An analysis of water-related sustainability disclosure of Socially Responsible Investment-indexed JSE-listed companies

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It all starts here ™

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REMARKS

The reader is reminded of the following:

- This dissertation is presented in article format and in accordance with the policies of the North-West University's Faculty of Economic and Management Sciences' WorkWell Research Unit and consists of two research articles.
- Article 1 was submitted to the Southern Africa Business Review (refer to Annexure 1). The article was formatted according to the journal's author guidelines (refer Annexure 2).

ABSTRACT

TITLE: An analysis of water-related sustainability disclosure of Socially Responsible Investment-indexed JSE-listed companies

KEYWORDS: Integrated reporting, water, sustainability reporting, sustainable disclosure, global reporting initiative (GRI), SRI index, key performance indicators.

South Africa is facing a water crisis in terms of the scarcity and the quality of its water. Considering this water-constrained future it is evident that companies in South Africa should pay attention to the pristine management of this scarce resource. The purpose of this study is to evaluate the reporting and disclosure requirements of water of Socially Responsible Investment-indexed (SRI) JSE-listed companies. The disclosure requirements of the integrated report, King III, the Global Reporting Initiative and the Association of Chartered Certified Accountants, provided the theoretical background to develop a water disclosure index. Content analysis was used as the research method to analyse the integrated and sustainability reports of a selected group of SRI indexed JSE-listed companies. The results were analysed in terms of the disclosure on items such as materiality, governance, corporate policies, environmental management systems, risk assessments and key performance indicators. The findings of the study include that most of the companies illustrate commitment towards water stewardship by reporting on water-related aspects. The mining sector rated the highest on disclosure and reporting of water-related aspects by providing the most detailed descriptions by indicating that they clearly understand the context of their operations and the associated risks. In the process of analysing the integrated and sustainability reports with specific reference to the key performance indicators, it was evident that companies lack comparability and consistency in their disclosure. It is recommended that companies improve the relevance, depth and clarity of their disclosure on water.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF GRAPHS

CHAPTER 1

1 INTRODUCTION

1.1 BACKGROUND

The relevance and reliability of annual financial reports as a basis for making decisions about an organisation, has been questioned by stakeholders. Stakeholders are unable to form a comprehensive picture of an organisation's performance and its ability to create and sustain value (IRCSA, 2011:1). Sustainability disclosure has become a necessary tool for an investor since it directly drives an organisation's value creation process. Sustainability reporting or triple bottom line reporting refers to a tripartite reporting framework that highlights the economic, environmental and social performance of an organisation (Choudhuri & Chakraborty, 2009:48). Since the turn of the century there has been a drive to move away from stand-alone financial and sustainability reports towards a more integrated approach. The first attempt in South Africa to enforce integrated reporting across all listed companies was introduced in 2010 by the Johannesburg Stock Exchange JSE Limited (JSE), which mandated integrated reporting (IRCSA, 2011:7). The listing requirements of the JSE compel compliance via the King III Report and therefore companies are now obliged to produce an integrated report (IRCSA, 2011:7).

In essence, an integrated report is a compilation of the conventional financial statements and the so-called sustainability report, with the aim of providing the stakeholders of the company with a complete overview of the company's historical operations and future prospects. It also integrates and links information about strategy, risks and opportunities and relates these to the social, environmental, economic and financial issues (IIRC, 2011:2).

In the 1990s some companies began to publish sustainability reports and as this was a voluntary action, these reports lacked reporting standards. The lack of standards led to the foundation of the Global Reporting Initiative (GRI), a non-profit organisation, in 1997 (Musikanski, 2012). The objective of the GRI was to provide guidelines for sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Since 2002, sustainability reporting has become a widely accepted practice and South Africa can be regarded an emerging market leader in

the field (IODSA, 2009:13). This is partially due to King II and other initiatives such as the JSE's Socially Responsible Investment (SRI) index. The SRI index is part of the JSE and is an index that measures companies' policies, performance and reporting in relation to the three pillars of the triple bottom line (environmental, economic and social sustainability), as well as corporate governance practice (JSE, 2013).

In 1994 the first King Report was published with the aim of promoting the highest standards of corporate governance in South Africa. This was followed by King II in 2002 which already started to move away from only reporting to shareholders and embraced the triple bottom line approach (IODSA, 2002:2). The King Report on Governance for South Africa 2009 (King III) defines integrated reporting as a holistic and integrated presentation of a company's performance of both its finance and sustainability. King III supports the notion of sustainability, but makes the case that it should be part of integrated reporting (IODSA, 2009:13).

The Integrated Reporting Committee of South Africa (IRCSA, 2011:7) suggested eight elements to be part of the integrated report, namely:

1. Report Profile;
2. Organisational overview, business model, and governance structure;
3. Understanding the operating context;
4. Strategic objectives and competencies;
5. Account of the organisations performance;
6. Future performance objectives;
7. Remuneration policies; and
8. Analytical commentary.

As part of the second element, “Organisational overview, business model and governance structure” the IIRC identifies six capitals which are in essence the financial and non-financial resources, namely:

- Financial capital;
- Manufactured capital;
- Human capital;
- Intellectual capital;
- Natural capital; and
- Social capital.

The importance of how organisations manage these capitals/resources has an effect on the long-term viability of organisations (Deloitte, 2012:16). One of the six resources mentioned above refers to the resource of natural capital and is important in the context of this study. These natural capital resources include water, land, minerals and forests as well as information regarding biodiversity and eco-system health. How companies report on issues specifically related to this part, namely water and water management, has led to the investigation of this problem.

1.2 PROBLEM STATEMENT

It is projected that South Africa could deplete its water resources by 2025, and in Gauteng, South Africa’s economic hub, it could be as early as 2015 (BDlive, 2013:1). On top of the scarcity of water there is a growing concern about the effect of climate change on agricultural production. South Africa receives half the average global annual rainfall and 98% of its water systems are in a crisis mode (WWF-SA, 2013). Furthermore, South Africa has no surplus water and all future development will be constrained by this fact. Farmers will have to double their use of water by 2050 if they are to meet growing food demands. To avoid a crisis, water supply needs to be enhanced and water use efficiency increased. Furthermore, the population is growing and getting wealthier and that adds to the problem of food security (WWF-SA, 2013).

The Carbon Disclosure Project (CDP) is an independent non-profit organisation holding the largest database of primary corporate climate change information in the

world. In 2013, the GRI and CDP signed an agreement with the aim of aligning the areas of their reporting frameworks (GRI, 2014). According to Simpson, the Chief Executive Officer of the Carbon Disclosure Project, there is a need for meaningful and systematic reporting on water globally. This has initiated research in terms of corporate water disclosure guidelines which was launched in 2010. As part of the Global 500, 56 companies from the 100 largest companies listed on the JSE were invited to participate in the research (CDP, 2012:2).

Another attempt in order to support reporting guidelines was published by the GRI in the latest reporting guidelines, the G4 guidelines. The performance indicators related to water aspects in the GRI are the following: i) EN 8: Total water withdrawal by source, ii) EN 9: Water sources significantly affected by withdrawal of water, and iii) EN 10: Percentage and total volume of water recycled and reused (GRI, 2011:14-16).

Taking cognisance of the scenario regarding the scarcity of water, there is a need for companies to not only report in their integrated reports about the environment, but specifically on their disclosure and management of water. As listed companies must comply and publish integrated reports, the following questions can be raised: Are companies currently complying with the disclosure on the use and management of water? If so, which performance measurement systems are they utilising to report on? And which key performance indicators are they using to report?

To conclude, if companies are required to report about the environment and specifically about water, then water-related issues require further investigation. Once water-related aspects are monitored and managed, the reporting thereof can improve. Companies generally make use of performance measurement systems to measure financial performance, but to measure non-financial aspects more contemporary approaches are required. The measurement of water is therefore important and the use of key performance indicators (KPIs) should be applicable.

1.3 OBJECTIVES

1.3.1 Primary objective

The primary objective of this study is to analyse and compare water-related reporting and disclosure requirements of SRI-indexed JSE-listed companies.

1.3.2 Secondary objectives

In order to reach the primary objective, the following secondary objectives are set:

- To conceptualise from literature the practise of integrated and sustainability reporting, including the need for reporting on water management;
- To conceptualise from literature the reporting and disclosure requirements of water;
- To identify whether companies are complying with the reporting and disclosure requirements of water in the narrative part;
- To identify and compare the required key performance measurement systems for the reporting and management of water; and to
- Identify and compare the required key performance indicators for the reporting and management of water.

1.4 RESEARCH METHOD

Both a literature review and an empirical analysis will be conducted. In order to perform the empirical study the research method that will be used as a data collection technique is content analysis.

1.4.1 Literature review

In the literature review the latest relevant journal articles, internet articles, dissertations, government publications, text books and discussion papers will be used in order to gain a thorough understanding of the theory.

1.4.2 Empirical research

The population identified for the study includes the companies listed on the JSE's SRI Index. In 2013, this index consisted of 72 of the JSE's largest listed companies.

According to the background and criteria of the SRI index they identify three broad categories that should be reported on, namely environment, society and governance and related sustainability concerns. In the environmental category the SRI index classifies companies as a high, medium or low impact company (SRI, 2014:4). By means of quota sampling, this study selects companies under the high impact category.

These companies' latest annual report (their integrated reports) will be analysed, including information that does not form part of the annual report, such as sustainability or environmental reports. A water disclosure index and water KPI framework will be developed from the literature study to assist in the gathering of data during the empirical study.

1.5 OVERVIEW

The study follows the article route dissertation format and is divided into six chapters:

Chapter 1: Introduction

The first chapter introduced the study and provided the background of sustainability disclosure and the importance of water. The chapter presented the problem statement and highlighted the research objectives set to address the problem statement. The research method to be followed was discussed and finally an overview to the study was provided.

Chapter 2: Research methodology

Chapter two will discuss the research methodology followed to address the set research objectives.

Chapter 3: Sustainability and integrated reporting

In chapter three the theoretical framework that supported the study was presented which includes a literature study on sustainability reporting, integrated reporting, the GRI, and other disclosure requirements.

Chapter 4 (Research article 1): **Evaluating the water-related reporting and disclosure requirements of SRI-indexed JSE-listed companies**

Chapter four is presented in the form of a research article that provides a discussion on sustainability and sustainability disclosure, integrated reporting, the GRI and natural capital accounting. The empirical results of a comparison between the developed water disclosure index is also presented.

Chapter 5 (Research article 2): **Analysis of water resource management disclosures in SRI-indexed JSE-listed companies**

Chapter five is presented in the form of a research article that discusses integrated reporting and performance reporting. The results of the empirical study on the key performance indicators that SRI-indexed companies report on are presented.

Chapter 6: **Conclusions and recommendations**

This chapter concludes the study with a summary of the key research results, conclusions and recommendations based on the research objectives set in the first chapter.

CHAPTER 2

2 RESEARCH METHODOLOGY

2.1 INTRODUCTION

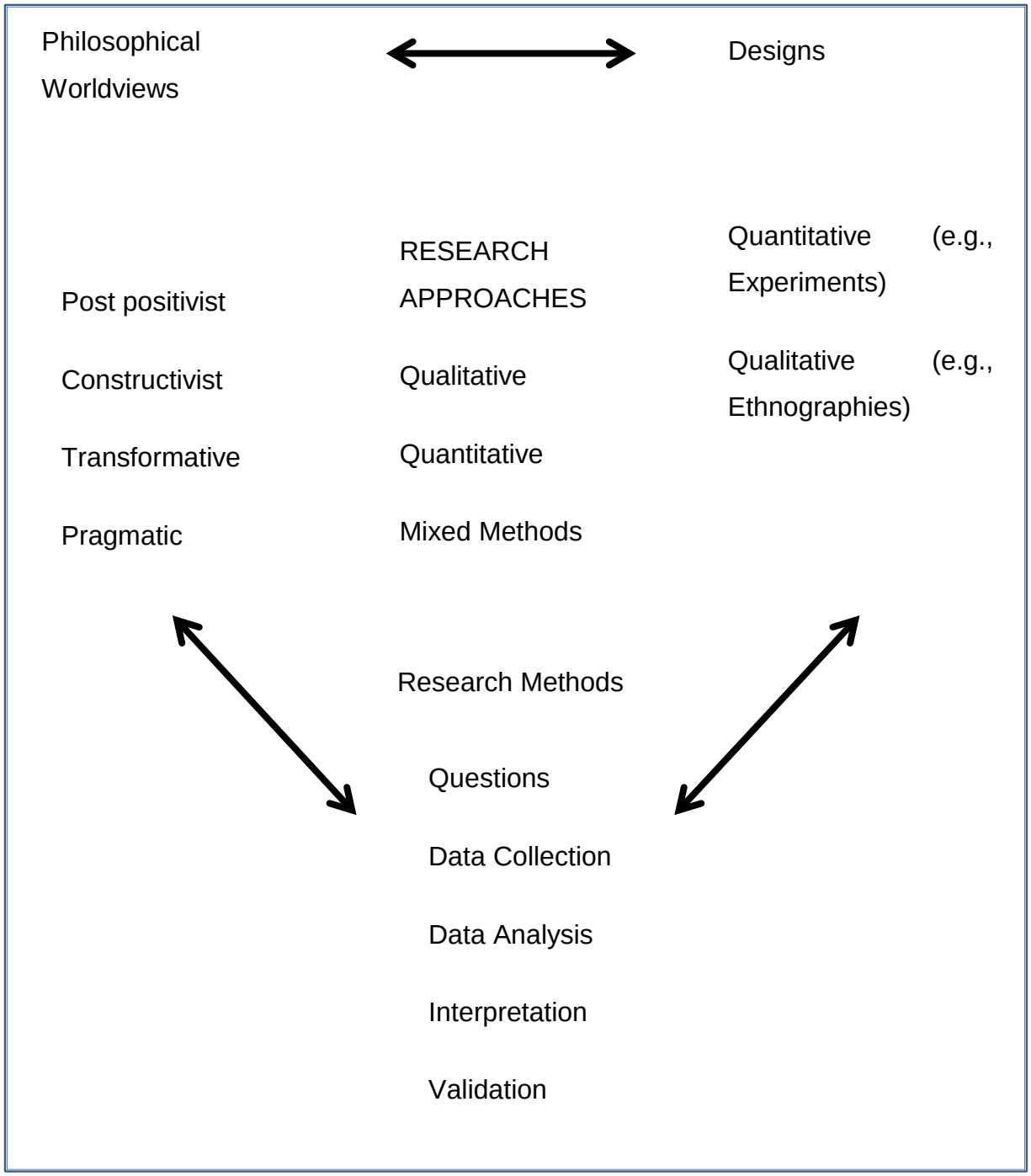
The purpose of this chapter is to understand what research is and to state the underlying philosophies that support the research process. A discussion will follow about the research process and the various research design methods. Remarks about the data collection method, population, sampling and analysis of data will conclude the chapter.

Research is the process in which scientific methods and techniques are used to expand knowledge in a specific field of study by using objective methods and procedures (Welman & Kruger, 2002). Kumar (2008:6) also describes research as an intensive and purposeful movement to obtain a fuller understanding of the unknown. The main purpose of research is to obtain new insight into a specific phenomenon and to formulate answers and solutions about previously identified research questions (Kumar, 2008:6). It can therefore be concluded that research is defined as applying methods to investigate the formulated research questions in order to gain and expand knowledge about the unknown.

2.1.1 The underlying philosophical assumptions in research

When doing research it is important to understand the underlying philosophical assumptions that direct the research process. The broad research approach involves the intersection of philosophy, research designs, and specific research methods. Creswell (2014:5) explains the interaction between these components in figure 2.1.

Figure 2.1: A Framework for Research – The Interconnection of Worldviews, Design, and Research Methods



Source: (Creswell, 2014:5)

The different philosophical worldviews as identified by Creswell (2014:6) are post positivist, constructivist, transformative and pragmatic. Many authors refer to these different philosophies as *epistemologies* (Myers, 2009:35) or paradigms (Mertens, 2010), but according to Creswell (2014:6) he sees this worldviews as a general

philosophical orientation about the world and the nature of research the researcher brings to a study.

Post positivists hold the deterministic philosophy in which causes determine the effects or outcomes. The knowledge that develops through a post positivist's lens is based on careful observation and measurement of the objective reality that exists "out there" in the world. There are laws or theories that govern the world, and these need to be tested or verified and refined so that we can understand the world. Thus, in the scientific method, the accepted approach to research by post positivists, the researcher will begin with a theory, collects data that either supports or refuses the theory, and then makes necessary revisions and conducts additional tests (Creswell 2014:7).

This research falls into the category of post positivists because the research begins with a theory, collects data that either supports or refuses the theory and then makes the necessary revisions or recommendations.

2.2 THE RESEARCH PROCESS

After the research proposal is finalised the researcher should follow a sequential procedure to conduct the research process. These steps are as follow (De Vos *et al.*, 2011:70):

1. Undertake an in-depth literature study;
2. Select a research design;
3. Select method(s) of data collection and analysis;
4. Select a sampling plan (if applicable);
5. Conduct a pilot study (if applicable);
6. Conduct the main research;
7. Process and analyse the data and interpret the results, and
8. Write the conclusions.

As indicated above, after the literature review has been conducted the next step is to select a research design.

2.3 RESEARCH DESIGN

Research design refers to a set of logical arrangements from which the researcher can select a suitable one to meet the specific research goals (De Vos *et al.,* 2011:73). Previously authors recognised the two well-known approaches to research, namely the qualitative and quantitative approach (De Vos *et al.*, 2011:63). A third approach called the mixed approach is added where the qualitative and quantitative approaches are combined (Creswell, 2014:46).

Research designs are types of inquiry within qualitative, quantitative, and mixed method approaches that provide specific direction for procedures in a research design. In broad terms this means that the researcher, depending on the problem, will make a choice between a qualitative, quantitative, or a mixed method to conduct the study.

Research design according to De Vos *et al*. (2011:171) is the plan, recipe or blueprint for the investigation, and as such provides the guidelines to select which data-collection method is the most appropriate to meet the researcher's objectives. The decision regarding the method of data analyses would have to be related to the selected data collection method.

Under the heading of quantitative designs, two designs, namely experimental design and non-experimental designs, such as surveys can be identified. In terms of qualitative designs, narrative research, phenomenology, grounded theory, ethnographies and case studies can be identified. According to the mixed methods, convergent, explanatory sequential, exploratory sequential and transformative, embedded or multiphase approaches could be identified (Creswell 2014:13).

Non-experimental designs such as surveys provide a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. It includes cross-sectional and longitudinal studies using questionnaires or structured interviews as methods to collect data (Creswell, 2014:13).

Both quantitative and qualitative research methods could be biased and have weaknesses. Triangulating data sources, namely to seek for convergence across quantitative and qualitative methods was invented in 1959 (Creswell, 2014:14). This has led to the development of the mixed approach. There are many designs in the mixed approach, but this study falls into the *convergent parallel mixed method*. This is a form of mixed method design in which the researcher converges or merges quantitative and qualitative data in order to provide a comprehensive analysis of the research problem. The qualitative and quantitative data are collected simultaneously, after which the researcher integrates the information in the interpretation of the overall results. Contradictions or incongruent findings are explained or further probed in this design.

In this study, the data collected from the sustainability reports will be in a quantitative as well as qualitative format. The data in the quantitative format are those collected by using the checklist that the researcher will develop from the literature. At the same time when the data of the disclosure procedures of the companies are collected the additional data regarding disclosure and measuring of water not on the checklist will be collected in the form of qualitative information from the following sources: i) the integrated sustainability reports of the companies will be compared against the ii) GRI guidelines, iii) King III, and iv) other items out of the literature utilised to prepare the checklist.

Therefore this study will be a convergent parallel mixed method and secondary data in the form of the sustainability reports will be utilized to gather the data.

2.4 DATA COLLECTION METHODS

This step in the research process refers to the method of collecting the data and includes the identification of the appropriate measuring instruments. To obtain valid and reliable data the researcher should make sure that the measurement procedures and the measurement instruments have acceptable levels of reliability and validity (De Vos *et al.*, 2011:172).

The method followed to collect the data is called content analysis. In the next paragraph a discussion about content analysis will follow as well as an explanation

and motivation for selecting this method as the most appropriate method for the study.

2.4.1 Content analysis

The definition of content analysis

Content analysis (CA) is widely used in accounting research to reveal useful insights into accounting practices (Steenkamp & Northcott, 2007:12). Content analysis is a systematic method of categorising the content of texts. It has traditionally been applied to the analysis of archival data, where it has been limited to manifest the characteristics of text such as the number of occurrences of words, or the number of words relating to particular themes (Smith, 2011).

Different approaches to content analysis

Two distinct generic approaches to content analysis can be identified, namely the "form orientated" (objective) analysis, which involves the routine counting of words, concepts, and themes, or the "meaning orientated" approach which is a more subjective approach focusing on interfering in the underlying meanings present in the texts being investigated (Smith & Taffler, 2002:626).

Commentators have noted the limitations of analysis procedures that are solely "form orientated", claiming that the utility of content analysis lies in its "meaning orientated" application. This explains the value of interpreting the meaning of the text through quantifying and analysing the presence of, and relationships of words and concepts, and then making contextualized inferences about the messages within the text. (Steenkamp & Northcott, 2007:13).

Therefore a more comprehensive definition of content analysis according to Krippendorff (2004:18) is that content analysis is a research technique for making replicable and valid inferences from texts to the contexts of their use.

In a research report published by the Society for Nutrition Education (Kondracki *et al*., 2002:224) they referred to content analysis as a set of qualitative and quantitative research methods for collecting and analysing data from verbal, print, or

electronic communication with numerous applications in nutrition education research. According to the report, textual information from interviews, focus groups, and open-ended survey questions can be evaluated using content analysis. Content analysis is a process for systematically analysing messages in any type of communication. It has been described as a technique which lies in the crossroads of quantitative and qualitative methods and a technique that allows a quantitative analysis of seemingly qualitative data (Kondracki *et al.,* 2002:224).

In view of the remark above, this research fits the description of lying in the crossroad between quantitative and qualitative research. The data as it appears in the sustainability reports of the companies is qualitative in nature, and by comparing it with the checklist it makes it possible to quantify the data or to add qualitative information.

2.5 IDENTIFYING THE MEASURING INSTRUMENT

A checklist will be developed from the literature study where the information on the latest requirements and trends regarding water disclosure is extracted. This checklist could also be called a disclosure index. This disclosure index is a research/measuring instrument comprising a series of pre-selected items, which, when scored, provide a measure that indicates a level of disclosure in the specific context for which the index was devised (Coy, 1995).

At its simplest, and using a binary coding system, the disclosure index provides an aggregated measure of the quantity of disclosure within a report and facilitates a cross-sectional analysis of the frequency of disclosure between the various reports. A binary coding system is similar to nominal scaling, recording the presence or absence of a characteristic, consisting of only one variable like when answering a closed-ended question. A disclosure index can be constructed to make allowance for the variations in the quality of individual disclosures. The perceived quality of disclosure is then assessed by using an ordinal scale ranging from, for example, poor to excellent. Several studies have recognised that some disclosure items are more important than others and that it is therefore undesirable to treat all items as being of equal value (Guthri & Abeysekera,. 2006:11).

For content analysis to be effective, certain technical requirements should be met. In the first place the categories of classification must be clearly and operationally defined and is called the units of analysis. In the second place the capturing of data should be systematic. This refers to an item either belonging or not belonging to a particular category. In the third place content analysis should demonstrate some characteristics for validity and reliability (Guthrie & Abeysekera, 2006:16). Validity and reliability is discussed next.

2.6 VALIDITY AND RELIABILITY

Validity determines if the research is measuring what it is supposed to measure and if the results are truthful. According to Golafshani (2003:598) a quantitative researcher needs to construct a measuring instrument according to predetermined procedures, but the question is if the measuring instrument measures what it is supposed to measure.

The concept of reliability refers to the fact that the same data must be produced at a later stage under similar circumstances by making use of the same instrument of measure (Brynard & Hanekom, 2008:48). The measuring instrument can be considered reliable if the results can be reproduced under a similar methodology and are consistent over time (Golafshani, 2003:598).

Both qualitative and quantitative researchers need to test and demonstrate that their studies are credible. Credibility in quantitative research depends on the instrument's construction, but in qualitative research the researcher is the instrument (Patton, 2002:14). Reliability is a concept to evaluate quality in quantitative research with the purpose of explaining, and in a qualitative study with the purpose of generating understanding (Stenbacka, 2001:551).

The data is collected by obtaining the integrated and sustainability reports published by the companies listed on the JSE's SRI index. A checklist is developed out of the literature study which is utilised as the measuring instrument to analyse the data. By applying the checklist it will ensure a reliable outcome for each separate company, therefore the results will be valid and reliable.

2.7 RESEARCH SAMPLE

A population consists of any well-defined set of elements or characteristics (Adams *et al.*, 2009:96). The population in this study is all the companies listed on the JSE's SRI index. A sample is a small representation of a whole. The most basic considerations in sampling are size and representativeness (De Vos *et al*., 2011:73).

Sampling can be divided into two major methods, namely probability methods and non-probability methods. Probability sampling is where each element in the population has an equal chance of being selected and the selection of elements is also completely random, while this is not the case with non-probability sampling (Maree & Pietersen, 2012:172).

Non-probability sampling will be used in this study as the selection of the population elements will not be randomly conducted. One of the types of non-probability sampling is quota sampling where the elements that are part of the quota adhere to certain criteria (Maree & Pietersen, 2012:172).

According to the background and criteria of the SRI index they identify three broad categories that should be reported on, namely environment, society and governance and related sustainability concerns. In the environmental category the SRI index classifies companies as a high, medium or low impact company (SRI, 2014:4). By means of quota sampling, this study selects companies under the high impact category.

2.8 RESEARCH ETHICS

Ethics can be defined when someone is responsible, honest and when doing something, doing it in an honest manner with the necessary level of integrity (Adams *et al*., 2009:35). According to Walliman (2006:148) researchers are ethically obliged to ensure that they are competent, honest and adequately skilled to undertake the proposed investigation. Because of the chosen method used in this study, namely content analysis, the main responsibility considering ethics will be on the researcher. The researcher should be responsible, honest and consistent when coding and analysing the integrated reports.

2.9 SUMMARY

In this chapter the research methodology was explained. It was concluded that the mixed method approach is the most appropriate method for this study. Therefore this study will make use of convergent parallel mixed method approach and secondary data in the form of the sustainability reports will be utilized to gather the data. The method used to perform the study is content analysis which is widely used in accounting research to reveal useful insights into accounting practices. The measuring instrument applied in the research is the checklist developed from the literature review conducted. The data will then be analysed and the results presented and discussed.

The next chapter will provide a literature study on the concepts of sustainability and integrated reporting.

CHAPTER 3

3 SUSTAINABILITY AND INTEGRATED REPORTING

3.1 INTRODUCTION

The aim of this chapter is to address the first two secondary objectives as set in the first chapter (refer paragraph 1.3.2, page 5). The first secondary objective is to conceptualise from literature the practise of integrated and sustainability reporting, including the need for reporting on water management. The second secondary objective is to conceptualise from literature the reporting and disclosure requirements of water.

The chapter starts with a broader introduction towards sustainability and sustainability disclosure. The importance of water, the scarcity and quality of water globally and nationally will be discussed. The focus will then shift to the importance of water as a natural capital asset and the disclosure thereof as discussed by King III, integrated reporting, and the Global Reporting Initiative (GRI). The second section will address the specific requirements for reporting and disclosure of water related issues. In this section the disclosure items will be differentiated based on the narrative and quantifiable parts of the reports.

3.2 THE IMPORTANCE OF SUSTAINABILITY

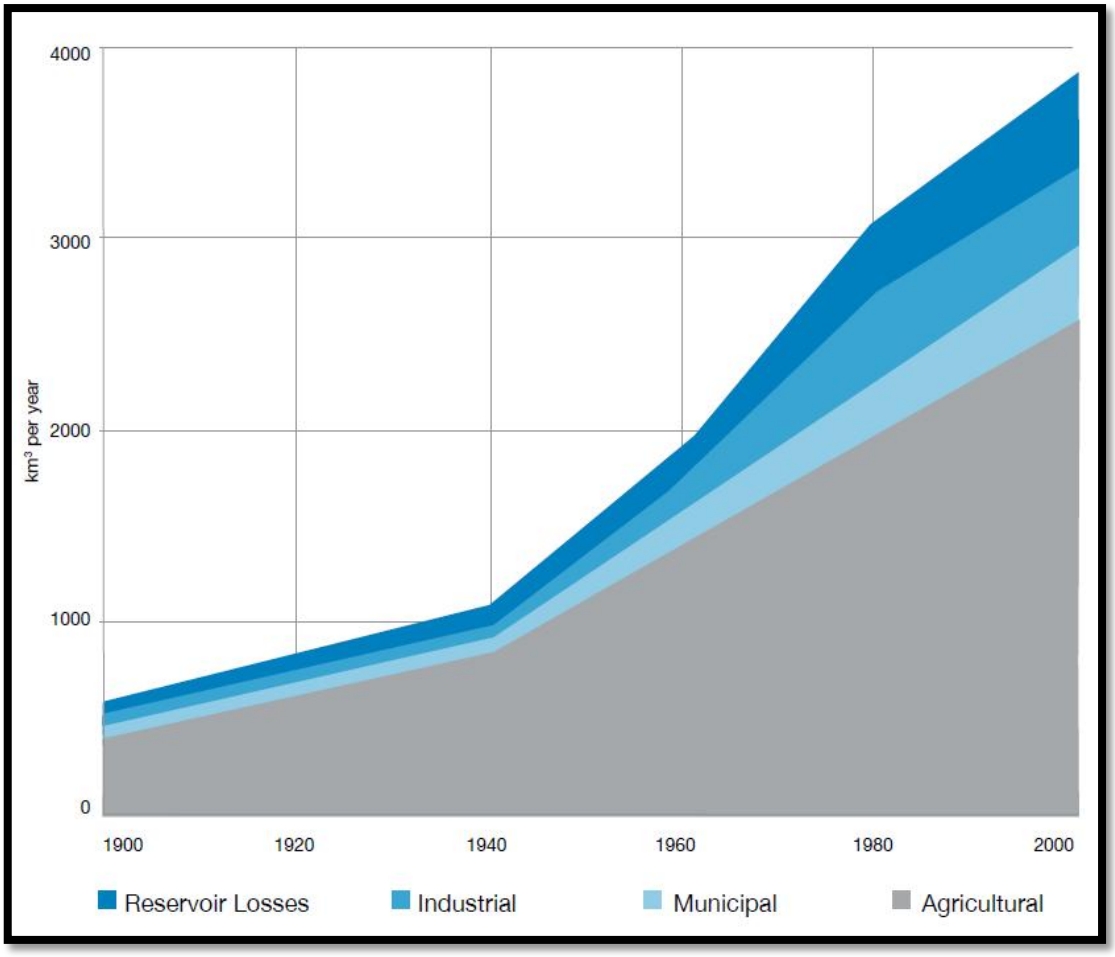
Sustainability can be defined as development that meets present needs without compromising the ability of future generations to meet their own needs (United Nations, 1987). According to Lo and Sheu (2007:346) corporate sustainability is an approach that creates long-term shareholder value by embracing opportunities and managing risks from economic, environmental and social dimensions. Environmental risks can simply not be ignored anymore, because the growing importance of environmental and social issues has put pressure on companies to implement environmental and social systems. The real challenge for organisations is to identify and find ways to reduce their impact on the environment in a sustainable manner.

In this context sustainability regarding our environment and natural resources becomes more important to organisations and should be integrated into day to day management activities. Therefore in this study the focus in terms of sustainability is about the effective management of non-renewable natural resources. As natural resources are limited, a collective effort is necessary to balance socio-economic needs with environmental needs. Natural resources are the land, air, water, living organisms and all formations of the earth's biosphere that provide us with ecosystem goods and services imperative for our survival and well-being (IISD, 2013:1). This study's focus in the context of sustainability, will be on a specific natural resource namely water.

3.2.1 The importance of water globally

The world has witnessed a massive increase in water demand over the past century, driven by forces of industrialisation, economic development and population growth. This growing demand for water globally is leading to increased tension and challenges around the effective management thereof especially in many parts of the world where industry, agriculture and local communities are competing for this precious resource. In figure 3.1 an illustration is provided to indicate the increase in water use from 1990 to 2000.

Figure 3.1: World Water Use 1990 – 2000



Source: (CDP, 2012:8)

3.2.2 The importance of water in South Africa

It is projected that South Africa could deplete its water resources by 2025, and in Gauteng, South Africa's economic hub, it could be as early as 2015 (BDlive, 2013:1). On top of the scarcity of water there is a growing concern about the effect of climate change on agricultural production. South Africa receives half the average global annual rainfall and 98% of its water systems are in a crisis mode (WWF-SA, 2013).

South Africa is famous for its biodiversity, and is the third most diverse country in the world. In terms of freshwater biodiversity, we have 223 different types of river ecosystems and 792 different types of wetland ecosystems (WWF-SA, 2013:10). South Africa's freshwater ecosystems have been mapped and classified into National Freshwater Ecosystem Priority Areas (NFEPAs). This mapping indicates that 60% of our river ecosystems are threatened and 23% are critically endangered.

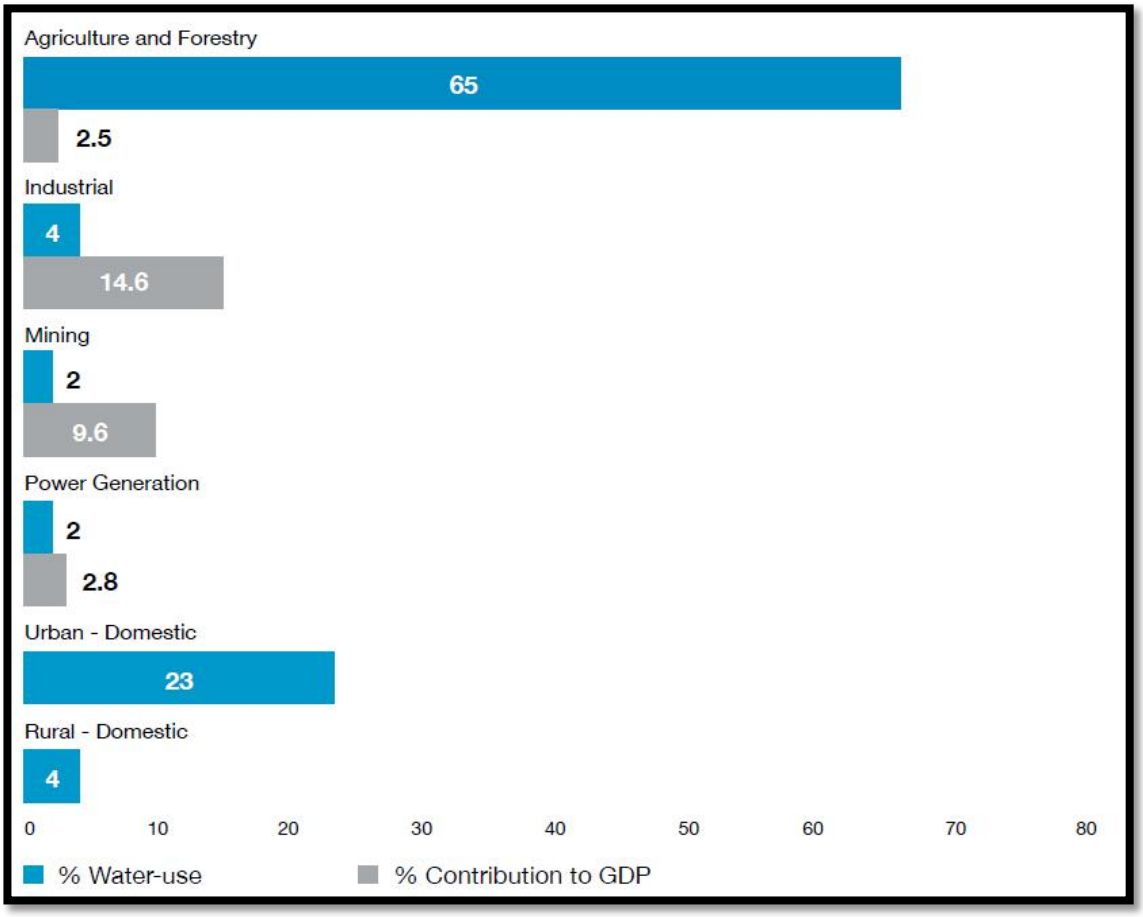
The situation for wetlands is even worse: 65% of our wetland types are threatened, and 48% are critically endangered.

Water faces many threats on its journey from the headwaters of the river basin to water users and estuaries. Pollution from fertilisers, waste water treatment plants and mining threatens to poison our rivers. Water is a renewable source, replenished each year during the rainy season. However, it is an irreplaceable source that cannot be substituted with anything else (WWF-SA, 2013:10). Furthermore, farmers will have to double their use of water by 2050 if they are to meet growing food demand of an estimated population in 2050 of 9 billion people worldwide. To avoid a crisis, water supply needs to be enhanced and the efficiency of water use increased (WWF-SA, 2013:11).

South Africa is expected to experience a 17% gap between water supply and water demand by 2030, equating to 2.7 billion m^3 of water (CDP, 2012:10). The concern is not only around the scarcity of water, but also the quality thereof. This water *quality* crisis poses a great risk to South Africa's long-term supply of fresh water. South Africa's water quality issues are primarily a legacy of past, and in some cases present mining practises could also be associated with inadequate maintenance and failing water sanitation infrastructure across the country (CDP, 2012:10).

In conclusion, South Africa is a water scarce country and we have to act urgently to protect our water resources and ensure that we use what is available in the most efficient and effective way. In this context every economic sector that consumes water, still has to contribute towards the Gross Domestic Product of the country. In figure 3.2 the water use per sector is compared with the contribution towards the Gross Domestic Product (GDP) per sector.

Figure 3.2: Water-use by sector versus contribution to GDP in South Africa



(Source: CDP, 2012:11)

As shown in figure 3.2 the agricultural and forestry sector are estimated to account for 65% of the county's water consumption, compared to 4% for the industrial sector and 2% each for the mining and energy production sectors (CDP, 2012:11).

Considering this water-constrained future, the impact of water shortages has a significant effect on any company's strategic planning and is therefore an issue that has to be addressed.

In South Africa we need to recognise where water comes from, how to protect it and how to stop wasting this scarce commodity. This will need good management and investment of our economically active community to meet our aspirations of social and economic development. In this sense sustainability reporting gained momentum and organisations started to recognise the importance of sustainability reporting and disclosure of important items.

3.3 SUSTAINABILITY DISCLOSURE

The relevance and reliability of annual financial reports as a basis for making decisions about an organisation, has been questioned by stakeholders as only financial information is used for making decisions while non-financial information is ignored. Stakeholders are unable to form a comprehensive picture of an organisation's complete performance and its ability to create and sustain value (IRCSA, 2011:1). Sustainability disclosure has therefore become a necessary tool for an investor since it directly drives an organisation's value creation process by including all relevant information. Sustainability reporting or triple bottom line reporting refers to a tripartite reporting framework that highlights the economic, environmental and social performance of an organisation (Choudhuri & Chakraborty, 2009:48).

Sustainability practises such as corporate sustainable indexes are now emerging to measure sustainability performance, for example, the SRI on the JSE. These indexes urge companies to provide vital and timely information to both customers and shareholders on the environmental health and sustainability of their company. The growing need for information on corporate sustainability practise has led to improved disclosure requirements. There is a growing emphasis on quantifying environmental impacts such as waste production, greenhouse gas emissions and other environmental hazards (Madu & Kuei, 2012:2).

The importance of reporting on natural capital such as water and the disclosure thereof, taking into consideration the requirements of integrated reporting, King III report and the GRI requirements, will be discussed next.

3.4 INTEGRATED REPORTING

Since the turn of the century there has been a drive to move away from stand-alone financial and sustainability reports towards a more integrated approach. The first attempt in South Africa to enforce integrated reporting across all listed companies was introduced in 2010 by the Johannesburg Stock Exchange Limited (JSE), which mandated integrated reporting (IRCSA, 2011:7). The listing requirements of the JSE compel compliance via the King III Report and therefore companies are now obliged

to produce an integrated report (IRCSA, 2011:7). In essence, an integrated report is a compilation of the conventional financial statements and the so-called sustainability report, with the aim of providing the stakeholders of the company with a complete overview of the company's historical operations and future prospects. It also integrates and links information about strategy, risks and opportunities and relates these to the social, environmental, economic and financial issues (IIRC, 2011:2).

The Integrated Reporting Committee of South Africa (IRCSA, 2011:7) suggested eight elements to be part of the integrated report, namely:

1. Report Profile,
2. Organisational overview, business model, and governance structure;
3. Understanding the operating context;
4. Strategic objectives and competencies;
5. Account of the organisation's performance;
6. Future performance objectives;
7. Remuneration policies, and
8. Analytical commentary.

As part of the second element, "Organisational overview, business model and governance structure" the IIRC identified six capitals which are in essence the financial and non-financial resources, namely:

1. Financial capital,
2. Manufactured capital,
3. Human capital,
4. Intellectual capital,
5. Natural capital, and
6. Social capital.

The importance of how organisations manage these capitals/resources has an effect on the long-term viability of organisations (Deloitte, 2012:16). One of the six resources mentioned above refers to the resource of natural capital and is important in the context of this study. These natural capital resources include water, land,

minerals and forests as well as information regarding biodiversity and eco-system health.

3.4.1 Natural capital accounting

According to research published by the World Bank in June 2012, it is stated the GDP consider only one part of the economic performance, namely income, but nothing is said about wealth and assets that underlie this income. For example, when a country exploits its minerals, it is actually depleting wealth. The same holds true for over-exploiting fisheries or degrading water resources. These declining assets are invisible in GDP and so, are not measured (World Bank, 2012:1).

The concept of accounting for natural capital has been around for more than 30 years. To date, however, progress in moving beyond conceptual thinking towards practical implementation of natural capital valuation has been slow (World Bank, 2012:1). Natural capital is a critical asset, especially for developing countries such as South Africa, where it makes up a significant share (36%) of total wealth. The World Bank believes that by valuing the environment and incorporating natural capital into national accounts could support better decisions. Wealth accounting (including natural capital accounting) can provide detailed statistics for better management of the economy, such as accounts for the sectorial inputs of water and energy, and outputs of pollution that are needed to model green growth scenarios (World Bank, 2012:2).

The ways and approaches that companies use to report on natural capital namely water, will follow in the next paragraphs.

3.4.2 Integrated reporting and water

A study performed by the Association of Chartered Certified Accountants (ACCA) in 2013, states that reporting on natural capital can be split into two main categories: i) narrative reporting on strategy and management, and ii) performance reporting. Narrative reporting provides stakeholders with a qualitative understanding of an organisation's relationship to natural capital and the processes used to manage the various risks and opportunities associated with such an organisation's activities.

While on the other hand, performance reporting provides stakeholders with quantitative information, in the form of key performance indicators that can be used to track performance over time (ACCA, 2013:4).

The existing integrated reporting framework does not have specific requirements in terms of water reporting. The natural capital resource, which water is part of, could be addressed under various sections of the integrated report namely governance, corporate policies, environmental management systems, risk assessment, materiality assessment and key performance indicators.

3.5 KING III REPORT

Since 2002 sustainability reporting has become a widely accepted practice and South Africa can be regarded as an emerging market leader in the field (IODSA, 2009:13). This is partially due to King II and other initiatives such as the JSE's Socially Responsible Investment (SRI) index.

In 1994 the first King Report was published with the aim of promoting the highest standards of corporate governance in South Africa. This was followed by King II in 2002 which already started to move away from only reporting to shareholders and embraced the triple bottom line approach (IODSA, 2002:2). The King Report on Governance for South Africa 2009 (King III) defines integrated reporting as a holistic and integrated presentation of a company's performance in terms of both its finance and sustainability. King III supports the notion of sustainability, but makes the case that it should be part of integrated reporting (IODSA, 2009:13).

3.5.1 King III Report and water

King III urges companies to identify the future of their business in the context of an ever-changing social, economic and environmental landscape. Among many other governance recommendations, King III encourages companies to produce meaningful integrated annual reports by using the guidance set out by the GRI (Rea, 2012:4). According to King III, sustainability reporting parameters are not yet standardised as in the case of financial reporting, and the performance indicators reported on should be explained in terms of their implications and taking cognisance

of available benchmarks. Many listed companies make use of the GRI guidance and also use the JSE SRI-index criteria as a guiding framework (IODSA, 2009).

Although the King III report indicates the importance of sustainability disclosure and emphasises the fact that it should be part of integrated reporting, no specific water disclosure requirements are recommended. As stated by Rea (2012:4), King III refers companies to use the GRI guidelines to assist them for improved disclosure.

3.6 GLOBAL REPORTING INITIATIVE

In the 1990s some companies began to publish sustainability reports and as this was a voluntary action, these reports lacked reporting standards. The lack of standards led to the foundation in 1997 of the Global Reporting Initiative (GRI), a non-profit organisation (Musikanski, 2012). The objective of the GRI was to provide guidelines for the compilation of sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103).

The Carbon Disclosure Project (CDP) is an independent non-profit organisation maintaining the largest database of primary corporate climate change information in the world. In 2013, the GRI and CDP signed an agreement with the aim of aligning the areas of their reporting frameworks (GRI, 2014). According to Simpson, the Chief Executive Officer of the CDP, there is a need for meaningful and systematic reporting on water globally. This has initiated research in terms of corporate water disclosure guidelines which were launched in 2010. As part of the Global 500, 56 companies from the 100 largest JSE-listed companies were invited to participate in the research (CDP, 2012:2).

National Business Initiative (NBI) released some of the results of the CDP Water Report 2012, which indicates that South African companies are particularly exposed to water-related risks. A significant 71% of respondents had already experienced financially-material water related impacts. The report also states that South Africa is one of the first country level samples to participate in the CDP's water information survey. This is in part due to a growing appreciation of increasingly strategic value of water to businesses operating in this water restricted region (NBI, 2013:1). The report highlights many examples of leading practices by South African companies as

they work to manage the impacts of water related risks. Guidelines provided by this report will also be included in the checklist that will be developed from the literature and used in the empirical research of this study.

3.6.1 Global Reporting Initiative and water

Companies using the latest GRI guidelines, also referred to as the G4 guidelines, are required to perform a stakeholder-inclusive materiality assessment and report to this effect. Materiality according to IODSA (2012:9) is a measure or threshold against which information can be evaluated. An item is material if it is of such importance and has an impact that could substantially influence the assessments and decisions of the organisation or its stakeholders. In the context of sustainability, materiality is a more difficult measure to define and a great deal of judgement is therefore required. The materiality assessment ensures that company reports are not cluttered by excessive information, but instead focused on the topics that matter the most. By performing the assessment and disclosing it to the stakeholders demonstrates that only real important items are included in the reports.

As companies are faced with a wide range of sustainability reportable issues, it is crucial to ensure that the real materiality issues regarding natural capital, specifically water issues, are reported on.

The checklist that will be developed will therefore include the materiality concept to determine whether water disclosure is applicable in the context of that company.

From the before-mentioned it is clear that the guidelines provided by the GRI should form the foundation that companies can build on to improve their reporting and disclosure practices. The rest of the chapter will be separated into the narrative disclosure part and performance reporting where the key performance indicators will be addressed.

3.7 NARRATIVE DISCLOSING REQUIREMENTS

As mentioned in paragraph 3.5, the integrated reporting framework does not have specific requirements in terms of water reporting. The Association of Chartered Certified Accountants (ACCA) states that natural capital resources which water is

part of, could be addressed under various sections in the integrated report, namely governance, corporate policies, environmental management systems, risk assessment and materiality assessment (ACCA, 2013:4). The various requirements will be discussed under the next headings.

3.7.1 Governance

When analysing the integrated reports, indications of having a director or senior staff member responsible for the company's sustainability programmes will demonstrate commitment and accountability (ACCA, 2013:4). Many companies disclose the mechanisms that support corporate water related decision-making and enhance accountability. Effective governance structures include i) a description of the processes used to develop water related policies, and ii) the chain of accountability for water related performance. Governance reporting should provide insight into which body in the company has ultimate oversight of water management and the mechanisms it uses to drive water related accountability (CDP, 2012:7).

In the case of this study, the analysis will focus on water and if the company disclose publicly the person/s responsible for such programmes. This part of governance should clearly indicate whether the company takes this issue seriously and is transparent about where the responsibility of water related issues lies within the management of the company.

3.7.2 Corporate policies

Disclosing sustainability policies is an effective method for companies to communicate their position on the subject, and policies that are agreed at board level serve as a way of focusing and aligning sustainability initiatives (ACCA, 2013:5).

Compliance with water related regulations as well as with voluntary standards or industry benchmarks may be used as a proxy for understanding a company's approach to managing water resources. Also internally developed standards can pertain to a variety of water management topics, such as water use efficiency, quality parameters, level of water treatment, and operational management protocols.

Reporting on these topics describe the nature of these standards, which entities within the business are encouraged and/or expected to meet (CDP, 2012:5).

By focusing on information where a company discloses water related policies are an illustration of commitment to good stewardship and the assurance that the company operates according to internationally recognised standards. Good or advanced disclosers may even indicate that the report is assessed internally or by a third party assessment body.

3.7.3 Environmental management systems

Implementing an environmental management system (EMS) helps companies to reduce their environmental impacts, comply with applicable laws and regulations and continually improve their environmental performance. By operating under internationally recognised standards, such as ISO 14001, and communicating this to stakeholders, companies are able to demonstrate their commitment to improve their environmental performance (ACCA, 2013:5).

A corporate water management system can generally be categorised into the following types of activities:

- Improving operational water performance

The most basic activity for companies is to understand how and to what extent direct operations use affect water resources, and then to take steps to become more efficient and reduce pollution. Companies therefore start their water management journey by firstly focusing on internal measures.

- Understanding how the company interacts with its surrounding basins

A company should consider the external environment in which it operates, including water stress, flooding, poor ambient water quality, regulatory uncertainty, and other factors. This knowledge is typically gained through internal data collection and assessment and the use of third party datasets and tools.

- Developing a comprehensive water strategy

Strategy development can include many dimensions, such as establishing corporate governance and accountability mechanisms, setting goals, and defining a water management philosophy. Comprehensive water strategies are integrally linked to core business and long-term business success (CDP, 2012:4).

When analysing the integrated reports, attention will be given to water laws and regulations, such as the GRI guidelines, CDP water disclosure requirements and ISO 14001. Furthermore, corporate water policies and management systems expand over time, for example, a company that has started to prioritise water issues may begin by focusing on water measurement and efficiency programs within their direct water operations. On the other hand, those with advanced water management systems might address a wider array of water related issues such as a comprehensive corporate water strategy, supply chain management, and engagement in sustainable water management activities outside the company.

3.7.4 Risk assessment

Companies that are clear about the key risks facing their operations and the plans that they have in place to mitigate those risks, can demonstrate to their stakeholders their level of preparation for uncertainty. This is of particular importance to investors who will be able to assess how well a company is managed by seeing the comprehensiveness of its risk assessments (ACCA, 2013:6).

Many companies are exposed to water related risks that can negatively affect business viability over the short or long term. Water risks can be grouped into four general categories, namely physical risks, regulatory risks, reputational risks and other risks.

- Physical risks occur when there is water stress (too little water), flooding (too much water), or pollution (lower water quality).
- Regulatory risks involve issues such as water permits and allocation, rates controlling withdrawal and discharge quantities, and restrictions on pollutant types and levels.

- Reputational risks manifest when water availability and quantity give rise to tension between businesses and local communities.
- Other risks can arise from issues such as litigation related to water related compliance or from changing consumer attitudes concerning water efficiency (CDP, 2012:5).

Therefore in the analysis of the reports, emphasis will be given to the companies' risk assessment in terms of their water issues, specifically those that have indicated that water is of extreme importance for their long-term survival.

3.8 PERFORMANCE REPORTING

The disclosure of key performance indicators (KPIs) is arguably the most effective means for companies to communicate their sustainability performance and their impacts on natural capital. Through the disclosure of KPIs companies are able to set targets and track their progress in meeting those targets over time. By using standards companies are encouraged to increase the level of comparability between companies and the trust in the data presented. The GRI also identifies a large number of KPIs related to environmental aspects that should be reported on. For example, if a company has reported on its management approach to a particular aspect, it can select the relevant indicators to provide specific data on performance and impacts. The G4 guidelines have three specific environmental indicators (EN 8 – 10) for water (ACCA, 2013:8). These are: i) EN 8: Total water withdrawal by source, ii) EN 9: Water sources significantly affected by withdrawal of water, and iii) EN 10: Percentage and total volume of water recycled and reused (GRI, 2011:14-16) (GRI, 2013:54-55). These three indicators are presented and discussed in the GRI guidelines as follows:

EN 8: Total water withdrawal by source

Total water withdrawal by source is the sum of all water drawn into the boundaries of the organisation from all sources (including surface water, ground water, rainwater and municipal water supply) for any use over the course of the reporting period.

The total water withdrawn indicates the organisation's size and importance as a water user, and provides a baseline figure for other calculations relating to efficiency and use. Total water use also indicates the level of risk posed by disruptions to water supplies or increases in the cost of water. Clean freshwater is becoming increasingly scarce, which can have an impact on production processes that rely on large volumes of water. In regions where water sources are highly restricted, the organisation's water consumption patterns can also influence relations with other stakeholders.

The reporting organisation must identify the total water withdrawal from any water source that was either withdrawn directly by the organisation or through intermediaries such as water utilities, including the abstraction of cooling water.

The following performance indicators will form the basis of the checklist to be developed in this study.

a. Report the total volume of water withdrawn in cubic meters per year (m^3/year) from the following sources:

    - Surface water, including water from wetlands, rivers, lakes and oceans;
    - Ground water;
    - Rainwater collected directly and stored by the organisation;
    - Waste water from another organisation; and
    - Municipal water supplies or other water utilities.

b. Report standards, methodologies, and assumptions used.

EN 9: Water sources significantly affected by withdrawal of water

Withdrawals from a water system can affect the environment by lowering the water table, reducing volume of water available for use, or altering the ability of an ecosystem to perform its functions. These changes have wider impacts on the quality of life in the area, including economic and social consequences.

This indicator measures the scale of impacts associated with the organisation's water use. In terms of relations with other users of the same water sources, this

indicator enables an assessment of specific areas of risk improvement, as well as the stability of the organisation's own water sources.

The reporting organisation must identify sources significantly affected by water withdrawal which meet one or more of the following criteria:

- Withdrawals that account for an average of 5% or more of the annual average volume of a given water body;
- Withdrawals from water bodies that are recognised by professionals as being particularly sensitive due to their relative size, function or status as a rare, threatened or endangered system (or to their support of a particular endangered species of plant or animal); and
- Any withdrawal from a Ramsar-listed wetland or any other nationally or internationally proclaimed conservation area regardless or the rate of withdrawal.

Ramsar refers to a convention held about wetlands in the Iranian city of Ramsar in 1971. The broad definition is that the convention adhered to wetlands includes lakes and rivers, swamps and marshes, wet grasslands and peat-lands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans (Ramsar, 2012:1).

The following performance indicators will form the basis of the checklist developed in this study.

a. Report the total number of water sources significantly affected by withdrawal by type:

- Size of water source in cubic meters (m^3);
- Whether or not the source is designated as a protected area (nationally or internationally);
- Biodiversity value (such as species diversity and endemism, total number of protected species); and
- Value or importance of water source to local communities and indigenous people.

b. Report standards, methodologies and assumptions used.

EN 10: Percentage and total volume of water recycled and reused

The rate of water reuse and recycling can be an efficiency measure and can demonstrate the success of the organisation in reducing total water withdrawals and discharges. Increased reuse and recycling can result in a reduction of water consumption, treatment and disposal costs. The reduction of water consumption through reuse and recycling can also contribute to local, national or regional goals for managing water supplies.

This indicator measures both water that was treated prior to reuse and water that was not treated prior to reuse. Grey water (collected rainwater and wastewater generated by household processes such as washing dishes, laundry and bathing) is included.

The following performance indicators will form the basis of the checklist developed in this study.

a. Report the total volume of water recycled and reused by the organisation in cubic meters per year (m^3/year).
b. Report the total volume of water recycled and reused by the organisation in cubic meters per year (m^3/year) as a percentage of the total water withdrawal reported under Indicator G4 – EN 8.
c. Report standards, methodologies and assumptions used (GRI, 2013:54-55).

3.9 SUMMARY

The aim of this chapter was to discuss the concepts of sustainability and sustainability disclosure. In the South African context where water is a scarce resource, the importance of communicating and presenting water related aspects were emphasised. The applicable guidelines related to good disclosure practises such as integrated reporting; King III and the GRI were addressed. Based on these practises the discussion then shifted by differentiating two parts, namely narrative reporting and performance reporting. The chapter concluded by discussing the various components of narrative and performance reporting.

The next two chapters are each presented in the form of an academic article. These two articles are grounded on these two components of narrative disclosure part (article one) and performance reporting (article two).

CHAPTER 4

4 RESEARCH ARTICLE 1

Title: Evaluating the water-related reporting and disclosure requirements of Socially Responsible Investment-indexed JSE-listed companies

The reader is requested to take note of the following:

- The article has been submitted to the following DHET indexed, peer-reviewed academic journal as follows:

Botha, M.J. & Middelberg, S.L. Evaluating the water-related reporting and disclosure requirements of Socially Responsible Investment-indexed JSE-listed companies. Southern Africa Business Review (ISSN: 1998-8125)

- The article as submitted is included in “Annexure 1: Article as submitted” on page 84. The article was written in line with the journal’s submission guidelines, which are included in “Annexure 2: Journal submission guidelines” on page 103.
- The article was researched and written by the first author as the candidate and primary author, while the second author fulfilled a reviewer function thereto as the research project’s study leader.

Abstract

South Africa is facing a water crisis in terms of the scarcity and the quality of its water. Considering this water-constrained future it is evident that companies in South Africa should pay attention to the pristine management of this scarce resource. The purpose of this paper is therefore to evaluate the reporting and disclosure requirements of water of Socially Responsible Investment-indexed (SRI) JSE-listed companies. The disclosure requirements of the integrated report, King III, the Global Reporting Initiative and the Association of Chartered Certified Accountants, provided the theoretical background to develop a water disclosure index. Content analysis was used as the research method to analyse the integrated and sustainability reports of a selected group of SRI indexed JSE-listed companies. The results were analysed in terms of the disclosure on items such as materiality, governance, corporate policies, environmental management systems and risk assessments. The findings of the study include that most of the companies illustrate commitment towards water stewardship by reporting on water-related aspects. The mining sector rated the highest on disclosure and reporting of water-related aspects by providing the most detailed descriptions concerning the various risks. It is recommended that companies improve the relevance, depth and clarity of their disclosure on water.

Keywords: Water, integrated reporting, sustainability reporting, sustainable disclosure, SRI index

4.1 BACKGROUND

Sustainability disclosure has become a necessary tool for an investor since it directly drives a company's value creation process. It also provides a stakeholder with a more comprehensive picture of a company's performance (IRCSA, 2011:1). Sustainability reporting, or triple bottom line (TBL) reporting, refers to a tripartite reporting framework that highlights the economic, environmental and social performance of a company (Choudhuri & Chakraborty, 2009:48). Since the year 2000 there has been an initiative to move away from stand-alone financial and sustainability reports towards a more integrated approach. The first attempt in South Africa to enforce integrated reporting across all listed companies was introduced in 2010 by the South African stock exchange, the JSE Limited (JSE), which mandated integrated reporting (IRCSA, 2011:7). The current listing requirements of the JSE compel compliance via the King III Report (also known as the King Report on Governance for South Africa, 2009) and as such companies have to produce an integrated report (IRCSA, 2011:7).

A company's integrated report is in essence a compilation of the conventional annual financial statements and the so-called sustainability report, with the aim of providing the stakeholders of the company with a complete overview of the company's historical operations and future prospects. It also integrates and links information around strategy, risks and opportunities and relates these to the social, environmental, economic and financial issues (IIRC, 2011:2).

In the 1990s certain companies began to publish sustainability reports and as this was a voluntary action, these reports lacked reporting standards. The lack of standards led to the foundation in 1997 of the Global Reporting Initiative (GRI), a non-profit organisation (Musikanski, 2012). The objective of the GRI was to provide guidelines aimed at sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Since 2002, sustainability reporting has globally become a widely accepted practice in South Africa being regarded as an emerging market leader in this field (IODSA, 2009:13). This is partially due to King II and other initiatives such as the JSE's Socially Responsible Investment (SRI) index. The SRI index is a JSE index that measures companies' policies, performance and reporting

in relation to the three pillars of the TBL (environmental, economic and social sustainability), as well as corporate governance practices (JSE, 2013).

The Integrated Reporting Committee of South Africa (IRCSA, 2011:7) suggested eight elements to be part of the integrated report. One of these eight elements is "Organisational overview, business model, and governance structure". Under this element the International Integrated Reporting Committee (IIRC) identifies six capitals which are, in essence, the financial and non-financial resources that companies should report on. These six capitals are i) financial, ii) manufactured, iii) human, iv) intellectual, v) natural, and vi) social capital.

The importance of how companies manage these capitals/resources has an effect on a company's long-term existence (Deloitte, 2012:16). One of the six capitals mentioned above refers to the resource of natural capital and is important in the context of this paper. This natural capital resource includes water, land, minerals and forests as well as information regarding biodiversity and eco-system health.

It is projected that South Africa could deplete its water resources by 2025, and in Gauteng, South Africa's economic hub, it could be as early as 2015 (BDlive, 2013:1). Moreover, the scarcity of water is a growing concern about the effect of climate change on agricultural production. South Africa receives half the average global annual rainfall and 98% of its water systems are in a crisis mode (WWF-SA, 2013). Furthermore, South Africa has no surplus water and all future development will be constrained by this fact. Farmers will have to double their use of water by 2050 if they are to meet growing food demands. To avoid a crisis, water supply needs to be refined and enhanced and water use efficiency increased. In addition, the population is growing and getting wealthier and that adds to the problem of food security (WWF-SA, 2013).

There were several attempts to improve both global and South African sustainability reporting guidelines such as the Carbon Disclosure Project (CDP), GRI, King III, as well as guidelines developed by the Association of Chartered Certified Accountants (ACCA). The Carbon Disclosure Project (CDP) is an independent non-profit company holding the largest database of primary corporate climate change information in the world. In 2013, the GRI and CDP signed an agreement with the

aim of aligning the areas of their reporting frameworks (GRI, 2014). According to Simpson, the Chief Executive Officer of the Carbon Disclosure Project, there is a need for meaningful and systematic reporting on water globally. The purpose of this study is aimed at addressing this need.

When companies are required to report about the environment and specifically about water, water-related aspects should firstly be identified. Once such aspects have been identified, it can be monitored and managed, and the reporting thereof can improve. As companies generally make use of performance measurement systems to measure and monitor financial performance, more contemporary approaches are required to measure and monitor non-financial aspects such as the pristine management of water. As the publishing of integrated reports are a JSE listing requirement, the following questions can be raised: Are companies currently complying with the disclosure on the use and management of water? If so, which performance measurement systems are they utilising to report on? These questions are designed to address the knowledge gap and provide the motivation for research conducted in this paper. The contribution of the study is to develop a water disclosure index to assist companies in evaluating their water-related disclosure and reporting practices.

The rest of the paper is structured as follows: firstly, the research objective is stated followed by the theoretical framework in which the concepts of sustainability, integrated reporting, natural capital and the importance of water are highlighted. This is followed by the empirical results and finally the paper concludes with recommendations, limitations and areas for further research.

4.2 RESEARCH OBJECTIVE

In order to address the research questions posed above, the main research objective of this paper is to evaluate the water-related reporting and disclosure of socially responsible investment-indexed JSE listed companies. The focus will be on SRI-indexed companies as these companies are perceived to be serious about sustainable development. Furthermore, the reporting and disclosure of water-related aspects as part of the integrated report is relatively new, the research will be conducted on these perceived market leaders in terms of sustainable development.

In order to achieve the research objective, the theoretical framework on which the study is based is discussed next.

4.3 THEORETICAL FRAMEWORK

4.3.1 Sustainability and sustainability disclosure

Sustainability can be defined as development that meets present needs without compromising the ability of future generations to meet their own needs (United Nations, 1987). In this context sustainability regarding our environment and natural resources becomes more important to companies and should be integrated into day to day management activities. The focus in this study in terms of sustainability is therefore concerning the effective management of non-renewable natural resources. Natural resources are the land, air, water, living organisms and all formations of the earth's biosphere that provide us with ecosystem goods and services imperative for our survival and well-being (IISD, 2013:1).

Sustainability practises such as corporate sustainable indexes are emerging to measure sustainability performance, for example, the SRI on the JSE. These indexes urge companies to provide vital and timely information to both customers and shareholders about the environmental health and sustainability of their company. The growing need for information on corporate sustainability practice has led to improved disclosure requirements.

4.3.2 The importance of water in South Africa

As mentioned in the introduction, South Africa is facing a water crisis. This is proven through the estimation that South Africa will have a 17% gap between water supply and water demand by 2030, equating to 2.7 billion m^3 of water. The concern is not only on account of the scarcity of water, but also the quality thereof. This water *quality* crisis poses a great risk to South Africa's long-term supply of fresh water. Considering a water-constrained future, the impact of water shortages has a significant effect on any company's strategic planning and is therefore an issue that has to be addressed good and early. In summary, the way in which companies manage the available natural capital has an effect on the long-term viability of a

company (Deloitte, 2012:16). A further aspect to consider is accounting for such natural capital.

4.3.3 Natural capital accounting

The concept of accounting for natural capital has been used for more than 30 years. To date, however, progress in moving beyond conceptual thinking towards practical implementation of natural capital valuation has been slow (World Bank, 2012:1). Natural capital is a critical asset, especially for developing countries such as South Africa, where it makes up a significant share (36%) of total wealth. The World Bank believes that by valuing the environment and incorporating natural capital into national accounts could support better decisions. Wealth accounting (including natural capital accounting) can provide detailed statistics for better management of the economy, such as accounts for the sectorial inputs of water and energy, and outputs of pollution that are needed to model green growth scenarios (World Bank, 2012:2).

The existing integrated reporting framework does not have specific requirements in terms of water reporting. The natural capital resource, which water is part of, could be addressed under various sections of the integrated report namely governance, corporate policies, environmental management systems, risk assessment, materiality assessment and key performance indicators.

4.3.4 KING III and water

The King Report on Governance for South Africa 2009 (King III) defines integrated reporting as a holistic and integrated presentation of a company's performance in terms of both its finance and sustainability. King III supports the notion of sustainability, but makes the case that it should be part of integrated reporting (IODSA, 2009:13).

King III urges companies to identify the future of their business in the context of an ever-changing social, economic and environmental landscape. Among many other governance recommendations, King III encourages companies to produce meaningful integrated annual reports by using the guidance set out by the GRI (Rea,

2012:4). According to King III, sustainability reporting parameters are not yet standardised as in the case of financial reporting, and the performance indicators reported on should be explained in terms of their implications and taking cognisance of available benchmarks. Many listed companies make use of the GRI guidance and also use the JSE SRI-index criteria as a guiding framework (IODSA, 2009).

Although the King III report indicates the importance of sustainability disclosure and emphasises the fact that it should be part of integrated reporting, no specific water disclosure requirements are recommended. As stated by Rea (2012:4), King III refers companies to use the GRI guidelines to assist in improving disclosure.

4.3.5 Global Reporting Initiative and water

The objective of the GRI is providing guidelines for the compilation of sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Companies using the latest GRI guidelines, also referred to as the G4-guidelines, are required to perform a stakeholder-inclusive *materiality* assessment and report to this effect. Materiality assessment is discussed in the next section.

Guidelines provided by the GRI should form the foundation that companies can build on to improve their reporting and disclosure practices.

4.3.6 Reporting and disclosure requirements of natural capital

The integrated reporting framework does not have specific requirements in terms of water reporting. A study performed by the Association of Chartered Certified Accountants (ACCA) found that reporting on natural capital can be split into two main categories (ACCA, 2013): i) narrative reporting on strategy and management, and ii) performance reporting. Narrative reporting provides stakeholders with a *qualitative* understanding of a company's relationship to natural capital and the processes used to manage the various risks and opportunities associated with such a company's activities. On the other hand, performance reporting provides stakeholders with quantitative information, in the form of key performance indicators that can be used to track performance over time (ACCA, 2013:4).

ACCA (2013:4) further states that natural capital resources which water is part of, could be addressed under various sections in the integrated report through narrative disclosure, namely materiality assessment, governance, corporate policies, environmental management systems, and risk assessment. The various requirements under each section are discussed below.

Materiality assessment

Materiality according to IODSA (2012:9) is a measure or threshold against which information can be evaluated. An item is material if it is of such importance and has an impact that could substantially influence the assessments and decisions of the company or its stakeholders. In the context of sustainability, materiality is a more difficult measure to define and crisp judgement is therefore required. The materiality assessment ensures that company reports are not cluttered by excessive information, but instead focused on the topics that matter the most. By performing the assessment and disclosing it to the stakeholders demonstrates that only real important items are included in the reports.

As companies are faced with a wide range of sustainability reportable issues, it is crucial to ensure that the real materiality issues regarding natural capital, specifically water issues, are reported on.

Governance

When analysing the integrated reports, indications of having a director or senior staff member responsible for the company's sustainability programmes will demonstrate commitment and accountability (ACCA, 2013:4). Governance reporting should provide insight into which body in the company has ultimate oversight of water management and the mechanisms it uses to drive water related accountability (CDP, 2012:7).

Corporate policies

Disclosing sustainability policies is an effective method for companies to communicate their position on the subject, and policies that are agreed at board level serve as a way of focusing and aligning sustainability initiatives (ACCA, 2013:5).

Compliance with water related regulations as well as with voluntary standards or industry benchmarks may be used as a proxy for understanding a company's approach to managing water resources. Additionally, internally developed standards can pertain to a variety of water management topics, such as water use efficiency, quality parameters, level of water treatment, and operational management protocols. Reporting on these topics describe the nature of these standards, which entities within the business are encouraged and/or expected to meet (CDP, 2012:5).

Environmental management systems

Implementing an environmental management system (EMS) helps companies to reduce their environmental impacts, comply with applicable laws and regulations and continually improve their environmental performance. By operating under internationally recognised standards, such as ISO 14001, and communicating this to stakeholders, companies are able to demonstrate their commitment to improve their environmental performance (ACCA, 2013:5).

A corporate water management system could include the following information: i) how to improve operational water performance, ii) to understand how the company interacts with its surrounding basins, and iii) whether the company has a water strategy.

In the context of this study, focus will be placed on the disclosure within the SRI-indexed companies' integrated reports of water laws and regulations presented in the GRI guidelines, CDP water disclosure requirements, ISO 14001 and the Water Act (Act 36 of 1998). The research method discussed in section 4 will provide more clarity on the empirical study conducted.

Risk assessment

Companies that are clear about the key risks facing their operations and the plans that they have in place to mitigate those risks, can demonstrate to their stakeholders their level of preparation for uncertainty. This is of particular importance to investors who will be able to assess how well a company is managed by reviewing the comprehensiveness of its risk assessments (ACCA, 2013:6).

Many companies are exposed to water-related risks that can negatively affect business viability over the short or long term. Water risks can be grouped into four general categories, namely physical risks, regulatory risks, reputational risks and other risks (CDP, 2012:5):

- *Physical risks* occur when there is water stress (too little water), flooding (too much water), or pollution (lower water quality).
- *Regulatory risks* involve issues such as water permits and allocation, rates controlling withdrawal and discharge quantities, and restrictions on pollutant types and levels.
- *Reputational risks* manifest when water availability and quantity give rise to tension between businesses and local communities.
- *Other risks* can arise from issues such as litigation related to water related compliance or from changing consumer attitudes around water efficiency.

When analysing the integrated reports, emphasis will be given to the companies' risk assessment in terms of their water issues, specifically those that have indicated that water is of extreme importance for their long-term survival.

4.4 RESEARCH METHOD

A post positivist approach has been followed in the design of this paper. The research method utilised was content analysis. This method was chosen because it is widely used in accounting research to reveal useful insights into accounting practices (Steenkamp & Northcott, 2007:12).This research can be classified as both quantitative and qualitative research. The data as it appears in the integrated and sustainability reports of the companies is qualitative and quantitative in nature, and by comparing it with the water disclosure index it makes it possible to quantify the data or to add qualitative information.

The data is collected by obtaining the integrated and sustainability reports published by the companies listed on the JSE's SRI-index. A water disclosure index had been developed which was utilised as the measuring instrument in analysing the data. These reports were then compared to the water disclosure index to evaluate the level of reporting and disclosure by each company.

The population in this study comprises all the companies listed on the JSE SRI-index. The SRI-index requires three broad reporting categories namely environment, society and governance, and related sustainability concerns. In the environmental category the SRI-index classifies companies as a high, medium or low impact company (SRI, 2014:4). By means of quota sampling, this paper selected companies under the high impact category. The sampled companies and the sector they represent are presented in the next section.

4.5 RESULTS AND CONCLUSIONS

The sample group of companies' statements that were analysed comprised 37 companies. These companies have been classified into four groups referred to as sectors, namely i) basic materials, ii) mining, iii) industrials, and iv) consumer goods. Table 4.1 presents the number of companies analysed per sector.

Table 4.1: The number of companies analysed per sector

SECTOR	NUMBER OF COMPANIES
Basic Materials	5
Mining	17
Industrials	7
Consumer Goods	8
TOTAL	37

The results will be presented based on the companies' disclosure and reporting under the various sections of the integrated report namely: i) materiality, ii) governance, iii) corporate policies, iv) environmental management systems, and v) risk assessment. Lastly, an evaluation of the companies' overall disclosure will be presented.

The integrated and sustainability reports of the companies were analysed to identify whether water was highlighted as a *material* aspect in the respective companies. Table 4.2 presents the results per sector. In the mining sector 76% of companies identified water as a *material* aspect, followed by the basic materials sector

with 60%. Taking cognisance of the scarcity of water in South Africa, it is crucial for all companies to acknowledge water as a potential material aspect. For example, one of the South African mining companies, Harmony Gold (Harmony Gold, 2013:5), mentioned in their integrated report that their operations use a significant amount of water, and that the growth of their assets depends on access to this resource.

Table 4.2: Materiality

SECTOR	MATERIALITY
Basic Materials	60%
Mining	76%
Industrials	43%
Consumer Goods	50%
Average %	62%

When considering *governance* as a section in the integrated report, two questions were posed and evaluated using the water disclosure index. The results are presented in table 4.3.

Table 4.3: Governance

SECTOR	Basic Materials	Mining	Industrials	Consumer Goods	Average %
GOVERNANCE					
Does the company have a director or senior staff member responsible for water disclosure programmes?	80%	94%	57%	88%	84%
Does the company have a water-related policy / policies?	80%	88%	43%	75%	76%

The mining sector indicated the highest commitment towards appointing a dedicated person responsible for water governance and this sector also indicated that water-related policies are in place. The next section of the integrated report that was

evaluated was on disclosure and reporting of *corporate policies*. Table 4.4 presents the results on corporate policies and the evaluation thereof.

Table 4.4: Corporate policies

SECTOR	Basic Materials	Mining	Industrials	Consumer Goods	Average %
CORPORATE POLICIES					
Does the company have internally developed standards on water-related issues?	100%	100%	57%	100%	92%
Does the company comply with external standards on water such as:					
GRI	80%	100%	100%	75%	92%
CDP Water program	80%	71%	29%	63%	62%
King III	100%	100%	100%	100%	100%
ISO 14001	80%	82%	100%	63%	81%
The Water Act(36:1998)	20%	41%	0%	0%	22%

Companies in all sectors except the industrial sector, indicated in their integrated and sustainability reports that they have internal water-related standards. This finding emphasises that most of the companies illustrate commitment towards water stewardship.

The next question evaluated whether the companies comply with the key external standards applicable to water. These external standards are the GRI, CDP Water program, King III, ISO 14001 and the Water Act. The results indicated that most of the companies adhere to the disclosure requirements of the GRI. Although the basic materials (80%) and mining (71%) sector acknowledge the requirements as stipulated by the CDP Water program, an average of 62% of the companies take the requirements of the CDP Water program into consideration. It is furthermore evident

that the industrial sector conforms 100% to ISO 14001 requirements, while the Water Act is not well acknowledged by all the sampled companies.

The next section will present the results of whether a company has environmental management systems in place. Three questions were developed as part of the water disclosure index and were then analysed. The results are presented in table 4.5.

Table 4.5: Environmental management systems

SECTOR	**Basic Materials**	**Mining**	**Industrials**	**Consumer Goods**	**Average %**
Establish whether the company has *environmental management systems (EMS)* for water-related issues by identifying the following:					
Does the company have indications of improving operational water systems by applying internal measures?	100%	100%	86%	100%	97%
Does the company indicate that it understands the context in which it operates in terms of water stress, flooding, water quality and regulatory uncertainty?	100%	100%	57%	88%	89%
Has the company developed its own water strategy?	80%	100%	57%	100%	89%

It is evident that all the sectors except the industrial sector perform above average on all three questions. In the analysis of the various integrated and sustainability reports, it was clear that the mining sector fully understands and appreciates the context in which they operate. The mining sector is the only sector with a 100% score in all three questions. The last of the sections of the integrated report disclosure requirement is *risk assessment*. It is important that companies must identify water-related risks that could possibly affect their business. In table 4.6, the risk assessment of the companies are analysed in three categories.

Table 4.6: Risk assessment

SECTOR	Basic Materials	Mining	Industrials	Consumer Goods	Average %
Establish whether the company has *risk assessment* actions for water-related issues by identifying the following:					
Has the company identified physical risks such as flooding, water stress and pollution?	60%	100%	71%	100%	89%
Has the company identified regulatory risks such as water permits, rates controlling water withdrawal, discharge quantities and other restrictions?	100%	94%	29%	75%	78%
Has the company identified reputational risks such as tensions between businesses and local communities or businesses and other supply chain members?	60%	94%	14%	63%	68%

The mining sector performed the best of all three categories by identifying physical risks (100%), regulatory risks (94%) and reputational risks (94%). Only 60% of the basic materials sector identified physical risks, while the industrial sector was the worst performer in identifying regulatory and reputational risks.

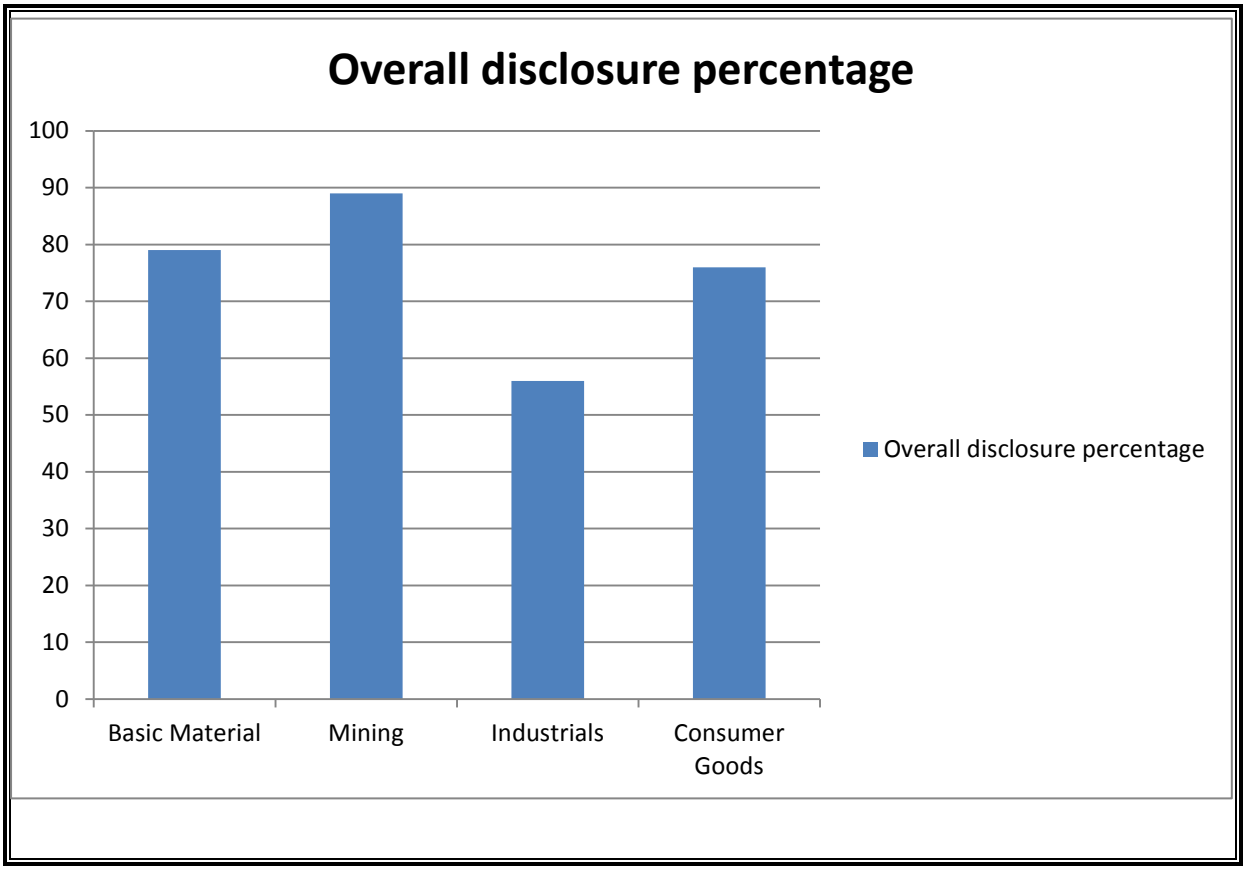
Physical risks are disclosed most frequently by all companies. Under this heading water scarcity was identified as the key risk which includes aspects such as the potential loss in quality of water and the resulting higher cost of water.

Under regulatory risks many companies identified that they have water use licences in place, but add that the renewal and application for licenses pose a potential risk.

Comprehensive disclosure about reputational risks was evident in the mining sector, with most of the companies identifying the influence of their operations on the community in terms of water quality and availability.

Finally, the companies' *overall* disclosure concerning materiality, governance, corporate policies, environmental management systems, and risk assessment was analysed. The overall percentage achieved by each sector is illustrated in graph 4.1.

Graph 4.1: Overall disclosure percentage per sector



As indicated in graph 4.1 the mining sector achieved the highest overall average of 89% while the industrial sector the lowest score of 56% overall.

Summarily, the *materiality* of water was of the greatest importance to the mining sector. Furthermore, with the exception of the industrial sector, it is evident that the companies are serious, transparent and responsible towards the *governance* of water. Many companies in the mining sector indicated that they have *corporate policies* including water management programmes and projects in place to manage the quality of water and to measure the consumption of water. The analysis of table 4.5 corresponds with the findings in table 4.2 that the mining sector has *environmental management systems* in place for water-related issues. While reviewing the reports, clear descriptions of the context in which these mining companies operate were provided. The mining companies also identified the water stressed areas of their operations.

4.6 CONCLUSION AND RECOMMENDATIONS

The main research objective was to evaluate the water-related reporting and disclosure practices of the sampled group of companies. It was evident from the study that not all the sectors disclose the required information to the same detail and depth. The results indicated that the mining sector outperforms the other sectors by disclosing and reporting the most detail on water-related aspects. The industrial sector on the other hand performs the worst.

As water is identified as a scarce resource and is perhaps the most important natural resource for human survival, more pressure should be placed on companies to disclose information about water-related issues. Investors and stakeholders are seeking detailed information on how companies address and manage water-related issues. In reviewing the integrated and sustainability reports of the sampled companies it is evident that in the narrative disclosure sections of the reports, companies do provide the *basic* disclosure items such as governance, corporate policies, EMS and risk assessment.

It is therefore recommended that companies could improve the relevance, depth and clarity of their disclosure on water. More detail could be provided on how companies are addressing the water risk they are facing.. It is furthermore recommended that the developed water disclosure index be utilised by companies to evaluate whether they are complying with the disclosure and reporting requirements of external standards such as the GRI, CDP Water program, King III, ISO 14001 and the Water Act. Finally, although companies reported that they have targets for water consumption and recycling of water, most of these targets are not supported by quantified figures. By supporting the narrative information with quantified figures, the disclosure on water will be improved.

4.7 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

The results of this study are limited by the fact that the focus was only on the SRI-indexed companies that were classified as companies that have a high impact on the environment. This limitation is an area identified for further research. The research study can therefore be expanded to include more companies. Companies that are

not listed on the SRI, but on the JSE could be included. Further research could be performed by comparing SRI-indexed and those not listed on the SRI. Research on other important natural capital resources such as air and land could also be considered.

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CHAPTER 5

5 RESEARCH ARTICLE 2

Title: Analysis of water resource management disclosures in SRI-indexed JSE-listed companies

The reader is requested to take note of the following:

- The article has not yet been submitted, but the proposed title is:

Botha, M.J. & Middelberg, S.L. Analysis of water resource management disclosures in SRI-indexed JSE-listed companies

- The article was researched and written by the first author as the candidate and primary author, while the second author fulfilled a reviewer function thereto as the research project's study leader.

Abstract

South Africa is amidst a water crisis in terms of the scarcity as well as the quality of water. To avoid a water crisis, water supply needs to be enhanced, but even more important is to increase the efficiency of water management and water consumption. In order to reach these goals it is important for companies to effectively manage their water resources. The disclosure of key performance indicators (KPIs) is one of the most effective means for companies to communicate their sustainability performance and their impacts on natural capital such as water. The purpose of this paper is identifying and analysing the required KPIs for the reporting and management of water in SRI-indexed JSE-listed companies. Content analysis was used as the research method to analyse the integrated and sustainability reports of a selected group of SRI indexed JSE-listed companies. In the process of analysing the integrated and sustainability reports with specific reference to the key performance indicators, it was evident that companies lack comparability and consistency in their disclosure.

Keywords: Water, integrated reporting, sustainability reporting, sustainable disclosure; key performance indicators.

5.1 BACKGROUND

South Africa is a country famous for its biodiversity, and is the third most diverse country in the world. In terms of freshwater biodiversity, the country has 223 different types of river ecosystems and 792 different types of wetland ecosystems (WWF-SA, 2013:10). South Africa's freshwater ecosystems have been mapped and classified into National Freshwater Ecosystem Priority Areas (NFEPAs). This mapping indicates that 60% of our river ecosystems are threatened and 23% are critically endangered. The situation for wetlands is even worse: 65% of our wetland types are threatened, and 48% are critically endangered. Water faces many threats on its journey from the headwaters of the river basin to water users and estuaries. Pollution from fertilisers, waste water treatment plants and mining threatens to poison our rivers. Water is a renewable source, replenished each year during the rainy season. However, it is an irreplaceable source that cannot be substituted by anything else (WWF-SA, 2013:10). South Africa is amidst a water crisis in terms of the scarcity as well as the quality of water.

Corporate sustainability is an approach that creates long-term shareholder value by embracing opportunities and managing risks from economic, environmental and social dimensions (Lo & Shue, 2007:346). Companies should focus on the effective management of limited non-renewable natural resources. A collective effort is however necessary to balance socio-economic needs with environmental needs. Natural resources are the land, air, water, living organisms and all formations of the earth's biosphere that provide us with ecosystem goods and services imperative for our survival and well-being (IISD, 2013:1). This study will however focus on water.

The world has witnessed a massive increase in water demand over the past century, driven by forces of industrialisation, economic development and population growth. This growing demand for water globally is leading to increased tension and challenges about the effective management thereof especially in many parts of the world where industry, agriculture and local communities are competing for this precious resource. To avoid a crisis, water supply needs to be enhanced and the efficiency of water use increased (WWF-SA, 2013:11).

According to Simpson, the Chief Executive Officer of the Carbon Disclosure Project (CDP), there is a need for meaningful and systematic reporting on water globally (CDP, 2012:2). Guidelines on how companies can improve water resource management and disclosure have been provided by organisations such as the Carbon Disclosure Project (CDP), Global Reporting Initiative (GRI), King III, and the Association of Chartered Certified Accountants (ACCA).

The disclosure of key performance indicators (KPIs) is arguably the most effective means for companies to communicate their sustainability performance and their impacts on natural capital such as water. Through the disclosure of KPIs companies are able to set targets and track their progress in meeting those targets over time. By using standards companies are encouraged to increase the level of comparability between companies and the trust in the data presented.

It can therefore be said that South Africa and the rest of the world, is facing a potential water crisis. As such, companies should focus on behaving sustainably by carefully monitoring and managing water resources. Once water-related aspects are monitored and managed, the reporting thereof can improve. The measurement of water is therefore important and the use of key performance indicators plays an important role. The following research questions can therefore be raised: Are South African companies currently complying with the disclosure on the use and management of water? And if so, which key performance indicators are they using to report? The main objective of this study is to address these research questions by identifying and analysing the required KPIs for the reporting and management of water. The contribution of the study is the development of a water KPI framework that companies could use in their management and reporting of water.

The rest of the paper is structured as follows: firstly, the theoretical framework in which the concepts of integrated reporting and performance reporting are highlighted. This is followed by a presentation of the results of the study and finally the paper concludes with recommendations, limitations and areas for further research.

5.2 RESEARCH METHOD

The research follows a mixed method approach by combining both qualitative and quantitative research techniques. The researcher followed a post positivist approach in the design of this paper and content analysis was the method used to collect the data. Content analysis is a systematic method of categorising the content of texts (Smith, 2011). The data was collected by locating the integrated and sustainability reports published by the companies listed on the South African stock exchange, the Johannesburg Stock Exchange Limited (JSE)'s Socially Responsible Investment (SRI)-index. A KPI framework was developed from the literature study which was utilised as the measuring instrument to analyse the data.

The population in this study is all the companies listed on the JSE SRI-index. According to the background and criteria of the SRI-index they identify three broad categories that should be reported on, namely environment, society and governance and related sustainability concerns. In the environmental category the SRI-index classifies companies as a high, medium or low impact company (SRI, 2014:4). By means of quota sampling, this paper selects companies under the high impact category.

5.3 THEORETICAL FRAMEWORK

5.3.1 Integrated reporting

Since the turn of the century there has been a drive to move away from stand-alone financial and sustainability reports towards a more integrated approach. The first attempt in South Africa to enforce integrated reporting across all listed companies was introduced in 2010 by the JSE, which mandated integrated reporting (IRCSA, 2011:7). The listing requirements of the JSE compel compliance via the King III Report and therefore companies are now obliged to produce an integrated report (IRCSA, 2011:7). In essence, an integrated report is a compilation of the conventional financial statements and the so-called sustainability report, with the aim of providing the stakeholders of the company with a complete overview of the company's historical operations and future prospects. It also integrates and links information about strategy, risks and opportunities and relates these to the social, environmental, economic and financial issues (IIRC, 2011:2).

In the 1990s some companies began to publish sustainability reports and as this was a voluntary action, these reports lacked reporting standards. The lack of standards led to the foundation of the GRI, a non-profit organisation, in 1997 (Musikanski, 2012). The objective of the GRI was to provide guidelines for sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Since 2002, sustainability reporting has become a widely accepted practice and South Africa can be regarded an emerging market leader in the field (IODSA, 2009:13). This is partially due to King II and other initiatives such as the JSE's Socially Responsible Investment (SRI) index. The SRI-index is part of the JSE and is an index that measures companies' policies, performance and reporting in relation to the three pillars of the triple bottom line (environmental, economic and social sustainability), as well as corporate governance practice (JSE, 2013).

King III supports the notion of sustainability, but makes the case that it should be part of integrated reporting (IODSA, 2009:13). King III urges companies to identify the future of their business in the context of an ever-changing social, economic and environmental landscape. Among many other governance recommendations, King III encourages companies to produce meaningful integrated annual reports by using the guidance set out by the GRI (Rea, 2012:4). According to King III, sustainability reporting parameters are not yet standardised as in the case of financial reporting, and the performance indicators reported on should be explained in terms of their implications and taking cognisance of available benchmarks. Many listed companies make use of the GRI guidance and also use the JSE SRI-Index criteria as a guiding framework (IODSA, 2009).

Although the King III report indicates the importance of sustainability disclosure and emphasises the fact that it should be part of integrated reporting, no specific water disclosure requirements are recommended. As stated by Rea (2012:4), King III refers companies to use the GRI guidelines to assist them for improved disclosure.

5.4 PERFORMANCE REPORTING

It is clear that the guidelines provided by the GRI should form the foundation that companies can build on to improve their reporting and disclosure practices. The GRI also identifies a large number of KPIs related to environmental aspects that should

be reported on. For example, if a company has reported on its management approach to a particular aspect, it can select the relevant indicators to provide specific data on performance and impacts. The latest GRI guidelines, namely the G4 guidelines, have three specific environmental indicators (EN 8, EN 9 and EN 10) for water (ACCA, 2013:8). These are: i) EN 8: Total water withdrawal by source, ii) EN 9: Water sources significantly affected by withdrawal of water, and iii) EN 10: Percentage and total volume of water recycled and reused (GRI, 2011:14-16; GRI, 2013:54-55). Each of these three indicators will now be presented and discussed.

5.4.1 Total water withdrawal by source (EN 8)

Total water withdrawal by source is the sum of all water drawn into the boundaries of the company from all sources (including surface water, ground water, rainwater and municipal water supply) for any use over the course of the reporting period.

The total water withdrawn indicates the company's size and importance as a water user, and provides a baseline figure for other calculations relating to efficiency and use. Total water use also indicates the level of risk posed by disruptions to water supplies or increases in the cost of water. Clean freshwater is becoming increasingly scarce, which can have an impact on production processes that rely on large volumes of water. In regions where water sources are highly restricted, the company's water consumption patterns can also influence relations with other stakeholders.

The reporting company must identify the total water withdrawal from any water source that was either withdrawn directly by the company or through intermediaries such as water utilities, including the abstraction of cooling water.

The following key performance indicators formed the basis of the framework that was developed in this study for measuring the total water withdrawal by source (EN 8).

Report the total volume of water withdrawn in cubic meters per year (m^3/year) from the following sources:

- Surface water, including water from wetlands, rivers, lakes and oceans;
- Ground water;

- Rainwater collected directly and stored by the company;
- Waste water from another company; and
- Municipal water supplies or other water utilities.

Report standards, methodologies, and assumptions used.

The second indicator evaluates the water sources significantly affected by withdrawal of water.

5.4.2 Water sources significantly affected by withdrawal of water (EN 9)

Withdrawals from a water system can affect the environment by lowering the water table, reducing volume of water available for use, or altering the ability of an ecosystem to perform its functions. These changes have wider impacts on the quality of life in the area, including economic and social consequences.

This indicator measures the scale of impacts associated with the company's water use. In terms of relations with other users of the same water sources, this indicator enables an assessment of specific areas of risk improvement, as well as the stability of the company's own water sources.

The reporting company must identify sources significantly affected by water withdrawal which meet one or more of the following criteria:

- Withdrawals that account for an average of 5% or more of the annual average volume of a given water body;
- Withdrawals from water bodies that are recognised by professionals as being particularly sensitive due to their relative size, function or status as a rare, threatened or endangered system (or to their support of a particular endangered species of plant or animal); and
- Any withdrawal from a Ramsar-listed wetland (refer to the details below) or any other nationally or internationally proclaimed conservation area regardless or the rate of withdrawal.

Ramsar refers to a convention held about wetlands in the Iranian city of Ramsar in 1971. According to the broad definition that the convention adhered to wetlands

includes lakes and rivers, swamps and marshes, wet grasslands and peat-lands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans (Ramsar, 2012:1).

The following performance indicators are used in the water KPI framework to evaluate the water sources significantly affected by water withdrawal.

Report the total number of water sources significantly affected by withdrawal by type:

- Size of water source in cubic meters (m^3);
- Whether or not the source is designated as a protected area (nationally or internationally);
- Biodiversity value (such as species diversity and endemism, total number of protected species); and
- Value or importance of water source to local communities and indigenous people.

Report standards, methodologies and assumptions used.

The third and last indicator measures the percentage and total volume of water recycled and reused.

5.4.3 Percentage and total volume of water recycled and reused (EN 10)

The rate of water reuse and recycling can be an efficiency measure and can demonstrate the success of the company in reducing total water withdrawals and discharges. Increased reuse and recycling can result in a reduction of water consumption, treatment and disposal costs. The reduction of water consumption through reuse and recycling can also contribute to local, national or regional goals for managing water supplies.

This indicator measures both water that was treated prior to reuse and water that was not treated prior to reuse. Grey water (collected rainwater and wastewater generated by household processes such as washing dishes, laundry and bathing) is included.

The performance indicators listed below will measure the company's performance in terms of the percentage and total volume of water recycled and reused.

Report the total volume of water recycled and reused by the company in cubic meters per year (m^3/year).

Report the total volume of water recycled and reused by the company in cubic meters per year (m^3/year) as a percentage of the total water withdrawal reported under Indicator G4 – EN 8.

Report standards, methodologies and assumptions used (GRI, 2013:54-55).

The results and conclusions of the study will now be discussed.

5.5 RESULTS AND CONCLUSIONS

A total number of 37 JSE's SRI-index companies' integrated and sustainability reports were analysed. This target group of companies were further clustered into four sectors according to their listings on the JSE. After this clustering there were four groups, namely basic materials, mining, industrials and consumer goods. Table 5.1 presents the number of companies analysed per sector.

Table 5.1: The number of companies analysed per sector

SECTOR	NUMBER OF COMPANIES
Basic Materials	5
Mining	17
Industrials	7
Consumer Goods	8
TOTAL	37

From table 5.1 it is clear that the sector with the most representatives was the mining sector with 17 companies. In the following tables the results related to the sectors' performance on the KPIs as identified in the literature will be presented and discussed. The results will be presented based on the three specific environmental

indicators of: i) EN 8: Total water withdrawal by source, ii) EN 9: Water sources significantly affected by withdrawal of water, and iii) EN 10: Percentage and total volume of water recycled and reused.

With reference to the first indicator of total water withdrawal by source, it is clear that all four sectors report above average on the total water withdrawal per source with an average of 89% (refer to table 5.2). All the companies in the basic material sector report on the total volume of water withdrawal per source, followed by the mining sector with 94%.

Table 5.2: Total water withdrawal by source (EN 8)

SECTOR	**Basic materials**	**Mining**	**Industrials**	**Consumer goods**	**Average %**
Reported on total volume of water withdrawn	100%	94%	86%	75%	89%
Report on detail withdrawal per source	60%	82%	43%	25%	59%
Water sources reported on by companies who provided detailed reports					
Surface water	2	10	0	1	
Groundwater	3	12	0	1	
Rainwater	0	2	0	0	
Waste water	2	6	0	0	
Municipal/potable water	3	12	3	2	

The GRI requests companies to not only report and disclose the total withdrawal, but also to provide more detail regarding the source of water withdrawal. As presented in table 5.2, the mining sector provides the most detail in connection with the different water sources reported, with a percentage of 82%. Twelve companies withdrew water from groundwater and municipal water, with surface water (10) and waste water (6) companies. The lack of detail in the other sectors indicates that companies are still struggling to collect and to report water data. There is a need for guidance regarding how and what to measure and an industry standard could support the process.

It was further found that some companies set a baseline year as a benchmark to measure against. This can be problematic because production levels (output) vary from year to year. Goldfields Limited (2013:86) expressed total water withdrawal (input) against one ounce of gold produced (output).

Table 5.3 deals with the second indicator of information provided about the water sources significantly affected by companies as the result of water withdrawal.

Table 5.3: Water sources significantly affected by withdrawal of water (EN 9)

SECTOR	Basic materials	Mining	Industrials	Consumer goods	Average %
Does the company report on the total number of water sources significantly affected by withdrawal of water taking the following into account:	60%	65%	29%	13%	46%
Size of water source affected	2	7	2	1	
Whether the source is in a designated or protected area	2	9	2	1	
Indication of biodiversity value	2	9	2	1	
Importance of water source to local communities	3	9	2	1	

In this key performance indicator companies performed below par, with an average of 46% disclosure. The mining sector disclosed the most information with 65%, followed by the basic material sector with 60%. The rest of table 5.3 deals with the detailed information about the size of the affected area, whether the source is in a designated or protected area, the biodiversity value and the importance of the area to the community. Once again the mining sector addressed most of these aspects with detailed descriptions.

The third and last indicator measures the percentage and total volume of water recycled and reused. This is an important indicator that measures a company's commitment towards recycling and reusing water. Table 5.4 presents the results of the analysis of the companies integrated and sustainability reports in terms of this indicator.

Table 5.4: Percentage and total volume of water recycled and reused (EN 10)

SECTOR	Basic materials	Mining	Industrials	Consumer goods	Average %
Total volume of water recycled	60%	65%	14%	25%	46%
% water recycled of total volume	20%	53%	14%	13%	32%

In this section 65% of the mining sector indicates the total volume of water that they recycled, with the basic material sector in second place with 60%. The second part of the question is even more important because it provides the percentage of companies that indicates the amount of water recycled as a percentage of total water withdrawal. Only 32% of the companies disclose this percentage. It should be emphasised that KPIs like this percentage of recycling is very important in South Africa as a water restricted country. The importance of water recycling and also how to measure and report on it is crucial.

5.6 CONCLUSIONS AND RECOMMENDATIONS

As mentioned in the literature the disclosure of KPIs is arguably the most effective means for companies to communicate their sustainability performance and their impact on natural capital. South Africa, and also the rest of the world, is facing a scarcity of water and therefore it is crucial that companies should monitor and manage their water usage. The main research objective was to identify and analyse the required KPIs for the reporting and management of water. In the results it was evident that companies lack comparability and consistency in their disclosure. The lack of detail in how much water is withdrawn, the detail about the sources, indications of sources significantly affected, as well as an indication about the amount or percentage reused or recycled indicates that most of the companies still struggle to collect and report on water data.

As presented in the results, it was found that companies set a baseline year as a benchmark to measure against. As production levels vary from year to year, this form of measurement can be problematic. It is therefore recommended that an

efficiency indicator that measures input in terms of output could improve the disclosure of important environmental information. This kind of an efficiency ratio has the potential to become a usable and comparable indicator per sector or industry. In the future it could be utilised as a benchmark or standard to assess effectiveness and improvement in relation to the scarce resource (water).

It is recommended that companies make use of the water KPI framework as developed in this study to measure, manage and report on their use of water to ensure that this scarce natural resource is used optimally and efficiently.

5.7 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

The results of this study are limited by the fact that the focus was only on the SRI-indexed companies that were classified as companies that have a high impact on the environment and as such the results cannot be generalised. Considering the above limitation, and the increasing importance of sustaining water, research can be expanded to include companies not listed on the SRI index. Other key performance indicators as listed in the G4 guidelines could also be investigated.

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CHAPTER 6

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 INTRODUCTION

This last chapter will summarise this study by drawing conclusions and making recommendations based on the research objectives as stated in chapter one (refer paragraph 1.3, page 5). The primary objective of this study was to analyse and compare water-related reporting and disclosure requirements of SRI-indexed JSE-listed companies. In order to achieve the primary objective it was supported by secondary objectives, namely:

- To conceptualise from literature the practice of integrated and sustainability reporting, including the need for reporting on water management (refer chapter 3, page 18),
- To conceptualise from literature the reporting and disclosure requirements of water (refer chapter 3, page 18)
- To identify whether companies are complying with the reporting and disclosure requirements of water in the narrative part (refer research article 1 chapter 4, page 37);
- To identify and compare the required key performance measurement systems for the reporting and management of water (refer research article 1 chapter 4, page 37); and to
- Identify and compare the required key performance indicators for the reporting and management of water (refer research article 2 chapter 5, page 59).

The study was performed by conducting both a literature review and empirical study. A summary of each will be provided below.

6.2 LITERATURE REVIEW SUMMARY

The problem statement as set in chapter one (refer paragraph 1.2, page 3) emphasised the importance of water for South Africa as a country and for companies in this country. Globally and in South Africa there is a shortage of water and it is therefore crucial that this limited natural resource should be properly monitored and

managed. Corporate sustainability includes that companies should take responsibility for managing water in their day to day operations by measuring its performance through key performance indicators.

Sustainability, integrated reporting and its requirements for sustainability disclosure were conceptualised. The disclosure guidelines as provided by the King III report, GRI and the CDP water program were also presented. These guidelines are not as comprehensive in terms of water management and disclosure. The most comprehensive guidelines of the three guidelines mentioned is the G4 GRI guidelines, which are the latest GRI guidelines. The King III report on corporate governance encourages companies to make use of the GRI guidelines when reporting and disclosing information in their integrated reports.

The importance of whether water is a material issue for the company and the value of reporting about water-related aspects, was also highlighted. The information gathered during the literature study enabled the researcher to develop both a water disclosure index and a water KPI framework that was utilised as a measuring instrument in collecting data.

6.3 EMPIRICAL STUDY SUMMARY

The empirical study was conducted by analysing the integrated and sustainability reports of the sampled group of JSE-listed companies from the SRI-index. This group included 37 companies clustered into four sectors, namely basic materials, mining, industrials and consumer goods. Content analysis was used to analyse the disclosure of the companies by measuring the information provided using the developed water disclosure index and water KPI framework. The water disclosure index focused on the narrative part of water disclosure while the water KPI framework concentrated on of the key performance indicators related to water.

The company's overall disclosure about materiality, governance, corporate policies, environmental management systems, and risk assessment was analysed with the mining sector achieving the highest overall average of 89% and the industrial sector the lowest score of 56%. It was found that companies clustered in the mining sector are at the forefront in terms of the detail and quality of their disclosure practices.

It was furthermore found after reviewing the integrated and sustainability reports of the sampled companies that it is evident that in the narrative disclosure sections of the reports, companies only provide the *basic* disclosure items such as governance, corporate policies, EMS and risk assessment.

It can therefore be recommended that companies should focus on improving the relevance, depth and clarity of their disclosure on water. The level of detail that is provided could be enhanced to include how a company is addressing the water risk that they are facing. Companies could use the developed water disclosure index to evaluate whether they are complying with the disclosure and reporting requirements of external standards such as the GRI, CDP Water program, King III, ISO 14001 and the Water Act.

Another finding on the disclosure on water include that although companies reported that they have targets for water consumption and recycling of water, most of these targets were not supported by quantified figures. The recommendation could be made that by supporting the narrative information with quantified figures, a company could improve their disclosure on water.

When comparing the results of the disclosure of key performance indicators as suggested by the GRI, it was evident that the sampled companies lack comparability and consistency in their disclosure. Most of the companies struggled to collect and report on data pertaining to water. This was evident in the lack of detail in how much water is withdrawn, the detail about the sources, indications of sources significantly affected, as well as an indication about the amount or percentage reused or recycled.

It was finally recommended that companies utilise the developed water KPI framework to measure, manage and report on their use of water to ensure that this scarce natural resource is used optimally and efficiently.

6.4 CONCLUDING REMARKS

As water is identified as a scarce resource and is perhaps the most important natural resource for human survival, more pressure should be placed on companies to

disclose information about water-related issues. Investors and stakeholders are seeking detailed information on how companies address and manage water-related issues.

This study has contributed to the knowledge on the reporting and disclosure of water-related aspects in SRI-indexed JSE-listed companies. Companies focused on behaving in a sustainable manner can utilise the water disclosure index and water KPI framework to improve their reporting on the management of water.

The research objectives have therefore been achieved.

6.5 LIMITATIONS OF THE STUDY

The results of this study are limited by the fact that only JSE-listed SRI-indexed companies classified as companies that have a high impact on the environment was part of the sampled companies. The results can therefore not be generalised. Another limitation of this study is that this study focused on South African companies and the results may therefore not be applicable to other countries.

6.6 AREAS FOR FUTURE RESEARCH

The limitations listed above provide a guideline for the areas for future research. This study could be expanded to include other listed companies that are not part of the SRI-index or that is not listed. It provides an opportunity for comparing the results between the SRI-indexed companies and those companies that do not form part of the index or are not listed.

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ANNEXURE 1: ARTICLE AS SUBMITTED

EVALUATING THE WATER-RELATED REPORTING AND DISCLOSURE REQUIREMENTS OF SOCIALLY RESPONSIBLE INVESTMENT-INDEXED JSE-LISTED COMPANIES

Abstract

South Africa is facing a water crisis in terms of the scarcity and the quality of its water. Considering this water-constrained future it is evident that companies in South Africa should pay attention to the pristine management of this scarce resource. The purpose of this paper is therefore to evaluate the reporting and disclosure requirements of water of Socially Responsible Investment-indexed (SRI) JSE-listed companies. The disclosure requirements of the integrated report, King III, the Global Reporting Initiative and the Association of Chartered Certified Accountants, provided the theoretical background to develop a water disclosure index. Content analysis was used as the research method to analyse the integrated and sustainability reports of a selected group of SRI indexed JSE-listed companies. The results were analysed in terms of the disclosure on items such as materiality, governance, corporate policies, environmental management systems and risk assessments. The findings of the study include that most of the companies illustrate commitment towards water stewardship by reporting on water-related aspects. The mining sector rated the highest on disclosure and reporting of water-related aspects by providing the most detailed descriptions concerning the various risks. It is recommended that companies improve the relevance, depth and clarity of their disclosure on water.

Keywords: Water, integrated reporting, sustainability reporting, sustainable disclosure, SRI index

1.1 BACKGROUND

Sustainability disclosure has become a necessary tool for an investor since it directly drives a company's value creation process. It also provides a stakeholder with a more comprehensive picture of a company's performance (IRCSA, 2011:1). Sustainability reporting, or triple bottom line (TBL) reporting, refers to a tripartite reporting framework that highlights the economic, environmental and social performance of a company (Choudhuri & Chakraborty, 2009:48). Since the year 2000 there has been an initiative to move away from stand-alone financial and sustainability reports towards a more integrated approach. The first attempt in South Africa to enforce integrated reporting across all listed companies was introduced in 2010 by the South African stock exchange, the JSE Limited (JSE), which mandated integrated reporting (IRCSA, 2011:7). The current listing requirements of the JSE compel compliance via the King III Report (also known as the King Report on Governance for South Africa, 2009) and as such companies have to produce an integrated report (IRCSA, 2011:7).

A company's integrated report is in essence a compilation of the conventional annual financial statements and the so-called sustainability report, with the aim of providing the stakeholders of the company with a complete overview of the company's historical operations and future prospects. It also integrates and links information around strategy, risks and opportunities and relates these to the social, environmental, economic and financial issues (IIRC, 2011:2).

In the 1990s certain companies began to publish sustainability reports and as this was a voluntary action, these reports lacked reporting standards. The lack of standards led to the foundation in 1997 of the Global Reporting Initiative (GRI), a non-profit organisation (Musikanski, 2012). The objective of the GRI was to provide guidelines aimed at sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Since 2002, sustainability reporting has globally become a widely accepted practice in South Africa being regarded as an emerging market leader in this field (IODSA, 2009:13). This is partially due to King II and other initiatives such as the JSE's Socially Responsible Investment (SRI) index. The SRI index is a JSE index that measures companies' policies, performance and reporting in relation to the three pillars of the TBL (environmental, economic and social sustainability), as well as corporate governance practices (JSE, 2013).

The Integrated Reporting Committee of South Africa (IRCSA, 2011:7) suggested eight elements to be part of the integrated report. One of these eight elements is "Organisational overview, business model, and governance structure". Under this element the International Integrated Reporting Committee (IIRC) identifies six capitals which are, in essence, the financial and non-financial resources that companies should report on. These six capitals are i) financial, ii) manufactured, iii) human, iv) intellectual, v) natural, and vi) social capital.

The importance of how companies manage these capitals/resources has an effect on a company's long-term existence (Deloitte, 2012:16). One of the six capitals mentioned above refers to the resource of natural capital and is important in the context of this paper. This natural capital resource includes water, land, minerals and forests as well as information regarding biodiversity and eco-system health.

It is projected that South Africa could deplete its water resources by 2025, and in Gauteng, South Africa's economic hub, it could be as early as 2015 (BDlive, 2013:1). Moreover, the scarcity of water is a growing concern about the effect of climate change on agricultural production. South Africa receives half the average global annual rainfall and 98% of its water systems are in a crisis mode (WWF-SA, 2013). Furthermore, South Africa has no surplus water and all future development will be constrained by this fact. Farmers will have to double their use of water by 2050 if they are to meet growing food demands. To avoid a crisis, water supply needs to be refined and enhanced and water use efficiency increased. In addition, the population is growing and getting wealthier and that adds to the problem of food security (WWF-SA, 2013).

There were several attempts to improve both global and South African sustainability reporting guidelines such as the Carbon Disclosure Project (CDP), GRI, King III, as well as guidelines developed by the Association of Chartered Certified Accountants (ACCA). The Carbon Disclosure Project (CDP) is an independent non-profit company holding the largest database of primary corporate climate change information in the world. In 2013, the GRI and CDP signed an agreement with the aim of aligning the areas of their reporting frameworks (GRI, 2014). According to Simpson, the Chief Executive Officer of the Carbon Disclosure Project, there is a need for meaningful and systematic reporting on water globally. The purpose of this study is aimed at addressing this need.

When companies are required to report about the environment and specifically about water, water-related aspects should firstly be identified. Once such aspects have been identified, it can be monitored and managed, and the reporting thereof can improve. As companies generally make use of performance measurement systems to measure and monitor financial performance, more contemporary approaches are required to measure and monitor non-financial aspects such as the pristine management of water. As the publishing of integrated reports are a JSE listing requirement, the following questions can be raised: Are companies currently complying with the disclosure on the use and management of water? If so, which performance measurement systems are they utilising to report on? These questions are designed to address the knowledge gap and provide the motivation for research conducted in this paper. The contribution of the study is to develop a water disclosure index to assist companies in evaluating their water-related disclosure and reporting practices.

The rest of the paper is structured as follows: firstly, the research objective is stated followed by the theoretical framework in which the concepts of sustainability, integrated reporting, natural capital and the importance of water are highlighted. This is followed by the empirical results and finally the paper concludes with recommendations, limitations and areas for further research.

1.2 RESEARCH OBJECTIVE

In order to address the research questions posed above, the main research objective of this paper is to evaluate the water-related reporting and disclosure of socially responsible investment-indexed JSE listed companies. In order to achieve the research objective, the theoretical framework on which the study is based is discussed next.

1.3 THEORETICAL FRAMEWORK

1.3.1 Sustainability and sustainability disclosure

Sustainability can be defined as development that meets present needs without compromising the ability of future generations to meet their own needs (United Nations, 1987). In this context sustainability regarding our environment and natural resources becomes more important to companies and should be integrated into day to day management activities. The focus in this study in terms of sustainability is therefore concerning the effective management

of non-renewable natural resources. Natural resources are the land, air, water, living organisms and all formations of the earth's biosphere that provide us with ecosystem goods and services imperative for our survival and well-being (IISD, 2013:1).

Sustainability practises such as corporate sustainable indexes are emerging to measure sustainability performance, for example, the SRI on the JSE. These indexes urge companies to provide vital and timely information to both customers and shareholders about the environmental health and sustainability of their company. The growing need for information on corporate sustainability practice has led to improved disclosure requirements.

1.3.2 The importance of water in South Africa

As mentioned in the introduction, South Africa is facing a water crisis. This is proven through the estimation that South Africa will have a 17% gap between water supply and water demand by 2030, equating to 2.7 billion m^3 of water. The concern is not only on account of the scarcity of water, but also the quality thereof. This water *quality* crisis poses a great risk to South Africa's long-term supply of fresh water. Considering a water-constrained future, the impact of water shortages has a significant effect on any company's strategic planning and is therefore an issue that has to be addressed good and early. In summary, the way in which companies manage the available natural capital has an effect on the long-term viability of a company (Deloitte, 2012:16). A further aspect to consider is accounting for such natural capital.

1.3.3 Natural capital accounting

The concept of accounting for natural capital has been used for more than 30 years. To date, however, progress in moving beyond conceptual thinking towards practical implementation of natural capital valuation has been slow (World Bank, 2012:1). Natural capital is a critical asset, especially for developing countries such as South Africa, where it makes up a significant share (36%) of total wealth. The World Bank believes that by valuing the environment and incorporating natural capital into national accounts could support better decisions. Wealth accounting (including natural capital accounting) can provide detailed statistics for better management of the economy, such as accounts for the sectorial inputs of water and energy, and outputs of pollution that are needed to model green growth scenarios (World Bank, 2012:2).

The existing integrated reporting framework does not have specific requirements in terms of water reporting. The natural capital resource, which water is part of, could be addressed under various sections of the integrated report namely governance, corporate policies, environmental management systems, risk assessment, materiality assessment and key performance indicators.

1.3.4 KING III and water

The King Report on Governance for South Africa 2009 (King III) defines integrated reporting as a holistic and integrated presentation of a company's performance in terms of both its finance and sustainability. King III supports the notion of sustainability, but makes the case that it should be part of integrated reporting (IODSA, 2009:13).

King III urges companies to identify the future of their business in the context of an ever-changing social, economic and environmental landscape. Among many other governance recommendations, King III encourages companies to produce meaningful integrated annual reports by using the guidance set out by the GRI (Rea, 2012:4). According to King III, sustainability reporting parameters are not yet standardised as in the case of financial reporting, and the performance indicators reported on should be explained in terms of their implications and taking cognisance of available benchmarks. Many listed companies make use of the GRI guidance and also use the JSE SRI-index criteria as a guiding framework (IODSA, 2009).

Although the King III report indicates the importance of sustainability disclosure and emphasises the fact that it should be part of integrated reporting, no specific water disclosure requirements are recommended. As stated by Rea (2012:4), King III refers companies to use the GRI guidelines to assist in improving disclosure.

1.3.5 Global Reporting Initiative and water

The objective of the GRI is providing guidelines for the compilation of sustainability reports through a multi-stakeholder approach (Eccles & Krzus, 2010:103). Companies using the latest GRI guidelines, also referred to as the G4-guidelines, are required to perform a stakeholder-inclusive *materiality* assessment and report to this effect. Materiality assessment is discussed in the next section.

Guidelines provided by the GRI should form the foundation that companies can build on to improve their reporting and disclosure practices.

1.3.6 Reporting and disclosure requirements of natural capital

The integrated reporting framework does not have specific requirements in terms of water reporting. A study performed by the Association of Chartered Certified Accountants (ACCA) found that reporting on natural capital can be split into two main categories (ACCA, 2013): i) narrative reporting on strategy and management, and ii) performance reporting. Narrative reporting provides stakeholders with a *qualitative* understanding of a company's relationship to natural capital and the processes used to manage the various risks and opportunities associated with such a company's activities. On the other hand, performance reporting provides stakeholders with quantitative information, in the form of key performance indicators that can be used to track performance over time (ACCA, 2013:4).

ACCA (2013:4) further states that natural capital resources which water is part of, could be addressed under various sections in the integrated report through narrative disclosure, namely materiality assessment, governance, corporate policies, environmental management systems, and risk assessment. The various requirements under each section are discussed below.

Materiality assessment

Materiality according to IODSA (2002:9) is a measure or threshold against which information can be evaluated. An item is material if it is of such importance and has an impact that could substantially influence the assessments and decisions of the company or its stakeholders. In the context of sustainability, materiality is a more difficult measure to define and crisp judgement is therefore required. The materiality assessment ensures that company reports are not cluttered by excessive information, but instead focused on the topics that matter the most. By performing the assessment and disclosing it to the stakeholders demonstrates that only real important items are included in the reports.

As companies are faced with a wide range of sustainability reportable issues, it is crucial to ensure that the real materiality issues regarding natural capital, specifically water issues, are reported on.

Governance

When analysing the integrated reports, indications of having a director or senior staff member responsible for the company's sustainability programmes will demonstrate commitment and accountability (ACCA, 2013:4). Governance reporting should provide insight into which body in the company has ultimate oversight of water management and the mechanisms it uses to drive water related accountability (CDP, 2012:7).

Corporate policies

Disclosing sustainability policies is an effective method for companies to communicate their position on the subject, and policies that are agreed at board level serve as a way of focusing and aligning sustainability initiatives (ACCA, 2013:5).

Compliance with water related regulations as well as with voluntary standards or industry benchmarks may be used as a proxy for understanding a company's approach to managing water resources. Additionally, internally developed standards can pertain to a variety of water management topics, such as water use efficiency, quality parameters, level of water treatment, and operational management protocols. Reporting on these topics describe the nature of these standards, which entities within the business are encouraged and/or expected to meet (CDP, 2012:5).

Environmental management systems

Implementing an environmental management system (EMS) helps companies to reduce their environmental impacts, comply with applicable laws and regulations and continually improve their environmental performance. By operating under internationally recognised standards, such as ISO 14001, and communicating this to stakeholders, companies are able to demonstrate their commitment to improve their environmental performance (ACCA, 2013:5).

A corporate water management system could include the following information: i) how to improve operational water performance, ii) to understand how the company interacts with its surrounding basins, and iii) whether the company has a water strategy.

In the context of this study, focus will be placed on the disclosure within the SRI-indexed companies' integrated reports of water laws and regulations presented in the GRI guidelines,

CDP water disclosure requirements, ISO 14001 and the Water Act (Act 36 of 1998). The research method discussed in section 4 will provide more clarity on the empirical study conducted.

Risk assessment

Companies that are clear about the key risks facing their operations and the plans that they have in place to mitigate those risks, can demonstrate to their stakeholders their level of preparation for uncertainty. This is of particular importance to investors who will be able to assess how well a company is managed by reviewing the comprehensiveness of its risk assessments (ACCA, 2013:6).

Many companies are exposed to water-related risks that can negatively affect business viability over the short or long term. Water risks can be grouped into four general categories, namely physical risks, regulatory risks, reputational risks and other risks (CDP, 2012:5):

- *Physical risks* occur when there is water stress (too little water), flooding (too much water), or pollution (lower water quality).
- *Regulatory risks* involve issues such as water permits and allocation, rates controlling withdrawal and discharge quantities, and restrictions on pollutant types and levels.
- *Reputational risks* manifest when water availability and quantity give rise to tension between businesses and local communities.
- *Other risks* can arise from issues such as litigation related to water related compliance or from changing consumer attitudes around water efficiency.

When analysing the integrated reports, emphasis will be given to the companies' risk assessment in terms of their water issues, specifically those that have indicated that water is of extreme importance for their long-term survival.

1.4 RESEARCH METHOD

A post positivist approach has been followed in the design of this paper. The research method utilised was content analysis. This method was chosen because it is widely used in accounting research to reveal useful insights into accounting practices (Steenkamp & Northcott, 2007:12).This research can be classified as both quantitative and qualitative research. The data as it appears in the integrated and sustainability reports of the companies is

qualitative and quantitative in nature, and by comparing it with the water disclosure index it makes it possible to quantify the data or to add qualitative information.

The data is collected by obtaining the integrated and sustainability reports published by the companies listed on the JSE's SRI-index. A water disclosure index had been developed which was utilised as the measuring instrument in analysing the data. These reports were then compared to the water disclosure index to evaluate the level of reporting and disclosure by each company.

The population in this study comprises all the companies listed on the JSE SRI-index. The SRI-index requires three broad reporting categories namely environment, society and governance, and related sustainability concerns. In the environmental category the SRI-index classifies companies as a high, medium or low impact company (SRI, 2014:4). By means of quota sampling, this paper selected companies under the high impact category. The sampled companies and the sector they represent are presented in the next section.

1.5 RESULTS AND CONCLUSIONS

The sample group of companies' statements that were analysed comprised 37 companies. These companies have been classified into four groups referred to as sectors, namely i) basic materials, ii) mining, iii) industrials, and iv) consumer goods. Table 1 presents the number of companies analysed per sector.

Table 1: The number of companies analysed per sector

SECTOR	NUMBER OF COMPANIES
Basic Materials	5
Mining	17
Industrials	7
Consumer Goods	8
TOTAL	37

The results will be presented based on the companies' disclosure and reporting under the various sections of the integrated report namely: i) materiality, ii) governance, iii) corporate policies, iv) environmental management systems, and v) risk assessment. Lastly, an evaluation of the companies' overall disclosure will be presented.

The integrated and sustainability reports of the companies were analysed to identify whether water was highlighted as a *material* aspect in the respective companies. Table 2 presents the results per sector. In the mining sector 76% of companies identified water as a *material* aspect, followed by the basic materials sector with 60%. Taking cognisance of the scarcity of water in South Africa, it is crucial for all companies to acknowledge water as a potential material aspect. For example, one of the South African mining companies, Harmony Gold (Harmony Gold, 2013:5), mentioned in their integrated report that their operations use a significant amount of water, and that the growth of their assets depends on access to this resource.

Table 2: Materiality

SECTOR	**MATERIALITY**
Basic Materials	60%
Mining	76%
Industrials	43%
Consumer Goods	50%
Average %	62%

When considering *governance* as a section in the integrated report, two questions were posed and evaluated using the water disclosure index. The results are presented in table 3.

Table 3: Governance

SECTOR	**Basic Materials**	**Mining**	**Industrials**	**Consumer Goods**	**Average %**
GOVERNANCE Does the company have a director or senior staff member responsible for water disclosure programmes?	80%	94%	57%	88%	84%
Does the company have a water-related policy / policies?	80%	88%	43%	75%	76%

The mining sector indicated the highest commitment towards appointing a dedicated person responsible for water governance and this sector also indicated that water-related policies are in place. The next section of the integrated report that was evaluated was on disclosure and reporting of *corporate policies*. Table 4 presents the results on corporate policies and the evaluation thereof.

Table 4: Corporate policies

SECTOR	**Basic Materials**	**Mining**	**Industrials**	**Consumer Goods**	**Average %**
CORPORATE POLICIES					
Does the company have internally developed standards on water-related issues?	100%	100%	57%	100%	92%
Does the company comply with external standards on water such as:					
GRI	80%	100%	100%	75%	92%
CDP Water program	80%	71%	29%	63%	62%
King III	100%	100%	100%	100%	100%
ISO 14001	80%	82%	100%	63%	81%
The Water Act(36:1998)	20%	41%	0%	0%	22%

Companies in all sectors except the industrial sector, indicated in their integrated and sustainability reports that they have internal water-related standards. This finding emphasises that most of the companies illustrate commitment towards water stewardship.

The next question evaluated whether the companies comply with the key external standards applicable to water. These external standards are the GRI, CDP Water program, King III, ISO 14001 and the Water Act. The results indicated that most of the companies adhere to the disclosure requirements of the GRI. Although the basic materials (80%) and mining (71%) sector acknowledge the requirements as stipulated by the CDP Water program, an average of 62% of the companies take the requirements of the CDP Water program into consideration. It

is furthermore evident that the industrial sector conforms 100% to ISO 14001 requirements, while the Water Act is not well acknowledged by all the sampled companies.

The next section will present the results of whether a company has environmental management systems in place. Three questions were developed as part of the water disclosure index and were then analysed. The results are presented in table 5.

Table 5: Environmental management systems

SECTOR	**Basic Materials**	**Mining**	**Industrials**	**Consumer Goods**	**Average %**
Establish whether the company has *environmental management systems (EMS)* for water-related issues by identifying the following:					
Does the company have indications of improving operational water systems by applying internal measures?	100%	100%	86%	100%	97%
Does the company indicate that it understands the context in which it operates in terms of water stress, flooding, water quality and regulatory uncertainty?	100%	100%	57%	88%	89%
Has the company developed its own water strategy?	80%	100%	57%	100%	89%

It is evident that all the sectors except the industrial sector perform above average on all three questions. In the analysis of the various integrated and sustainability reports, it was clear that the mining sector fully understands and appreciates the context in which they operate. The mining sector is the only sector with a 100% score in all three questions. The last of the sections of the integrated report disclosure requirement is *risk assessment*. It is important that companies must identify water-related risks that could possibly affect their business. In table 6, the risk assessment of the companies are analysed in three categories.

Table 6: Risk assessment

SECTOR	Basic Materials	Mining	Industrials	Consumer Goods	Average %
Establish whether the company has *risk assessment* actions for water-related issues by identifying the following:					
Has the company identified physical risks such as flooding, water stress and pollution?	60%	100%	71%	100%	89%
Has the company identified regulatory risks such as water permits, rates controlling water withdrawal, discharge quantities and other restrictions?	100%	94%	29%	75%	78%
Has the company identified reputational risks such as tensions between businesses and local communities or businesses and other supply chain members?	60%	94%	14%	63%	68%

The mining sector performed the best of all three categories by identifying physical risks (100%), regulatory risks (94%) and reputational risks (94%). Only 60% of the basic materials sector identified physical risks, while the industrial sector was the worst performer in identifying regulatory and reputational risks.

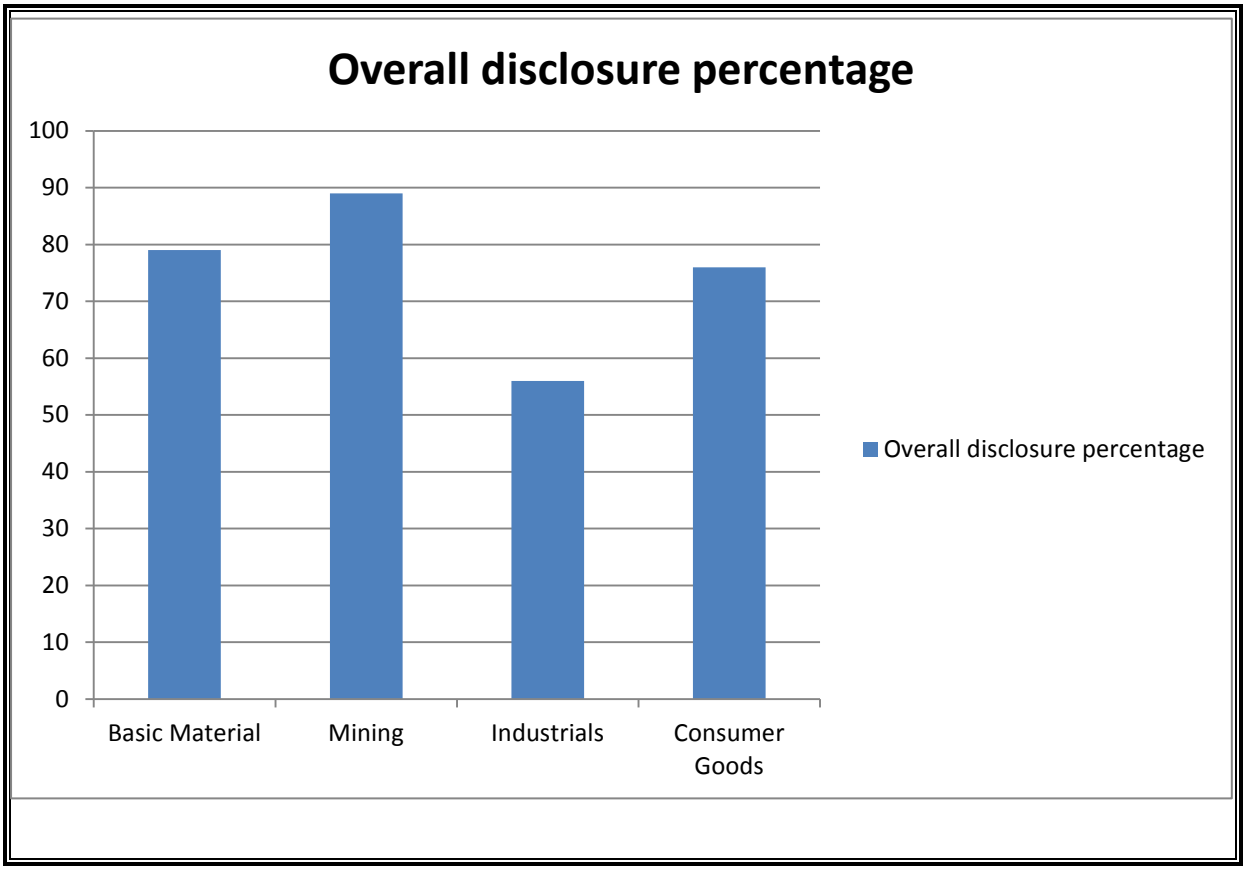
Physical risks are disclosed most frequently by all companies. Under this heading water scarcity was identified as the key risk which includes aspects such as the potential loss in quality of water and the resulting higher cost of water.

Under regulatory risks many companies identified that they have water use licences in place, but add that the renewal and application for licenses pose a potential risk.

Comprehensive disclosure about reputational risks was evident in the mining sector, with most of the companies identifying the influence of their operations on the community in terms of water quality and availability.

Finally, the companies' *overall* disclosure concerning materiality, governance, corporate policies, environmental management systems, and risk assessment was analysed. The overall percentage achieved by each sector is illustrated in graph 1.

Graph 1: Overall disclosure percentage per sector



As indicated in graph 1 the mining sector achieved the highest overall average of 89% while the industrial sector the lowest score of 56% overall.

Summarily, the *materiality* of water was of the greatest importance to the mining sector. Furthermore, with the exception of the industrial sector, it is evident that the companies are serious, transparent and responsible towards the *governance* of water. Many companies in the mining sector indicated that they have *corporate policies* including water management programmes and projects in place to manage the quality of water and to measure the consumption of water. The analysis of table 5 corresponds with the findings in table 2 that the mining sector has *environmental management systems* in place for water-related issues. While reviewing the reports, clear descriptions of the context in which these mining companies operate were provided. The mining companies also identified the water stressed areas of their operations.

1.6 CONCLUSION AND RECOMMENDATIONS

The main research objective was to evaluate the water-related reporting and disclosure practices of the sampled group of companies. It was evident from the study that not all the sectors disclose the required information to the same detail and depth. The results indicated that the mining sector outperforms the other sectors by disclosing and reporting the most detail on water-related aspects. The industrial sector on the other hand performs the worst.

As water is identified as a scarce resource and is perhaps the most important natural resource for human survival, more pressure should be placed on companies to disclose information about water-related issues. Investors and stakeholders are seeking detailed information on how companies address and manage water-related issues. In reviewing the integrated and sustainability reports of the sampled companies it is evident that in the narrative disclosure sections of the reports, companies do provide the *basic* disclosure items such as governance, corporate policies, EMS and risk assessment.

It is therefore recommended that companies could improve the relevance, depth and clarity of their disclosure on water. More detail could be provided on how companies are addressing the water risk they are facing. It is furthermore recommended that the developed water disclosure index be utilised by companies to evaluate whether they are complying with the disclosure and reporting requirements of external standards such as the GRI, CDP Water program, King III, ISO 14001 and the Water Act. Finally, although companies reported that they have targets for water consumption and recycling of water, most of these targets are not supported by quantified figures. By supporting the narrative information with quantified figures, the disclosure on water will be improved.

1.7 LIMITATIONS AND AREAS FOR FURTHER RESEARCH

The results of this study are limited by the fact that the focus was only on the SRI-indexed companies that were classified as companies that have a high impact on the environment. This limitation is an area identified for further research. The research study can therefore be expanded to include more companies. Companies that are not listed on the SRI, but on the JSE could be included. Further research could be performed by comparing SRI-indexed and those not listed on the SRI. Research on other important natural capital resources such as air and land could also be considered.

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Annexure 2: Journal submission guidelines

SA Business Review

Guidelines for contributors

The Southern African Business Review is a refereed and accredited journal of the College of Economic and Management Sciences of the University of South Africa. The *Southern African Business Review* is an open access journal and as of 2008, published in electronic form only.

Nature of contributions

The *Southern African Business Review* serves as a vehicle for the publication and dissemination of research in the fields of the economic and management sciences. Research contributions should conform to high standards of scholarly research inquiry. The following should at least be addressed: purpose/objective of the article, sound conceptualisation/theoretical foundation, statement of the research problem or hypothesis, research methodology (where applicable), analysis/discussion of research findings (where applicable) and conclusion.

Guidelines for manuscripts

1. Articles should preferably not exceed 7 500 words including tables, figures and graphs, using the font Times New Roman (12 point) and 1.5 line spacing. Authors should ensure that the contents of very short articles are substantial enough to warrant publication.
2. All tables, illustrations and figures should be incorporated in the body of the manuscript. The editor reserves the right to refuse publication of any submission for which the artwork is not of an acceptable standard.
3. Since the Southern African Business Review follows a policy of blind peer review, the first page of the text proper should carry the title of the article, but not the name(s) of the author(s).
4. A separate page should carry the title of the article, its author(s) and relevant biographical information, including full name, academic title, current position and institution (where appropriate). Postal and e-mail addresses should also be provided.
5. The article should be preceded by a single paragraph abstract of the article, not exceeding 200 words. The abstract should not form part of the text. A list of as many key words as possible should be submitted per article for cataloguing purposes.
6. The reference technique should be according to the Harvard method. For a practical example, see a recent issue of the Southern African Business Review. Recent issues are available at http://www.unisa.ac.za/sabusinessreview

Submission and review process

1. Manuscripts for the review process should be submitted by e-mail in MS Word to the address below.
2. Manuscripts will be submitted to independent reviewers. A policy of double blind peer review is followed. The editor will make the final decision whether to publish an

article.

3. If approved subject to revision, the manuscript will be returned to the author(s) who will make the necessary alternations/corrections. The final copy of the manuscript will then be returned to the editors. This copy should be submitted in MS Word by e-mail.
4. It is required that all authors have their draft articles reviewed for language proficiency before submitting them to the editors. Sometimes excellent submissions have to be drastically amended or even rejected because of linguistic ineptitude. The editors reserve the right to make minor editorial adjustments without consulting the author. The use of abbreviations should be avoided as far as possible.
5. Footnotes should be avoided. Endnotes may be use, which should be consecutively numbered and listed at the end of the text, before the list of references.
6. Publication fees of R1 500 are payable on the acceptance of the article. The author(s) will receive written acknowledgement of acceptance accompanied by an invoice for publication fees.

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ANNEXURE 3: WATER DISCLOSURE INDEX

RESEARCH ARTICLE 1: EVALUATING THE WATER-RELATED REPORTING AND DISCLOSURE REQUIREMENTS OF SOCIALLY RESPONSIBLE INVERSTMENT-INDEXED JSE-LISTED COMPANIES

		YES	NO
1.	**Materiality**		
	Does the company identify water as a material aspect?		
2.	**Governance** **Establish the awareness of *governance aspects* for water by identifying the following:**		
2.1	Does the company have a director or senior staff member responsible for water disclosure programmes?		
2.2	Does the company have water-related policy/policies?		
3.	**Corporate policies** **Establish whether the company has clear *corporate policies* on water-related issues by identifying the following:**		
3.1	Does the company have internally developed standards on water-related issues?		
3.2	Does the company comply with external standards on water such as:		
3.2.1	GRI		
3.2.2	CDP Water Program		
3.2.3	KING III		
3.2.4	ISO 14001		
3.2.5	Water Act (36:1998)		
4.	**Environmental management systems (EMS)** **Establish whether the company has *environmental management systems (EMS)* for water-related issues by identifying the following:**		
4.1	Does the company have indications of improving operational water systems by applying internal measures?		
4.2	Does the company indicate that it understands the context in which it operates in terms of water stress, flooding, water quality and regulatory uncertainty?		
4.3	Has the company developed its own water strategy?		

5.	**Risk assessment** **Establish whether the company has *risk assessment* actions for water-related issues by identifying the following:**		
5.1	Has the company identified physical risks such as flooding, water stress and pollution?		
5.2	Has the company identified regulatory risks such as water permits, rates controlling water withdrawal, discharge quantities and other restrictions?		
5.3	Has the company identified reputational risks such as tensions between businesses and local communities or businesses and other supply chain members?		

ANNEXURE 4: WATER DISCLOSURE INDEX

RESEARCH ARTICLE 2: ANALYSIS OF WATER RESOURCE MANAGEMENT DISCLOSURES IN SRI INDEXED JSE-LISTED COMPANIES

		Yes	No
1.	**Total water withdrawal by source**		
1.1	Does the company report the total volume of water withdrawn in cubic meters per year (m^3/year) from the following sources:		
	Surface water, including water from wetlands, rivers, lakes and oceans;		
	Ground water;		
	Rainwater collected directly and stored by the organisation;		
	Waste water from another organisation; and		
	Municipal water supplies or other water utilities.		
2.	**Water sources significantly affected by the withdrawal of water**		
2.1	Does the company report on the total number of water sources significantly affected by withdrawal of water taking the following into account:		
	Size of water source in cubic meters (m^3);		
	Whether or not the source is designated as a protected area (nationally or internationally);		
	Biodiversity value (such as species diversity and endemism, total number of protected species); and		
	Value or importance of water source to local communities and indigenous people.		
3.	**Percentage and total volume of water recycled and reused**		
3.1	Does the company report on the total volume of water recycled and reused by the organisation in cubic meters per year (m^3/year)?		
3.2	Does the company report the total volume of water recycled and reused by the organisation in cubic meters per year (m^3/year) as a percentage of the total water withdrawal reported under Indicator G4 – EN 8.		