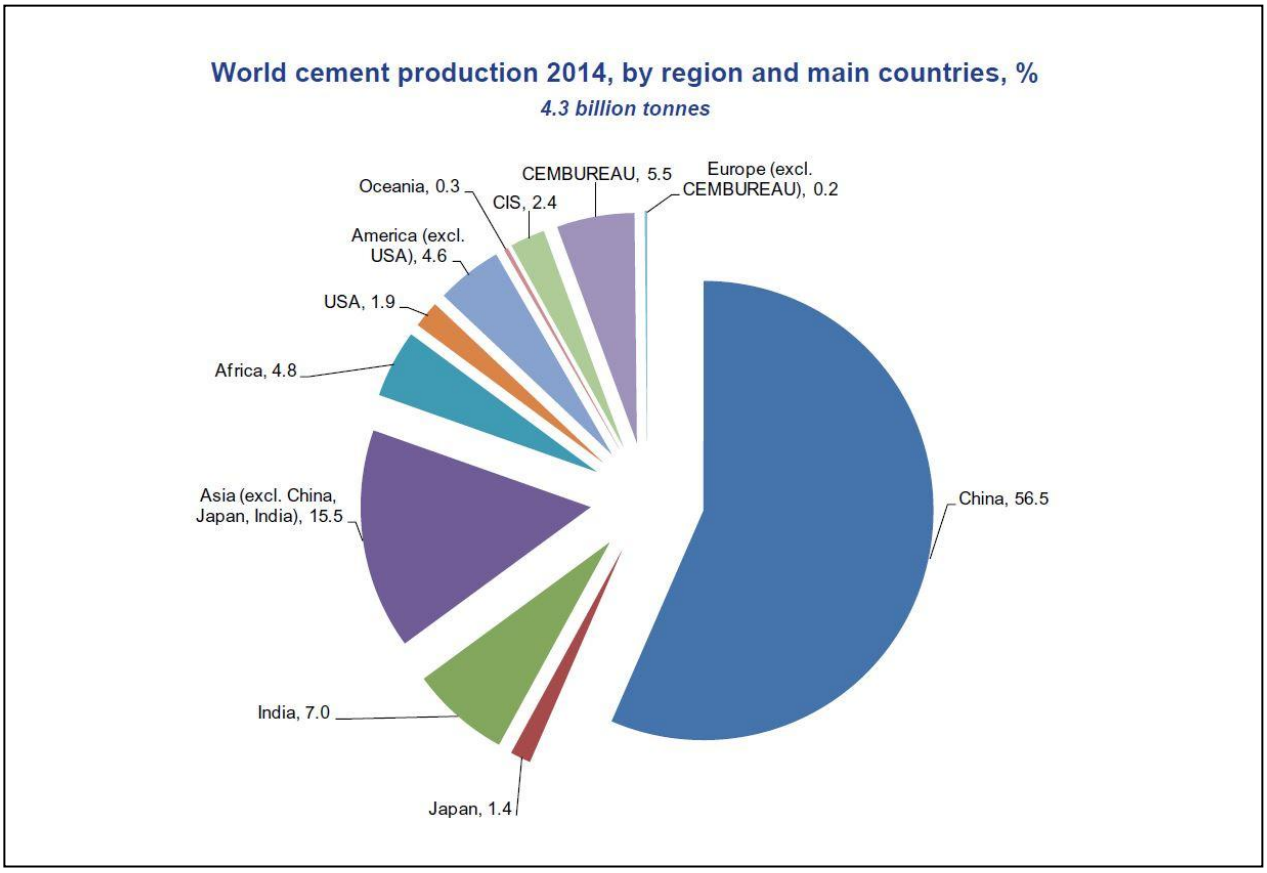

Figure 1: 2014 World Cement Production by region and main countries

(CEMBUREAU, 2014)

The cement industry is expected to rebound sharply in North America and Western and Eastern Europe while growth in Africa, the Middle East and Asia Pacific Region is

expected to decelerate significantly between 2012 and 2017 (The Freedonia Group, 2010). China will account for new demand in cement and grow at an annual rate of eight percent (The Freedonia Group, 2010).

The African cement sector is going through a period of sustained growth with numerous investments across the region to boost production (Ecobank, 2014). Africa is a marginal producer on a global scale with a production of 116 million metric tonnes accounting for 2.9 percent in 2013 (Ecobank, 2014). This is because of underutilised capacity and underinvestment in the sector reflecting high costs of production making the industry less favourable in a market replete with cheap imports. Africa increased production in 2014 led by Nigeria, South Africa, Ethiopia and Angola (Ecobank, 2014).

Table 2: Sub Saharan Africa's leading cement producers

Country	Production (Million metric tonnes)
Nigeria	28.3
South Africa	19.0
Ethiopia	12.6
Angola	8.0
Kenya	7.4
Ghana	6.7
Senegal	6.5
Tanzania	3.7
Uganda	2.6
Cote d'Ivoire	2.5
Benin	2.1
Others	6.4
Total	**115.8**

(Ecobank, 2014)

In South Africa, four companies account for more than eighty percent of the cement production in the country. These are AfriSam South Africa Pty Ltd, Lafarge South Africa,

Natal Portland Cement Cimpor and Pretoria Portland Cement (PPC) with two new entrants: Sephaku Cement to start operations in 2014 (Heyns, 2013) and Mamba Cement currently constructing a plant in Limpompo Province (Edwards, 2014). Sephaku Cement has since started production with two cement producing facilities in Mpumalanga and North West Province (Sephaku Cement, 2015). Cement production started in 2014 at Delmas milling plant and Aganang plant by the fourth quarter of 2014.

Cement industries are usually delineated into geographic areas due to the high cost of transporting it (Heyns, 2013). Transportation costs account for a third of costs and in most instances, it is seen as uneconomical to transport for distances of more than two hundred and fifty kilometres from a milling plant (Heyns, 2013). This is particularly an issue in a country such as South Africa, which is dependent on road transportation for cement.

Table 3: Footprints of the South African cement companies

Cement Company	**Number of cement plants**	**Production Capacity**	**Main Supply Area**
1. Pretoria Portland Cement	7	4.75 million tonnes/year	Inland market, Western and Eastern Cape
2. Natal Portland Cement Cimpor	3	3.15 million tonnes/year	KwaZulu Natal and Mozambique
3. AfriSam	2	2.05 million tonnes/year	Inland market
4. Lafarge	2	2.0 million tonnes/year	Inland market

(Heyns, 2013; Edwards, 2014)

The four companies in the table above previously operated as part of a cartel until its disbandment. Since then, competition has remained low, though it is intensifying due to weaker demand resulting in margin pressure (Heyns, 2013). The entry of Sephaku and

Mamba into the market is projected to make the industry shakier and poorer (Edwards, 2014).

2.3.2 *Sustainability issues facing the cement industry*

Cement-based buildings offer various socioeconomic benefits. This is because they provide strength and durability, which in turn contributes to improved quality of life. Furthermore, the thermal mass of cement-based building proffers energy efficiency of buildings through reducing heating and cooling during the life cycle of the building (Mapiravana, 2014). Though cement is beneficial, it poses sustainability risks which are a cause for concern.

Cement production is an energy intensive process; consuming 12-15 percent of industrial energy (Madlool, Saidur, Hossain, & Rahim, 2011). South Africa relies mainly on fossil fuel (coal) for its energy which when combusted results in large carbon dioxide emissions and other sustainability concerns such as pollutant emissions, major land disturbance through blasting and other pollutants (NO_x, SO_x). The use of “alternative fuels” in the cement industry protects non-renewable stocks of fossil fuels and reduces carbon dioxide emissions. However, the use of alternative fuels may increase the concentrations of heavy metal toxins such as lead, cadmium and chromium in cement kiln dust (groundWork, 2006). In the industrial sector, the cement industry is rated as one of the largest carbon emitters in the world, accounting for about 5% of atmospheric carbon dioxide emissions (Mikulc̆ic, Vujanovic´, & Duic, 2013). In addition to this, depletion of non-renewable resources or slowly renewable resources is a cause for concern (WBCSD, 2002).

There are also a number of social and economic issues in the cement industry. The cement industry has negative impacts on human quality of life as evidenced by community concerns about the siting of plants, traffic congestion that in turn causes road damage, aesthetics, noise and dust (WBCSD, 2002). Though the development or expansion of cement facilities can result in job creation and economic growth, as

productivity improves the cement industry employment decreases per tonne of product (WBCSD, 2002).

From this viewpoint, the South African cement industry's reporting practices need to be reviewed for its performance in dealing with emerging environmental issues as a result of their operations in order to bring accountability.

2.4 The Cement Sustainability Initiative

2.4.1 *How it was created*

The Cement Sustainability Initiative is a sector project of The World Business Council on Sustainable Development (WBCSD) specifically targeting cement sustainability (WBCSD, 2015). It is a global effort by 25 major cement producers with cement plants in more than 100 countries accounting for 30% of global cement production who believe in pursuing sustainable development as part of their business operation (WBCSD, 2015). These participants have signed the CSI Charter that captures individual member actions, which are in the Agenda for Action for the CSI; this charter represents the key sustainability issues that are facing the cement industry. The Agenda for Action was published in 2002 after a two-year research and stakeholder consultative process on what sustainable development is for the cement industry. This sets out practical actions for companies in the following areas:

Table 4: CSI Key Performance Areas and Indicators

Broad Key Performance Area	Indicator
• CO_2 and Climate Protection	Carbon emissions per tonne of production Setting of emission targets and report against this baseline
• Responsible Use of Fuels and Raw Materials	Specific heat consumption of clinker production (MJ / ton clinker) Alternative fuel rate (% of thermal energy consumption) Biomass fuel rate (% of thermal energy

	consumption) Alternative raw materials rate Clinker / cement ratio (%)
• Employee Health and Safety	Number of fatalities (directly employed) Number of fatalities per 10,000 directly employed Number of fatalities (contractors / subcontractors) Number of fatalities (3rd party - on-site / off-site) Number of Lost Time Injuries (directly employed) Total number of Lost Time Injuries Lost Time Injuries per 1 million man hours (directly employed)
• Emissions Monitoring and Reduction	Specific NOx emissions (g/ton clinker) Specific SOx emissions (g/ton clinker) Specific Dust emissions (g/ton clinker) Target reduction for NOx Target reduction for SOx Target reduction for Dust % Clinker produced with monitoring of major and minor emissions % Clinker produced with continuous monitoring of major emissions (NOx, SOx, Dust)
• Local Impacts on Land and Communities	% of active quarries with quarry rehabilitation plans in place Number of active quarries within, containing or adjacent to areas designated

	for their high biodiversity value (number and coverage), biodiversity value as defined by GRI EN11 % of quarries with high biodiversity value (according to KPI 1) where biodiversity management plans are actively implemented Water KPI are currently under research
▪ Sustainable supply chain management	KPI's currently under research

(WBCSD, 2015)

The above are key areas that CSI members are tasked with making progress and reporting on. On joining, companies are given four years to meet the requirements of the CSI Charter and the CSI secretariat is tasked with managing the process and ensures that companies are aware of, and fulfil their various commitments. The CSI charter is renewed as emerging issues come up. In addition, CSI members not only report on their progress in a sustainability report but also agree to conduct third party assurance audits of a number of the key performance indicators (KPIs), which are publicly reported (WBCSD, 2015).

2.4.2 *CSI Reporting Framework compared to Global Reporting Initiative (G4)*

The G4 Reporting starts by identification of key aspects of a company and topics which the organisation might report on (GRI, 2013). This is based on any impacts the company can come up with related to all of its activities, products, services, and relationships, regardless of whether these impacts occur within or outside of the organisation. This is in contrast to CSI, which conducts multi stakeholder processes that sets out the key reporting areas for the companies. In so doing, it means companies do not choose which area to report on in order to make their report more appealing to stakeholders. Rather,

companies will be compelled to report on specific areas regardless of whether or not they have made progress. Furthermore, as part of its reporting process G4 tasks the companies with prioritising the key aspects identified in Step 1 (GRI, 2013). This process, in contrast to CSI Reporting, creates a bias as companies might possibly be more inclined to report on areas on which they have made progress. In addition, since relative importance is different from company to company, this makes direct comparison difficult.

It should be noted that significant gaps exist involving what companies report on versus reporting guidelines requirements (Barkemeyer *et al*., 2011; Gray & Bebbington, 2005). Most of the guidelines, including the GRI, unintentionally allow companies to adopt a "tick-the-box" approach which gives companies leeway to show an incremental improvements approach. The risk with this approach is that it can divert focus on larger and deeper impacts of the business (Gray, 2010).

2.5 Research Questions

Based on the literature review we can conclude that Sustainability Reporting is a complex issue with its own industry specific challenges. We may thus conclude that the CSI Reporting Framework is a tool, which can be used to make reasonable comparative analysis between the South African cement industry and the global cement industry. Based on the problem statement we have put forward the following research questions:

Research Question 1:
How do South African companies' reports compare with African cement companies?
Research Question 2:
How do South African companies' reports compare with global cement companies?
Research Question 3:
How closely do South African cement companies, African cement companies and global cement companies adhere to the Cement Sustainability Initiative Reporting Framework?

2.6 Conclusion of Literature Review

This literature clearly explains the importance of Sustainability Reporting and what information it reveals. Majority of the literature in this area was drawn from work of initial authors in the area of corporate sustainability reporting. The review offered an understanding of what sustainability reporting is, and the complexities and challenges that make sustainability difficult to bring about change in sustainable development in the business sector. The review also went into the main challenges and the current condition of the cement industry, which is the topic under study. The review was concluded by a sector specific reporting method, which was compared to the more holistic G4 Reporting method. This showed the importance of the CSI Reporting Framework for the purposes of this research as it is based on measurable targets and there is accountability within this reporting scheme. This accountability is what makes for an interesting and insightful research as these companies can be used as a benchmark for comparison of their South African counterparts.

This literature review concludes by giving an understanding that gaps do exist in how companies report (Barkemeyer *et al*., 2011; Gray & Bebbington, 2005; Milne *et al*., 1999) which gives importance to our research problem on what are the gaps that exist in this research.

2.6.1 *Research Question 1:*

How do South African companies' reports compare with African cement companies?

2.6.2 *Research Question 2:*

How do South African companies' reports compare with global cement companies?

2.6.3 *Research Question 3:*

How closely do South African cement companies, African cement companies and global cement companies adhere to the Cement Sustainability Initiative Reporting Framework?

CHAPTER 3. RESEARCH METHODOLOGY

3.1 Research methodology / paradigm

Researchers have different ways in which they exist and interact in their environment; this implies even the way in which research is conducted varies. This brings about different research paradigms. Taylor, Kermode and Roberts defined a paradigm as “a broad view or perspective of something” (2007, p. 5). This view is what guides the way in which an investigation is conducted. There are mainly two research paradigms; positivisms and anti-positivism (naturalistic inquiry) (Dash, 1993). Positivism theory is based on ideas by French philosopher August Comte who emphasised on study and reason as a means of understanding human behaviour. It systematises the knowledge generation process through quantitative methodology for precision in description of parameters and the relationships between them (Dash, 1993). An anti-positivism approach however emphasises that the interpretation of social reality is based on the ideological perspectives of the researcher. Anti-positivists have a belief that reality is multi-faceted and complex (Cohen, Louis, Manion, & Morrison, 2000) and a single phenomenon thus have multiple ways in which it can be interpreted. The emphasis is on probing various unexplored dimensions rather than establishing relationships among the different components. This suggests a qualitative rather than a quantitative approach.

For this study, an anti-positivism (interpretivist) approach was used. This is because the study of sustainability reporting is enshrined in social, economic, environmental and legislative circumstances. It requires an appreciation of context, something the positivist view would not be able to capture to the required depth. This study was mainly to gain insight and understanding on the extent of disclosure between different groups (global, African and South African context). It thus relies heavily on a data collection technique, which reflects various perspectives and contexts of operations, something the anti-positivism approach is well suited for. An anti-positivism approach is affected by institutional and personal bias (Bluhm, Harman, Lee, & Mitchell, 2011) this is in line with the data for the study as it is largely a reflection of the company’s perception of

sustainability. This research is a reflective process on the areas that companies place emphasis on for reporting and possibly the reasoning behind it. This is line with Cole who asserts that “qualitative researchers are more concerned about uncovering knowledge about how people feel and think in the circumstances in which they find themselves, than making judgements about whether those thoughts and feelings are valid” (2006, p. 26).

3.2 Research Design

The research design adopted for this study was a descriptive one through the review of literature in the form of company sustainability reports. This aim of the research was to give a picture on the sustainability reporting of South African cement companies versus global cement industry this is in line with Neuman who defined descriptive research as one that shows a picture of the specific details of a situation, social setting or relationship (2006). Descriptive research offers a profile of factors thus clearly defining the phenomenon under review (Zikmund, 2003). This was of importance in this study, which sought to look, at which areas (factors) are reported on more and which ones reported less on or ignored. A descriptive study thus provided a clear picture of this.

3.3 Population and sample

3.3.1 *Population*

The population included key participants in the South African cement industry, African cement industry and global cement industry.

Table 5: Population for study

Category	Qualifying criteria
South African cement companies	- Significant share of the South African market
African cement companies	- Annual Production
Global cement companies	- Core Member of CSI

3.3.2 *Sample and sampling method*

The study used a purposive sampling technique to identify respondents from the population. The purposive sampling technique is the selection of an informant due to the qualities the informant possesses (Tongco, 2007).

A sample size of twenty was used as follows: five South African cement companies, five African cement companies and the remaining ten being global cement companies of the CSI. Five companies were used for the South African companies with four contributing more than 80% of the cement production process and one being an emerging entrant into the cement industry. The five African cement companies were also selected based on being top in production exclusive of the five South African companies. Ten global companies were used to allow for more spread and analysis in the data as this represents more than half of the core members of the CSI who were initial signatories.

3.4 The research instrument

The research instrument that was used for this study is the Key Performance Areas and Key Performance Indicators from the literature review on the Cement Sustainability Reporting Framework. This framework is the benchmark that gives a holistic picture of the key areas for reporting in the cement industry. In using this framework, a standardised tool was made available which is useful for comparative analysis between the two groups on the nature and extent of sustainability reporting. This instrument also allowed for identification of improvement areas for South African cement companies and in so doing benchmark to global standards.

3.5 Procedure for data collection

The sampling criteria data used for this study was the review of the company's sustainability report for 2014 published on the internet. The reports for African cement companies were downloaded off respective companies' website. Those for global cement companies were downloaded from the WBCSD-CSI website; where available

and relevant company website information and other interim reports for the 2014 were used as part of the data set.

The CSI Key Performance Areas and Indicators were the basis on which the data was captured for analysis.

3.6 Data analysis and interpretation

In order to review the selected sustainability reports; assessment categories were adopted as per the CSI Reporting Framework:

- CO_2 and Climate Protection
- Responsible use of fuels and raw materials
- Employee health and category
- Emissions monitoring and reduction
- Local impacts on land communities
- Sustainable supply chain management

This data was evaluated in two ways:

i. Tick box approach of Yes or No - For research question 1 a tick box approach was used to establish if a company reports on the Key Performance Areas according to the CSI Framework. In order to fully answer research question 3 a basic rating scale of zero and one was used for noting the presence or absence of information.
ii. Content Analysis - this sought to establish what the companies actually said on a Key Performance Area

The CSI Key Performance Areas and Indicators were used as the basis for the content analysis of the sustainability reports and additional company material. Content analysis is a method that is used to gather and analyse data. This entails codifying both qualitative and quantitative information into pre-defined categories in order to develop patterns on reporting of information by companies. For content analysis to be effective, certain technical requirements should be met (Guthrie, Petty, & Yongvanich, 2004) these are:

- Units/Categories of analysis must be clearly and operationally defined - the recording units will represent a segment of content and the placed in the corresponding category.
- Data capture must be methodical - there must be clarity on whether an entry belongs or not.
- Content analysis must display some qualities for reliability and validity.

The reliability of this research was enhanced with using paragraphs to establish context and relevance rather than sentences from the sustainability reports. Milne and Adler (1999) highlighted the use of paragraphs is more fitting than using a word count for drawing inferences from an account as it gives more meaning than just using a word or sentence. Furthermore, non-narrative disclosures such as charts, tables, graphs and photographs were included for analysis (Unerman, 2000). This is in support of Wilmshurst and Frost (2000) who did not include pictures in their data analysis and at concluding research indicated that this was a potential drawback as a picture is a useful tool which might be used as a way of emphasising the manage approach to sustainability issues.

The study also looked at the incidence of occurrence (number of paragraphs) in order to ascertain the general importance of a story as each area competes for the right of space in the report.

3.7 Limitations of the study

- Sample for CSI companies might not be representative of the sustainability reporting practices of the whole group as sample focuses on core members only
- Content analysis technique has a potential risk of not capturing a complete picture of the company's operations (Unerman, 2000) however "it is a widely accepted and recognised research instrument" (Marx & Van Dyk, 2011, p. 41)
- The study was conducted prior to the publishing of KPIs for water and sustainable supply chain

3.8 Validity and reliability

A good qualitative study can help us “understand a situation that would otherwise be enigmatic or confusing” (Stenbacka, 2001, p. 551).

The four key constructs for acceptance of trustworthiness of qualitative research are enshrined under four key constructs: credibility, transferability, dependability and confirmability (Shenton, 2004).

This research is valid as it used a commonly available framework (CSI Key Performance Areas and Key Performance Indicators) for data analysis. Furthermore, the company sustainability reports were publicly available and easily accessible which means one could easily replicate the study. The sourcing of the data was from independent sources, which improves the reliability and validity of the study. The method of analysis (content analysis) was one that is available and has been used for similar study by other researchers.

External validity was impacted during content analysis when dealing with graphs versus paragraphs as in some instance it was unclear which reports a Key Performance area more explicitly. This became a subjective exercise left to the discretion of the researcher, however the approach was systematic and every effort made to ensure the same criteria.

CHAPTER 4. RESULTS

4.1 Introduction

The purpose of this chapter is to present the results obtained from document review and content analysis of the company sustainability reports described in Chapter 3. For this study, the CSI Key Performance Areas and Indicators were the themes for content analysis and document review. The results obtained from the content analysis and document review were discussed in relation to the relevant research question.

4.2 Sample

This research was conducted in the cement industry, and twenty companies were chosen that included:

- 10 global cement companies which are core members of the CSI
- 5 African cement companies chosen from the countries with largest production capacity
- 5 South African cement companies; 4 have the largest market share and 1 being an emerging entrant into the cement industry

The companies were purposefully selected based on:

- Their position as core members within the CSI for global cement companies
- Production capacity within Africa for African cement companies
- Market share for South African cement companies

The sample comprised of emerging and market leaders within the cement industry. The basic demographics of the sample are shown in the table to follow.

Table 6: Details of Companies Analysed

Company	Year Started	Country of Operations	Production Capacity in tonnes	Ownership
Afrisam	1934	South Africa	2.05million	Founded as Anglovaal Portland Cement Company Limited
Lafarge South Africa	2001	South Africa	2million	Previously Blue Circle taken over by Lafarge in 2001
NPC Cimpor	1964	South Africa	3.15million	Owned by Intercement Brazil
PPC	1892	South Africa	4.75million	Founded as De Eerste Cement Fabrieken Beperkt
Sephaku Cement	2013	South Africa	2.5million	36% owned by Sephaku Holdings and 64% by Dangote Plc
Ashakacem Plc	1979	Nigeria	1million	82% Lafarge Africa Plc Nigerian Investors 17.5%
Bamburi Cement	1951	Kenya and Uganda	2.1million	Subsidiary of Lafarge
Dangote	1992	Nigeria	20.25million	Founded as Obajana Cement Plc
Ghacem	1967	Ghana	2.2million	Founded by the Government of Ghana in collaboration with Norcem AS
Lafarge Africa Plc	1960	Nigeria and South Africa	4.5million	Merger and consolidation of Lafarge Cement

				WAPCO Nigeria Plc and Lafarge SA
Cemex	1906	Mexico and presence in 50countries	94million	Founded as Cemex
Cimpor	1976	Brazil, Argentina, Paraguay, Portugal, Egypt, Mozambique, South Africa, Cape Verde	36million	Owned by Camargo Corrêa
CRH Plc	1970	34 countries in the Americas, Europe and Asia	19million	Formed through merger of 2 Irish Public companies
Heidelberg	1873	40countries in Europe, Asia, North America and Africa	129million	Founded as Heidelberg in Germany
Holcim	1912	70countries in Asia, Europe, North America, Latin America and Middle East	218million	Founded as Holcim in Switzerland

Italcementi	1864	20countries in North America, Europe, Asia and Africa	68million	Founded as Italcementi in Italy
Lafarge	1833	France and presence in 60countries	215million	Founded as Lafarge in France
Secil	1994	Portugal, Tunisia, Lebanon, Angola, Cape Verde	8million	Founded as Companhia de Cimentos de Portugal
Taiheiyo Cement Corp	1881	Japan, USA, China, Vietnam, Philippines, South Korea	43million	Formed from merger of Chichibu Onoda and Nihon Cement
Votorantim Cimentos	1933	Brazil, Bolivia, Uruguay, USA Argentina, Chile, Peru, Canada, Spain, Turkey, Tunisia, Morocco, India and China	54.5million	

The spread in geography of operations are vital because of the differing sustainability disclosure thus providing depth to the study.

It is important to note that not all companies had sustainability reports. Some of the companies reported on their sustainability initiatives in their annual reports while others made the information available on their websites. Of the twenty companies:

- 9 had sustainability reports- namely Dangote, Cemex, CRH, Heildelberg, Holcim, Italcementi, Lafarge Group and Taiheiyo Cement Corporation.
- 8 reported on sustainability in their annual reports- namely AshakaCem Plc, Lafarge Africa, Secil, Bamburi, Cimpor, Votorantim, Sephaku and Lafarge South Africa
- 3 had neither sustainability reports nor annual reports but provided information on their sustainability initiatives on their website-namely Ghacem, Afrisam and NPC Cimpor.

For purposes of presentation of the results, the following key is used for Key Performance Areas and Key Performance Indicators:

Table 7: Key for KPA's and KPI's

Key Performance Areas	Reference Key	Key Performance Indicator	Reference Key
CO_2 and Climate Protection	1	Carbon emissions per tonne of production	1.1
		Setting of emission targets and report against this baseline	1.2
		Specific heat consumption of clinker production (MJ / ton clinker)	2.1
		Alternative fuel rate (% of thermal	2.2

Responsible Use of Fuels and Raw Materials	2	energy consumption)	
		Biomass fuel rate (% of thermal energy consumption)	2.3
		Alternative raw materials rate	2.4
		Clinker / cement ratio (%)	2.5
Employee Health and Safety	3	Number of fatalities (directly employed)	3.1
		Number of fatalities per 10,000 directly employed	3.2
		Number of fatalities (contractors / subcontractors)	3.3
		Number of fatalities (3rd party - on-site / off-site)	3.4
		Number of Lost Time Injuries (directly employed)	3.5
		Total number of Lost Time Injuries	3.6
		Lost Time Injuries per 1 million man hours (directly employed)	3.7
		Specific NOx emissions (g/ton clinker)	4.1
		Specific SOx emissions (g/ton clinker)	4.2
		Specific Dust emissions (g/ton clinker)	4.3

Emissions Monitoring and Reduction	4	Target reduction for NOx	4.4
		Target reduction for SOx	4.5
		Target reduction for Dust	4.6
		% Clinker produced with monitoring of major and minor emissions	4.7
		% Clinker produced with continuous monitoring of major emissions (NOx, SOx, Dust)	4.8
Local Impacts on Land and Communities	5	% of active quarries with quarry rehabilitation plans in place	5.1
		Number of active quarries within, containing or adjacent to areas designated for their high biodiversity value (number and coverage), biodiversity value as defined by GRI EN11	5.2
		% of quarries with high biodiversity value (according to KPI 1) where biodiversity management plans are actively implemented	5.3
		Water KPI are currently under research	5.4
Sustainable supply chain management	6	KPI's currently under research	6.1

4.3 Results pertaining to research question 1

Research Question 1: How do South African companies' reports compare with African cement companies?

A tick box approach was employed to establish if a company reported on the KPA and KPI. The full results for the Y/N response were made available in the appendix of this study. After this tabulation was done, the results were grouped into African companies and South African companies to establish the percentage reporting on a KPA and KPI for each group.

Table 8 shows a summary of the results obtained for the groups on the whether they report on a KPI or not.

Table 8: Reporting Areas South African cement companies versus African cement companies

KPA	KPI	African Companies		South African Companies	
		% Reporting on this section	% Not Reporting on this section	% Reporting on this section	% Not Reporting on this section
1	1.1	0	100%	20%	80%
	1.2	0	100%	20%	80%
2	2.1	0	100%	0	100%
	2.2	20%	80%	20%	80%
	2.3	0	100%	0	100%
	2.4	0	100%	0	100%
	2.5	0	100%	0	100%
	3.1	60%	40%	60%	40%
	3.2	0	100%	40%	60%
	3.3	60%	40%	40%	60%

3	3.4	60%	40%	40%	60%
	3.5	40%	60%	20%	80%
	3.6	60%	40%	60%	40%
	3.7	0	100%	20%	80%
4	4.1	0	100%	20%	80%
	4.2	0	100%	20%	80%
	4.3	0	100%	20%	80%
	4.4	0	100%	0	100%
	4.5	0	100%	0	100%
	4.6	0	100%	0	100%
	4.7	0	100%	0	100%
	4.8	0	100%	0	100%
5	5.1	0	100%	20	80%
	5.2	0	100%	0	100%
	5.3	0	100%	0	100%
	5.4	0	100%	40%	60%
6	6.1	0	100%	0	100%

Reporting by both groups was generally very poor on all the KPAs. However, South African companies reported on more of the KPAs than other African companies did. The KPA that both groups had a high reporting frequency was that of employee health and safety, while the least reported areas were CO_2 and climate change, emission monitoring and reduction, and local impacts on land and communities.

For the companies that reported on a KPA area, the context and depth of disclosure of the corresponding KPIs was reviewed using content analysis. The KPI were the code words and units of analysis for the study as they elaborated on the KPA. The results are shown using the six KPAs from the CSI Reporting Framework:

KPA 1: CO_2 and Climate Protection

African companies did not disclose any information on carbon emissions per tonne of production in addition no emission targets were included in the report to use as a baseline for reporting. Out of the five South African companies, only PPC reported on its emissions and had emission targets on which to respond as a baseline. PPC reported 838CO_2/tonne of cement, a 3.5% improvement from its 2010 baseline. PPC also provides carbon emissions figures from 2010-2014 from this it can be inferred that PPC aims to provide a quantitative performance reporting on its carbon dioxide emissions.

KPA 2: Responsible use of fuels and raw materials

Reporting on KPA 2 was similar for both groups as only one company in each group disclosed any information. For African companies, Bamburi only disclosed information on the alternative fuel rate (KPI 2.2) and disclosed some information on clinker production that would have been relevant to the clinker-cement ratio (KPI 2.5) if reported on fully. Bamburi disclosed its alternative fuel rate for both its Kenya and Uganda operations. Kenya operations included the Mombasa and Nairobi plants which had a 4% and 25% substitution rate respectively. Uganda operations offered an incremental substitution rate from 26% in 2010 to 57% in 2014. From the content analysis it can be inferred that Bamburi prioritises alternative fuel use and reduction in carbon dioxide footprint as this was a big focus of its sustainability report. In addition, Bamburi disclosed on clinker production, which was up by 3% from 2013. However, it did not provide a ratio for clinker to cement in order to make a quantitative assessment on the improvement in clinker production per tonne of cement. Lafarge South Africa similarly reported on KPI 2.2, which showed an improvement in alternative fuel rate of 12.6% up from 6.5% in 2013. Lafarge South Africa placed great emphasis on cost savings as the report sighted a savings of ZAR25 million due to alternative fuel use.

KPA 3: Employee health and safety

From both groups it can be inferred that employee health and safety is a high priority as this is the KPA largely reported on. All the African companies did not report on KPI 3.2

(number of fatalities per 10 000) and KPI 3.7 (lost time injuries per one million man). This reporting can be deemed incomplete and ineffective alone as the level of risk cannot be established. Within the African companies, two did not report at all on any of the KPIs namely Dangote and Ghacem. Dangote in its report only touched on commitment to employee safety and health with no metrics on which to measure performance for risk management. Similarly, for South African companies Afrisam and NPC Cimpor did not report at all on any of the KPIs.

The reporting for fatalities on Bamburi was somewhat unclear as on one hand they reported zero fatalities but in describing operations in Uganda they reported two injuries and a fatality involving a third party. The report also highlighted an additional four accidents that resulted in four third party fatalities indicating inaccuracies in reporting. Ashakacem reported qualitatively with no quantitative figures to substantiate their claims. The report mentioned record lows and incidents that resulted in lost time incidents but no figures were provided. This reporting makes it difficult to put risk management and safety training mechanisms in place as there are no figures on which to measure performance.

Three companies namely Lafarge Africa, Lafarge South Africa and PPC showed a similar reporting structure. All the companies practiced trend reporting as they referred to 2013 metrics for comparison. Zero fatalities (KPI 3.1-3.4) were reported in all groups while fewer injuries were also reported. The only deviation was Lafarge Africa which did not provide figures for lost time due to injuries, (3.5 - 3.6) but rather made mention of the improvement. Lafarge South Africa is the only company in both groups to report on KPI 3.7 (lost time injury per million man-hours). It can be inferred that Lafarge South Africa places importance on understanding the time risk because of injuries thus making it easier to measure progress in safety and health over time. Sephaku Cement reported no major incidents that the researcher took to mean there were zero fatalities reported. Sephaku reported on all lost-time injuries with the exception of KPI 3.7

KPA 4: Emissions monitoring and reduction

Emissions monitoring and reduction is one of least reported areas by both groups. All companies with the exception of PPC provided no information on emissions monitoring

and reduction. PPC however only reported on KPIs 4.1 - 4.3 that quantify the amounts of $N0_x$, SO_x and dust emitted from operations. The report also shows the emissions from 2012 and 2013 for comparative assessment. This might possibly be a sign of PPC's commitment to improve its emissions standards to meet its global counterparts.

KPA 5: Local impacts on land and communities

Similarly, with KPA 4, KPA 5 is one of the least reported areas by both groups. PPC reports on KPI 5.1 as it has 95% of its quarries with rehabilitation plans in place. In addition, PPC together with Sephaku reports on water use and management KPI 5.4. As CSI Reporting Framework has not yet put KPIs for water in place themes were drawn from the company report and these are presented in this study. PPC reports on annual municipal water usage and provides information for 2013, 2013 and 2012. In the same way, Sephaku also reports on water consumption however, the variation is consumption is calculated per tonne of cement. It can be inferred that Sephaku's KPI is a way of measuring water use efficiency within its kilns rather than using absolute terms as PPC does.

KPA 6: Sustainable supply chain management

KPA 6 is the least reported area out of all KPAs. Both groups do not provide any information on supply chain.

Conclusion to Research Question 1

The research objective for question 1 was to assess the variations that exist in reporting between African cement companies and South African cement companies. African companies and South African companies show some similarities in their reporting. The least reported areas for both groups are on emissions monitoring and reduction local impacts on land communities and sustainable supply chain management. The highly prioritised area for both groups is on employee health and safety.

4.4 Results pertaining to research question 2

Research Question 2: How do South African companies' reports compare with global cement companies?

The same procedure employed for research question 1 was used for research question 2. Table 9 shows a summary of the results obtained for the groups on whether they report on a KPI or not.

Table 9: Reporting Areas South African cement companies versus global cement companies

KPA	KPI	Global Companies		South African Companies	
		% Reporting on this section	% Not Reporting on this section	% Reporting on this section	% Not Reporting on this section
1	1.1	100%	0	20%	80%
	1.2	90%	10%	20%	80%
2	2.1	60%	40%	0	100%
	2.2	80%	20%	20%	80%
	2.3	70%	30%	0	100%
	2.4	80%	20%	0	100%
	2.5	70%	30%	0	100%
3	3.1	90%	10%	60%	40%
	3.2	50%	50%	40%	60%
	3.3	90%	10%	40%	60%
	3.4	90%	10%	40%	60%
	3.5	70%	30%	20%	80%
	3.6	70%	30%	60%	40%
	3.7	50%	50%	20%	80%
	4.1	100%	0	20%	80%

4	4.2	100%	0	20%	80%
	4.3	100%	0	20%	80%
	4.4	50%	50%	0	100%
	4.5	40%	60%	0	100%
	4.6	50%	50%	0	100%
	4.7	40%	60%	0	100%
	4.8	40%	60%	0	100%
5	5.1	100%	0	20	80%
	5.2	90%	10%	0	100%
	5.3	90%	10%	0	100%
	5.4	90%	10%	40%	60%
6	6.1	30%	70%	100%	0

Reporting by global companies for all KPAs was generally better than for South African cement companies. Global companies generally had more than 50% of the companies reporting on the all the KPAs except for Sustainable Supply Chain Management. Emissions monitoring (KPA 5) had a 100% frequency for global cement companies only for NOx, SOx and dust disclosure KPIs however it had a low frequency for the remaining KPI on targets and clinker production.

As done for research question 1 the context and depth of disclosure of the KPIs was reviewed using content analysis.

KPA 1: CO_2 and Climate Protection

As indicated in results for Research Question 1 only PPC reported on its emissions and had emission targets on which to respond as a baseline. PPC reported 838CO_2/tonne of cement, a 3.5% improvement from its 2010 baseline. PPC also provides carbon emissions figures from 2010-2014 from this it can be inferred that PPC aims to provide a quantitative performance reporting on its carbon dioxide emissions. In contrast, all global companies reported on their CO_2 emissions; however, Votorantim did not disclose its emission targets and report against this as a baseline. All the global companies provide

quantitative metrics for carbon dioxide emissions in line with the CSI Reporting Framework.

All the global companies with the exception of Votorantim have set carbon reduction values that they have to achieve by 2020 set from 1990 baseline. In so doing, this allows for the evaluation of opportunities to reduce carbon footprint and defining of goals for carbon reduction. Most of the global companies have achieved more than twenty percent reduction in carbon emissions because of this in contrast with PPC that has achieved 3.5% since 2010. In addition to this, most global companies report on carbon emissions for whole production lifecycle (asphalt, lime, concrete) this implies carbon emission reduction strategies are set up to encourage reduction in carbon footprint.

KPA 2: Responsible use of fuels and raw materials

Responsible use of fuels and raw material is one of the least reported areas by global cement companies. This is similar to South African cement companies that had only 1 out of the 5 KPIs being reported on by one company. As reported earlier Lafarge South Africa similarly reported on KPI 2.2, which showed an improvement in alternative fuel rate of 12.6% up from 6.5% in 2013. The similarity between the two groups is in baseline reporting of alternative fuel disclosures to show improvement. Within the group Cemex, CRH, Heidelberg and Lafarge did not disclose on heat consumption of clinker production. In sharp contrast, the remaining six reported on this and made a comparative assessment with previous years. This emphasises the importance within the companies of efficiency energy use. Important to note is Cimpor behaved similar to Afrisam, PPC, Sephaku and NPC Cimpor as it did not disclose on any of the KPIs.

- **KPA 3: Employee health and category**

Cimpor again behaved similarly to Afrisam and NPC Cimpor, as it did not report at all on any of the KPIs. In sharp contrast, Sephaku, Cemex, Lafarge Group and Taiheiyo reported on the KPIs. It can be surmised that Sephaku, though a new entrant into the cement industry, places similar priority to safety and health that pioneer companies do. Lafarge South Africa and PPC reported along the same lines with global companies as it

used baseline metric reporting for performance comparison. In addition, Lafarge South Africa is the only company in the group of South African companies to report on KPI 3.7 (lost time injury per million man-hours). It can be inferred that Lafarge South Africa draws some of its reporting standards from its parent company Lafarge Group.

KPA 4: Emissions monitoring and reduction

Emissions monitoring and reduction is one of least reported areas by South African companies. PPC is the only South African company to provide information on emissions monitoring and reduction. PPC however only reported on KPIs 4.1-4.3, which quantifies the amounts of $N0_x$, SO_x and dust emitted from operations. This is in sharp contrast with global cement companies that had 100% reporting by all companies for KPIs 4.1-4.3. The reporting for this KPI is similar in that it makes a comparison with the years 2012 and 2013. The major difference between the two groups is the absence of the number of kilns in use for reporting for PPC. This would be a useful measure for efficiency of the kilns in terms of the amount of CO_2 per tonne of cement from the kilns.

Five global cement companies (Secil, Cimpor, Heidelberg, Holcim, and Italcelementi) did not report on target emission reductions for SO_x, NO_x and dust similar to PPC. This means that though they are monitoring emissions, they do not have targets for emissions reduction. Mitigation measures and plans will be slowly implemented, as there is no measurement of progress against targets. Similarly there is variation in monitoring of minor and major emissions with only four companies (Secil, Cemex, CRH and Lafarge Group) reporting on them. In addition to these four companies reporting on them they have identified their minor emissions (e.g. mercury) to allow for setting of standards and strategies to reduce their footprint in the cement production process. Furthermore, these companies have developed internal Environmental Management Systems, which ensure they are below regulation limits.

KPA 5: Local impacts on land and communities

KPA 5 is the most reported area by global cement companies with no less than nine companies reporting on all KPIs. In contrast, it is one of the least reported areas by

South African cement companies. Only PPC reports on KPI 5.1 as it has 95% of its quarries with rehabilitation plans in place. There is similarity between the two groups for this KPI as reporting is shown over time to show improvements as rehabilitation plans are a continuous process. Most of the global companies report on areas adjacent to areas of high biodiversity value. In contrast, PPC is typically in areas that are not fertile, and thus biodiversity disruption is not a great risk. In addition to reporting on quarries with rehabilitation plans in place, some companies such as Heidelberg have set targets for quarry rehabilitation to ensure 100% rehabilitation is achieved by 2020. Some companies such as CRH have included the number of communities that have engagement plans in place. This is similar to South African companies such as PPC, Afrisam and NPC Cimpor which work to understand what their local community needs are and aim to provide this.

Though there are no KPIs for water in CSI Reporting Framework, nine global companies report in some form on this. This is in contrast to South African companies in which only PPC and Sephaku reports on water use and management KPI 5.4. As CSI Reporting Framework has not yet put KPIs for water, themes were drawn from the company report and these are presented in this study. PPC reports on annual municipal water usage and provides information for 2014, 2013 and 2012. In the same way, Sephaku also reports on water consumption however, the variation is consumption is calculated per tonne of cement. It can be inferred that Sephaku's KPI is a way of measuring water use efficiency within its kilns rather than using absolute terms as PPC does. Most of the global companies reporting on water publish water consumption by source and not strictly municipal water. In addition to this, some global companies have taken it a step further and report on water conservation strategies such as Cemex, which in 2014 began construction of water recycling and recovery system at its Balcones plant. In addition, Cimpor also uses the WBCSD tool to identify operations located in areas of water stress or scarcity and reports on them also publishes water withdrawal by source not strictly municipal water. Cimpor reports similarly to Sephaku in that reports water used per tonne of clinker meaning reporting is not strictly in absolute terms for risk mitigation.

KPA 6: Sustainable supply chain management

KPA 6 is the least reported area out of all KPAs. South African companies do not provide any information on this, in contrast three global companies report on this area. As CSI Reporting Framework has not yet put KPIs for supply chain management themes were drawn from the company report and these are presented in this study.

Cemex reported on the launch of its program Supplier Sustainability Program a program designed to review procurement and energy spend across the supply chain by 2020. Cemex reports on:

- Progress made in ensuring suppliers meet the company's health and safety standards- Cemex has achieved this with 95% of its suppliers
- Its suppliers have training for staff, contractors and suppliers- Cemex has achieved this with 68% of its suppliers
- Local sourcing of products to improve domestic market of operations- 95% of sourcing was domestic for 2014

Heidelberg in contrast reports on its participation in the working group for CSI Reporting Framework responsible for setting KPIs for supply chain. Lafarge on the other hand is employing the UN Global Compact Principles for supply chain and is currently reporting on the progress made with supply chain assessments. It has a target for 100% assessments by 2020. By 2014, it had completed 25% of assessments up from 10% in 2013.

Conclusion to Research Question 2

The research objective was to assess the variations that exist in reporting between global cement companies and South African cement companies. Global companies have at least three companies reporting on the CSI KPI in contrast to South African cement companies which have some areas not being reported at all by any of the companies. Emissions Monitoring and Reduction KPIs 4.4-4.8 the area with no reporting by South African cement companies also represents the areas with least reporting by global cement companies. This generally means target reduction for NO_x, SO_x and dust and clinker produced with monitoring of minor and major emissions is still in its infancy.

4.5 Results pertaining to research question 3

Research Question 3: How closely do South African cement companies, African cement companies and global cement companies adhere to the Cement Sustainability Initiative Reporting Framework?

Analytical reading was done to review the contents of the sustainability reports. A rating scale of zero and one was used to note the presence or absence of information. In doing so a conclusion could be drawn on how closely the companies adhere to the CSI Reporting Framework. A score of 0 means there is no significant information provided on the KPI, whereas a score of 1 indicates that the report includes the information in some degree either qualitatively or quantitatively. The sum of the scores for each sustainability report was divided by the number of KPIs and expressed as a percentage score. The overall scores for individual companies are shown in the tables to follow. Table 10 shows the KPI score sheet for the South African companies. The new entrant into the cement industry Sephaku Cement had the highest score of 48.1% while the lowest score of zero was recorded for NPC Cimpor and Afrisam.

Table 10: South African Companies KPI Score sheet

KPA	KPI	NPC Cimpor	PPC	Sephaku	Afrisam	Lafarge SA
1	1.1	0	1	0	0	0
	1.2	0	1	0	0	0
2	2.1	0	0	0	0	0
	2.2	0	0	0	0	1
	2.3	0	0	0	0	0
	2.4	0	0	0	0	1
	2.5	0	0	0	0	0
3	3.1	0	1	1	0	1
	3.2	0	1	1	0	0
	3.3	0	0	1	0	1
	3.4	0	0	1	0	1
	3.5	0	0	1	0	1
	3.6	0	1	1	0	1
	3.7	0	0	1	0	1

4	4.1	0	1	1	0	0
	4.2	0	1	1	0	0
	4.3	0	1	1	0	0
	4.4	0	0	1	0	0
	4.5	0	0	0	0	0
	4.6	0	0	1	0	0
	4.7	0	0	0	0	0
	4.8	0	0	0	0	0
5	5.1	0	1	0	0	0
	5.2	0	0	0	0	0
	5.3	0	0	0	0	0
	5.4	0	1	1	0	0
6	6.1	0	0	0	0	0
SUBTOTAL		0	10	13	0	8
% SCORE		**0**	**37%**	**48.1%**	**0**	**29.6%**
AVG SCORE				**22.9%**		

Table 11 shows the KPI score sheet for African companies. Lafarge Africa had the highest score of 22.2% while the lowest score of zero was recorded for Dangote and Ghacem. The highest score of 22.2% was lower than the non-zero scores for South African cement companies.

Table 11: African Companies KPI Score sheet

KPA	KPI	AshakaCem Plc	Dangote	Lafarge Africa	Bamburi	Ghacem
1	1.1	0	0	0	0	0
	1.2	0	0	0	0	0
2	2.1	0	0	0	0	0
	2.2	0	0	1	0	0
	2.3	0	0	0	0	0
	2.4	0	0	0	0	0
	2.5	0	0	0	0	0
	3.1	1	0	1	1	0
	3.2	0	0	0	0	0

3	3.3	1	0	1	1	0
	3.4	1	0	1	1	0
	3.5	1	0	1	0	0
	3.6	1	0	1	1	0
	3.7	0	0	0	0	0
4	4.1	0	0	0	0	0
	4.2	0	0	0	0	0
	4.3	0	0	0	0	0
	4.4	0	0	0	0	0
	4.5	0	0	0	0	0
	4.6	0	0	0	0	0
	4.7	0	0	0	0	0
	4.8	0	0	0	0	0
5	5.1	0	0	0	0	0
	5.2	0	0	0	0	0
	5.3	0	0	0	0	0
	5.4	0	0	0	0	0
6	6.1	0	0	0	0	0
SUBTOTAL		5	0	6	4	0
% SCORE		**18.5%**	**0**	**22.2%**	**14.8%**	**0**
AVG SCORE				**11.1%**		

Table 12 shows the KPI score sheet for global cement companies. Cemex and Cimpor had the highest score of 96.3% while the lowest score of 63% was recorded for Votorantim. The lowest score of 63% was greater than the highest scores for both the South African cement companies and African cement companies.

Table 12: Global Companies KPI Score sheet

KPA	KPI	Secil	Cemex	Cimpor	CRH	Heidelberg	Holcim	Italcementi	Lafarge	Taiheiyo	Votorantim
1	1.1	1	1	1	1	1	1	1	1	1	1
	1.2	1	1	1	1	1	1	1	1	1	0
2	2.1	1	0	0	1	0	1	1	0	1	1
	2.2	1	1	0	1	1	1	1	1	1	0
	2.3	0	1	0	1	1	1	1	1	1	0
	2.4	1	1	0	1	1	1	1	1	1	0
	2.5	0	1	0	1	1	1	1	0	1	1
3	3.1	1	1	0	1	1	1	1	1	1	1
	3.2	1	1	0	1	0	0	0	1	1	0
	3.3	1	1	0	1	1	1	1	1	1	1
	3.4	1	1	0	1	1	1	1	1	1	1
	3.5	0	1	0	1	0	1	1	1	1	1
	3.6	0	1	0	1	0	1	1	1	1	1
	3.7	0	1	0	1	1	0	0	1	1	0
4	4.1	1	1	1	1	1	1	1	1	1	1
	4.2	1	1	1	1	1	1	1	1	1	1
	4.3	1	1	1	1	1	1	1	1	1	1
	4.4	0	1	0	1	0	0	0	1	1	1
	4.5	0	1	0	0	0	0	0	1	1	1
	4.6	0	1	0	1	0	0	0	1	1	1
	4.7	1	1	0	1	0	0	0	1	0	0
	4.8	1	1	0	1	0	0	0	1	0	0
5	5.1	1	1	1	1	1	1	1	1	1	1
	5.2	1	1	1	1	1	1	1	1	0	1
	5.3	1	1	1	1	1	0	1	1	1	1
	5.4	1	1	1	1	1	1	1	1	1	0
6	6.1	0	1	0	0	1	0	0	1	0	0
SUBTOTAL		18	26	26	22	21	18	19	25	23	17

% SCORE	**66.7%**	**96.3%**	**96.3%**	**81.5%**	**77.8%**	**66.7%**	**70.4%**	**92.6%**	**85.2%**	**63%**
AVG SCORE				**79.7%**						

The overall score for the three groups was calculated as an average of the number of companies in the group. This was presented as a percentage final score. On completing the assessment, the information was presented in a tabular form.

Table 13 below shows a summary of the results obtained for Research Question 3 regarding how closely South African cement companies, African cement companies and global cement companies adhere to Cement Sustainability Initiative Reporting Framework.

Table 13: KPI Reporting Average Scoring

Category	**Average Score- Adherence to CSI Framework**
South African Companies	22.9%
African Companies	11.1%
Global Companies	79.7%

Global companies had the highest score and from this we can deduce they had most adherences to the CSI reporting framework. South African companies show better adherence to the CSI reporting framework than do African companies.

4.6 Summary of results

Overall, global companies report more on CSI Reporting Framework KPA and KPI compared to South African companies and African companies. This may be attributed to them having been a part of the process of mapping out the KPI and KPA as members of the CSI. An interesting result was that most some of the African cement companies (Lafarge Africa, Lafarge SA, Bamburi and AshakaCem Plc are owned by Lafarge Group and yet their reporting disclosure are different. In the same way Sephaku is majority owned by Dangote however it discloses more than its parent company. Overall it can be

noted that though emissions monitoring has increased in the cement industry disclosures for NO_x, SO_x, dust and minor emissions is still in the infancy stage as shown by the results.

Analysis of results stated in this chapter will be discussed in detail in chapter 5.

CHAPTER 5. DISCUSSION

5.1 Introduction

The purpose of this chapter is to answer the research questions that were posed in Chapter 2. A discussion will be conducted on the results of the content analysis and document review discussed in Chapter 4 with the literature review summarised in Chapter 2 based on the research questions. The intention and objective of this discussion is to understand how South African cement companies reporting practices compare with African cement companies and global cement companies using the Cement Sustainability Initiative Reporting Framework as a benchmark.

For ease of reference, the research questions listed in Chapter 2 are listed below:

Research Question 1:
How do South African companies' reports compare with African cement companies?
Research Question 2:
How do South African companies' reports compare with global cement companies?
Research Question 3:
How closely do South African cement companies, African cement companies and global cement companies adhere to the Cement Sustainability Initiative Reporting Framework?

5.2 Discussion pertaining to research question 1

The objectives of research question 1 are to evaluate the variations that exist in how South African companies report in comparison to African cement companies

As highlighted in Chapter 2 a report is considered a sustainability report if it is made publicly available and contains quantitative and qualitative information on the extent to

which a company succeeds or fails in improving its economic, social and environmental dimensions. A review of the company sustainability reports of the African and South African cement companies showed a variation in the way in which companies report on their successes or failure for the dimensions mentioned above. This is in line with Gray, (2010)who concluded that companies choose elements of sustainability they consider relevant to their own view of sustainability. In addition to this, there are many international standards and guidelines for implementation of sustainability in business as highlighted in the literature review. This means whatever is emphasised and prioritised in the report differs according to the standards applied (Hrebicek et al., 2015).

This is evident in the results from this study. Reporting was generally poor for both groups however, employee safety and health was a high priority for both. This is likely due to the safety and health legislation implementation by most governments. This is in line with a study by Sonnenberg and Hamann (2006) in which they concluded an emphasis is placed on reporting mandatory or recommended issues. Hence, as legally issues of occupational health and safety require objective and quantitative disclosure most of the companies reported on this. Dangote's report offered a more futuristic reporting on employee safety and health. In their report their touched on commitment to safety and health with no specific metrics reported on. This can be construed to be a more tick box approach to reporting with no accountability on the extent of failure or success. In addition, it shows a commitment to sustainability principles without making tangible commitments towards sustainability (Gray, 2010).

Ashakacem reported qualitatively with no quantitative figures to substantiate their claims. The report mentioned record lows and incidents that resulted in lost time incidents but no figures were provided. Both Ashakacem and Dangote thus reported more on what Morgan, Ryu and Mirvis (2009) termed a structural orientation towards sustainability. Structural orientation in contrast to measures for actual sustainability performance is not a measure of performance and not a guarantee of performance; it is

rather a mention of arrangements that are destined to attain sustainability (Schneider & Meins, 2012).

From the results presented on carbon emission and fuel efficiency there, was minimal disclosure with only PPC disclosing on its carbon emissions and setting emissions standards. Only Bamburi and Lafarge South Africa reported on energy efficiency. The minimal reporting on these KPI especially for the Nigerian companies (Lafarge Africa, AshakaCem and Dangote could be as a result of poor enforcement of legislation within then country. Nigeria as an oil rich country has strict legislation on Environmental Management however it faces poor enforcement of existing laws hence companies can take advantage (Uwalomwa, 2011). The South African scenario is somewhat different as companies like NPC Cimpor and Afrisam are not listed on the JSE they are not legally required to produce public annual reports (Sonnenberg & Hamann, 2006).

The areas reported on by PPC contained comprehensive information with clear and quantitative metrics. PPC typically showed results for previous years in order for readers to track improvement or lack of improvement in sustainability initiatives. This is a confirmation of a previous research done by Sonnenberg and Hamann in which they concluded some of the leading companies on the JSE have moved towards a systematic reporting approach with quantitative and comparable data (2006).

5.3 Discussion pertaining to research question 2

The objectives of research question 2 are to evaluate the variations that exist in how South African companies report in comparison to global cement companies

KPAs Reporting was generally better for global companies than South African cement companies were. In addition, the depth and relevance of disclosure is better for global cement companies. This variation in reporting could be attributed to the background of

critique on negative social and environmental implications of globalisation. Kolk (2010) asserts that multinational companies have been more active in reporting to prevent the externalities associated with international trade and production. Global cement companies are more visible and influential than South African cement companies thus; they are singled out on a global scale to show evidence of corporate governance and sustainability thus they have to show commitment to improving sustainability performance. Kolk (2010) also asserts that standardisation in reporting is likely to improve the quality and quantity in reporting. The results for research question 2 are in support of this. Global cement companies are following the standardised CSI Reporting Framework and thus their disclosures are greater and more in depth. In contrast, South African companies are following an internal values approach and thus disclosure is limited to personal areas of priority.

Global companies generally had more than 50% of the companies reporting on the all the KPAs except for Sustainable Supply Chain Management. Emissions monitoring (KPA 5) had a 100% frequency for global cement companies only for NOx, SOx and dust disclosure KPIs. However, it had a low frequency for the remaining KPIs on targets and clinker production. As mentioned in the literature review the cement industry is rated as one of the largest carbon emitters in the world accounting for about 5% of atmospheric carbon dioxide emissions (Mikulc̆ic, Vujanovic´, & Duic, 2013). This could account for the high incidence of reporting for NOx, SOx and dust disclosure KPIs. The differences in reporting shown by the results can be attributed to social values and understanding of sustainability. Van Zyl (2013) points out that sustainability is a subjective and perception based construct informed by social values.

The sustainability process typically involves four processes:

- Review and identification of material sustainability issues and risks
- Create action plan-adapt and integrate sustainability and core business strategy
- Implementation and monitoring-tracking of key performance indicators
- Preparation of report

(Van Zyl, 2013)

As members of CSI, the global companies have benefitted from the consultative processes that led to establishment of guidelines, key performance indicators and measurable targets for sustainability (WBCSD, 2012). This has aided their reporting process and ensured the reporting is insightful, credible and relevant. As South African companies did not report on most of the information on KPAs it can be construed that data requirements and performance measures were not set before report preparation. Instead reporting was done based on the collection of data points that the company deemed to be important for disclosure purposes.

Sustainability reporting has its roots from Corporate Social Responsibility (CSR) a voluntary exercise adopted by companies in communities they operate (Perez & Sanchez, 2009). Reviewing the data beyond the scope of the CSI Reporting Framework showed the South African companies tend to focus on Corporate Social Responsibility initiatives as a well to address social and environmental needs in the communities. This is in line with Sonnenberg and Haman (2006) who concluded that sustainability reporting by some companies is predominantly focused on corporate social investment and philanthropy. Hence, South African companies as an emerging economy were previously focused CSR and are now starting to focus on issues of biodiversity conservation and management hence the poor reporting. In so doing, the information provided does give the reader insight into the company's overall performance. Such is the case with companies such as Afrisam and NPC Cimpor. In addition, these companies are not listed on JSE Exchange hence they are not mandated to provide sustainability reports.

5.4 Discussion pertaining to research question 3

Global companies adhered most to the CSI Reporting Framework with a score of 79.7% while South African companies came second with a score of 22.9% and lastly African companies with a score of 11.1%. The difference in adherence to reporting can be because of differences in economies. Sustainability trends tend to be different in emerging markets compared to developed markets. This is because mature markets with low overall growth come under increasing scrutiny on their environmental and social impacts. In contrast, emerging markets with rapid growth and increased demand for cement are more likely driven by voluntary disclosure and competitive access to resource (WBCSD, 2012). In addition to this emerging markets are also faced with difficulties in reconciling environment and sustainability issues with the challenges of poverty eradication, unemployment and service delivery while ensure growth in the economy (Robb, Tyler, & Cloete, 2010). This makes policy and institutional changes with environmental issues such as emissions monitoring challenging (Van Zyl, 2013).

As highlighted earlier the significance of a sustainability report is set by the scope that is declared by the company. This is enshrined in how a company defines sustainability and how it views accountability (Van Zyl, 2013). As is the case with global cement companies, they are largely accountable to the CSI as signatories of the CSI Charter and the legislations of the countries they operate in. Most of their operations are largely in the mature economies that are increasingly under scrutiny hence the reporting and level of disclosure would be higher. This is further substantiated by the fact that some of these companies e.g. Lafarge Group and Cimpor have ownership of cement companies in emerging economies such as Lafarge Africa, AshakaCem, Bamburi, Lafarge SA and NPC Cimpor however their level of reporting is far less. However, because of policy constraints highlighted earlier and a lack of cohesive legislation and monitoring accountability then comes at the company's discretion.

It should be noted that the CSI guidelines are generic to all the global cement companies and do not take into account country specific issues. The African and South African cement companies could be reporting on areas that are more specific to their national agendas and would thus have fewer adherences to the CSI Reporting Framework.

5.5 Conclusion

In conclusion variations do exist in the reporting of South African companies, African companies and global companies. Global companies tend to disclose and adhere more to the CSI Reporting Framework. This is attributed to them being signatories to the CSI Charter. South African companies show better reporting than African companies with a greater disclosure and adherence to the CSI Reporting Framework.

CHAPTER 6. RECOMMENDATIONS AND CONCLUSION

6.1 Introduction

The purpose of this study was to analyse and compare the sustainability reporting practices of South African cement companies with African cement companies and Global cement industry with the intention of determining the differences and areas of possible improvement.

6.2 Conclusion of the study

With the increased focus on sustainability and call for accountability many companies are now reporting on their performance with regards to social, environmental and economic dimensions in addition to providing a financial report. As emphasised in this paper this reporting needs to be relevant, credible and rich in depth in order to offer meaningful value to stakeholders and companies. This is especially important for companies in order to mitigate risk through sustainability strategies and mitigation plans. The study found that variations do exist in how the three groups (South African companies, African companies and global companies) report on sustainability. South African and African companies offered minimal disclosure with very little metrics and performance targets for reporting while global cement companies had metrics and performance targets for reporting. In addition, global cement companies had highest adherence to CSI Reporting Framework followed by South African companies and lastly African cement companies.

6.3 Recommendations

A characteristic found in this research is that each company adopts different approaches for information disclosure. This is more so for South African and African

cement companies who are not adopters of the CSI Reporting Framework. This suggests sustainability reporting is a unique process for each company largely dependent on the resource base, technical expertise and stakeholders. On the strength of the results of the study, it is recommended that African companies and South African companies could further improve the reporting process through benchmarking with competitors in the industry and their global parent companies and review of literature on sustainability reporting. This is largely important in adoption of minimal standards for reporting and setting performance targets for evaluation. An adoption of minimal standards for reporting will also increase credibility, reliability and depth of sustainability reporting thus adding value to stakeholders.

Currently CSI members agree to conduct third party assurance audits on their publicly reported KPIs in the sustainability report. However as revealed by the study not all companies are disclosing information as required by the CSI charter hence CSI needs to conduct the third party assurance on its members to ensure adherence. In addition, this assists in preventing a tick box approach by companies, as they can be held accountable on lack of improvement and outright failure.

6.4 Suggestions for further research

The study was undertaken prior to the publishing of CSI Reporting Framework water KPIs and sustainable supply chain KPIs and it is recommended that an analysis similar to the one undertaken here should be performed once these are published. This should be done to assess the relevance and depth of disclosure by the companies on the aforementioned KPIs. For this study, the global companies selected are core members for the CSI. It is also recommended that future research focus on the sustainability reporting of CSI participating members, smaller African cement companies in terms of production capacity and non-CSI global cement companies.

In addition, further research can focus on third party assurance of sustainability reports in the cement industry to understand the credibility and reliability of information disclosed in the sustainability reports.

CHAPTER 7. REFERENCES

Barkemeyer, R., Holt, D., Preuss, L., & Tsang, S. (2011). What Happened to the 'Development' in Sustainable Development? Business Guidelines Two Decades After Brundtland. *Sustainable Development, 22*(1), 15-32.

Bluhm, D. J., Harman, W., Lee, T. W., & Mitchell, T. R. (2011). Qualitative Research in Management: A Decade of Progress. *Journal of Management Studies, 48*(1), 198-201.

Bourdeau, L. (1999). Sustainable development and the future of construction: a comparison of various countries. *Building Research & Information, 27*(6), 354-366.

Brorson, T., & Larsson, G. (1999). *Environmental Management* (Vol. 3rd Edition). Stockholm, Sweden: EMS AB.

Brown, H. S., De Jong, M., & Lessindrenska, T. (2009). The rise of the Global Reporting Initiative: a case of institutional entrepreneurship. *Environmental Politics, 18*(2), 182-200.

CEMBUREAU. (2014). *World cement production 2014, by region and main countries, %.* Retrieved May 31, 2016, from CEMBUREAU: http://www.cembureau.be/sites/default/files/World%20Cement%20production_2.pdf

Cohen, Louis, Manion, & Morrison. (2000). *Research Methods in Education.* London.

Cole. (2006). Qualitative research: a challenging paradigm for infection control. *British Journal of Infection Control, 7*, 25-29.

Cooper, S., & Owen, D. L. (2007). Corporate social reporting and stakeholder accountability: The missing link. *Accounting, Organisations and Society, 32*, 649–667.

Cuthill, M. (2010). Strengthening the 'Social' in Sustainable Development: Developing a Conceptual Framework for Social Sustainability in a Rapid Urban Growth Region in Australia. *Sustainable Development, 18*, 362-373.

Dash, N. K. (1993). Research Paradigms in Education: Towards a Resolution. *Journal of Indian Education, 19*(2), 1-6.

Daub, C. H. (2003). *Assessing the quality of sustainability reporting: An alternative Methodological Approach .* Switzerland: University OAS North-Western Switzerland Aargau: Institute for Sustainable Management.

Daub, C. H. (2007). Assessing the quality of sustainability reporting: an alternative methodological approach. *Journal of Cleaner Production, 15*, 75-85.

DeSimone, L. D., & Popoff, F. (2000). *Eco-efficiency. The Business Link to Sustainable Development.* Boston: MIT Press.

Dillenburg, S., Greene, T., & Erekson, H. (2003). Approaching Socially Responsible Investment with a Comprehensive Ratings Scheme: Total Social Impact. *Journal of Business Ethics, 43*(3), 167-177.

Ecobank. (2014, July 24). *Middle Africa's cement sector: explosive growth.* Retrieved June 19, 2015, from Ecobank: www.ecobank.com/upload/20140724011129637822cPHHGNvnw6.pdf

Edwards, P. (2014, December 11). *The cement industries of Southern Africa*. Retrieved June 21, 2015, from Global Cement: http://www.globalcement.com/magazine/articles/894-the-cement-industries-of-southern-africa

Frost, & Sullivan. (2013). *Strategic Outlook of sub-Saharan Africa's cement industry.* Cape Town: Frost and Sullivan.

Gray, R. (2010). Is accounting for sustainability actually accounting for sustainability...and how would we know? An exploration of narratives of organisations and the planet. *Accounting, Organisations and Society, 35*, 47-62.

Gray, R., & Bebbington, J. (2005). *Corporate Sustainability: Accountability and the Pursuit of the Impossible Dream.* Scotland: Centre for Social and Environmental Accounting Research.

GRI. (2006). *Sustainability Reporting Guidelines Version 3.0 (G3).* Amsterdam: Global Reporting Initiative.

GRI. (2006). *Sustainability Reporting Guidenlines.* Retrieved from GRI: https://www.globalreporting.org/resourcelibrary/G3-Guidelines-Incl-Technical-Protocol.pdf

GRI. (2013). *G4 Sustainability Reporting Guidelines.* Amsterdam: Global Reporting Initiative.

GRI. (2015). *Reporting Framework Overview*. Retrieved February 15, 2015, from GRI: https://www.globalreporting.org/reporting/reporting-framework-overview/Pages/default.aspx

groundWork. (2006). *Analysis and write up of burning alternative fuels in cement kilns.* groundWork: Pietermaritzburg.

Guthrie, J., Petty, R., & Yongvanich, K. (2004). Using content analysis as a research method to inquire into intellectual capital reporting. *Journal of Intellectual Capital, 5*(2), 282-293.

Heyns, R. (2013). *Kagiso Asset Management Quartely: Cement in South Africa.* Cape Town: Kagiso Asset Management.

Hrebicek, J., Faldik, O., Kasem, E., & Trenz, O. (2015). Determinants of Sustainability Reporting in Food and Agriultural Sectors. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 63*(2), 539-552.

Hussey, D. M., Kirsop, P. L., & Meissen, R. E. (2001). Global reporting initiative guidelines: an evaluation of sustainable development metrics for industry. *Environmental Quality Management, 11*(1), 1-20.

ISEA. (1999). *AA1000-Standards, Guidelines and Professional Qualification.* London\: Institute of Social and Ethical Accountability.

JSE. (2015). *The JSE Socially Responsible Investment (SRI) Index promotes sustainable and transparent business practices*. Retrieved February 15, 2015, from JSE: https://www.jse.co.za/services/market-data/indices/socially-responsible-investment-index

Kolk, A. (2010). Trajectories of sustainability reporting by MNCs. *Journal of World Business, 45*, 367-374.

Lamas, W. D., Palau, J. C., & Carmago, J. R. (2013). Waste materials co-processing in cement industry: Ecological efficiency. *Renewable and Sustainable Energy Reviews*, 200-207.

Leipziger, D. (2003). *The Corporate Responsibility: Code book.* London: GreenLeaf Publishing.

Lozano, R. (2013). Sustainability inter-linkages in reporting vindicated: a study of European companies. *Journal of Cleaner Production, 51*, 57-65.

Lozano, R., & Huisingh, D. (2011). Inter-linking issues and dimensions in sustainability reporting. *Journal of Cleaner Production, 19*, 99-107.

Luken, R., & Stares, R. (2005). Small business responsibility in developing countries: a threat or an opportunity? *Business Strategy and the Environment, 14*(1), 38-53.

Madlool, N. A., Saidur, R., Hossain, M. S., & Rahim, N. A. (2011). A critical review on energy use and savings in the cement industries. *Renewable and Sustainable Energy Reviews, 15*, 2042-2060.

Madlool, N. A., Saidur, R., Hossain, M. S., & Rahim, N. A. (2011). A critical review on energy use and savings in the cement industries. *Renewable and Sustainable Energy Reviews, 15*, 2042-2060.

Mapiravana, J. (2014). *Building Materials for a sustainable future – cement.* Retrieved February 15, 2015, from CSIR: http://researchspace.csir.co.za/dspace/bitstream/10204/7578/1/Mapiravana_2014.pdf

Marx, B., & Van Dyk, V. (2011). Sustainability reporting and assurance: An analysis of assurance practices in South Africa. *Meditari Accountancy Research, 19*(1/2), 39-55.

Mikulc̆ic, H., Vujanovic´, M., & Duic, N. (2013). Reducing the CO2 emissions in Croatian cement industry. *Journal of Applied Energy*, 41-48.

Milne, M. J., & Adler, R. W. (1999). Exploring the reliability of social and environmental disclosures content analysis. *Accounting, Auditing & Accountability Journal, 12*(2), 237-256.

Mofatt, I. (2000). Ecological Footprint and Sustainable Development. *Ecological Economics, 32*, 359-362.

Morgan, G., Ryu, K., & Mirvis, P. (2009). Leading Corporate Citizenship: Governance, Structure, Systems. *Corporate Governance, 9*(1), 39-49.

Morhardt, J. E., Baird, S., & Freeman, K. (2002). Scoring corporate environmental and sustainability reports using GRI 2000, ISO 14031 and other criteria. *Corporate Social Responsibility and Environmental Management, 9*, 215-233.

Neuman, W. L. (2006). *Qualitative and Quantitative Approaches.* Pearson Education.

OECD. (2007). *OECD Glossary of statistical terms.* Retrieved May 31, 2016, from Europa: http://ec.europa.eu/eurostat/ramon/coded_files/OECD_glossary_stat_terms.pdf

Perez, F., & Sanchez, E. L. (2009). Assessing the Evolution of Sustainability Reporting in the Mining Sector. *Environmental Management, 43*(6), 949-961.

Robb, G., Tyler, E., & Cloete, B. (2010). Carbon trading or carbon tax? Weighing up South Africa's mitigation options. In H. Winkler, H. Marquard, & M. Jooste, *Putting a price on carbon: Economic instruments to mitigate climate change in South Africa and other developing countries. Proceedings of the conference held at the University of Cape Town 23-24 March 2010* (pp. 196-213). Cape Town: Energy and Research Centre, University of Cape Town.

Robert, K. H. (2000). Tools and concepts for sustainable development, how do they relate to a general framework for sustainable development, and to each other? *Journal of Cleaner Production, 8*, 243-254.

SADC. (2015). *SADC*. Retrieved February 15, 2015, from The SADC-Regional Infrastructure Development Master Plan: http://www.ridmp-gis.org/

SAI. (2015). *SA 8000 Standards and Documents*. Retrieved June 22, 2015, from Social Accountability International: http://www.sa-intl.org/index.cfm?fuseaction=Page.ViewPage&pageId=937

Schneider, A., & Meins, E. (2012). Two Dimensions of Corporate Sustainability Assessment: Towards a Comprehensive Framework. *Business Strategy and the Environment, 21*(4), 211-222.

Sephaku Cement. (2015, June 24). *About us*. Retrieved June 27, 2015, from Sephaku Cement: http://www.sephakucement.co.za/about-us/about-us#1

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22*, 63-75.

Sonnenberg, D., & Hamann, R. (2006). The JSE socially responsible investment index and the state of sustainability reporting in South Africa. *Development Southern Africa, 23*(2), 305-320.

Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision, 39*(7), 551-556.

Taylor, B., Kermode, S., & Roberts, K. (2007). *Research in Nursing and Health Care: Evidence for Practice.* Sydney: Thomson.

The European Cement Association. (2014). *Cement and Concrete: Key facts and figures*. Retrieved June 20, 2015, from The European Cement Association: http://www.cembureau.be/about-cement/key-facts-figures

The Freedonia Group. (2010). *World Cement: Industry Forecasts for 2013 and 2018.* Ohio: The Freedonia Group.

Tongco, M. D. (2007). Purposive Sampling as a Tool for Informant Selection. *A Journal of Plants, People and Applied Research*, 147-158.

Unerman, J. (2000). Methodological issues - Reflections on quantification in corporate social reporting content analysis. *Accounting, Auditing & Accountability Journal, 13*(5), 667-680.

Uwalomwa, U. (2011). *Corporate Environmental Reporting Practices: A comparative study of Nigerian and South African Firms.* Ogun State: Covenant University.

Valderama, C., Granados, R., Cortina, J. L., Gasol, C. M., Guillem, M., & Josa, A. (2012). Implementation of best available techniques in cement manufacturing: a life cycle assessment study. *Journal of Cleaner Production, 25*, 60-67.

Van Zyl, A. S. (2013). Sustainability And Integrated Reporting In The South African Corporate Sector. *International Business & Economics Research Journal, 12*(8), 903-926.

WBCSD. (2002). *Towards a sustainable cement industry: Summary Report.* Geneva: WBCSD.

WBCSD. (2012). *CSI Progress Report.* Geneva: WBCSD.

WBCSD. (2015). *About CSI*. Retrieved June 19, 2015, from WBCSD: Cement Sustainability Initiative: http://www.wbcsdcement.org/index.php/en/about-csi

Willis, A. C. (2003). The Role of the Global Reporting Initiative's Sustainability Reporting Guidelines in the Social Screening of Investments. *Journal of Business Ethics, 43*(3), 233-237.

Wilmshurst, T. D., & Frost, G. R. (2000). Corporate environmental reporting: A test of legitimacy theory. *Accounting, Auditing & Accountability Journal, 13*(11), 10-26.

Zikmund, W. G. (2003). *Business Research Methods.* Chicago: Dryden Press.